

**Inuvialuit Traditional Ecological
Knowledge of Fisheries in Rivers
West of the Mackenzie River in the
Canadian Arctic**

Richard Papik, Melissa Marschke and G. Burton Ayles



**CANADA/INUVIALUIT
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TECHNICAL REPORT SERIES**

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ABSTRACT

The West Side Working Group (WSWG) was formed by the Fisheries Joint Management Committee (FJMC) in January 2000 to bring different stakeholders together to cooperate on the development of a comprehensive fisheries management plan for rivers west of the Mackenzie River to the Yukon / Alaska border. The scientific information, to be assembled by the Department of Fisheries and Oceans (DFO), and the Traditional Ecological Knowledge (TEK), to be assembled by the WSWG and the Aklavik HTC, would be input into the DFO Science Regional Advisory Process (RAP). This TEK fisheries study, carried out during February and March 2002 and January 2003, enabled fishers and elders to share their knowledge related to fish species, fishing methods and changes in species and fishing areas over time.

Prior to the 1930's and 1940's Inuvialuit lived at a number of locations along the Beaufort Sea coast and fished for Dolly Varden char (*Salvelinus malma*) on the coast at river mouths and at fish holes inland on streams that had spawning char. Char is no longer essential for survival but it remains important for food and cultural purposes. Char continue to be harvested but at a more limited number of sites, primarily close to summer camps. Inuvialuit elders and fishers agreed that the char population of the Big Fish River is significantly reduced and is at a critical stage. This is considered to be a result of significantly reduced flows in the river, possibly changes in water salinity and possibly over fishing of an already stressed stock of fish. Char populations in other streams west of the Mackenzie are considered to be in good condition.

PREFACE

The Fisheries Joint Management Committee (FJMC) Report Series was initiated in 1986 and reports were published sporadically in a variety of formats until 1998. Information on the earlier publications can be obtained directly from the FJMC office. The Series was re-initiated in 2003 and a common format established with concurrent publication on the FJMC website (www.FJMC.ca).

The WSWG was formed by the Fisheries Joint Management Committee (FJMC) and charged with the development of a comprehensive fisheries management plan for rivers west of the Mackenzie River to the Yukon / Alaska border. The workplan of the WSWG is based on a preliminary Department of Fisheries and Oceans (DFO) framework for “Objective-Based Fisheries Management Plans” but it is up to the co-management partners to develop a process that matches their needs and that is the task of the WSWG. The process calls for the assembly of both traditional ecological knowledge and scientific knowledge. This report addresses the former component.

The WSWG contracted with two facilitators to carry out the study. One of the authors (R.P.) is familiar with the area, is a resource user, speaks Inuvialuktun fluently and had participated in an earlier TEK study on the Big Fish River. Another (M.M.) is experienced with participatory research and working with indigenous groups on traditional knowledge. The third author (B.A.) is a member of the FJMC and led a review of the results of the initial study.

Scientific information and knowledge in support of this initiative has been published in a number of different journals and report series and is being summarized in the DFO Science Regional Advisory Process and available on the DFO website (www.DFO-MPO.gc.ca). The completed comprehensive fisheries management plan will be published by the FJMC and available on the FJMC website.

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INTRODUCTION

Traditional Ecological Knowledge (TEK) takes a holistic perspective towards the environment, and considers how components within an ecosystem interrelate. Since TEK is multigenerational and developed over periods of time spent living and interacting within a specific landscape, TEK provides one important way of understanding changes in an environment. TEK plays a central role within Inuvialuit culture, and elders are recognized as strong holders of TEK. It is with this recognition and appreciation of TEK that the West Side Working Group (WSWG) initiated a TEK Fishing Study for the rivers west of the Mackenzie River to the Yukon / Alaska border. This TEK fisheries study, carried out during February and March 2002 and January 2003, enabled fishers and elders to share their knowledge related to fish species, fishing methods and changes in species and fishing areas over time.

The WSWG was formed by the Fisheries Joint Management Committee (FJMC) in January 2000 to bring different stakeholders together to cooperate on the development of a comprehensive fisheries management plan for rivers west of the Mackenzie River to the Yukon / Alaska border (primarily Big Fish River, Blow River, Babbage River, Firth River and Malcolm River) (Appendix 1 - Figure 1). The workplan of the WSWG is based on a preliminary Department of Fisheries and Oceans (DFO) framework for developing what DFO calls, "Objective-Based Fisheries Management Plans". DFO has stressed that in the Inuvialuit Settlement Region, and in other areas where co-management regimes have been established, this DFO framework does not have to be followed. It is up to the co-management partners to develop a process that matches their needs and that is the task of the WSWG. Representatives from the Aklavik Hunters and Trappers Committee (Aklavik HTC), the Aklavik Elders Committee (AEC), the FJMC, the Department of Fisheries and Oceans (DFO) and Parks Canada (PC) participate in the working group. A representative of the Aklavik HTC chairs the WSWG.

The initial task in the workplan of the WSWG was to assemble extant information on the fisheries in the rivers and streams in the plan area. The scientific information, to be assembled by DFO, and the TEK, to be assembled by the WSWG and the Aklavik HTC, would be input into the DFO Science Regional Advisory Process (RAP). A study of indigenous wisdom of the Big Fish River had been carried out for the Aklavik HTC in the early 1990's (Byers, 1993) but the only documented information on the other rivers was collected as part of the Arctic Borderlands Coop study (Arctic Borderlands, 2003), was very general in nature and not of sufficient detail for use in a fisheries management planning process. Accordingly the WSWG initiated a TEK fishing study to:

- (a) collect traditional ecological fisheries knowledge on the area west of the Mackenzie River; and
- (b) use this TEK information for incorporation into the objective-based fisheries management planning process.

This report details the key findings from the TEK fishing study, which took place in Aklavik and Inuvik, NWT in February and March 2002 with a follow-up verification component in January 2003. We begin by briefly outlining the research methodology. This is followed by general information on fish species and their trends in abundance and distribution followed by a description of specific fishing locations or 'main sites' that the

Inuvialuit use or have used in the past. Fishing methods, seasonality of fishing, taste preferences and other issues raised by the fishers and elders, along with changes in the landscape are briefly considered. Concluding remarks include recommendations for further dissemination of this information and recommendations for future management actions.

STUDY METHODS

The general approach to the TEK study was designed by the WSWG. It was the opinion of the Inuvialuit members of the working group that broad based surveys of the general public or intensive one-on-one interviews were not appropriate for the information that needed to be collected or for the individuals they felt should participate. A series of free flowing group discussions amongst knowledgeable fishers and elders was the method that the working group decided would be most effective.

The WSWG contracted with two facilitators to (a) refine the general approach to the TEK fishing study, (b) organize a synthesis and sharing workshop(s), and (c) finalize the report. One of us (R.P.) is familiar with the area, is a resource user, speaks Inuvialuktun fluently and had participated in the earlier TEK study on the Big Fish River. Another (M.M.) is experienced with participatory research and working with indigenous groups on traditional knowledge. A series of participatory tools were used. The Inuvialuit members of the working group identified fishers and elders (12 men and 7 women see Appendix I for names) that they knew were experienced fishers or were knowledgeable of fishing traditions in the area of interest. Four focus group discussions (with three to four people each) took place with fishers and elders in Aklavik and Inuvik. Discussions were held in both English and Inuvialuktun. Large 1:250 000 maps of the study area were used in each of these sessions enabling participants to locate both traditional and current fishing grounds. The Inuvialuit Harvest Calendar was used to help clarify fish species since this calendar has fish species listed in both English and Inuvialuktun. The Inuvialuit members of the working group felt that there were some elders who would not feel comfortable in a group discussion and as a result six one-on-one interviews were also held.

Following the group discussions and interviews a general presentation was delivered to the participants and the Aklavik HTC members to allow for further input and clarification of details. A draft report was then prepared and input provided to the DFO Regional Advisory Process (RAP). On reviewing the draft report for the RAP the Inuvialuit members of the working group raised a number of concerns regarding emphasis and correctness of certain aspects of the draft report. An additional small group of working group members, experienced fishers and elders met with one of us (B.A.) in January 2003 to review the report, particularly the information on fishing sites. The authors note that caution should be exercised in interpreting some of the comments particularly those that relate to quantities of fish.

To avoid confusion for local fishers and elders this report uses local names for all fish species throughout (Inuvialuktun name, accepted common name, and scientific name are included the first time a name is used). Although the focus of this study was on char

(iqaluqpiq, Dolly Varden, *Salvelinus malma*), fishers and elders identified and discussed other fish species throughout this study. Appendix II lists local names, Inuvialuktun name, accepted common name, and scientific name for all species referred to. It should be noted that as with most areas of the world local names do not always conform to accepted scientific nomenclature. For example “herring” usually refers to Arctic cisco (qaaqtaq, *Coregonus autumnalis*), but it can also refer to Pacific herring (qaluhaq, *Clupea harengus*) or big-eyed herring (iriqpaligaurat, least cisco, *Coregonus sardinella*). And “devilfish”, “rockfish” and “bullhead” are all used to describe sculpin species (kanayuk, sculpin sp., *Cottidae* sp.) and possibly other species as well.

For a more complete listing of fish found in the Western Canadian Arctic readers should see reports by Evans and Reist (2002) and the Western Arctic Handbook Committee (2002).

FISHING IN CONTEXT

Fishing is part of a series of activities that have long been undertaken by Inuvialuit and is important for sustenance and culture. The oral traditions have been compiled in “Inuvialuit Pitqusiit” (Department of Education, 1991): “Fishing was an important summer activity. Loads of fish were caught and hauled back to camps for gutting and drying. Sinew nets were used to catch fish in deeper waters. In the shallow streams and river beds, the fish were trapped using rocks, driftwood and willows. Spears were then used to catch the fish.” One of the elders that participated in this study has described many of the practices that people employed to catch fish in the area in “Call Me Ishmael: Memories of an Inuvialuk Elder” (Alunik, 1998). Although there have been many changes fish remain an important source of country food for the Inuvialuit (Usher 2002).

It is worth considering how different factors have all affected where people fish. A brief historical perspective sheds insight into why Inuvialuit have changed their fishing locations and practices in the area west of the Mackenzie. Prior to the 1930’s people lived at various sites along the coast in places like Herschel Island, Kay Point, King Point and Shingle Point and the entire coastline was used for fishing. In the 1930’s RCMP posts and stores began closing and good muskrat trapping opportunities developed in the Mackenzie River Delta as fur prices rose. By the 1940’s most of the people along the coast had moved to Aklavik. With the introduction of the snowmobile in the 1960’s and people stopped using dog teams and it became less necessary to fish extensively for dog food. People visited the coast for shorter trips and fished more in areas nearer to Aklavik such as the fish hole on the Big Fish River. In the 1970’s and 1980, particularly with the development of the oil and gas industry more Inuvialuit moved towards a wage economy resulting in less dependency on country food. In the 1990’s more people began returning to the coast during holidays and many people built small cabins, especially at Shingle Point.

Inuvialuit culture is known for its strong family networks and sharing. However, since fewer people are fishing the amount of fish caught has declined so people cannot share their fish as much as they once did. For example, giving a tubful of char was once considered very little but would now be considered a lot. People continue to share with

their families and their friends; those families who are not out on the land much have to buy their fish and other traditional foods. Of course many changes have affected the Inuvialuit: understanding fishing practices is only part of a much bigger story.

MAIN FISHING SITES

Information for the TEK Fishing Study was collected from five rivers along the north slope of the Yukon and NWT (Big Fish River, Blow River, Babbage River, Firth River and the Malcolm River) and several mainland sites (Shingle Point/Running River, Kay Point/Philips Bay, Nunaluk Spit, Ptarmigan Bay, Herschel Island and Komakak Beach/Fish Creek. Although the Inuvialuit used the entire coastline, these are some of the key areas that people used historically. Figure 1 gives the place names while Figure 2 gives information on fishing and important areas. What follows is a description and analysis of information for each of these main sites.

BIG FISH RIVER

The Big Fish River is a close distance from Aklavik (perhaps 70 km or so by snowmobile), one of the reasons that it was a popular fishing site until its closure in 1987. Many families camped along the Big Fish River. In particular, the “Fish Hole” (located on Cache Creek, a tributary of the Big Fish River) was known for its abundance of char that ran in October every year. This fish hole (like other fish holes throughout the study area) provides a spawning and over-wintering area for the char as the water stays open in these areas year round. Fishers could easily take overnight trips to the Fish Hole from Aklavik by dog team or later by snowmobile. People mostly fished for char, although grayling (*suluqpauraaq*, Arctic grayling, *Thymallus arcticus*) were also caught amongst their catch.

Elders remember that fishing was ‘really good’: people caught two to three hundred fish per dog team at the Fish Hole. Fifteen to twenty dog teams might be fishing and using the area over a ten-day period. Fishers and elders emphasized that this does not mean they were feeding char to the dogs. Char was generally reserved for human consumption. Each family would set three to four nets in the area (perhaps fifteen nets in total were set). In one day, a family could catch one hundred char that were gutted and hung. One elder suggested that five to ten grayling for every one hundred char were caught. Although fish catch varied annually the char stock appeared healthy until the early 1980’s when local people noticed a decline in their catch. During this time there were many little fish that were growing up but these little fish were never caught.

In the 1960’s when the Big Fish River char stock was healthy, the water was very salty at the Fish Hole and undrinkable. Since then the water has changed and it is now so fresh that you can drink it. The water level has also dropped significantly since the 1960’s. One elder spoke of using hip waders to cross the stream in the 1960’s whereas he could now use rubber boots and, in most places, just walk on the gravel. The once loud, gushing waterfall upstream from the Fish Hole is now much smaller and seems like a little trickle.

Areas of the lower Big Fish River where it joined the Delta were also used. Families were able to return to town with boatloads of fish. Elders remembered when jackfish (siuliq, northern pike, *Esox lucius*) and loche (titaalirq, burbot, *Lota lota*) were thrown into a pit to use as bait. Fishers reported that where the Big Fish enters the Delta the water levels seemed lower than in the past and many more gravel beds were exposed. People traveling in the Delta have to stick to main channels and watch for sandbars.

BLOW RIVER

Elders and fishers did not talk about using the Blow River extensively. There are no obvious fish holes or over-wintering sites for char and nobody reported fishing for char in the Blow.

Hunters, hunting for caribou or geese, noticed grayling in the river but few participants talked about fishing for grayling except for an evening meal during the hunt. Several elders suggested that grayling are not eaten by many Inuvialuit since other fish are better tasting and this fish species is considered to be 'ugly'. Many people said that they did not know how to prepare grayling.

One elder recalled hearing loons on the Blow River suggesting that they may feed on small fish in the river.

No one commented if the Blow River was shallower in recent years: this river system is not used much these days.

SHINGLE POINT/RUNNING RIVER

Shingle Point and the nearby Running River were main fishing and whaling locations along the coast for many years. People lived here permanently: hunting caribou and trapping (in the wintertime for white fox), fishing, whaling and seal hunting (in the summer). With the muskrat boom from the 1930's to the 1950's, the permanent residents of Shingle Point moved into the Mackenzie Delta to trap. A school serving the area shut down in 1938 and Shingle Point became a seasonal fishing and hunting area. The cabins that had been built in the 1920's and 1930 were washed away in storms or rotted away.

In the early 1970's George and Barbara Allen built a new cabin out at Shingle Point. This was the first time that any family had lived in this area in quite a while. During the 1980's more families began to build summer homes at Shingle Point. It was estimated that around thirty-nine houses have been built in the past fifteen years. Although many people are now using this area in the summer, only ten to fifteen families are actually fishing. This has become a culturally significant area for the Inuvialuit of Aklavik.

Fishers have noticed a change in the number of fish caught in the area. Elders and fishers noted that thirty years ago there were more herring (qaaqtaq) and char. A fisher might have average two hundred herring for his family while now he averages about one hundred and fifty herring per season. Several people commented that the fish all seem slightly smaller today but others commented that size varies from year to year. Fishers currently fish mainly for herring at Shingle Point in early July till early August when they

can make dry fish. In mid August the fishers' fish for char when the char are running. Among their catch of fish are coney (siirgarq, inconnu, *Stenodus leucichthys*), bullheads and occasionally flat fish (flounder sp., nataarnarq, *Plueronectidae* sp). Several people noted that the char caught at Shingle Point are a bit larger than the fish they catch in the rivers. (i.e., Big Fish River).

There are now six cabins at Running River, including an old miners cabin. This location is now used seasonally, with people mainly fishing for herring and char, but also coney. Nellie Arey suggested that depending on the weather, fishers could catch up to five hundred herring and dry them although some years the catch was smaller because of stormy weather. There are now fewer char running at Shingle Point, so some fishers set their nets inside the bay and some set their nets further away. Perhaps one hundred and fifty to two hundred char are caught per season in this area. Interestingly, in the past few years, people began catching whitefish (aanaarlirq, broad whitefish, *Coregonus clupeaformis*), jackfish and loche more frequently. These are species that were rarely caught in their nets before.

People commented that the water was not salty at Shingle Point or Running River until sometime in July. The water only becomes salty when it starts to clear up.

BABBAGE RIVER/KAY POINT/PHILLIPS BAY

The Inuvialuit have fished in this area for many years. People lived at the mouth of the Babbage River, Kay Point and on Phillips Bay when Herschel Island possessed a thriving little community. David Roland recalls that his grandmother Kutuuk was the last person to live at Phillips Bay, leaving the area by plane in 1942. In the 1930's, families hunted caribou in the mountains and used several fish holes along the Babbage River to catch their winter supply of fish. Trout Lake (68°50'N; 138°45'W), which is now an historical archeological site, was mentioned as having good fishing (lake trout, *Salvelinus namaycush*). People fished mostly in the late summer and early fall when the char started migrating to their spawning areas: herring and grayling were also amongst their catch. There is a small waterfall on the Babbage River that prevents char from moving further up the river. Several participants mentioned the DFO weir that operated on the Babbage in the early 1990's (see Sandstrom et al., 1997).

The winter supply of fish was stored in icehouses that were dug in the permafrost. Ice fishing for kanauyk took place in the wintertime when dogs needed to be fed or a fresh supply of fish was needed.

One elder commented that they used to see a reddish fish whose skin turned white every fall along the Babbage River. She was perhaps referring to the spawning female char.

Along the coast the char are typically larger than those in the rivers and the Babbage River stock is no exception. Back in the 1930's and 1940's the fish (herring and char) were bigger than today and had more fish fat when they were boiled. It was commented that there are big whitefish found year round in the shallow lakes inland between Kay Point and King Point.

Phillips Bay, especially at the Kay point area, has been getting shallower over the years. For example, schooners were able to dock in this area in the 1950's whereas a boat now has to be poled through the water at this point. In fact this area has become a very shallow lake area. Elders commented that this is not surprising since water is low everywhere along the coast, the rivers and within the Mackenzie River Delta. It is probable that along the coast at least this is due to sediments rather than sea level changing.

NUNALUK SPIT

Nunaluk Spit (located between Phillips Bay and Ptarmigan Bay) was a permanent campsite in the early 1930's. Several families used to have cabins in that area since the area was good for fishing. The water is now very shallow. For example, schooners used to dock at the beach along there and now people cannot even travel on the water with a small boat and outboard motor.

FIRTH RIVER/PTARMIGAN BAY

Along the Firth River, there is a place called 'Iggitchiarq'. This is an old fishing location for the Inuvialuit, and archaeologists have carbon-dated the artifacts back to 8000 years ago. People have always caught char (late July – mid Aug) on this river. The mouth of the Firth River, and Ptarmigan Bay was a main fishing area used by the Inuvialuit when Herschel Island was a trading post. Elders recalled how the water "shimmered" which would suggest that a fish run was about to start. This was a signal for fishers to get ready to cast their nets. The fish swam in schools of thirty to forty fish every five minutes apart. Both char and herring were caught, although the occasional big whitefish was also found in the nets (like a broad whitefish but with a larger, white belly), and David Roland speculated these were most likely from the lakes.

Besides fishing at the mouth of the Firth, Elders recalled three good fishing holes: Iggitchiarq, Sheep Creek and Joe Creek. These are probably the over-wintering and spawning areas that are known on the river but none of the active fishers had been to the up river parts of the Firth in the wintertime. It was noted that any eddy on the Firth River was a good fishing spot. One elder reported one other fish hole (location and name not remembered) that never quite froze up in the winter and little fish (a hand length) could be found here during the winter months. Small grayling were spotted along all the small creeks of the Firth River, especially in August.

During the winter months, families used the Firth River to travel by dogteam upstream to the Old Crow Flats for muskrat trapping (they also followed the upper Babbage through the mountains to the Flats). David Roland recalled how during winter months in the 1930's, family and friends from Alaska would come to the Firth River/Ptarmigan Bay area during hardships in the winter. There was enough food in that area to share with anyone that needed a helping hand.

The Firth River delta now is too shallow to travel in. Although most of the channels were once used for fishing and schooners could dock along the shore, this is no longer possible in the Firth River.

HERSCHEL ISLAND

In the early 1900's Herschel Island was used as a main port for whalers in the Beaufort Sea. Herschel Island once had a population of about 1500. People used to live there year round, hunting, trapping and fishing. As whaling began to decline, the muskrat boom in the Mackenzie Delta began. Those that survived the periodic flu epidemics of the late 1940's and early 1950's, gradually moved into the Delta leaving Herschel Island as a seasonal location.

In the early 1960's there were a few families going to Herschel Island to hunt seal. They also fished for char in late July until about the middle of August. In the late 1960's there was only one family going to Herschel Island to hunt for seal (Jonas Meyook family). Today, a few families will take the trip to Herschel to fish for char, since the char are bigger than at Shingle Point. Fishers can catch other species, such as herring, from Shingle Point or Running River. There were once several icehouses at Herschel Island but now only one or two are useable where people store their catch until they are ready to go back to Aklavik. Current fishers reported that Alaskan Inupiat traveling from Alaska to visit friends and relatives in Aklavik and returning to Alaska often stop off and camp on Herschel and around the Firth River area to fish for char. Some suggested that the Alaskans may catch a significant number of char that would not be identified in the Inuvialuit harvest studies. Others did not feel that this was the case.

People commented that the water at Herschel Island is saltier than at Shingle Point. It was suggested that because of the lower turbidity and saltiness of the water, the fish caught at Herschel Island are bigger and tastier than at Shingle Point.

MALCOLM RIVER

Few details were given relating to this fishing location. This area is not used for fishing now because it is too shallow and very far from Aklavik. People commented that Herschel Island residents and others fished in this area in the early part of the last century and that there was a good fish hole on the Malcolm River, at Stickler Lake. Several elders commented that the char were larger than what they see today. Participants reported that fish, probably char, over winter on the Malcolm River since areas of the river never freeze. Grayling were also common in the Malcolm and dog salmon (paiirluq, chum salmon, *Onchorhynchus keta*), probably strays from Alaska rivers, were often seen in the river.

There is a fish hole approximately fifteen miles inland from Komakak Beach on Fish Creek just before you reach the mountains. This location is still used once in a while, although since the location is too far for most fishers to travel people only use this fish hole when traveling to and from Alaska.

KOMAKAK BEACH

People use this location on the way to and from Barter Island, Alaska. People will stop and day fish at Komakak Beach (see comments above on Herschel Island).

A SYNTHESIS OF INFORMATION ON THE FISHERIES

FISHING METHODS

Fishing practices have changed over time. Alunik (1998) has described fishing practices pre-European contact. Elders remember fishing in the 1930's to the 1960's with 4 to 4.5 inch mesh gill nets that were between forty feet to fifty feet long. The larger mesh enabled smaller fish to escape. Fishers caught many fish, using their gill nets as sweep nets along the coast and in the fish holes. Some Elders talked about fishing at the mouths of rivers when the fish were moving downstream (e.g., the Babbage River) although others suggested that this is not an Inuvialuit practice it does still occur in other areas of the ISR. Nets were set throughout the summer months until all the fish runs ended. Another fishing practice included the use of willow branches to make traps that could catch loche. During the winter hooking or jigging through the ice was a common fishing method in the past and people continue to use this method today. When fish are abundant, it is very easy to catch something by hooking or jigging.

Perhaps in the 1970's, fishers began using herring nets with 3.5 inch mesh that they set along the shore for many fish species. After twenty to thirty minutes, fishers would return to take the fish out of these nets. Such nets were shorter than the usual nets they used, perhaps between ten to fifteen feet in length. For example, shorter nets are used in places such as Running River and Shingle Point (the main fishing spot for Aklavik people now) since the fish swim in schools along the shores as they are feeding. However, for the char fishery, fishers continue to use 4 or 4.5-inch mesh nets. At Herschel Island fishers talked of using 4.5 inch nests that are around thirty feet in length. In the Mackenzie River Delta, they use 4 to 4.5 inch nets that are checked several times a day or left out overnight and checked in the morning.

SEASONS

Elders and fishers have a clear idea of when herring or char are going to begin running. In terms of coastal fishing, elders and fishers talked most specifically about fishing around Shingle Point and Running River. Each fishery is associated with the main fish and other fish that are found within these runs. In mid- to late June, depending upon when the ice leaves, the herring run begins and it can last until mid July or so. In early July, towards the last few days of the herring run, the big-eyed herring begin to run, although in smaller numbers. In late July or early August, the char runs begin. The char can run for two to three weeks.

When the Big Fish River was open, fishers usually fished char in late September or early October. Although people no longer fish on the lower Big Fish River, when the river did freeze over people would ice fish for loche, coney and jackfish at the mouths of creeks leading to the main river. Beginning in early October and further into the Mackenzie River Delta some fishers set gill nets through the ice for herring, whitefish and coney. The nets can be kept under the ice until late November fishing for coney and whitefish.

Several elders suggested that the timing of char migrations might be changing. For example, for the past two years the char was late but three years ago the char began

running at the beginning of July. Others suggested that whitefish spawn earlier now than in the past, and it is difficult to find any whitefish with eggs. In the past, there were many egg fish in the fall time. Perhaps these events are part of a cycle or perhaps they are a result of variable weather or climactic conditions.

AMOUNT OF FISH CAUGHT

We attempted to obtain rough estimates of fish harvested in different years but found this to be problematic. The elders and fishers took a more holistic perspective on the resource and did not focus on numbers of fish caught per season. As a result any numbers reported in this study should be taken as qualitative statements only. For example one elder recalled that after freeze up, in the 1960's, he used a sweep net and caught three thousand char at Fish Hole. This seems improbable considering the numbers that others reported (100-150 per day). However, fishers and elders were prepared to compare relative differences such as differences in catch over time. For example one elder noted; "In the past there were always plenty of fish, we just took what we needed. This is not so today".

When the Inuvialuit depended on dog teams for winter travel, fishers caught many fish to feed themselves and their dog teams (especially whitefish and herring). Families owned two or three dog teams, and each dog team had a minimum of six dogs. People were dependent on their summer and fall fishing to feed their dog teams for the winter. Although specific numbers of fish caught are hard to estimate, it was suggested that each family would catch between two thousand to five thousand fish to last the winter depending on how many dog teams the family had. One elder noted that one dog team could take two toboggan loads of fish (one thousand fish) that were a good size (60 cm in length).

With the introduction of the snowmobile dog teams became less prevalent. In the late 1960's most people had switched to using snowmobiles and by the mid 1970's no one used dog teams to travel anymore. In present times families do not rely on dog teams but there are two to three dog teams in Aklavik. They are used for racing purposes, and fed a combination of fish and commercially purchased dog food. As a result, fishing practices have significantly changed. Families are catching fish for subsistence purposes or for sale within Aklavik not to feed their dogs. It is expensive for families to go up the coast so most fishing is close to town. For example a family might catch between two hundred and six hundred herring in one herring run. Fewer char are caught than herring.

CHANGES AND DIFFERENCES IN FISH SPECIES

The discussion groups considered changes in quality and size of fish harvested over the years. Some participants felt that there were changes in the fish had occurred over the years but others reminded us that there was significant year-to-year variation and significant variation between fish. The following are some differences that were noted during the group discussions but not necessarily supported by all group members or noted in other groups:

- In the 1960's, in the lakes near Shingle Point and King Point, a fisherman could find really big, firm crooked back (pikuktung, lake whitefish,

Coregonus clupeaformis) although many people considered the whitefish to now be “watery” i.e. the flesh is not as firm. Whitefish and coney are also considered more “watery”. It should however, be noted that the Arctic Borderlands (2003) study showed that there were year to year differences in whitefish quality and no consistent trend was reported.

- Char are much skinnier than in the past and in some years the char are thinner than in others. Perhaps this is caused by a shortage of food for the char someone suggested or because the entire coast is warmer.
- In some summer months, the herring can have many white worms in their meat and tend to be thinner when they have worms. Elders recalled that once in a while herring would get worms, so the extent to which there are more worms is contested.
- Loche livers sometimes look different. People prefer to eat the loche liver in the Mackenzie River Delta because it is much fatter than along the coast.
- At Running River, when the water gets too high, the big char start running and these fish have a very “mossy” taste. This mossy taste is new.

There was more agreement about differences in size of fish along the coast. There tends to be smaller herring and char around Shingle Point and rivers closer to Aklavik. Char and herring are bigger and as you go further along the coast west towards Herschel and bigger mesh sizes are used for gillnets. Some commented that the char around Herschel Island tends to be oily possibly from feeding on little shrimp. So far as changes in the relative sizes of fish, people commented that while the char are always bigger at Herschel Island, in general, fish captured in this area are smaller now than they were in the past.

Fish such as the loche, whitefish and jackfish were reported to be captured more frequently along the coast than before. Several elders expressed concern over the abundance of jackfish particularly in the Delta. Additionally, rockfish and flat fish are also noticed along the shore. A “round fish”, like suckers (long nose sucker, *Catostomus catostomus*), with herring colors, but darker as been observed and elders report that they have never seen these fish before¹.

TASTE PREFERENCES

Different people have different preferences for their fish. Several elders commented that because there are many fish to choose from, one could afford to be picky. For example, some preferred male char because the meat is firmer; others suggested that char is too oily and that herring has a much better taste and is better to dry. Some said they enjoyed whitefish and crooked back whitefish. Few people talked about eating grayling.

Jackfish were also not favored. People suggested that jackfish have too many worms particularly in the intestines. Dogs were fed the jackfish but even the dogs would get sick, unless the jackfish stomachs were removed.

¹ Note Sam Stephenson of DFO reports that these may be round whitefish (*Prosopium cylindraceum*)

Talking with elders about their preferences for char indicates the range of opinions held on the taste of fish. When asked about choosing male or female fish elders said that male meat is preferred unless the female is taken for her eggs (a delicacy). They stated that female char tends to be really soft and watery when with eggs, whereas the male char is much firmer. Elders suggested that all fish are taken although it was suggested that most people prefer eating the silvers (not yet mature char) as opposed to spawning char. Several elders suggested that they would catch the silver char and leave the brown spawning char. One elder suggested that only elders ate female char. Someone else suggested that sometimes, female char are used for the dogs whereas the male char are eaten by people.

COMMERCIAL FISHING

Although there have been several attempts on behalf of the government and the Inuvialuit to establish a commercial fishery in the area, there has been little success with these ventures. Elders reported that in the 1960's, a commercial fishery was established at Shingle Point and Herschel Island. Fish were flown from Herschel Island to Shingle Point, one planeload at a time. At Shingle Point, they had a barge with a deep-freezer. After two or three years the fishery went "belly up". This fishery was too expensive to operate, the fish run was too short and not enough fish were caught to sustain a commercial fishery². Others noted that the HTC in Inuvik ran a commercial fishery in the Mackenzie Delta in the early 1990's, but this venture also proved to be unsuccessful.

OTHER MARINE ANIMALS

Although this research focused in on fish and fishing activities, other information about animals was also shared. Elders spoke of seeing walruses and killer whales around Herschel Island. For example, several recalled shooting a walrus near Herschel Island. In the springtime, walruses used to be sighted near Herschel Island: all the seals disappeared when the walruses were around. Killer whales have also been sighted near Herschel Island, and similar to walruses, there are no seals around when a killer whale is around. Ishmael Alunik's grandfather told him a story of how a killer whale had bitten a white whale in half.

Until the late 1960's, people used to hunt seals along Herschel Island when the seal prices were good. Seals were also hunted for dog food. No one hunts seals along the Yukon coast any longer because the price of seal pelts is too low. There were some suggestions that seals eat up to 30 fish a day.

Dolphins and otters have been known to enter the Mackenzie River Delta. Harry Gordon reportedly shot a dolphin in the Delta in the 1950's or 1960's and Ishmael Alunik said there were two of them near his cabin. Some elders suggested that there are more river otters now than there used to be for example a pair of otters was seen in 2001 near Margaret Lake on the Firth River.

² Note: Several elders suggested that DFO ran this commercial operation. This is not correct. There was a small domestic/commercial fishery operated by residents of Herschel Island in the mid-1960's. The Menzies Fish Co. Ltd. conducted commercial fishing for char from Pauline Cove and Ptarmigan Bay off Herschel Island in 1965 and 1966 (Baker 1987).

CHANGES ALONG THE COAST

The landscape used by the Inuvialuit has changed over the years. As noted in the individuals elders talked of there now being less water everywhere, at river mouths and in the Mackenzie River Delta. Areas where water used to be deep are now shallow. This has been especially noted at the mouths of major rivers such as the Malcolm, Firth, Babbage and Big Fish Rivers. In the 1950s when people used to own schooners the water was deep enough that sandbars were not touched. Schooners can no longer enter many river mouths because the water is so shallow. More specifically, at Nuneluk Spit the water is now too shallow even for speedboats. It was suggested that less water is flowing within these rivers and that the entire Mackenzie River Delta is far shallower than in the 1960's³.

Other changes have also been noticed. Erosion is now an issue. For example, landslides between Shingle Point and Whiteman Hill have been noticed and beaches along the coast are becoming wider. The willows along the coast used to be stunted shrubs: they are now growing thicker and bushier. Moreover, many willows are growing in areas where they never grew before. One elder wondered if this was a result of global warming.

OTHER INTERESTING COMMENTS

Several elders mentioned fish coming onto the ice on the Firth River when there was a sudden breakup. Some suggested that this was an annual event, and others suggested that this was an unusual event. What was agreed upon was that in the springtime, at the mouth of the Firth River, water floods the river when the ice and snow begins to melt. Water rises over the frozen ice and fish (all types including char) begin to swim over the ice. If fishers are able to witness this event, there are plenty of fish that the fishers can just pick up. However, if fishers miss this event then scavengers eat the fish.

Someone else spoke about “sugar fish” (small fish, which when frozen and eaten taste like sugar). In the past you could get ‘sugar fish’ at a time with big waves (season not stated) but they are rarely seen anymore. They were used for “quok” (frozen, small fish of various species that can be eaten frozen). Another elder noted that you could still find sugar fish in the late fall, but not nearly as many as in the past. “Sugar fish” for some reason, are more common on the Alaskan side of the coast. They were described to look like mini-cisco but should not be confused with the small fish with teeth known as stink fish or smelt (boreal smelt *Osmerus eperlanus*). Others were not familiar with “sugar fish” and they could not be identified to species.

CONCLUSIONS AND LOCAL WISDOM FOR FISHERIES MANAGEMENT

A wealth of information was generated from this TEK Fishing Study. From a historical perspective, a better understanding of how people fished emerged. Changes such as market prices (market prices have to do with seals and not fish so far as I can tell from the above), the introduction of the snowmobile and global warming have impacted where and how people fish. Although fishing practices declined with the introduction of the snowmobile and the closing of the Big Fish River, families are returning to Shingle Point

³ Note: Another possibility is that the shallower water is a result of natural sedimentation. It is unlikely that the coastline has actually risen noticeably in the lifespan of any of the elders.

and Running River for fishing during the summer months. There is some indication that fewer char and herring can now be found along the coast, and more freshwater species are now being caught in peoples' nets. Physical changes in the landscape such as erosion are also affecting fishing and the water in some areas is far less salty than before. The results of this research illustrate how people remain in touch with their landscape, and just how much knowledge is known about one particular resource.

The fishers and elders some strong ideas for management in the area. The following recommendations were repeatedly made:

- The coastal areas must be protected and managed so that future generations can continue to experience the landscape and fishing activities
- Protect fish holes i.e. no development in these areas;
- Leave the spawners;
- If a fish is diseased, take it out so that it doesn't pollute the system;
- Use common sense.

How this information is used is up to the WSWG and the community of Aklavik, the FJMC and DFO. The rich material found in this report indicates that this knowledge should be shared with others in the ISR and elsewhere and should be used in future management initiatives. It is hoped that others can learn from these insightful comments and that people will be able to continue to experience fishing along the coast and rivers for many years to come.

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FIGURE 1. MAP OF THE AREA WEST OF THE MACKENZIE RIVER TO THE CANADA/ALASKA BORDER SHOWING PLACE NAMES.

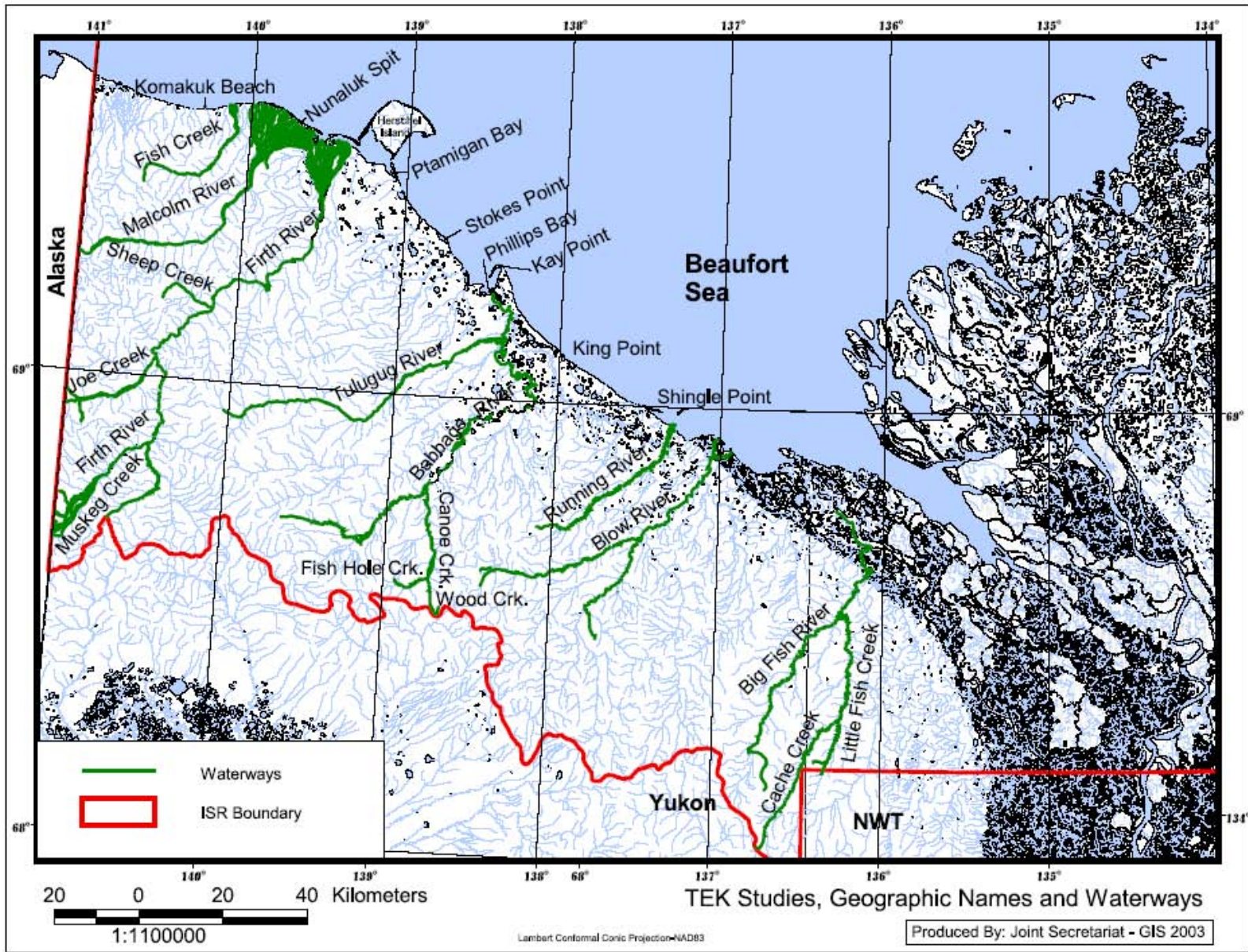
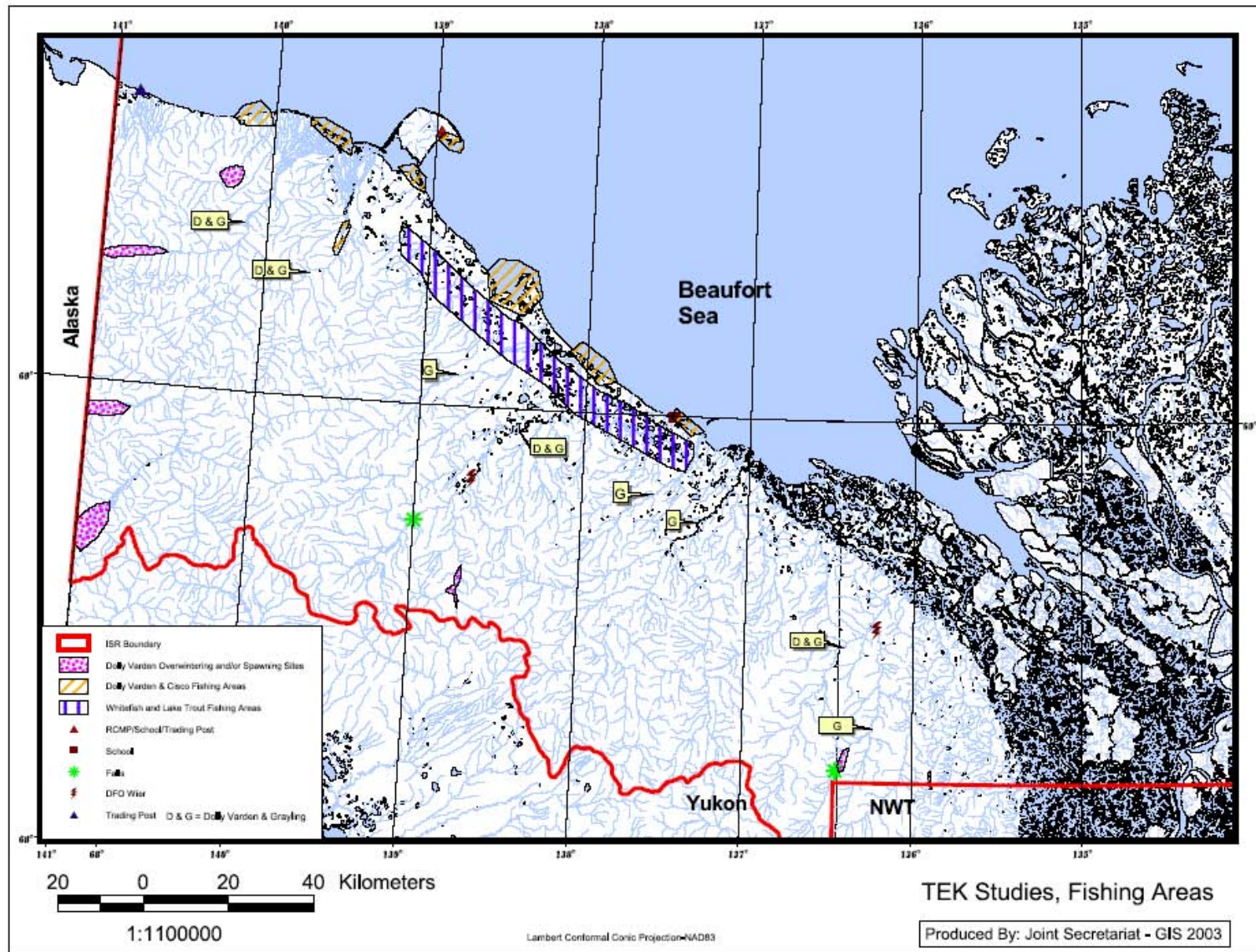


FIGURE 2. MAP OF THE AREA WEST OF THE MACKENZIE RIVER TO THE CANADA/ALASKA BORDER SHOWING FISHING SITES AND SPECIES HARVESTED.



APPENDIX I**PARTICIPANTS IN THE STUDY*****PARTICIPANTS IN THE TRADITIONAL KNOWLEDGE STUDY MARCH 2002***

Sara Meyook	Aklavik
Nellie Arey	Aklavik
Rosie Erigaktoak	Aklavik
Barbara Allen	Aklavik
Mary Ruth Meyook	Aklavik
Carol Arey	Aklavik
Ida Inglangasuk	Aklavik
Moses Kayotuk	Aklavik
Jacob Archie	Aklavik
Arnold Archie	Aklavik
Donald Aviugana	Aklavik
Danny A. Gordon	Aklavik
Danny C. Gordon	Aklavik
Colin Allen	Inuvik
Billy Day	Inuvik
David Roland	Inuvik
Ishmael Alunik	Inuvik

PARTICIPANTS IN THE REVIEW OF THE TRADITIONAL KNOWLEDGE REPORT NOVEMBER 2002

Billy Archie	Aklavik
Donald Aviugana	Aklavik
Danny A. Gordon	Aklavik
Danny Gordon Junior	Aklavik

APPENDIX II**LIST OF FISH SPECIES IDENTIFIED DURING THE STUDY**

Local Name	Inuvialuktun Name	Common Name	Scientific Name
char	iqaluqqiq	Dolly Varden	<i>Salvelinus malma</i>
coney	siirgarq	inconnu	<i>Stenodus leucichthys</i>
flatfish	nataarnarq	flounder sp.	<i>Pleuronectidae sp.</i>
grayling	suluqpauraaq	Arctic grayling	<i>Thymallus arcticus</i>
herring	qaagtaq	Arctic cisco	<i>Coregonus autumnalis</i>
herring	qaluhaq	Pacific herring	<i>Clupea harengus</i>
big-eyed herring	iriqpiligaurat	least cisco	<i>Coregonus sardinella</i>
jackfish	siuliq	northern pike	<i>Esox lucius</i>
loche	titaalirq	burbot	<i>Lota lota</i>
rockfish/ devilfish/ bullhead	kanayuk	sculpin sp.	<i>Cottidae sp.</i>
lake trout		lake trout	<i>Salvelinus namaycush</i>
dog salmon	paiirluq	chum salmon	<i>Onchorhynchus keta</i>
smelt/stink fish		Boreal smelt	<i>Osmerus eperlanus</i>
sucker		long nose sucker	<i>Catostomus catostomus</i>
sugar fish			<i>Not identified</i>
whitefish	aanaarlirq	broad whitefish	<i>Coregonus nasus</i>
crooked back/ humpback whitefish	pikuktung	lake whitefish	<i>Coregonus clupeaformis</i>