**“WHERE HAVE ALL THE TRAPLINES GONE?”:
The Mercury Contamination of the English-Wabigoon
River System And Its Consequences on the
Ojibway of Grassy Narrows**

by

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A thesis submitted to
the Faculty of Graduate Studies and Research
in partial fulfillment of the requirements for the degree of

Master of Arts

Department of Geography
and Environmental Studies

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Abstract

This thesis evaluates whether or not the knowledge of the mercury contamination between the late 1960's and to 1973 has had an effect on the dietary habits and traditional subsistence practices of the Ojibway of Grassy Narrows. Of particular interest to this thesis is how the residents of Grassy Narrows have been made aware of dangers to their health as a result of the mercury contamination of the English-Wabigoon River System, and how they have responded to this information. The results of this thesis support the conclusion that knowledge of the mercury contamination of the late 1960's up to 1973 has had a severe effect on these Ojibway, which has resulted in a shift in their dietary habits and traditional subsistence practices. The mercury contamination of the English-Wabigoon River System was, however, not the sole cause for this change in diet and the resulting economic, social, cultural and health impacts. The relocation of this community, the subjection of its children to the residential school system, and the mercury contamination all contributed to the adverse effects that have been affecting this community for the past thirty-two years.

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Table of Contents

ABSTRACT.....	II
TABLE OF CONTENTS.....	IV
LIST OF TABLES AND FIGURES	VI
CHAPTER 1 INTRODUCTION.....	1
THESIS GOAL	2
RELEVANT QUESTIONS	3
RELEVANT PREVIOUS STUDIES	5
HOW THIS THESIS DIFFERS FROM PREVIOUS STUDIES	11
THESIS ORGANIZATION:	12
HOW THIS STUDY FITS INTO THE DISCIPLINE OF GEOGRAPHY.....	13
METHODOLOGY	15
CHAPTER 2 THE HISTORY OF THE OJIBWAY	18
PREHISTORY OF THE OJIBWAY	18
THE RECENT HISTORY OF THE OJIBWAY	19
OLD RESERVE LIFE.....	24
LIFE ON THE TRAPLINES	26
RELOCATION IN 1963.....	30
LIFE ON THE NEW RESERVE	36
CHAPTER 3 THE POLLUTION OF THE ENGLISH-WABIGOON RIVER SYSTEM.....	39
THE DISCOVERY OF MERCURY CONTAMINATION OF THE ENGLISH-WABIGOON RIVER SYSTEM	39
EFFECTS OF MERCURY CONTAMINATION OF THE NATURAL ENVIRONMENT	40
HEALTH RISKS ASSOCIATED WITH MERCURY AS A RESULT OF THE CONTAMINATION OF THE ENGLISH- WABIGOON RIVER SYSTEM.....	41
THE INITIAL GOVERNMENT RESPONSE	42
ASSESSING THE RISK OF MERCURY CONTAMINATION.....	45
HEALTH EFFECTS.....	48
CHAPTER 4 THE IMPACT OF INFORMATION DISTRIBUTION ON THE RESIDENTS OF GRASSY NARROWS	52
INFORMATION DISTRIBUTION BY THE ONTARIO MEDICAL SERVICES AIMED AT IMPROVING LOCAL HEALTH.....	54
CONSEQUENCES OF THE DISTRIBUTED KNOWLEDGE ON LOCAL FOOD CONSUMPTION AND TRADITIONAL STRUCTURES.....	56
THE FISH HOUSE AS AN ALTERNATIVE SOURCE OF FOOD	58
GOVERNMENT CONSULTATION AND INFORMATION DISTRIBUTION IN RECENT YEARS.....	61
WHAT THE PEOPLE OF GRASSY NARROWS KNOW TODAY	63
CHAPTER 5 MERCURY CONTAMINATION AND DIABETES.....	71
DIABETES.....	72
SYMPTOMS OF DIABETES AND ACUTE MERCURY POISONING	79
<i>Dietary Scenario #1</i>	82
<i>Dietary Scenario #2</i>	83

CHAPTER 6 CONCLUSION.....	85
TANGIBLE EFFECTS OF THIS STUDY FOR THE HEALTH OF THIS COMMUNITY.....	88
BIBLIOGRAPHY	91
APPENDIX A: MAPS.....	93
MAP 1 THE SETTLEMENT MOVEMENTS OF THE OJIBWAY OF ONTARIO.....	93
MAP 2 THE CURRENT LOCATION OF GRASSY NARROWS (INCLUDING THE LOCATION OF THE ENGLISH-WABIGOON RIVER SYSTEM).....	94
MAP 3 GRASSY NARROWS TOWN MAP	95
APPENDIX B: CHARTS	96
FIGURE 1.1 CHRONOLOGICAL CHART OF ACTIONS TAKEN BY THE PROVINCIAL AND FEDERAL GOVERNMENTS IN RESPONSE TO THE MERCURY CONTAMINATION OF THE ENGLISH- WABIGOON RIVER SYSTEM	96
FIGURE 1.2 VARIOUS MERCURY LEVELS (TOTAL MERCURY)* IN HUMAN BLOOD AND HAIR:	97
APPENDIX C: PHOTOGRAPHS.....	98
FIGURE 2.1 FROZEN FISH FROM LAKE ATHABASCA (AVAILABLE AT THE GRASSY NARROWS FISH HOUSE).....	98
FIGURE 2.2 THE HUDSON'S BAY STORE AT ITS CURRENT LOCATION	99
FIGURE 2.3 (LOON CLAN).....	99
FIGURE 2.4 (CRANE CLAN).....	100
FIGURE 2.5 (FISH CLAN)	100
FIGURE 2.6 (MARTEN CLAN).....	101
FIGURE 2.7 (BIRD CLAN)	101
FIGURE 2.8 (HOOF CLAN)	102
APPENDIX D: SURVEY MATERIALS.....	103
FIGURE 3.1 FOOD PURCHASES PER WEEK OF SELECTED ITEMS IN THE HBC STORE IN GRASSY NARROWS – DATED ON 1972-73 DATA.....	103
FIGURE 3.2 SAMPLE SURVEY QUESTIONNAIRE UTILIZED IN THE SURVEY ADMINISTERED TO GRASSY NARROWS RESIDENTS IN JULY OF 2000	104

List of Tables and Figures

Table 1 -	The Clan System of the Ojibway	27
Figure 1 -	Description of Lifestyle Changes and Community Responses by 64 respondents.....	65
Figure 2 -	The Impact of the Knowledge of Mercury Contamination on Diet.....	69
Figure 3 -	The Incidence of Diabetes in Grassy Narrows.....	77

Chapter 1 Introduction

This thesis addresses a situation that is faced by the Ojibway of Grassy Narrows as a result of the mercury contamination of their surrounding environment. The Ojibway are a First Nation who are also known as the Anishnabe, which means ‘the people’. They are Canadian Indigenous people who reside primarily within the boundaries of the province of Ontario and a portion of eastern Manitoba. While the Ojibways’ territory used to cover most of southern Ontario, this changed in the mid-17th century when the Ojibway were forced into the north of Ontario by another Indigenous people known as the Iroquois. Today there are still Ojibway living in southern Ontario. However, the majority now reside in the north of Ontario (Appendix A, Map 1).

The Ojibway of Grassy Narrows are located on the English-Wabigoon River System. They are part of the Winnipeg Saulteaux group of Ojibway (Appendix A, Map 2) that inhabits the area north of Lake of the Woods and south of Lake Winnipeg. The English-Wabigoon River System (Appendix A, Map 2), is one of Canada’s most polluted waterways (Donnan, 1986: 1). As we shall see in this thesis, the pollution of the English-Wabigoon River system, which took place from about 1961 to 1970 (Shkilnyk, 1983:5), has resulted in the contamination of fish and wild animals that residents of Grassy Narrows have long included in their diet. The way in which information pertaining to this situation was distributed to members of this community appears to have been inadequate, with the result that the health of the people of Grassy Narrows has suffered.

I first became aware of the pollution of the environment of the Ojibway community at Grassy Narrows in 2000 when I attended a demonstration against the clear-

cutting of northern Ontario forests on Parliament Hill in Ottawa. It was here that I met Judy Dasilva and Steve Fobister of the Ojibway Community of Grassy Narrows. After a lengthy discussion with them, both individuals expressed extreme concern about the health situation of their community members. They attributed this situation to the mercury contamination of their surrounding environment, which had begun to be recognized in the late 1960's and early 1970's. However, neither individual could tell me how high current mercury contamination levels were, nor could they tell me how much other members of their community knew about mercury contamination and its impact on their environment and their health. With respect to the health of Grassy Narrows residents I am speaking of the incidence of diabetes within their community or in terms of the impact of mercury poisoning on this community's residents. Both of these individuals, however, said they believed that the mercury contamination of the region was not only having a severe impact on their community in terms of the health of its members, but also on their ability to continue their traditional reliance on fish and wild animals and related modes of behaviour.

Thesis Goal

As a result of this conversation and my subsequent discussions with the Chief and Council of the Grassy Narrows First Nation, this study has been designed to determine the extent to which the residents of Grassy Narrows are currently aware of the mercury contamination of their environment, its effect on their health and the impact that contamination has had on their traditional subsistence practices. Toward this end, this

thesis considers how the information pertaining to the mercury contamination within the traditional diet of the Ojibway of Grassy Narrows has been distributed to this community's members, including how this information has been 'delivered' to them by outside 'experts'. I am concerned with the nature of the knowledge that Grassy Narrows community members have about the contamination of their environment and its dangers for their health, and, specifically, the extent to which they have altered aspects of their dietary habits and traditional economic practices as a result of such knowledge. A number of specific questions inform the discussions in the following chapters, including the following.

Relevant Questions

- When did the environment become polluted and how did the pollution affect wild foods (also known as country foods), people's health, and their ability to rely on wild foods?
- How have the people of Grassy Narrows been made aware of the pollution of their environment by mercury poisoning and the resultant contamination of their traditional food supply? Specifically, what actions have been taken by relevant government officials and community leaders in order to protect the health of Grassy Narrows residents?
- How have the residents of Grassy Narrows 'processed' this information about mercury pollution and the contamination of their traditional food supply, and how have they responded to protect their health?

This thesis will also address the extent to which other factors have exacerbated the consequences of mercury poisoning on people's health and traditional subsistence practices. As we shall see, the contamination of fish and wild animals has not been the only source of change for the people of Grassy Narrows over the past thirty-two years.

Relocation of Grassy Narrows residents from an earlier reserve to their current location, the impact of residential school, and, very significantly, the increased reliance on southern, store-bought food products also have had an impact on the health and traditional practices of this community.

As the above questions indicate, a major question in this thesis addresses how mercury contamination has affected the ability of this community to maintain a mode of economic life that includes the trapping of wild animals, fishing in local waters, and associated social relations and settlement forms that derive from their indigenous culture's traditions. By focusing on how people are made aware of dangers to their health and, in particular, the extent to which they have integrated such information into their own understandings of the world, I hope to provide an analysis that sheds light on the complex relationship between what people believe and their consequent behaviour. That is to say, my goal is to provide an analysis that takes into account the way in which outsider or 'expert' information is articulated with local forms of knowledge and cultural practices, and the extent to which such articulations either promote or work against the health and well-being of local residents.

The information and analysis presented in this thesis will hopefully assist the Grassy Narrows First Nation in attaining a better understanding of how the environment surrounding the Ojibway community located at Grassy Narrows has been contaminated by the release of inorganic mercury, and how this has had an ill effect on their health. Such an understanding is essential as this community works to limit the impact of

mercury contamination on their health and traditional activities related to subsistence practices.

Relevant Previous Studies

In this section I discuss five publications that are especially relevant to my study. I begin with Usher, Anderson, Brody, Keck and Torrie, whose 1979 report The Economic and Social Impact of Mercury Pollution on the Whitedog and Grassy Narrows Indian Reserves, Ontario was commissioned by the Anti-Mercury Ojibway Group (AMOG). According to Peter Usher the name for this group was also chosen as the word 'amog' in the Ojibway or Anishnabe language means 'bee'. AMOG was formed in 1975 by the Grassy Narrows and White Dog reserves in response to the mercury pollution of the region in order to aid in a 1976 legal action pertaining to the contamination of the English-Wabigoon River System in 1976. AMOG in co-operation with the two affected reserves commissioned this report as an "...inquiry into the significance and meaning of the fishery to the two reserves, and the social and economic consequences of its loss" (Usher et al., 1979: 4)). This report stated that

an estimated 20,000 lbs. of mercury [was released] into the river...Fish tested in 1970 in Clay Lake had mercury levels as high as 16 ppm., far exceeding the standard of 0.05 ppm set by the World Health Organization and accepted as the Canadian limit. Thus although Dryden Chemicals reduced its mercury discharges in 1970 and eliminated the use of mercury in its processing completely after 1975, large quantities of the metal remain in the sediment of the river system and will continue to affect the health of persons consuming fish from the contaminated waters for many years in the future. (Usher et al., 1979: 220)

It was ascertained that the mercury contamination of this river system would continue to affect those individuals consuming contaminated fish indefinitely (unless the mercury was removed from the waters). Usher et al. (1979) further stated that soon after tests on community residents were completed in 1970, concerns about the dangers of excessive fish consumption were heard, although conflicting views on the severity and longevity of the risk continued to be aired. In 1970, the provincial government did not place restrictions on sport fishing, although several lodges, such as the nearby Ball Lake Lodge, closed down due to adverse publicity that resulted due to immediate issuing of a pollution control order by the provincial government against the Reed Paper Co. at Dryden (which had been the company that for years routinely discharged mercury as industrial waste into the river system). This order also banned commercial fishing on nearly 200 km of waterway downstream (Usher et al., 1979: 1). For a detailed and chronological overview of the actions taken by the provincial and federal government in response to the mercury contamination of the English-Wabigoon River System, please refer to Appendix B, Figure 1.1.

Anastasia Shkilnyk's 1983 report titled Final Report: Taskforce On Organic Mercury in the Environment - Grassy Narrows and White Dog provides the background to the issue of the contamination of the English-Wabigoon River System, as well as a summary of the dietary habits and communication problems experienced with community members between 1970 and 1973. This report further provides a history of mercury contamination in humans (by providing the previously recognized cases of Japan, Iraq, West Pakistan, Guatemala, and New Mexico). She further uses these studies to compare

them to the effects of the mercury contamination on the residents of Grassy Narrows. In her report Shkilnyk outlines that extensive testing was conducted on each affected individual of Grassy Narrows. She does, however, fail to state how many individuals were tested, the reason for the testing of these particular individuals and what the results of these tests in relation to the total population were. What is of particular interest in this report is that Shkilnyk here provides data from the USA, Canada, Sweden, Finland, and Japan, regarding the various mercury levels in human blood and hair and what is considered to be safe or unsafe (Appendix B , Figure 1.2). She states that the results are remarkably similar in the setting of blood and hair levels for mercury (Shkilnyk, 1983:7). She further provides an account of the actions regarding this matter of the province of Ontario's, Medical Services, those by the Task Force On Organic Mercury in the Environment, as well as those of the Federal Government. This report also outlines a number of proposals to address the problems experienced by the two communities in question. These proposals include ongoing health programs that were to be monitored by the provincial government, the surveillance of methyl mercury in the environment, as well as other programs such as a clinical testing program, and making available local medical practitioners that have to be "...reminded and updated on the current status of the methyl mercury situation at regular intervals, and their co-operation resolicited" (Shkilnyk, 1983: 15). This report was preceded by her 1981 report titled Government Indian Policy and its Impact on Community Life: A Case Study of the Relocation of the Grassy Narrows Band.

Anastasia Shkilnyk's also authored a book entitled A Poison Stronger Than Love - The Destruction of an Ojibwa Community, which was published in 1985. In this book she portrays the Ojibway of Grassy Narrows as a community in desperate trouble. The author does not deny that this community was most certainly affected by the mercury contamination of the region. She does, however, state that the 1963 relocation of this community, prior to the contamination of the region, was the predominant reason for the desperate situation in which this community continued to find itself. Shkilnyk focuses in particular on the 1963 relocation of this particular community as she seems to believe that the root cause for this community's problems is the relocation from the old reserve to the new reserve. According to Shkilnyk, this relocation further resulted in extreme conditions of alcoholism. Shkilnyk goes into great detail with the problems that were being experienced by community members such as the manner in which housing on the new reserve is spaced. The spacing of the new housing didn't take into account the manner in which this community had lived in the past. As a result community members now found themselves living very close to members of other families with whom they would normally not have had close contact with. She also addresses how clan alignments are mixed up on the new reserve and how this further disturbs the traditional way of living of this particular community. As a result of these conditions she concludes that "...the Ojibwa of Grassy Narrows are a truly broken people" (Shkilnyk, 1985: xv).

Jack A. Donnan's 1986 report Mercury Pollution in the Wabigoon-English River System - A Socio-Economic Assessment of Remedial Measures is a comprehensive socio-economic assessment of the proposed remedial actions regarding the situation that

residents of Grassy Narrows have had to face as a result of the mercury contamination of their surrounding environment. The remedial measures that were proposed by Donnan are the following:

- the continued monitoring of mercury levels in local residents
- the continuation of the fish consumption program
- a pilot project for semi-continuous resuspension of non-mercury contaminated sediment which proposes a variation developed by the Steering Committee on the clay covering option presented in 1982 into the system at critical points - this should be conducted and assessed thereby reducing the bio-availability of mercury by resuspension of clean sediment
- the dredging of the river between Dryden and Clay Lake (to remove mercury contaminated sediment)
- the flushing of the river the covering of contaminated sediment with clean sediment (Donnan, 1986: 34 - 35)

This report was commissioned by the Northwestern Regional Office of the Federal Ministry of the Environment. In this report Donnan further outlines the following specific objectives:

- to identify and quantify, to the extent possible, the potential beneficial consequences of the proposed remedial measures and associated economic values
- to specify which agencies, groups and/or regions would enjoy the benefits and costs ; and to compare the benefits and costs in an appropriate manner (Donnan: 1986: ii).

In this report Donnan concludes that

...the key finding of the study is that any benefits would only be derived if the remedial measures caused an acceleration of the natural decline in the levels of mercury contamination in fish that has been occurring over the past decade...[and that the u]ses and activities associated with the rivers and lakes that do not involve fish, including the use of water for drinking, are not affected by the mercury contamination (Donnan, 1986: ii).

Donnan continues this line of thought by stating that

...despite the extensive investigations carried out by federal and provincial scientists, reliable estimates could not be provided...of the rate of decline in mercury concentrations in different fish species due to the remedial actions, and...[nor could they be provided] of when, or if ever, average

mercury concentrations in each fish species would achieve a desired level (e.g., 0.5 ppm [parts per million] for commercially caught fish) (Donnan 1986: iii).

Further findings include that any benefits outlined in his report, such as reduced physical and mental health risks, increased commercial fishing opportunities, increased food-fishing, increased enjoyment of sport fishing and the resulting increase of tourism in the area, as well as social benefits in terms of reduced social disruption to local residents, would only be realized if the proposed remedial actions were successful in accelerating the reduction of mercury contamination in the fish of the region. None of these measures was ever followed up on by the provincial or federal governments.

In 1990, Usher, Torrie, Anderson, Brody and Keck produced the report titled Mercury Contamination of an Indian Fishery in Subarctic Canada, which was submitted to Society and Natural Resources on November 8, 1990, to highlight the manner in which the mercury contamination of the English-Wabigoon River System has affected the northern Ontario Ojibway communities of White Dog and Grassy Narrows from the time that these two communities experienced the effects of mercury contamination and became aware of the reasons for these effects. Within this report, Usher et al. (1990) summarize the history of these two communities in terms of the history of their subsistence lifestyles, their industries such as fishing and trapping, as well as the economic losses that occurred as a result of the closure of their commercial fisheries. This is further complemented by an analysis of the health effects of the mercury contamination of the region, the social effects of the issue, and the developments since 1979 (including the creation of the Mercury Disability Fund). Usher et al. (1990)

conclude their report with the finding that severe economic losses occurred as a result of the contamination of the region and that the response to this situation must consist of "... something more than cash, because what is lost is not simply livelihood, but community and competence" (Usher et al., 1990: 16). Usher et al. (1990) further state that in "...the case described, the fishery was the embodiment of a system of human relations. Restoration of the fishery in some form, and perhaps even more importantly replacement of the support it provided to the social system, was the most fundamental need, but one which remains unfulfilled" (Usher et al., 1990: 16).

Two additional reports relate directly to this thesis. These reports are Togwell Jackson's 1980 report titled Mercury Pollution in the Wabigoon-English River System of Northwestern Ontario, and Possible Remedial Measures and Ignatius E. La Rusic's A Report on Mercury in the Environment in the Communities of White Dog and Grassy Narrows: The Dietary Aspects and Problems of Communicating with the Local Populations and will also be drawn on in subsequent chapters.

How this thesis differs from previous studies

This thesis differs from the above works in that it addresses the present situation experienced by the residents of Grassy Narrows. However, the above reports and books are taken into consideration in this thesis. A particularity of this thesis, which further distinguishes it from the above works, is that its focus is on the manner in which information pertaining to the mercury contamination of the English-Wabigoon River System was received by the residents of Grassy Narrows, and how that information was and continues to be processed by them.

Thesis Organization:

The thesis is organized as follows. Chapter 2 provides an introduction to the Ojibway of Grassy Narrows, including a brief outline of their history and their cultural practices both before their relocation to their present site in 1963, and after their relocation. I will pay particular attention to their relationship with the natural environment prior to 1963 and the nature of their traditional subsistence practices.

Chapter 3 provides background information regarding the pollution of the English-Wabigoon River System due to the release of inorganic mercury by a chloralcali plant at the Dryden Paper Mill during the late 1960s and early 1970s. Chapter 3 will then review the initial government response to the problem, as well as the evidence that mercury poisoning has had serious consequences for people's health, with particular reference to the people of Grassy Narrows.

Chapter 4 will continue the discussion of the impact that the contamination of the English-Wabigoon River System has had on the Ojibway community of Grassy Narrows, with particular reference to their dietary habits and related economic patterns, as well as to efforts by outside 'experts' aimed at informing this community of the risks to their health. This chapter will also attempt to determine whether or not information about mercury contamination that has been distributed to the Ojibway of Grassy Narrows has provided an effective aid for this population to minimize the intake of mercury. In Chapter 4, I am especially concerned with the question of what local residents of Grassy Narrows now know regarding the reasons for their ill health and how they have articulated such information within their traditional knowledge. For example, I will

consider to what extent local residents now attribute their ill health to the contamination of their traditional supply of local wild foods, and to what extent they have altered their diet as a result of their knowledge of the contamination of these local wild foods. As we shall see in Chapter 4, since 1970, the Ojibway people of this community have altered their traditional diet to varying degrees, although their reasons for doing so have not been solely the result of informed understandings of the contamination of their traditional supply of wild foods. Moreover, the evidence suggests that a number of developments, including some awareness of the effects of mercury contamination, have resulted in a change from a diet consisting of wild foods to one that now consists predominantly of store-bought foods, which are extremely high in carbohydrates.

In Chapter 5, we shall see that the evidence suggests that this shift in people's diet has not been an adequate solution to the problem of contaminated wild foods, but instead it has had a detrimental effect both on the community's health and on their traditional cultural practices. In Chapter 5 in particular, we will further find that diabetes has become an additional health concern for this community.

Chapter 6 will provide a summary of my findings and will consider briefly the extent to which the research for this thesis may serve to improve the health situation for community residents of Grassy Narrows.

How This Study Fits Into the Discipline of Geography

In their book The Dictionary of Human Geography, Agnew, Livingstone and Rogers state that the discipline of geography is "...an empirical discipline, concerned

with understanding the world and transmitting that understanding to a wider audience" (Agnew et al., 1996: 5). Agnew et al. continue by stating that geography addresses the concrete questions of where and under what conditions a wide range of phenomena connected to the Earth and its occupation occur, and that this discipline furthermore includes recourse to theoretical concepts (Agnew, Livingstone, and Rogers, 1996: 5). What I believe characterizes geography as a discipline is that it involves an applicable, hands-on and on-the-ground approach, which trains individual geographers to think in terms of the practicality and usefulness of their work. A further way of viewing the practicality of this discipline is introduced by Agnew et al., in the manner in which this discipline can be examined in terms of its commercial, political and geopolitical uses. I believe that this multilateral approach allows geographers to make many linkages, which are generally not found in other, more isolationist disciplines.

The preceding paragraph certainly attempts to answer what geography in general strives to accomplish. This study, however, makes particular use of human geographical approaches, which examine

...the patterns and interactions of human culture, both material and non-material, in relation to the natural environment. This thesis follows what Johnston outlined as Sauer's concept of the new human geography, which grounds the idea of culture in social relations of production and reproduction (Johnston, 1994: 112).

In The Dictionary of Human Geography, Cosgrove states that Sauer's theories eventually led to ideas pertaining to cultural geography that were expressed in the 1960's. These ideas placed special emphasis on culture, communications and environmental relations and further enabled me to study the impact of the knowledge of the mercury

contamination of the English-Wabigoon River System on the Ojibway of Grassy Narrows. This gave me the ability to provide the Ojibway, as an 'other', with one of many avenues to make themselves heard and to be included in a discourse that has traditionally excluded them from consideration in the Western social sciences, the humanities, Western scientific thought and in the international political arena.

The notion of 'othering' originated with Edward Said's book Orientalism (1979), which has had a significant impact on the discipline of geography as the process of 'othering' a particular segment of the world, or of a particular society, is often resource or culturally based. The notion of 'othering' becomes a useful focus for analysis in order to understand areas such as development, ethnicity, gender, and indigenous peoples within the field of geography.

I chose the discipline of geography in order to conduct this study due to the fact that Geography employs a wide variety of approaches. For me, it's interdisciplinary nature represented the perfect vehicle by means of which I was given the privilege to study and tell the story of the Ojibway of Grassy Narrows.

Methodology

For the purpose of this study I spent the month of July 2000 living in the Ojibway community at Grassy Narrows. During this period I conducted 45 interviews with community members and I administered a survey that had a 53% response rate (110 households of 208 households). These interviews and this survey were components of a multiple research strategy, which also made use of secondary sources from environmental

and health studies. These were assessed critically as some of them may not have been conducted in an objective manner. The interviews that were conducted in Grassy Narrows included both men and women because "...neither men nor women alone can fully represent the knowledge of their community" (Grenier, 1998: 39). I also conducted interviews with individuals who belong to various age groups.

These interviews were conducted in a place of the interviewed person's choice in order to ensure that these individuals were not disturbed during their daily activities and that they were comfortable for the duration of the interview. These interviews were conducted in a loosely structured and conversational manner, although the 'question-answer format' was also employed when it seemed appropriate (Grenier, 1998: 39). These above-mentioned interviews were taped, if written permission to do so was obtained from the individual. As it turned out, twenty-eight of the interviews were taped because many of the interviewees wanted their statements to be part of an official record.

My methodology was also part of a participatory action research strategy, which foregrounds a focus on community concerns. My goal as a researcher was "... to work closely with participants to define problems, explore alternative solutions, and facilitate change" (Law, 1997: 38). I did work closely with Chief Bill Fobister, Councillor Steve Fobister and a local resident by the name of Judy DaSilva. With them I was able to identify a specific set of issues regarding the knowledge (or lack thereof) of the mercury contamination of the surrounding environment of the Ojibway of Grassy Narrows. The specific issues that we identified included the consequences of changes in the dietary habits of local residents since the pollution of the English-Wabigoon River System,

including health effects such as an increased incidence of adult onset diabetes and changes in previous cultural/economic practices.

Chapter 2 The History of the Ojibway

Prehistory of the Ojibway

In order to understand the current situation of the Ojibway, it is important to have an understanding of the prehistory as well as the recent history of this nation. According to the anthropologist and ethno-historian Charles Bishop, who authored the book The Northern Ojibwa and the Fur Trade, the Ojibways'

...pre-contact institutional structures were closely adjusted to the resources upon which they depended for their survival. As the environment changed and became depleted of certain key resources, the result of overhunting or movement into a different geographical zone within the historical period, the Ojibway were often forced to give up old patterns in order to survive (Bishop, 1974: 3).

Bishop further states that the Ojibways' language "...is one of several belonging to the group known as Central Algonkian" (Bishop, 1974: 3). Bishop continues by stating that there existed a

...general agreement on the approximate boundaries of the Ojibwa[y] in eastern, southeastern, and southwestern regions, their occupation of the area north and northwest of Lake Superior, however, has been a controversial subject among recent scholars...Some scholars believe that the prehistoric Ojibwa[y] occupied the same general area in northern Ontario as present, while others have provided data that indicate that a major migration has taken place within the historical period (Bishop, 1974: 4 - 5).

According to Bishop the historical evidence seems to support the latter of the two theories. He further suggests that migration from the shores of Lake Superior did occur as, "...all evidence suggests that the Ojibwa[y] at contact occupied an area from the east end of Georgian Bay on Lake Huron to Michipicoten Bay on the northeast shore of Lake Superior" (Bishop, 1974: 5).

Bishop elaborates on his account of the Ojibways' pre-contact era as being one of a "...rich and varied economy which permitted a semi-sedentary life. During the warmer months of the year, they resided in villages ranging in size from 100 to 300 persons. There seem to have been about twenty or more such villages or groupings, suggesting an aboriginal population of perhaps 4,500 persons" (Bishop, 1974: 7). Bishop continues by stating that such groups "...communally exploited hunting and fishing zones sharing the results of their efforts" (Bishop, 1974: 7 - 8).

The Recent History of the Ojibway

The name Ojibway is derived from the word ojib or Ojibwa, which means literally 'puckered, or drawn up'. The name Ojibway seems to derive from a peculiarity in the make or fashion of their moccasin, which has a puckered seam lengthways over the foot, and which is termed the O-jib-wa moccasin (Warren, 1984: 36). Another theory suggests that the name was derived from the history of warfare between the Ojibway and other First Nations. William W. Warren authored a book titled History of the Ojibway People that was first published in 1885 and was republished in 1984. His work represents one of the first accounts on the Ojibway peoples. Warren states that the word Ojibwa means 'to roast until puckered up', and that the Ojibway peoples used to "...secure captives, whom under the uncontrolled feelings incited by aggravated wrong, and revenge for similar injuries, they tortured by fire in various ways" (Warren, 1984: 36). Thus they are said to have roasted their captives until they 'puckered up'. Warren stated in 1885 that the Ojibway as a nation are Algonquian peoples, who

...are scattered over, and occupy a large extent of country comprising all that portion of the State of Michigan lying north of Green Bay and west of the Straits of Michilimackinac, bordering on Lake Superior, the northern half of Wisconsin and the northeastern half of Minnesota Territory. Besides this they occupy the country lying from the Lake of the Woods, over the entire north coast of Lake Superior, to the falls of St. Mary's and extending even east of this point into Upper Canada. They literally girdle the great 'Father of Lakes,' and the largest body of fresh water in the world may emphatically be called their own, Ke-che-gum-me, or 'Great Water.' They occupy, through conquest of war against the Dacotas, all those numerous lakes from which the Mississippi and the Red River of the North derive their sources. (Warren, 1984: 37-38)

Further research uncovered that to the French the Ojibway were also known as the "...Saulteurs," which was anglicized into Saulteaux, from their residence around the rapids at the eastern end of Lake Superior (Dunning, 1959: 3). The Ojibway were heavily influenced by the European fur trade. "From the mid seventeenth century...until Lord Selkirk's Treaty of 1817 with the 'Chiefs and warriors of the Chippeway or Saulteaux Nation south of Lake Winnipeg, the Ojibway moved constantly westward with the European traders and garrisons" (Dunning, 1959: 3). During this time the Ojibway

...first traded furs with the French, then became carriers for the French and for their successors, the Nor' Westers, and finally moved into the lands of the Cree, Sioux and Assineboine on the river route west of the lakehead, settling down as permanent hunters and trappers (Dunning, 1959: 3).

According to Dunning, from the eighteenth century the Ojibway experienced a growing dependence on commercialism. He further states, however, that

...there were many groups whose hunting territories were remote from developing areas, and who therefore remained for a long period almost completely isolated from the new civilization. Moreover, some families migrated from centres of population, such as the Lake Winnipeg area, to seek unused lands to the north (Dunning, 1959: 4 - 5).

Dunning further states that, according to his sources, "...these people remained relatively remote from the traffic that passed through Lake Winnipeg [as well as other routes] by way of the well known canoe routes...Such contact as they had with European civilization seems to have reinforced their own way of living" (Dunning, 1959: 5).

Dunning continues by stating that "...while the fur-trading posts were the original focal point for the mediation of changes in the technology of these [First Nations] through their acquisition of firearms,...nevertheless the demand for fur supported and encouraged the perpetuation of their aboriginal ecological adaptation...hunting" (Dunning, 1959: 5).

According to Bishop the

...fur trade and missionary influences had probably reached the Ojibwa[y] by 1610, first indirectly through other intermediate tribes such as the Ottawa and Huron, and by the 1620's directly through Europeans themselves...After 1641, large gatherings of Ojibwa[y] and other tribal groups often numbering 1, 500 souls collected near Sault St. Marie to exchange fur pelts and material commodities (Bishop, 1974: 8).

Bishop continues that "...these large gatherings lasted only a few weeks in the summer so that individual group and tribal autonomy was not seriously threatened. For much of the year the Ojibwa[y] groups continued to hunt and fish in their traditional territories"

(Bishop, 1974: 8). According to Bishop, the fur trade began "...in the early 1500s when European fishermen began taking fur bearers in the St. Lawrence drainage area" (Bishop, 1974: 108). This trend continued until the end of the 1600s, when "...two French traders, Radisson and Groseilliers, subsequently associated themselves with the English leading to the formation of the Hudson's Bay Company in 1670 thereby giving the English a monopoly of the trade in the Hudson Bay Drainage area (Prince Ruperts Land)"

(Bishop, 1979: 109). It was within this time period that the Ojibway made contact with the traders of the Hudson's Bay Company.

The current Ojibway community of Grassy Narrows is part of the group residing in the area near Lake of the Woods. However, they did not always live in the current location. The site of an old reserve established in 1873 consisted of a collection of islands that were each inhabited by one of the various families (the Fobister's lived on one island and the Keesick's lived on another for example). It was located approximately three miles from the current site, to which the community moved in 1963. According to many of the residents interviewed, this community survived on the earlier reserve by living off the land. This involved the hunting and trapping of animals for the residents' personal use as well as for commercial purposes. The furs obtained by hunting and trapping were most often sold to the Hudson's Bay Company for either funds or credit at the local Hudson's Bay Company store. In the case of the old reserve that Grassy Narrows residents used to live on, the Hudson's Bay Company store was located on a centrally located island and was thereby accessible to all residents. At the time of relocation in 1963, the building which used to house the Hudson's Bay Company store was moved across the ice to the location of the current reserve. This building still survives and can be viewed in Appendix C, Figure 2.2.

Many elders today view this pre-1963 period as a time when 'things were good, food was plentiful and where everyone had what they needed' (Interviewee # 15). These elders conveyed the general impression that this time was one of independence and balance. In more recent times, commercial activities participated in by the Ojibway of

Grassy Narrows have included the exploitation of the sport fishing community. Guides would take tourists out on the river, often for several days at a time. They would show them the best fishing spots and provide shore lunches for their charges. Each guide would be paid by their guests for their efforts and would as a result be able to aid in the survival of their families. Some local guides continue to do this for tourists that come to the region as part of the 'Fish for Fun' program that was instituted by the Province of Ontario in the 1970's (see Chapter 4).

In order to obtain a precise picture of the Ojibways' life before and after their 1963 relocation, as well as after the contamination of their region one has to delve deeper. This can be done in a variety of ways, one of which includes the reading of Anastasia M. Shkilnyk's book A Poison Stronger Than Love (1985). As we saw in Chapter 1, Shkilnyk focuses on the impact of relocation on the Ojibway community residing at Grassy Narrows. She also divides the history of the Grassy Narrows into three distinct periods. The first period, from 1873 to 1945, "...is characterized by the primacy of the Hudson's Bay Company and the missions in Indian life and the minimal state interference in community affairs" (Shkilnyk, 1985: 109). This was characterized by the existence of a Hudson's Bay Store on one of the islands of the old reserve (the old store has since been dragged across the ice to the new reserve), as well as by the presence of a missionary couple on another of the islands of the old reserve. The minister and his wife maintained a church on this island, but also spent a great deal of their time travelling to the other islands of the old reserve. This was done in order to maintain contact with local residents, as well as to minister to them should their circumstances mean that travel

to the church was not feasible due to the distance they would have to cover in order to attend services.

The second distinct period (1945-1963) "...is marked by the beginning of provincial government involvement in land-use and resource-use regulations, the extension to Indians of certain universal federal government programs, and the beginning of a movement of Indian people off the reserve and into private sector wage jobs" (Shkilnyk, 1985: 109).

The third period 1963 to 1985, encompasses the time in which this community was relocated to its current location. It is further characterized "...by massive federal government intervention in band affairs...[and] a sharp decline in the traditional mode of production..." (Shkilnyk, 1985: 109). The second and third period were also characterized by the removal of the community's children to area residential schools. This particular aspect will, however, not be discussed in great detail within this thesis.

Old Reserve Life

Prior to relocation from the old reserve in 1963 (Appendix A, Map 3), Grassy Narrows community members travelled in an area unrestricted by any form of federally or provincially assigned boundaries. They moved about the land according to a seasonal cycle in order to sustain themselves. During this pre-1963 period, the area inhabited by the Ojibway of Grassy Narrows (formerly known as the Saulteaux Tribe) extended to Wisconsin in the United States. On October 3rd, 1873, Treaty No. 3 was signed. This treaty covered a territory encompassing 55 000 square miles, and it resulted in the

establishment of the old reserve that was located approximately three miles from the location of the current reserve. After 1873, community members returned in the summer from their trap lines, which were often located several day's distance from permanent homes that were built on their family's island. This was done in order to sell furs and to pick up supplies from the Hudson's Bay Company. It also gave community members the opportunity to visit with friends and family and have the community feast at Christmas time. Throughout the late winter and spring time (the period from mid-January to March or April) community members spent their time on the trap lines. In March or April community's members returned to hunt and trap in the immediate area of the old reserve. Early during the month of May the community celebrated Treaty Day (despite the fact that Treaty No. 3 was signed on October 3rd, 1873) on the mainland near the community gardens. According to one local resident, the timing of Treaty Day is determined by the Department of Indian and Northern Affairs. The date varies from year to year.

Spring time was also the time when the vegetable gardens were planted in each family garden. These gardens usually contained potatoes, corn, turnips and carrots, which were stored and consumed throughout the winter season on the trap lines. The community's members spent the summer months hunting, fishing and picking berries in preparation for the winter month, which the majority of the community's members spent on their respective family's trap line. During this time period, these Ojibway families were based on their individual family islands. The fall, on the other hand, was spent hunting, harvesting wild rice, harvesting the gardens, smoking fish and meat. A

traditional diet used to consist of moose, deer, beaver, muskrat, fish, ducks, geese, berries and bannock. Some tasks, such as blueberry picking, were performed by some families more than by others.

Life on the Traplines

Among current Grassy Narrows community members who I interviewed as part of the research for this study, some had traplines prior to the 1963 relocation to the new site of the community's settlement. They told me that life on the traplines was very isolated and that for the most part family members who spent time on the trap lines together only had contact with one another. One male community member, who was in his mid-30s at the time, elaborated in the following manner about the length of time his family would spend on their trapline.

I think about a month at a time and then we come back for a week at a time and then we'd head back out. Our diet mainly consisted of flour, sugar, lard, a lot of wild meat...that's all we really took...flour, sugar, and lard. Those are the three main ingredients that we took...In the fall and winter we'd go out on a trap line. In the summer time we...ah...July/August would be blueberry picking time...and that would be replaced by rice harvesting...people just got up and moved from the blueberry fields, to the rice fields, to the trap line...kind of like a circle.
(Interviewee #3)

The only permanent date when all Grassy Narrows families met and socialized was during Treaty Day in May and for Christmas celebrations, when the families would all arrive on the mainland portion of the old reserve to have a feast and celebrate. While these Ojibway families were living on their respective traplines and were working together for their survival, each job that had to be performed for this purpose was

supervised by a headman or 'boss'. In the case of rice picking, this individual would be called the rice boss. A boss directed the various family members in their tasks.

An important aspect of the traditional life on the old reserve of this particular Ojibway community was the division of labour within the various family units living on their traplines throughout the winters. Family's had to work together in order to ensure their survival. As a result the parents of the various families were predominantly responsible for the hunting, trapping, and fishing. The grandparents in the family, on the other hand were responsible for the raising of the children. This included the teaching of their people's traditional subsistence practices. As simple as this sounds, life was far from boring for these peoples. Each family member was always busy with their own chores. As a result children did not have any form of curfew as they would go to bed by choice as a result of exhaustion. As one particular elder told me during his interview "... children would go to bed with the sun and would get up with the sun. That was how it was always done." (Interviewee # 15)

In her 1981 report Government Indian Policy and its Impact on Community Life: A Case Study of the Relocation of the Grassy Narrows Band, Shkilnyk includes a discussion of life on the traplines prior to the relocation of Grassy Narrows residents in 1963:

...the Ojibway family came to assume an importance unlike anything known in less isolated settings. During those long, lonesome stretches of time on the winter trapping grounds, the family group, for all practical purposes, became a community unto itself: it was an industry, a school, a hospital, a sanctuary. The bonds of family on the old reserve were very close because the family had the responsibility of providing for the physical survival of its members, educating the young, sheltering the dependent, curing the ill, and transmitting the moral and spiritual values of

the culture. In a society with very few public institutions and no formal association, the membership of the individual family unit was the primary source of identity and support (Shkilnyk: 1981: 44).

As Shkilnyk indicates, life on these traplines was never easy, but it did provide community members with the necessary provisions (physically and mentally) to live in a sustainable manner off the land. Shkilnyk's description is echoed by personal accounts by several elders who I interviewed. They told me that community members used to always be busy while living this type of lifestyle. According to one individual interviewed, the summer months were spent quite happily, often congregating at the mainland gathering grounds on the mainland of the old reserve (families used to live on various islands, while most gatherings took place at one location on the mainland), planting community gardens, picking berries, fishing and hunting (see Appendix B, Figure 1.11). "There were few social occasions that were organized for the [community] as a whole. Treaty Day, a feast at Christmas, and ceremonial observances around the gathering of wild rice, constituted the community-wide events on the old reserve" (Shkilnyk, 1981: 45). Community members (including the children) used to get up with the sun and go to bed with the sun. Everyone was always busy and everyone worked together. "The idea that 'if you divide the family work, you tear it apart in other ways as well' is one which the Grassy Narrows people often express" (Shkilnyk, 1981: 46).

For the Ojibway, clans have been an important social unit (see Table 1). The clan system consists of seven clans and these clans each have very specific responsibilities to the community, as well as to the environment. These clans also have their own colours. These clans are the loon, crane, fish, bear, marten, bird and the hoof clan. The chart on

the following page indicates the clan, its role within Ojibway society, as well as their colours and take their names from important animal totems.

Table 1 The Clan System of the Ojibway

Clan Name	Role of the clan within Ojibway society	Clan Colours
Loon Clan	This clan is responsible for the leadership of the community. This responsibility to the community is shared with the Crane Clan.	gray and white
Crane Clan	This clan is responsible for the leadership of the community. This responsibility to the community is shared with the Loon Clan.	blue and white
Fish Clan (includes the turtle, reptile, snake and frog clans)	This clan represents the intellectuals of the community.	blue and green.
Bear Clan (includes the brown bear, the white bear, kodiak, skunk)	This clan is responsible for the policing, patrolling, peace keeping, protection and the provision of medicine to the community.	Maroon and black
Martin Clan (includes the lynx, fox, bobcat, mink, and muskrat)	This clan represents the strategists, providers, protectors of the water of the community. They were also the ones that were responsible for adoptions that took place within the community.	Yellow, brown and black
Bird Clan (includes the golden eagle, swimmers and divers)	Members of the bird clan (which were responsible for the knowledge keeping of a community. Members of the bird clan were the agriculturalists and were responsible for the soil, seeds, and were also responsible for the spiritual well-being of the community.	Yellow and orange
Hoof Clan (includes the antelope, caribou, buffalo, moose, sheep and elk)	This clan represents the artistic elements of a community. They were the reconcilers and gatherers of the community. Music and poetry were also closely associated with this clan.	Brown and black

(This information was provided courtesy of Chief Clarence White of Whitefishbay, Ontario)

For visual depictions of the various clans please see the photographs of artwork done by a young Grassy Narrows resident in Figures 2.3 to 2.8 in Appendix C.

Members of the same clan were never to inter-marry. These restrictions apply to both on-reserve community members, as well as to members of other Ojibway nations. To marry someone who originated from the same clan would represent the equivalent of incest.

To summarize thus far, elders today report that life on the trap lines provided a reliable source of food and that this life was not associated with starvation. Accounts by surviving elders always include sentences such as ‘...life was good back then and food was plenty. And people never used to get sick like we do now.’ This is a statement that is being repeated by both youth, adults and elders when referring to life prior to the relocation of this particular community in comparison with present day realities. It may represent a nostalgic reference to ‘the good old days’, which downplays former hardships, but it also suggests a more fulfilling and healthy lifestyle than the one that many experience today.

Relocation in 1963

According to Shkilnyk, it was during "...the summer of 1963, [that] the Department of Indian Affairs began to relocate the people of Grassy Narrows to a ‘new reserve’ about five miles south of the old settlement" (Shkilnyk, 1985: 2). This Ojibway community was relocated from a group of islands in the north-western corner of the reserve boundaries to its current location, which provided a more urban setting which the provincial government considered to be less expensive to service, because it would

permit a centrally located school accessible to the entire community's children, electricity, centrally located housing, welfare, and a medical clinic. Shkilnyk states that this period was characterized by a "...dramatic alteration in settlement patterns, the breakup of the extended family and the shift to nuclear households, the beginning of dependency on social assistance... [and] a sharp decline in the traditional mode of production..." (Shkilnyk, 1985: 123) An example of the impact the discontinuation of the trapline lifestyle by the family unit as a whole (as in the present only men are returning to the traplines, if at all) can be seen below:

Women in particular felt downgraded as a result of not being able to share in the work of the men. Children and grandparents, who once had their own duties and responsibilities, were also caught in the disorientation. The extended family of the old reserve could not survive the transplantation to the new reserve; neither its structure nor its functions could be maintained outside the trapping culture (Shkilnyk: 1981: 46).

Further problems emerged on the new reserve as the community's traditional structures were not adhered to. Traditional settlement patterns relating to clan and family living practices were not respected at the new site, and neither was it easy to access the family's traplines. The location of the reserve, as well as the necessity for the community's children to regularly attend the local school represented obstacles to the continuation of the community's traditional subsistence practices.

After relocation women had to resign themselves to raising children and/or working at the Band office or anywhere else where opportunity presented itself on or off the reserve (and there were and are few of these opportunities) instead of working as part of the family unit for their collective survival. At present approximately three women

from Grassy Narrows actively participate in the traditional cultural patterns that are typical to the Ojibway of this region. These activities include the hunting and trapping of animals, the gathering of medicines in the manner taught to them by their grandmothers, and the catching of fish for their families. Some of these women are also currently working as guides for tourists that visit the area.

As already noted on the previous page, the current community residing at Grassy Narrows is that they are no longer as self-reliant as when residing on the old reserve. In many cases community residents became dependent on support by both the federal and provincial government. The situation only worsened when the English-Wabigoon river system was contaminated with mercury.

A decreased reliance on the land due to the 1963 relocation had a severe effect on the dietary habits as well as on the traditional social structures of this Ojibway community. After 1963, this community was exposed to an even greater extent to urban life. The relocation of this community made it difficult for community members to continue the following of their traditional practices. Structures that had been relied upon to govern the smooth running of their daily interactions were no longer present. For example, clan members no longer lived in clan groups separated by water. As we saw above, these clans traditionally lived on separate islands. Furthermore, the layout of the settlement planned by the provincial government for the new reserve did not take these practices into account with the result that houses were built too close together. This created a certain amount of discomfort among community members.

Other factors that came into play were that the community's children were removed to residential schools and this undermined the community's traditional system of learning. Children were no longer reared primarily by their grandparents nor did they benefit to the same extent as they had in the past from their grandparent's knowledge. The parents in turn no longer spent their time providing for their families by hunting, fishing and gathering. As the continuation of these practices and the continuation of language are tied very closely together, this represented the beginning of the loss of language and traditional knowledge of subsistence survival methods within this community. As a result of these factors and others that will be explored below, this community responded very badly to their relocation. This response occurred despite the fact that the relocation of community members from the old reserve to the new reserve only involved a distance of five miles. One result was the effective disintegration of the clan system so that it was no longer possible to effectively regulate and govern the community's interactions. Thus it can be surmized that the situation within Grassy Narrows was already critical before the mercury contamination of the wild food supply occurred.

A further effect of relocation and the resulting dense settlement was the decrease in the participation by local youth in the traditional practices of the Ojibway of Grassy Narrows (i.e. the traditional hunting and fishing lifestyle and the rice harvest). The Ojibway of Grassy Narrows were not used to living in close proximity to other members of their community, nor were they used to living immediately beside individuals not

belonging to their own clan or family group. One community member related the situation with respect to the spacing of on-reserve housing in the following manner.

Maybe 20 to 30 feet now, and it seems they're getting closer because the closer we live together the cheaper the services get like water and sewer. I figure within the next ten years, perhaps more, to look out from your windows people will be bumping their heads (Interviewee #6).

Despite these changed living arrangements, the following of their traditional practices would not necessarily have been impossible had the mercury contamination of the region not occurred. Prior to the contamination of their surrounding environment in the late 1960s and early 1970s, this community had lived within easy access to the natural resources that were necessary for their survival. Community members had the choice of living in the new urban location of the new reserve that is currently occupied by this community and hunting on an occasional basis in order to provide their families with food off the land. They were also able to choose to live on the reserve and spend winters on the trap line. According to some elders interviewed, this was done by approximately 50% or slightly more of the population that lived on the reserve in the 1960s and 1970s. Thereby some community members were able to follow their traditional practices in a more or less sustainable manner.

While living off the land, community members sustained themselves by consuming wild food obtained from the trap lines, such as deer meat, moose meat, blueberries, and wild rice was supplemented by vegetables such as...

...potatoes, cabbages, turnips, corn, carrots, and tomatoes. These were grown in amounts sufficient to last the winter season and were stored in carefully made storing pits in the ground. What was little known in those

years for these people. As was the custom, if a family went in need, there was always a friend to help. (Shkilnyk, 1983: 2)

As we saw earlier, while on the old reserve, these vegetables had been grown in either community or family gardens. These gardens were also one of the reasons why community members objected to being relocated to the current site. The new site did not provide protection for these gardens from the community's dogs that generally roamed freely wherever community members lived (prior to 1963, community members lived in clan groups on various islands and planted their gardens on the mainland that was not accessible to the community's dogs). Community members continued to own dogs that roamed freely in the new reserve location of their community despite the fact that dogs increasingly lost their use as many community members discontinued their reliance on their trap lines. According to community members a further difficulty was that the soil in the current location is not as productive and fertile as the soil had been in their previous location on the mainland of the old reserve. Community members further protested the move to the current location of their community due to the fact that

... on the new reserve, they would be separated physically and spiritually from the life-giving waters of the English-Wabigoon river on which they had been residents for many generations. The people resisted the relocation for two years. Finally, a few families moved to the new site because they were attracted by the benefits of medical care, electric power, a road, a school, wage employment and welfare that were promised to them by government officials; the rest of the families moved to the new reserve because they had no choice. (Shkilnyk, 1981: 1)

By 1970, all the other families had also decided to move to the new site as, according to Shkilnyk, many were coerced by the threat that family allowances would be

cut off to parents who did not send their children to school” (Shkilnyk, 1981: 72). As local families depended on these allowances for their survival, relocation was no longer an option. Relocation had become a necessity. According to Interviewee #8, the reliance on these family allowances has been replaced by the community’s current reliance on Welfare payments. According to this interviewee, this reliance has contributed to the decrease in the continuation of the traditional subsistence practices of this community.

Living close to the fish from the river and lakes and the trap lines and blueberry picking areas was of utmost importance to the Ojibway of Grassy Narrows. It is evident here that the relocation of this community resulted in not only the physical upheaval of this community, but also in an obvious psychological change for them. These people’s lifestyle was simply not respected by both the federal and provincial governments at the new reserve. Their living patterns, their religion, and their traditional practices were systematically interrupted. As we shall see in the next chapter, this condition was worsened as a result of the mercury contamination of the region.

Life on the New Reserve

Today the Ojibway of Grassy Narrows live approximately one hours’ driving distance north of Kenora (one Highway 671). The Grassy Narrows people were not asked to choose whether to continue the traditional lifestyle or to move to the new reserve. The current location of the Grassy Narrows Band was chosen for various reasons. As we have seen, among these reasons are the ability for this community to have access to a road, access to improved housing which included access to a sewage

system, access to a school, and access to electricity. The current population of the community in Grassy Narrows consists of 1121 individuals, 70% of whom live on-reserve throughout the year. According to the information obtained at the office Grassy Narrows' Band Council, the rate of unemployment of the on-reserve population ranges between 80% and 90%.

Since relocation in 1963, the Grassy Narrows community has acquired a very modern school with access to computer facilities, a Cultural Centre for Youth and Elders, a state of the art Kindergarten, a Community Centre, a Crisis Centre that operates until 4 a.m., and a Family Services Centre. Approximately 150 children attend the school. In the summer only about a dozen men and women are hired as guides within the region. These guides continue their traditional subsistence practices (for economic and personal reasons) to a certain degree. They, as well as a small number of other community members, continue to hunt and fish and at times also maintain family traplines. These traplines are often several days travel from the new reserve. They also continue to harvest rice for their own and their families' benefit. The rice harvest, however, has become one of the more volatile issues within the community. Due to the regulation of the water levels of the English-Wabigoon River System by hydro-electric dams located near Dryden, the water levels of the river fluctuate to such a degree that the rice harvests have failed for a number of years. This represents an additional hurdle for Grassy Narrows residents who are attempting to continue to practice a subsistence lifestyle based on hunting, fishing and gathering.

As we will see in Chapter 4, the number of Grassy Narrows residents that follow the traditional way of life is still low. Approximately half a dozen residents continue to regularly hunt and fish for food. Very few, if any, however, solely rely on wild food as their sole source of food throughout the year and none of the current community residents follow the seasonal cycle to such a degree that winters are spent of the family's trapline. Most supplement their diet with store-bought food from grocery stores in Kenora or from one of the two stores within the village of Grassy Narrows.

However, according to Interviewee # 4, among the young people of the village there seems to be a rise in participation in traditional practices. This extends to the religious practices of the Medewin Society. The Medewin Society is the Ojibways' secret traditional religious society, which is comparable to a priesthood. Secrecy is kept in order to protect their religion from outside influences and misuse, as well as to maintain the spiritual practices and knowledge of the Ojibway peoples. The Medewin Society will, however, not subject of further discussion within the context of this thesis, to the traditional hunting and fishing lifestyle of the Ojibway of Grassy Narrows. The above described rise in the participation in traditional practices is, however, not intended to deceive the reader. The numbers are still low. According to Interviewee # 11, out of an average group of ten teenagers, approximately three are interested in learning the traditional way of life, including hunting, fishing, blueberry picking, and dancing at Pow Wows.

Chapter 3 The Pollution of the English-Wabigoon River System

This chapter will outline how the English-Wabigoon River System became polluted with mercury and how the consequences of this pollution for the residents of Grassy Narrows were identified. It will then consider the initial response of various industry and government offices to this pollution. In this chapter I am especially concerned with when and how the Ojibway community of Grassy Narrows was first notified of the mercury pollution and how the risks to them of this contamination were assessed by government commissioned studies.

The Discovery of Mercury Contamination of the English-Wabigoon River System

The English-Wabigoon River is located in northwestern Ontario, approximately 80 km northeast of Kenora off Highway 604 North. The main residential portion of the community of Grassy Narrows is bounded by Grand Lake to the west, Grassy Narrows Lake to the south and east, and the main community access road to the north (Appendix A, Map 3). As a result of health concerns expressed by residents of Grassy Narrows in 1970, the provincial government tested and found this river system to be polluted due to the release of inorganic mercury by Reed Paper Co., a chloralkali plant owned by Dryden Chemicals, from the late 1960's to the mid-1970's. The contamination was discovered after Grassy Narrows community residents began to exhibit symptoms of mercury poisoning such as the numbness of hands and feet, failing eyesight, and the shaking of limbs, which are not unlike those that appear as a result of acute mercury poisoning (Minamata Disease).

Effects of Mercury Contamination of the Natural Environment

According to Anastasia Shkilnyk's Final Report of the Task Force on Organic Mercury in the Environment of the Grassy Narrows and White Dog communities, the result of the presence of inorganic mercury in the Ojibways' food chain was that the "...chemical processes converted it to organic or methyl mercury. Concentrated at each step in the food chain, levels of methyl mercury in fish have been reported at 30 times the "safe" standard of 0.5 parts per million ... (Shkilnyk, 1983: 5). The difference between organic (methyl mercury) and inorganic mercury is that organic mercury...

...is the most toxic form of mercury. Mercury was a threat to public health was first recognized following the mass outbreak of methyl mercury poisoning in 1964, in Minamata, Japan. Methyl mercury in fish reached levels of 50 ppm and 85 ppm in shellfish. 121 persons were poisoned by eating these fish, 40 families were affected and 46 persons died (Shkilnyk, 1983: 6).

For a comparisons of acceptable blood levels of mercury, see Appendix B, Figure 1.2.

One aspect of the impact of the mercury contamination of this region was the resulting loss of employment to the community. Another aspect to this is the effect the knowledge of mercury contamination has had on the traditional practices and dietary patterns on the members (young as well as old) of this community. One young community member of this Ojibway community makes the following observations:

Yes, the whole lifestyle has been affected. My dad has fished a couple of times, but not that much. Before, the other generation, they did that [hunt and trap] all year 'round. Mercury changed everything and we can't do the things we used to do. So now there's alcoholism. These feelings are seeping down to the younger generation. They're getting depressed and they're turning to alcoholism. That's why so few of them are interested in learning the old lifestyle and don't learn to hunt and trap anymore (Interviewee #11).

This is an obvious trend on the reserve. While conducting my research within this community I observed that the majority of young people spend their days at home watching TV. Only a small number still occasionally go out fishing and hunt in order to supplement their store-bought diet.

Health Risks Associated with Mercury as a Result of the Contamination of the English-Wabigoon River System

As we have previously seen, mercury represents a serious health risk to a population when it occurs in an ecosystem such as the English-Wabigoon river system. Mercury occurs in two forms; organic (also known as methylmercury) and inorganic mercury. According to the Final Report Task Force on Organic Mercury in the Environment, methylmercury is the most toxic form of mercury and represents a threat to public health. The Taskforce further elaborated by stating that this was...

...first recognized following the mass outbreak of methyl mercury poisoning in 1964, in Minamata, Japan. Methyl mercury in fish reached levels of 50 ppm and 85 ppm in shellfish. 121 persons were poisoned by eating these fish, 40 families were affected and 46 persons died (Shkilnyk, 1983: 6).

Some of the symptoms observed with Grassy Narrows residents are very similar in nature to those observed with acute mercury poisoning patients in Minamata, Japan. Other outbreaks occurred in "...Iraq (1956), in West Pakistan (1961), in Panorama, Guatemala (1963-65), and Alamagardo, New Mexico (1969)." (Shkilnyk, 1983: 6) According to the Final Report of the Task Force on Organic Mercury further states that studies in the U.S., Canada, Sweden, Finland and Japan "...agree remarkably well in setting blood and hair levels for mercury." (Shkilnyk, 1983: 7) Further studies indicated that survey

...conducted between 1971 and 1978 showed that some individuals in both [the Grassy Narrows and White Dog] communities had blood mercury levels exceeding 100 parts per billion (ppb), even in the winter (when blood levels should be lowest owing to reduced consumption of fish). The highest levels were generally in the range of 200-500 ppb, but the maximum value recorded was 600 ppb. At blood levels above 100 ppb, a human adult is considered to be 'at risk', and symptoms of methyl mercury poisoning (Minamata disease) may first be seen in the most sensitive 5% of adults whose blood levels are in the range of 200 – 500 ppb...uncertainty arises from the fact that symptoms of mild forms of Minamata disease are similar to those of various other conditions, thus making conclusive diagnosis difficult (Jackson, 1980: 3-4).

This is supported by statements made by two of the doctors that see patients from Grassy Narrows, who stated that symptoms of acute mercury poisoning (also known as Minamata disease) are virtually identical to those of Type 2 Diabetes Mellitus.

The Initial Government Response

According to the Task Force on Organic Mercury in the Environment, tests conducted on Grassy Narrows residents in 1970 indicated that mercury levels were exceeding estimated "safe" levels. According to the task force's final report, the mean blood level in 1970 was "...46.37 with a maximum of 159 ppb [parts per billion]. In December 1972 and January 1973,...[t]he mean at Grassy Narrows was 52.01 ppb with a maximum of 289 ppb" (Shkilnyk, 1983: 8). Based on these figures it is clear that the health situation that has been associated with the mercury contamination of the English-Wabigoon River System has not improved between 1970 and 1973.

Usher et al. (1979) outline the government response, which included the establishment of a task force on the occurrence of organic mercury in the environment in

order to deal with the problem of the mercury contamination of the region. This taskforce was established "...by direction of the Honourable Marc Lalonde, Minister of National Health and Welfare, on April 3, 1973, 'in order to respond to the problem of higher-than-usual mercury levels in relation to the health and well-being of the residents of Grassy Narrows..." (Shkilnyk, 1983: 1). The report was further meant to call

...attention to the persistent consumption of fish by certain individuals and families in the communities, especially those whose work is associated with sport fishing, or who attempt to live the traditional way of life; it also examines current dietary practices with respect to protein and starch foods and suggests there has been a deterioration in the native diet in recent years; it points out that there is a considerable amount of misinformation concerning organic mercury pollution and its effects on native health; and examines the problems of communication with these Ojibway people who do not have a written language (Shkilnyk, 1983: 5).

Information relevant to Grassy Narrows community members was not, however, released to the public for another three years. Nor were residents of Grassy Narrows notified.

Individuals who were tested in 1970 received no word about the results until 1973, although results of the findings were presented by Dr. Sutherland at a meeting of federal and provincial officials in Ottawa held in June 1971 to discuss mercury contamination in humans. There Dr. Sutherland pointed out that the data were limited by the fact that the dietary habits of the individuals tested were unknown. In the meantime, press reports circulating about the health hazards involved, and at the high levels of mercury recorded in some individuals caused considerable alarm to residents of Whitedog and Grassy Narrows. (Usher et al., 1979: 228).

This three year delay regarding the distribution of information regarding the mercury contamination rendered the local population helpless as they were not able to ascertain a means of protecting themselves effectively. Many were not even sure if the

mercury contamination of their surrounding environment was something real as this type of contamination was not something tangible or visible to the naked eye. Despite the fact that information regarding this matter was distributed in an at best sparse manner via the media and some verbal communiqués and postings at the local store, the residents of Grassy Narrows experienced a period of "...growing awareness of the hazards of mercury and the extent of the impact..." (Usher et al., 1979: 238).

When the results of the tests that had been conducted in 1970 were finally released in 1973, they came in the form of sealed envelopes addressed to the individuals concerned. "Individuals who had readings above 100 ppb [parts per billion] were told in form letters that although mercury was not affecting their health, their level was 'somewhat too high', and they were advised that it would be 'wise to lower it', with no further explanation" (Usher et al., 1979: 229-230).

The manner in which this information was distributed was, therefore, questionable as Grassy Narrows residents...

...received informal notice about the risks of taking fish from the English-Wabigoon river system for household consumption through conversations with MNR [Ministry of Natural Resources] officials in 1970; they received no formal notification until 1973, when letters written in English were distributed to every household (Usher et al., 1979: 227).

Every household was contacted in writing by representatives of the provincial government and in this manner received information pertaining to the mercury contamination of the region and its effects on the local health situation. Despite the fact that this form of information dissemination occurred, one may question the manner in which this attempt was made, as many Grassy Narrows residents at that time were unable

to read. The manner in which information was distributed at that time, however, lasted only for a period of approximately five years. After this time period the information distribution with respect to mercury did not continue in the same manner.

Assessing the Risk of Mercury Contamination

In 1978, 1979 and in the winter and spring of 1986, scientists were employed by the federal government to assess the risks of the mercury contamination of the English-Wabigoon River System. Their reports concluded that the risk factor for Grassy Narrows residents was high as "...mercury methylation occurs mainly in the surface sediment and water column" (Jackson, 1980: 8). The Progress Report on the Mercury Pollution in the Wabigoon-English River System of Northwestern Ontario is a technical report that contains the results of investigations of mercury pollution in the said area. This report further represents a detailed compilation that is concerned with the assessment of mercury pollution in the system and with the evaluation of methods which might be employed to accelerate the natural recovery of the system. Mercury methylation is problematical to Grassy Narrows residents as

...mercury concentrations in sediments decline sharply from Dryden to Ball Lake, methyl mercury levels remain relatively high throughout, and even increase from Clay Lake to Ball Lake. In general, chemical speciation of the sedimentary mercury varies systematically with distance downstream from the source of pollution, reflecting a gradational transition from the deposits of rotten wood and slime near Dryden to the clay-silt mud and associated iron-manganese oxides and humic matter which predominate in Ball Lake. Methyl mercury from lake sediments is probably more available to bottom-feeding fish than to phelagic fish; phelagic species (e.g. walleye) may be more strongly affected by the mercury transported into the lakes by river water (Jackson, 1980: 2-3).

Walleye is one of the more popular fish to catch within this particular region. It was concluded that these contaminant levels would furthermore not improve in the near future as the Progress Report on Mercury Pollution in the English-Wabigoon River System of north-western Ontario states the following:

According to Federal and Provincial studies, mercury levels in Clay Lake fish and crayfish have been declining exponentially since 1970, when the unregulated discharge of mercury into the river was halted. However, the rate of decline is now so gradual that fish in this lake are expected to continue to exceed the guidelines for human consumption for a long time – probably for many decades – unless effective measures can be taken (Jackson, 1980: 3).

According to Grassy Narrows residents who were interviewed in July 2000, effective measures have not been taken to date. Furthermore...

About 5 metric tons of mercury, comprising 50% of the total quantity discharged, are estimated to have accumulated in sediments deposited between the plant at Dryden and the outflow of Clay Lake, and approximately 2 to 3 of these tons of mercury are in the riverbed upstream from Clay Lake (Jackson, 1980: 3).

The exposure to mercury by Grassy Narrows residents due to "...pre-1971 discharges and subsequent plant effluents from the pulp and paper industrial complex at Dryden..." (Jackson, 1980: 8) has resulted in problems, which persist to the present day. The covering of the mercury by sediment could represent a means of controlling the mercury problem within the region (short of actual removal of the toxin). This, however, seems to be an impossibility as the regulation of the river system by means of dams keeps disturbing the sediment and therefore does not confine the mercury below it. As a result bottom feeders continue to exhibit high levels of mercury, which as a result also enters the food chain.

The physical impact of mercury contamination has contributed to a decreased consumption of wild food and the discontinuation of a number of traditional subsistence practices. One interviewee made the following observations:

I'm still conscious of the mercury myself and that's why I don't eat much of the wild food. Most of the time I give the fish away. I don't know if they [other community members] think about it. When I went to school I thought about it a lot. I wouldn't eat fish...I didn't want anything to do with it. When I was little we lived with my aunt and uncle. They were commercial fishermen. I ate fish a lot then. At the time I thought that mercury was some sort of motor...when we first heard the word. I blame mercury. I keep asking people who are paid compensation that are trembling 'is that a sign?' Most say yeah...it helps them get compensation.

I used to paint, but had to stop, because I was trembling. I sort of blame that. But I don't want to go for the test. I'm sort of scared to find a high level of mercury. I was kind of upset, because I couldn't paint anymore. I have all those ideas, but I can't do it anymore (Interviewee # 11).

As a result it is obvious to see that the impact of the mercury contamination of the surrounding environment of this community has had a greater impact on this community than simply with respect to their dietary habits. Everything begins and returns to the issue of food consumption and the choices that are associated with this.

Although the chloralkali plants used elemental, inorganic mercury in the production of caustic soda and chlorine, mercury in the fish in the vicinity of the plants contained organic (methyl) mercury, a more toxic form of the metal. In the late 1960's, Swedish research had proven that under suitable conditions, inorganic mercury in sediments can be converted by certain micro-organisms into methyl mercury, in a process known as biomethylation. The organic mercury so produced is then ingested through the food chain, and stored in larger amounts in fish which are bottom feeder or predacious...Wastes from the pulp and paper plant at Dryden have depleted the oxygen load of the water in the Wabigoon River and thus contributed to conditions conducive to biomethylation (Usher et al., 1979: 219-220).

Health Effects

Mercury contamination has had serious health as well as economic effects on the community. Mercury builds up in your system and it takes a number of years to become apparent that an individual is in fact suffering from mercury contamination. An additional problem that Grassy Narrows residents have had to and still continue to face is that without the appropriate blood work/examinations it is extremely difficult to determine whether or not a person is in fact suffering from acute mercury contamination, i.e. Minamata disease. The initial symptoms of this disease are similar to those of diabetes, which, as I will elaborate in Chapter 5, has now reached epidemic proportions within this particular community. These symptoms are generally known as 'glove and sock syndrome', which includes a numbness or tingling of hands and feet. Further symptoms that of both Minamata Disease and Diabetes share...

...involve chiefly the central nervous system. These include the following: paresthesia of mouth, lips, tongue, hands, feet; inability to concentrate, lack of interest at home and at work, weakness, apathy and extreme fatigue; difficulty in swallowing and in articulating words; concentric constriction of visual fields (tunnel vision), with abnormal blindspots; hearing difficulty, especially in picking out one voice from a group; emotional instability, with fits of anger, depression or rage; ataxia, alexia, agraphia and dysdiadochokinesia, with clumsiness in handling familiar objects and inability to recall basic things (alphabet, familiar dates and so forth); grotesque, wholly unco-ordinated movements; and spasticity, intention tremor, paralysis, coma and death (Shkilnyk, 1983: 7).

The report of the Taskforce on Organic Mercury In the Environment states that methyl mercury has further been proven to "...adversely affect reproduction in plants, animals and humans. The fetal nervous system has proved far more sensitive to its ravages than the adult – although both are irreversibly damaged by toxic doses"

(Shkilnyk, 1983: 8). The report further states that "...the danger of organic mercury compounds in foods has probably been overstated, and evidence is mounting that most Canadians have been ingesting unsuspected amounts of mercury for years" (Shkilnyk, 1983: 8). This statement, in my opinion, does not address the issue at hand as there are no figures provided for the 'average' Canadian consumption of organic mercury compounds in food and that a comparison with measurements taken from tested individuals from Grassy Narrows is as a result impossible to conduct.

It is undeniable that the consumption of organic mercury poses a threat to the health of fish consumers. Fish consumers, however, fall into several categories. First of all, bioaccumulation affects people as individuals equally. We as people accumulate certain toxins in our bodies until the time of our death. This, under normal circumstances, represents a relatively minor threat to our health (in an urban environment). In Grassy Narrows, however, this takes on an entirely different perspective. Not only do the residents' bodies bioaccumulate mercury throughout their lifetimes, but these toxins (in this case mercury) are passed on to the fetus (in the case of a pregnant woman). As a result, this...

...represents a further step in the food chain beyond the mother. All persons who consume mercury-contaminated fish, and especially pregnant females, must be considered at risk. As fish-eating persists amongst sections of the native populations, this group merits special concern (Shilnyk, 1983: 5 & 6).

This threat to community health has not disappeared in the present (30 years after the fact), despite the fact that...

...mercury effluent discharge from the Dryden Mill was reduced in 1970 by ministerial order to less than 3%, or a few ounces per day, it may take

up to 70 years for the river system to cleanse itself through natural processes. High methyl mercury fish levels will, therefore, persist for the foreseeable future (Shilnyk, 1983: 6).

This represents a bleak prediction for the foreseeable future of the Ojibway of Grassy Narrows, although these statements support the claims the community has made in the past, as well as in the present.

When community members read statements such as the one immediately above, it often becomes painfully obvious that two classes of citizens exist within the region. This is due to the fact that the manner in which pollution is addressed differs between the indigenous community and residents of Kenora. One instance that was related to me by one community member was that of a mercury spill at a highschool in Kenora. In this case 8 ounces of mercury had been spilled in one of the labs. As a result the entire school was immediately evacuated until further notice. These types of measures were not taken within the community residing at Grassy Narrows, whose residents not only lived in an extremely contaminated area, but also relied on the wild food and water supply of the region. Despite the fact that 20,000 lbs of mercury had been intentionally spilled into the English-Wabigoon river system, the Ojibway community residing at Grassy Narrows was not evacuated, nor were they immediately provided with an alternate food source.

Grassy Narrows...residents received informal notice about the risks of taking fish from the English-Wabigoon river system for household consumption through conversations with MNR officials in 1970; they received no formal notification until 1973, when letters written in English were distributed to every household" (Usher et al., 1979: 227).

Despite the obvious threat to this community's health as a result of the mercury contamination of the English-Wabigoon river system by the Reed Paper Mill located in

Dryden, Ontario, it took several years (from the discovery of the problem in 1970) to discontinue the discharge of mercury into this particular river system. This means that community residents potentially were subject to exposure to mercury for another three years. According to Usher et al.

...the first tests of mercury levels in hair and blood...were conducted by Dr. Ralph Sutherland of the Ontario Ministry of Health in 1970. Since health is a matter of provincial jurisdiction, the province took charge of the monitoring program; the federal department of National Health and Welfare was kept informed of the test results. Individuals who were tested in 1970 received no word about the results until 1973, although results of the findings were presented by Dr. Sutherland at a meeting of federal and provincial officials in Ottawa held in June 1971 to discuss mercury contamination in humans. There Dr. Sutherland pointed out that the data were limited by the fact that the dietary habits of the individuals tested were unknown. In the meantime, press reports circulating about the health hazards involved, and the high levels of mercury recorded in some individuals caused considerable alarm to residents of ...Grassy Narrows (Usher, Anderson, Brody, Keck, and Torrie, 1979: 227-228).

The delay of these results represents potentially serious problems for the Ojibway community residing at Grassy Narrows. Health problems that could have been avoided, especially for the younger generation had accurate information pertaining to the impact of the mercury contamination of their surrounding environment been immediately made available to affected community members.

Chapter 4 The Impact of Information Distribution on the Residents of Grassy Narrows

As outlined in Chapter 3, in the late 1960's to the mid 1970's, the English-Wabigoon river system was found to be polluted due to the release of inorganic mercury by Reed Paper Co., a chloralcali plant owned by Dryden Chemicals. At this time "...it was learned that the fish in the river-lake system had mercury concentrations exceeding 0.5 ppm, all commercial fishing in the affected area was banned" (Jackson, 1980: 3). As I will elaborate in this chapter, significant responses to this knowledge have included changes in the local food consumption patterns and in related traditional economic and social practices of the Ojibway of Grassy Narrows.

As we have seen, information pertaining to the contamination of the English-Wabigoon River System was officially distributed within the Ojibway community residing at Grassy Narrows beginning in 1973. Initial awareness had been raised only when symptoms of acute mercury contamination began to be observed among community members and the 1970 tests of mercury levels in blood and hair were conducted by the Ontario Ministry of Health. According Steve Fobister, a member of the Grassy Narrows Band Council, the result of these tests were not released to local Grassy Narrows residents until 1973. As Fobister continues:

... and yet the governments had the results in June of 1971. And even when the people did get their mercury readings in the mail, none bothered to explain what mercury 'was all about'... [As a result t]he people of Grassy Narrows...were left with the impression that they could eat fish at their own risk. (Grassy Narrows Band Council, 1979: 10)

It appears that people's understanding of the problem was inadequate, although after 1973 local residents were aware of the fact that a problem existed.

The provincial government decided to close the fisheries in the early 1970s, both for personal and commercial consumption.

On April 6, 1970, Rene Brunelle, Ontario Minister of Lands and Forests, closed all commercial and sports fishing in the Wabigoon River below Dryden up to and including Clay Lake. On May 1 he announced that commercial fishing was closed on Ball, Lount, Indian, Grassy Narrows, Separation, Umfreville, Tetu, Swan and Eaglenest Lakes. Action was withheld concerning the sport fishery on those lakes pending consultation with the health department, but anglers were advised not to eat the fish. On May 14, the sports fishing ban was lifted, but anglers were still cautioned that their catches were unfit for consumption. (Usher et al., 1979: 221)

The closing of the fisheries along with additional warnings to local residents pertaining to the mercury contamination of the English-Wabigoon River System by the provincial Department of Health had a definite impact on the Ojibway of Grassy Narrows. This occurred despite the implementation by the province of the 'Fish for Fun' program, which was designed to

...encourage fishing for the sake of challenge rather than consumption. Signs with that slogan depicting a fish and a fry pan crossed out with a large 'X' were posted on trees in the area, but officials of the Department of Lands and Forests were later told not to put up further notices. Camp owners were also told that the problem would clear up in sixteen to twenty weeks (Usher et al., 1979: 224-225).

These measures were implemented in order to provide some economic support to local community members. Most tourists that had been visiting the region on a seasonal basis for the purpose of spending a few days or weeks fishing during the summer now only followed this seasonal pattern in a severely limited fashion.

In addition, after 1973 many local community members began to fear the consumption of fish from the surrounding lakes. There were, however, some exceptions to the rule. They came in the form of fishing guides

...who tended to continue to eat fish especially while out on the rivers. This is in what is called the 'preparation of the shore meal' for the sport fishermen who are guided. This meal consists of the fish caught in the morning, so that each guide eats at least one fish meal per day. In addition, the guide frequently brings some of the day's catch to his family in the evening. It would appear that this was happening as often as three times per week. (La Rusic, 1973: 8-9)

Despite the warnings not to eat locally caught fish, these guides continued to consume this fish. As a result of this, a limited consumption of contaminated fish persisted among those community members who continued to attempt to make a living by guiding. Thus these particular residents of Grassy Narrows continued to be exposed to the threats of mercury contamination on a weekly basis. Overall, however, the consumption of locally caught fresh fish within the community was drastically reduced and led individuals to seek out alternative sources for their dietary needs.

Information Distribution by the Ontario Medical Services Aimed at Improving Local Health

In the early 1970's "...the Thunder Bay Zone of the Ontario Region, Medical Services Branch had stepped up its Public Health program [in Grassy Narrows]..." (Shkilnyk, 1983: 11). This program initially began with the conducting of public meetings with Grassy Narrows residents and a clinical testing program of those individuals that were considered to be at risk. The group of subjects that was tested was, however, too small determine whether their mercury levels were representative of the

entire community. The individuals chosen were also not necessarily individuals who had lived by consuming food off the land in the past. Due to these factors these test results were not conclusive.

The Ontario zone nurses who had worked within the community throughout the 1970's, as well as recent and current zone nurses continue to make regular visits to each reserve. These nurses conduct health education programs. They also "...provide increased surveillance of the prenatal group and the infant population" (Shkilnyk, 1983: 11). In addition, the doctors that serve the community of Grassy Narrows

...have been alerted by both the provincial Ministry of Health and by the Task Force [on Organic Mercury In the Environment Grassy Narrows and White Dog Communities] . The medical fraternity have also been asked to pay special attention to pregnant mothers and to the new-born. (Shkilnyk, 1983: 15)

These actions, however, have not benefited this particular community a great deal with respect to the problems that are plaguing them as a result of the mercury contamination of the surrounding environment. The 1983 recommendation of the Task Force on Organic Mercury in the Environment was that "...local medical practitioners will be required to be reminded and up-dated on the current status of the methyl mercury situation at regular intervals..."(Shkilnyk, 1983: 15). This recommendation represented a positive development on this issue. In the present this has, however, not translated into positive action for local community residents.

Consequences of the Distributed Knowledge on Local Food Consumption and Traditional Structures

To summarize thus far, we have seen that as a result of the mercury contamination, the Ojibway community of Grassy Narrows began to be seriously affected. These side effects were twofold in nature. The primary effect was that the local commercial fisheries were immediately closed by the federal government. As a result an important source of income has disappeared indefinitely. Moreover, the fishery for personal consumption was undermined. As a result, locally obtained fish as an important source of protein has declined as well, forcing community members to begin to depend on store-bought food items instead of wild food items.

This has become a serious problem as many community members find it very difficult to supply themselves with store-bought food given that the funds they possess do not suffice to feed an entire family by purchasing only store-bought food. As a result, the provincial government began to provide the Grassy Narrows Community with a program, which has been paid for by the Grassy Narrows Band Office, that provides frozen fish to all on-reserve residents throughout the year. This program was and continues to be utilized by Grassy Narrows community members, but is not the preferred source of fish.

Also, at the time that the mercury pollution problem became widely recognized, not all Grassy Narrows residents were convinced that it was in fact unhealthy to consume the fish from the surrounding area as one can neither taste nor see mercury, nor are the effects due to consumption immediately identifiable. As a result some individuals have continued the consumption of fresh fish from the river and lakes in the region for years.

Many Grassy Narrows community residents resent the fact that they have been forced to resort to the consumption of frozen fish rather than continuing to eat their traditional foods. The discontinuation of even one aspect of the traditional mode, such as the fisheries, has represented a problem for the Ojibway of Grassy Narrows. This continues to be the case in the present as well.

This results from the fact that each aspect of the traditional mode, which is linked to the seasonal cycle, is inextricably connected to the next. As a result, the destruction of the fisheries did not simply represent the loss of fresh, local fish to these peoples, but it has contributed to the breakdown of the traditional seasonal cycle. The seasonal cycle and its accompanying activities have not only linked individual community members, but each activity also has provided the funds in order to participate in the next activity of the seasonal cycle. As a result, the destruction of the rice harvest due to flooding, for example, has meant a great deal more than simply not consuming rice in a given year. It has meant that a family may not be able to replace the motor for their fishing boat in order to participate in this activity and provide for their families.

The loss of the fishery also has had an economic impact on the people of Grassy Narrows. As we saw above, for a considerable time the community had benefited from the commercial fishery and a prosperous industry in guiding sport fishermen. These two industries represented a major source of income and a certain level of economic stability for the Ojibway of Grassy Narrows.

The economic impact of the loss of the fisheries was addressed with the implementation of the Fisheries Loan Act "...which created a cost sharing system by the

federal and provincial governments to provide financial assistance to commercial fishermen in Lake St. Clair and in the Kenora area affected by the mercury pollution” (Usher et al., 1979: 222). No residents of Grassy Narrows who suffered as a result of the closure of the fisheries have ever been compensated for their losses.

Furthermore, the ‘Fish for Fun’ program initiated in 1971, which was the catch and release program introduced by the provincial government in an attempt to ensure employment opportunities of Grassy Narrows residents, was not an adequate replacement for the previous sports fishing industry. In fact there was a decline of the tourist industry of the region, the closure of the Ball Lake Lodge (which employed approximately 300 Grassy Narrows residents throughout the year), and an unemployment rate that has ranged and still ranges between 80-90%. This can be examined in comparison to statements made with respect to the situation prior to the mercury contamination of the region.

The Hudson’s Bay Company manager indicates that a man could make up to \$ 10,000 from trapping in the area. And the same kind of statement was echoed by the Wildlife people of the Ontario Government. (La Rusic, 1973: 4)

We can conclude that with the onset and recognition of the mercury contamination of the region, the economic base of the Ojibway of Grassy Narrows had effectively been eliminated.

The Fish House as an Alternative Source of Food

According to former Chief and current Band Council member Steve Fobister, the Fish House was established in Grassy Narrows in approximately 1980 in order to provide

this community with an alternate source of fish. The fish is caught in Lake Athabasca (See Appendix C, Figure 2.1 for a photograph), frozen and then flown into this community. This fish has, however, not been provided by the Ontario government (as is outlined by Jackson's 1980 Progress Report on Mercury Pollution in the Wabigoon-English River System of Northwestern Ontario) free of charge to the community residing at Grassy Narrows, but is paid for by the local Band Office. Possibly as a result, fewer individuals feel the need to go out on the river and lakes in order to supply themselves and their families with fish. In many cases this may have lead to a decreased ingestion of mercury.

Some individuals such as community elders, however, continue to insist on consuming fresh fish out of a preference for fresh fish over frozen fish. This does not, however, extend to the consumption of other wild foods. One interviewee made the following statements on the subject.

Partially... we used to think that bush food is healthier, 'cause there are no chemicals in it...there used to be no chemicals in the land or the wild animals. As opposed to farm animals...you know there have certain chemicals that help to grow. They say that wild animals are free of that. I guess they're not. (Interviewee #3)

Four interviewees (former commercial fishermen, elderly women) stated that they did not believe that eating wild foods was dangerous. In fact, they stated that wild foods are more nutritious and better for them than store-bought foods.

Most individuals that were interviewed, however, continue to believe that the mercury contamination of the surrounding environment persists and they refuse to eat any

food that is obtained from the land. One interviewee in her mid 40's, for example, made the following statements:

I think the problem with the mercury is still there. They say it eventually goes away when it settles to the ground, but the fish...the bottom ground feeders...eat it and are eaten by bears and it ends right back up in the food system and the cycle repeats itself. Some people eat bears.
(Interviewee#2)

This quote indicates that concern pertaining to the mercury pollution of the surrounding environment still exists. The result is a dramatic change in the dietary habits for Grassy Narrows residents since the early 1970's. According to Appendix D, Figure 1.1, it is evident that...

...a considerable portion of the diet is made up of starches while the amount of meat purchased amounts to about 2 lbs per person per week. The type of meat is most telling. The largest portion is made of neck bones, pork riblets and hamburger. Subtracting the bone and fat content in this, the amount of protein would certainly be less than half the gross weight. This would then amount to about one pound per person per week. The remainder of the diet is made up of spaghetti, canned beans, canned meats, etc. Vegetables are conspicuous by their absence. Fresh fruit is rarely purchased...[The a]verage Canadian meat consumption is approximately 3 lbs per week... (La Rusic, 1973: 11)

This move consisted of consuming store-bought foods instead of wild food such as moose, deer, duck, goose, beaver, fish, wild rice and blueberries.

Nonetheless, the recognition of the importance of the survival of the traditional structures, which the fishery was and continues to be a part of, has survived with the elders and has in part been passed on to the current generation. Although the heavy reliance on the local fishery has not persisted as a practice to the present, both young and old still recognize its importance. The community continues to value fish, although most of the fish that is being consumed by community residents is frozen and does not

originate from the area. Nor is this frozen fish an adequate replacement for the earlier, more balanced diet that included substantial amounts of fresh fish along with other wild foods. Instead, the diet of this particular community has shifted from a balanced and nutritious diet to one that is high in sugars, fats and carbohydrates. This trend has continued despite the fact that many community residents no longer believe that local fish are dangerous to eat. As we shall see in the next section of this chapter, this is due to the fact that little information pertaining to the continued mercury contamination of the surrounding environment has been circulated within the community for the past 10 to 15 years. "Consequently, some reserve residents have viewed the 'mercury scare' as merely a hoax, perpetuated by the government to shut down both their commercial and their domestic fishery, and give the fish resource entirely over to the tourist camp operators (Usher et al., 1979: 32). Despite the occurrence of this view, which is held by older residents, many local residents have changed their current dietary patterns to such a degree that up to 75% of their diet consists of store-bought food items.

Government Consultation and Information Distribution in Recent Years

The community located at Grassy Narrows has not received up-to-date information pertaining to mercury contamination in approximately 10 to 15 years. Currently, information distribution pertaining to mercury contamination and its effects on the human population has come to a virtual stand-still. When asked in July, 2000, one of the doctors who examines clients from Grassy Narrows stated that he did not know how information pertaining to the mercury contamination was being delivered by outside

experts to local residents (Interviewee # 33). This doctor has, among other things, the responsibility to perform 45 minute neurological examinations, which have been agreed on by the Mercury Board. The Mercury Board is a local body that controls the Mercury Disability Fund containing one million dollars in cash compensation to be paid out to individuals adversely affected by the mercury contamination of the region. This board was established in 1984 in order to evaluate mercury compensation claims within Grassy Narrows and award compensation to those individuals who are affected by the mercury contamination. This board continues to fulfil this function to date. With respect to the effects of chronic long term, low level mercury exposure this doctor made the following statements.

I don't know what chronic long term low level mercury exposure does.
The question is what chronic long term low level mercury exposure does.
Maybe people have symptoms due to this long term low level exposure,
but presently symptoms can't be distinguished from symptoms of diabetes.
(Interviewee #33)

Medical examinations are typically used for the grading of patients' disability. This same doctor responded, with respect to the impact of the knowledge of mercury on the dietary habits of local residents, in the following manner.

I don't think that it has made a huge difference. I haven't seen much information that has been distributed. I ask people about their fish consumption. Some people still eat fish every day. There seems to be discrepancy...they can't sell fish commercially, but no information is being distributed to the community on whether or not people can eat the fish locally. (Interviewee #33)

As we shall see below, this view by this doctor is consistent with the survey data collected which indicates that the current population's diet still consists of up to 25% of wild food.

What the People of Grassy Narrows Know Today

In order to determine the current state of people's knowledge of mercury contamination of wild foods, in July of 2000 I conducted a survey among the households of this community. I visited every household in Grassy Narrows (there are 209 households in Grassy Narrows) and was able to administer the survey at 110 of these household. I did not return to those households where no one answered the door. Each surveyed house had between four to ten individuals living in it. One person answered the survey questions on all the household members' behalf.

The survey itself consisted of 13 questions that were administered in order to obtain information regarding the age and sex of the person surveyed, the number of individuals living in the house, data regarding Diabetes, Kennedy Disease and Thyroid Disease (regarding both adults and children), information regarding the surveyed person's awareness of mercury (or other) contamination, as well as information pertaining to the types of food they eat in their household and why they this particular food is eaten.

Based on the results of this survey, I was able to determine that 64 of the 110 individuals consulted (which constitutes 58% of those consulted) stated that lifestyle changes had in the past had a significant impact on their life. Of these 64, 62 further

answered a question pertaining to the actual cause of these lifestyle changes. The responses were not predetermined for the respondents to choose from. Furthermore, the categories listed in the Figure 1 were the result of responses by community residents and fell into the twenty categories listed below.

Figure 1 Description of Lifestyle Changes and Community Responses by 64 Respondents

Number	Description of reason for lifestyle change	Responses
0	no description given	2
1	mercury	4
2	destruction of the fisheries	9
3	destruction of the fur trade	1
4	relocation	12
5	learn from elders	1
6	residential school	2
7	convenience of the new reserve	12
8	regular school	1
9	adopted out of the reserve	1
10	work (too busy)	3
11	not taught traditional practices	1
12	lived in the city	3
13	toxins in animals	2
14	health problems due to store-bought food	1
15	fear of contamination	N/A
16	relocation and residential school	1
17	moved out of parents' house	4
18	clearcuts	1
19	relocation and the gov't took over the trapping	1
20	#19 + the destruction of the fisheries	2

Of those surveyed 9 individuals gave the destruction of the fisheries as the reason for their lifestyle change. This number increases to 10 individuals if # 20 is taken into consideration. Furthermore, 4 individuals listed the mercury contamination of their surrounding environment as the reason for their lifestyle change. When taking #4 into consideration, 12 individuals felt that the community's relocation in 1963 was the reason for their lifestyle changes. When taking into consideration that # 16 and # 19 also fall into this category the number of respondents answering positively rises to 14. When asked, 11 further individuals felt that the convenience of the new reserve was the reason, 3 individuals felt that they had simply become too busy and thereby experienced a lifestyle change, 3 individuals stated that they/their family had moved to the city and thereby had experienced a lifestyle change and finally, 4 individuals had moved out of parents house. It is clear at this point that those surveyed did list the mercury contamination of their surrounding environment as one of the main factors affecting their lives. It was, however, not the major factor that they thought had subjected them or their families to major lifestyle changes. If one, however, considers that the destruction of the fisheries is directly related to the mercury contamination of the English-Wabigoon river system, the number of interviewed individuals who attributed lifestyle change to the impact of the mercury contamination of their river system, rises to 13 households.

This, however, could be considered the academic's view, which provides a very unemotional view of the situation. This view is valid, but does not fully take into account the views of a community member pertaining to this matter. It does not contain the personal experiences of the people who are in actual fact affected by these conditions and

their accompanying effects. As a result, one must in addition consider view points such as those provided by individual community members, who analyse this issue from a more personal angle. This particular interviewee makes the following, very interesting observations pertaining to the shift in the diet of his people (particularly with respect to the younger generations).

...Particularly they were made to believe that food of the land which you pick was either...any wild meat like moose, beaver, deer...that these are untreated meats that won't have government codes...and most of the people outside would ridicule native people. They discussed a lot that they considered such. I think it was that way with more and more of the younger generation turn away and want to be more and more like the white man. (Interviewee #6)

The interviewee elaborates on the subject of diet by addressing the fact that the Ojibway of this region used to consume wild food in combination with items attained by the Hudson's Bay Store prior to relocation and the impact of the residential school system.

The interviewee stated that...

...when trappers used to be given provisions by Hudson Bay, that's all we had. We had sugar, salt, and beans, pork and a thing called lard, which we used for oil. We used that a lot. We consumed that a lot, but it never bothered us, you know. I think it's a lot of ingredients, the processed food that they're putting into us now these days. There've put in all kinds of junk now. You can read it on the labels. It's so full of garbage. You don't know what it is. And why are they doing that is because of the condition of the animals before they process it? Is the animal itself safe to eat now? (Interviewee #6)

Not only does this indicate a distrust in processed foods, but also a distrust as to the contents of this food. A number of times, while in conversation with a variety of community members, the words organic foods were applied to wild foods. In this case this was meant to indicate that wild foods used to be free of any type of additives (which

represents a heading under which mercury is included). Currently, wild foods are no longer perceived in the same manner, although a small number of community residents are returning to the increased consumption of wild foods. A deep distrust in wild foods of any type (fish in particular) has evolved in this community as a result of three decades of information distribution pertaining to contaminant levels in these same wild foods. This has led to the fact that most community members consume a mixed diet consisting of approximately up to 25% of wild food and 75% or more of store-bought food items. As can be seen on the following page, these figures can be further broken down into the percentage of wild food consumed as part of a mixed diet by the Ojibway of Grassy Narrows. Furthermore, the survey questionnaire I administered indicated that ninety-two individuals stated that their households consume a mixed diet consisting of both wild food and store-bought food. None of the individuals surveyed stated that their household consumes only wild foods, and eighteen of the individuals surveyed stated that their households only consume store-bought foods.

Sixty-five households report that they consume a mixed diet consisting of approximately 1-25% of wild food. Twenty-two households of those surveyed report that they consume between 26–50% of wild food in their diet, 4 households of those surveyed report their consumption of 51–75% of wild food, and a further 2 households (1.8%) of those surveyed report a consumption of 76–100% wild food as part of their regular diet. This indicates that 92 households of the 110 surveyed households rely on a mixed diet. Either these individuals are not aware of the impact that mercury has on a human being

and, as a result, continue to consume wild food. Or this indicates that these people have limited their consumption of wild foods to what they consider a safe or attainable level.

The question thus arises as to whether or not the knowledge of contaminants in the surrounding environment directly affects the dietary habits of the Ojibway of Grassy Narrows. When consulted by means of the above mentioned survey, those Grassy Narrows households that were consulted responded as shown in Figure 2.

Figure 2 The Impact of the Knowledge of Mercury Contamination on Diet

This figure indicates that 46 of the 110 individuals representing the households consulted felt that any number of contaminants affect what they and their families consume while living in their present location. Sixty-two households said knowledge of the contaminants that may be found in the wild food supply did not affect their diet. Two

individuals did not answer this question. This could very easily be due to the fact that these households have not received any up-to-date information pertaining to the mercury contamination of their surrounding environment and as a result are not aware of the severity of the health problems this contamination could cause.

Finally I ask a more general question regarding which contaminants might be a problem for the community. Sixty-one of the 110 surveyed households reported that they did not have an answer for this question, as many individuals surveyed per household did not know which contaminants they were subject to. Thirty-three of these individuals were aware of the existence of mercury in the diet of community members, but were not necessarily concerned with the impact this has on themselves and their families. This is due to the fact that a large portion of the local population predominantly depends on store-bought food. At this point it is important to state that it is apparent that the concerns of the 1970's brought about changes that have resulted in Grassy Narrows residents not being worried about the consumption of wild foods as they were in the past. Of interest to me was that quite a number of these individuals asked me about the impacts of E-coli contamination on their community, which presumably was prompted by the problems that had arisen recently in Walkerton, Ontario. What I discovered at this point was that E-coli was present within the water tanks that supply water (Appendix A, Map 4) every summer. This issue has never been dealt with by authorities outside of Grassy Narrows.

Chapter 5 Mercury Contamination and Diabetes

As we have seen in the previous chapters, the residents of Grassy Narrows were informed of the problems pertaining to the mercury contamination of their surrounding environment in 1970. This information was in fact distributed by the provincial government to community members. From 1970 onwards community residents did know, although to varying degrees, that the community was subject to major health problems due to the existence of mercury in the wild food they had been consuming for generations. They were also warned of the possible consequences should they persist in the consumption of wild food.

According to individuals that I interviewed, the majority of the local population believed the information they were provided with despite the fact that mercury could neither be seen nor tasted in the food they had eaten for generations. Many local residents did, over time, make a change in their eating patterns and in particular they began to rely heavily on store-bought foods as opposed to the wild foods they had been consuming for generations.

However, this change in eating patterns, which included the increased consumption of carbohydrate-high foods, seems to have led to an increase in the occurrence of diabetes within this particular community. This has been the case especially with regard to Type 2 diabetes.

Diabetes

Diabetes is a debilitating disease that used to be virtually unknown in Grassy Narrows, as well as in other First Nations communities across Canada. Diabetes exists in two forms; Type 1 and Type 2 Diabetes mellitus. Type 1 diabetes "...occurs when the pancreas produces little or no insulin. This used to be called insulin-dependent diabetes mellitus. It accounts for about 10% of diabetes cases, and usually occurs in children. (Chronic Conditions, April 17, 2000) Type 2 diabetes, however, is the most common form of this disease and represents

...about 90% of cases. Among aboriginal peoples, this proportion may be even higher. Type 2 diabetes occurs when the pancreas does not produce enough insulin, or the body does not use the insulin effectively. It usually occurs in adults. In recent years, it has been diagnosed at younger ages, in children and adolescents. This is worrisome, because it means that serious complications can develop by the time the person reaches early adulthood. Type 2 diabetes used to be called Non-insulin-dependent diabetes mellitus (NIDDM) (Chronic Conditions, April 17, 2000).

Diabetes used to be virtually unknown among First Nations communities. The incidence of diabetes, however, began to increase throughout the past 50 years, with a rapid increase "...in the short period between 1991 and 1997" (Diabetes Statistics Reference Sheet, Monday, April 17, 2000). Furthermore, diabetes is "...a chronic disease with multifactorial causes involving the interactions of genetic susceptibility and environmental factors" (Young, Reading, Elias and O'Neil, 2000: 563). Within Grassy Narrows, not only is there now a marked increase in the incidence of diabetes recognized, but according to one interviewee the disease was actually virtually unheard of until approximately 15 years ago.

According to Dr. Hirsh of Ottawa, Ontario, as well as according to Young, Reading, Elias and O'Neil, Type 2 diabetes mellitus in Canada's First Nations has reached epidemic levels and has, as a result caused very serious health problems for most First Nations Communities in northern Canada. Diabetes is...

...manifested in the various long-term complications affecting the cardiovascular system, eyes, kidneys and nerves, resulting in premature death, disability and compromised quality of life. In the FNIRHS, 50% of the respondents with diabetes also reported having hypertension, and 26% reported having heart disease, prevalence rates that were 3.3 and 3.9, respectively, times those among the respondents without diabetes (Young et al., 2000: 562).

Young et al. further elaborate by stating that female residents on reserves are subject to a greater than 5-fold risk of death from diabetes. Furthermore, by "...age 30-39, 5% of First Nations people have already developed diabetes, and rates continue to increase with age. According to the 1997 Regional Health Surveys, a third of people over age 65 have diabetes" (Diabetes Statistics Reference Sheet, Monday, April 17, 2000). Young et al. further address a Sandy Lake Study in which...

...[s]ystematic genome-wide scanning for diabetes susceptibility among affected sibling pairs revealed 4 markers suggestive of association with diabetes...The S319 allele is present in 20% of diabetic subjects who are homozygous for S319 tend to have an earlier age at onset, a lower body mass index and a higher postchallenge plasma glucose level (Young et al., 2000: 563).

This, in combination with the incidence of gestational diabetes, which "...is associated with higher serum triglyceride levels, measures of obesity and fasting insulin level" (Young et al., 2000: 563). They further state that gestational diabetes...

...is a strong predictor of high birth weight in the newborn, which predisposes to future diabetes. Surveys in northern Ontario and Quebec

have shown that gestational diabetes may affect as many as 13% of pregnancies among Aboriginal women. Aboriginal women over age 35, just under half of all pregnancies are associated with pre-existing type 2 diabetes or gestational diabetes; this substantially increases the risk of diabetes in the next generation. Cross-sectional surveys have tended to show an association between diabetes and hyperlipidemia and between diabetes and obesity. Unlike half a century ago, obesity is now prevalent in many Aboriginal populations (Young et al., 2000: 563).

They continued by stating that diabetes "...affects the psychosocial well-being of affected people. Those with diabetes are more likely to regard their health as poor and to experience some limitation in their daily activity" (Young et al., 2000: 563). This, in many ways, compounds the problem for Grassy Narrows residents, who have already undergone drastic changes in lifestyle and had to deal with the mercury contamination of the English-Wabigoon River System in the past thirty years that resulted in a change in diet of the resident population. This in turn led to an increase in obesity of the general population. One male community member in his mid-40's remarked upon this specifically . He stated that "...nowadays more people are fat. We didn't used to be like that. We always used to have things to do. Everyone had a job to do. Now we just sit around." (Interviewee #6) This interviewee further stated that now (as he believed), due to this increased obesity within their community, increased body weight among women is considered beautiful. This shift with regard to what is considered beautiful by the Ojibway of Grassy Narrows, as well as other First Nations across Canada, is indicative of the adverse effect of a shift in diet on such communities. The fact that obesity could rarely be avoided was accommodated with a change in the value system of this community.

The Grassy Narrows population is not isolated in the occurrence of this phenomenon. "The obesity among Aboriginal people is predominantly of the central (or abdominal, upper-body) type, characterized by a high waist-to-hip ratio, which is associated with a higher risk of diabetes." (Young et al., 2000: 563-564) However, Young et al. also state that an...

...association between diabetes and dietary factors has not been demonstrated consistently. Two studies from northern Ontario and Manitoba have shown that diabetic subjects consume a higher level of proteins (adjusting for total caloric intake) than non-diabetic subjects but differ in terms of the protective effect of fibre. In Sandy Lake, diabetes was found to be associated with the consumption of "junk foods" and a "fatty" method of food preparation (Young et al., 2000: 564).

This coincides with trends that I observed while residing in Grassy Narrows for the purpose of conducting my field research in July of 2000. The sedentary lifestyle, which the Ojibway of Grassy Narrows have adopted after relocation and the mercury contamination of the English-Wabigoon River System occurred, have increased the risk of developing diabetes earlier on in life. According to Young et al., the emergence of a diabetes epidemic occurred in the 1970s. Although the medical community seems to be aware of the problems that are being experienced by the Ojibway community residing in Grassy Narrows, this has not translated into this knowledge being fully imparted to this particular community. The reasons for this are not necessarily logical, as workshops pertaining to type 2 diabetes mellitus, as well as home visits by the local nurses occur on a regular basis within Grassy Narrows.

Type 2 Diabetes represents a problem of epidemic proportions to First Nations communities within Canada. Young et al. state that the "...crude prevalence of

diabetes...was 8% among men and 13% among women. When age-adjusted to the Canadian population, the prevalence was 3.6 and 5.3 times higher among First Nations men and women respectively than among Canadian men and women (Young et al., 2000: 562). These numbers are staggering and indicate a larger problem. Young et al. further state the following points pertaining to the effectiveness of screening First Nations populations for diabetes with the use of oral glucose tolerance surveys.

Oral glucose tolerance surveys have been conducted in few localities. In 2 Algonquin reserves in northeastern Quebec and among the Oji-Cree of Sandy Lake, in north-western Ontario, the prevalence reached as high as 25% among all adults and 80% among women aged 50-64 years. New cases detected by oral glucose tolerance screening account for 40% of all diabetes cases, an indication that diagnosed cases do not represent the total burden of disease (Young et al., 2000: 562).

If this means that 40% of all diabetes cases are diagnosed by means of oral glucose tolerance screening, this leaves approximately 60% of the affected First Nations population without adequate medical care. Self-diagnosis or self-reporting is difficult in First Nations communities, as accurate information pertaining to type 2 diabetes mellitus is not being distributed adequately. This is also the case in Grassy Narrows despite the fact that diabetes workshops take place approximately four times per year. Attendance at these workshops has been very poor in the past. This occurs despite the fact that these events are advertised by means of posters at the Band Office, the stores, the Community Centre, the Cultural Centre and Family Services. Diabetic foot care services, however, which are being provided by representatives of the Health Access Centre which visits the Grassy Narrows community at a minimum of once per month, are well attended. This claim is supported by the survey data obtained in Grassy Narrows during July 2000,

where 30 of the 42 diagnosed cases of Type 2 diabetes mellitus self-identified themselves.

Figure 3 The Incidence of Diabetes in Grassy Narrows

Although it seems to be evident that the number of diabetes cases reported to this survey was relatively accurate (30 individuals self identified as having Type 2 Diabetes Mellitus), claims made by health care workers and a number of residents still indicate that information pertaining to health problem is still not being circulated adequately. As a result, many individuals consulted (including health care workers) stated that "...most people don't have any idea about diabetes." Some community members do attempt to attain information pertaining to diabetes, as well as information pertaining to mercury

from the doctors that treat community members. One community member, who was very concerned with the impact of diabetes on herself and her family narrated the result of her consultation with one of the local doctors.

...there is three things that they think that might cause a person to be a diabetic. The first questions that they asked me was 'did you know if any of your relations that have diabetes?' But I don't recall any of my father or my mother's side or my grandmother's side or my grandfather's side of the family having any of these things. Just to...bother of checking these types of things. So after saying that what they said at this point is that it runs in families. If any of them have it, then I have it too. The second question that they ask me...they questioned me 'do you drink heavy alcohol?' 'Yeah', I said, 'yeah, in my teens I did use a lot of booze and I recall that was fifteen years...my teenage years.' Then they said 'well, then there is a possibility that you might have damaged your pancreas...once the pancreas is gone then your body doesn't kill the sugar. When your pancreas is not working' (Interviewee #1).

Others do not take this type of initiative. The reasons for this vary and as a result some are not able to take preventative measures of any kind. The potential problem with respect to this is that a case may go undiagnosed and as a result untreated, and could potentially escalate until a case becomes critical. Furthermore, of the forty-two reported cases of diabetes within Grassy Narrows, none of these are Type 1 Diabetes Mellitus (juvenile diabetes). Children, however, have now been observed to be developing type 2 mellitus within First Nations communities. This is due to a less nutritious diet and a less active lifestyle. It is obvious from the following statements by one made interviewee in his 50's that community members within Grassy Narrows are aware of this.

The other thing that was very interesting was that long before the...other nation come in...like before the Indians were here, you know, things from the land like moose, partridge, duck, fish – these are all good foods and all these were strictly for diet food. Like you know, that was good. I was saying the dietrician or nurse – they say that...now today what natives are

eating. They buy things now from those supermarkets ...and they all say...natives are not used to the kind of food we eat now, eh? It's...most of those foods are fat foods, where before we weren't eating the kind of rich food. It's more like dietary food...but now every thing is available. Sugar and pop and all this... (Interviewee #1).

Grassy Narrows medical staff elaborate on this matter by stating that in Canada, and increase of the incidence of type 2 diabetes mellitus seems to be developing in children that are living within First Nations communities who are experiencing an increasingly stagnant existence.

The age of onset seems to be dropping over time, and in the past 10 years, Type 2 diabetes has been diagnosed in roughly 100 First Nations children in Manitoba and northern Ontario. People who develop diabetes in childhood are likely to develop complications by the time they are young adults. As well, the women will be diabetic during any pregnancies they may have; this puts the next generation at increased risk of diabetes, since the infants are affected by the intrauterine environment (Diabetes Statistics Reference Sheet, Monday, April 17, 2000).

Despite the existence of this data, however, there have been no such cases diagnosed within the resident population of Grassy Narrows. According to a nurse in Grassy Narrows, the Health Access Centre was going to conduct random testing of all the children within Grassy Narrows. However, this did not take place due to difficulties that were encountered with respect to obtaining consent from the parents. This may be something to focus on in the future by the Community Health Representatives (CHRs).

Symptoms of Diabetes and Acute Mercury Poisoning

The result of the changes in the dietary habits of the Ojibway of Grassy Narrows was a high incidence of Diabetes in the local population. This occurred as a result of a

shift from a highly nutritious diet of wild food to a store-bought diet that is high in sugars, fats and carbohydrates. The symptoms of Diabetes in a human coincide with those exhibited by individuals that have been subject to the consumption of mercury. Typical symptoms of Diabetes that have been identified by Grassy Narrows community members, as well as resident medical staff, are the 'glove and sock syndrome' which include the numbness and tingling of hands and feet. The symptoms of mercury poisoning are virtually identical. They include 'glove and sock syndrome', but also include the shaking of limbs, loss of eyesight, developmentally delayed individuals, and in acute cases this includes spasticity. The issue, however, is that the doctor who visits this community does not usually specifically test for mercury. One of the doctors who also treats patients from this community stated that one can definitely not "...distinguish between the signs and symptoms of diabetes and mercury poisoning..." (Interviewee # 41), without conducting hair or blood tests in order to specifically determine how high an individual's mercury levels are. This doctor further stated that bloodcord sampling, which is used to determine levels of mercury contamination in humans at birth, should be conducted at the birth of children by Grassy Narrows residents. This generally does not occur, as it is up to the parents to request this procedure. As this does not seem to be commonly known, Grassy Narrows parents have not generally made this request.

When asked about the incidence of Diabetes and whether or not it has become a problem within this community, the same doctor made the following statements.

Yes, the percentage of Type 2 diabetes is endemic if not epidemic there. A huge percentage of adults are developing Type 2 diabetes. It's a huge percentage! I don't see all the patients from Grassy Narrows, but I would

think it's a huge percentage. Diabetes is the biggest problem. It's a gigantic problem (Interviewee # 41).

As there are 42 reported cases of Type 2 Diabetes Mellitus within Grassy Narrows (with 6 of them being insulin dependent), which represent 9.19% of the population (the total population surveyed in July 2000 was 457 residents – this represents a sample from approximately 53% of the total population which consists of a membership of 1121 – otherwise approx. 70% [784.7 individuals] live on the reserve). While conducting my survey something interesting did occur, however. Only 30 cases of diabetes were reported at this time. This is 12 cases less than exist within the community in actual fact. The one explanation that I arrived at was that the individuals affected by the disease were not at their homes and that many individuals are not very well informed of the symptoms of Diabetes or they do not realize that they or family members have Type 2 Diabetes, which can be regulated by diet, rather than by means of insulin injections. In Grassy Narrows children, Type 1 Diabetes does not seem to be recognized at all, as no figures pertaining to this exist.

One might ask how community residents deal with the issue of controlling the symptoms of Diabetes. This is a very difficult question to answer. As there are 42 cases of Diabetes on the Reserve of which only 6 cases are treated with insulin, diet is the main manner in which this subject is addressed. Type 2 Diabetes can be controlled by regular physical activity, as well as with a properly balanced diet. This is problematic for some elderly community residents, as many continue to fulfil their traditional duties of raising the grandchildren. This does, however, not translate into receiving an increased income in order to feed and clothe these children and provide for themselves as well. As a result,

the object is to obtain as much food as possible from either of the community stores or from Kenora. These supplies are further supplemented with wild food. This is supported by the following statements made by one community residents. This individual stated the following:

I think it might have changed a little since mercury was discovered. People might be more cautious and are not eating too much fish. We've been told by the government that you can eat fish that are a certain size. Some people do...they follow the instructions...but there are some that are forced to still eat fish...cause of a poor income (Interviewee #3).

This situation, however, does not solely apply to elderly community residents, but also to the younger generation who also have the responsibility to raise their children. In general, Young, Reading, Elias and O'Neil are in accordance with opinions expressed by Grassy Narrows community members when they state that many First Nations

...consider diabetes an example of "white man's illness," a new, introduced disease similar to smallpox and tuberculosis in the past. The adoption of modern foods and the decline of hunting and fishing are widely believed to be the underlying causes of the epidemic (Young et al., 2000: 565).

Many community residents agreed with this throughout a number of interviews and for the most part described of the two scenarios in the above context as outlined below.

Dietary Scenario #1

Store-bought food is expensive in northern Canada (especially meat and vegetables). Grassy Narrows represents no exception to this fact. On an average food budget of \$ 195.00 per month (per adult member of this community) this represents an enormous problem. This is particularly problematic in nature as, according to a number

of interviewees, traditionally the grandparents are the ones to raise the children in Ojibway society. An elderly person (suffering from Type 2 Diabetes for example) with a food budget of \$ 195.00 per month and 2-4 young dependants, is facing enormous difficulties simply surviving. Although it is thought healthier to rely on store-bought foods in order to control Type 2 Diabetes, it is virtually impossible for an elderly person suffering from this disease to do so. A mixed diet of both store-bought and wild food will have to be relied on out of necessity. This in turn makes it extremely difficult to control Type 2 Diabetes (which can be controlled by diet) as mercury has been known to exacerbate Diabetes. This represents a problem for some Grassy Narrows residents that are suffering from Type 2 Diabetes.

Dietary Scenario #2

While most Grassy Narrows families currently tend to varying degrees rely on a mixed diet (predominantly originating from the store and approximately 1 to 25 % being wild food). This is due to several reasons. The first reason is that not all local residents hunt and fish for themselves (due to the grandparents' having been sent to residential school where they were not allowed to continue any of their traditional practices). The second reason is that the parents have stopped hunting and fishing for themselves out of fear of mercury contamination. As a result the grandchildren now do not possess the skills necessary to provide their families with wild food on a regular basis. A mixed diet still persists, however, as within Grassy Narrows, the traditional food sharing among community members also persists. As a result it can be seen that the change in dietary habits has had a severe impact on local community member's health.

The difference between these two dietary scenarios is the manner in which they arrive at the same result, which is that the Ojibway of Grassy Narrows rely on a mixed diet that consists of store-bought foods as well as of wild foods. This occurs either out of economic necessity such as an individual being a recipient of welfare payments, or due to the fact that many local residents, who would like to rely on store-bought food cannot do so. This is due to the fact that these individuals simply cannot afford it. On the other hand, local residents who would like to rely on wild foods cannot do so as they are lacking the skills to obtain these foods, they are afraid of the mercury, or they are both lacking the skills to obtain wild foods from the land and they are concerned about the mercury contamination of their surrounding environment.

Chapter 6 Conclusion

Within this thesis my goal has been to focus on the residents of Grassy Narrows and consider how they have been made aware of dangers to their health as a result of the mercury contamination of the English-Wabigoon River System, and how they have responded to this information.

Has knowledge of mercury contamination affected the dietary choices of the Ojibway of Grassy Narrows? The results of the survey that I conducted in July 2000, as well as the 45 interviews that were done with individual Grassy Narrows residents, seem to support the conclusion that knowledge of the mercury contamination of the late 1960's up to 1973 has had an effect on the dietary habits of this particular community. In fact, it can be stated that the Ojibway community of Grassy Narrows was severely affected by the mercury contamination of the English-Wabigoon river system. One can, however, further state that this mercury contamination of this river system was not the sole cause of a shift in the dietary habits (and the resulting economic, social, cultural and health impacts) of this particular community. The relocation of this community, the subjection of the children of this community to the residential school system, as well as the mercury contamination all contributed to the shift in the dietary habits of this community. When asked, community residents supported this conclusion while answering questions for the survey that was conducted throughout the month of July 2000. However, this shift from a consumption of wild food to the consumption of store-bought food items was not total in nature. Rather than totally abstaining from wild foods, the community trend has been

to consume a mixed diet of wild foods and store-bought foods. Approximately 84% of the population consumes a mixed diet. As mentioned previously in this thesis, approximately 74 households (67%) of the surveyed population regularly consume a mixed diet consisting of approximately 1-25% of wild food. In addition to this, approximately 20 of the surveyed households (18%) consume between 26–50% of wild food in their diet, approximately 4 of the surveyed households (4%) consume 51–75% of wild food, and approximately 2 of the surveyed households (2%) consume 76–100% wild food as part of their regular diet. Many of these households also consume frozen fish from the Grassy Narrows Fish House in addition to the wild food items and the store-bought food items mentioned above. As a result of this shift, even though it represents only a partial shift, the community's traditional structures did suffer significantly. None of the families that are currently residing within Grassy Narrows have continued to regularly visit their trap lines for an extended period. Some individuals still maintain the trap lines they had inherited from their parents or grandparents, but most now permanently reside within the permanent location of the Grassy Narrows reserve. In some cases a reliance on Welfare payments also has contributed to the decrease in the continuation of the traditional subsistence practices of this community.

Traditional structures such as the clan system have also been damaged as a result of the impact of relocation, the residential school system and the mercury contamination of the surrounding environment. The clan system used to serve as the basis for traditional governance. It also represented a means of governing local interactions. However, these structures have not disappeared. They were damaged, but not eliminated. In the present,

elders are beginning to teach the children, adolescents, and young adults to hunt, fish, trap and to go blueberry picking again. Although only a small number of young individuals are currently participating, interest in this is rising. Many community members either still or have begun to regularly attend Pow Wows again. Many dance at these Pow Wows and are teaching their children to do the same.

Many community residents are aware that their community is experiencing a variety of serious problems as a result of the effects of mercury contamination of their wild foods. Unfortunately it has been difficult for community residents to attain up-to-date information on its subject of mercury contamination and its symptoms for at least the past 10 years. Of the three mercury workers that were interviewed, none had received formal training when requested, nor had they received materials pertaining to the mercury contamination of the surrounding environment for the purpose of distributing it within the community within this time period. As a result of this unfortunate situation, Grassy Narrows residents are left without any form of recourse. Furthermore, mercury compensation payments do not represent a solution (although these payments are of great help to those individuals that have been adversely and identifiably affected by the mercury contamination of their surrounding environment), as they do nothing to contribute to the elimination of the problem as mercury contamination persists in the environment surrounding this community. To varying degrees, Grassy Narrows community members continue to consume wild foods that are obtained off the land and as a result some individuals continue to exhibit symptoms of mercury poisoning. In addition, since the 1970's community members have consumed significant amounts of

store-bought foods, which are bought on the basis of their price or popularity rather than their nutritional quality. Many of these foods are high in carbohydrates and sugars. This new diet has in turn led to additional health problems, in particular diabetes, that have been experienced by many community members. Data pertaining to the reasons and incidence for diabetes mellitus 2 is, however, not readily available within the community. At this point, serious efforts are being made by the local nursing staff in order to educate the community with respect to this disease. This includes, but is not limited to, nutritional workshops. These workshops are, however, poorly attended. As a result, this information does not reach most community residents.

Tangible Effects of this Study for the Health of this Community

While residing within this community I realized that this particular study could benefit the community in quite unexpected ways. First of all, community members became aware of my presence in the community. Inquiries revealed that I was looking at dietary habits and their health impacts. My focus at that point was the resulting incidence of diabetes in connection to a shift in dietary habits. After approximately one week I discovered that I had acquired the nickname of 'Diabetes Lady' (among others). This, to a certain degree raised some awareness at that point. I became aware of this as a result of repeated questions with respect to the incidence of diabetes within the context of the interviews that were being conducted, as well as during casual conversations. This represented a good start. The mercury workers, after not being able to produce any up-to-date mercury information of any kind, began to question the reasons for this and the

impact this may have on their community. No actions were taken at this point (and they may not be taken in the near future either), but awareness was raised. I also discovered, however, that a critical consciousness of these issues already existed within this community and had existed there for the past twenty years. Community members are aware of the issues and the associated problems. The community is taking action by sending members to various conferences in order to speak on behalf of their community. They are also sending representatives to Ottawa for the purpose of attending environmental protests, discussions with parliament members, treaty negotiations (which include addressing the issue of mercury contamination). The list of these types of efforts is extensive. Work such as that done in the conducting this study, in combination with local and national efforts on this subject matter could aid the community in their effort to create more effective action in order to combat any destructive trends resulting from relocation, the residential school system, as well as from the mercury contamination of the environment that surrounds this particular Ojibway community located at Grassy Narrows. Whatever the solutions may be, however, the initiative must come from within this community and must be assisted from the outside. In order to gain control over their lives and their environment, this Ojibway community has reached out to other First Nations communities and the greater Canadian public by means of extensive and non-traditional networking techniques. This effort has involved meetings with the governments of these other First Nations, as well as meeting with Canadian government leaders. This effort has also included the attempt to create a high media profile for the issues and problems these Ojibway face in the community located at Grassy Narrows.

These approaches are very non-traditional, as most problems this community has had to face in the past used to be handled internally by their traditional leaders.

Finally the question remains to be answered whether I as the researcher in July 2000 facilitated change within this community. I believe that as a result of this study a number of local residents became more aware of the lack of access to information regarding the mercury contamination of their surrounding environment. Some also gained an increased awareness of the impact their diet has had on their health. Did this necessarily result in a change of current dietary habits. I will have to honestly state that in most of those cases this is not the case. I do, however, also believe that much of the change that could result from this study will occur once this document has been completed and provided to the Grassy Narrows residents by means of distribution by the Band Council, as well as by the local Health Clinic.

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Appendix A: Maps

Map 1 **The Settlement Movements of the Ojibway of Ontario**

(Warren, 1984: 332)

Map 2

The Current Location of Grassy Narrows (Including the Location of the English-Wabigoon River System)

(Shkilnyk, 1985)

Map 3 Grassy Narrows Town Map

Appendix B: Charts

Figure 1.1 Chronological Chart of Actions Taken by the Provincial and Federal Governments in Response to the Mercury Contamination of the English-Wabigoon River System

Date	Event
1961 - 1970	<ul style="list-style-type: none"> On a daily basis, between 10 and 20 lbs. of inorganic mercury were emitted into the English-Wabigoon River System
1970	<ul style="list-style-type: none"> Effluent discharge is reduced by ministerial order to less than 3% 35 individuals from Grassy Narrows are tested by the Ontario Ministry of Health Closure of the commercial fishing industry Institution of the Fish for Fun Program
1970 - 1973	<ul style="list-style-type: none"> The Provincial Government discusses the Fourth Report of the Mercury Task Force. It's recommendations were not accepted in total and the report is tabled by the Ontario Minister of Health The blood and hair testing program continues The Ontario Ministry of Health is working in close co-operation with the Department of National Health and Welfare The Ontario Ministry of Health has conducted, and is continuing to conduct, an information program to inform the community's leaders not to eat locally caught fish
1972	<ul style="list-style-type: none"> The Federal Government sponsors a workshop on Mercury in Man in Ottawa - this workshop attracted scientists from several countries abroad, as well as from Canada and the US Studies are being carried out by Nutrition Canada in which base line blood levels of mercury are being determined on a representative sample of the Canadian population Animal studies are being carried out by Health Protection Branch to determine the effects of mercury. One of these studies involved the feeding of fish from Clay Lake (which is part of the English-Wabigoon River System) to cats who subsequently show neuropathological changes attributable to organic mercury. The financing of Health Programs Branch of external studies on mercury by University and public health groups. Preparation by the National Research Council Subcommittee on Metals of a monograph on mercury
1973	<ul style="list-style-type: none"> 18 individuals whose blood mercury levels of December 1972 and January 1973 exceeded 100 ppb, were invited to undergo comprehensive clinical examinations at the Winnipeg General Hospital. 6 of these identified individuals agree to complete the examination

(Shkilnyk, 1983: 5-10)

Figure 1.2 Various Mercury Levels (Total Mercury)* in Human Blood and Hair:

	Whole Blood (ppb)	Red Cells (ppb)	Hair (ppm)
"Normal"	5	10	10
Estimated maximum "safe" level	100	200	60
Overt Symptoms may appear	500	1,000	150
Known Fatal	1,300	(2,400)**	500

* The proportion of organic mercury to total mercury may roughly be estimated from the ration $\frac{\text{Red Cell Mercury}}{2 (\text{Whole Blood Mercury})}$,

as organic mercury tends to bind the red cell portion of the blood.

** Calculated as 1.85 times whole blood level

(Shkilnyk, 1983: 7)

Appendix C: Photographs

Figure 2.1 Frozen Fish from Lake Athabasca (available at the Grassy Narrows Fish House)

Picture: Soha Kneen

Figure 2.2 The Hudson's Bay Store at its Current Location

Picture: Soha Kneen

Figure 2.3 (Loon Clan)

Painting: Jason Fobister
Picture: Soha Kneen

Figure 2.4 (Crane Clan)

Painting: Jason Fobister
Picture: Soha Kneen

Figure 2.5 (Fish Clan)

Painting: Jason Fobister
Picture: Soha Kneen

Figure 2.6 (Marten Clan)

Painting: Jason Fobister
Picture: Soha Kneen

Figure 2.7 (Bird Clan)

Painting: Jason Fobister
Picture: Soha Kneen

Figure 2.8 (Hoof Clan)

Painting: Jason Fobister
Picture: Soha Kneen

Appendix D: Survey Materials

Figure 3.1 Food Purchases per week of selected items in the HBC Store in Grassy Narrows – Dated on 1972-73 data.

Item	Lbs/week	Lbs/capita
Meat (Fresh, include bone)	925	1.85
Canned Meats (Klik etc.)	54	0.10
Canned Beef Stew	36	0.07
Baked Beans (Canned)	57	0.10
Spaghetti Sauce (meat type)	15	0.03
Creamed Corn	28	0.05
Potatoes	350	0.70
Onions	50	0.10
Bread (350 loaves)	500	1.00
Flour	230	0.46
Kraft Dinner	21	0.04
Macaroni	24	0.05

(La Rusic, 1973: 11)

Figure 3.2 Sample Survey Questionnaire Utilized in the Survey Administered to Grassy Narrows Residents in July of 2000

Introduction:

My name is Soha Al-Haddad and I am an M.A. student within the department of Geography and Environmental Studies at Carleton University in Ottawa and I am conducting a survey for my field research in Grassy Narrows. For my thesis I am interested in what the members of your community know of contaminants in the bush food of your territory and what kinds of food the members of your community eat. The aim of this study is to determine whether or not the existence of contaminants in the bush food supply has caused the members of your community to change the types of food which they eat (store-bought foods vs. bush foods). Of interest to me is also if community dietary habits have had an impact on the health of the community.

Questions:

1. Estimated age:

- 1 (15-20 yrs of age)
- 2 (21-30 yrs of age)
- 3 (31-40 yrs of age)
- 4 (41-50 yrs of age)
- 5 (51-70 yrs of age)
- 6 (71-90 yrs of age)

2. Sex:

- 1 (male)
- 2 (female)

3. How many people are there in your household?

4. Does anyone in your household have Diabetes?

- 1 (yes)
- 2 (no)

5. Does anyone in your household have Kennedy Disease?

- 1 (yes)
- 2 (no)

6. Does anyone in your household have Thyroid Disease?

- 1 (yes)

2 (no)

7. How many adult members of your household have Diabetes?

8. How many children in your household have Diabetes?

9. How many adult members of your household have Kennedy Disease?

10. How many children in your household have Kennedy Disease?

11. How many adult members of your household have Thyroid Disease?

12. How many children in your household have Thyroid Disease?

13. Were the children in your household breastfed?

1 (yes)

2 (no)

14. What type of food do you eat?

1 (bush food)

2 (store-bought food)

3 (both bush food and store-bought food)

15. If you answered 'both bush food and store-bought food' to # 14, what percentage of bush food do you eat?

1 (1-25%)

2 (26-50%)

3 (51-75%)

4 (76-100%)

16. Has there been a lifestyle change in your life?
- 1 (yes)
 - 2 (no)
17. Why?
- 0 (no answer)
 - 1 (mercury)
 - 2 (destruction of the fisheries)
 - 3 (destruction of the fur trade)
 - 4 (relocation)
 - 5 (learn from elders)
 - 6 (residential school)
 - 7 (convenience of the new reserve)
 - 8 (regular school)
 - 9 (adopted out of the reserve)
 - 10 (work – too busy)
 - 11 (not taught traditional practices)
 - 12 (lived in the city)
 - 13 (toxins in animals)
 - 14 (health problems due to store-bought food)
 - 15 (number not used)
 - 16 (relocation and residential school)
 - 17 (moved out of parent's house)
 - 18 (clearcuts)
 - 19 (relocation and the government took over trapping)
 - 20 (#19 + destruction of the fisheries)
18. When?
-
19. Does knowledge of contaminants affect your diet?
- 1 (yes)
 - 2 (no)
20. Which contaminants might be a problem for community?
- 1 (mercury)
 - 2 (spray over areas that are to be clearcut)
 - 3 (e-coli)
 - 4 (mercury and spray over areas that are to be clearcut)
 - 5 (not sure)
 - 6 (mercury and e-coli)

Thank you for participating in this survey!