

**U.S. Fish and Wildlife Service  
Office of Subsistence Management  
Fisheries Resource Monitoring Program**

**Subsistence Fisheries Assessment:  
Kvichak River Watershed Resident Species**

**Final Report for Study No: FIS02-034**

Theodore Krieg. Division of Subsistence, Alaska Department of Fish and Game, PO Box 1030, Dillingham, Alaska, 99576-1030; 907-842-5925; theodore\_krieg@fishgame.state.ak.us

Molly Chythlook. Division of Subsistence, Alaska Department of Fish and Game, PO Box 1030, Dillingham, Alaska, 99576-1030; 907-842-5925; molly\_chythlook@fishgame.state.ak.us

Philippa Coiley-Kenner. Division of Subsistence, Alaska Department of Fish and Game, 333 Raspberry Road, Anchorage, Alaska, 99518; pippa\_kenner@fishgame.state.ak.us

Davin Holen. Division of Subsistence, Alaska Department of Fish and Game, 333 Raspberry Road, Anchorage, Alaska, 99518; davin\_holen@fishgame.state.ak.us

Kurt Kamletz. Division of Sport Fish, Alaska Department of Fish and Game, 333 Raspberry Road, Anchorage, Alaska, 99518; kurt\_kamletz@fishgame.state.ak.us

Hans Nicholson. Natural Resources Department, Bristol Bay Native Association, PO Box 310, Dillingham, Alaska, 99576-0310; hnicholson@bbna.com

February 15, 2005



# TABLE OF CONTENTS

List of Figures .....	ii
List of Tables .....	iii
List of Plates .....	vii
Abstract .....	1
Chapter One: Introduction .....	3
Background .....	3
Objectives .....	6
Chapter Two: Methods .....	9
Project Approvals.....	9
Estimates of Harvests and Uses .....	9
Hiring and Training Local Research Assistants.....	9
Content and Distribution of Calendars .....	10
Calendar Returns.....	11
Final Round of Summary Interviews .....	14
Data Analysis .....	15
Traditional Ecological Knowledge .....	16
Key Respondent Interviews .....	16
Place Names and Map.....	18
Inventory of Field Notes, Trip Reports, and Audio Tapes .....	18
askSam Methods .....	19
Background.....	19
Chapter Three: Findings .....	25
Demography.....	25
Estimated Harvests.....	25
Use and Harvest Estimates.....	25
Harvests by Gear Type.....	26
Timing of Harvests .....	27
Evaluation of Study Year and Meeting Needs.....	28
Comparisons with Harvest Estimates from Other Study Years.....	28
Traditional Ecological Knowledge .....	30
AskSam TEK Database.....	30
Summary of Use Patterns and TEK Observations by Species.....	31
Arctic Grayling .....	31
Blackfish .....	39
Burbot .....	41
Longnose Sucker.....	44
Northern Pike .....	48
Rainbow Smelt.....	56

Trout and Char: Dolly Varden and Arctic Char.....	59
Lake Trout.....	65
Rainbow Trout .....	71
Brook Trout and Mountain Trout .....	79
Whitefish: Humpback and Broad Whitefish.....	82
Round and Pygmy Whitefish.....	86
Least Cisco.....	88
 Chapter Four: Discussion and Conclusions .....	 93
Discussion.....	93
Study Findings .....	93
Study Methods .....	94
Recommendations.....	95
 Acknowledgments.....	 99
Literature Cited.....	101
Footnotes .....	105
Figures .....	109
Tables .....	145
 APPENDIX A. Training Manual.....	 221
APPENDIX B. Harvest Calendar .....	227
APPENDIX C. Post-Season Survey .....	231
APPENDIX D. Protocol for Collecting TEK .....	237
APPENDIX E. Conversion Factors .....	241

## LIST OF FIGURES

Figure 1. Kvichak Watershed Study Area.....	108
Figure 2. The Home Page on the CD .....	20
Figure 3. The Instructions Page on the CD .....	20
Figure 4. The “Search Results” Window on the CD .....	22
Figure 5. The “Map of Area” Page on the CD .....	23
Figure 6. The “Database” Page on the CD.....	24
Figure 7. Harvests of Nonsalmon Freshwater Fish, Pounds Usable Weight Per Household, Study Communities, 2002/2003.....	111
Figure 8. Harvests of Nonsalmon Freshwater Fish, Pounds Usable Weight Per Capita, Study Communities, 2002/2003.....	112
Figure 9. Composition of Nonsalmon Freshwater Fish Harvest, Kvichak Watershed Communities, 2002/2003 .....	113
Figure 10. Percentage of Usable Pounds of Nonsalmon Freshwater Fish Harvested by Gear Type, Study Communities, 2002/2003 .....	114

Figure 11. Harvests of Nonsalmon Freshwater Fish by Month, Kvichak Watershed Study Communities, 2002/2003 .....	115
Figure 12. Estimated Harvests of Nonsalmon Freshwater Fish, Study Communities of the Kvichak Watershed, Pounds per Capita .....	116
Figure 13. Estimated Harvests of Nonsalmon Freshwater Fish in Pounds Usable Weight per Person, Kvichak Watershed Communities Combined, by Decade .....	117
Figure 14. Composition of Nonsalmon Freshwater Fish Harvest, Kvichak Watershed Communities Combined, by Decade .....	118
Figure 15. Local English Place Names, Igiugig .....	119
Figure 16. Central Yup'ik Place Names, Igiugig .....	121
Figure 17. Local English Place Names, Iliamna .....	123
Figure 18. Local English Place Names, Kokhanok .....	124
Figure 19. Central Yup'ik Place Names, Kokhanok .....	125
Figure 20. Local English Place Names, Levelock .....	126
Figure 21. Central Yup'ik Place Names, Levelock .....	127
Figure 22. Local English Place Names, Nondalton .....	128
Figure 23. Local English Place Names, Pedro Bay .....	129
Figure 24. Local English Place Names, Port Alsworth .....	130
Figure 25. Grayling Harvest Locations .....	131
Figure 26. Local Knowledge of Freshwater Spawning Locations and Cycle of Grayling in Fall .....	132
Figure 27. Blackfish Harvest Locations .....	133
Figure 28. Burbot Harvest Locations .....	134
Figure 29. Longnose Sucker Harvest Locations .....	135
Figure 30. Northern Pike Harvest Locations .....	136
Figure 31. Rainbow Smelt, Freshwater Smelt, and Stickleback Harvest Locations .....	137
Figure 32. Dolly Varden and Arctic Char Harvest Locations .....	138
Figure 33. Lake Trout Harvest Locations .....	139
Figure 34. Rainbow Trout and Steelhead Harvest Locations .....	140
Figure 35. Mountain Trout and Brook Trout Harvest Locations .....	141
Figure 36. Whitefish Harvest Locations .....	142

## LIST OF TABLES

Table 1. Communities of the Kvichak Watershed .....	3
Table 2. Nonsalmon Finfish Used for Subsistence Purposes in the Kvichak/Iliamna Lake Area .....	145
Table 3. Uses and Harvests of Fish Other Than Salmon, Kvichak/Iliamna Lake Communities .....	147

Table 4.	Estimated Harvests of Freshwater Fish, Kvichak/Iliamna Lake Communities, 1973/74.....	147
Table 5.	Most Recent Estimates of Harvests of Nonsalmon Fish, Kvichak/Iliamna Lake Communities (prior to this study) .....	148
Table 6.	Chronology of Activities.....	149
Table 7.	Sample Achievement, Calendars and Post-Season Interviews .....	150
Table 8.	List of Key Respondent TEK Interviews .....	151
Table 9.	Demographic Characteristics of Study Communities, 2002/2003.....	152
Table 10.	Estimated Harvest and Use of Nonsalmon Freshwater Fish, Igiugig, October 1, 2002 – September 30, 2003 .....	153
Table 11.	Estimated Harvest and Use of Nonsalmon Freshwater Fish, Iliamna, October 1, 2002 – September 30, 2003 .....	154
Table 12.	Estimated Harvest and Use of Nonsalmon Freshwater Fish, Kokhanok, October 1, 2002 – September 30, 2003 .....	156
Table 13.	Estimated Harvest and Use of Nonsalmon Freshwater Fish, Levelock, October 1, 2002 – September 30, 2003.....	157
Table 14.	Estimated Harvest and Use of Nonsalmon Freshwater Fish, Newhalen, October 1, 2002 – September 30, 2003 .....	158
Table 15.	Estimated Harvest and Use of Nonsalmon Freshwater Fish, Nondalton, October 1, 2002 – September 30, 2003.....	159
Table 16.	Estimated Harvest and Use of Nonsalmon Freshwater Fish, Pedro Bay, October 1, 2002 – September 30, 2003.....	160
Table 17.	Estimated Harvest and Use of Nonsalmon Freshwater Fish, Port Alsworth, October 1, 2002 – September 30, 2003 .....	161
Table 18.	Estimated Harvests of Nonsalmon Freshwater Fish in Pounds Usable Weight, Study Communities, 2002/2003.....	162
Table 19.	Estimated Harvest of Nonsalmon Freshwater Fish in Numbers by Gear Type, Igiugig, October 1, 2002 through September 30, 2003.....	163
Table 20.	Estimated Harvest of Nonsalmon Freshwater Fish in Numbers by Gear Type, Iliamna, October 1, 2002 through September 30, 2003.....	164
Table 21.	Estimated Harvest of Nonsalmon Freshwater Fish in Numbers by Gear Type, Kokhanok, October 1, 2002 through September 30, 2003 .....	165
Table 22.	Estimated Harvest of Nonsalmon Freshwater Fish in Numbers by Gear Type, Levelock, October 1, 2002 through September 30, 2003 .....	166
Table 23.	Estimated Harvest of Nonsalmon Freshwater Fish in Numbers by Gear Type, Newhalen, October 1, 2002 through September 30, 2003.....	167
Table 24.	Estimated Harvest of Nonsalmon Freshwater Fish in Numbers by Gear Type, Nondalton, October 1, 2002 through September 30, 2003 .....	168
Table 25.	Estimated Harvest of Nonsalmon Freshwater Fish in Numbers by Gear Type, Pedro Bay, October 1, 2002 through September 30, 2003 .....	169
Table 26.	Estimated Harvest of Nonsalmon Freshwater Fish in Numbers by Gear Type, Port Alsworth, October 1, 2002 through September 30, 2003.....	170
Table 27.	Estimated Harvest of Nonsalmon Freshwater Fish in Usable Pounds by Gear Type, Igiugig, October 1, 2002 through September 30, 2003.....	171
Table 28.	Estimated Harvest of Nonsalmon Freshwater Fish in Usable Pounds by Gear Type, Iliamna, October 1, 2002 through September 30, 2003 .....	172

Table 29.	Estimated Harvest of Nonsalmon Freshwater Fish in Usable Pounds by Gear Type, Kokhanok, October 1, 2002 through September 30, 2003 .....	173
Table 30.	Estimated Harvest of Nonsalmon Freshwater Fish in Usable Pounds by Gear Type, Levelock, October 1, 2002 through September 30, 2003 .....	174
Table 31.	Estimated Harvest of Nonsalmon Freshwater Fish in Usable Pounds by Gear Type, Newhalen, October 1, 2002 through September 30, 2003 .....	175
Table 32.	Estimated Harvest of Nonsalmon Freshwater Fish in Usable Pounds by Gear Type, Nondalton, October 1, 2002 through September 30, 2003 .....	176
Table 33.	Estimated Harvest of Nonsalmon Freshwater Fish in Usable Pounds by Gear Type, Pedro Bay, October 1, 2002 through September 30, 2003 .....	177
Table 34.	Estimated Harvest of Nonsalmon Freshwater Fish in Usable Pounds by Gear Type, Port Alsworth, October 1, 2002 through September 30, 2003.....	178
Table 35.	Percentage of Estimated Harvest of Nonsalmon Freshwater Fish by Gear Type, Igiugig, October 1, 2002 through September 30, 2003.....	178
Table 36.	Percentage of Estimated Harvest of Nonsalmon Freshwater Fish by Gear Type, Iliamna, October 1, 2002 through September 30, 2003 .....	179
Table 37.	Percentage of Estimated Harvest of Nonsalmon Freshwater Fish by Gear Type, Kokhanok, October 1, 2002 through September 30, 2003 .....	180
Table 38.	Percentage of Estimated Harvest of Nonsalmon Freshwater Fish by Gear Type, Levelock, October 1, 2002 through September 30, 2003 .....	181
Table 39.	Percentage of Estimated Harvest of Nonsalmon Freshwater Fish by Gear Type, Newhalen, October 1, 2002 through September 30, 2003 .....	182
Table 40.	Percentage of Estimated Harvest of Nonsalmon Freshwater Fish by Gear Type, Nondalton, October 1, 2002 through September 30, 2003 .....	183
Table 41.	Percentage of Estimated Harvest of Nonsalmon Freshwater Fish by Gear Type, Pedro Bay, October 1, 2002 through September 30, 2003 .....	184
Table 42.	Percentage of Estimated Harvest of Nonsalmon Freshwater Fish by Gear Type, Port Alsworth, October 1, 2002 through September 30, 2003.....	185
Table 43.	Percentage of Estimated Harvest of Usable Pounds of Nonsalmon Freshwater Fish by Gear Type, Study Communities, 2002/2003 .....	186
Table 44.	Estimated Percentage of Harvest of Nonsalmon Freshwater Fish by Gear Type and Species, All Study Communities, October 1, 2002 – September 30, 2003.....	187
Table 45.	Estimated Number of Households Harvesting Nonsalmon Freshwater Fish by Gear Type, Igiugig, 2002/2003 .....	188
Table 46.	Estimated Number of Households Harvesting Nonsalmon Freshwater Fish by Gear Type, Iliamna, 2002/2003 .....	189
Table 47.	Estimated Number of Households Harvesting Nonsalmon Freshwater Fish by Gear Type, Kokhanok, 2002/2003.....	190
Table 48.	Estimated Number of Households Harvesting Nonsalmon Freshwater Fish by Gear Type, Levelock, 2002/2003.....	191
Table 49.	Estimated Number of Households Harvesting Nonsalmon Freshwater Fish by Gear Type, Newhalen, 2002/2003 .....	192
Table 50.	Estimated Number of Households Harvesting Nonsalmon Freshwater Fish by Gear Type, Nondalton, 2002/2003.....	193

Table 51.	Estimated Number of Households Harvesting Nonsalmon Freshwater Fish by Gear Type, Pedro Bay, 2002/2003.....	194
Table 52.	Estimated Number of Households Harvesting Nonsalmon Freshwater Fish by Gear Type, Port Alsworth, 2002/2003.....	195
Table 53.	Estimated Harvests of Nonsalmon Freshwater Fish in Numbers of Fish by Month, Igiugig, October 2002 through September 2003.....	196
Table 54.	Estimated Harvests of Nonsalmon Freshwater Fish in Numbers of Fish by Month, Iliamna, October 2002 through September 2003.....	197
Table 55.	Estimated Harvests of Nonsalmon Freshwater Fish in Numbers of Fish by Month, Kokhanok, October 2002 through September 2003.....	198
Table 56.	Estimated Harvests of Nonsalmon Freshwater Fish in Numbers of Fish by Month, Levelock, October 2002 through September 2003.....	199
Table 57.	Estimated Harvests of Nonsalmon Freshwater Fish in Numbers of Fish by Month, Newhalen, October 2002 through September 2003.....	200
Table 58.	Estimated Harvests of Nonsalmon Freshwater Fish in Numbers of Fish by Month, Nondalton, October 2002 through September 2003.....	201
Table 59.	Estimated Harvests of Nonsalmon Freshwater Fish in Numbers of Fish by Month, Pedro Bay, October 2002 through September 2003.....	202
Table 60.	Estimated Harvests of Nonsalmon Freshwater Fish in Numbers of Fish by Month, Port Alsworth, October 2002 through September 2003.....	203
Table 61.	Estimated Harvests of Nonsalmon Freshwater Fish in Usable Pounds of Fish by Month, Igiugig, October 2002 through September 2003.....	204
Table 62.	Estimated Harvests of Nonsalmon Freshwater Fish in Usable Pounds of Fish by Month, Iliamna, October 2002 through September 2003.....	205
Table 63.	Estimated Harvests of Nonsalmon Freshwater Fish in Usable Pounds of Fish by Month, Kokhanok, October 2002 through September 2003.....	206
Table 64.	Estimated Harvests of Nonsalmon Freshwater Fish in Usable Pounds of Fish by Month, Levelock, October 2002 through September 2003.....	207
Table 65.	Estimated Harvests of Nonsalmon Freshwater Fish in Usable Pounds of Fish by Month, Newhalen, October 2002 through September 2003.....	208
Table 66.	Estimated Harvests of Nonsalmon Freshwater Fish in Usable Pounds of Fish by Month, Nondalton, October 2002 through September 2003.....	209
Table 67.	Estimated Harvests of Nonsalmon Freshwater Fish in Usable Pounds of Fish by Month, Pedro Bay, October 2002 through September 2003.....	210
Table 68.	Estimated Harvests of Nonsalmon Freshwater Fish in Usable Pounds of Fish by Month, Port Alsworth, October 2002 through September 2003.....	211
Table 69.	Assessment of Harvests and Uses Compared to Other Years.....	212
Table 70.	Reasons for Lower Subsistence Harvests/Uses.....	213
Table 71.	Were Needs Met?.....	214
Table 72.	Reasons Why Needs Not Met.....	215
Table 73.	Estimated Harvests of Nonsalmon Freshwater Fish, Pounds Usable Weight per Capita, Study Communities, All Study Years.....	216
Table 74.	Estimated Harvests of Nonsalmon Freshwater Fish by Decade in Pounds Usable Weight, Study Communities.....	217
Table 75.	Estimated Harvests of Nonsalmon Freshwater Fish in Pounds Usable Weight by Species by Decade, All Study Communities Combined.....	218



## LIST OF PLATES

Plate 1.	Aerial View of Kokhanok with Airplane Lake center left, March 2003 .....	47
Plate 2.	Aerial View of Nondalton, March 2003 .....	50
Plate 3.	Milton Delkittie of Nondalton holding a picture of a locally harvested pike March 2003. ....	53
Plate 4.	Boats at Igiugig near the confluence of Lake Iliamna and the Kvichak River October 2003.....	83
Plate 5.	Humpback Whitefish at Igiugig, October 2003 .....	84



## ABSTRACT

The project collected information about subsistence harvests of nonsalmon freshwater fish by residents of the eight communities of the Kvichak River watershed of the Bristol Bay area, southwest Alaska, for a 12-month period from October 2002 through September 2003. Local research assistants were hired and trained to collect harvest calendars from participating households and conduct a post-season harvest survey. Data were collected on amounts harvested, gear types used, timing of harvests, and location of harvests. There was a high level of involvement in the subsistence use of nonsalmon fish in the study communities, although harvests were low compared to previous estimates from the 1970s, 1980s, and 1990s, primarily because the unusually warm winter in 2002/2003 inhibited travel and the use of traditional methods such as ice fishing. Also, TEK interviews were conducted with 28 individuals, covering such topics as population trends, fish ecology, and traditional harvest methods. These interviews were transcribed and incorporated into a searchable database using the askSam program.

**Key Words:** Alaska blackfish, Arctic char, Arctic grayling, Bristol Bay, burbot, Dolly Varden, harvest calendars, harvest survey, Igiugig, Iliamna, Kokhanok, Kvichak River watershed, lake trout, Levelock, longnose sucker, Newhalen, Nondalton, northern pike, Pedro Bay, Port Alsworth, rainbow smelt, rainbow trout, traditional ecological knowledge, whitefish

**Citation:** Krieg, T., M. Chythlook, P. Coiley-Kenner, D. Holen, K. Kamletz, and H. Nicholson. 2005. Subsistence Fisheries Assessment: Kvichak River Watershed Resident Species. Federal Subsistence Fishery Monitoring Program, Final Project Report No. FIS 02-034. U. S. Fish and Wildlife Service, Office of Subsistence Management, Fisheries Resource Monitoring Program, Fishery Information Service, Anchorage, Alaska.



# CHAPTER ONE: INTRODUCTION

## BACKGROUND

The purpose of this project was to update information about subsistence harvests and uses of nonsalmon freshwater fish species by the residents of the communities of the Kvichak/Iliamna Lake/Lake Clark area of the Bristol Bay region, and to collect traditional ecological knowledge (TEK) about these species. Table 1 lists the communities of this subarea of the Bristol Bay Management Area, along with their estimated populations and the number of households in each community in 2000 (also see Fig. 1). The research was conducted by the Division of Subsistence of the Alaska Department of Fish and Game (ADF&G) and the Natural Resource Department of the Bristol Bay Native Association (BBNA) through contracts with the Fisheries Information Services Division (FIS) of the US Fish and Wildlife Service Office of Subsistence Management (Project No. FIS 02-034).

Community	Population 2000	Number of Households
Igiugig	53	16
Iliamna	102	35
Kokhanok	174	52
Levelock	122	45
Newhalen	160	39
Nondalton	221	68
Pedro Bay	50	17
Port Alsworth	104	34
Total	986	306

Source: US Bureau of the Census 2001

Previous research by the Division of Subsistence (Fall et al. 1996) demonstrated that freshwater fish comprise a significant component of the subsistence harvests of the study communities. Table 2 lists the fish other than salmon that are known to be used for subsistence purposes in these communities (excluding marine species). Most study community households use nonsalmon fish for subsistence purposes. Table 3 indicates the percentage of households interviewed during systematic household surveys that used, fished for, harvested, received, or

gave away nonsalmon fish in previous study years, as well as estimates of harvests per household and per person in pounds usable weight.

There were two previous, near-comprehensive, single year estimates of nonsalmon fish subsistence harvests for the study area. The first is for a 12-month study year in 1973/74 based on research conducted by the University of Alaska, although Port Alsworth was not part of that research (Gasbarro and Utermohle 1974) (Table 4). In 1983, the Division of Subsistence conducted systematic household interviews in all the communities of the area except Levelock (Morris 1986). Since then, updated estimates are available for Levelock (for 1988 and 1996), Iliamna (1991), Newhalen (1991), Kokhanok (1992), Igiugig (1992), and Pedro Bay (1996) (reported in Scott et al. 2001 and ADF&G 2001b). Before this research, there had been no recent updates in Port Alsworth or Nondalton. Table 5 reports the most recent prior subsistence harvest estimates by species for each community based upon research by the Division of Subsistence of ADF&G (Fall et al. 1996).

As noted in Fall et al (1996:77, 134-135; see also Ellanna and Balluta 1992:139-172), residents of Kvichak River watershed communities use a variety of gear to harvest nonsalmon fish, including set nets, sweep seines, set hooks, hook and line, rod and reel, and traps. Although nonsalmon fish are taken year round, harvests are lowest in the summer months when people focus on fishing for salmon. Fishing through the ice in winter with hook and line is particularly important. Net fishing for whitefish is productive in spring and fall (Fall et al. 1996:76).

There are no annual subsistence harvest assessment programs for nonsalmon fish in the study communities.<sup>1</sup> Updating information through this project was desirable for several reasons. First, the most recent data for most communities were eight or more years old. Second, with recent relatively low returns of sockeye salmon to the Kvichak system, it is important to understand how freshwater fish may be used to compensate for below-desired salmon harvests. Also, previous efforts to estimate nonsalmon subsistence harvests in Bristol Bay encountered several issues. An effort by the Division of Subsistence to compile existing data on subsistence uses of these species in the Bristol Bay Area noted (Fall et al. 1996:119, 122):

Harvest estimates for non-salmon freshwater fish are more difficult to obtain than for other widely used resources such as salmon, caribou, moose, or furbearers. Commonly, household heads have trouble tracking or remembering precise annual harvests. There are several reasons for this difficulty. Harvests of freshwater fish often occur in a less concentrated fashion than salmon and over a longer period of time. Particular harvesters within households often vary from season to season or even day-to-day, again in contrast to salmon, where harvest and processing groups are usually quite stable. Furthermore, households often have specific harvest goals for big game (which are also controlled by seasonal limits) and salmon (such as a number of racks in a smokehouse), while families generally do not have specific harvest goals for nonsalmon freshwater fish (harvests are more opportunistic).

Species identification is sometimes a problem in documenting harvest of freshwater fish. Yup'ik classification of "trout" in the region is based on different principles than those used by Western taxonomies. Reliable harvest and use data are difficult to obtain

without a knowledge of the Yup'ik fish categories. Knowledge of local English names for kinds of freshwater fish is also necessary, as in the case of "lake trout" and "Togiak trout" at Manokotak, Aleknagik, and some other communities. Similar cautions apply to whitefish.

This study concluded that:

Monitoring harvests of freshwater fish [in the Bristol Bay Area] is particularly difficult because the seasonal use pattern creates problems for reliable retrospective recall from respondents. If harvest information is needed for management, culturally appropriate, non-intrusive methods need to be developed in consultation with local communities (Fall et al. 1996:156).

This previous study attempted to collect harvest data in several communities in the Nushagak River drainage using a combination of calendars and retrospective recall interviews. This experience provided guidance for the design of this project (Fall et al. 1996:5, 7-8) (see Chapter Two). In the Nushagak River project, the return rate for the calendars was low because they were mostly distributed by mail and there was no local person hired to assist with distribution and collection. Even though people in these communities were accustomed to recording their subsistence salmon harvests on permits, it was difficult to apply the same experience to nonsalmon.

Unlike subsistence salmon fishing, which is usually conducted by groups of people in concentrated time periods, freshwater fishing occurs over many months much more sporadically, with weather and travel conditions playing a major role. Harvesters are more commonly alone or in small groups. Daily catches can be small, but when catches are large, it is not customary to make an exact count of the catch. Consequently, self-monitoring of freshwater fishing requires more effort than reporting salmon harvests on permits, and it is difficult for one person in a household to track the fishing activities of the other household members for multiple species over a year's time (Fall et al. 1996:7).

Nevertheless, the report concluded that the calendar effort had benefits in alerting key harvesters of the interest in documenting catches and providing a guide for species identification. The calendars also provided a topical focus when researchers visited the households. With periodic follow-up (especially by local assistants), it was concluded that calendars can be a useful harvest assessment tool. This report also concluded that periodic interviews with households were the most effective data collection method. Key harvesting households were interviewed three times over the course of a year to cover harvests in three, four-month periods (Fall et al. 1996:8). A combination of calendars and interviews, with calendars collected and interviews conducted several times over the study year, appeared to be the best approach to achieving participation in the program and obtaining reliable harvest estimates, and this was the approach selected for the current study.

Since 1986, the Division of Subsistence has conducted research on traditional ecological knowledge (TEK) of salmon and freshwater fish in the Bristol Bay area, including traditional taxonomies, trends in abundance, condition of fish stocks, movement, timing of runs, areas of

harvest, timing of harvests, means of harvests, food types, preservation methods, sharing, and customary trade. Information on resident freshwater fish species has been provided by local fishing experts from 11 Bristol Bay communities, including two (Levelock and Pedro Bay) in the Kvichak River watershed area. While three reports have summarized subsistence use patterns (Fall et al. 1996; BBNA and ADF&G 1996; Kenner et al. 1999), until recently most of the traditional knowledge on freshwater fisheries provided by local fishing experts remained in hand-written interviews and typed notes, trip reports, and audio tapes.

The Division completed the first version of “From Neqa to Tapa: A Database with Traditional Knowledge about the Fish of Bristol Bay Area” (Kenner 2001) as part of project No. FIS 00-012, supported by funding from USFWS, Office of Subsistence Management. The goal was to convert the existing TEK narrative text data into a retrievable, usable format (a computer-accessible CD-ROM using the AskSam software, the Division standard). Entries were key worded by general categories and the data set was assessed for coverage of topic area, species, and geographic area. Data gaps were identified for future work. Version 2.0 of this database was produced in 2003 as part of FIS Project No. 01-109 (Kenner 2003). For both versions, the priority was to include information from western Bristol Bay (Togiak, Manokotak, Twin Hills) and the Alaska Peninsula.<sup>2</sup>

As part of FIS Project No. 00-017, ADF&G Division of Subsistence and the Alaska Inter-Tribal Council (AI-TC) organized a Subsistence Fisheries Harvest Assessment Working Group (Fall and Shanks 2000). The Working Group had three representatives of ADF&G, three federal agency members, and five tribal members. Its purpose was to review current programs for collecting subsistence fisheries harvest data and develop a set of recommendations for a “unified subsistence fisheries harvest assessment program.” This project was designed to be consistent with these recommendations. Among other things, the Working Group recommended that baseline harvest data be periodically updated if an annual harvest assessment program is unnecessary (Recommendation C.1); that partnerships between management agencies, tribes, and user organizations be developed (Recommendations B.3, B.4, and B.7); that harvest assessment programs develop training components (Recommendation B.8); and that TEK and other contextual information be collected (Recommendation E.2).

## **OBJECTIVES**

The research had the following objectives.

1. Estimate subsistence harvests of Dolly Varden/Arctic char, whitefish, pike, grayling, lake trout, rainbow trout, blackfish, burbot, smelt, and longnose sucker by communities of the Kvichak River watershed, including Levelock, Igiugig, Kokhanok, Pedro Bay, Iliamna, Newhalen, Nondalton, and Port Alsworth, for an annual round of harvests from Fall (October) 2002 through Summer (September) 2003;



2. Describe subsistence use patterns (gear type, timing of harvests, location of harvests, preservation and preparation methods, distribution and exchange) for each type of freshwater fish;
3. Describe trends in harvests and use patterns, fish populations, and fish ecology, based on traditional knowledge;
4. Compile TEK collected in this project and in past projects in the study communities in a searchable database (CD-ROM using askSam format).
5. Evaluate the need for more long-term subsistence harvest monitoring of nonsalmon freshwater fish; and
6. Prepare and distribute a final report.

The dates of the study year presented in objective number one were changed from those appearing in the study design. Initially the 12-month study year was proposed to start on April 1, 2002, and end March 31, 2003. The study year dates for this project were changed to start October 1, 2002, and end September 30, 2003, for several reasons. Initially BBNA and ADF&G were notified by USFWS that this project did not make the cut to be funded when FIS Federal Fiscal Year (FFY) 2002 proposals were being evaluated due to a lack of sufficient funding (and not due to any technical deficiencies in the design). When another FY 2002 project that had been chosen for funding was dropped, this project (FIS 02-034) took its place and was approved for funding. However, in the interim, BBNA and ADF&G had developed schedules to complete and implement other projects. Planning to fit this project into those work schedules required the start date for the study year to be shifted from the spring to the fall of 2002.



## CHAPTER TWO: METHODS

### PROJECT APPROVALS

Procedures used in this project to collect subsistence harvest data were consistent with the recommendations for effective subsistence harvest assessment programs developed by the Subsistence Fisheries Harvest Assessment Working Group (SFHAWG 2001).<sup>3</sup> Among other things, these recommendations stress community approval, training of local research assistants, anonymity of respondents, collection of contextual information to help interpret harvest numbers, and communication of study findings back to the study communities.

BBNA obtained tribal council approval for each community through the resolution process. Each council received a description of the project. Each governing body gave their approval of the project as it was written; none asked for modifications to the design. After project approval, the councils submitted signed resolutions to the BBNA Natural Resource Department requesting them to work in cooperation with the ADF&G Division of Subsistence to conduct the project. The only exception was in Port Alsworth, which is not a federally recognized tribe. There, verbal approval to conduct the project was obtained from the Port Alsworth Improvement Corporation, which is the main governing body for the community. After each council approved of the project, BBNA requested a list of key respondents for the TEK interviews. Job announcements were posted with approval from the council to hire one Village Assistant in each community to distribute and collect the harvest calendars, assist with the TEK interviews, and transcribe the tapes of the TEK interviews.

### ESTIMATES OF HARVESTS AND USES<sup>4</sup>

#### *Hiring and Training Local Research Assistants*

Two procedures were used to collect harvest data: harvest calendars and interviews.<sup>5</sup> All households in each community were asked to record nonsalmon fish harvests on calendars that were to be collected four times (quarterly), covering a 12-month period from October 1, 2002, through September 30, 2003. Their participation was voluntary.

Table 6 provides a chronology of key steps in the implementation and fieldwork phases of the project. Village Assistants were hired and trained by BBNA and ADF&G staff from November 5 to 7, 2002, in each community except Pedro Bay. A training manual (Appendix A), modeled on those used for other Division of Subsistence projects, guided these sessions. Each assistant

received a manual for future reference. After planning and scheduling training meetings with the local assistants, Hans Nicholson with BBNA and Ted Krieg with ADF&G flew to Iliamna on November 5, 2002, and worked together to train the assistants in Iliamna and Newhalen. The next day Hans flew to Pedro Bay where he learned that the village assistant hired there had left the community and was no longer available for the job. Because no one else was available to be hired on short notice, Hans continued on to Kokhanok, Igiugig, and Levelock and trained the assistants in each of those communities. Ted flew to Nondalton and Port Alsworth where he trained the assistants.

Where possible, as part of the training Hans and Ted accompanied the assistants to several households to help them get started. They explained the project, demonstrated how to document harvests on the calendar, and had the household record any harvest that occurred since the October 1 start date of the project. Local research assistants then independently distributed the first set of calendars and explained the project to representatives of the rest of their community's households. They emphasized that the project start date was October 1 and instructed participants to record harvests that had occurred since then on the calendar.

A Pedro Bay resident did not apply for the local research assistant position until February 2003. Hans hired and trained her on February 11 and had her interview each participating household to recall and record their harvests for the first quarter calendar (October 1, 2002, to December 31, 2002) and for the second quarter calendar through the February 11, 2003.

### *Content and Distribution of Calendars*

With the exception of Pedro Bay, the first set of calendars was to be collected starting on January 1, 2003, with additional sets of calendars distributed and the earlier set collected in April 2003 and July 2003. The last set of calendars was to be collected in October 2003. This schedule was not followed in all communities, as described below. When collecting the calendars, local researchers were asked to supplement the data recorded on the calendars through a short interview. This was intended primarily to verify that all harvests for the past quarter had been recorded on the calendar and to record any comments or observations the households might have. In addition, in October 2003, at the end of the study year, the goal was to interview all households in the community including those who did not keep calendars. These interviews were also designed to document sharing of harvests. More detailed instructions can be found in the training manual in Appendix A. All information collected on the calendars and during interviews is anonymous.

Information collected on the calendars (Appendix B) included the following: harvest in number of fish or other appropriate unit (e.g. buckets or gallons); date of harvest; gear type; and location of harvest. Pictures of species were printed on the back of the calendars. During interviews for collection of data not recorded on calendars, all of the same information was collected through recall except date of harvests (although an approximation of timing was sometimes possible).

## *Calendar Returns*

Table 7 summarizes the number of calendars returned by quarter as well as the number of post-season interviews conducted. For the first and second quarters, participation in the project was high in all eight study communities, with 85.8 percent of households providing information for the first quarter and 81.0 percent for the second quarter. Participation fell off in some communities (notably Iliamna, Kokhanok, and Pedro Bay) in the third and fourth quarters, resulting in overall calendar return rates of 67.8 percent and 71.2 percent, respectively. Because no post-season surveys were conducted in Iliamna and because of a relatively low survey achievement in Kokhanok and Pedro Bay, the overall survey sample achievement was 59.7 percent. Nevertheless, a strong majority of households in the other five communities completed post-season surveys.

Quarterly harvest calendar collection and distribution faced challenges, in part due to conflicts with the annual cycle of subsistence and work activities. From winter breakup in late April or early May until after moose hunting season in late September, many Bristol Bay residents are outdoors for work and subsistence activities and unavailable for surveys. It was anticipated that from early June to the middle of August, subsistence fishing effort in the study communities would be focused on salmon. Local residents involved in the commercial fisheries for herring at Togiak (which usually takes place in early May), halibut (which starts in May), and salmon are not at home at this time. Local assistants would not be able to find many households at home during much of July as this is the peak of the Bristol Bay commercial sockeye salmon fishing season. Therefore, it was anticipated that the third quarter (April 1 to June 30, 2003) calendars would be collected late and the fourth quarter calendars would be distributed late. Nonsalmon fishing during the early part of the fourth quarter (July 1 to September 30, 2003) was expected to be minimal so it would be relatively easy for the households to recall and document all harvests that took place up to the time the fourth quarter calendars were delivered.

The following is an account by community of the distribution and collection of the harvest calendars. If a household was not documenting harvests on the calendar as they occurred the assistant was instructed to ask them to recall their harvest and document it on the calendar as accurately as possible.

### **Kokhanok**

Calendars were distributed during the first week of November 2002. The first quarter calendars were collected the second week of January 2003. Second quarter calendars were collected the first two weeks of April 2003. At this time the local assistant resigned due to negative comments she received from some community members while she was collecting the calendars. The third and fourth quarter calendars and the final surveys were completed by Molly Chythlook (ADF&G) and Hans Nicholson (BBNA) working with the second local assistant on October 6,

2003. The second local assistant agreed to help only because no one else could be located in the community to assist with the job. Other duties and job requirements of this assistant prevented him from successfully completing the remainder of the work. This accounts for the drop-off in project participation in Kokhanok after the second quarter.

### **Levelock**

Initial contacts with the households occurred in mid January of 2003. Nonsalmon fish harvests for the first quarter were documented at that time by recall and the second quarter calendars were distributed. The second, third, and fourth quarter calendars were collected and the final surveys completed with 17 households on October 29, 2003, when Hans Nicholson and Molly Chythlook traveled to Levelock to help the local assistant. Although the second quarter calendars had been delivered to the households within two to three weeks of the start of the second quarter, no households had used them to record harvests as they occurred. Thus harvests for these 17 households for the second, third, and fourth quarters were documented by recall in October. At a later date the local assistant returned harvest data for three additional households. In addition to holding another job during the winter and spring, the local assistant was away from the community for part of the summer of 2003. During that time all attempts to contact him failed so that status of the work during the time was uncertain until contact was reestablished during the fall of 2003.

### **Igiugig**

The first quarter calendars were distributed the second week of October 2002 and collected the third week in January 2003, when the second quarter calendars were distributed. When the time came to pick up the second quarter calendar the local assistant could not be contacted. After repeated tries to contact the local assistant with no success it was learned that the assistant had left the community. On October 8, 2003, a new local assistant was hired when Hans Nicholson and Molly Chythlook traveled to the community to complete the work. Then, with the help of the local assistant, they collected the second, third, and fourth quarter calendars and completed the final survey for all but one household. The last household was interviewed later in the same month.

### **Newhalen**

From the records that the first local assistant returned it appears the assistant started contacting households to distribute calendars on November 6, 2002, the day after training occurred. Evidently, the assistant started collecting calendars the last few days of December 2003, prior to the end of the first quarter of the study year. Apparently the assistant determined that those households did not intend to fish the last days of the quarter. The first quarter calendars were

received at BBNA on January 17, 2003. After that the local assistant was unavailable and did not return messages. Eventually it was learned that she had moved to Anchorage. On October 6, 2003, John Chythlook and Ted Krieg trained a new local assistant. She collected harvest data by recall from households for the second, third, and fourth quarter calendars and she completed the final surveys. She sent the completed work to BBNA on October 30, 2003.

## **Iliamna**

The first quarter calendars were distributed on November 16 and 17, 2002. The first quarter calendars were collected between January 10 and 14, 2003 and the second quarter calendars were distributed at that time. The second quarter calendars were collected on April 6 and 7, 2003, and the third quarter calendars were distributed. At this point, it became difficult to contact the local assistant, who was working at a job away from Iliamna over the summer. On October 9, 2003, John Chythlook and Ted Krieg trained a new local assistant. Ted helped this assistant complete the last two calendars and surveys for two households and left these with the assistant to be sent in with the completed calendars and surveys from the remainder of the community. The completed paperwork for those two households was later lost and never recovered. The second local assistant did not do any more of the work and eventually the first local assistant returned and agreed to complete the work. On November 24 and 25, 2003, the original local assistant completed the fourth quarter calendars with households by recall but did not document the third quarter harvests or complete the final surveys. Apparently, the two households that had third quarter calendars documented their harvests as they occurred.

## **Pedro Bay**

The first assistant moved before starting the work and a replacement was hired and trained by Hans Nicholson on February 10, 2003. The first quarter harvests were documented on the calendars by recall and were completed by February 24, 2003. The completed second quarter calendars were received by BBNA on June 6, 2003, and the third quarter calendars were received by BBNA on October 6, 2003, although they had been collected earlier and had reportedly been in the mail for three weeks. On October 9, 2003, John Chythlook and Ted Krieg traveled to Pedro Bay to train the local assistant in administering the final survey and to help the assistant get started on collection of the fourth quarter calendars and complete the final surveys. During the evening of October 9 and the morning of October 10, 2003, fourth quarter calendars were collected and final surveys were completed for seven households. Final surveys and calendar collections for seven households remained for the local assistant to complete after John and Ted left on October 10. For reasons that remain unknown, the local assistant never completed this task and no data were collected after that date.

## **Nondalton**

The Local Research Assistant was hired and trained on November 6, 2002. The first quarter calendars were distributed through November 11, 2002, and were collected between February 3 and 19, 2003. The second quarter calendars were collected between April 5 and 13, 2003 and the third quarter calendars collected between August 20 and 30, 2003. The local assistant was trained to conduct the final surveys on October 10, 2003, but due to preparations for a funeral the principal investigators were not able to go to any households with her on this final phase of the project. Collection of the fourth quarter calendars and conducting the final surveys extended into January 2004, but all work was completed satisfactorily.

## **Port Alsworth**

The Local Research Assistant was hired and trained on November 7, 2002. The first quarter calendars were distributed from November 18 to 21, 2002, and were collected on January 10, 2003. The second quarter calendars were collected on April 3, 2003. Although exact collection dates cannot be determined based on the available records, BBNA received the third quarter calendars on August 26, 2003. The local assistant was trained to conduct the final surveys on October 8, 2003. She took time off from other work for the training and returned to that work after the training so the principal investigators were unable to go to additional households with her. She completed collecting the fourth quarter calendars and conducting the final surveys on November 6, 2003. She was very reliable and timely in all aspects of this project.

### ***Final Round of Summary Interviews***

A survey instrument was developed (see Appendix C) to complement the data collected on the calendars, to document harvests that were not collected on the calendars, and to document the harvest for households that did not participate in the calendar survey.<sup>6</sup> In addition to harvests the surveys were designed to document sharing, evaluate the harvests in the study year compared to previous years, document if the household needs for nonsalmon fish were met during the study year, solicit comments or suggestions for the project, and record any questions, comments or concerns. To insure that harvests documented on the calendar were not duplicated on the survey, a Harvest Calendar Summary/Tally Sheet documented the harvests for each household that had been recorded on the calendars prior to the final survey.

From October 6 to 10, 2003, John Chythlook from BBNA and Ted Krieg from ADF&G visited the communities of Iliamna, Newhalen, Nondalton, Port Alsworth, and Pedro Bay. Davin Holen from ADF&G also visited the communities of Iliamna, Newhalen, and Nondalton with John and Ted. Also, from October 6 to 10, 2003 Hans Nicholson from BBNA and Molly Chythlook from ADF&G traveled to Kokhanok and Igiugig. At that time the principal investigators worked with



the local assistants and trained them to conduct the final survey along with the final calendar pickup. In Kokhanok and Igiugig new Local Research Assistants were hired and trained to complete the work. During this trip Molly and Hans completed TEK interviews in Igiugig for this project. On October 29, 2003, Molly and Hans traveled to Levelock and worked with the local assistant to collect the calendars and conduct the final surveys.

## DATA ANALYSIS

Harvest data were entered for analysis using Statistical Package for the Social Sciences (SPSS) software. In Chapter Three, harvests are summarized at the community level and reported by numbers of fish and by pounds usable weight using standard factors (Appendix E). Compilations by gear type and timing of harvests are also provided. Initially study findings were to be reviewed in community meetings that were to take place in the fall of 2003, but with the late start of the project and the delays in receiving the data, and in consideration of the costs involved, a separate set of community review meetings did not occur. ADF&G and BBNA staff will offer to review and discuss the study findings in the communities as opportunities arise in the future. In addition to appearing in this report, the study findings will be summarized in the Alaska Subsistence Fisheries Database, the Alaska Subsistence Fisheries Annual Report (e.g. ADF&G 2001a), and the Community Profile Database (Scott et al. 2001). This report also contains recommendations regarding the need for long-term monitoring of subsistence harvests of nonsalmon fish.

As shown in Table 7, not all households completed harvest reports for each quarter, and not all households were surveyed at the end of the study year. Thus, harvest records were incomplete for many households. Additionally, some households left the communities during the study year, while some others moved in. In order to account for missing data and demographic changes, harvest estimates were developed for each community for each quarter. Reported harvests for all households for which data were available were expanded to the number of households known to be present in the community in that quarter. Community harvests for each quarter were then added to produce an estimate for the year. Average household harvests for the year were calculated by dividing the total estimated harvest by the average number of households present in the community over the four quarters. To calculate the harvests per capita, an average community size was estimated based on the average household size as derived from the post-season surveys and the average number of households. Because no post-season surveys were conducted in Iliamna, the average household size was calculated based on data from the federal 2000 census.

## TRADITIONAL ECOLOGICAL KNOWLEDGE

### *Key Respondent Interviews*

The investigation plan proposed that ADF&G and BBNA staff conduct two to three key respondent interviews in each village about use patterns, trends, fish ecology, and fish populations. As part of their job the local research assistants helped set up and conduct these interviews except in Newhalen. Although the primary focus was to be on nonsalmon fish, respondents discussed salmon as well. If it seemed appropriate, round-table discussions among key respondents, in addition to or instead of individual interviews, were arranged in selected study communities (Huntington and Mymrin 1996; see also Huntington 1998 and Fall et al. 1991). This technique was employed in Newhalen where three key respondents were brought together for a round-table interview. Protocols (Appendix C) for collecting TEK were developed in consultation with community governments through BBNA, consistent with recommendations in Miraglia (1998) and the Principles for the Conduct of Research in the Arctic (ISSTF 1998). With the permission of the respondents, interviews were audio taped. Transcriptions or detailed notes from each interview were key-worded and entered into an AskSam database, consistent with procedures developed in the “Traditional Knowledge of Fish in the Bristol Bay Area” project (Kenner 2001) (see below for methods followed to produce the database). Examples of entries in the database appear in Chapter Three.

Table 8 provides an overview of the TEK interviews conducted for this project. In total, 22 interviews involving 31 people were conducted.

Between March 24 and 27, 2003, BBNA staff person Hans Nicholson and ADF&G staff person Ted Krieg conducted three key respondent interviews per community with the help of local assistants in Port Alsworth, Nondalton, and Kokhanok. Also in March 2003, ADF&G staff person Davin Holen traveled from Anchorage to Iliamna and Newhalen to conduct TEK interviews. Although this work was confirmed with the local assistants prior to Davin’s trip, when he arrived neither the local assistant in Newhalen nor the assistant in Iliamna was available. (The assistant in Iliamna had to leave earlier than anticipated to compete in a regional high school basketball tournament.) Consequently Davin was not able to proceed with the interviews as planned.

From May 5 to 9, 2003, Davin again traveled to the study communities and conducted two key respondent interviews in Pedro Bay. A third interview was to be completed later by the local assistant but the key respondent was never available. One interview with three key respondents was conducted in Newhalen where the local assistant was once again unavailable. Three interviews were conducted in Iliamna with the help of the local assistant. All interviews except for one done in Iliamna were taped. The tapes were left with the local assistants in Iliamna and Pedro Bay to be transcribed. Davin took thorough notes during the one Iliamna interview that was not taped as well as during the taped interviews.

The Newhalen interview and the remaining two Iliamna interview tapes were left with the Iliamna assistant to be transcribed. The local assistant misplaced these original tapes, copies of which had not been made. The tapes were later found and another local assistant agreed to transcribe them. At this point, some young children got the tapes and taped over them. Fortunately, Davin had taken thorough notes of each these interviews so that the important information was not lost, and the interviews could become part of the TEK database.

In retrospect, when the tapes were relocated after being lost the first time provisions should have been made for the tapes to be returned to the principal investigators and copied and then returned to the community for an assistant to work on. Additionally, a policy that will be adopted in the future is to make a copy of the tapes before they are left with the local assistant. This will require the principal investigators to take a recorder capable of producing copies. Also immediately after completing the interview the tabs that allow the tape to be taped over or erased should be removed to prevent loss of the taped interview.

The Port Alsworth TEK interviews took place on March 24 and 25, 2003, and were conducted by Hans Nicholson, Ted Krieg, and the local assistant. The tapes were left with the local assistant and transcripts were quickly completed and returned.

The Nondalton TEK interviews were conducted by Hans Nicholson, Ted Krieg, and the Local Assistant on March 25 and 26, 2003. The tapes were left with the local assistant, who was only able to access a computer intermittently and had no computer access throughout the summer of 2003. After school started in the fall of 2003 she anticipated being able to access a computer there or at the tribal council which, up to that point, had been experiencing computer problems but had them resolved. She completed hand written transcripts of two of the interviews, and with the help of her daughter, had them word processed and copied on a computer disk. When the disk arrived in Dillingham the files were missing from the disk and could no longer be located on the hard drive of the computer in Nondalton. By that time her daughter was out of the village at school so the hand-written, hard copies of the transcripts were word processed into Microsoft Word files by Eunice Dyasuk in the Dillingham ADF&G office. A handwritten transcription of the approximately five-sixths of the third interview was completed by the Nondalton local assistant and more than half of that was again word processed by Eunice Dyasuk. The remainder of the interview will be word processed and transcribed by Laura Jurgensen in the Natural Resources Department at BBNA and at a later date added to the database of the TEK interviews for this project.

In Kokhanok the TEK interviews were conducted on March 26 and 27, 2003, by Hans Nicholson, Ted Krieg, and the local assistant. The local assistant later resigned after becoming discouraged with the negative comments directed at her when she was distributing and picking up calendars. At that point she was also unwilling to transcribe the taped interviews. After repeated tries to locate and hire someone in Kokhanok to transcribe the tapes the Port Alsworth local assistant agreed to transcribe the tapes and did so in a timely manner without difficulties.

Key respondent TEK interviews with four key informants in Levelock were conducted by Molly Chythlook, and Hans Nicholson on September 24, 2003. All of these interviews were eventually

transcribed by Molly Chythlook after the local assistant was given ample time to complete the task but never did. Repeated attempts by project staff to contact this person failed.

Key respondent TEK interviews in Igiugig were conducted on October 8 and 9, 2003, by Molly Chythlook, Hans Nicholson, and the local assistant for two interviews. The local assistant transcribed portions of the taped interviews but then quit without notice. It was later learned he had moved from the community. Hans later completed transcribing one interview and Molly transcribed the other two. One of these was entirely in Central Yup'ik and included extensive place names mapping. The other interview contained major portions in Yup'ik.

### ***Place Names and Maps***

Local English place names are presented on seven maps in Chapter Three. Central Yup'ik place names were elicited as part of some of the TEK interviews in Igiugig, Kokhanok, and Levelock. These names are presented in three maps in Chapter Three.

### ***Inventory of Field Notes, Trip Reports, and Audio Tapes***

ADF&G staff completed an inventory of ADF&G field notes, trip reports, audiotapes, and other records for information regarding traditional knowledge of fish (salmon and other species) in the study communities of Igiugig, Kokhanok, Iliamna, Newhalen, Nondalton, Pedro Bay, and Port Alsworth. The inventory for Levelock was completed as part of the "Traditional Knowledge of Fish in the Bristol Bay Area" project (Kenner 2001). This work followed the procedures developed in the "Traditional Knowledge of Fish in the Bristol Bay Area" project, and was essentially a continuation of that initiative and Project FIS 01-109 (Kenner et al. 2004). The database produced for Project 01-109, From *Neqa to Tepa* Version 2.0 includes 600 documents related to fisheries in the Kvichak watershed study communities. Additional field notes from ADF&G research in Igiugig and Kokhanok have been incorporated into the TEK database. Field notes from Steven Behnke's 1976 research in Nondalton have yet to be added to the database.

## AskSam METHODS

### *Background*

One product of this project is the CD-ROM *From Neqa to Tepa, Luq'a to Chuqilin: A Database with Traditional Knowledge about the Fish of Bristol Bay and Northern Alaska Peninsula*<sup>7</sup>, a searchable database of indigenous local knowledge about the fish of Bristol Bay and the northern Alaska Peninsula. The extent of the coverage in this database reflects the research the Division has done in the area and is by no means comprehensive. The purpose of the CD is to make this information available to agency biologists and fisheries managers and the public.

*From Neqa to Tepa, Luq'a to Chuqilin* is a collection of hundreds of notes, each less than one page long. In the askSam Program, each note is a "document" and is like a card in a card file. At the top of each document are listed nine fields or main categories of information describing the contents of each document: community, researcher, code, year, ethnicity, respondent, location, species, keywords. Users of *From Neqa to Tepa, Luq'a to Chuqilin* are provided with a "view-only version" of the askSam software, as licensed by the Alaska Department of Fish and Game from askSam Systems.

The database is made up of the edited transcripts of interviews with knowledgeable respondents. The transcripts have been edited to remove extemporaneous dialogue, such as "Come in, the door's open", and to clarify the content of the discussion. Other parts of the database include notes taken during surveys quantifying subsistence harvests, researcher observations, and other notes.

### **The Outline of "From Neqa to Tepa, Luq'a to Chuqilin"**

There are seven parts to the CD ROM and the database is just one of these. Across the top of every page of the CD ROM are the same seven hypertext links (These links can be identified by their blue type - **hypertext link**): Home, Instructions, Keywords, Acknowledgments, Technical Papers, Map of Area, and Go to Database. To view any of these topics, click the mouse on the link.

**The "Home" Link.** The CD ROM opens at the Home page, shown in Fig. 2. The Home page lists the communities mentioned in the database. The Home page has a link to ADF&G's copyright notice as well as descriptions of each of the other six links. Notice that there is a scroll bar on the right side of the screen to view the rest of the page.

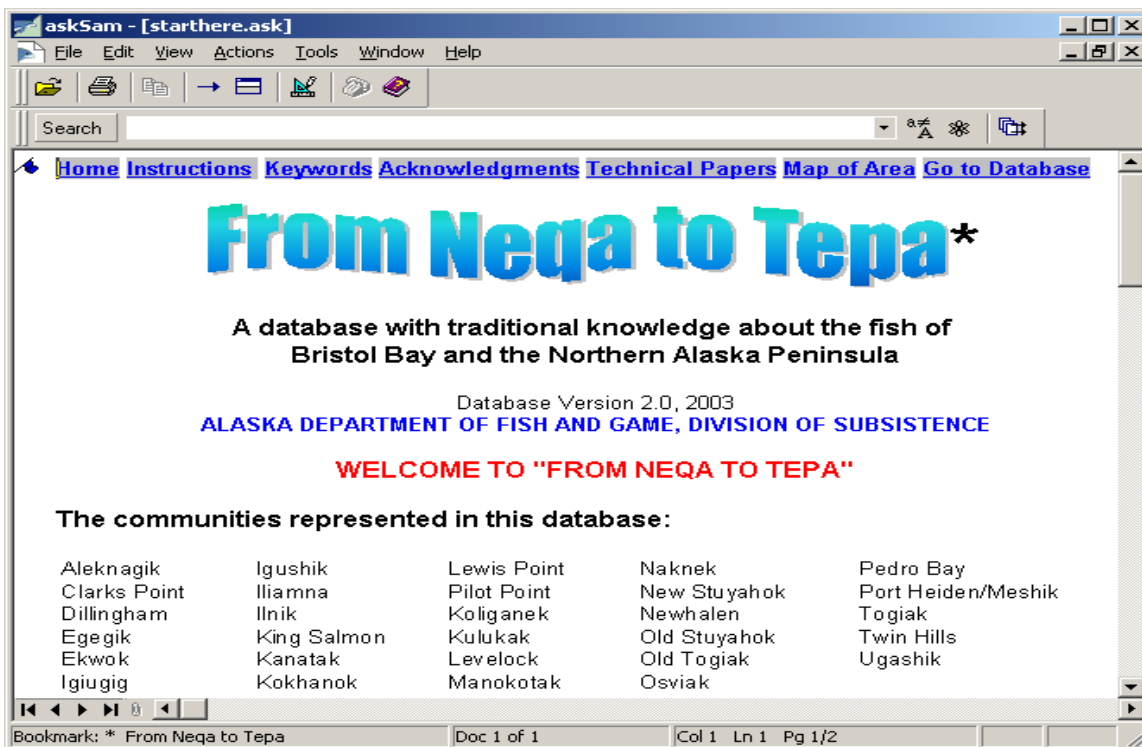


Figure 2. The Home Page on the CD ROM.

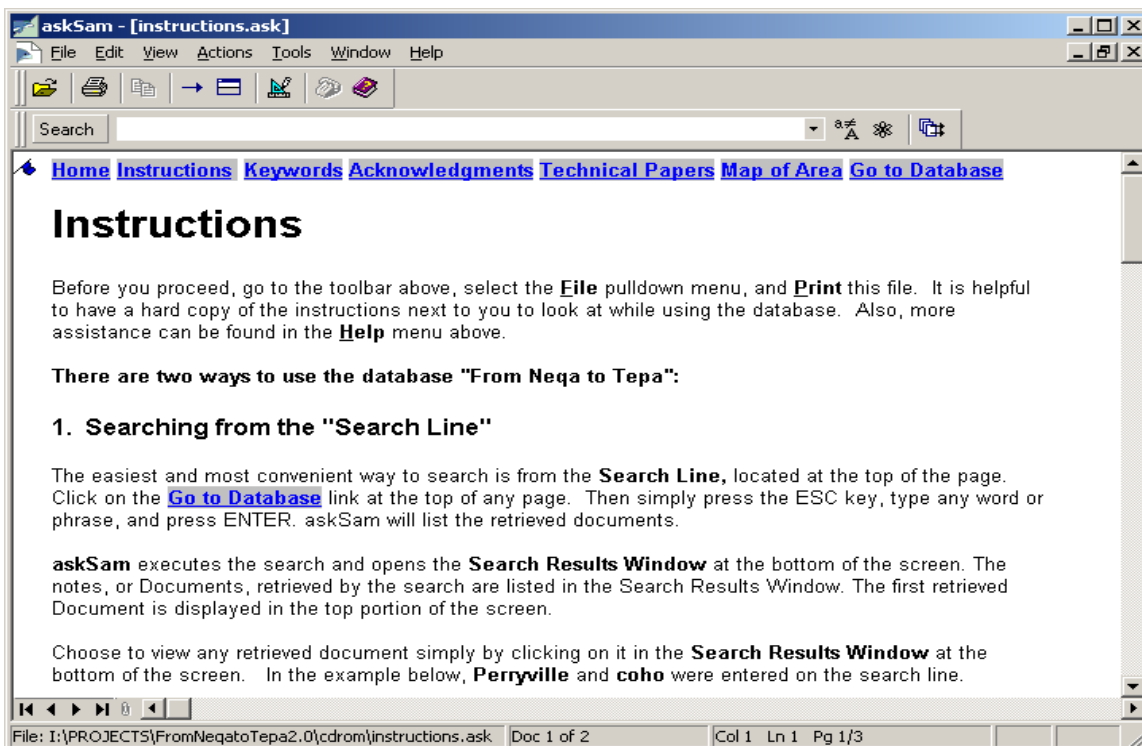


Figure 3. The Instructions Page on the CD ROM.

**The “Instructions” Link.** The second link is to the Instructions, the screen image of which is shown in Fig. 3. On this page, two database search methods are described, as well as how to view the results of a search, and how to print the results of the search. The following is a short description of this information.

**Searching Using the “Search Line”.** In Fig. 3 notice the Search Line at the top of the page. Search requests are entered here from the first page of the database part of the CD ROM. When searching using this method, askSam recognizes Boolean searches, using AND, OR, and NOT, wildcard searches, using \* for letters and ? for numbers, and searches for multiple words or phrases. This is described in more detail on the rest of the Instructions page on the CD.

**Searching Using "Fields" and "Keywords".** Using this method, keywords are placed in fields which allow for faster and more specific searches. The askSam program looks for a keyword in one field only (e.g. “Perryville” in the Community field) rather than searching through the entire text of thousands of documents. Multiple fields can be searched at the same time. The fields are located at the beginning of each entry in the database. All of the fields and keywords are listed on the Keyword page the CD ROM.

**“Search Results” Window.** The Search Results window is one feature that makes the CD ROM such a powerful research tool. The Search Results window, at the bottom of Fig. 4, lists the notes retrieved when “Perryville and coho” have been requested from the Search Line. The first retrieved note is displayed in the top portion of the screen. Choose to view any document found by the search simply by clicking on it in the Search Results window, and it will replace the note at the top of the screen. Notice at the top of the Search Results window shown in Fig. 4, it shows that there were 19 documents found that match the search criteria, having both “Perryville” and “coho”. The window is configured to show the contents of three fields for each of the 19 found documents: community, year, and keywords.

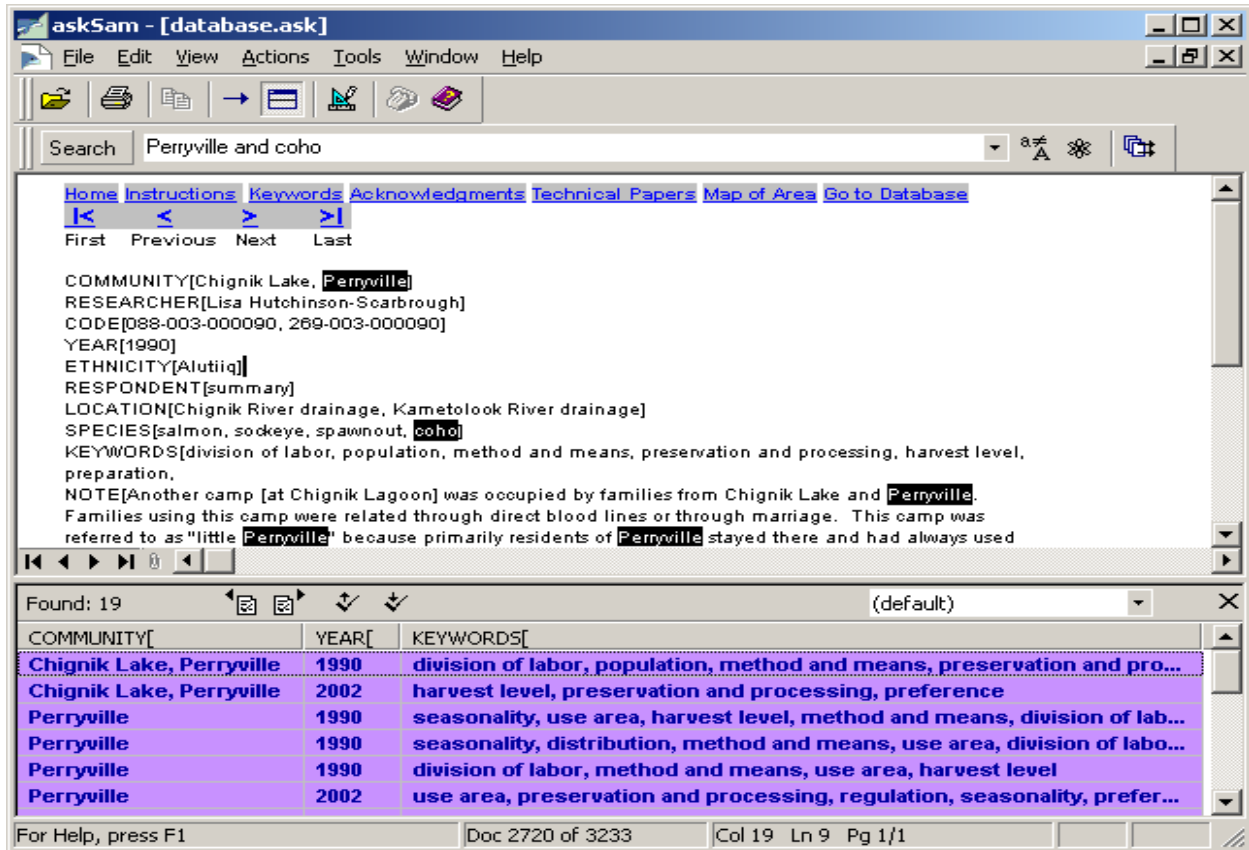


Figure 4. The “Search Results” Window on the CD ROM.

### The “Keywords” and “Acknowledgments” Links

The third part of the CD ROM is the list of keywords. The fourth part is the acknowledgments.

### The “Technical Papers” Link

This page of the CD ROM is a list of titles of reports that are part of the Division of Subsistence, ADF&G, technical paper series. The reports listed contain information about subsistence fisheries in Bristol Bay and the northern Alaska Peninsula from information collected between 1983 and 2003. Each title is a link to the entire report. At the top of the page is a link to the Adobe web page where a free Adobe Reader can be downloaded in order to view the reports, which are in .PDF format.



## The “Map of Area” Link

Part six of the CD ROM is a detailed map of the study area (Fig. 5). It is in Adobe .PDF format, allowing the viewer to zoom in on the map with no loss of detail.

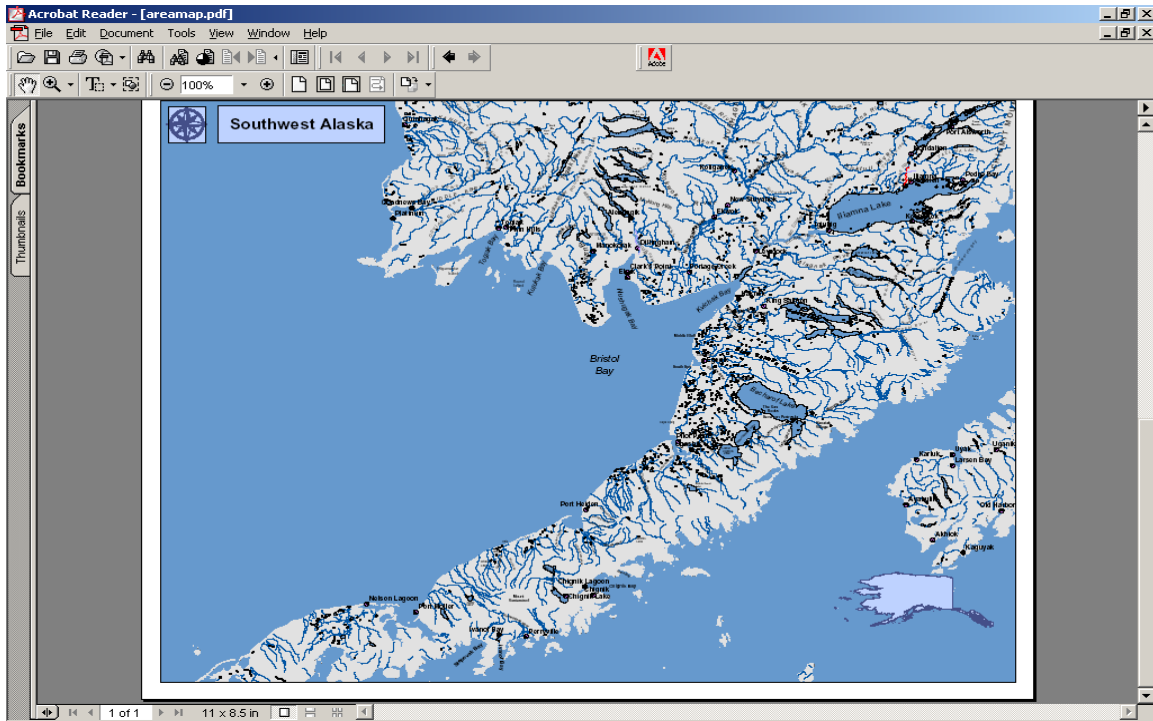


Figure 5. Map of Area on the CD ROM

## The “Go to Database” Link

The seventh and final part of the CD ROM is the database. The first page of the database is shown in Fig. 6. The Search Line is at the top of the page for quick searches of the database, as described above in the Instructions section. Each document can be viewed by clicking on the Next arrow button at the top of the window. The link **Conduct a search and view the results** opens the Search dialogue box for more complex searches and searches in fields. The link **Print the results of a search that is on the screen** opens the Export dialogue box and saves the results of a search quest in a new file. Every document in the database begins with the nine fields filled with keywords. The fields are community, researcher, code, year, ethnicity, respondent, location, species, keywords. The line at the bottom of the screen indicates that the document in the window is the first of 3,233. The help menu at the top of the screen provides detailed information on other ways to view and organize the database.

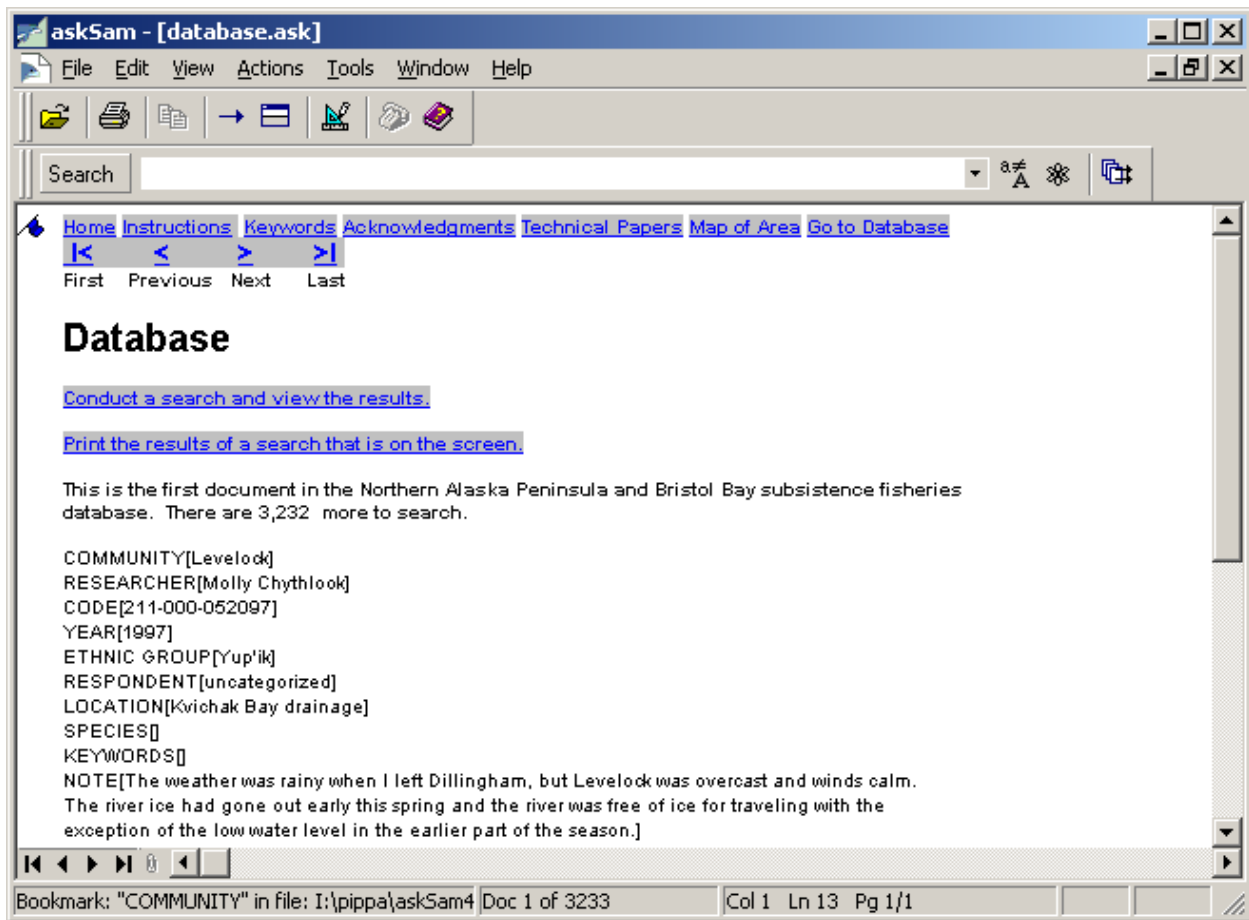


Figure 6. The Database Page on the CD ROM.

## CHAPTER THREE: FINDINGS

### DEMOGRAPHY

Table 9 presents study findings related to selected characteristics of each study community's population. These data derive from the post-season surveys. As discussed in Chapter Two, no surveys were conducted in Iliamna. Therefore, except for the number of households, demographic information for that community is not available through this project. The average size of Iliamna households as reported in the federal 2000 census was used to estimate the community population and to calculate per capita harvest estimates.

In every community but Port Alsworth, a large majority of the households (more than 85 percent) were Alaska Native (Table 9). (Note that the ethnic background of individuals was not collected in this project.) In Port Alsworth, 16.7 percent of the households were Alaska Native.

### ESTIMATED HARVESTS

#### *Use and Harvest Estimates*

At the outset, it needs to be noted that the study year was "atypical" in that the winter of 2002/2003 was very warm. Lakes did not freeze and there was little snow. These conditions inhibited travel and restricted traditional subsistence activities such as ice fishing. Comparisons of the 2002/2003 study year are discussed later in this chapter.

Table 10 through Table 17 report the estimated percentage of households in each study community that used, fished for, harvested, received, or gave away each type of nonsalmon freshwater fish during the October 2002 through September 2003 study year. Virtually every household in the study area used and fished for at least one kind of nonsalmon freshwater fish. All the households in Igiugig, Iliamna, Kokhanok, Levelock, Newhalen, Pedro Bay, and Port Alsworth used freshwater fish, as did 94.4 percent of the households in Nondalton. In Nondalton, 97.2 percent of households fished for nonsalmon fish, as did 96 percent in Kokhanok, and 100 percent of the households in the other six study communities.

Note that information about receiving and giving away fish was only collected during the post-season surveys. Because post-season surveys were not conducted in Iliamna, this information is not available for that community. As noted in Chapter Two, it was intended that all community households would be interviewed during the post-season survey, but it appears that only those

households that had participated in the harvest calendar program were interviewed. Thus it is possible that the sample over-represents fishing households, and that the levels of participation in fishing indicated here may be high. On the other hand, non-surveyed households, if they did not fish, may have been more likely to receive fish than those who were active harvesters. Thus the percentage of households receiving fish may be underestimated.

As estimated in pounds usable weight per household, harvests of nonsalmon freshwater fish totaled 161.6 pounds per household in Newhalen, 115.9 pounds in Kokhanok, 108.4 pounds per household in Igiugig, 80.7 pounds in Levelock, 59.4 pounds per household in Iliamna, 38.8 pounds in Nondalton, 24.4 pounds in Pedro Bay, and 0.6 pounds in Port Alsworth (Fig. 7; Table 10 through Table 17). As estimated in pounds usable weight per person, harvests were 47.9 pounds per person in Newhalen, 30.6 pounds in Igiugig, 29.4 pounds in Kokhanok, 26.9 pounds in Levelock, 20.4 pounds in Iliamna, 11.8 pounds in Nondalton, 6.3 pounds per Pedro Bay, and 0.2 pounds in Port Alsworth (Fig. 8; Table 10 through Table 17).

As reported in Table 18 and illustrated in Fig. 9, as estimated in usable pounds, harvests of “rainbow trout,” including rainbow trout, steelhead and “unknown trout,” made up the largest portion of the total nonsalmon freshwater fish harvests for all study communities combined in 2002/2003, at 30.9 percent. Ranking second were Dolly Varden/char (including Arctic char, brook trout, and Dolly Varden) at 26.9 percent. Northern pike ranked third, with 9.9 percent of the total pounds harvested, followed by lake trout (8.1 percent), Arctic grayling (7.1 percent), whitefish (all species combined) (8.3 percent), suckers (4.9 percent), rainbow smelt (3.6 percent), burbot (0.4 percent), and blackfish (less than 0.01 percent). Only one household, in Igiugig, reported a harvest of blackfish during the study year. Only Levelock households harvested rainbow smelt, which do not ascend the Kvichak River as far as Iliamna Lake.

### *Harvests by Gear Type*

Table 19 through Table 26 report the estimated number of each freshwater fish resource harvested by gear type for each study community. Table 27 through Table 34 report harvests in pounds usable weight by gear type for each study community. Table 35 through Table 42 report the percentage of the harvest of each type of freshwater fish by gear type by study community.

Table 43 reports harvests of all freshwater fish combined (in usable pounds) for each community by gear type. Hand line produced the majority of the harvests at Newhalen (81.3 percent of the total for all nonsalmon fish), Nondalton (55.6 percent), and Kokhanok (50.2 percent), and a substantial portion at Iliamna (32.4 percent) and Pedro Bay (17.9 percent). Hand line here means fishing in open water. Use of a hand line through the ice in winter is classified as “ice fishing.” Ice fishing was the dominant method of fishing at Igiugig (50.6 percent of the total harvest) and Levelock (45.0 percent), and important at Iliamna (21.4 percent), but negligible elsewhere. Gillnets were used to take about a third of the nonsalmon freshwater fish harvest at Levelock (33.2 percent), Igiugig (33.1 percent), and Iliamna (32.6 percent). All of Port Alsworth’s small

harvest of freshwater fish occurred with rod and reel, as did 59.2 percent of the harvest at Pedro Bay. In no community did much of the harvest take place using seines, dip nets, or set lines.

Table 44 reports harvests for each type of freshwater fish for the entire area (all study communities combined) by gear type. Hand line was the dominant gear type for harvests of all fish (about half or more of the harvest) except the relatively small harvests of suckers (98.3 percent of the harvest occurred with set nets) and blackfish (100 percent with dip nets). Gillnets were an important gear for whitefish harvests (39.1 percent, second to hand line). Ice fishing produced 38.2 percent of the Arctic char harvest. Rod and reel was important for harvests of rainbow trout (26.9 percent of the total harvest), Dolly Varden (18.6 percent), grayling (19.0 percent), pike (16.1 percent), and lake trout (10.6 percent).

Fig. 10 illustrates the total nonsalmon freshwater fish harvest by gear type for all study communities combined (see also Table 43 and Table 44). Hand line harvests accounted for 50.9 percent of the total pounds harvested, with rod and reel ranked second at 15.5 percent, followed by gillnet (13.6 percent), ice fishing (12.5 percent), unknown gear (6.6 percent), seine (0.8 percent), dip net (0.2 percent), and set line (less than 0.1 percent).

The relatively low harvests from ice fishing (and the virtual absence of ice fishing harvests at Nondalton) are extremely unusual and are the result of the very warm winter in 2002/2003 experienced in this area. Large lakes did not freeze and the lack of snow inhibited travel.

Table 45 through Table 52 report the estimated number of households in each study community that used each type of gear to harvest nonsalmon freshwater fish during the study year. At Igiugig (Table 45), the most households used rod and reel (9 households), went ice fishing (8 households), or used a gillnet (5 households). At Iliamna (Table 46), rod and reel (17 households) and ice fishing (13 households) were also used by the most households. At Kokhanok (Table 47) the most households used hand lines (about 31 households), with rod and reel second (about 15 households) and gillnets (about 10 households) third. Because of the availability of smelt in the winter in the Kvichak River, ice fishing was the harvest methods used by the most households at Levelock (18 households) (Table 48). There, rod and reel (14 households) and gillnets (8 households) ranked second and third, respectively. At Newhalen, hand line (40 households) and rod and reel (about 18 households) were by far the most used harvest methods (Table 49), and this was also the case at Nondalton (Table 50) and Pedro Bay (Table 51). Rod and reel was the only gear used to harvest nonsalmon fish by Port Alsworth residents in the study year (Table 52).

### *Timing of Harvests*

Table 53 through Table 60 report the estimated numbers of each freshwater fish resource harvested by month. Table 61 through Table 68 report estimated monthly harvests in pounds usable weight.

As shown in Fig. 11, for the area in total, most harvests occurred in the winter and spring months of December through May. Nonsalmon freshwater fish harvests tended to be relatively low during the summer and early fall, when area residents focus on salmon fishing and then moose and caribou hunting.

### *Evaluation of Study Year and Meeting Needs*

In the post-season survey, households were asked to compare their harvests and uses of nonsalmon freshwater fish in the study year with other recent years. If they said that the study year was different (either higher or lower than other recent years), they were to provide a reason for the change. Table 69 reports responses to the evaluation question, and Table 70 summarizes reasons given for lower harvests or uses. Half or more of the households in Igiugig (80.0 percent), Levelock (50.0 percent), Newhalen (50.0 percent), and Pedro Bay (85.7 percent) said that their harvest and uses were less than other recent years, as did 43.8 percent in Kokhanok. Most of the rest of the households said uses were about the same. The relatively low number of households in Nondalton that said their uses were lower (27.6 percent) is surprising, given the relatively low harvest levels in the community compared to other study year.

As reported in Table 70, “weather conditions,” mostly related to the warm winter and lack of ice, was the reason given most often for why harvests and uses of freshwater fish were down from other recent years. Some households also cited personal reasons (e.g. “too busy to harvest”) or a more general scarcity of fish.

Also during the post-season survey, respondents were asked, “Were your household’s needs for freshwater fish met during the October 2002 to September 2003 study year?” They were also asked, “If your needs were not met, why?” As shown in Table 71, in all the study communities except Pedro Bay, at least half the households responded that their needs had been met. In most, a large majority (70 percent or more) answered “yes” to this question. At Pedro Bay, 57.1 percent of the households (four of the seven households interviewed post-season) said their needs were not met.

Table 72 reports reasons given by households that said that their freshwater fish needs had not been met in the study year. Weather conditions that inhibited winter harvesting and personal reasons were cited most often.

### *Comparisons with Harvest Estimates from Other Years*

As noted in Chapter One, there is at least one previous estimate of freshwater fish harvests for each of the study communities, and for all but Port Alsworth there are estimates for three or four previous years (see Tables 3, 4, and 5 in Chapter One). Table 73 reports estimated harvests in

pounds usable weight per person by species or category of fish for each study community for each study year. Fig. 12 illustrates estimated harvests of all nonsalmon freshwater fish in pounds per person by community and study year. With the exception of Newhalen, the per capita harvest estimates for the 2002/2003 study year were the lowest on record for the study communities. In four communities – Igiugig, Kokhanok, Nondalton, and Pedro Bay – harvests were less than half of the previous low estimate. The primary explanation for this relatively low harvest is the unusually warm winter in 2002/2003. Ice failed to form on the major lakes, inhibiting travel to harvest locations and preventing winter ice fishing, usually one of the major sources of nonsalmon fish. At Newhalen, fishers were able to access productive fishing locations, despite the lack of ice, and fish with hand lines. Notably, while harvests at nearby Iliamna were much lower than 1991, the last year for which comprehensive data are available, the per capita harvest of about 20 pounds was not much different than the other two estimates from 1973 (21 pounds per person) and 1983 (26 pounds per person).

The available data can be used to compare annual subsistence harvest trends for nonsalmon freshwater fish in the eight Kvichak watershed study communities over four decades: the early 1970s, the mid 1980s, the early 1990s, and 2002/2003 (the present study year). Table 74 shows this decade by decade comparison by study community for all freshwater fish resources combined (pounds usable weight). Table 75 is a decade by decade comparison of estimated annual harvests by species, combining all the study communities. The estimated total harvest of nonsalmon freshwater fish for the area overall in 2002/2003 was substantially lower than annual estimates for the previous three decades. The per capita harvest estimate for 2002/2003 was also lower than previous estimates (Fig. 13). Total annual harvest estimates for the 1980s and 1990s approached 50,000 pounds usable weight for the area's eight communities combined, higher than the estimate of about 27,000 pounds for 1973/74. On a per capita basis, however, the available data suggest stability in subsistence harvests over the last three decades of the 20<sup>th</sup> century: 51.6 pounds per person for 1973/74, 49.4 pounds per person for the mid-1980s, and 53.9 pounds per person for the mid-1990s. No trend towards lower subsistence harvests of nonsalmon fish is evident from these data. This suggests that the unusually warm winter in the 2002/2003 study year resulted in an atypically low harvest of freshwater fish, rather than suggesting that the relatively low harvests in 2002/2003 are part of a trend towards less subsistence use of these resources.

Fig. 14 illustrates the composition of the annual subsistence harvest of nonsalmon freshwater fish by species or resource category for each of the four decades. With a few exceptions, the overall ranking of species has been relatively stable; Dolly Varden and rainbow trout generally have each contributed about 20 percent to 30 percent of the total harvest, with pike, grayling, and lake trout generally a bit lower at around 10 percent, or slightly less, each. Harvests of suckers, burbot, and blackfish have been relatively low. While important at Levelock and shared throughout the area, harvests of rainbow smelt are generally less than 5 percent of the total nonsalmon fish harvest.

An important difference in the composition of the nonsalmon fish subsistence harvest in the Kvichak watershed in 2002/2003 compared to previous years was the relatively low harvest of whitefish. In the annual estimates for each previous decade, whitefish ranked first in terms of pounds usable weight harvested, at around 25 percent of the total. In 2002/2003, whitefish fell to

fourth place (behind rainbow trout, Dolly Varden/char, and northern pike), at 8.3 percent of the total. There were several explanations offered by key respondents as to why harvests of whitefish were low in 2002/2003. At Nondalton, one respondent said that whitefish populations are down at such traditional fishing locations as Chulitna River and Pickerel Lake. This respondent also observed that not as many people are drying whitefish as in the past, preferring to use the fish fresh. At Kokhanok, one person reported that abundance of whitefish at Gibraltar River is down by two-thirds compared to three or four years ago.

## TRADITIONAL ECOLOGICAL KNOWLEDGE

### *AskSam TEK Database*

As discussed in Chapter Two, project researchers conducted 22 interviews involving 31 people to collect traditional knowledge about fisheries resources (see Table 8 in Chapter Two). Following the procedures described in Chapter Two, these interviews were transcribed or otherwise summarized in a searchable database using the askSam program.

As noted in Chapter Two, *From Neqa to Tepa: A Database with Traditional Knowledge about the Fish of Bristol Bay* (Kenner 2001, Kenner 2003) was completed by the Division of Subsistence as part of two previous projects. This database was compiled from interviews in communities primarily on the west side of Bristol Bay and the Alaska Peninsula. These were the first two phases of a project to convert existing TEK narrative text data on fish into a retrievable, usable format. The current project was a third step in this process, the database called *From Neqa to Tepa, Luq'a to Chuqilin: A Database with Traditional Knowledge about the Fish of Bristol Bay*.

The database has several design features added specifically in response to requests from some researchers. So that researchers could view more than just short pieces of interviews taken out of context, the entire text of every edited interview is in the database. This means that the context of the information in a document (described in adjacent documents), can be quickly viewed by clicking on the arrows at the top of the page. Another feature of the CD is the use of keywords (listed on the Home page of the CD). Before every note, or document, is the name of the communities and species mentioned in the notes.

To fully understand how to use the CD, think of the database as an old fashioned card file used to organize research notes, and these notes are the transcripts of interviews highlighting traditional ecological knowledge of various species of fish (as well as other types of information). Rather than manually organizing these notes and searching them for specific information, the researcher asks the askSam software to do this. For instance, one might want to see the notes from the community of Nondalton. Or one might want to see all the notes connected with a group of



communities, or notes organized by species (lake trout, pike), or both (Nondalton and lake trout). All of these notes can be quickly viewed.

More specific searching can also be done. For example, entering “[Nondalton or Port Alsworth] and pike” on the Search Line produces all the notes about pike from both Nondalton and Port Alsworth interviews in the Search Results Window. The research below was completed with the aid of the database.

## **SUMMARY OF USE PATTERNS AND TEK OBSERVATIONS BY SPECIES**

The testimony below describes, among other topics, popular fishing spots that people returned to many times, as well as places from which people remembered harvesting fish only once or twice in their lives. Also described are fish harvest sites that people only had heard of from others, often elders describing activities from the past. Figures 15 to 24 are maps of place names, and Figures 25 to 36 are maps of harvest locations by species.

Key respondent testimony describing trends in harvest and use patterns often focused on decreasing abundance of freshwater fishes at fishing locations that were used in the past and the decrease in reliance on fish for dog food, mainly because of the introduction of snow machines and frequent plane travel.

### ***Arctic Grayling***

Arctic grayling *Thymallus arcticus* inhabit clear, cold streams and lakes in the Bristol Bay region. They are a slow-growing fish that reach 12 inches in length by six or seven years of age. The Bristol Bay region, especially the Ugashik lake system, is known for its trophy-sized grayling. Arctic grayling over winter in deep water. In April and May, they move upstream to tributaries to spawn. Adult fish then swim further upstream and establish territories in pools in summer. In September, the grayling begin moving downstream to over wintering areas in deep water. Their tolerance of low dissolved oxygen levels allows grayling to survive the long winters in areas where many salmonids would die. Like salmon, grayling faithfully return every year to the same spawning and feeding areas (Ashley 1994a, Morrow 1980:145-147).

### **Subsistence Use Patterns and Trends**

***Gear Type.*** In Iguigig there was and is still a great deal of ice fishing and this is the primary method used to harvest grayling. One couple said they ice fished between February and April

but could not in the survey year because the ice was too thick. In the 1950s people were still ice fishing for grayling up the Alagnak River in front of cabins, and one informant remembers ice fishing beginning as soon as the weather was good and the rivers frozen over. Grayling were caught incidentally while ice fishing for rainbow trout and Dolly Varden.

One Igiugig couple explained that during February ice fishing slows down, but little “trouts” and grayling can still be caught through the ice in certain areas. One person reported using a fly rod and rod and reel, but this was an exception. Most caught grayling through the ice. In Iliamna grayling were caught primarily while ice fishing.

Kokhanok interviews described catching grayling in the winter with ice fishing gear, a single hook with a plastic egg or saltfish (“carp” was mentioned, probably referring to sucker). Traditionally freshwater fish, including grayling, were seined or caught ice fishing with hook and line.

There was less rod and reel fishing described by Nondalton than Port Alsworth respondents, although it was a gear type often used. Fishers often trolled in Lake Clark (including Six Mile Lake) in boats, using salmon roe as bait. People reported year round fishing using ice fishing gear and fly rods. The traditional method of fishing for grayling was with a trout net. “[P]eople just use[d to] throw out hand line, usually from the beach or ice. Forty years ago it was only one hook. Now a couple of hooks are used. People don’t use trout net anymore. Most use hook and line.” This informant explained that the use of nets has stopped because people were worried about low abundance of some fish. Another informant remembers hearing that people seined for grayling a long time ago for dog food. The net was placed in a particular creek known to have grayling. Another man remembers people using “scoop” nets to harvest grayling at particular places with high abundance at certain times of the year.

Port Alsworth respondents described taking grayling by rod and reel more often than any other method. Grayling were harvested at favorite fishing sites in open water. People were specific about the tackle that was used to successfully harvest grayling, which were usually harvested along with “trout”.

***Timing of Harvests.*** There is winter ice fishing on Lake Clark, but in Port Alsworth most people reported harvesting grayling in the summer and other open water times with rod and reel. Late June and early July specifically were mentioned. In spring some people went to a couple of specific areas of grayling abundance and fished with rod and reel.

A Nondalton resident explained that many small grayling were caught near spawning areas in the spring. This is also when the lake is more shallow. Mid to late summer, after the salmon have passed, was a good grayling time, particularly along the shore of Lake Clark. Grayling were said to bite year around and “They are pretty abundant, but winter is probably the best time. I know on the lake up here, right outside of the fish camp you get a lot of grayling about this time of the year. About March month, that’s when every body like[s] to go out fishing.” Another person remembered his family catching grayling in the summer to feed the dogs (probably when other fish were not biting or nearby and the family was out of salmon to feed staked dog teams).

There was only a little information from Levelock residents about the grayling harvest, all during winter ice fishing, and in the past on the Alagnak River while trapping or staying at cabins.

In Kokhanok it was reported that in the fall time there was too much scattering of grayling for them to be targeted. In fall “We miss the grayling”. Grayling were caught occasionally while ice fishing on Lake Iliamna. It seems that later winter, before March, was the time when people expected to harvest grayling, ice fishing in the bay and in a local lake. “That grayling wasn’t [caught] that much [by] our people. Mostly it was rainbows and dollies that we took in springtime”.

In Igiugig, grayling seemed to be harvested primarily after freeze up at specific places known for grayling abundance. A couple in Igiugig said that February is a slow month for ice fishing, but they caught little “trouts” and grayling at a certain spot at a nearby island. In March the couple did not fish for grayling and there was less ice fishing than in the past due to employment and weather. Some grayling were harvested in the fall

A woman in Iliamna reported jigging for fish out on the ice in front of the village. To learn where to fish she followed the crowd. In the fall she got grayling; these are fatter in the fall.

**Use Areas.** In Igiugig, grayling have been caught at the mouths of Pecks and Kaskanak creeks (Fig.1, see Fig. 25 for harvest locations). At Pecks Creek grayling were caught while targeting pike. Grayling were harvested in the Alagnak River, specifically at a creek about a mile south of the Katmai Lodge. The same couple said they had caught grayling all the way up to the lakes. The couple reported targeting grayling at Lower Talarik Creek, not far up from the mouth.

An Igiugig elder reported going to Ben Courtney Creek for grayling in the past, but now goes up Kaskanak Creek maybe 50 miles to where the grayling are abundant (Fig. 1). He said he fishes in the creeks and goes two to three miles past the “fork”. Also, there were lots of grayling near Egg Island and Ed Conn’s Island (Figs. 15, 16, and 20). Occasionally, a grayling is caught on the beach in front of the village along with rainbow trout. One person described a lot of grayling in the upper Alagnak River where there are islands and the river gets shallow. At his cabin on the Alagnak River at the mouth of Yellow Creek he caught mostly grayling, and grayling along with rainbow trout at Grants Creek. Occasionally, grayling are caught while ice fishing on Lake Iliamna.

An Iliamna respondent reported using Tazimina Lakes primarily as a grayling harvest site, as well as Boodle Head (Figs. 1 and 17). Grayling are also caught by ice fishers in front of the village.

In Kokhanok it was said that there were not a lot of grayling, but they were caught once in awhile. Around Kokhanok, people fished at the fish camp at the mouth of the Gibraltar River and some grayling were caught there (Fig. 1). The other site mentioned was Penia’s fish camp, indicated by a Dena’ina name not transcribed meaning “place where the seagulls sit”. It was described as having “a big grassland out in front that they land on”. Grayling were harvested in

the springtime in Sid Larson Bay, USGS Nielson Bay, (not USGS Sid Larson Bay, which locally is called Nielsen Bay) (Figs. 17 and 18) at the mouth of a creek locally called Sid Larson Bay Creek. This site was called Little Lake Beach, a sandy beach in a tiny cove. A fishing site called Grayling Lake is located up the Kokhanok River, beside “Moadulies” Hill. A grandparent was said to have fished there. One man had traveled across the lake to the Newhalen River and caught grayling. Tommy Creek was also mentioned. Intricate Bay and Copper River were mentioned as grayling harvest sites no longer used. The young informant said he never caught fish in these two places but other people used to and he does not hear them talking about it anymore. People fished the Copper River to the falls, just above Fog Lake.

Levelock people used to fish in the Alagnak River for many species, including grayling, where people have cabins and there is the old village site where several families lived before moving to Levelock (Figs. 19 and 20). Several people mentioned the old village site was a good fishing spot, especially for trout and grayling. One informant described his old trapping area and a creek below Lucky Hill as a good grayling fishing creek and he remembered harvesting grayling there in the past when he trapped in the area. It was right at the mouth of the creek near the old village site. Also, he remembered harvesting grayling from a creek about one mile down from a specific cabin site. “Trouts” were also caught in this spot. On the Alagnak River he said grayling were caught in the sloughs. Grayling were harvested along with other fish at the mouth of Kaskanak Creek on the Kvichak River (Charlie Jensen’s cabin was mentioned). The area of the Kaskanak Flats on the Kvichak River was a popular fishing site for all kinds of fish and was mentioned often. Sometimes the grayling were abundant in this area. A Levelock resident from Igiugig said he and his sister, living in Igiugig, harvested trout and grayling in Lake Iliamna below the airport at Igiugig. A person originally from the Nushagak area fished at locations in that area. She mentioned there were grayling up and down the Alagnak River, but they fished in Swan Bay and caught grayling as well as other species of fish. They fished the Alagnak River from the forks on up to the lakes. One informant remembers seeing people ice fishing and harvesting grayling in the 1950s when he was young, up near John and Mary Tallekpalek’s cabin on the Alagnak River.

In Nondalton grayling fishing sites around Lake Clark included Long Lake, Nikabuna Lake, Chulitna River, and Caribou Creek (Figs. 1 and 22). “Matter of fact, all these creeks on the south side, grayling tends to be in the mouth of the creeks where you only see the bottom about seven to eight feet, blue water, then the water drops way deep. You fish along these creeks.” This description includes “22” Creek (Fig. 24). Also mentioned was the Newhalen River down to the “Landing” and Hammer Cache Creek, Steambath Creek, Pickerel Creek, Volcano Creek, and along the shore of Six Mile Lake and Lake Clark. One informant was asked, “Do you know where the grayling spawn?” They spawn in certain creeks at Pickerel Lake and “it was possible they use to go up there and seine them long time ago for dog food.”

A very active Port Alsworth couple reported that grayling fishing was particularly good at “22” Creek (mentioned by several people), Indian Point, and Tommy Creek (mentioned by several people) and that they sometimes targeted grayling at these sites. Portage Creek (in spring before it silts up) and Twin Lakes were also mentioned (Figs. 1 and 24). When the Tanalian River is flowing, they stopped to do a little fly fishing and harvested grayling there. Another location: “Up on the north end of the lake there’s a couple of really good creeks that come in, up towards the head of the lake. That’d be I guess on the east side where we would fish, and you’d catch

nice grayling right here, and boy, in the springtime that's just incredible, before the silt starts coming in. That's always been a good spot a favorite spot for them."

***Preservation and Preparation Methods.*** On Lake Clark, most grayling were eaten immediately and some were frozen. People in the past cleaned it and dried it for dog food. One person remembers her mother salting and smoking a few, maybe 15 grayling. Grayling were baked and fried. In Dena'ina communities, it was sometimes used to make fish *nivagi* with berries.

***Distribution and Exchange.*** Grayling were not traded as extensively as other species of freshwater fish, such as humpback whitefish from Igiugig, but they were shared within a community. Only one comment, from Nondalton, was collected concerning exchange of grayling.

***Trends in Harvest and Use Patterns.*** A Kokhanok informant remembers preserving a large number of grayling only once when he caught about 40 grayling. His wife canned them and they ate them like tuna fish. Other than that he does not remember drying trout or grayling for later consumption. The same person noted "That grayling wasn't [caught] that much [by] our people." It is unclear if other residents would agree with this.

In Levelock was heard "Everything but grayling is in the Alagnak River. However, there used to be lots of grayling. Now a lucky person will catch one or two. This is probably due to over fishing."

One Nondalton informant explained that now people keep a rainbow or two, but usually catch grayling or whitefish. Another said years ago he remembers his mother cleaning and drying grayling for dog food. It was harvested in the summertime by women, salted, and smoked, in small quantities of 15 or so. A Nondalton man remembers "When I was a kid we had a dog team and we had to set a net out quite a ways." Today there are fewer dogs in the village, and he thought they were fed some grayling and whitefish. When was abundant it was usually the primary fish fed to dogs. Another man said that "Years ago they use to clean [grayling] and they dried a lot of it for dog's feed. We use to get a lot in the summertime." There was a grayling spawning area in Pickerel Lake and "It was possible they use to go up there and seine them long time ago for dog food" (Fig.1). Feeding grayling to dogs was mentioned several more times. "They put up most of their dog feed in the summertime when there's plenty of salmon. Then during the winter, they didn't rely on the trouts much. What they usually did was salmon. Besides salmon they would go to Pickerel Creek and get the suckers, and they use to put that up and graylings for dog feed."

In Port Alsworth one informant said that there used be more, or larger, grayling in "22" Creek (Fig. 24). He only caught very small grayling, four inches, last year. It is possible that he was harvesting only young grayling because they had recently hatched. It was reported that "22" Creek is a grayling spawning site. The same man said that he didn't go to Portage Creek last year, but thinks it is getting depleted, too, but did not mention what species specifically. "Well, I

think pressure was greater last year for the last time. Maybe things will get better again now. Although I just [saw] a bunch of seats come in for [lodge-owned] boats.” Another man explained that grayling spawn by Portage Creek because a lot of small grayling are caught there. He referred to catching dozens of the small ones in the springtime.

## **Traditional Knowledge Observations Regarding Grayling Populations and Ecology**

***Grayling Populations.*** An Igiugig elder was asked, “Do you notice any difference fishing today than what was available many years ago? Like when you first started fishing, some of your earliest recollections. Is there more fish, about the same, or is there less?” Answer:

Well, there is different species, like the grayling on the Kvichak. We use to catch them in Ben Courtney [Creek] [Fig. 1] all the time and now it is not like that any more. Seems like they are in the creeks... I finally found where the grayling are. And then we go up every fall fishing. You can catch them anywhere on the river with a fly hook or them little Mepps Spinners but we go up Kaskanak maybe 50 miles or more and catch a lot of grayling up there, and brook trout.

The interview continued with the following interaction: “So it is more difficult today?” Answer: “Yeah, it is way up the creek now.” “So you got to go farther?” Answer: “Um-hum.”

In Kokhanok an active fisher was asked, “Are there areas where there used to be grayling [but they are no longer there]?” He responded, “Fish Camp River and Copper River. I never caught grayling in Copper River, but other people used to, quite a few...and I don’t hear them talking about much anymore” (Fig. 18). Then he was asked, “In your opinion, what would it take to bring the health of the grayling back?” “Less pressure, but I don’t know how that’s gonna happen.”

In Levelock one informant mentioned the population of grayling was down in the Alagnak River and the reason for this was over fishing. He was not sure if primarily sport or subsistence fishers were responsible.

In Nondalton, several people mentioned that there was no noticeable change in grayling population or size even as the condition of other species had changed, such as pike and lake trout. Ice fishing was still occurring in late winter and early spring, ice conditions permitting. It was suggested that grayling were less abundant in specific areas, such as the Tazimina River, and the decline began before the salmon crash. A popular theory was that the gravelly spawning grounds and eggs were being disturbed by jet boats.

In Port Alsworth, little change was noticed in grayling populations or size, and one of the reasons given for this was the preference for trout for an immediate meal. An active fisher related the following:

I think the grayling seems to be doing pretty good, partly because, I think, if somebody is going to throw something in the freezer, or if you're going to do something for lunch, its easier to catch something like a trout or lake trout that you don't have to scale first. Grayling are good eating, too, its just most people, if you have choice between one or the other, the other fish are easier to clean. But the only place I've seen any difference is again in some of those same streams where someone is going to on a regular places.

Another active fisher was asked, "The salmon have declined tremendously since the mid 1990s. Have you seen a correlation with those diminishing runs?" He said there was a declining population of grayling at Tommy Creek which was otherwise a grayling harvest site (Fig. 24). This is directly related to the reduced salmon runs in the creek and lack of food in the form of roe and carcasses.

In specific streams you have. Like at Tommy Creek, there would be salmon that would come up into there, and you could consistently catch a lot of grayling and lake trout right out in front of it. Well anymore, when there's no salmon showing up, well you can still catch a few fish there but its not anything like it used to be. And probably in an adverse way we talked about the big pike and the big lake trout and all that you used to catch. It's probably related. I mean, it's a little farther down the chain but if the pike are feeding on the lake trout and grayling which feed on the salmon--they may not be feeding on the salmon directly--that probably has a good deal to do with it, why you don't see the numbers and bigger fish. The places where there aren't as many or as big a fish there's really two things going on. There aren't as many salmon and there's more people fishing. So anywhere there's that combination there's the place you notice that the fishing isn't as good as it used to be. The places that are either closed systems and the places that are still getting a heavy salmon run seem to be pretty healthy.

**Grayling Ecology.** Igiugig respondents were not sure when grayling spawn but some of them had observed good sized eggs that September, about a month before the interview. "About a month ago they weren't ready to spawn but they had big eggs in them." Little grayling and other juvenile species were seen returning to the lake from little springs just inland, away from the outlet of Lake Iliamna into the Kvichak River. When cut open "we see the bellies are just full of little, little tiny, all different kinds of fish, probably suckers, whitefish, and even grayling because they feed on fish and it don't make no difference what kinds of fish they'll eat".

A man in his forties from Iliamna said that the Newhalen River, Iliamna River, Nondalton area, and Knutson Bay were always good fishing, including for grayling (Fig. 1). The grayling made their way up creeks in June. The pike followed next and then the suckers. In October, they came back down. Also, "The whitefish are at Nondalton in March and then winter in Lake Clark. Grayling spawn in early May, and suckers spawn in mid-June in Pickerel Lake." And, "The grayling make a cycle moving from Six-Mile Lake in to Pickerel Lakes, then into Lake Clark and back down. This occurs in the fall" (Fig. 26).

According to an active Kokhanok fisher, grayling were found at the head of Larson Bay in the spring and it was assumed they were there to spawn. In the fall time grayling were hard to catch

because of “too much scattering”. An elder said grayling come the same time that Dolly Varden come to spawn, in the springtime. He thought they went up Lower Talarik Creek, Gibraltar River and Dennis Creek on the south side of the lake, March to June (Figs 1 and 18).

Nondalton testimony has some of the same observations as in Port Alsworth. In addition was the description of grayling habitat, at the mouths of the creeks on the south side of Lake Clark, in about eight feet of silt-free water, where the bottoms drops off to deeper water. Grayling can be found along this shelf. Fall grayling were observed to be fatter than in other seasons and males a little larger than females, but the same color. Grayling fishing seemed better when the water is not really high. “Seems like when the water is really high a lot of the fish don’t come up in the river.”

In Nondalton it was observed that grayling in Lake Clark usually spawn in the springtime, around March, and in smaller local lakes, even Six Mile Lake. Grayling were found across from Keyes Point in the spring, another possible spawning location, and also spawned up Alexcy Creek. In the winter time grayling were seen down by Steambath Creek on the south side of the lake, and concentrated in local ponds in the same area (Figs. 1 and 22).

Grayling stay in deeper and cooler water but may “crawl” up into Little Lake Clark even though it is very silty said one Port Alsworth resident (Fig. 1). They are prey to lake trout and pike. “We’ve caught lake trout with a bigger grayling, even a 17 or 18 inch grayling, hanging out of their mouths.”

The following is a description of grayling by a local Port Alsworth expert: “Anywhere there’s a stream flowing into the lake you can catch grayling, just about. Everywhere you have marked off here, except for Chulitna, you catch grayling.”

Q: Just on Lake Clark or all the other areas?

A: All the other, everything besides Chulitna, you can. This is the one thing that seems to be pretty abundant. I think it’s because they’re real[ly] diverse, like trout are, more so than the other species. They’ll feed on bugs a lot, and they’ll feed on suspended stuff in the water, and they’ll feed off the bottom. So pretty much any time of the year, I think, they can find food.

Q: Is there any difference between summer and winter, where you go?

A: I’ve never actually ice fished in an area that they catch grayling. I know people have caught them just right out in the main lake here. As far as summer, like I said, anywhere there’s a stream. And they hang out even when there isn’t a good stream, just in the water by a stream. Anywhere there’s a good stream, where the water’s flowing. As long as the waters open you can find them.

Q: The salmon have declined tremendously since the mid 1990s. Have you seen a correlation with those diminishing runs?

A: ...The places where there aren’t as many or as big a fish there’s really two things going on. There aren’t as many salmon and there’s more people fishing. So anywhere there’s that combination there’s the place you notice that the fishing isn’t as good as it used to be. The places that are either closed systems and the places that are still getting a heavy salmon run seem to be pretty healthy.



Another man explained,

Now, when the salmon come in, its been my experience...prior to the salmon--and for us right here the run is usually right around the 20<sup>th</sup> of July--but fishing up to that point for the grayling and lake trout is normal. But then after the salmon get here and start cruising, catching a good lake trout is really tough, and I don't know if it's because of the size of the salmon being in the lake drives all the other fish out into the center of the lake or down deeper or what. But it has to do with when the salmon get in. Its tough to catch them unless you get over like Kijik, where they're spawning and they're running up there and then you can catch them just outside of the ball of salmon. You can catch them but as far as trolling for them and in all the normal regular places it just doesn't work. It doesn't work and you'd have to wait I guess till the salmon quit running and that would be late August. First of September the fishing starts to pick back up again here for the lake trout and stuff like that. But now, the Chulitna River salmon do not run up the Chulitna so that stays good fishing. But yeah, when the salmon get here, in here, it gets really tough to catch anything else. Once they start cruising its like everything else disappears for awhile. Especially the lake trout.

A Port Alsworth informant explained that grayling move to spawning areas, such as Portage Creek and Pickerel Lake, in the spring and are not seen again until the salmon have passed (Figs. 1 and 24). Then they return to the mouths of creeks and streams. An experienced fisher said grayling are not moving to the mouth of streams and creeks that in the past had large runs of returning salmon where grayling fed on roe and carcasses.

### ***Blackfish***

Blackfish *Dallia pectoralis* are a small (average length eight inches) fish that inhabit densely vegetated areas of ponds, rivers, and lakes in the Bristol Bay drainage. They grow slowly, and may live up to eight years. Blackfish are bottom dwellers that feed primarily on insects. They spawn from May to August. These fish move between summer habitat in tundra ponds and winter habitat in deeper lakes. The Alaska blackfish are unique because they have a modified esophagus capable of gas absorption, meaning they can exist off atmospheric oxygen. The existence of an air-breathing fish in Arctic regions at first seems unlikely as most oxygen problems in the water would be expected to occur in winter--a time when air breathing would not appear to be of any advantage because of the ice cover. However, this capability allows these little fish to live in the small, stagnant tundra or muskeg pools that are almost devoid of oxygen in summer and also to survive in the moist tundra mosses during extended dry periods while waiting for rain to fill the tundra pools again (Armstrong 1994, Morrow 1980:161-163).

## **Subsistence Use Patterns and Trends**

***Gear Type.*** An Igiugig elder said his grandfather harvested blackfish by setting a fish trap in creeks. An active fisher from Kokhanok remembers scooping blackfish from holes drilled in the ice during springtime. A Levelock elder said blackfish were caught in locally made fish traps.

***Timing of Harvests.*** An active fisher in Kokhanok remembers harvesting blackfish from lakes near Levelock in spring as the lakes were thawing.

***Use Area.*** An Igiugig elder said his grandfather harvested blackfish in some of the creeks running into the Kvichak River, below the Alagnak River confluence (see Fig. 27 for harvest locations). Another Igiugig elder said he used to harvest blackfish across the river from Levelock and near “Graveyard” (Fig. 20). An active fisher in Kokhanok remembers harvesting blackfish from lakes near Levelock. A Levelock elder said people used to harvest blackfish from Swimming Lake, located directly behind the old airport. Another elder harvested blackfish from Bear Creek, Alagnak River just south of Alex Tallekpalek’s fish camp site, southeast of Alagnak River Lodge, and Cottonwood Creek near Levelock.

***Preservation and Preparation Methods.*** A Levelock elder said blackfish were boiled before being eaten.

***Distribution and Exchange.*** No information was provided on this topic.

***Trends in Harvest and Use Patterns.*** An active Kokhanok fisher said he remembers harvesting enough blackfish to use as dog food. A Levelock elder said people used to harvest blackfish locally but do not anymore because they cannot find any blackfish, even though they try.

## **Traditional Knowledge Observations Regarding Blackfish Populations and Ecology**

***Blackfish Populations.*** An active Kokhanok fisher said he does not know of any blackfish habitat in the area except for hearing there were blackfish in upper Ole Creek (Fig. 1). A Levelock elder said there was once blackfish in a couple of locations around the village, but they do not exist in those places anymore.

An active Nondalton fisher and an elder said blackfish do not exist in the area. An elder couple in Nondalton said blackfish and sucker are always available, and people ate them when they had no other food. These species were described as starvation food, along with sticklebacks and “bullheads”, probably referring to a species of sculpin.

Two active Port Alsworth fishers said they were not aware of blackfish habitat existing in the area. However, a woman present at the interview interrupted, saying a relative told her stories of harvesting, drying, and smoking blackfish in a little bay by Chi Point (Fig.1).

**Blackfish Ecology.** Igiugig elders said blackfish exist in almost all of the little creeks from Igiugig south to around Pecks Creek (Fig. 1). One's grandfather told him that blackfish, burbot, and sucker are all fish that get their food from the muddy bottoms of lakes and creeks. It was important for him to know about them because when salmon are scarce, these are going to be the only fish left, fish that feed from the mud, his grandfather told him. Another Igiugig elder said he was told by a friend that blackfish could be found in almost all the creeks and lakes around Graveyard, in springtime when they started to overflow (Fig. 22). A Levelock elder said blackfish are not found in the lake at the end of the airport anymore because it is filled with grass now.

### ***Burbot***

Burbot *Lota lota*, also known as ling cod or lush, inhabit streams and lakes, and are usually concentrated in deep holes through much of the year. They are mostly sedentary, but some move to spawning areas in shallow water. Spawning usually occurs in January to March in lakes under ice cover. Burbot grow slowly, and may reach 20 inches in length after eight years of life. The burbot is the only representative of the cod (*Gadidae*) family in fresh water in North America (Holmes 1994, Morrow 1980:181-184).

### **Subsistence Use Patterns and Trends**

**Gear Type.** An Igiugig elder said burbot were always harvested with the same fish traps as were used to harvest blackfish.

[in Yup'ik] When my *ap'a* [grandfather] is going to set *manigna* traps, he used to examine the water current, where the current flows, using a blade of grass which was not too long by tying it to the end of a long willow branch. Then [he] lowers it in the water to check the current, and if the blade of grass swivels around every which way, the location is not good...but if the blade of grass sits straight and still, that indicates the path of the ling cods...

Another elder said he was harvesting burbot with a fish trap until five years ago.

An active Kokhanok fisher said burbot were caught through the ice with set hooks, baited with something "stinky". In the past he remembers his family using burbot nets in winter, however,

hardly anyone used a net anymore. An elder couple said a burbot was occasionally caught in their subsistence salmon net. A Levelock elder said his dad harvested burbot using a fish trap under the ice.

A Nondalton elder said it was common in the past for people to harvest burbot using traps. A younger, active Nondalton fisher reported harvesting burbot using an overnight set line with just one baited hook. Another elder said he harvested burbot off the bottom while icefishing.

Active local Port Alsworth fishers who were new to the area said they harvested burbot while “bait” fishing, dropping a line in the water and leaving it for several hours. They reportedly harvested one in their salmon net. One described a local practice called “burbot bopping” done in early spring when burbot are found right under the shore ice and are easily caught. Another long time resident had heard of people catching burbot while ice fishing in a local river and also of a man setting traps under the ice when he was young. Also, he said, people snare burbot under the ice by using a stick with a snare on it. To do this, a person cuts a whole in the ice, dips the snare in the water, and watches for a burbot to enter the snare and then catches it. The traps he described were like crab traps, big and round, shaped like a tube, and not made of wood anymore. Once in the trap, a burbot cannot escape. One person in Port Alsworth reported harvesting burbot using a set line.

***Timing of Harvests.*** An Igiugig elder said burbot fish traps were placed in fall time, as soon as the weather turned cool, up until Christmas, and again in February and March, depending on the area. An active fisher in Kokhanok said burbot were best caught in winter through the ice. January and February are supposed to be the best time to catch them, but he has been able to catch them in late fall and in spring, only, depending on the area. A Levelock elder said his dad and others used to harvest burbot in January and February.

An active Nondalton fisher said burbot are best caught after freeze-up, when the ice is strong enough to walk on, and into springtime. An elder said burbot were caught in fall as they are migrating to spawn. A Port Alsworth resident said burbot were harvested by “bopping” in the springtime as the lake ice was breaking up.

***Use Area.*** Burbot were harvested in the past by Igiugig residents about three to six miles up Kaskanak Creek and from the Alagnak River near the old village (see Fig. 28 for harvest locations). Iliamna residents reported harvesting burbot from Eagle Bay, near Pedro Creek (Fig. 17). Kokhanok respondents reported harvesting burbot from in front of the village, Gibraltar lake and river, and Reindeer Bay (Fig. 18).

Fishing for burbot by Levelock residents occurred near the mouth Kaskanak Creek and Kaskanak Flats, across from John Tallekpalek’s cabin on Alagnak River when fish traps were still being used, and near Egg Island near Igiugig (Fig. 20).

Nondalton respondents were able to catch burbot at several locations on Six Mile Lake, even in shallower water, and from the north side of Keys Point into Portage Bay on Lake Clark, around

the islands near the mouth of “22” Creek, Chulitna Bay, Hardanberg Bay in Kontrashibuna Lake, and other deep channels in Lake Clark (Figs. 1, 22, and 24).

Port Alsworth respondents reported harvesting burbot from Portage Creek (one a fishing trip), a little bay near Chi Point, Six Mile Lake in front of Nondalton, lower Tanalian River, and ice fishing in Lake Clark in deep water (Figs. 1 and 24).

***Preservation and Preparation Methods.*** An Igiugig elder couple said burbot, sucker, stickleback, and blackfish are “starvation” food. A long time ago, when there was hardly anything to eat, people poked these fish with needles to make them bleed before placing them in the cooking pot. Then they would drink the broth. These were the fish it was important to know and to teach children about. In Kokhanok burbot were boiled or fried in butter with little bits of onion. Probably the most common way to cook burbot in Nondalton was by boiling. An elder suggested freezing a burbot just long enough to be able make a cut around the head easily, peeling the skin off, and frying the fish. A Port Alsworth resident said he liked dipping chunks of boiled burbot in butter sauce.

***Distribution and Exchange.*** There was no information offered on this topic.

***Trends in Harvest and Use Patterns.*** A Kokhanok resident said elders told him they would harvest enough burbot from Gibraltar Lake to fill up their sleds (Fig. 1). He said no one in the village sets nets for freshwater fish anymore, but when they did it was common to get at least one or two burbot in a net every week. In Levelock, an elder remembered his father catching a “thousand” burbot in his fish trap set under the ice at Kaskanak Creek when the family lived in a winter camp there. In Port Alsworth, an occasional burbot was caught incidentally in subsistence salmon nets.

## **Traditional Knowledge Observations Regarding Burbot Populations and Ecology**

***Burbot Populations.*** In Igiugig, an elder said that the burbot in the Alagnak River were smaller than the burbot in the Kvichak River. In Kokhanok, burbot were said to be from 12 to 24 inches plus long. An active fisher said there were fewer burbot than in the past, but it was hard to know for sure because people did not target them in large quantities anymore. A Newhalen elder said that burbot were sometimes seen in Upper Talarik Creek, but this was a rare occurrence.

A Nondalton elder said the largest concentration of burbot of which he knows is at the mouth of Chulitna River (Fig. 1). An active fisher also mentioned the mouth of the Chulitna River as a place having a high abundance of burbot and suggested they are eight to ten inches long, the biggest being 14 inches. He had not noticed a change in the abundance of burbot. Nor had he noticed a change in the abundance of large burbot. All the burbot he had been catching were nice and fat, he said. But another Nondalton elder mentioned that the abundance of burbot was

shrinking. He said, however, that the proportion of large to small burbot had not been effected. The local burbot were about 24 inches long, he said. He does not see burbot in summertime, but they are plentiful in winter.

***Burbot Ecology.*** In Igiugig, burbot were described as one of three types of fish, the others being suckers and blackfish, that find food in the muddy bottom of lakes and creeks, and can be found even when salmon are scarce. People keep passing down the knowledge of these fish in the event of times of resource scarcity and food shortages. Burbot are harvested from slow running or still water.

A Kokhanok resident said he was told by his uncle that the best time to harvest burbot was January and February, and that this might be when they spawn. He has tried to harvest them from Gibraltar Lake at this time but the ice was too thick and he could not get through it with his auger.

A Levelock elder said that burbot are moving up the Kvichak River to Kaskanak Flats at the same time as the whitefish, in fall. A Nondalton elder said burbot spawn in the Chulitna River and are not found further than the flats (Fig. 1).

A Port Alsworth resident described burbot behavior that he has witnessed.

They actually wedge themselves up between the ice and the rocks when the ice is first forming. You can walk around, whatever time of year we finally get ice, and see these little burbot. They get into this shallow stuff. I've never seen the big ones. But if you're going to catch them, use something dead to catch them with. I've never caught one on a lure or anything like that. They like looking around for something that doesn't have a lot of fight left in it, and eat that... Once the ice gets thick you can't see through it good enough to tell [if they are still there]. But I know when there's an inch of ice they'll do that.

### ***Longnose Sucker***

Longnose suckers *Catostomus catostomus* are bottom feeders which begin spawning runs in late spring. They move from lakes into inlet streams or from pools in streams to graveled sections. After spawning, adults return to lakes or remain in the rivers, but generally do not undertake any long migrations (Morrow 1980:173-175).

## Subsistence Use Patterns and Trends

***Gear Type.*** An elder Igiugig couple said suckers were harvested with nets in spring along with other species of fish, such as, whitefish and pike. Another elder said that, in the past, he would set a net overnight when targeting suckers.

An active Kokhanok fisher said suckers were always harvested with nets because they will not bite a hook. In the past, he remembered people putting nets under the ice to harvest suckers. Levelock and Newhalen elders also reported harvesting suckers with nets.

An active Nondalton fisher said suckers can only be harvested with nets because they will not bite hooks. An elder said that when there were a lot of dogs in the community, large quantities of suckers were harvested with a seine.

In Port Alsworth a couple of people mentioned that they were catching more suckers in their subsistence salmon nets than in the past. One person remembered, from the past, that when a lot of fish were needed for dog food, suckers and other fish were caught in nets.

***Timing of Harvests.*** An elder Igiugig couple in Igiugig mentioned harvesting suckers in spring, end of May and first week of June. A small number of suckers were harvested little earlier in April from other areas. An active Iliamna fisher said he harvested suckers in spring. An active Kokhanok fisher said that suckers were available to harvest year around, however, he specifically remembers people harvesting them from under ice. A Levelock elder reported harvesting sucker in spring, and Newhalen elders reported harvesting sucker at their spring camp.

***Use Area.*** An elder Igiugig couple said they harvested suckers at Pecks and Ole creeks and Kaskanak Flats (see Fig. 29 for harvest locations). Another elder added the area of river between the two creeks (Fig. 1). An active Iliamna fisher said he harvested suckers from Whistlewing Bay (Fig. 17). An active Kokhanok fisher said people used to harvest suckers from Intricate Bay (Fig. 1). Several Levelock elders said suckers were harvested at Kaskanak Flats on the Kvichak River.

A couple of Newhalen elders said that pike were harvested at Lower Talarik Creek, along with other species of fish, such as rainbow trout and pike (Fig. 1). An active Nondalton fisher said people usually fished for suckers at Perculate Creek (Fig. 22). An active Port Alsworth fisher said sucker were harvested at the mouth of the Chulitna River.

***Preservation and Preparation Methods.*** Elders in Igiugig said that they were taught to pay special attention to suckers, blackfish, and burbot. During times of food scarcity or “starvation”, these fish are still available for harvesting. The fish were poked and boiled, and the bloody broth was considered to be particularly nutritious.

In Nondalton, suckers were boiled, and in the past were dried, eaten, and fed to dogs, especially in years when the salmon runs failed. People ate the head, and in the head are little bones shaped like the parts of land mammals, such as antlers. People look for these bones when eating sucker heads and this is part of the enjoyment of the meal. An elder said that some people still harvested and ate suckers, but they did not eat the whole fish because there are so many bones. What they usually did was cut the heads off and eat the head part.

***Distribution and Exchange.*** No information was collected concerning this topic.

***Trends in Harvest and Use Patterns.*** An elder Igiugig couple said that when they were targeting whitefish and pike, only three or four suckers were usually found in the net. Another elder said he used primarily whitefish and suckers to feed his dogs in the past.

A long-time Kokhanok resident said suckers are small but heavy and oily—particularly well suited for dog food. In the past, when people kept more dogs, suckers were harvested in larger numbers. Five or six fish filled a dog pot, “We didn’t have to fill the dog pot too much to keep them happy.”

An active Nondalton fisher said suckers were once dried and stored in large quantities to feed dogs, especially in years when salmon were scarce. An elder said that, in the past, people preserved and stored salmon for dog food in summer. Besides salmon they would go to Pickerel Creek and harvest “a boatload” of suckers, then preserve and store it for dog food (Fig. 22)

A long-time Port Alsworth resident said that people used to harvest suckers in larger quantities to feed their dogs, and Port Alsworth residents do not target suckers anymore, but they were caught in salmon nets occasionally.

### **Traditional Knowledge Observations Regarding Sucker Populations and Ecology**

***Sucker Populations.*** An elder Igiugig couple said that suckers appear in large numbers at Pecks and Ole creeks and Kaskanak Flats (Fig. 1). An active Kokhanok fisher said the abundance of suckers has stayed about the same, maybe a little less fish. He said they were found mostly in the Copper River, Intricate Bay, and suckers were abundant in many of the local lakes. He said the biggest was about 18 inches. Suckers are round, compact fish, typically weighing around three or four pounds, heavy for their size. An elder said that suckers were now present in Airplane Lake, whereas before people harvested Dolly Varden in the lake, but not anymore (Plate 1 and Fig. 18).





Plate 1. Aerial View of Kokhanok with Airplane Lake center left, March 2003. Photograph by Hans Nicholson.

A Newhalen elder said that suckers, along with blackfish and burbot, can always be found in deep water of Lake Iliamna, no matter what the environmental circumstances. A Nondalton elder said that the largest concentration of suckers in the area was in the Chulitna River (Fig. 1). An active Nondalton fisher said that suckers were very abundant in the area. He said sucker fish were as long as 14 inches, healthy looking, and most abundant in July. There is a place in Six Mile Lake where suckers have been seen “boiling” they were in such large numbers. The abundance of suckers did not seem to have changed from the past.

***Sucker Ecology.*** An elder couple in Igiugig said suckers arrive in large numbers at Pecks Creek and Kaskanak Flats and spawn there in spring (Fig. 1). An active Iliamna fisher said suckers move up creeks in June, after grayling and pike already have, returning to the lake in fall. Suckers spawn in Pickerel Lake in mid June, he added.

An active Kokhanok fisher said suckers spawn in the Copper River, “Copper River’s just black with them,” in spring and fall. There was a resident population of suckers in Airplane Lake. Suckers were present year around, specifically in Intricate Bay. A Kokhanok elder said suckers were all over Reindeer Bay in spring (Fig. 18). A Levelock elder said suckers spawn at Kaskanak Flats.

A Nondalton elder said that enormous numbers of suckers migrate up the Chulitna River in July (Fig. 1). “There’s no end to them.” One person said suckers also spawn in Hudson Bay on Lake Clark where she saw them “boiling” in the water (Fig. 22). An active fisher said that suckers were most abundant in July. He has seen juvenile suckers, four or five inches long, just off the shore of Six Mile Lake when the water was high. They probably spawn in many of the lakes at the end of creeks running to Six Mile Lake from the southeast. Salmon were also known to enter these lakes. The informant said suckers congregated at Perculate Creek, all over Six Mile Lake, and Hudson and Portage bays at Lake Clark. Suckers were usually harvested in waters more shallow than deep. Another Nondalton elder said suckers congregate at Pickerel Creek, too, where there are a lot of sloughs. He said the Chulitna River is very muddy, but suckers are not deterred by it. After November, suckers were not seen again until spring.

Recent residents of Port Alsworth had seen “hundreds” of sucker fish at the mouth of the river to Kijik Lake, probably preparing to spawn (Fig. 1)

### *Northern Pike*

Northern pike *Esox lucius linnaeus* inhabit lakes, rivers, and sloughs. They may reach a size of 20 pounds or more, and fish weighing up to 30 pounds and measuring 4 feet in length have been caught. Six to eight year old fish weigh an average of about five pounds and are 25 inches long. These fish over winter in deep, slow moving waters of larger rivers or in deeper lakes. In spring, a short migration occurs upstream or inshore to spawning areas. Pike spawn in spring along lake shores or slow-moving portions of streams in shallow, marshy areas after the ice goes out. The adult fish, usually solitary, then occupy "holes" throughout most of the summer. The diet of larger pike is composed almost entirely of fish, including other pike, but shore birds, small ducks, muskrats, mice, shrews, and insects are also eaten. (Alt 1994a, Morrow 1980:165-169).

### **Subsistence Use Patterns and Trends**

**Gear Type.** In Igiugig, pike were harvested while ice fishing and in nets. An Igiugig elder was taught while young to harvest pike in a fish trap. The fish trap was about five feet by two feet and made out of small mesh chicken wire. The frame of the trap was made from the root of *nekevraartuq* (spruce). The root was split in half and tied in a circular shape. These circular shape ends were called the *igyaraq* (wider end) of the fish trap. He described using his trap.

The fish traps have *igyaraq* [wider end of trap]. We would set the fish traps with the wider end of the fish trap facing down river. Fish going up river would get trapped... Also the pike, or any fresh nonsalmon [fish] that have entered into the lakes, will *tuigteq* [turn around] and travel out of the lakes in the fall [time] just before it freezes. Then the fish traps that were set out facing down river, you understand me, again will be turned around to face up river, placing the wider end

*asgurutmun* [set against a natural force such as water current]. [Fish] would become inaccessible when the ice started blowing onshore. [Fish] would go out into deep water, then they will go down river... I used to always accompany my uppa [grandpa] to learn when he would go and set fish traps. He never used nets except fish traps.

A middle-aged Iliamna man said he started fishing when he was six years old with a hook and line. He would help his father fish for pike with a net. Ice fishing in Lake Iliamna was a popular activity of Kokhanok residents, and pike were often harvested.

In Levelock, an informant said he caught pike while seining for whitefish. He drifted a net down a creek, pulling the net onto the beach to retrieve the fish. Pike were also targeted while ice fishing in specific areas of pike abundance and while ice fishing for whitefish. One informant, who remembers first seeing freshwater fishing activities when he was young in the late 1950s, remembers that in some creeks it was the custom to place a net under the ice to harvest pike. He also remembered an older man using a fish trap and occasionally catching a pike in it. Set nets were also placed in sloughs to target pike.

In Newhalen, an informant who moved to the village in 1955 described using nets in the Newhalen River to harvest pike and other species of fish.

A Nondalton elder remembered hearing stories in which, lacking a hook, chunks of moose and caribou meat were tied to a piece of string and thrown in the water. Pike would bite it and could be pulled out of the water. Whitefish was also used for bait to catch pike. Another Nondalton elder remembers harvesting pike in king salmon nets in a local lake where the net would be set across a little slough.

A knowledgeable Port Alsworth resident described trolling for pike in specific areas. Lake Clark residents have used nets to harvest pike in Chulitna Bay, but not recently (Fig. 1). "I know in Chulitna, traditionally, there's been nets put out for the pike and the suckers that come through there, mostly for dog food." Several Port Alsworth informants described ice fishing for pike as a favorite wintertime activity.

There was some older guys from Nondalton that used to come up fishing in the springtime. I guess it would be safe to say that it was like a carnival, because the days are getting longer, and its warm, and people would just come out of everywhere. And then especially on a weekend, you could find 20 or 30 people over there [Chulitna Bay]... That's what I think is probably the best way to end the winter, is [to] start fish[ing] over there on the longer days. Fishing pikes through the ice like that was always good fun. We'd get a lot of people from Nondalton coming up and people from Port Alsworth going over, and it would be good fun... Yep, and if we get winter back, we'll be back doing that.

***Timing of Harvests.*** In Igiugig, an elder couple described catching pike in traps in the past. In springtime, around April and May when pike are swimming upriver, fish traps facing downriver

were set in the river. October and November, the traps were turned around to catch out-migrating fish. After freeze up, wind blown shore ice prevented further fishing. Pike and whitefish were harvested together while ice fishing and in nets to be air dried during fair weather in April and May. The couple preferred to wait until cold, windy conditions started to warm in spring before starting to ice fish in spring. Generally only a handful of pike were harvested, up to 10 fish. If the pike were present in larger quantities, they were not biting. This couple did not ice fish as often as in the past because of work schedules and other reasons.

A life-long Iliamna resident in his forties targeted pike and suckers in Whistlewing Bay in spring.

Two elder residents of Kokhanok said pike were harvested in spring, around March, while ice fishing. One mentioned harvesting pike in fall time, also. Pike, suckers, and whitefish were targeted up to the first week of June.

In winter Levelock people went ice fishing for pike, one man describing harvesting pike while trapping along the Alagnak River when he was younger. Also, pike were harvested incidentally in whitefish nets in October. In November and December, pike were harvested with hooks, and in the past, with nets under the ice.

In Nondalton, March is the best time to harvest pike, when they are “nice and fat” and taste better (Plate 2). Several people described that in years when the lake ice is safe, people gather in Chulitna Bay to harvest pike while ice fishing, often in March.



Plate 2. Aerial View of Nondalton, March 2003.  
Photograph by Hans Nicholson.

In Port Alsworth, pike harvesting with rod and reel occurred during open water times from late May through mid September, especially June and July with fishers moving into sloughs later in summer, late July and August. Ice fishing for pike was said to occur in winter and springtime when the days are longer and warmer. Ice fishing had been limited in recent years by warmer than usual weather resulting in ice free lake conditions.

***Use Areas.*** Igiugig elders said pike were harvested from Pecks Creek, a lake near USGS Big Mountain (possibly the lake at the head of Dennis Creek), the mouth of Ben Courtney Creek, Grants Lagoon (also know as First Lagoon), Upper Talarik Creek (“First” Talarik), and Reindeer Lake (Fig. 1 and see Fig. 30 for harvest locations).

A life-long resident of Iliamna in his forties harvested pike from Whistlewing Bay. An elder caught her pike in Schoolhouse Lake, behind the airport, and at Stone House (Fig. 17).

A knowledgeable informant from Kokhanok said pike were harvested at Dennis Lake, Reindeer Bay Lake (a small lake near the old landing strip), the small lakes behind Reindeer Bay, Pike lake and creek, Copper River, and “Sequa nit” Lake, the lake up Belinda Creek (Fig. 18).

According to Levelock informants, pike were harvested from the Alagnak River in the sloughs, Pete Chukwak’s cabin site, the old Alagnak cannery site, and incidentally at a spot across from John Tallekpalek’s cabin (Fig. 20). Also mentioned were Kaskanak Creek (near the mouth), just above Ben Courtney Creek, Swan Bay, an unnamed lake behind Levelock village, Horseshoe Bend, and Egg Island.

A Newhalen resident harvested pike in the Newhalen River and Lower Talarik Creek (Fig. 1). A creek near the airport was habitat to pike and trout, but the creek was blocked to stop flooding on the runway.

Nondalton elders had harvested pike from Pickerel Lake, Snowshoe Bay, Chulitna bay and river, Long Lake, and Nikabuna Lake (Figs. 1 and 22).

Knowledgeable Port Alsworth residents described harvesting pike from most of the Chulitna River watershed (including Long and Nikabuna lakes), the southwest corner of Pike Bay (USGS Hardanberg Bay, Miller Creek (the islands at the mouth), and the outlet of the Tlikakila River. Indian Point (USGS Turner Bay, across the lake from Port Alsworth) was identified as a pike use area by all Port Alsworth informants (Figs. 1 and 24).

***Preservation and Preparation Methods.*** In Igiugig and Kokhanok, when preserved, pike were air dried for later use. In Nondalton, pike were air dried, an activity that once included drying suckers for dog food. However, most pike were eaten fresh boiled. One Port Alsworth resident mentioned preparing freshly caught pike on the beach. A pike was filleted, seasoned, wrapped in foil, and cooked on hot coals. This was a favored preparation method, especially when large

groups of people gathered ice fishing on Chulitna Bay. Some people arrived with firewood. Pike was also breaded and fried in oil in pans heated on portable stoves.

***Distribution and Exchange.*** No testimony was collected describing this subject.

***Trends in Harvest and Use Patterns.*** In both Port Alsworth and Nondalton, younger residents said that, traditionally, nets were put out to harvest pike and suckers for dog food in larger numbers than today. An elder in Levelock said that pike had become the most commonly caught freshwater fish locally, other species being harder to catch.

### **Traditional Knowledge Observations Regarding Pike Populations and Ecology**

***Pike Populations.*** An Iliamna resident in his thirties said that Lake Iliamna pike were smaller and fewer than in the past.

An active Kokhanok fisher said that all fish except suckers and maybe whitefish were getting smaller and fewer. However, he said, pike could be harvested in just about any lake draining into a creek draining to Lake Iliamna, with the highest concentration in Pike lakes on the Copper River. He explained that the chain of lakes from “Pacudolek” to Gibraltar Lake, used to have good salmon runs, including a lake behind the airport. These runs had been severely impacted by beaver dams, and so had the abundance and size of pike. Big ones in this environment were once three feet long but now “you’re lucky if you get eighteen inches any more.” This phenomenon was repeated in the lakes behind Reindeer Bay where reportedly no pike existed anymore. “Sequanit” Lake once was habitat to trout, char, and rainbow. Now, only pike and leeches are left (Figs. 1 and 18).

An active fisher in Kokhanok said pike were once as big three and a half feet, but “Now they’re just like, what they call, hammer handles. They’re just little ones.” An elder couple described pike found behind the village, past the hills, as smaller and browner in color than the pike caught locally.

An elder from Nondalton when asked, “Where do you fish pike?” replied “Anyplace where there’s water.” and added that a long time ago, he remembers pike in just one area, the Chulitna drainage. Pike had spread a great distance since then. Two examples he offered were a little lake right off Macfal Bay that pike have moved into in recent times and a nearby creek that used to host only spawning salmon, now containing pike also (Fig 1). Pike had spread to areas that were easy for them to access.

A Nondalton fisher described one pike he caught about five years ago in Lake Clark. It was four feet long, about 60 pounds, and as thick as the circumference of a five-gallon bucket (Plate 3). An elder supposed that the largest concentrations of pike were in Pickerel Lake and the Chulitna drainage, including Long and Nikabuna lakes (Fig. 1).



Plate 3. Milton Delkittie of Nondalton holding a picture of a locally harvested pike, March 2003. Photograph by Hans Nicholson.

A Port Alsworth resident observed smaller pike and lake trout and fewer fish in general than in 1994, when he first arrived. A young, active fisher said, “Traditionally we used to be able to catch [pike] right in the back of the southeast corner of Hardanberg Bay, right here by Port Alsworth. But there’s not many of them there anymore.” He explained that sport fishers often kept the largest pike. Pike over 40 inches were caught consistently ten or more years ago. Now pike that large were harvested only occasionally. There seemed to be fewer pike in Chulitna Bay, but particularly acute was the disappearance of pike from marshy areas where the Tlikakila River becomes braided, flowing into Little Lake Clark (Fig. 1).

***Pike Ecology.*** An elder couple in Igiugig said that pike move out of Lake Iliamna in fall and return in spring. Another elder observed otters and pike on the ice at the mouth of some creeks.

A life-long Iliamna resident said that the water level of the lake [Iliamna] is lower now and warmer. An elder, while discussing pike, said that, “The beaver are worse now as nobody breaks open the dams anymore.”

In Kokhanok, people have caught pike with grayling and rainbow trout in their stomachs. An active fisher said that the reason pike were not found in some local lakes anymore was because when the beaver dams went up and salmon could not get up the creeks anymore, there was no food for the pike who normally eat salmon eggs and carcasses.

An elder said that when she was growing up a person went to the west side of Lake Iliamna to catch grayling, in the middle of the lake to catch rainbow trout, and the east side of the lake to catch pike and “walleye” pike, which has a round tail.

A Nondalton elder talked about the muskrat decline in the Chulitna drainage.

[19]56, Chulitna, trapping for muskrat, there was just so many of them, over there, everywhere. All the way up Chulitna River into [unintelligible] lake. The people make money on muskrat skin, fur, beautiful fur. I think what happen [is that] one year [there was a] flood after it snowed heavy. [Then it] turned mild, and then water came. I think muskrats drowned right in their dens. They didn't have a chance to get out. It happened two times. Nature had it happen. If it didn't do that there'd probably be thousands of muskrats.

The main predator of whitefish is pike. Pike were known to eat grayling, trout, whitefish, other pike, and other species of fish, leaches, and one person found a partially digested bird in a pike stomach.

Another Nondalton elder said pike spawn in Long and Nikabuna lakes in the Chulitna drainage (Fig. 1). “They like these really sloppy areas.”

A younger Nondalton respondent said he believed pike spawn in Long and Nikabuna lakes because the abundance of pike was very high there. Another elder thought that pike spawn in the Chulitna drainage and also mentioned Pickerel Lake.

When asked, “It sounds like the pike stay in their own area?” an experienced Port Alsworth resident described the seasonal movement of pike.

I don't think they circulate, which is a neat thing about Lake Clark, you got these areas that are a little shallow where the pike will hang out, but you still have a really healthy trout population... You don't see the pike eating everything out right in these areas. You get up in Chulitna Bay and the only other fish you see are the big lake trout that the pike don't mess with.

The [pike] go up through the Chulitna [Bay], on up the Chulitna River, and into Long Lake, the Nikabuna [lakes]. There's a lot of pike still up in Long lake and Nikabuna. To find the bigger pike, a lot a times you have to get out in those places... Places that are less accessible still have the bigger fish.

I think they actually spawn all through, like in Chulitna and I'm not sure of the exact timing for the pike spawning. I know you still find them in the whole river and the Chulitna area. You find them pretty much year round, so it seems like they stay in a lot of the same area. More germane is the water levels than any of their cycles... If there's enough water in these different areas then you'll find them there. Actually, it's the same over here even so, and anywhere that I've been in the winter you can find them there.



Pike were observed in all the Chulitna drainage lakes visited by the respondent. The timing of the pike spawning cycle was not well understood and one informant explained that pike were found in the drainage year around, and that the extent of pike distribution in the Chulitna was determined more by the presence or absence of water more than the pike life cycle. Some areas in the drainage were known to dry up during part of the year when the water was at its lowest.

A younger Port Alsworth man said that pike eat almost anything. He told of catching a pike on a lure with a fish in its mouth. He has seen pike go into a feeding frenzy, attacking a school of suckers. "I've also seen them eat muskrats, mice, and baby ducks. I've actually seen them take a swallow out of the air before. So anything that they can get their mouth [around]."

When asked "Do you know if [pike] have any direct effect on any other species?" he responded

Definitely, in the areas that they are, there's no other fish. Well, the suckers keep going back there and getting eaten but everything else... Where you find a lot of pike then you don't find much of anything else. But in places right here in Port Alsworth, even when there was a lot of pike here you could still catch a lot of grayling and lake trout...For the most part [pike] are in their own little areas, and where they're thick, they are all you'll find there.

This is a description of a scene caught on video and viewed by a young Port Alsworth man.

There was really shallow water, and there were bugs that were swimming on the water. This bird kept coming down and he'd touch the water each time. He was getting one of those bugs. He kept doing it in the same area and, all of a sudden in the grass, the V in the water... you could see this pike moving in closer and closer... So what that pike did was just wait for him...He must have seen that disturbance in the water over and over and went out to check it out. [This] was in a place that we would consistently catch half a dozen or more big, 45 inch plus pike everyday, so it was a big fish that was used to feeding on big stuff.

He said pike wedge themselves between lake ice and beach rocks when the ice is first forming, as do burbot. It appeared that fish move out as ice thickens, but the ice gets too thick to see through and he was unsure of the behavior of the fish after this.

A longtime Port Alsworth resident described pike seasonal movement.

...at Indian Point, the fishing in here is pretty good in June and July for the pike [Fig. 24]. As the summer goes on we would come up here into these sloughs, up here where it's all braided. We'd come up into these sloughs where its really shallow. There's be some big old pike. And that's just a whole bunch of little sloughs in there that you'd [push a paddle through] 'cause it's too shallow. This is the Chulitna River, and it comes down all braided ...I think all the big pike go

back up in there in the summer...And in the winter we'll drill holes right there and fish for pike. It's one of those deals where when you're drilling you'll go through three feet of ice and maybe hit the sand and move over 2 feet, drill, and you're in 15 feet of water. And that's spectacular pike fishing in the winter. That's where we would typically go this time of year and fish. And there would be lots of people over there. People from Nondalton would be up there, and a lot of people from Port Alsworth would go over and fish.

This area here is Lynx Creek where [unintelligible] once trapped muskrat. Last fall when we were up there fishing, he told me that they used to trap muskrats up in there a lot, but there was no pike. There was no pike in this at all, but the muskrats were thick, and they used to trap them. [Then] the pike showed up. The muskrats started to decline, and now there're no muskrats there at all, but there's a lot of big pike....It had to be 30, 40 years ago.

Pike fishing does stay good. You just have to go farther up into the river into those sloughs. A lot of this areas go dry. [Pike] hang out in the winter and it'll go dry and freeze and they come up in this area where we were fishing for them by Owl [Bluff]. But once [it's] springtime and everything starts to get water again and the ducks start coming in--they'll get tons, thousands and thousands, of ducks up in here--and the pike go up in here and they start catching ducklings...This is all in Chulitna. This is up here in the flats up in the sloughs. And they'll get just thousands of duck in there and I think the pike at that point they definitely leave this area down in here, this where they've been in the channel all winter. They migrate back up into this area and they stay in these sloughs and that's probably good hunting for them. I think that's what they do is hunt...And they go back up there in the summer and that's where the good fishing for them is.

And the pike, anything sitting on the top of the water, that moves on the top of the water, those little furry mice, man they'll nail them hard...

I've watched them take out baby ducks and that's kind of an awesome sight to see. You'll see mama duck out there teaching all the little ones how to get across the lake then all of a sudden you'll see this big boil come out of the water, then there's one less baby duck and the rest of them are swimming faster. Now, we'll watch that happen over in springtime, when all the ducks are learning about flying and then swimming.

### ***Rainbow Smelt***

Rainbow smelt *Osmerus mordax* are found in coastal Alaska waters. Most are saltwater fishes. Populations near the ocean are anadromous (but those in the midwest of the United States are

landlocked). They are found in near shore saltwater environments; also estuaries, inland lakes and streams. They are typically seven to nine inches in length. Rainbow smelt spawns in spring, principally during darkness (Rook 2004).

### **Subsistence Use Patterns and Trends**

***Gear Type.*** An active Kokhanok fisher said people harvested smelt using dip nets made out of mosquito net. An elder said he punches holes in a coffee can and uses it to dip the smelt from the water. A Levelock elder said people caught smelt while icefishing with hook and line.

***Timing of Harvests.*** No information was collected on this topic.

***Use Area.*** An elder Kokhanok couple said that freshwater smelts used to run up the creek that runs into Schoolhouse Lake (near the community of Iliamna) (see Fig. 31 for harvest locations). They also harvested smelt, along with Dolly Varden and rainbow trout, from a bay near Tommy Point where smelts are known to migrate in large numbers (Fig. 1)

A Levelock elder recalled fishing for smelt from the local beach when he first moved to Levelock from Igiugig in 1956. An active fisher who moved to the area in the past few years reported harvesting smelt in front of the village. Several elders said that almost all of the smelt fishing occurs by the village, by the old scow. One said he might have caught smelt in the Alagnak River a long time ago. A newly arrived resident of Levelock from the region said she has caught smelt in Ben Courtney Creek and Charlie Jensens Creek (Figs. 1 and 20).

An elder Newhalen couple said smelt were found in a creek across the bay.

***Preservation and Preparation Methods.*** An Igiugig elder said that his grandparents told him a story. “During [a starvation time], when salmon was scarce, it was found out that smelt were not food. Long time ago, people would be found starved to death with backsack on their back full of smelt. [Smelt] are not food [nourishment], this is what my ap’a use to tell about.” A Levelock elder said he brought his smelt home, boiled it, and ate it right away.

***Distribution and Exchange.*** No information was collected on this topic.

***Trends in Harvest and Use Patterns.*** An active Kokhanok fisher said freshwater smelt were caught by the gunny sack load. Even though there are far fewer smelt now, there was still some local effort to catch them. Kokhanok elders said that they used to catch freshwater smelt to feed dogs.

One Levelock elder said he had not noticed smelt much until he heard Dillingham people talking about catching them. He remembers beginning to harvest local smelt in the 1980s. The year of the interview, he said people could not get around because the ice was too thin to travel on. He caught about ten smelt near his house. A newly arrived resident of Levelock from the region said that year of the interview her family did not do much smelting because of poor ice conditions.

### **Traditional Knowledge Observations Regarding Rainbow Smelt Populations and Ecology**

***Rainbow Smelt Populations.*** An active Kokhanok fisher said that there used to be a lot of smelt locally in creeks across the bay. But there are fewer now. A Levelock elder reported that there are still heavy smelt runs locally, “Some years we get a nice heavy run”.

***Rainbow Smelt Ecology.*** An Igiugig elder said the smelt swim upriver twice a year. In the spring, May through June, and September through October. He called them *iqalluaq*, and smelt in English. Then he and his wife talked about *neqalluat*, freshwater smelt or herring that are found in Lake Iliamna. Another Igiugig elder said smelt come into the Kvichak River when the river first opens up, in spring. When they are ready to spawn, smelt migrate into little creeks. By October, most of smelt have migrated back down the Kvichak River.

A Kokhanok elder was looking through pictures of fish. When she got to rainbow smelt she said, “[in Yup’ik] We refer to those as *iituuliiyaq* [ones with large eyes]. What do they call them?... Those are *iituuliiyaq*.” And she continued to identify other fish from the pictures. An active Kokhanok fisher said that the decrease in smelt abundance may be due to beavers damming up creeks where smelt used to spawn. The three places he knows that they spawn are Sandy Beach, and a sandy beach up by “Pacudolek”, and on Reindeer Bay on another sandy beach (Figs. 18 and 19). He said, “all those places have been dammed. You can’t find anything now.” He said that he has caught big rainbow trout when the smelt are running, and suggested the trout are eating the smelt. These are freshwater smelt and are not seen in the Kvichak River returning to Bristol Bay. They are resident in Lake Iliamna year around, he said.

Smelt are *iqalluaq*, according to a Levelock elder (this name is used by other coastal Yup’ik-speaking communities on Bristol Bay for anadromous rainbow smelt). An active Levelock fisher newly arrived in the community reported seeing smelt along most of the length of the Kvichak River. One elder said he remembers beginning to harvest local smelt in the 1980s. Concurrently, he remembers there being less trout. He remembered one year there were a lot of dead smelt observed by people.

A Nondalton elder, while reviewing photographs of freshwater fish, thought that the locally occurring smelt might be least cisco, “I think that cisco is kind of like smelt”.

## *Trout and Char*

### *Dolly Varden and Arctic Char*

There are both anadromous and resident (non-migratory) populations of Dolly Varden *Salvelinus malma* in the Bristol Bay region. (The closely related Arctic char *Salvelinus alpinus* may also occur in portions of the region. These are included within the "Dolly Varden" category throughout the report because the subtle biological distinction between "char" and "Dolly Varden" is not meaningful to subsistence fishermen in the region.) The anadromous populations of Dolly Varden spawn in clear water streams in October and November. The eggs hatch in March, and the fish rear in streams and grow slowly. In their third or fourth year, as five inch long smolts, they migrate to the sea in May or June. These anadromous Dolly Varden then spend the rest of their lives moving in April to June from wintering areas in lakes to summer feeding areas in salt water. The return to freshwater occurs in August and September. Mature Dolly Varden (five or six years old) spawn in their natal streams, and then move on to lakes. The mortality rate for spawning Dolly Varden is about 50 percent. Resident Dolly Varden occur towards the headwaters of the Bristol Bay region. They over winter in deep pools, and disperse through tributary streams in the summer. They rarely enter the major rivers, however (Hubartt 1994, Morrow 1980:61-63).

The Arctic char is present in North America in both the anadromous (seagoing) and the non-anadromous (freshwater resident) forms. It is distributed throughout the polar regions and is the most northerly distributed of char and its closely related cousin, the Dolly Varden. It was only in the 1980s that taxonomists established the relationship between these species in North America. This relationship, however, is still under consideration by some scientists.

There are some external characteristics which can be used to differentiate between Arctic char and Dolly Varden. Arctic char generally have a shorter head and snout, a trait particularly evident in spawning males. The tail of an Arctic char has a slightly deeper fork than that of a Dolly Varden, and the base of the Arctic char's tail is narrower (DeCicco 1994).

### **Subsistence Use Patterns and Trends**

**Gear Type.** In Igiugig an elder couple recalled harvesting Dolly Varden while icefishing on the Alagnak River and on Nonvianuk and Kukaklek lakes (Fig. 1). She suggested that the mesh was too big on their subsistence salmon net to incidentally catch Dolly Varden in it. Another elder said that up until five years ago he put a fish trap about three miles up a creek (probably Kaskanak Creek) and at the mouth of the creek and caught Dolly Varden and whitefish in it. Icefishing on Lake Iliamna, he and his wife caught mainly rainbow trout and Dolly Varden.

An Iliamna elder said she harvested Dolly Varden and other species while icefishing near the village.

An active Kokhanok fisher said he caught Dolly Varden with handline from the beach or in a three-inch webbed net. In winter the handline was about 12 feet long and in summer it was about 60 feet long. He baited the hook, threw out the line, and sat for awhile. In Kokhanok, an elder said Dolly Varden and rainbow trout were seined by his father in creeks and in Lake Iliamna. In winter time he used a hook and line.

An elder from Levelock reported catching sea-run Dolly Varden in his subsistence salmon net, set next to the village, but not anymore.

In 1955 when a Newhalen respondent moved to the area, nets were used to harvest Dolly Varden and other species of fish from the Newhalen River.

An active Nondalton fisher said he harvested Dolly Varden with rod and reel, using bait, and fly rod. A Nondalton elder said the best way to harvest Dolly Varden was with rod and reel or a handline. A few Dolly Varden used to be caught in nets, but the use of nets had declined because of local concerns of freshwater fish abundance.

A Pedro Bay elder said that when she was young she fished trouts with a handline using salmon chunks and eggs as bait. Another elder used lures to catch Dolly Varden, but he said they do not bite the lures as often as eggs and salmon meat.

***Timing of Harvests.*** In Igiugig an elder said there were hardly any Dolly Varden locally but they were caught up in Iliamna Lake. Another elder reported harvesting rainbow trout and Dolly Varden icefishing in fall, as soon as there was ice.

An active Kokhanok fisher said Dolly Varden were more abundant in spring, especially for a short period around mid-May, when he enjoys harvesting them. He targeted Dolly Varden in summer and winter. An elder talked of harvesting Dolly Varden and other species while icefishing. He said the most commonly used fish locally was rainbow trout and Dolly Varden harvested in spring.

A Nondalton elder said it is best to catch Dolly Varden in summer or early spring, in March. He said that if the water was too high, it meant colder water, and Dolly Varden did not seem to come close to the beach to be caught. Dolly Varden were easier to catch before salmon arrived, and after the salmon came Dolly Varden did not bite. An active fisher said that Dolly Varden harvested in the spring tend to be wormy, and less desirable.

A Pedro Bay elder said she began fishing around March because earlier in the year fish were scarce. Years ago people fished more into April and May because the ice stayed on the lake longer. She said she really enjoyed fresh fish in the springtime.

A Port Alsworth fisher said that Dolly Varden were rare in the area, but he remembers getting one in late fall.

**Use Area.** An elder Igiugig couple described harvesting Dolly Varden on the Alagnak River in a creek near the mouth of one of the lakes (see Fig. 32 for harvest locations). They have harvested Dolly Varden in both Nonvianuk and Kukaklek lakes when ice fishing, and Dolly Varden could be harvested down the Alagnak River to the lodge (Figs. 1 and 20). Another elder said that up until five years ago he set a fish trap three miles up Kaskanak Creek, catching Dolly Varden and whitefish. He and his wife also icefished near the village on Lake Iliamna, 50 to 100 yards offshore, and caught primarily rainbow trout and Dolly Varden. He has harvested Dolly Varden from the Iliamna River and small coves in Reindeer Bay. Another Iliamna elder reported harvesting Dolly Varden around Flat Island and Boodle Head, primarily (Figs. 17 and 23).

An active Kokhanok fisher said that he could catch Dolly Varden in almost every creek and stream around the local bay, especially at certain times in spring at Sid Larson Bay and the mouth of the Kokhanok River to just below the falls (Figs. 1 and 18). Other use areas include Miller Creek (also called Nick G Creek), the local beaches, Breddans Point, and a local smelt bearing creek.

A Levelock elder remembers harvesting Dolly Varden from near the airport at Igiugig, where he was born in the 1940s and still has siblings. He went fishing there when visiting. Another elder said he could get Dolly Varden and other species of fish at the upper end of Kaskanak Flats (Fig. 1). Dolly Varden and other species were harvested from Nonvianuk Lake. Another elder said he harvested Dolly Varden and other species in the Alagnak River from the fork in the river on down to the mouth. A Newhalen elder said that Dolly Varden were harvested from the Newhalen River.

An active Nondalton fisher said he harvested Dolly Varden at Steambath Creek, creeks running to the narrows between Six Mile Lake and Lake Clark, and the mouth of Alexcy Creek on the Newhalen River (Fig. 1 and 22).

A Pedro Bay elder said she fishes both sides of the inlet upon which she lives for Dolly Varden and rainbow trout, including Knutson Bay (Fig. 23). She still went up to Iliamna River to fish but only for char as the other fish are located nearby. She also mentioned Wooden Spoon Bay as a fishing location. Another elder said he fishes across the bay at any stream for Dolly Varden and trout, and Arctic char in the Iliamna River. He also fished on Porcupine and Flat islands and Lonesome Bay (Figs. 1 and 23).

New residents of Port Alsworth recalled harvesting Dolly Varden in Twin lakes, in the Mulchatna River drainage (Fig. 1). An experienced local fisher said that Dolly Varden were caught mostly in Tazimina, Kontrashibuna, and Kijik lakes. These lakes were the most consistent for harvesting Dolly Varden. Other use areas include Caribou lakes on the Koksetna River and Snipe Lake. He said not many Dolly Varden were caught in Lake Clark. From Port Alsworth, the most accessible of the above areas is the lower end of Kontrashibuna Lake, which a person can walk to, but the other areas were generally reached by plane.

***Preservation and Preparation Methods.*** An Iliamna elder said that her family used to dry Dolly Varden for two or three days, and then eat them later with seal oil. Her kids used to smoke the fish so they could be fed to their dogs in the winter.

An active Kokhanok fisher said that excess Dolly Varden were split and hung for a “little” while. Half dried Dolly Varden were boiled or baked to eat.

A Pedro Bay elder and active fisher said people prefer to eat freshwater fish soon after catching them, but when too many are caught to eat fresh, people hang them to dry. People boil and eat “half” dry Dolly Varden.

***Distribution and Exchange.*** No new information was collected on this topic.

***Trends in Harvest and Use Patterns.*** In Kokhanok an elder reported that in springtime people harvested primarily rainbow trout and Dolly Varden, locally, and she recounted a memory from when she was around 10 years old when about 1,500 trout were caught all in one day near the village, but it is not clear if this was Dolly Varden or rainbow trout.

A Levelock elder said he used to harvest an occasional Dolly Varden in his subsistence salmon net, but not anymore.

An active Nondalton fisher said that more Dolly Varden were caught when salmon were present.

An active Port Alsworth fisher said he has caught only one or two Dolly Varden in front of the community. Another active fisher said Dolly Varden were harvested a few at a time from specific fishing sites.

In several communities; Newhalen, Iliamna, and Kokhanok; people mentioned using Dolly Varden for dog food, along with other species of freshwater fish, an activity that probably occurred more in the past when there were more dog teams.

## **Traditional Knowledge Observations Regarding Dolly Varden and Arctic Char Populations and Ecology**

***Dolly Varden and Arctic Char Populations.*** An active Kokhanok fisher said that freshwater fish in general, including Dolly Varden, were getting smaller and there were fewer of them. Also, the Dolly Varden were appearing to be more skinny than in the past, he said, especially in spring when Dolly Varden are observed more than in other seasons. He described seeing Dolly Varden in the past three or four years that were deformed, missing fins or with snub noses, and having white tumor-like growths from outside through to the insides of the fish. He said Dennis and Tommy creeks and Breddans Point were areas with an abundance of Dolly Varden, especially in spring, but Dolly Varden were not abundant in these areas any longer (Fig. 18).



An elder Kokhanok couple thought that a large number of sea-run Dolly Varden migrated into Lake Iliamna in May to spawn. They are whiter in color with fewer spots than non-searun Dolly Varden. He said many of them migrate to within five miles of the mouth of Iliamna River and stay there for awhile, hard to catch because they are not biting, until passing up the Iliamna River to spawn.

An active Nondalton fisher said that Dolly Varden occur in the Newhalen River down to the Landing, and up as far as the falls in the Tazimina River (Fig. 1 and 22). Dolly Varden congregate by the thousands at Steambath Creek, where they spawn. He said that the Dolly Varden population has declined, probably due to decreasing numbers of salmon. And, when the salmon were running, there were more Dolly Varden around. The size of Dolly Varden has decreased and maybe they were a little skinnier than in the past. In the spring, Dolly Varden tend to have worms.

A Nondalton elder said there used to be Dolly Varden in Volcano Creek, but he does not see many there anymore (Fig. 22). Dolly Varden used to be at least two and a half feet long, but he rarely sees one that big anymore. Dolly Varden appear more skinny, and when opened, there were little, yellow round balls inside the fish, probably a parasite, he explained. He sees Dolly Varden with damaged mouths from catch and release fishing with barbed hooks.

Several Pedro Bay elders said that they were seeing fewer “trout” than in past years. One said that Pedro Creek used to contain char, six to eight inches long, following spawning salmon. The creek was blocked by a beaver dam, and she implied that there were fewer char in the creek now. The other elder added, “When the salmon runs are bad, so is the Dolly Varden.”

An active Port Alsworth fisher said that he has not noticed much of a change in Dolly Varden populations and that the local lodges were practicing catch and release fishing and not keeping fish. He implied that this practice was helping to protect the population of Dolly Varden. This was not always the case as he described below.

[You] can see in places where some lodges have picked a particular stream...using it over and over, and even just doing a shore lunch each day they'd kill two or three fish a day and do that four or five times a week...for that stream you might as well forget it for the rest of the year. And maybe for a couple of years until the fish come back. And so it doesn't take long. Kontrashibuna Lake is one in particular [where this has happened] [Fig. 1].

***Dolly Varden and Arctic Char Ecology.*** An Iliamna elder said that Dolly Varden, rainbow trout, and candlefish (round whitefish) are all spring spawners, after which they lose weight. The Dolly Varden that she has seen at Boodle Head have yellow bellies and have been seen no where else. She believed these are land-locked Dolly Varden (Fig. 17). Another active fisher said Lake Iliamna was lower and warmer than it used to be.

An active Kokhanok fisher said Dolly Varden spawn in Nick G Creek, in the spring (Fig. 18). He has harvested Dolly Varden with rainbow trout in the stomach. An elder couple noticed that Dolly Varden spawn in spring.

Knowledgeable Newhalen elders said Dolly Varden and rainbow trout eat the salmon eggs that do not get buried.

A Nondalton elder said that about four years ago, a friend told him what he saw in Six Mile Lake. There was a creek that contained more Dolly Varden than he had ever seen in one place. They were probably spawning. An active Nondalton fisher said Dolly Varden spawn about a mile and a half up Steambath Creek where he has seen “thousands” of Dolly Vardens, in May, spawning (Fig. 22). Dolly Varden live on bugs and other small fish.

Another Nondalton elder also said that Dolly Varden spawn at the head of Steambath Creek. He mentioned the past bounty on Dolly Varden, and said it did not seem right to blame the fish for the decreased salmon runs.

A Pedro Bay elder said she stopped catching Dolly Varden and rainbow trout in the fall time, around November. She said the larger Dolly Varden and rainbow trout had eggs, clams, and little snails in their stomachs. She usually began to see the Dolly Varden and rainbow trout again in April or May. In the spring when the salmon first arrive, the “trout” travel with the salmon to eat the salmon spawn. She said that freeze up was happening later and breakup earlier than in the past. The spring she was interviewed she said Lake Iliamna’s water level was particularly high.

Another Pedro Bay elder described the migration of “trout” as spending the winter in the deep waters of Iliamna Lake. In the spring they move up the rivers and streams to the smaller lakes to spawn, following the salmon up to eat their eggs. This makes it easy to catch them with salmon eggs and chunks of salmon. In the late fall, after the salmon have run, the “trout” return to the bay to spend the winter. He said both Dolly Varden and rainbow trout eat salmon eggs and spawnout salmon as well as bugs. He said a stream near the village used to be red with salmon sometimes during the summer, but now only a couple of salmon make it into the local streams. Many of those were harvested by bears, and beaver dams were impeding the return of the salmon.

An active Port Alsworth fisher explained that Dolly Varden populations in lakes that are “closed”, that is without an outlet draining into Lake Clark, are particularly sensitive to over exploitation. The depletion of the Dolly Varden population in one of these lakes happens quickly if a lot of fish are killed, and the population does not rebound very quickly. He used Tazimina and Kijik lakes as examples (Fig 1). Dolly Varden can move between the two Tazimina lakes, but waterfalls block access to Lake Clark. Kijik Lake has an outlet running to Lake Clark, but Dolly Varden rarely use it. Other lakes do not have salmon running into them, and that adds to the vulnerability of freshwater fish populations.

## *Lake Trout*

Lake trout *Salvelinus namaycush* are Alaska's biggest freshwater fish. They are also the largest representatives of a group of fish known as char and are closely related to Dolly Varden and Arctic char. Lake trout can be distinguished from other chars by the absence of pink spots and their deeply forked tail. They are common in the large, deep, cold lakes of the Bristol Bay region, where they spend their entire lives. In spring, when the lake is cold, lake trout can be found near the surface, but they descend deeper as the lake warms in summer. Spawning takes place over clean, rocky lake bottoms from September through November. Eggs hatch early in the following spring. Lake trout growth varies from place to place depending on diet, water temperature, altitude, and genetics. Alaska lake trout can live longer than 40 years (Bendock 1994, Morrow 1980:55-58).

### **Subsistence Use Patterns and Trends**

**Gear Type.** At Port Alsworth, lake trout were usually harvested with rod and reel in open water. Bait fishing with a lure was mentioned by active fishers, as was fly fishing. Trolling in the lake was common. A couple of active fishers, who arrived in the area in the early 1990s, mentioned ice fishing only once or twice on Lake Clark. One person mentioned that during some years there was a fish shack located on the lake ice for warming up while fishing through the ice.

An experienced fisher was asked, "What's the best way to catch lake trout, trolling or bait?"

It depends on the depth that they're at. In all of these small lakes we're just casting off the shore either fly fishing or...it depends on what they're feeding on. If they're feeding on something on the surface, then you can catch them on a fly, fly fishing. They're eating bugs and stuff? Then subsurface you use little fish imitations whether it's a fly or lure. In a big lake, like Lake Clark, you have pretty good success trolling 'cause you can cover more area, obviously. But later when the salmon come in, they'll move in closer to where the salmon are spawning and then you can catch them. Where you have salmon you catch them [lake trout] pretty consistently just right off shore, when the salmon are spawning.

One of the dangers to lake trout is to catch a lot of those big ones. If you're in an area where you know there's lake trout, they can't resist [using] a big chunk of dead fish [for bait], whether it's subsistence or people sport fishing. I think that's one of the most successful ways to hook into one, and there's people doing that. And obviously, if its for subsistence you're going to try and keep them anyway, but if it's for sport fishing there's a little bit more danger in doing it that way. If you don't do it right the fish swallow it, and [there's not even] the option of releasing it.

In other words, as a general rule, to catch big fish, use big bait.

In Pedro Bay “trouts” was the general term used to describe lake trout, Dolly Varden, and Arctic char. Hand lines were used to catch lake trout. Use of a birch pole was mentioned. In the past trout were harvested by traps with funnels at both ends to trap the fish. A fence was used to block a river directing fish towards the trap. An active fisher said that trout preferred salmon eggs and salmon meat over lures.

In Nondalton, one active fisher said that the best way to catch lake trout was with a “leader”, artificial lures sometimes using bait depending on the type of fishing that was being done. They were harvested with the most ease while trolling in deep water. He described catching very big lake trout in Lake Clark. Frozen whitefish was used for bait sometimes. People used to harvest lake trout with nets close to shore in shallow water and with nets under the ice using weights to sink the nets. Another way of catching lake trout was described by another active fisher who said he was using set hooks through the ice when he caught a burbot about 18 inches long. It was alive but had been chewed on. He threw his hooks down again and pulled out seven lake trout, one after the other, that had probably been biting the burbot.

An elder woman from Kokhanok explained that she was used to catching lake trout in a net, but also mentioned hook and line. She remembers fishing for lake trout using “sinker gear, diving gear, hand line, set hooks. You name it, we’ve tried it.” She explained that lake trout were usually caught in her net in the spring incidentally to catching rainbow trout and Dolly Varden.

An Iliamna life long resident in his forties said he “sport fished” for lake trout using rod and reel.

***Timing of Harvest.*** In Port Alsworth, fresh lake trout are enjoyed year around. But most people quit catching them when the salmon arrive by the later part of June or early July because the trout are busy eating salmon eggs. One informant explained that, “because we haven’t had any ice, it’s a rarity, but normally we don’t catch lake trout through the ice. Normally we catch whitefish or we catch pike. And this year without the ice and being able to have our boat in the water its been kind of a delicacy to have fresh lake trout in March.”

A Pedro Bay fisher explained he catches trout all year around. “We only fish to eat, so we could catch them whenever we want fish.” But this year “they didn’t get fish all winter until just this spring. There was a few came in. Used to be we can go over there and catch them by the hundreds.”

In Nondalton it was reported that lake trout abundance was at its highest in May. Years ago, lake trout were commonly harvested in deep water in the winter through the ice with weighted nets.

A middle-aged, life-long Kokhanok resident said that the best time she remembers harvesting lake trout was in the fall near specific creeks on Lake Iliamna. An elder said people caught a few lake trout in nets incidental to harvesting other species of trout, in spring. The same elder mentioned that people preferred harvesting lake trout in the spring when they tasted better, less like rotten fish, probably from eating rotting salmon and salmon eggs.

**Use Areas.** An elder Igiugig resident remembered harvesting lake trout from Nonvianuk Lake, Battle Lake, and Grants Creek (Figs. 1 and 15). Also, on the east side of the Alagnak River two to three miles below the Forks, at the mouth of a little creek. One Iliamna informant mentioned harvesting lake trout from Lake Clark.

An middle aged, life-long resident of Kokhanok said that Grayling Lake, behind the village, is the only place he knows for sure he can catch lake trout (Fig. 18). He described harvesting lake trout in Lake Iliamna as “hit or miss”. And also “sometimes at the mouth of Gibraltar [River]...you’ll catch lake trout, but boy, not very often”. Lake trout were also found at the mouths of specific salmon-bearing creeks where they are feeding on salmon eggs. Lake trout were also harvested at the head of USGS Sid Larson Bay (locally known as Nielsen Bay) when people could travel there by dog team, but people were more hesitant to travel long distances on the ice in recent times.

Levelock residents remember catching lake trout from the Alagnak River, Ben Courtney Creek, the east end of Kulik Lake, and parts of Nonvianuk Lake (Fig. 1).

Lake trout use areas mentioned in Nondalton include West Point on Lake Clark, Hudson Bay, the Six Mile Lake shoreline, the mouth of Tazimina Creek, Snowshoe Bay, Portage Bay, and Chulitna Bay (Figs. 1 and 22).

An older, long-time resident of Pedro Bay reported catching lake trout at Lonesome Bay, and “trouts” in Iliamna and Pile rivers, Smokehouse Bay, Edna’s Bay, Knutsen Bay, and around Porcupine and Flat islands (Figs. 1 and 23).

Port Alsworth respondents recalled harvesting lake trout from Portage Creek, Twin Lakes (visited once, abundant lake trout), Tanalian River, Dry Creek, trolling across the lake in front of the community, Kontrashibuna Lake, “22” Creek, Chulitna Bay (especially at specific sites along an underwater shelf that runs from Cape Shishcan to Owl Bluff), Chulitna River, Long Lake, Nikabuna lakes, Tommy Creek, Hardanberg Bay (locally called Pike Bay), the mouth of Miller Creek, and straight out from Copper Mountain at the cliffs (Figs. 1 and 24 and see Fig. 33 for harvest locations).

One Port Alsworth informant explained that the glaciers around Lake Clark bring a lot of silt into the lake. In the spring the lake is clear. When the weather warms, silt is deposited in the northern part of the lake. Gradually the silt line, visible at the edge of the lake, moves south and the lake becomes less clear. Mid July the silt reaches Port Alsworth, and the water becomes emerald green. The silt continues to move through the lake until late September. Fishing activity moves with the fish from north to south.

**Preservation and Preparation Methods.** In Port Alsworth, lake trout were eaten fresh and were rarely frozen for later use. They were sometimes breaded and often pan fried.

In Nondalton an informant described boiling lake trout, a common method for cooking many kinds of wild foods. Lake trout were also used to make *nivagi*, a Dena'ina dish made with berries.

***Distribution and Exchange.*** No new information was collected regarding lake trout on this topic.

***Trends in Harvest and Use Patterns.*** Respondents from Port Alsworth all described enjoying lake trout fresh, and harvesting one or two lake trout that were eaten immediately. Even though size and abundance of lake trout had decreased, they were still able to harvest them.

It was reported by Nondalton residents that the harvest levels of lake trout were down, but that people continued to go to those same areas that they had traveled to in the past to harvest lake trout. One fisher said harvesting a couple of lake trout took all day now in places where more were harvested in the past.

Lake trout were not the most commonly harvested fish by Kokhanok informants, and the only change in harvest levels discussed was due to the long distance from the village to once popular use areas or difficulty getting there. One active fisher recalled one year about 10 years ago when there was a good harvest of lake trout, when “quite a few” were harvested, at the village fish camp at the mouth of the Gibraltar River.

### **Traditional Knowledge Observations Regarding Lake Trout Populations and Ecology**

***Lake Trout Populations.*** A Kokhanok informant in his 40s said a big lake fish is around 10 pounds and up to three feet long. He said before “his time” it was easier to catch big lake trout, especially in Intricate Bay (Fig. 1). Stories were recorded from Kokhanok and Igiugig residents of the, so called, monster fish in Lake Iliamna. The Lake Iliamna monster was said to have a head like a lake trout by one person. Several people suggested the monster might be an extra large pike or lake trout. An elder in Kokhanok, having lived in the area all his life, estimated that the largest lake trout he had ever caught was about 40 inches long.

A Kokhanok informant said the lake trout were in good condition that he caught in his net incidentally in the spring while fishing for other fish; although, it is not clear if he ate them. An elder said “I don't like old lake trout fish, when he's old white fish.”

One 40 year resident of Nondalton and life-long resident of the area described having to fish for hours on the ice to harvest enough fish, but “long time ago we use[d] to be able to go out and get all the fish in abundance here.” He was referring to lake trout as well as other species. He said lake trout were now two to three and a half feet long, with the larger ones weighing as much 20 to 30 pounds. However, in the past lake trout in the area grew to even larger sizes. He explained

that the overall abundance of lake trout have not declined but certain geographic areas have been almost completely depleted.

A knowledgeable elder from Nondalton said, “I’m not sure but some of these big lake trout take 20 to 30 years to get as big as they get, you know, and that’s why for us, [if] we catch big ones we turn them back, just to keep them for breeding stock and all that. We’ll just keep the eating size ones. And that’s just kind of that’s been the rule of thumb here. Whereas the guys from the lodges, they’re going to kill the biggest fish they can get. Its kind of reverse thinking of what we’re doing...It’s good fishing, but its not what it used to be.” Several people reported having caught very, very large lake trout. There are stories of a lake trout breaking 30 pound test fishing line and six feet in size.

A Pedro Bay elder observed a substantial decrease in the trout populations in the areas typically used by villagers. He said that trout were less firm and of lesser quality, bad tasting, then in the past. The condition of salmon was worse, though.

A Port Alsworth resident living in the area less than 20 years said lake trout and pike were getting smaller because of the number of fish killed by sport fishers, especially those staying at lodges in the area. One reason is sport fishers target more large fish. As areas are depleted of lake trout, especially large lake trout, sport fishers move to different areas. Kontrashibuna Lake was singled out by another person as an area where the large lake trout had been completely removed from the population, a lake that reportedly was once the habitat of particularly large lake trout, “[In Kontrashibuna Lake]... they were 25 to 30 pounders. Now a five pounder’s a monster up there.”

One long-time Port Alsworth resident and active fisher was asked, “The salmon have declined tremendously since the mid 1990s. Have you seen a correlation with those diminishing runs?” He answered yes and described trout and grayling declining at creeks and streams where the salmon runs had also declined. Tommy Creek was an example (Fig. 24). Lake trout seemed to be healthiest in the fall, and this generally is true of most fish, according to a knowledgeable informant.

***Lake Trout Ecology.*** A newly arrived Port Alsworth resident was surprised to find the lake trout disappearing, or not biting, suddenly every July, “It’s amazing to me”, as the salmon runs passed into Lake Clark.

A knowledgeable Port Alsworth informant described some of the local ecology of lake trout.

There is the difference that while the water is real cold, like when there’s ice, you can catch [lake trout] through the ice, whenever there’s ice. And then while the water is cold, they’re going to be up closer to the surface in 24 feet of water, and then when it gets a little bit warmer, they’ll just get deeper and deeper. It seems like they’re feeding whenever the ice is open. They’re feeding on other little fish and stuff. Fall time you’ll catch them with fish hanging out of their mouths, so I know they eat grayling, quite a bit of grayling. And I’ve seen them with suckers,

and little ciscoes. They eat a lot of the sculpin too. [I see] them feeding on the bottom for those sometimes.

And then again [lake trout] are like the char. They are in an area where the salmon come into. The local fish will hang out in the area and then they'll congregate around schools of salmon, once the salmon come in. Even more than the char they eat the actual salmon, the carcasses and stuff, after they're spawned out. There's still some big lake trout, but not as big. You don't catch them as big on average as you used to. Most people are more conscious of that, and so, they're doing a little more catch and release. I try to encourage all the locals, well, if you're going to keep some for eating keep the little guys. They taste just as good, a couple of the little ones (two or three), as the big ones. But we still catch them anywhere. The average is around two or three pounds. We used to catch them up to 15 and 20 pounds. Not as [common] as used to [be], but there's still some big ones out there. Every once in awhile you'll catch one that's close to 30 [pounds].

And then again, you see those bigger fish in areas that get salmon run. All the trout you catch in these [closed systems], they're real pretty fish, but there the average is a little smaller. I think because it's a closed area and they're not very mobile, feeding [on what ever is] there instead of having salmon coming in and replenishing each year.

To keep places like that good fishing you got to be kind of careful because there's not as much food and it doesn't repopulate as quick[ly]. The fish don't grow as big. You got to manage it well if you're going to be fishing it.

He continued to explain that, as a general rule, lake trout can consistently be found just off the shoreline of Lake Clark when the salmon are spawning. During times of open water, lake trout are usually found past the edge of deep, underwater drop offs.

It was assumed that lake trout do not migrate to spawning areas, but spawn in there usual habitat. Lake trout vary in color from place to place depending on what they're eating as well as other factors, such as being ready to spawn. Based on this, he thought that eggs are deposited from late August to mid fall season. Based on where lake trout were caught this time of year, spawning probably occurs in gravel-bottomed areas.

During times of open water, lake trout were found throughout Lake Clark. "The only time that I've noticed a higher concentration of them is where there is some salmon spawning. Then, in the spring when the ice first goes out, they congregate in some open water areas to feed." It is not unusual to find an entire grayling in the throat of a lake trout, several people said.

One person was asked, "Is there any other fish or animals that effect the abundance of lake trout?"



No, not significantly. There's eagles and [other animals] that take them every once in a while, but I don't think that they [effect them], especially since those fish hang out deep. We're probably the only animals that affect them directly, but you know the pike eat quite a few of them. And like I said, there's an interesting balance in Chulitna where you can catch pike and lake trout on the outer portion [see section on pike]. It's been like that since grandma and grandpa were here.

An elder Nondalton informant said that lake trout will not come around if they are spooked. Lake trout feed at night, and were known to eat just about anything including adult grayling and burbot. Another Nondalton elder explained that there are more lake trout in Six Mile Lake after the salmon have moved through, towards fall time, but lake trout are hard to find when the fall rains start. He said lake trout spend the winter in deep water, preferring clean, clear water over the silty water (described as milky white) in the summer, especially during rainy summers when more silt is washed into the lake. Another informant had observed lake trout spawning in the narrows in "Igiugig" in a shallow channel in April. The trout were finning by sandbars in the channel (Fig. 22). Lake trout have been harvested with freshwater "herring" (see the section on whitefish) in their stomachs by a Nondalton resident.

In "Necovina" [USGS Nikabuna], Bill Hamersley, and Long lakes, in the past, fish were observed floating dead on the surface during the winter. An elder suggested that the lake froze to the bottom and the fish suffocated from lack of oxygen (Figs. 1 and 22).

Kokhanok informants observed that lake trout are temperature sensitive. They have been harvested with rainbow trout and sticklebacks in their stomachs. In October, lake trout follow whitefish when they spawn near a lodge on the Alagnak River. They eat the whitefish eggs, offered an Igiugig elder.

A Pedro Bay elder said that lake trout spawn in the local bays, unlike Arctic char and rainbow trout that go up the Iliamna and Pile rivers to spawn (Fig. 1).

### ***Rainbow Trout***

Rainbow trout *Oncorhynchus mykiss* inhabit lakes and streams in the Bristol Bay area. Among resident rainbow, those living in or migrating to large lakes with sockeye salmon runs generally grow faster and larger than fish which remain year round in streams. Adult rainbow trout (three years old) which inhabit lakes move from mid April to late June to shallow, graveled portions of clear water streams to spawn. Spawning trout are characterized by generally darker coloration. The adults return to the lake about three to six weeks later, and will spawn again in subsequent years. Rainbow trout in the Iliamna and Naknek drainages return to streams in August and September to feed on salmon eggs and to over winter. Other rainbow trout spend their entire lives in streams, and are non-migratory. Sea-going rainbows are known as steelhead trout (Ashley 1994b, Krasnowski 1987:77, Morrow 1980:50-53).

## Subsistence Use Patterns and Trends

**Gear Type.** An elderly Igiugig couple said that they caught small rainbow trout, probably steelhead, while ice fishing near the village. Another elder said he caught rainbow trout with rod and reel in front of the village, and when he was young there were people who set nets for rainbow trout in Kukaklek Lake. He and his wife's method for ice fishing was to go 50 to 100 yards from shore to find deeper water than near shore. In fall, they waited until the ice was about 5 inches thick and then began ice fishing.

An active Kokhanok fisher caught rainbow trout with rod and reel. An elder ice fisher said she had caught rainbow trout through the ice in the winter, and trout were commonly caught in seine nets, along with other types of freshwater fish. When she was young, she remembers her uncle catching hundreds of small "trout" one morning with hook and line. He cut the barb off his hook and wrapped red yarn around the hook. Using a container of salmon eggs, he dipped the yarn in the egg "juice", and the fish would just come off the hook after they were caught. When fish quit biting he would dip the yarn in the juice again. Rainbows also were caught incidentally in salmon nets in summer, according to several elders.

An elder and a younger couple in Levelock said that they commonly used rod and reel to harvest rainbow trout. Another elder said that in the 1950s, "in my days", John Tallekpalek used to make himself a big fish trap and harvested mostly "lingcod and rainbow trout, and once in awhile pike, from the Alagnak River. He also had caught rainbow trout fishing with a net in winter, but he was not targeting them.

An elder Newhalen couple said that when they first moved to Newhalen in the mid 1950s, some people used nets to catch rainbow trout and other species in the Newhalen River. Nets have been used more recently, too.

A Nondalton elder remembers hearing that a long time ago, rainbow trout were snared in Talarik Creek (Fig. 1). A younger, life-long resident said he harvested rainbow trout with rod and reel using lures. No bait was needed. Another elder said that in the past a heavy twine had to be used to catch rainbow trout because of their large size, but now a much lighter line was used because the size of the fish was smaller. People once used spears to harvest rainbow trout in the Tazimina River, because of the large size of the fish.

An elder Pedro Bay fisher said that she sometimes threw salmon eggs into a creek and waited "for anything that comes around", including "trout". She said "trout" were rainbow trout and Dolly Varden, and the word was used interchangeably for both species. Born and raised at Iliamna River, she had fished with a handline using salmon chunks and eggs as bait. An elder man said that in the past he used hand lines to harvest rainbow trout, because "that's all we had", except for birch poles if they were straight. He remembers using a fish trap when he was young. A fence was put in the river to block fish movement where some entered a "box" trap, which had openings at both ends. He said trout preferred salmon eggs and meat over lures.

A life-long Port Alsworth resident in his thirties said that smaller rainbows could be caught while fly fishing. He did not keep rainbow trout when he caught them because there were so few of them.

**Timing of Harvests.** An elder Igiugig couple said that steelhead trout, *qatelrit talaarvit* (Yup'ik—large white rainbow trouts) were present in the river in October and were caught then. The wife said that rainbow trout and other fish were harvested in the springtime in her net that she put out to try to catch early salmon. The couple said they caught steelhead, little rainbow trout, and a few grayling ice fishing locally, beginning in February. Fishing was slow at first. Another elder couple said they caught rainbow trout and other species while ice fishing in Lake Iliamna in the fall, as soon as the ice was thick enough to travel on.

An Iliamna elder remembers fishing primarily for steelhead and rainbow trout in the fall at Chekok.

An active Kokhanok fisher said there were some particularly good fishing sites where rainbow trout were harvested in the spring. He said that rainbow trout were good caught anytime except August, September, and October when trout have been eating dead salmon, and rainbow trout get more “rank” than other species from doing this. An elder said that the most common freshwater fishes harvested in the area were probably rainbow trout and Dolly Varden in the springtime. She said that people also caught an occasional rainbow trout in their subsistence salmon nets in the summer.

A Levelock elder said rainbow trout and an occasional coho salmon were caught in the Alagnak River in November. He said that fishing for rainbow trout was best in April. When asked if he traveled to any lakes on sno-go to fish, he said from February to April people used to go up the Kvichak to Kaskanak Creek and fish through the ice for rainbow trout and an occasional grayling, but last winter the ice was too thin and he almost went through a couple of times while trying to go up the river (Fig. 1). In the past while traveling on the river in fall, he and others would stop at Horseshoe Bend and fish for rainbow trout (Fig. 20).

Researchers in Newhalen were told that Russian lent occurs in the spring. During this period of time, which can last up to seven weeks, most people eat only fish. The rainbow trout spawn in the spring just as lent is ending and the two sometimes overlap. In the past, they would go camping on Lower Talarik Creek for the entire lent season to fish for freshwater species, as they could not eat meat (Fig. 1). They would stay until Palm Sunday and then return home to prepare for Russian Easter, which occurs at the end of the lunar cycle. The regulatory season for rainbow trout ends on April 15<sup>th</sup>; however, as in the case of last year, lent lasted from March 10 to April 26. That meant that people would have to break the law to fish until the end of lent. They do not want to be called criminals, but the calendar fluctuates and doesn't allow for changes in the lunar cycle. Due to the law people will go out and catch one or two fish and then go hide them. “We won't kill all the fish” that we rely on, said one person. “We just need to take a few until the end of lent.”

An elder in Pedro Bay explained she and others did not start fishing for rainbow trout before March because there were none around at other times of the year, at the spots where they fished. After November the rainbow trout could not be caught. Years ago in March there would have been three feet of ice on the lake, and they would not started fishing until April, but there has not been that much ice for a “long time”. She knew of one person going to Talarik Creek in the spring to harvest rainbow trout. She said, “We are used to having fresh fish in the springtime.” An elder man said that he fished all year around catching char and rainbow trout, “We only fish to eat, so we catch them whenever we want fish,” spring and fall. However, he said fall trout do not taste or smell good.

In Port Alsworth, springtime was a popular rainbow trout fishing season because the trout were plentiful and could be targeted at some sites, according to one active fisher.

**Use Area.** An elder couple in Iguigig harvested rainbow trout at the Kukaklek Lake outlet, the mouth of Pecks and Ole creeks, Horseshoe Bend; and steelhead in the Alagnak River and at Horseshoe Bend (Figs. 1, 15, and 20 and see Fig. 34 for harvest locations). Occasionally they caught steelhead and rainbow trout in Kaskanak Creek. Another elder talked about traveling to upper Kaskanak Creek and harvesting little rainbow trout there, and harvesting rainbow trout from the Alagnak River at the old village site, from the beach at Levelock, the mouth of Moraine Creek on the west side of Kukaklek Lake, above the fork in the Alagnak River in both forks, especially braided sections, the outlet of Nonvianuk Lake, a mile above his cabin on Yellow Creek, the mouth of a creek at Horseshoe Bend, Kaskanak Flats, from Lake Iliamna at Igiugig, Lower Talarik Creek a quarter of a mile past the bend, occasionally in the Newhalen River when visiting, and USGS Reindeer Bay. He has flown to Bruin Bay, Pacific side, and harvested rainbow trout in the little bays (Fig. 18). He had also fished for rainbow trout at Brooks Camp on Naknek lake, in the 1950s.

An active Iliamna fisher harvested rainbow trout from the Iliamna River and Lake Clark. An elder reported targeting rainbow trout in Pile Bay (Fig. 1).

An active Kokhanok fisher said he caught rainbow trout in the Kvichak River, Tommy Point, Newhalen River, Upper Talarik Creek, Gibraltar River, and “Nityonek”, and “Tukaollik” (locations undocumented), and Dennis Creek. An elder couple said people used to ice fish for rainbow trout in Airplane Lake, next to the Kokhanok airstrip, and Copper River (Figs. 1 and 18).

A Levelock elder said that rainbow trout were harvested at the mouth of Kaskanak Creek on the Kvichak River, the lower Alagnak River between the “village” and John Tallekpalek’s old cabin, at the outlet of Nonvianuk Lake (rainbow was the most abundant trout by far in this area), the fork on the Alagnak River, and Charlie Jenson’s cabin on Walter Creek (Figs. 1 and 20). A younger couple reported catching rainbow trout at Ben Courtney Creek on the Kvichak River and at many sites up the entire Alagnak River. John Tallekpalek used to put his fish trap in front of his cabin site on the Alagnak River and catch mainly burbot and rainbow trout, reportedly. Another elder said that many fish species, including rainbow trout, was caught in the lower Alagnak around the old village site and various cabin sites, such as Pete and Anna Chukwak’s

cabin, Eua Andrew's cabin, and John Tallekpalek's cabin, Horseshoe Bend, the west side of Kaskanak Flats, Nonvianuk Lake, and the outlet of Lake Iliamna to the Kvichak River.

A Newhalen elder reported that people harvest rainbow trout from the Newhalen River. The best fishing location in the area was Lower Talarik Creek where their spring camp used to be (Fig. 1). Lower Talarik Creek had been used by community members to harvest freshwater fish for at least several generations and probably since people began living in the area. A creek near the airport used to have good runs of rainbow trout and pike, but the creek was blocked to stop the runway from flooding.

A Nondalton elder remembers people using Talarik Creek to harvest rainbow trout. Another elder said rainbow trout were all along the Newhalen River and the most abundance was found at the Landing (Fig. 22). Another use area was a little slough on the east side of Igiugig (at the outlet of Lake Clark into Six Mile Lake), and Lower Talarik Creek.

A Pedro Bay elder said rainbow trout and Dolly Varden use areas included Chekok, Log Cabin Bay, Pedro Bay, Wooden Spoon Bay, and Knutsen Bay (Fig. 23). She also fished from the local beaches. Another use area was the Iliamna River, but she reportedly caught mainly char there since the other species she could catch closer to home. One person occasionally flies to Talarik Creek to harvest rainbow trout. Another elder used Lonesome Bay, Iliamna River, Pile River, Knutson Bay just on the other side of the airport, Smokehouse Bay, Edna's Bay, and "good looking" bays around Flat Island in Lake Iliamna.

An active Port Alsworth fisher said that in the past five or six years he has started catching more rainbow trout than usual between "22" Creek and Port Alsworth, including the Tanalian River (Figs. 1 and 24). Other rainbow trout use sites included the Tazimina River at Six Mile Lake and up the river a little ways and Alexcy Creek off the Newhalen River (Fig. 22).

***Preservation and Preparation Methods.*** A Pedro Bay elder said people ate fresh caught trout, "We get them and we cook them." She explained that she does not have a tradition of freezing trout because years ago she did not have electricity and refrigerators to keep food frozen. So people would hang and dry trout instead. Trout were not smoked to preserve them. The "half dried" trout was then boiled before eating. She had seen places where people stored food in underground caches, but had not done it herself. Even in the present, when more trout were caught than could be eaten fresh, the surplus trout was dried. She said that people did not remove the skin before eating, and trout were boiled and the meat eaten off the bones.

An elder woman in Kokhanok said that rainbow trout used to be filleted and dried for later consumption and some still were for dog food. An active Kokhanok fisher said that rainbow trout harvested incidentally in the summer might be frozen for later use, but trout harvested in spring was usually eaten fresh.

An active Nondalton fisher in his thirties said he likes fried rainbow trout. His family used to freeze some trout but not anymore because the number of trout harvested has shrunk. An elder

said he usually fried trout, and another common way to cook trout was by boiling. He explained that people usually harvest just enough trout for one or two meals at a time.

***Distribution and Exchange.*** No information was offered on this topic.

***Trends in Harvest and Use Patterns.*** An elder couple in Igiugig explained that they never have caught a lot of steelhead, but just one every once in awhile.

An Iliamna elder remembers ice fishing in the winter for many species of fish, including rainbow trout, to feed her family's dog teams, which she no longer keeps.

A Kokhanok elder said that for freshwater fish, people mostly harvested rainbow trout and Dolly Varden, in the springtime. Smaller rainbow trout were filleted and dried and fed to dogs, even though the dogs were "no long used" (for transportation).

A Newhalen elder remembered that when she first moved to Newhalen, people still put nets in the Newhalen River catching many species of fish, including rainbow trout, to feed dog teams. The elder thought that people were fishing more for rainbow trout now because the salmon returns were poor so people were eating more trout.

An active Nondalton fisher said that people did not target rainbow trout very much and were happy if they caught one or two. He used to freeze some rainbows but now he does not catch a surplus to freeze. Occasionally he would still catch one or two in Six Mile Lake, but not very often.

## **Traditional Knowledge Observations Regarding Rainbow Trout Populations and Ecology**

***Rainbow Trout Populations.*** At the mouth of Kukaklek Lake an elder couple from Igiugig described seeing dark colored rainbow trout that are not the same as the rainbow trout they see in the rivers. They called these fish *tungurparnek pilariat* in Yup'ik, meaning "they are referred to as large black ones" in English; and *tungulrianek* in Yup'ik, meaning "ones that are black or dark" in English. The fish were further described by the couple, "Their sides look like rainbow trout, that's why they call them rainbow trout." Another name used for these fish by the couple was *tungulret talaarit* in Yup'ik, meaning "black rainbow trout" in English. In March and April there were large, dark rainbow trout in Pecks Creek (Fig. 1). He had noticed that the rainbow trout up the creeks were small, about three to three and a half pounds.

An active Kokhanok fisher said, "Fish are getting smaller and there's less of them." When he was young, 20 to 40 years ago, fishing in front of the village, a rainbow trout under two feet was considered small, but now a rainbow trout this big was considered large. He suggested the growing sport fishery was the culprit, harvesting large rainbow trout. When asked, "Are there any of the streams that used to have rainbow that [don't any longer]?" He replied Dennis and

Tommy creeks were depleted of rainbow trout (Fig. 1). An elder said he noticed, “There’re a lot of big rainbows, but they’ve been caught so many times that they’re all tore up.” And, “Rainbows is not as big as they use to be. And there were a lot more big rainbow then there are now.” An elder said that people used to icefish in Airplane Lake where there were rainbows, but the fish had grown scarce, and may have migrated out of the lake (Fig. 18). Another elder said he had noticed that rainbow trout were smaller than they used to be, and he noticed rainbow trout that were torn up from catch and release fishing.

A Levelock elder said he noticed less abundance of rainbow trout at his use areas and that the trout were smaller. A Newhalen elder remembered seeing rainbow trout three feet long.

A Nondalton elder said he heard from others that there were not as many rainbow trout in the Tazimina River as there used to be and the depletion had been a steady decline for several years (Fig. 19). He said, “I would like to try to figure out why they are not coming back, and why they are coming back so small?” He said rainbow trout were usually less than ten inches long, now. An active fisher in Nondalton said the biggest rainbow trout he sees are 12 to 16 inches long, smaller than when he was young.

An active Port Alsworth fisher said that rainbow trout were seldom seen or caught in Lake Clark. Traditionally, there was a heavier salmon run into the Tazimina River, one of the closest places to find rainbow trout in larger numbers (Fig. 1). Rainbow trout populations existed in the Mulchatna drainage, from the mouth of the Chilikadrotna down (maybe further up, too), and in the Kvichak drainage from Six Mile Lake down, including the creeks and streams flowing into Lake Iliamna. The rainbow trout got larger the closer they were to the bay. However, he remembered one or two rainbow trout harvested from the Tanalian River and Kijik, “I’d say that was a fish that was lost.” He occasionally heard of someone catching a rainbow trout in the Chulitna River.

When asked, “Any idea why there’s not many rainbows up in Lake Clark?” He said in his memory and knowledge there never had been many rainbow trout in Lake Clark. He mentioned several possible reasons from what he knew and his own experiences and observations. First, in the past people harvested trout tails for a bounty, and the harvest of trout in Six Mile Lake for the bounty may have reduced the chances of the rainbow trout population spreading into Lake Clark. Other places were just as easy to “cap off” when people were harvesting surplus trout to collect the bounty. Second, rainbow trout may be in the process of spreading up the Kvichak system. Poor salmon returns and other possible factors prevented rainbow trout from moving north of Six Mile Lake, and even the Tazimina River populations seemed to be retreating or dying (Fig. 1). An exception was the recently observed population of rainbow trout at “22” Creek on Lake Clark (Fig. 24).

***Rainbow Trout Ecology.*** An elder couple from Igiugig said that rainbow trout and steelhead “get out of the way” while salmon go upriver, and then continue up river themselves. In October trout follow whitefish moving up the Alagnak River to spawn. Another elder said that after the salmon spawn, the bigger rainbow trout go down into the Kvichak River to continue to eat, and the area near the village was a popular catch and release, sport fishing site.

The elder Igiugig couple said that large, dark-colored rainbow trout moved into Pecks Creek in March or April, around the time that rainbow trout spawn (Fig. 1). Another elder said in spring rainbow trout moved up many of the local creeks to springs and lakes and spawned. These are the places where small fish were seen leaving. He said their stomachs contained small fish of an unknown variety, but probably suckers, whitefish, and grayling.

An active Kokhanok fisher said that there was an abundance of rainbow trout at the mouth of creeks and streams in spring when they are spawning. Rainbow trout were often caught in shallow water in these areas, particularly in April and May. He thought rainbow trout were widespread in the lake in the winter, looking for food, and did not congregate in any one place. Rainbow trout had been seen in the Gibraltar River and Airplane Lake in winter (Fig. 1 and 18). He had seen rainbow trout in the stomachs of pike, lake trout, and Dolly Varden. He had observed a mouse in the stomach of a rainbow trout. In August, September, and October, rainbow trout are too “strong” to eat from eating dead salmon. Big rainbow trout could be caught when the freshwater smelt were running (see section on rainbow smelt).

Knowledgeable Newhalen elders said that rainbow trout spawn in the spring just as lent is ending, and the two sometimes overlap. Rainbow trout migrate up the Newhalen River to Six Mile lake in October and November, eating salmon and salmon eggs that have not been buried. They remembered that when the salmon runs grew small in the past, a bounty was put on rainbow trout and Dolly Varden.

A Nondalton elder said that rainbow trout and Dolly Varden are the dominate freshwater fish from Lake Iliamna to Six Mile Lake. The abundance of rainbow trout tapered off entering Lake Clark, and he thought this was because of the silt in Lake Clark that salmon avoided. In the past people harvested only what rainbow trout they could use, and not more which is done with salmon to sell commercially. Several elders said rainbow trout appear when the salmon arrive. Another elder said rainbow trout sometimes prefer the sloughs in the Newhalen River and can be caught in shallow, two feet deep water. He suggested that rainbow trout seemed to prefer the fast running creeks and streams around Six Mile Lake rather than Lake Clark.

An active Nondalton fisher said that rainbow trout spawn in Steambath Creek (Fig. 22). More rainbow trout were seen when salmon were present, “They return with the salmon.”

An elder in Pedro Bay said that the larger trout he used to catch had clams, fish eggs, and sometimes little snails in their stomachs. Rainbow trout were seen eating insects from the surface of the lake. He said that Lake Iliamna was freezing over later and breaking up earlier than in the past. Water levels in the lake were also changing, sometimes higher and other times lower than usual. For instance, this spring the water was unusually high. Another elder explained that in the spring the fish can be found at the mouth of creeks and rivers waiting to follow the salmon upriver. When the salmon spawn out, the Dolly Varden and rainbow trout eat the fish and the eggs that they lay if the eggs have not been well buried in the gravel and sand. She also she finds bugs and clams in the stomachs of the fish.



A Pedro Bay elder described the migration of rainbow trout and char. They spend winter in the deep waters of Iliamna Lake. In the spring they move up the rivers and streams to the smaller lakes to spawn, following the salmon up to eat their eggs. This makes it easy to catch them with salmon eggs and chunks of salmon. In late fall, after the salmon have run, the fish return to the bay to spend the winter. He said both char and rainbow trout eat salmon eggs and spawn out salmon. He said that the bigger char and rainbow trout “go up river like salmon goes up river.” They migrate up Pile and Iliamna rivers to spawn, then return to the lake (Fig. 1).

An active Port Alsworth fisher said that rainbow trout eat little fish and insects, and smaller rainbow trout can be caught on flies. Sport fishers were really interesting in catching rainbow trout because there were so few of them around, but, “We just don’t kill any of the rainbows,” so he had not gotten many chances to see the contents of rainbow trout stomachs, to know what they were eating.

### ***Brook Trout and Mountain Trout***

Many respondents in most of the communities where interviews were conducted reported harvesting a species of trout known as brook trout in some communities (e.g. Igiugig, Kokhanok, and Iliamna) and mountain trout in other communities (e.g. Nondalton). The following are descriptions of these trout from the interviews. One Igiugig elder said that brook trout look similar to little rainbow trout but are more colorful than rainbow trout. A Kokhanok man named the small trout in the area brook trout. He did not call them mountain trout, and said his grandmother used a Dena’ina name for them that he could not remember. A Kokhanok elder said some people think brook trout are small “dogs”, most of them are “canning” size, and they have spots on them that look just like a dog’s spots. Another Kokhanok elder named them *manigtacuarat* (Yup’ik--brook trouts) when informing researchers that this fish was missing from the identification photographs they showed her. A knowledgeable Levelock elder said that some people call dark-colored rainbow trout, brook trout. He mentioned this while describing the Dolly Varden and rainbow trout in Nonvianuk Lake.

An active Nondalton fisher said mountain trout look similar to Dolly Varden and rainbow trout, but they do not get very big, seven or eight inches long. He remembered that his grandmother was aware of the existence of a mountain trout. A Nondalton elder called mountain trout *dghili chuna* and said mountain trout look similar to Dolly Varden, grow to about eight inches long, about five inches on average, and were in creeks in the mountains.

The fish *Salvelinus fontinalis*, also known as brook trout and brook char, belongs to the char group. They were introduced in Southeast Alaska between 1917 and 1950 and are not known to occur naturally in Alaska, and have not been introduced to Bristol Bay drainages, as far as anyone knows (Schmidt 1994).

## **Subsistence Use Patterns and Trends**

***Gear Type.*** A Igiugig elder used a fly hook or little Mepps spinner to catch brook trout. An Iliamna elder said brook trout were caught while ice fishing in the Iliamna River. Several Kokhanok people said that brook trout were harvested in March, while ice fishing. An active Nondalton fisher said mountain trout were harvested with hook and line, using salmon roe for bait, specifically by ice fishing.

***Timing of Harvests.*** An Igiugig elder said that brook trout were caught in the fall along with grayling. In winter (probably includes early spring), brook trout were caught through the ice, according to an Iliamna elder. An active Kokhanok fisher said brook trout were present in spring and was best then because of the roe. Brook trout were abundant in fall also, just before freeze up, and were harvested then also. An elder from Nondalton said that mountain trout appeared locally in March and were harvested until fall. An active fisher from Nondalton said they were caught most often in July and then their numbers decrease.

***Use Area.*** In Igiugig an elder said he caught brook trout about 50 miles up Kaskanak Creek (Fig. 1 and see Fig. 35 for harvest locations). In Kokhanok an active fisher said brook trout were caught in the Gibraltar River. A Kokhanok elder said brook trout were harvested while ice fishing in the bay in front of the village. A Levelock elder said brook trout were harvested from Nonvianuk Lake and the Alagnak River.

An active Nondalton fisher said he had caught mountain trout from the higher elevations in creeks running from the mountains into Lake Clark. The water in these creeks slows down in the winter but increases in summertime. A Nondalton elder said mountain trout were found in lakes and creeks running into Six Mile Lake. In Pedro Bay an elder reported harvesting brook trout from Pedro Creek (Fig. 23).

***Preservation and Preparation Methods.*** No information was collected on this subject.

***Distribution and Exchange.*** No information was collected on this subject.

***Trends in Harvest and Use Patterns.*** An active Kokhanok fisher reported that it was sometimes possible to harvest a hundred brook trout from Gibraltar River in spring (Fig. 1). A Kokhanok elder also reported seeing hundreds of brook trout harvested from Gibraltar River in the past. Another elder in Kokhanok said he did not catch many brook trout anymore, maybe because the Gibraltar River gets plugged with ice and the brook trout can not move up the river anymore.

## **Traditional Knowledge Observations Regarding Brook and Mountain Trout Populations and Ecology**

***Brook and Mountain Trout Populations.*** Brook trout were plentiful in the Iliamna River, according to an elder living in Iliamna (Fig. 1). An active Kokhanok fisher said “[brook trout] used to be in just about every little creek around, but not so much any more for some reason.” He said brook trout were in upper Dennis Creek, upper Belinda Creek, also called Belinda Creek flats, Reindeer Bay, Gibraltar River, and maybe Nielsen Bay (Fig. 18). Reindeer Lake and many creeks were once brook trout habitat, but not anymore. He thought that several years of low water in the 1990s may have reduced the population and habitat of brook trout. In Kokhanok an elder thought the abundance of brook trout was down because the Gibraltar River kept getting plugged with ice, effectively damming the mouth of the river and preventing fish movement up the river. A Levelock elder said that there was a lot of rainbow trout and Dolly Varden in the Alagnak River. Some of the rainbow trout are a dark color and these are brook trout. An active Nondalton fisher said that mountain trout were abundant in the local drainages.

***Brook and Mountain Trout Ecology.*** An elder in Igiugig, when asked if brook trout are immature rainbows or a different kind of fish, said that brook trout are small and probably spawn in Yellow Creek (Fig. 15). He called them mountain trout and brook trout interchangeably, or small little rainbow trout.

An active Kokhanok fisher said that brook trout used to be in just about every little creek around, but were not seen as much any more. He has observed them in upper Dennis Creek and Belinda Creek and Reindeer Bay. Brook trout (or “brookies”) may be in Nielsen Bay (Fig. 1). There were several years of low water in the 1990s which is possibly the reason for the reduced abundance of brook trout, he suggested. Brook trout could be caught in Lake Iliamna, usually right at freeze up, and they migrate into the Gibraltar River where they were observed in large numbers in spring. An elder, when asked if he was concerned about the condition of any freshwater fish species, said that brook trout were not being harvested as much as in the past. He suggested it was because the Gibraltar River was “plugged up” and the fish can not migrate into it. Locally, they say this is when the river is “anchored”. This condition in the river ends when a small steam of water finally breaks through the ice.

A Nondalton elder named a type of small trout he observed, mountain trout. Mountain trout arrived locally around March when a few were harvested through the ice of Six Mile Lake, before moving into creeks. He said mountain trout never were very abundant, but “now days you don’t get that much.” There were more mountain trout in the summer, in July and August. They did not stay in the area all year around.

A Pedro Bay elder said that there used to be little char and brook trout, six to eight inches long, in Pedro Creek which has been dammed by beaver (Fig. 23). In the past salmon moved up this creek to spawning ponds, and trout followed them. Another elder said that brook trout spawn in many bays and creeks in the area, like lake trout do. A knowledgeable Iliamna elder said brook trout were plentiful in the Iliamna River in March.

## *Whitefish*

Whitefish are a generally abundant group of several related species which inhabit all kinds of freshwater habitats. There are several kinds of whitefish in the Bristol Bay drainage. The most common on the western side of the drainage is the round whitefish *Prosopium cylindraceum*. Both the round whitefish and the closely related pygmy whitefish *Prosopium coulteri* have round cigar shaped bodies. They spawn in rivers and along lake shores in late September and October. The least cisco *Coregonus saardinnela* is another common whitefish in the Bristol Bay area. Some least cisco undertake long spawning migrations upstream in September and October to clear streams with gravel bottoms. Lake-dwelling populations of least cisco do not migrate. The humpback whitefish *Coregonus pidschian* is closely related to the least cisco. In the Bristol Bay region, they are most common in the Lake Iliamna area. These fish move upstream in summer and fall, and spawn in October in the upper reaches of streams. Also closely related is the broad whitefish *Coregonus nasus*, which is uncommon in the Bristol Bay drainage, although some occur in the upper Nushagak and in the Wood - Tikchik Lakes system (Alt 1994b, Minard, personal communication 1987, Morrow 1980:29-38;). Whitefish are discussed in three subgroups below: humpback and broad whitefish; round and pygmy whitefish; and least cisco.

### *Humpback and Broad Whitefish*

The humpback whitefish and the broad whitefish are referred to as true whitefish. In both species, the head is small and the body deep or wide from stomach to backbone. Broad whitefish is uncommon in the Bristol Bay drainage. The broad whitefish can be distinguished from the humpback by its larger size, deeper head, shorter gillrakers, and short, blunt snout. Spawning occurs in the fall with most fish spawning over a gravel bottom. The humpback whitefish is closely related to the least cisco. In the Bristol Bay region, they are most common in the Lake Iliamna area. These fish move upstream in summer and fall, and spawn in October in the upper reaches of streams (Alt 1994b; Morrow 1980:29-38; Minard, personal communication, 1987).

### **Subsistence Use Patterns and Trends of Humpback Whitefish**

**Gear Type.** An elder Igiugig woman said that *uraruq* are humpback whitefish. In Igiugig, *uraruq* were harvested in nets, called “humpy gear”, having less than a three inch mesh but “not a salmon net”. An elder described targeting humpback whitefish in his fish trap until five years ago. According to an active Kokhanok fisher, occasionally humpback whitefish were caught incidentally in set nets, in Lake Iliamna.

In Levelock, some humpback whitefish were harvested in the Alagnak River while ice fishing during recent times.

A Nondalton elder said that humpback whitefish were most abundant in the Lime Village area, including Long lake, and were caught with nets in spring, when Nondalton people were still trapping in that area.

**Timing of Harvests.** An elder Igiugig woman said that she harvested humpback whitefish in spring so they could be air dried and stored for future use. Humpback whitefish were more abundant in fall, around mid October, and more were harvested then.

**Use Area.** An elder Igiugig woman said she caught humpback whitefish in the Kvichak River at Horseshoe Bend in the fall (Plate 4); and Kaskanak Flats, Ole and Pecks creeks in May and June (Figs. 1 and 15 and see Fig. 36 for harvest locations). An active Kokhanok fisher said that humpback whitefish were caught incidentally in moderately deep water in Lake Iliamna.



Plate 4. Boats at Igiugig near the confluence of Lake Iliamna and the Kvichak River, October 2003. Photograph by Hans Nicholson.

Levelock elders said they had harvested whitefish in Kaskanak Creek, in Alagnak River in front of the old village, in front of John Tallekpelek's camp, and lower in the Alagnak River near Pete and Anna Chukwak's camp (Figs. 1 and 20). A younger couple said they caught humpback whitefish and other fish at Ben Courtney Creek.

An active Nondalton fisher said that he caught humpback whitefish all over Six Mile Lake. He also caught them in Pickerel Lake, Chulitna Bay, and Hudson Bay (Figs. 1 and 22).

***Preservation and Preparation Methods.*** An elder woman in Igiugig said that spring-caught whitefish were hung to air dry in the cool, dry weather. After spawning in November, the condition of humpback whitefish is such that people do not prefer to eat them. An active Kokhanok fisher said that humpback whitefish were baked or eaten raw frozen, sometimes with seal oil.

***Distribution and Exchange.*** An older couple in Igiugig who have lived in the area all their lives said that humpback whitefish caught by local people was shared with others all over the region (Plate 5). People start calling them in October asking if they have any whitefish yet. One elder said "It's good to share with people. My grandpa taught me how to do that."



Plate 5. Humpback Whitefish at Igiugig, October 2003.  
Photograph by Hans Nicholson.

***Trends in Harvest and Use Patterns.*** Kaskanak Flats was a well-known area for harvesting humpback whitefish (Fig. 1). Residents of Igiugig, the closest community to the flats, harvested them by the net full in the fall and distributed them to the other communities. An elder couple in Igiugig said the spring harvest of whitefish was always small. One said, “When we catch humpback whitefish we don’t get lots everyday. One or two, sometime you get nothing, go next day two or three. We don’t get a lot of it.” The couple described the fall migration of humpback whitefish. At the time of the interview, in October, the whitefish had not arrived yet. They said that the migration was “slow” this year. Other years the whitefish seemed to come “fast”, “It’s never the same.”

### **Traditional Knowledge Observations Regarding Humpback Whitefish Populations and Ecology**

***Humpback Whitefish Populations.*** In Igiugig, the fact that the humpback whitefish were not passing the village yet on their migration from Lake Iliamna to spawn at Kaskanak Flats did not seem odd to the elders that were interviewed, even though the fish would arrive later than in other years (Fig. 1). When asked about this, the respondents said, “Certain years there are less whitefish. Certain years there are more whitefish.” They likened the whitefish migration to a salmon migration.

An active Kokhanok fisher said the locally caught whitefish, humpback whitefish, were up to three feet long and red, like a big sockeye.

An active Nondalton fisher said there were “a few” humpback whitefish around. An elder said that there are different kinds of whitefish, and he wasn’t familiar with the distinction between broad, lake whitefish and humpback whitefish. The local *telay* have a humpback.

Another Nondalton elder agreed that humpback whitefish were found mostly at the end of the lake, moving up streams to spawn. He was not sure about the ecology of broad whitefish, when asked.

An active Port Alsworth fisher said humpback whitefish were the largest in the area and averaged around 12 inches in length, the larger ones up to 24 inches long. A gut pile returned to the bay could be swarmed by humpback whitefish. He thought that humpback were present anywhere there was a salmon run, probably.

***Humpback Whitefish Ecology.*** Elders in Igiugig said the humpback whitefish they harvested in the fall had eggs. Humpback whitefish spawn near the shore of Lake Iliamna between November 18 and 20. After spawning, humpback whitefish are thin and the flesh mushy.

In Igiugig, another elder said that pike and humpback whitefish spawn in November and that the rainbow trout followed them to eat their eggs. After the whitefish spawn, some of them return to the Kvichak River. In the fall, October, humpback whitefish migrate from creeks and streams into the Kvichak River, congregating throughout Kaskanak Flats (Fig. 1).

An active Kokhanok fisher said Kokhanok Flats was the only place with an abundance of humpback whitefish or the only place where humpback whitefish were targeted, of which he knew.

A Levelock elder knew that humpback whitefish would be migrating in October month, and could be easily harvested in the Kvichak River below Igiugig.

An active Nondalton fisher said that humpback whitefish spawn in Six Mile Lake, and he knew of one other lake where he thought they spawned. But he wasn't sure if they spawn during fall or springtime.

One life-long Port Alsworth resident remembers from last year some humpback whitefish in Snipe Lake, and more at Kijik (Fig. 1).

### ***Round and Pygmy Whitefish***

Another common species of whitefish found in the Kvichak drainage is round whitefish. Round whitefish spawn in rivers and along lake shores in late September and October. Both the round whitefish and the related pygmy whitefish, have rounded cigar-like bodies with tiny, pointed snouts. In both species the upper jaw extends out over the lower so the mouth is underneath. The pygmy whitefish has a toothless mouth and large eyes. Round whitefish in most streams seldom exceed 16 inches in length, while pygmy whitefish rarely reach 8 inches. Even though pygmy whitefish are present in the Kvichak drainage, they were not mentioned by any of the informants.

### **Subsistence Use Patterns and Trends**

***Gear Type.*** An active Nondalton fisher said he harvested round whitefish with a one-prong hook. In Kokhanok people set a “herring” or other small-mesh net at the mouth of the Gibraltar River and seined in Gibraltar Lake, “When we make the set at the mouth of the [Gibraltar] river, we wait for them to come down out of the [Gibraltar] lake to scoop them up” (Fig. 1).

***Timing of Harvests.*** An Iliamna elder said that “candlefish” or round whitefish were harvested in the winter while ice fishing, and are also available in April. In Kokhanok, round whitefish were caught in October, usually, although some are harvested in winter, also. In Nondalton an



active fisher said that “candlefish” or round whitefish were caught year around, but there are more in March and April.

**Use Area.** An active Kokhanok fisher said the communities main round whitefish harvesting areas are the mouth of the Gibraltar river and lake (see Fig. 36 for harvest locations). He had also caught a few round whitefish in Russian Creek (Figs. 1 and 18). An active fisher in Levelock said her family caught round whitefish and other species of fish near where the barge is parked on the Kvichak River, close to Igiugig. In Nondalton, round whitefish were harvested from Six Mile Lake and the southern end of Lake Clark up to Chulitna Bay.

**Preservation and Preparation Methods.** In Kokhanok, round whitefish were reportedly baked, broiled, fried, and frozen. Some people used to hang them upside down to dry, but that is rarely done anymore. Dried round whitefish were sometimes eaten on crackers or added to berry *akutaq*. The fish were first cooked, sometimes in a pressure cooker.

**Distribution and Exchange.** Not information was collected under this topic.

**Trends in Harvest and Use Patterns.** In Kokhanok the fall round whitefish harvest was typically large with “thousands” being harvested per net load. An active fisher said that more round whitefish were being caught than five years ago, but twenty years ago, they were harvested by the thousands. In Gibraltar Lake a net put out in the winter caught only three or four round whitefish every four or five days.

## **Traditional Knowledge Observations Regarding Round Whitefish Populations and Ecology**

**Round Whitefish Populations.** In Kokhanok, round whitefish were called the most common whitefish in the area. An active fisher described round whitefish populations as having decreased from the past. He said the villagers were not targeted them any more than in the past, that he could tell, but the population was down two thirds from what he remembers in the past. This could be a cyclical trend, he suggested, because from his observations, conditions were very good three or four years ago, but people were not able to harvest more than about 150 fish all fall season. There were more now, though.

**Round Whitefish Ecology.** A Kokhanok elder identified the locally popular *cavirrutnaq* as round whitefish. *Cavirrutnaq* is called candlefish in English. An active Nondalton fisher described candlefish as straight, long, and about eight inches long. An elder agreed that candlefish are long and narrow. In most of the study communities, round whitefish are called “candlefish”, and *cavirrutnaq* in Yup’ik. However, in Igiugig and Levelock *cavirrutnaq* can refer to least cisco, and in Igiugig least cisco was often referred to as candlefish.

An Iliamna elder said round whitefish are seen from Eagle Bay to Iliamna Bay, and are also harvested locally (Fig. 1). Round whitefish spawn in the spring and then loose weight. Round whitefish migrate in large numbers to Gibraltar River in October, according to a Kokhanok informant. Some round whitefish enter other smaller creeks, but not like the large number entering Gibraltar River.

A Newhalen elder described seeing round whitefish spawning in Hammer Cache Creek in two to three feet of water during the fall time (Fig. 22). An active fisher thought round whitefish probably spawn in the same areas as humpback whitefish, such as Long Lake, because they are often seen together (Fig. 1). Round whitefish are in Long Lake year around. He has seen them moving in and out of Pickerel Lake, also.

### *Least Cisco*

The least cisco, sometimes called herring, is a slender herring-like fish with a superior mouth, which means a weak lower jaw projecting beyond the upper. Adults are brown to olive green and silvery below. The least cisco is found in lakes, streams, and estuaries of the Bristol Bay drainage. At the age of 4 to 6, mature least cisco migrate upstream in the fall to spawn in clear streams with gravel bottoms. Spawning takes place in early October. Least cisco found in lakes seldom exceed 14 inches. Least cisco are very important in the food chain, as they are eaten by predacious pike and burbot (Alt 1994b, Minard, personal communication, 1987).

A discussion of the traditional taxonomy of “freshwater herring” is necessary here because the locally occurring “freshwater smelt”, “freshwater herring”, and least cisco were not always given the same characteristics by people in the study area. In the rest of this section, the descriptions of freshwater herring and least cisco do not always agree with the biological description above by Alt (1994b) and Minard (1987).

An active Kokhanok fisher said the only place he knows of “freshwater herring” occurring is Reindeer Bay (Fig. 1). They spawn in May over about one week. They are about 12 inches long, like small [saltwater] herring.

A Levelock elder remembered traveling to Charlie Jensens and harvesting *cavirrutnaq* (Fig. 20). In some parts of Bristol Bay, *cavirrutnaq* refers to least cisco. From the interview transcript it is possible that this informant was pointing to a picture of least cisco. People living on Lake Iliamna use *cavirrutnaq* to refer to “candlefish”, round whitefish.

When people living in Nondalton mentioned the name “least cisco”, they were referring to what they call freshwater herring. Several people said that they have asked ADF&G biologists in the past what these fish are called that run up the Chulitna River in such large numbers, and they have been told that they are least cisco (Fig. 1). So when researchers asked about least cisco, they described freshwater herring. One active fisher from Nondalton remarked:

MD: Up here at Igiugig [the outlet of Lake Clark] and up here at Chulitna River and up here at Snowshoe River. I've seen some come in there by the millions. I didn't know what they were. I thought they were just herring but we showed to some Fish and Game biologist and that's what they told us they were.

HN: Is there a traditional name for cisco or what you use to call it?...

MD: Well. We thought it was herring so that's what we've been calling it all these years until we've found out it was called cisco.

A Nondalton elder said:

Freshwater herring [are] called cisco by Fish and Game in King Salmon. They say it is all over....Yeah. Those are cisco. I told Fish and Game... I told them I ...wanted to find out. They said they are all over, over in Naknek River. They are all over where there's freshwater... I always call it freshwater herring. Not the real name.

Another knowledgeable elder said:

Only thing I didn't mention was whitefish, uh, we got a, uh, I don't know if it was a whitefish or what. They call it freshwater herring and they look like whitefish. I was looking at this. They kind of look like this [respondent was looking at pictures of whitefish, probably least cisco].

## **Subsistence Use Patterns and Trends**

***Gear Type.*** An Igiugig elder said she harvested *cavirrutnaq*, probably least cisco, sometimes while ice fishing. She had also seen a herring net being used. An active Kokhanok fisher said his dad put a net out for freshwater herring. A Levelock elder reported harvesting *cavirrutnaq* through the ice.

An active Nondalton fisher said that least cisco were easy to catch by setting out a box trap which fills rapidly if fish are present. A box trap could be about two feet wide and two and half feet long. The tunnel was pointed up river. Box traps were made from barbed wire and spruce wood. Two elders mentioned scooping or dipnetting least cisco from Chulitna Bay when they were younger (Fig. 1).

***Timing of Harvests.*** A Levelock elder said he harvested *cavirrutnaq*, probably least cisco, in February or April while icefishing. He said he tried to go last winter but the ice was too thin to travel on. A Nondalton elder said that least cisco were harvested in spring, around April, or after the ice cover was gone.

**Use Area.** An Igiugig elder said she remembers harvesting “candlefish”, probably least cisco, from the Alagnak River. The same elder said freshwater herring were harvested from in front of the village (see Fig. 36 for harvest locations).

An active Kokhanok fisher said he occasionally harvested least cisco near fish camp at the mouth at the Gibraltar River, from places in Intricate Bay, and freshwater herring were harvested from Reindeer Bay (Figs. 1 and 18). A Levelock elder remembers harvesting *cavirrutnaq* and other species of fish by Charlie Jensens cabin (Fig. 20).

An active Nondalton fisher said least cisco were harvested at “Igiugig” (the outlet of Lake Clark), Chulitna River, and Snowshoe River (Figs. 1 and 22). An elder said that “long time ago” people used to go up to Chulitna Bay yearly to harvest least cisco in shallow water near the beach.

**Preservation and Preparation Methods.** A Kokhanok resident said that freshwater herring are fried and eaten fresh. A Levelock elder said that he still put *cavirrutnaq* in a box until they began to smell with age, and then he put them in the freezer to be eaten later while still frozen.

A Nondalton fisher said that they freeze least cisco and use it as bait for pike and lake trout. An elder said least cisco were usually split in half and dried. They have a lot of eggs, and people would squeeze the fish and collect the eggs from their mouths, to be eaten fresh, “That was their lunch.” In the present, people didn’t harvest many least cisco because there is not much meat on them. If some were caught it was often fried and eaten.

**Distribution and Exchange.** No information was collected for this topic.

**Trends in Harvest and Use Patterns.** Freshwater herring were reportedly used by residents of Nondalton, Iliamna, and Kokhanok more in the past than today. Part of the reason for this is the decline in the keeping of dogs for whom large quantities of wild resources were harvested to feed. Also mentioned by respondents was trouble traveling and ice fishing due to warmer weather and a lack of ice cover.

## **Traditional Knowledge Observations Regarding Least Cisco Populations and Ecology**

**Least Cisco Populations.** In Igiugig, an elder said freshwater herring were three to four inches long and “when we talk about fresh[water] herring [in] lake, you talk about Bristol Bay? They’re not much different.” He said they may be a little bit smaller than herring in Bristol Bay. A population of freshwater herring occur near the village.

In Nondalton, the three primary respondents all said that least cisco were very abundant. One person said they run in the “millions” and they can be so abundant at certain places that they

literally can be harvested by the scoopful. One elder described them as six to nine inches long, but in less abundance than in the past and of smaller size.

***Least Cisco Ecology.*** An active Kokhanok fisher said freshwater herring spawn in Reindeer Bay in spring (Fig. 1). A Levelock elder said there were *cavirrutnaq* in waters around the village.

Several Nondalton elders said they once thought of commercializing freshwater herring, as is done with saltwater herring, because they were incredibly abundant. Several elders said freshwater herring migrate for a month, moving up the Chulitna River in September (Fig. 1). An active Nondalton fisher said that other than September he sees no freshwater herring. An elder said that he saw them in the summer, too, along beaches in small schools and he had noticed that they do not bite a hook. One suggested they spawn in Long and Nikabuna lakes. One elder suggested that there was a smaller spring run of freshwater herring.



## CHAPTER FOUR: DISCUSSION AND CONCLUSIONS

### DISCUSSION

#### *Study Findings*

The study documented the continued importance of the subsistence harvests of nonsalmon freshwater fish in the communities of the Kvichak River watershed of the Bristol Bay area. In 2002/2003, most households in the study communities used a variety of nonsalmon fish for subsistence purposes, and most were involved in the harvest of these fish. While harvest levels were lower overall compared to previous estimates, in all the communities but Port Alsworth these harvests contributed substantially to the annual food supply for the area's families. There is clearly a continuing reliance on these fish for subsistence purposes in Kvichak River watershed communities.

The study findings regarding levels of subsistence harvests of nonsalmon fish in 2002/2003 illustrate the need to obtain contextual data to interpret the results. The harvest levels documented in all the communities through the calendars and household surveys for 2002/2003 are much lower than other recent years. Unusually warm winter weather prevented traditional ice fishing and travel. Clearly, the study year was not typical, demonstrating the dangers of relying on a single year's data to determine, for example, the amount necessary for subsistence uses, a finding that the Alaska Board of Fisheries under state law must make.

Thus this project also demonstrates the importance of building a time series of harvest estimates for all resources used for subsistence purposes, including nonsalmon fish. The time series data for nonsalmon fish for the Kvichak River watershed study communities, and for most of the rest of the communities of the Bristol Bay area, are better than that available for most of the rest of the state due to the University of Alaska study from the early 1970s (Gasbarro and Utermohle 1974) and the periodic rounds of household surveys conducted by the Division of Subsistence of ADF&G (primarily using federal funds). Even so, there was a gap of 20 years for harvest data for two of the study communities (Nondalton and Port Alsworth) and of 10 years for most of the rest. Given the differences in harvest levels between years documented in this study, more frequent updating of nonsalmon fish subsistence harvests is advisable.

Another key study finding relates to the great deal of traditional knowledge held by Kvichak watershed community residents about nonsalmon freshwater fish. The key respondent interviews provided a rich source of information about fish abundance and movements, ecology, and population trends. But it must be noted that this project interviewed only a small number of the knowledgeable people in the study communities. Much more could be learned through additional research.

## *Study Methods*

As noted in Chapter One, this project attempted to build upon the recommendations in Fall et al. (1996) regarding the collection of subsistence harvest data for nonsalmon freshwater fish. Key aspects of the methodology were periodic collection of harvest calendars by local research assistants, systematic verification of the harvest data through brief quarterly interviews, and overall review of the data through a round of post-season household surveys.

This project made a major commitment to capacity building in the study communities through training community residents to collect information and otherwise facilitate the research. The project relied upon the local assistants to explain the project to community residents, collect the harvest calendars, verify data, follow-up on household surveys, arrange TEK interviews, transcribe tapes, and maintain clear records. Project staff from ADF&G and BBNA invested substantial time in preparing training materials, conducting training sessions, and attempting to maintain systematic communication with the local assistants to assess progress and address any problems as they arose.

As described in detail in Chapter Two, the project encountered challenges over the study year in maintaining good communication with several of the local assistants, obtaining timely submission of work products, and locating reliable replacements when assistants quit or disappeared. Although the local assistants in a few communities were very reliable throughout the project, in the majority of communities project staff had difficulties in keep in touch with the assistants and evaluating the status of the work. In some cases, this resulted in delays but the work was eventually accomplished. But in the worst cases, valuable information was lost and considerable staff time and project fiscal resources were wasted. Indeed, in retrospect, ADF&G and BBNA project staff sometimes focused on their commitment to local involvement and capacity building at the cost of getting the work done in a timely and efficient manner by just doing it themselves. As a result, there are some gaps in coverage and there was some divergence from the study design.

The following are some observations from project staff about some of the problems encountered that resulted in missing information or delays.

- In some cases, local assistants were given multiple opportunities to complete a task, stretching over months. They were taken at their word that they would complete the work, but in a number of cases never did. A great deal of time was wasted as a result, when replacing the local assistant was probably justified.
- Clearly, project results are very much dependent on the person hired. Success is contingent on the local assistant being recognized and respected in the community so they can be welcomed in people's homes. This is especially the case when confidential information such as subsistence harvest numbers is being requested. Hired individuals must be able to explain with confidence why the project is important and why the information is being requested.



The fact of the matter is that going house to house, knocking on people's doors, and asking a lot of questions about sensitive topics is not an easy job for everyone.

- Compared to other years, fishing effort was down during the study year because of poor weather. This may have discouraged interest in the project and in the calendars for some households.
- In many cases, local assistants worked best when teamed with BBNA or ADF&G project personnel. This provided a learning experience as well as a role model.

Nevertheless, there is nothing to suggest that this project's methods, using a combination of harvest calendars and post-season surveys, was not sound. Nor are we suggesting that projects such as this one not utilize a network of local research assistants to collect harvest data. In the final section of this report, we provide some recommendations based on the experiences for this project for improved design and implementation of projects such as this one that seek to develop local research capacity without sacrificing data quality.

## RECOMMENDATIONS

The following recommendations are based upon the experience of ADF&G and BBNA project staff in conducting this project. They focus primarily on ways to enhance the involvement of local community residents in research. The first two, however, address continuing data needs.

1. There needs to be more frequent updating of subsistence harvest information for nonsalmon fish in the Kvichak River watershed. It is probably not necessary to implement an annual harvest assessment program due to costs and the overall lack of management issues for most species. Nevertheless, given the changes from year to year in subsistence harvests that have been documented to date, periodic updates every five years or so are advisable. An alternative might be a project of several years' duration in a few communities to document annual variations in harvests more closely. Adding to the need to more frequently document subsistence harvests is the potential development of the Pebble Copper Mine in an area near Iliamna. The mine development may bring many new residents to the area, improve access for recreational fishing, and create changing environmental and socioeconomic conditions that might affect subsistence harvests. As this report was in preparation, the Division of Subsistence of ADF&G; the National Park Service, Lake Clark National Park and Preserve; and Stephen Braund and Associates were developing a study plan for systematic household interviews in the five resident zone communities of the park (Nondalton, Port Alsworth, Iliamna, Newhalen, and Pedro Bay). Among other things, these surveys would provide another annual estimate of harvests of nonsalmon fish for the year 2004.

2. Additional collection and analysis of traditional ecological knowledge about the fisheries resources of the Kvichak River watershed is needed. Given the many changing environmental conditions noted by local residents and recent failures of returns of sockeye salmon to this drainage, the detailed and long-term perspectives contributed by traditional knowledge are necessary for an effective understanding of trends in fish populations and ecology.
3. Future research on subsistence harvests and uses and traditional knowledge should continue the initiatives developed by this project and improve upon the performance of the local network of local research assistant network. Some suggestions regarding areas of potential improvements include the following.
  - a. Clearly, reliable and mature individuals need to be hired as local research assistants. They need to be respected individuals who have a knowledge of the resource and of subsistence uses. Hiring such individuals may reduce instances of negative and discouraging comments from some participating households. Based upon the experience in this project, high school students and other immature individuals should not be hired for a project that is spread out over many months, collects sensitive information that cannot be easily replaced, and requires good record keeping.
  - b. In a project that involves harvest calendars, a balance must be struck regarding the frequency of data collection. On the one hand, very frequent collection (e.g. monthly) may result in respondent fatigue, but less frequent contacts may result in waning interest in the project on the part of the participating households and the local assistants themselves. Collection might be organized around fishing schedules, with more frequent collection during periods of concentrated effort, rather than just on fixed quarterly schedule.
  - c. Maintaining frequent communication is necessary. Local assistants need encouragement. More face-to-face interaction with local assistants probably should be built into project design, instead of just one training session at the beginning of the project.
  - d. Timely submission of work products must occur and must be insisted upon. Project managers should not hesitate to replace local assistants who cannot be located after a reasonable effort. A lot of time can be wasted trying to track down people who have lost their commitment to the project. The result is lost information that may compromise the study results.
  - e. Agency and partner organization staff need to be ready to complete the work when local assistants fail. Although local hire and capacity building are important goals, a commitment to these goals should not come at the cost of failing to produce reliable results. Lack of performance needs to be established quickly. Then, professional staff need to step in and collect the calendars, conduct the surveys, or perform whatever task is needed to adhere to the project's methods and meet the project's goals. Project travel budgets need to be planned with this contingency in mind.

4. Projects need to develop strict procedures for handling completed calendars, surveys, and, especially, audiotapes. Original tapes should not be left in study communities until copies have been made.

5. Provisions need to be made to make sure that local assistants have the tools needed to accomplish their assignments. Access to word processing equipment is especially critical.

6. Project budgets must be designed realistically to provide adequate agency and partner organization staff time to provide guidance to local assistants and to accomplish project tasks as necessary. Projects such as this one require professional results that can only be achieved with adequate professional involvement.

To close on a positive note, it should be recognized that a large majority of households in all the study communities agreed to record subsistence harvests on calendars and be interviewed about their subsistence activities. Knowledgeable elders and other individuals readily participated in interviews focusing on their traditional knowledge about fish. Local research assistants were involved in most aspects of the project and contributed in many ways to meeting project objectives. The result was detailed documentation of subsistence harvests of fish, demonstration of the continuing importance of these fish to local communities, and production of a database of traditional knowledge that can be used to better understand and protect the fisheries resources of the Kvichak River watershed.



## **ACKNOWLEDGEMENTS**

The authors would like to thank the many people in the eight study communities who took the time to complete the harvest calendars and agreed to be interviewed. We especially thank those individuals who agreed to be interviewed about their traditional knowledge of fish. Also, we thank the governments of each community for their support of the research.

The U.S. Fish and Wildlife Service, Office of Subsistence Management, provided \$74,249 in funding support for this project through the Fisheries Resource Monitoring Program, under project number FIS02-034 and contract number 701812J441 (ADF&G No. COOP 03-015).



## LITERATURE CITED

- Alaska Department of Fish and Game [ADF&G]. 2001. Alaska Subsistence Fisheries 1999 Annual Report. Division of Subsistence. Juneau.
- Alt, K. 1994a. The Northern Pike in Alaska. Alaska Department of Fish and Game, Wildlife Notebook Series (Revised and updated), Juneau.
- 1994b. The Whitfish in Alaska. Alaska Department of Fish and Game, Wildlife Notebook Series (Revised and updated), Juneau.
- Ashley, D. 1994a. The Arctic Grayling in Alaska. Alaska Department of Fish and Game, Wildlife Notebook Series (Revised and updated), Juneau.
- 1994b. The Rainbow Trout in Alaska. Alaska Department of Fish and Game, Wildlife Notebook Series (Revised and updated), Juneau.
- Behnke, Steven R. 1982. Wildlife Utilization and the Economy of Nondalton. Alaska Department of Fish and Game, Division of Subsistence Technical Paper No. 47. Juneau.
- Bendock, T. 1994. The Lake Trout in Alaska. Alaska Department of Fish and Game, Wildlife Notebook Series (Revised and updated), Juneau.
- Bristol Bay Native Association (BBNA). 2000. Bristol Bay Priority Information Needs Assessment. Report submitted to the Bristol Bay Regional Subsistence Advisory Council, March 2000. Dillingham.
- Bristol Bay Native Association (BBNA) and Alaska Department of Fish and Game (ADF&G). 1996. The Harvest and Use of Freshwater Fish in Togiak and Manokotak, 1994-95. Natural Resource Department BBNA and Division of Subsistence ADF&G. Dillingham.
- Brown, Louis A., David A. Caylor, Gretchen B. Jennings, and Charles J. Utermohle. 2000. Alaska Subsistence Fisheries Database for Microsoft Access. Version 3.0. Alaska Department of Fish and Game, Division of Subsistence. Anchorage.
- DeCicco, F. 1994. The Arctic Char in Alaska. Alaska Department of Fish and Game, Wildlife Notebook Series (Revised and updated), Juneau.
- Ellanna, Linda and Andrew Balluta. 1992. *Nuvendaltin Quht'ana: The People of Nondalton*. Washington: Smithsonian Institution.

- Fall, James A, Molly B. Chythlook, Janet Schichnes, and Judith M. Morris. 1996. An Overview of the Harvest and Use of Freshwater Fish by the Communities of the Bristol Bay Region, Southwest Alaska. Alaska Department of Fish and Game, Division of Subsistence Technical Paper No. 166. Juneau.
- Fall, James A. and Judith M. Morris. 1987. Fish and Wildlife Harvests in Pilot Point, Ugashik, and Port Heiden, Alaska Peninsula, 1986-1987. Alaska Department of Fish and Game, Division of Subsistence Technical Paper No. 158. Juneau.
- Fall, James A. and Roland Shanks. 2000. Statewide Subsistence Fisheries Harvest Monitoring Strategy. Study Number FIS 00-017. Final Report. Alaska Department of Fish and Game, Division of Subsistence, and Alaska Inter-Tribal Council. Anchorage.
- Gasbarro, Anthony G. and George Utermohle. 1974. Unpublished field data, Bristol Bay Subsistence Survey. Files, Division of Subsistence, Alaska Department of Fish and Game. Anchorage.
- Holmes, R. 1994. The Burbot in Alaska. Alaska Department of Fish and Game, Wildlife Notebook Series (Revised and updated), Juneau.
- Hubartt, D. 1994. The Dolly Varden in Alaska. Alaska Department of Fish and Game, Wildlife Notebook Series (Revised and updated), Juneau.
- Huntington, Henry P. 1998. Observations on the Utility of the Semi-directive Interview for Documenting Traditional Ecological Knowledge. *Arctic* 51(3):237-242.
- Huntington, Henry P. and Nikolai I. Mymrin. 1996. Traditional Ecological Knowledge of Beluga Whales: An Indigenous Knowledge Pilot Project in the Chukchi and Northern Bering Seas. Anchorage: Inuit Circumpolar Conference.
- Interagency Social Science Task Force. 1998. Principles for the Conduct of Research in the Arctic.
- Krasnowski, P. 1987. Bristol Bay/Lower Kuskokwim Rainbow Trout Management Plan. Report to the Alaska Board of Fisheries. Alaska Department of Fish and Game, Division of Sport Fish. Anchorage.
- Kenner, Philippa Coiley, Molly B. Chythlook, James A. Fall, Louis Brown, and Charles J. Utermohle. 1999. Harvests of Fish Other Than Salmon by the Communities of Pedro Bay and Levelock, Southwest Alaska, April 1996 – March 1997. Alaska Department of Fish and Game, Division of Subsistence Technical Paper No. 247. Juneau.
- Kenner, Philippa Coiley. 2001. From Neqa to Tapa: A Database with Traditional Knowledge about the Fish of Bristol Bay Compact Disk Version 1.0. USFWS Office of Subsistence Management, Fisheries Resource Monitoring Program, Final Report No. FIS00-012, Anchorage, Alaska.



- Kenner, Philippa Coiley. 2003. From Neqa to Tapa: A Database with Traditional Knowledge about the Fish of Bristol Bay and the Northern Alaska Peninsula. Compact Disk Version 2.0. USFWS Office of Subsistence Management, Fisheries Resource Monitoring Program, Final Report No. FIS 01-109, Anchorage, Alaska.
- Krieg, Theodore M., Philippa Kenner, Lisa Hutchinson-Scarborough, and Louis Brown. 1996. Subsistence Harvests and Uses of Caribou, Moose, and Brown Bear in 12 Alaska Peninsula Communities, 1994/95. BBNA Natural Resource Department and Division of Subsistence ADF&G. Alaska Department of Fish and Game, Division of Subsistence Technical Paper No. 240. Juneau.
- Krieg, Theodore M., James A. Fall, Charles J. Utermohle, and Louis Brown. 1998. Subsistence Harvests and Uses of Caribou, Moose, and Brown Bear in 12 Alaska Peninsula Communities, 1995/96 and 1996/97. BBNA Natural Resource Department and Division of Subsistence, ADF&G. Alaska Department of Fish and Game, Division of Subsistence Technical Paper No. 244. Juneau.
- Krieg, Theodore M., Hans C. Nicholson, and Philippa Coiley-Kenner. 2004. Traditions, Knowledge, and Customs of the Alaska Peninsula/Becharof National Wildlife Refuge Complex and Aniakchak National Monument Subsistence Fishing Communities. USFWS Office of Subsistence Management, Fisheries Resource Monitoring Program, Final Report No. FIS 01-109, Anchorage, Alaska.
- Miraglia, Rita. 1998. Traditional Ecological Knowledge Handbook. Prepared for the *Exxon Valdez* Oil Spill Trustee Council under Restoration Project No. 97052B by the Alaska Department of Fish and Game, Division of Subsistence. Anchorage.
- Morris, Judith M.. 1986. Subsistence Production and Exchange in the Iliamna Lake Region, Southwest Alaska, 1982 – 1983. Alaska Department of Fish and Game, Division of Subsistence Technical Paper No. 136. Juneau.
- Morrow, J.E. 1980. The Freshwater Fishes of Alaska. Alaska Northwest Publishing Company. Anchorage.
- Rook, E.J.S. 2004. <http://www.rook.org/earl/bwca/nature/fish/osmerus.html> (describing rainbow smelt biology and habitat). Original materials copyright 1999 by Earl J.S. Rook.
- Scott, Cheryl, Louis B. Brown, Gretchen B. Jennings, and Charles J. Utermohle. 2001. Community Profile Database for Microsoft Access 2000. Version 3.12. Alaska Department of Fish and Game, Division of Subsistence. Juneau.
- Schmidt, A.E. 1994. The Brook Trout in Alaska. Alaska Department of Fish and Game, Wildlife Notebook Series (Revised and updated), Juneau.

Stickman, Karen, Andrew Balutta, Mary McBurney, and Dan Young. 2003. *K'ezghlegh*: Nondalton Traditional Ecological Knowledge of Freshwater Fish. Final Report. FIS Project 01.075.

Subsistence Fisheries Harvest Assessment Working Group [SFHAWG]. 2001. Statewide Subsistence Fisheries Harvest Monitoring Strategy: Final Report. Submitted to the Office of Subsistence Management, US Fish and Wildlife Service under Project No. FIS00-017. Alaska Department of Fish and Game, Division of Subsistence, and The Alaska Inter-Tribal Council. Anchorage.

US Bureau of the Census. 2001. Profiles of General Demographic Characteristics 2000: Alaska. 2001. US Department of Commerce. Washington, DC.

## FOOTNOTES

---

<sup>1</sup> Through 2003, State of Alaska subsistence fishing regulations required a subsistence permit for trout and char, but there was no effective program to issue and collect these permits. Beginning in 2003, federal subsistence regulations require a permit for rainbow trout for federally-managed waters. This program is in early stages of implementation.

<sup>2</sup> While this project was underway, another FIS-funded project, 01-075, conducted by the National Park Service, Lake Clark National Park and Preserve, investigated subsistence uses and traditional knowledge regarding fisheries resources at Nondalton (Stickman et al. 2003). Future development of searchable databases should consider including the findings from that research.

<sup>3</sup> This working group was formed under FIS project 00-017, "Statewide Subsistence Fisheries Harvest Monitoring Strategy." The SFHAWG included three representatives of ADF&G, three representatives of federal agencies, and five tribal members selected by the Alaska Inter-Tribal Council. The SFHAWG reviewed programs for collecting and reporting subsistence fisheries information, and developed a set of recommendations for "A Unified Subsistence Fisheries Harvest Assessment Program."

<sup>4</sup> Training local research assistants was a goal of this project and the research design called for relying on them for much of the data collection and project facilitation. Therefore, we have included in this overview considerable detail about BBNA and ADF&G staff efforts to implement the original design, the problems encountered in some communities, and the accommodations that were made in order to complete the project. Further observations about this process are offered in Chapter Four.

<sup>5</sup> Participating households were asked to record harvests as they occurred on the calendars, but as noted below, it was often necessary to collect the harvest data through recall interviews at the end of a quarter.

<sup>6</sup> Although all households in the communities including those that did not participate in the calendar portion of the survey were to be contacted, it appears that only the households that participated in the calendar collections also completed the final survey.

<sup>7</sup> *Neqa to Tepa* in the Yup'ik language is the generic name for "fish", *neqa*, to the making of "aging fish heads", *tepa*. *Luq'a to Chuqilin* in the Dena'ina Athabascan language is the name for "fish", *luq'a*, and its production into *chuqilin*. These phrases combine the knowledge of harvesting wild fish and its production into a local delicacies. The importance of both the wild fish and the knowledge of fish by the local people are connected in this phrase.





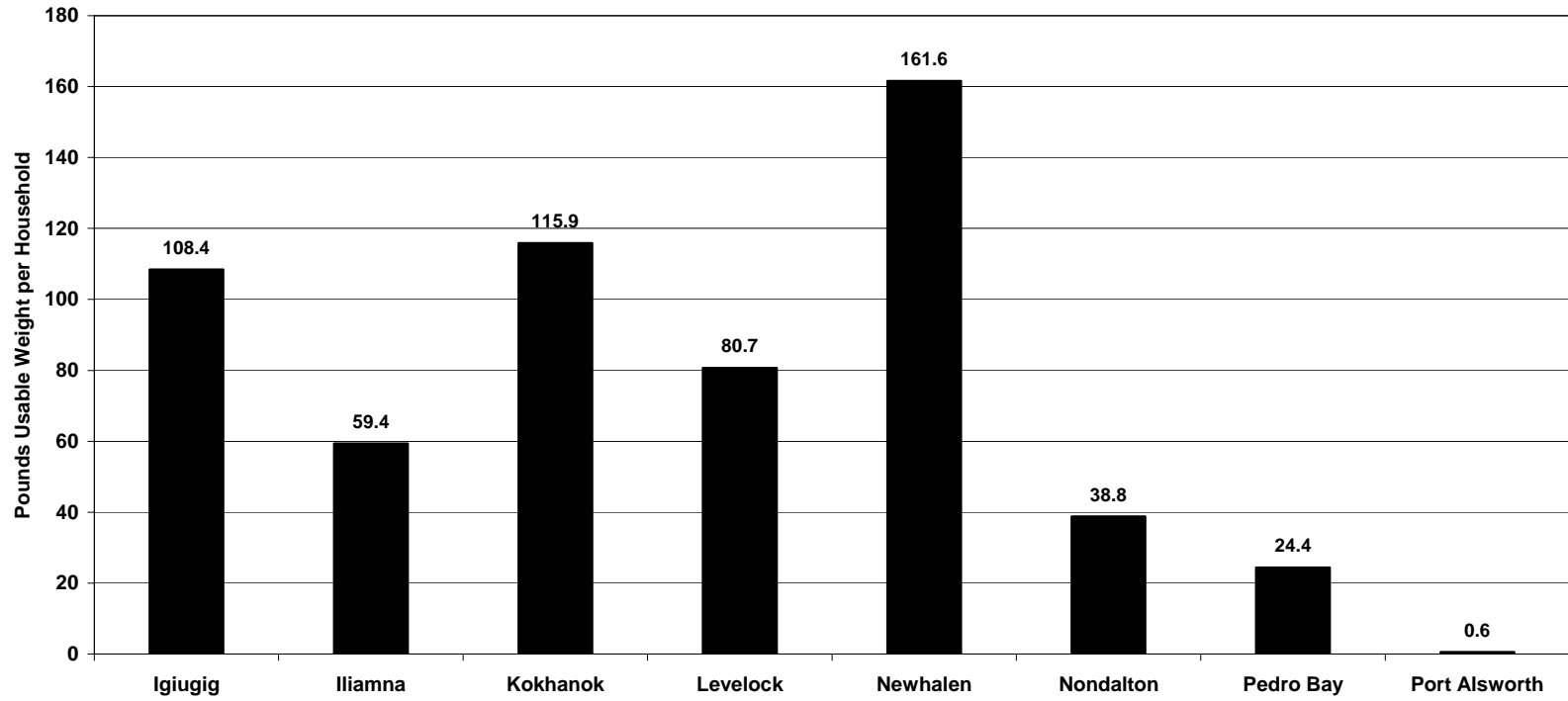


Figure 1, first page

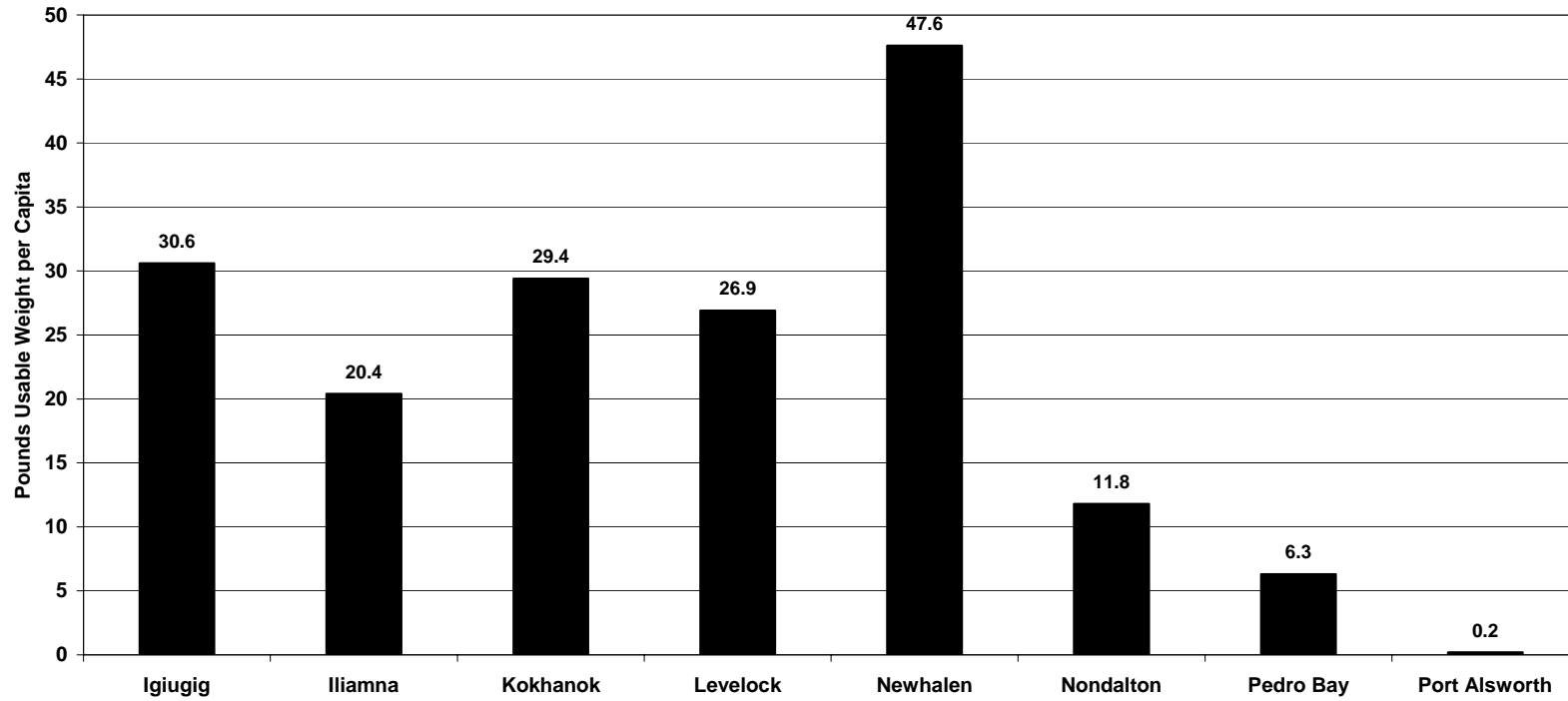
Figure 1, second page



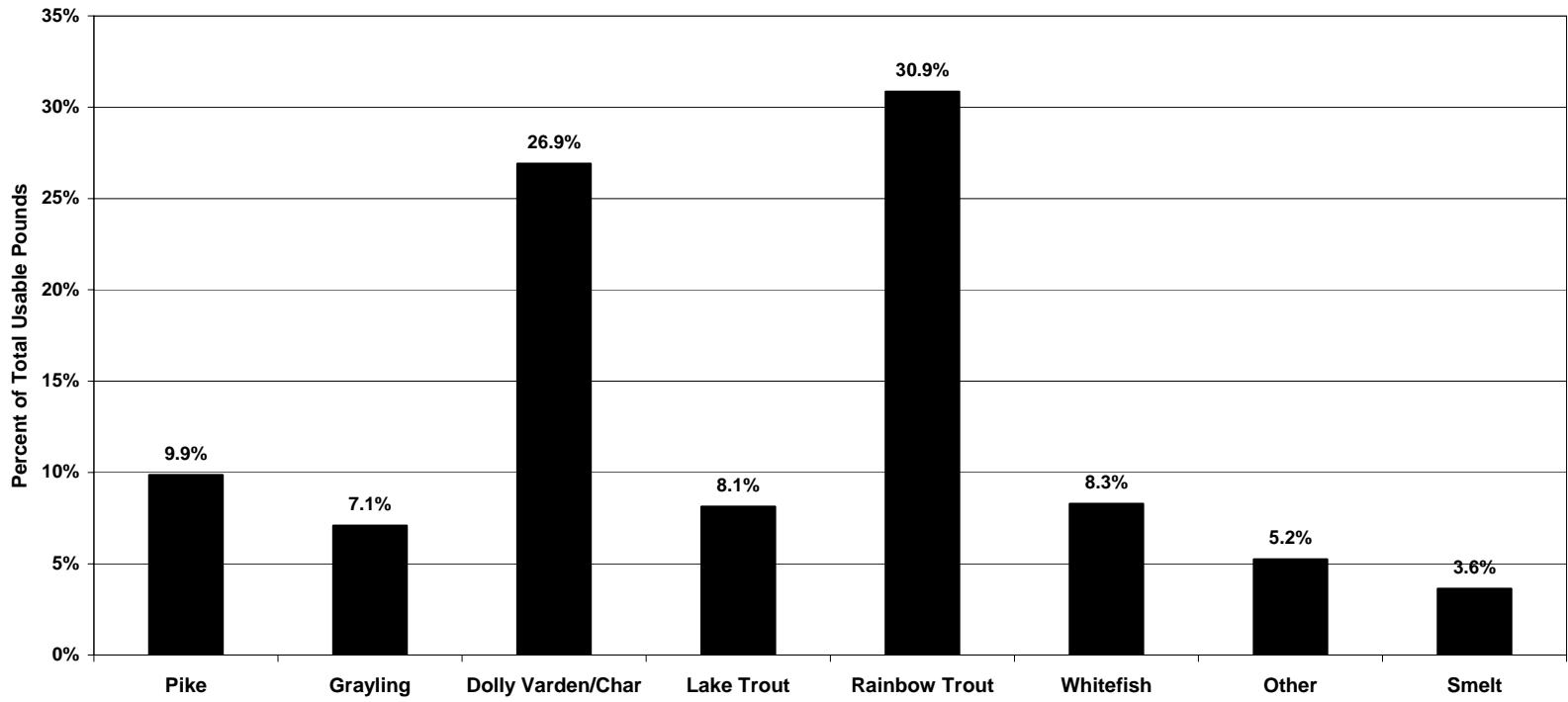
**Figure 7. Harvests of Nonsalmon Freshwater Fish, Pounds Usable Weight per Household, Study Communities, 2002/2003**



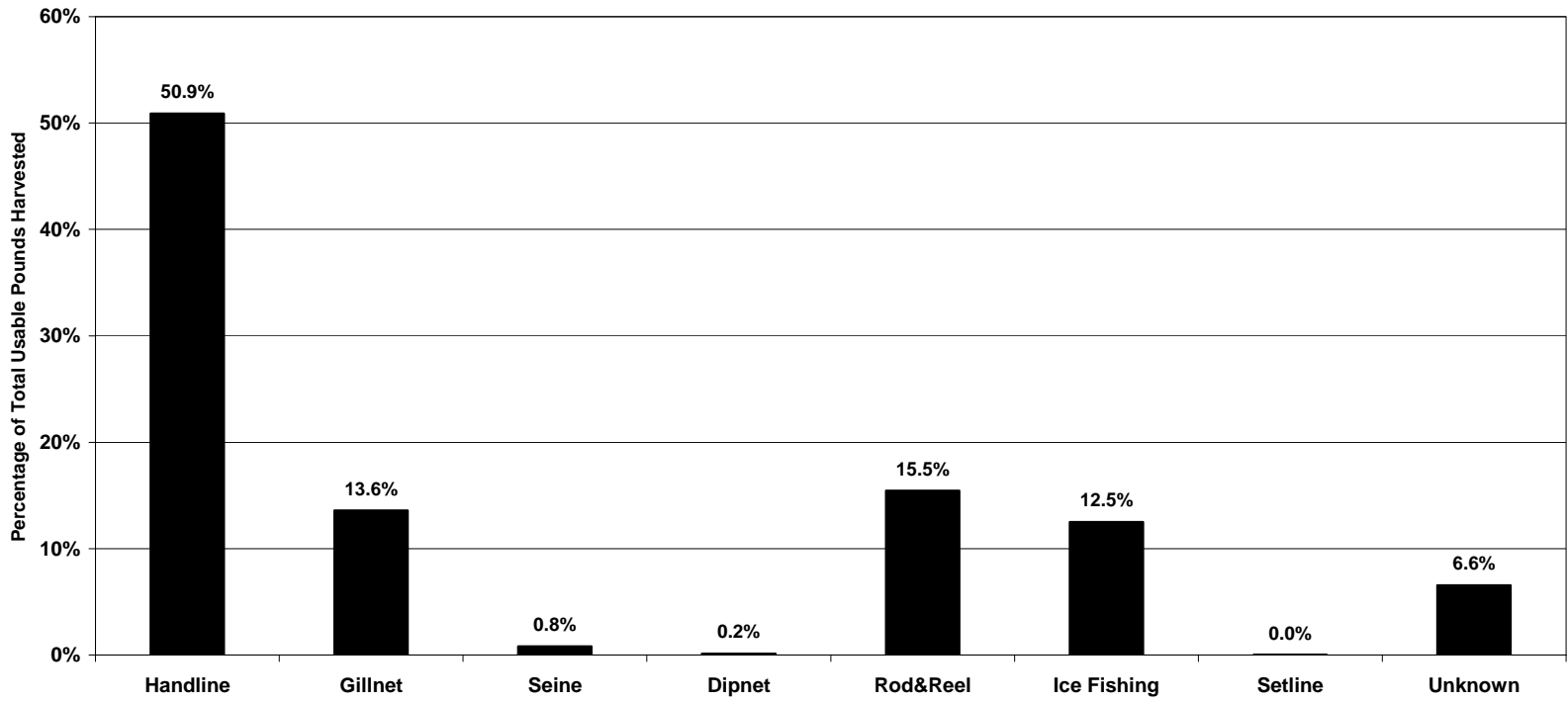
**Figure 8. Harvests of Nonsalmon Freshwater Fish, Pounds Usable Weight per Capita, Study Communities, 2002/2003**



**Figure 9. Composition of Nonsalmon Freshwater Fish Harvest, Kvichak Watershed Communities, 2002/2003**



**Figure 10. Percentage of Usable Pounds of Nonsalmon Freshwater Fish Harvested by Gear Type, Study Communities, 2002/2003**



**Figure 11. Harvests of Nonsalmon Freshwater Fish by Month, Kvichak Watershed Study Communities, 2002/2003**

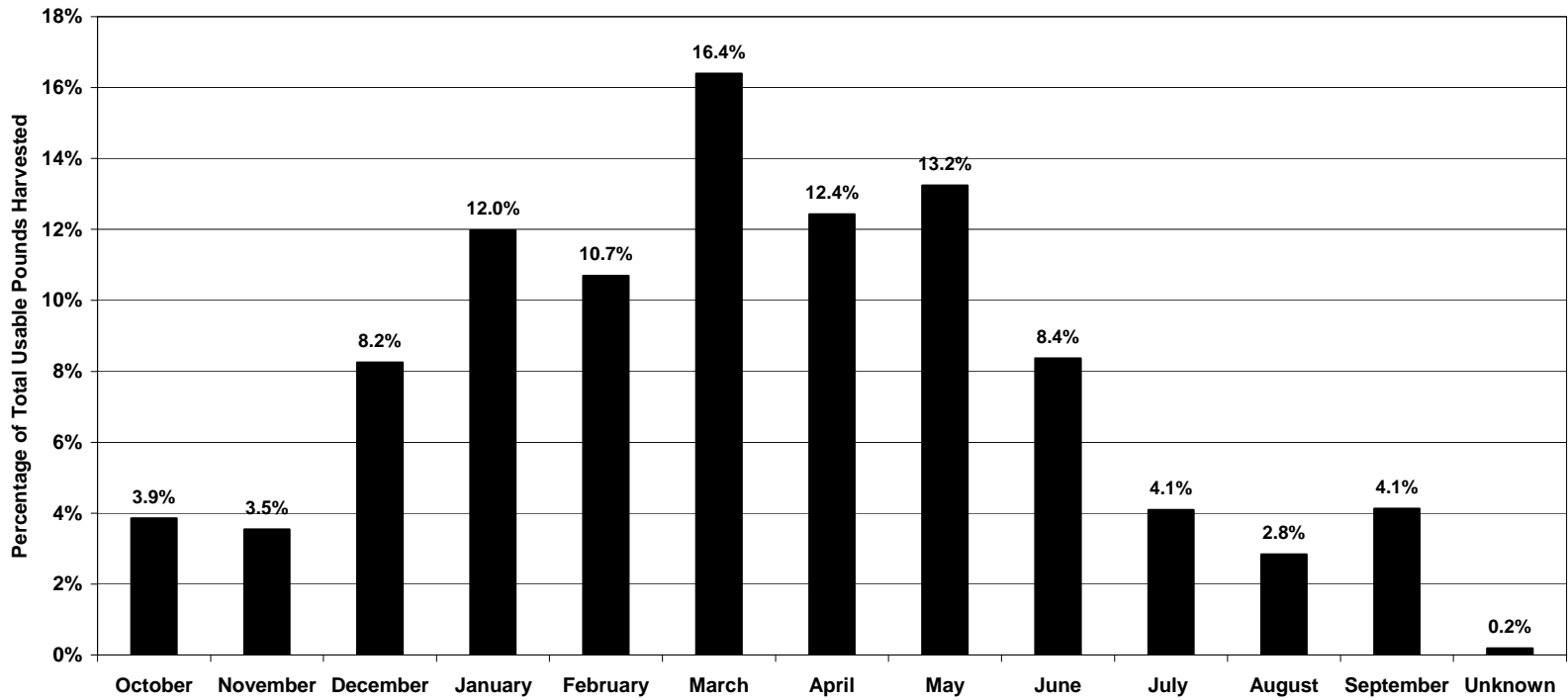
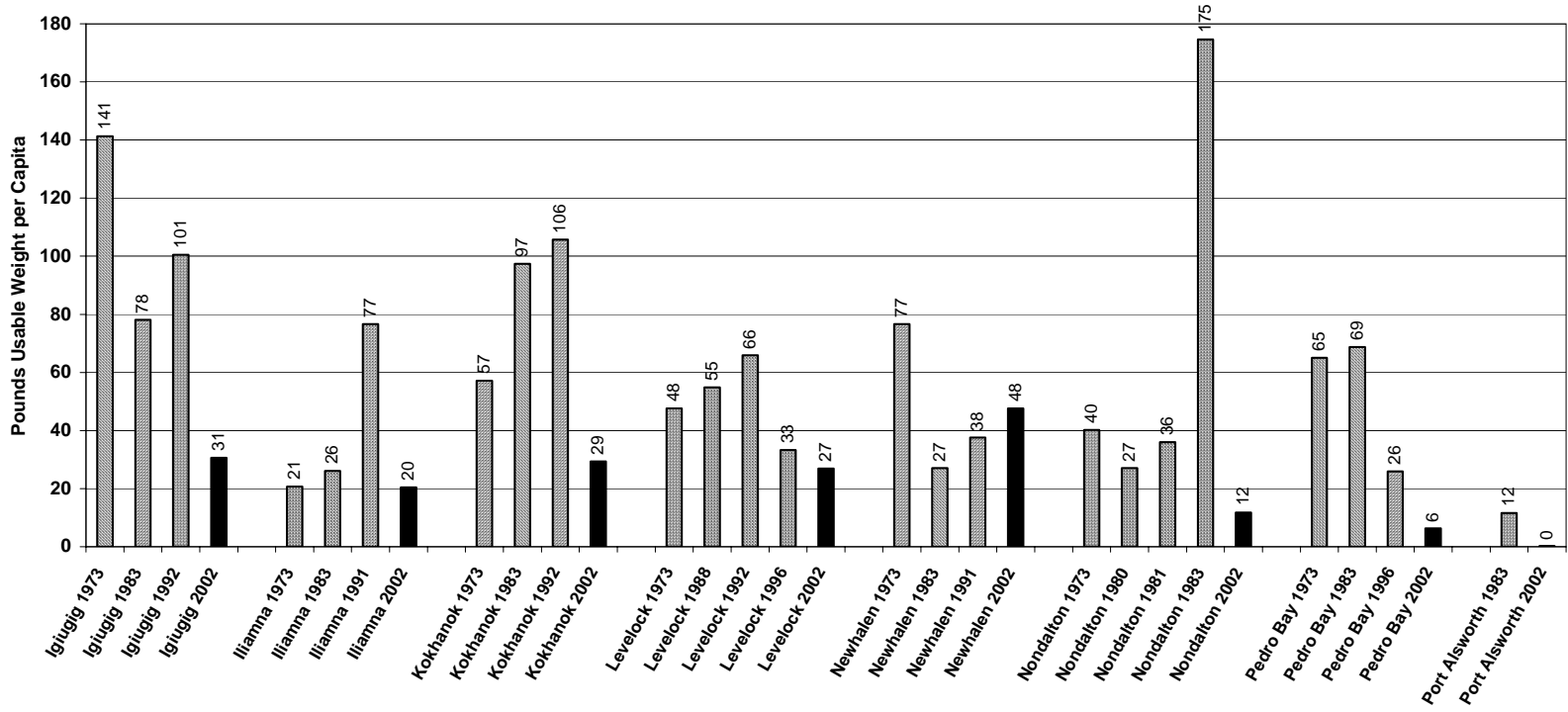


Figure 12. Estimated Harvests of Nonsalmon Freshwater Fish, Study Communities of the Kvichak Watershed, Pounds Per Capita



**Figure 13. Estimated Harvests of Nonsalmon Freshwater Fish in Pounds Usable Weight per Person, Kvichak Watershed Communities Combined, by Decade**

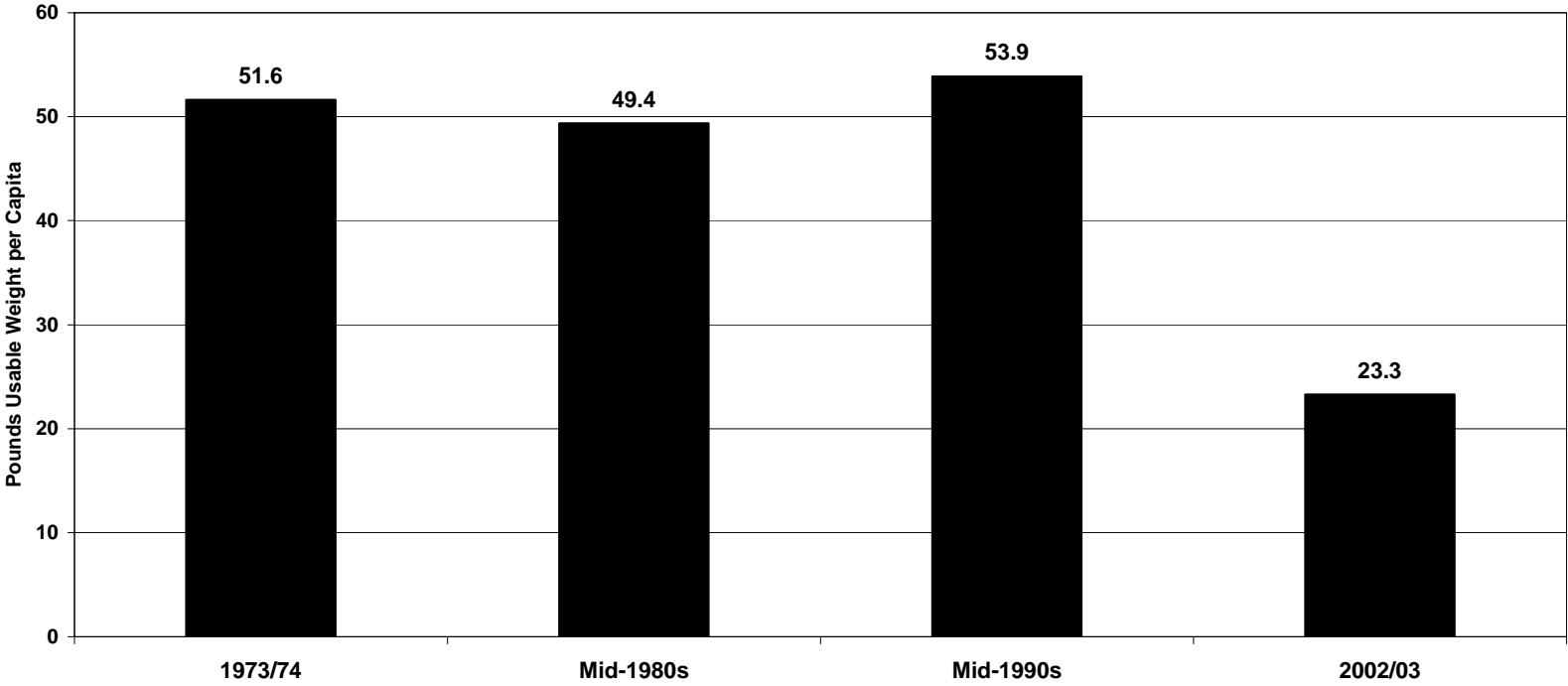
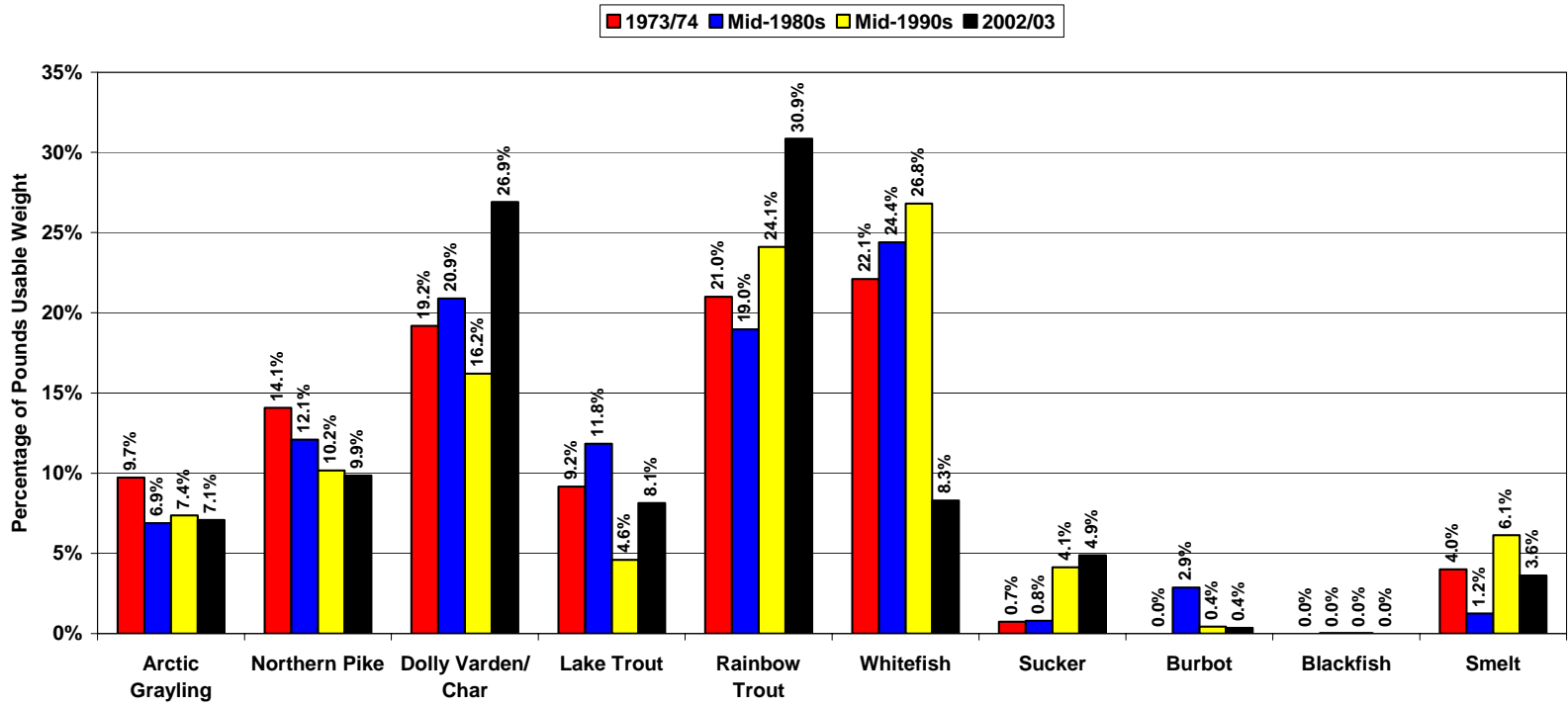


Figure 14. Composition of Nonsalmon Freshwater Fish Harvest, Kvichak Watershed Communities Combined, by Decade





f15



Fig 16, first page

figure 16, second page

f17



f19

125

f20



21f





























35

141









Table 2. Nonsalmon Finfish Used for Subsistence Purposes in the Kvichak/Iliamna Lake Area.

Common English Name	Scientific Name	Yup'ik Name	Dena'ina Name
Arctic Grayling	<i>Thymallus arcticus</i>	<i>Nakurllugpak</i> <i>Culugpak</i>	<i>Ch'dat'an</i>
		Levelock, Kokhanok	
Blackfish	<i>Dallia pectoralis</i>	<i>Can'giiq</i>	<i>Huzhegh</i>
Burbot, lingcod	<i>Lota lota</i>	<i>Manignaq</i>	<i>Ch'unya</i>
Trout and Char			
Dolly Varden	<i>Salvelinus malma</i>	<i>Yugyak</i>	<i>Qak'elay</i>
Arctic Char	<i>Salvelinus alpinus</i>		
Lake Trout	<i>Salvelinus namaycush</i>	<i>Cikignaq</i>	<i>Zhuk'udghuzha</i>
Rainbow Trout	<i>Oncorhynchus mykiss</i>	<i>Talaariq</i> <i>Tungulret Talaarit</i>	<i>Tuni</i>
		Igiugig--black rainbow trout	
Steelhead		<i>Quatelrit Tallaarvit</i>	
		Igiugig--large white rainbow trout	
Mountain trout			<i>Dghili Chuna</i>
		<i>Talariyarat</i> <i>Talaarit Mikcuavat</i>	
		Nondalton Igiugig--small rainbow trout Igiugig--small mountain trout	
Brook trout		<i>Maniqtacuarat</i>	
		Kokhanok	
Longnose Sucker	<i>Catostomus catostomus</i>	<i>Cungartak</i>	<i>Duch'ehdi</i>
Northern Pike	<i>Esox lucius</i>	<i>Cuukvak</i>	<i>Ghelguts'i</i>
Whitefish			
(Continued)			

Table 2. Continued

Common English Name	Scientific Name	Yup'ik Name		Dena'ina Name
Humpback Whitefish	<i>Coregonus pidschian</i>	<i>Uraruq</i>		<i>Q'untuq'</i>
Broad Whitefish	<i>Coregonus nasus</i>			<i>Telay</i>
Round Whitefish/Candlefish	<i>Prosopium cylindraceum</i>	<i>Cavirutnaq</i>	<i>Kokhanok, Newhalen</i>	<i>Hesten</i>
Pygmy Whitefish	<i>Prosopium coulteri</i>			
Least Cisco, herring	<i>Coregonus sardinella</i>	<i>Cavirutnaq</i>	<i>Levelock, Igiugig</i>	<i>Ghelguts'i k'una</i>
Rainbow Smelt	<i>Osmerus mordax</i>	<i>Iqalluaq</i> <i>Lituuliyak</i>	<i>Levelock (anadromous)</i> <i>Kokhanok</i>	

Source: Fall et al. 1996

Table 3. Uses and Harvests of Fish Other Than Salmon, Kvichak/Iliamna Lake Communities

Community	Year	Percentage of Households					Average Lbs Harvested		% of Total Harvest
		Use	Fish for Harvest	Receive	Give		Per HH	Per Person	
Igiugig	1973			83.3			683.0	141.3	16.2
	1983		100.0	100.0	0.0		494.5	78.1	12.6
	1992	100.0	100.0	100.0	80.0	80.0	392.0	100.5	12.4
Iliamna	1973			66.7			75.9	20.7	11.2
	1983		60.0	60.0	35.0		102.0	26.1	6.3
	1991	87.0	73.9	73.9	65.2	43.5	249.7	76.6	8.1
Kokhanok	1973			100.0			355.2	57.1	4.8
	1983		78.9	78.9	42.1		517.9	97.4	14.0
	1992	91.7	86.1	86.1	72.2	61.1	469.9	105.7	10.1
Levelock	1973			87.5			220.4	47.6	6.9
	1988	92.6	70.4	70.4	88.9	63.0	180.7	54.8	4.4
	1992	90.0	76.7	73.3	76.7	63.3	186.6	65.9	6.4
	1996	71.4	64.3	64.3	57.1	57.1	116.5	33.3	NA
Newhalen	1973			63.6			348.0	76.6	12.1
	1983		54.5	45.5	9.1		130.5	27.1	3.5
	1991	100.0	96.2	92.3	73.1	46.2	185.1	37.6	5.0
Nondalton	1973			80.8			210.5	40.2	5.2
	1980						130.0	27.1	2.6
	1981						204.9	36.0	4.9
	1983		90.5	90.5	23.8		906.4	174.6	14.9
Pedro Bay	1973			87.5			259.9	65.0	10.2
	1983		82.4	82.4	17.5		202.2	68.7	7.9
	1996	76.9	53.8	53.8	53.8	30.8	85.6	25.9	6.5
Port Alsworth	1983		61.5	61.5	7.7		42.0	11.6	3.2

Note: data are unavailable (not collected) for blank cells.

Source: Scott et al. 2001; Gasbarro and Utermohle 1974; Fall et al 1996:32

Table 4. Estimated Harvests of Freshwater Fish, Kvichak/Iliamna Lake Communities, 1973/74

Community	Arctic Grayling	Dolly Varden	Lake Trout	Longnose Sucker	Northern Pike	Rainbow Trout	Whitefish
Igiugig	923	273	0	133	427	1,115	1,480
Iliamna	202	643	8	0	30	64	53
Kokhanok	123	903	170	0	120	638	1,596
Levelock	141	44	0	0	268	384	1,217
Newhalen	587	1,130	268	0	232	1,536	30
Nondalton	1,782	62	730	0	281	273	1,607
Pedro Bay	0	655	594	0	3	51	0
Total	3,758	3,710	1,770	133	1,361	4,061	5,983

Source: Gasbarro and Utermohle 1974, as summarized in Fall et al. 1996:131

Table 5. Most Recent Estimates of Harvests of Non-Salmon Fish, Kvichak/Iliamna Lake Communities<sup>4</sup>  
(prior to this study)

Community	Study Year	Arctic Grayling	Blackfish	Burbot	Dolly Varden <sup>1</sup>	Lake Trout	Longnose Sucker	Northern Pike	Rainbow Trout <sup>2</sup>	Smelt <sup>3</sup>	Whitefish
Igiugig	1992	112	7	0	120	31	216	293	733	12g	956
Iliamna	1991	565	0	22	1,677	104	863	120	1,442	0	166
Kokhanok	1992	302	0	0	1,577	28	7	217	3,898	246g	7,280
Levelock	1996	232	0	0	0	0	0	253	631	150g	193
Newhalen	1991	593	0	0	1,318	111	151	345	1,311	0	354
Nondalton	1981	3,249		35		505		175	525	0	1,260
Pedro Bay	1996	0	0	0	231	73	6	0	218	0	0
Port Alsworth	1983	276	0	71	0	162	0	19	0	0	126
Total		5,329	7	128	4,923	1,014	1,243	1,422	8,758	408g	10,335

<sup>1</sup> Includes fish identified by respondents as Arctic char.

<sup>2</sup> Includes steelhead and "unknown trout" which might be lake trout or Dolly Varden

<sup>3</sup> g - gallons

<sup>4</sup> Excludes marine species; estimates for Nondalton for 1983 may be atypical, so 1981 is reported here (Fall et al. 1996:89)

Source: ADF&G 2001b

Table 6. Chronology of Activities

October 1, 2002	Start of Study Year
November 5 to 7, 2002	Village Assistant training in communities (except Pedro Bay)
February 2003	Training of Pedro Bay Assistant
March 2003	TEK interviews: Port Alsworth, Nondalton, Kokhanok
May 2003	TEK interviews: Pedro Bay, Newhalen, Iliamna
September 2003	TEK interviews: Levelock
September 30, 2003	End of Study Year
October 2003	Travel to communities to train local assistants and conduct post-season surveys and TEK interviews
January 2004	Last of surveys and calendars received

Table 7. Calendar Returns and Post Season Interviews

	First Quarter		Second Quarter		Third Quarter		Fourth Quarter		Post-Season Surveys	
	Oct. to Dec. 2002		Jan. to March 2003		April - June 2003		July - Sept. 2003		Households Present	Interviewed
	Households Present	Calenders Returned	Households Present	Calenders Returned	Households Present	Calenders Returned	Households Present	Calenders Returned		
Igiugig	13	10	12	12	12	12	12	12	12	12
Iliamna	28	27	28	26	28	2	28	24	28	0
Kokhanok	38	32	38	31	36	17	36	17	36	17
Levelock	23	20	25	15	26	18	28	20	28	18
Newhalen	42	38	42	29	42	29	42	29	42	29
Nondalton	46	35	44	37	44	36	43	35	43	34
Pedro Bay	18	18	17	17	17	17	16	7	16	7
Port Alsworth	31	25	31	25	31	29	31	24	31	24
Totals	239	205	237	192	236	160	236	168	236	141
Overall Return Rate	85.8%		81.0%		67.8%		71.2%		59.7%	



Table 8. List of Key Respondent Interviews

Community	Name of Interviewee	Date
Igiugig	Mike & Dallia Andrew	10/8/03
	George Wilson	10/9/03
	Mary Olympic	10/9/03
Iliamna	Rose Hedlund	5/8/03
	Tim Anelon	5/8/03
	Flora Johnson	5/8/03
Kokhanok	Gary Nielson	3/26/03
	Danny & Nellie Roehl	3/27/03
	Catherine, Gregory, & Nick Mike	3/27/03
Levelock	Nick Apokedak	9/24/03
	Charlie Andrew	9/24/03
	Brian & Mary Apokedak; Alex Tallekpallek	9/24/03
	Alex Tallekpallek	9/24/03
Newhalen	Evelyn, Greg, and Herman Anelon	5/8/03
Nondalton	Milton Delkittie	3/25/03
	Jack Hobson	3/26/03
	Mike Delkittie	3/26/03
Pedro Bay	Hazel Knighton	5/5/03
	George Jacko	5/8/03
Port Alsworth	Bryan Vincent	3/24/03
	Tony & Pat Sardenga	3/24/03
	Glen Alsworth Jr.	3/25/03

Table 9. Demographic Characteristics of Study Communities

Characteristic	Igiugig	Iliamna <sup>2</sup>	Kokhanok	Levelock	Newhalen	Nondalton	Pedro Bay	Port Alsworth
Number of Households								
Total	12	28	36	26	42	43	16	31
Sampled <sup>1</sup>	12	0	17	18	29	35	7	24
% Sampled	100.0%	0.0%	47.2%	69.2%	69.0%	81.4%	43.8%	77.4%
Household Size								
Mean	3.5	n/a	3.9	3.0	3.4	3.3	3.9	2.9
Minimum	1	n/a	1	1	1	1	1	1
Maximum	7	n/a	8	7	6	8	7	8
Sample Population	39	n/a	67	51	91	112	27	67
Estimated Community Population	43	81	142	78	142	142	62	90
Alaska Native Households								
Sample	11	n/a	17	17	26	34	6	4
Estimated	11	n/a	36	25	38	42	14	5
Percent of total households	91.7%	n/a	100.0%	94.4%	89.7%	97.1%	85.7%	16.7%

<sup>1</sup> Number of households interviewed with the post-season survey form. See Table 7.

<sup>2</sup> The US census for 2000 reported 35 households with 102 people for Iliamna, for an average household size of 2.91. This average was used to estimate the population size of Iliamna for analysis for this project.

Source: ADF&G Division of Subsistence and BBNA, Household Surveys, 2003

Table 10. Estimated Harvest and Use of Nonsalmon Freshwater Fish, Igiugig, October 1, 2002 - September 30, 2003

Resource	Percentage of Households					Pounds Harvested			Amount Harvested		Harvest
	Use	Attempt	Harvest	Receive	Give	Total	Mean HH	Per Capita	Total	Mean HH	Per Capita
Non-Salmon Fish	100.0%	100.0%	100.0%	63.6%	36.4%	1328.5	108.4	30.6	951.4	77.7	21.9
Pike	54.5%	54.5%	54.5%	27.3%	18.2%	104.1	8.5	2.4	37.2	3.0	0.9
Grayling	72.7%	81.8%	72.7%	0.0%	0.0%	87.5	7.1	2.0	125.0	10.2	2.9
Char	36.4%	54.5%	36.4%	0.0%	9.1%	156.8	12.8	3.6	112.0	9.1	2.6
Arctic Char	0.0%	0.0%	0.0%	0.0%	0.0%	0.0	0.0	0.0	0.0	0.0	0.0
Brook Trout	9.1%	9.1%	9.1%	0.0%	0.0%	14.0	1.1	0.3	10.0	0.8	0.2
Dolly Varden	36.4%	54.5%	36.4%	0.0%	9.1%	142.8	11.7	3.3	102.0	8.3	2.3
Lake Trout	0.0%	9.1%	0.0%	0.0%	0.0%	0.0	0.0	0.0	0.0	0.0	0.0
Trout	100.0%	100.0%	100.0%	45.5%	27.3%	486.8	39.7	11.2	347.7	28.4	8.0
Rainbow Trout	100.0%	100.0%	100.0%	45.5%	27.3%	381.8	31.2	8.8	272.7	22.3	6.3
Steelhead	18.2%	18.2%	18.2%	0.0%	9.1%	105.0	8.6	2.4	75.0	6.1	1.7
Unknown Trout	0.0%	0.0%	0.0%	0.0%	0.0%	0.0	0.0	0.0	0.0	0.0	0.0
Whitefish	63.6%	72.7%	63.6%	18.2%	9.1%	478.9	39.1	11.0	308.8	25.2	7.1
Round Whitefish	18.2%	18.2%	18.2%	0.0%	0.0%	15.0	1.2	0.3	15.0	1.2	0.3
Humpback Whitefish	45.5%	63.6%	45.5%	18.2%	9.1%	330.3	27.0	7.6	188.7	15.4	4.3
Least Cisco	0.0%	0.0%	0.0%	0.0%	0.0%	0.0	0.0	0.0	0.0	0.0	0.0
Broad Whitefish	0.0%	0.0%	0.0%	0.0%	0.0%	0.0	0.0	0.0	0.0	0.0	0.0
Unknown Whitefish	18.2%	18.2%	18.2%	0.0%	0.0%	133.7	10.9	3.1	105.1	8.6	2.4
Burbot	0.0%	0.0%	0.0%	0.0%	0.0%	0.0	0.0	0.0	0.0	0.0	0.0
Blackfish	9.1%	9.1%	9.1%	0.0%	9.1%	0.8	0.1	0.0	11.7	1.0	0.3
Sucker	36.4%	18.2%	18.2%	18.2%	0.0%	13.5	1.1	0.3	9.0	0.7	0.2
Smelt	27.3%	0.0%	0.0%	27.3%	9.1%	0.0	0.0	0.0	0.0	0.0	0.0
Rainbow Smelt	27.3%	0.0%	0.0%	27.3%	9.1%	0.0	0.0	0.0	0.0	0.0	0.0
Unknown Non-Salmon F	0.0%	0.0%	0.0%	0.0%	0.0%	0.0	0.0	0.0	0.0	0.0	0.0

Source: ADF&G Division of Subsistence and BBNA, harvest calendars and household surveys, 2002 & 2003

Table 11. Estimated Harvest and Use of Nonsalmon Freshwater Fish, Iliamna, October 1, 2002 - September 30, 2003

Resource	Percentage of Households <sup>1</sup>					Pounds Harvested			Amount Harvested		Harvest
	Use	Attempt	Harvest	Receive	Give	Total	Mean HH	Per Capita	Total	Mean HH	Per Capita
Non-Salmon Fish	100.0%	100.0%	100.0%	n.a.	n.a.	1662.5	59.4	20.4	1285.7	45.9	15.8
Pike	0.0%	0.0%	0.0%	n.a.	n.a.	0.0	0.0	0.0	0.0	0.0	0.0
Grayling	84.6%	84.6%	84.6%	n.a.	n.a.	170.5	6.1	2.1	243.5	8.7	3.0
Char	69.2%	69.2%	69.2%	n.a.	n.a.	725.7	25.9	8.9	518.4	18.5	6.4
Arctic Char	0.0%	0.0%	0.0%	n.a.	n.a.	0.0	0.0	0.0	0.0	0.0	0.0
Brook Trout	0.0%	0.0%	0.0%	n.a.	n.a.	0.0	0.0	0.0	0.0	0.0	0.0
Dolly Varden	69.2%	69.2%	69.2%	n.a.	n.a.	725.7	25.9	8.9	518.4	18.5	6.4
Lake Trout	0.0%	0.0%	0.0%	n.a.	n.a.	0.0	0.0	0.0	0.0	0.0	0.0
Trout	69.2%	69.2%	69.2%	n.a.	n.a.	220.8	7.9	2.7	157.7	5.6	1.9
Rainbow Trout	69.2%	69.2%	69.2%	n.a.	n.a.	220.8	7.9	2.7	157.7	5.6	1.9
Steelhead	0.0%	0.0%	0.0%	n.a.	n.a.	0.0	0.0	0.0	0.0	0.0	0.0
Unknown Trout	0.0%	0.0%	0.0%	n.a.	n.a.	0.0	0.0	0.0	0.0	0.0	0.0
Whitefish	7.7%	7.7%	7.7%	n.a.	n.a.	20.5	0.7	0.3	16.2	0.6	0.2
Round Whitefish	0.0%	0.0%	0.0%	n.a.	n.a.	0.0	0.0	0.0	0.0	0.0	0.0
Humpback Whitefish	0.0%	0.0%	0.0%	n.a.	n.a.	0.0	0.0	0.0	0.0	0.0	0.0
Least Cisco	0.0%	0.0%	0.0%	n.a.	n.a.	0.0	0.0	0.0	0.0	0.0	0.0
Broad Whitefish	0.0%	0.0%	0.0%	n.a.	n.a.	0.0	0.0	0.0	0.0	0.0	0.0
Unknown Whitefish	7.7%	7.7%	7.7%	n.a.	n.a.	20.5	0.7	0.3	16.2	0.6	0.2
Burbot	0.0%	0.0%	0.0%	n.a.	n.a.	0.0	0.0	0.0	0.0	0.0	0.0
Blackfish	0.0%	0.0%	0.0%	n.a.	n.a.	0.0	0.0	0.0	0.0	0.0	0.0
Sucker	7.7%	7.7%	7.7%	n.a.	n.a.	525.0	18.8	6.4	350.0	12.5	4.3
Smelt	0.0%	0.0%	0.0%	n.a.	n.a.	0.0	0.0	0.0	0.0	0.0	0.0
Rainbow Smelt	0.0%	0.0%	0.0%	n.a.	n.a.	0.0	0.0	0.0	0.0	0.0	0.0
Unknown Non-Salmon F	0.0%	0.0%	0.0%	n.a.	n.a.	0.0	0.0	0.0	0.0	0.0	0.0

<sup>1</sup> Post-season surveys were not administered in Iliamna. Therefore, data on households' receipt and giving away of resources are not available.

Source: ADF&G Division of Subsistence and BBNA, harvest calendars and household surveys, 2002 & 2003

Table 12. Estimated Harvest and Use of Nonsalmon Freshwater Fish, Kokhanok, October 1, 2002 - September 30, 2003

Resource	Percentage of Households					Pounds Harvested			Amount Harvested		Harvest
	Use	Attempt	Harvest	Receive	Give	Total	Mean HH	Per Capita	Total	Mean HH	Per Capita
Non-Salmon Fish	100.0%	96.0%	92.0%	48.0%	40.0%	4288.1	115.9	29.4	3051.0	82.5	20.9
Pike	32.0%	36.0%	32.0%	4.0%	12.0%	313.3	8.5	2.1	111.9	3.0	0.8
Grayling	28.0%	28.0%	28.0%	0.0%	0.0%	104.1	2.8	0.7	148.7	4.0	1.0
Char	80.0%	80.0%	80.0%	20.0%	36.0%	1829.2	49.4	12.5	1306.6	35.3	9.0
Arctic Char	12.0%	12.0%	12.0%	0.0%	0.0%	70.5	1.9	0.5	50.4	1.4	0.3
Brook Trout	12.0%	20.0%	8.0%	4.0%	4.0%	10.0	0.3	0.1	7.2	0.2	0.0
Dolly Varden	72.0%	72.0%	72.0%	8.0%	28.0%	1297.6	35.1	8.9	926.9	25.1	6.4
Lake Trout	52.0%	52.0%	52.0%	8.0%	16.0%	451.0	12.2	3.1	322.2	8.7	2.2
Trout	84.0%	80.0%	76.0%	20.0%	32.0%	1792.5	48.4	12.3	1280.3	34.6	8.8
Rainbow Trout	80.0%	76.0%	76.0%	16.0%	32.0%	1758.9	47.5	12.1	1256.3	34.0	8.6
Steelhead	12.0%	12.0%	8.0%	8.0%	4.0%	33.6	0.9	0.2	24.0	0.6	0.2
Unknown Trout	0.0%	4.0%	0.0%	0.0%	0.0%	0.0	0.0	0.0	0.0	0.0	0.0
Whitefish	36.0%	32.0%	24.0%	28.0%	16.0%	133.9	3.6	0.9	126.6	3.4	0.9
Round Whitefish	20.0%	24.0%	20.0%	12.0%	12.0%	117.0	3.2	0.8	117.0	3.2	0.8
Humpback Whitefish	24.0%	16.0%	8.0%	20.0%	4.0%	16.9	0.5	0.1	9.7	0.3	0.1
Least Cisco	0.0%	0.0%	0.0%	0.0%	0.0%	0.0	0.0	0.0	0.0	0.0	0.0
Broad Whitefish	0.0%	0.0%	0.0%	0.0%	0.0%	0.0	0.0	0.0	0.0	0.0	0.0
Unknown Whitefish	4.0%	0.0%	0.0%	4.0%	4.0%	0.0	0.0	0.0	0.0	0.0	0.0
Burbot	0.0%	0.0%	0.0%	0.0%	0.0%	0.0	0.0	0.0	0.0	0.0	0.0
Blackfish	0.0%	0.0%	0.0%	0.0%	0.0%	0.0	0.0	0.0	0.0	0.0	0.0
Sucker	4.0%	4.0%	4.0%	0.0%	0.0%	115.2	3.1	0.8	76.8	2.1	0.5
Smelt	12.0%	16.0%	0.0%	12.0%	8.0%	0.0	0.0	0.0	0.0	0.0	0.0
Rainbow Smelt	12.0%	16.0%	0.0%	12.0%	8.0%	0.0	0.0	0.0	0.0	0.0	0.0
Unknown Non-Salmon F	0.0%	0.0%	0.0%	0.0%	0.0%	0.0	0.0	0.0	0.0	0.0	0.0

Source: ADF&G Division of Subsistence and BBNA, harvest calendars and household surveys, 2002 & 2003

Table 13. Estimated Harvest and Use of Nonsalmon Freshwater Fish, Levelock, October 1, 2002 - September 30, 2003

Resource	Percentage of Households					Pounds Harvested			Amount Harvested		Harvest
	Use	Attempt	Harvest	Receive	Give	Total	Mean HH	Per Capita	Total	Mean HH	Per Capita
Non-Salmon Fish	100.0%	100.0%	92.3%	46.2%	84.6%	1937.2	80.7	26.9	3433.5	143.1	47.7
Pike	61.5%	46.2%	46.2%	23.1%	30.8%	506.6	21.1	7.0	180.9	7.5	2.5
Grayling	69.2%	76.9%	61.5%	15.4%	30.8%	78.7	3.3	1.1	112.5	4.7	1.6
Char	38.5%	38.5%	30.8%	7.7%	15.4%	24.5	1.0	0.3	17.5	0.7	0.2
Arctic Char	0.0%	0.0%	0.0%	0.0%	0.0%	0.0	0.0	0.0	0.0	0.0	0.0
Brook Trout	0.0%	0.0%	0.0%	0.0%	0.0%	0.0	0.0	0.0	0.0	0.0	0.0
Dolly Varden	30.8%	30.8%	23.1%	7.7%	15.4%	19.1	0.8	0.3	13.6	0.6	0.2
Lake Trout	23.1%	23.1%	15.4%	7.7%	0.0%	5.5	0.2	0.1	3.9	0.2	0.1
Trout	76.9%	76.9%	76.9%	15.4%	30.8%	358.0	14.9	5.0	255.7	10.7	3.6
Rainbow Trout	76.9%	76.9%	76.9%	15.4%	30.8%	358.0	14.9	5.0	255.7	10.7	3.6
Steelhead	0.0%	7.7%	0.0%	0.0%	0.0%	0.0	0.0	0.0	0.0	0.0	0.0
Unknown Trout	0.0%	0.0%	0.0%	0.0%	0.0%	0.0	0.0	0.0	0.0	0.0	0.0
Whitefish	53.8%	38.5%	23.1%	38.5%	15.4%	232.3	9.7	3.2	183.0	7.6	2.5
Round Whitefish	15.4%	15.4%	7.7%	7.7%	7.7%	1.3	0.1	0.0	1.3	0.1	0.0
Humpback Whitefish	0.0%	0.0%	0.0%	0.0%	0.0%	0.0	0.0	0.0	0.0	0.0	0.0
Least Cisco	0.0%	7.7%	0.0%	0.0%	0.0%	0.0	0.0	0.0	0.0	0.0	0.0
Broad Whitefish	38.5%	7.7%	0.0%	38.5%	15.4%	0.0	0.0	0.0	0.0	0.0	0.0
Unknown Whitefish	15.4%	15.4%	15.4%	0.0%	0.0%	231.0	9.6	3.2	181.7	7.6	2.5
Burbot	0.0%	0.0%	0.0%	0.0%	0.0%	0.0	0.0	0.0	0.0	0.0	0.0
Blackfish	0.0%	7.7%	0.0%	0.0%	0.0%	0.0	0.0	0.0	0.0	0.0	0.0
Sucker	23.1%	23.1%	15.4%	7.7%	0.0%	79.3	3.3	1.1	52.8	2.2	0.7
Smelt	61.5%	61.5%	61.5%	7.7%	53.8%	657.8	27.4	9.1	2631.0	109.6	36.5
Rainbow Smelt	61.5%	61.5%	61.5%	7.7%	53.8%	657.8	27.4	9.1	2631.0	109.6	36.5
Unknown Non-Salmon F	0.0%	0.0%	0.0%	0.0%	0.0%	0.0	0.0	0.0	0.0	0.0	0.0

Source: ADF&G Division of Subsistence and BBNA, harvest calendars and household surveys, 2002 & 2003

Table 14. Estimated Harvest and Use of Nonsalmon Freshwater Fish, Newhalen, October 1, 2002 - September 30, 2003

Resource	Percentage of Households					Pounds Harvested			Amount Harvested		Harvest
	Use	Attempt	Harvest	Receive	Give	Total	Mean HH	Per Capita	Total	Mean HH	Per Capita
Non-Salmon Fish	100.0%	100.0%	100.0%	39.0%	12.2%	6785.9	161.6	47.9	4989.9	118.8	35.3
Pike	39.0%	36.6%	31.7%	12.2%	4.9%	839.4	20.0	5.9	299.8	7.1	2.1
Grayling	78.0%	78.0%	78.0%	14.6%	7.3%	497.9	11.9	3.5	711.3	16.9	5.0
Char	78.0%	80.5%	78.0%	22.0%	7.3%	3016.1	71.8	21.3	2154.4	51.3	15.2
Arctic Char	0.0%	0.0%	0.0%	0.0%	0.0%	0.0	0.0	0.0	0.0	0.0	0.0
Brook Trout	26.8%	19.5%	19.5%	9.8%	2.4%	843.5	20.1	6.0	602.5	14.3	4.3
Dolly Varden	78.0%	75.6%	75.6%	19.5%	7.3%	1428.5	34.0	10.1	1020.4	24.3	7.2
Lake Trout	19.5%	19.5%	17.1%	7.3%	2.4%	744.1	17.7	5.3	531.5	12.7	3.8
Trout	97.6%	100.0%	97.6%	19.5%	9.8%	1976.4	47.1	14.0	1411.7	33.6	10.0
Rainbow Trout	97.6%	100.0%	97.6%	19.5%	9.8%	1570.8	37.4	11.1	1122.0	26.7	7.9
Steelhead	4.9%	2.4%	2.4%	2.4%	2.4%	405.5	9.7	2.9	289.7	6.9	2.0
Unknown Trout	0.0%	0.0%	0.0%	0.0%	0.0%	0.0	0.0	0.0	0.0	0.0	0.0
Whitefish	31.7%	17.1%	17.1%	19.5%	4.9%	401.0	9.5	2.8	357.7	8.5	2.5
Round Whitefish	22.0%	14.6%	14.6%	9.8%	2.4%	198.4	4.7	1.4	198.4	4.7	1.4
Humpback Whitefish	2.4%	0.0%	0.0%	2.4%	2.4%	0.0	0.0	0.0	0.0	0.0	0.0
Least Cisco	0.0%	0.0%	0.0%	0.0%	0.0%	0.0	0.0	0.0	0.0	0.0	0.0
Broad Whitefish	0.0%	0.0%	0.0%	0.0%	0.0%	0.0	0.0	0.0	0.0	0.0	0.0
Unknown Whitefish	12.2%	4.9%	4.9%	7.3%	0.0%	202.6	4.8	1.4	159.3	3.8	1.1
Burbot	12.2%	4.9%	4.9%	7.3%	2.4%	55.0	1.3	0.4	55.0	1.3	0.4
Blackfish	7.3%	0.0%	0.0%	7.3%	0.0%	0.0	0.0	0.0	0.0	0.0	0.0
Sucker	2.4%	0.0%	0.0%	2.4%	0.0%	0.0	0.0	0.0	0.0	0.0	0.0
Smelt	7.3%	0.0%	0.0%	7.3%	0.0%	0.0	0.0	0.0	0.0	0.0	0.0
Rainbow Smelt	7.3%	0.0%	0.0%	7.3%	0.0%	0.0	0.0	0.0	0.0	0.0	0.0
Unknown Non-Salmon F	0.0%	0.0%	0.0%	0.0%	0.0%	0.0	0.0	0.0	0.0	0.0	0.0

Source: ADF&G Division of Subsistence and BBNA, harvest calendars and household surveys, 2002 & 2003

Table 15. Estimated Harvest and Use of Nonsalmon Freshwater Fish, Nondalton, October 1, 2002 - September 30, 2003

Resource	Percentage of Households					Pounds Harvested			Amount Harvested		Harvest
	Use	Attempt	Harvest	Receive	Give	Total	Mean HH	Per Capita	Total	Mean HH	Per Capita
Non-Salmon Fish	94.4%	97.2%	83.3%	33.3%	27.8%	1716.4	38.8	11.8	1482.4	33.5	10.2
Pike	5.6%	16.7%	5.6%	0.0%	2.8%	20.1	0.5	0.1	7.2	0.2	0.0
Grayling	75.0%	86.1%	69.4%	16.7%	8.3%	346.7	7.8	2.4	495.3	11.2	3.4
Char	41.7%	44.4%	36.1%	16.7%	11.1%	312.9	7.1	2.1	223.5	5.1	1.5
Arctic Char	5.6%	5.6%	5.6%	0.0%	0.0%	101.6	2.3	0.7	72.5	1.6	0.5
Brook Trout	8.3%	16.7%	2.8%	8.3%	0.0%	34.4	0.8	0.2	24.6	0.6	0.2
Dolly Varden	2.8%	11.1%	2.8%	0.0%	0.0%	1.7	0.0	0.0	1.2	0.0	0.0
Lake Trout	36.1%	44.4%	33.3%	11.1%	11.1%	175.3	4.0	1.2	125.2	2.8	0.9
Trout	55.6%	61.1%	47.2%	16.7%	11.1%	635.6	14.4	4.4	454.0	10.3	3.1
Rainbow Trout	52.8%	58.3%	44.4%	16.7%	11.1%	615.6	13.9	4.2	439.7	9.9	3.0
Steelhead	0.0%	0.0%	0.0%	0.0%	0.0%	0.0	0.0	0.0	0.0	0.0	0.0
Unknown Trout	2.8%	2.8%	2.8%	0.0%	0.0%	20.0	0.5	0.1	14.3	0.3	0.1
Whitefish	61.1%	72.2%	52.8%	19.4%	5.6%	238.2	5.4	1.6	190.9	4.3	1.3
Round Whitefish	22.2%	22.2%	19.4%	5.6%	2.8%	17.1	0.4	0.1	17.1	0.4	0.1
Humpback Whitefish	2.8%	11.1%	0.0%	2.8%	2.8%	0.0	0.0	0.0	0.0	0.0	0.0
Least Cisco	0.0%	0.0%	0.0%	0.0%	0.0%	0.0	0.0	0.0	0.0	0.0	0.0
Broad Whitefish	13.9%	36.1%	0.0%	13.9%	0.0%	0.0	0.0	0.0	0.0	0.0	0.0
Unknown Whitefish	52.8%	52.8%	52.8%	0.0%	0.0%	221.1	5.0	1.5	173.8	3.9	1.2
Burbot	11.1%	16.7%	11.1%	2.8%	0.0%	8.6	0.2	0.1	8.6	0.2	0.1
Blackfish	0.0%	0.0%	0.0%	0.0%	0.0%	0.0	0.0	0.0	0.0	0.0	0.0
Sucker	22.2%	30.6%	22.2%	0.0%	0.0%	154.3	3.5	1.1	102.8	2.3	0.7
Smelt	0.0%	0.0%	0.0%	0.0%	0.0%	0.0	0.0	0.0	0.0	0.0	0.0
Rainbow Smelt	0.0%	0.0%	0.0%	0.0%	0.0%	0.0	0.0	0.0	0.0	0.0	0.0
Unknown Non-Salmon F	0.0%	0.0%	0.0%	0.0%	0.0%	0.0	0.0	0.0	0.0	0.0	0.0

Source: ADF&G Division of Subsistence and BBNA, harvest calendars and household surveys, 2002 & 2003



Table 16. Estimated Harvest and Use of Nonsalmon Freshwater Fish, Pedro Bay, October 1, 2002 - September 30, 2003

Resource	Percentage of Households					Pounds Harvested			Amount Harvested		Harvest
	Use	Attempt	Harvest	Receive	Give	Total	Mean HH	Per Capita	Total	Mean HH	Per Capita
Non-Salmon Fish	100.0%	100.0%	100.0%	25.0%	33.3%	415.4	24.4	6.3	294.7	17.3	4.5
Pike	16.7%	8.3%	8.3%	8.3%	8.3%	5.6	0.3	0.1	2.0	0.1	0.0
Grayling	8.3%	0.0%	0.0%	8.3%	8.3%	0.0	0.0	0.0	0.0	0.0	0.0
Char	91.7%	91.7%	91.7%	25.0%	25.0%	278.0	16.4	4.2	198.6	11.7	3.0
Arctic Char	8.3%	8.3%	8.3%	0.0%	0.0%	8.4	0.5	0.1	6.0	0.4	0.1
Brook Trout	0.0%	0.0%	0.0%	0.0%	0.0%	0.0	0.0	0.0	0.0	0.0	0.0
Dolly Varden	75.0%	75.0%	75.0%	25.0%	16.7%	188.8	11.1	2.9	134.9	7.9	2.1
Lake Trout	25.0%	25.0%	25.0%	8.3%	8.3%	80.8	4.8	1.2	57.7	3.4	0.9
Trout	91.7%	91.7%	91.7%	25.0%	8.3%	131.8	7.8	2.0	94.1	5.5	1.4
Rainbow Trout	91.7%	91.7%	91.7%	25.0%	8.3%	131.8	7.8	2.0	94.1	5.5	1.4
Steelhead	0.0%	0.0%	0.0%	0.0%	0.0%	0.0	0.0	0.0	0.0	0.0	0.0
Unknown Trout	0.0%	0.0%	0.0%	0.0%	0.0%	0.0	0.0	0.0	0.0	0.0	0.0
Whitefish	0.0%	0.0%	0.0%	0.0%	0.0%	0.0	0.0	0.0	0.0	0.0	0.0
Round Whitefish	0.0%	0.0%	0.0%	0.0%	0.0%	0.0	0.0	0.0	0.0	0.0	0.0
Humpback Whitefish	0.0%	0.0%	0.0%	0.0%	0.0%	0.0	0.0	0.0	0.0	0.0	0.0
Least Cisco	0.0%	0.0%	0.0%	0.0%	0.0%	0.0	0.0	0.0	0.0	0.0	0.0
Broad Whitefish	0.0%	0.0%	0.0%	0.0%	0.0%	0.0	0.0	0.0	0.0	0.0	0.0
Unknown Whitefish	0.0%	0.0%	0.0%	0.0%	0.0%	0.0	0.0	0.0	0.0	0.0	0.0
Burbot	16.7%	0.0%	0.0%	16.7%	0.0%	0.0	0.0	0.0	0.0	0.0	0.0
Blackfish	0.0%	0.0%	0.0%	0.0%	0.0%	0.0	0.0	0.0	0.0	0.0	0.0
Sucker	0.0%	0.0%	0.0%	0.0%	0.0%	0.0	0.0	0.0	0.0	0.0	0.0
Smelt	8.3%	0.0%	0.0%	8.3%	0.0%	0.0	0.0	0.0	0.0	0.0	0.0
Rainbow Smelt	8.3%	0.0%	0.0%	8.3%	0.0%	0.0	0.0	0.0	0.0	0.0	0.0
Unknown Non-Salmon F	0.0%	0.0%	0.0%	0.0%	0.0%	0.0	0.0	0.0	0.0	0.0	0.0

Source: ADF&G Division of Subsistence and BBNA, harvest calendars and household surveys, 2002 & 2003

Table 17. Estimated Harvest and Use of Nonsalmon Freshwater Fish, Port Alsworth, October 1, 2002 - September 30, 2003

Resource	Percentage of Households					Pounds Harvested			Amount Harvested		Harvest
	Use	Attempt	Harvest	Receive	Give	Total	Mean HH	Per Capita	Total	Mean HH	Per Capita
Non-Salmon Fish	100.0%	100.0%	37.5%	100.0%	0.0%	20.1	0.6	0.2	14.9	0.5	0.2
Pike	25.0%	25.0%	0.0%	25.0%	0.0%	0.0	0.0	0.0	0.0	0.0	0.0
Grayling	62.5%	62.5%	12.5%	62.5%	0.0%	0.7	0.0	0.0	1.1	0.0	0.0
Char	87.5%	87.5%	37.5%	87.5%	0.0%	19.4	0.6	0.2	13.9	0.4	0.2
Arctic Char	0.0%	0.0%	0.0%	0.0%	0.0%	0.0	0.0	0.0	0.0	0.0	0.0
Brook Trout	0.0%	0.0%	0.0%	0.0%	0.0%	0.0	0.0	0.0	0.0	0.0	0.0
Dolly Varden	12.5%	12.5%	0.0%	12.5%	0.0%	0.0	0.0	0.0	0.0	0.0	0.0
Lake Trout	87.5%	87.5%	37.5%	87.5%	0.0%	19.4	0.6	0.2	13.9	0.4	0.2
Trout	0.0%	0.0%	0.0%	0.0%	0.0%	0.0	0.0	0.0	0.0	0.0	0.0
Rainbow Trout	0.0%	0.0%	0.0%	0.0%	0.0%	0.0	0.0	0.0	0.0	0.0	0.0
Steelhead	0.0%	0.0%	0.0%	0.0%	0.0%	0.0	0.0	0.0	0.0	0.0	0.0
Unknown Trout	0.0%	0.0%	0.0%	0.0%	0.0%	0.0	0.0	0.0	0.0	0.0	0.0
Whitefish	37.5%	37.5%	0.0%	37.5%	0.0%	0.0	0.0	0.0	0.0	0.0	0.0
Round Whitefish	0.0%	0.0%	0.0%	0.0%	0.0%	0.0	0.0	0.0	0.0	0.0	0.0
Humpback Whitefish	37.5%	37.5%	0.0%	37.5%	0.0%	0.0	0.0	0.0	0.0	0.0	0.0
Least Cisco	0.0%	0.0%	0.0%	0.0%	0.0%	0.0	0.0	0.0	0.0	0.0	0.0
Broad Whitefish	0.0%	0.0%	0.0%	0.0%	0.0%	0.0	0.0	0.0	0.0	0.0	0.0
Unknown Whitefish	0.0%	0.0%	0.0%	0.0%	0.0%	0.0	0.0	0.0	0.0	0.0	0.0
Burbot	25.0%	25.0%	0.0%	25.0%	0.0%	0.0	0.0	0.0	0.0	0.0	0.0
Blackfish	0.0%	0.0%	0.0%	0.0%	0.0%	0.0	0.0	0.0	0.0	0.0	0.0
Sucker	0.0%	12.5%	0.0%	0.0%	0.0%	0.0	0.0	0.0	0.0	0.0	0.0
Smelt	0.0%	0.0%	0.0%	0.0%	0.0%	0.0	0.0	0.0	0.0	0.0	0.0
Rainbow Smelt	0.0%	0.0%	0.0%	0.0%	0.0%	0.0	0.0	0.0	0.0	0.0	0.0
Unknown Non-Salmon F	0.0%	0.0%	0.0%	0.0%	0.0%	0.0	0.0	0.0	0.0	0.0	0.0

Source: ADF&G Division of Subsistence and BBNA, harvest calendars and household surveys, 2002 & 2003

Table 18. Harvests of Nonsalmon Freshwater Fish in Pounds Usable Weight, Study Communities, 2002/2003

	Igiugig	Iliamna	Kokhanok	Levelock	Newhalen	Nondalton	Pedro Bay	Port Alsworth	Region totals	Percentage of Regional Total
Pike	104	0	313	507	839	20	6	0	1,789	9.9%
Grayling	88	170	104	79	498	347	0	1	1,286	7.1%
Dolly Varden/Char <sup>1</sup>	157	726	1,378	19	2,272	138	197	0	4,887	26.9%
Lake Trout	0	0	451	5	744	175	81	19	1,476	8.1%
Rainbow Trout <sup>2</sup>	487	221	1,792	358	1,976	636	132	0	5,602	30.9%
Whitefish <sup>3</sup>	479	21	134	232	401	238	0	0	1,505	8.3%
Burbot	0	0	0	0	55	9	0	0	64	0.4%
Blackfish	1	0	0	0	0	0	0	0	1	<.01%
Sucker	14	525	115	79	0	154	0	0	887	4.9%
Rainbow Smelt	0	0	0	658	0	0	0	0	658	3.6%
<b>Total</b>	<b>1,328</b>	<b>1,662</b>	<b>4,288</b>	<b>1,937</b>	<b>6,786</b>	<b>1,716</b>	<b>415</b>	<b>20</b>	<b>18,154</b>	

<sup>1</sup> Includes Arctic Char, Brook Trout, and Dolly Varden

<sup>2</sup> Includes Rainbow Trout, Steelhead, and unknown Trout

<sup>3</sup> Includes round whitefish ("candle fish"), humpback whitefish, least cisco, broad whitefish, and unknown whitefish

Source: ADF&G Division of Subsistence and BBNA, Harvest Calendars and Household Surveys, 2002 & 2003

Table 19. Estimated Harvest of Nonsalmon Freshwater Fish in Numbers by Gear, Igiugig, October 1, 2002 - September 30, 2003

Resource	Estimated Number of Fish Harvested								Total Harvest
	Handline	Gillnet	Seine	Dipnet	Rod&Reel	Ice Fishing	Setline	Unknown	
Non-Salmon Fish									
Pike	0.0	23.2	0.0	0.0	0.0	14.0	0.0	0.0	37.2
Grayling	0.0	7.0	0.0	0.0	53.0	65.0	0.0	0.0	125.0
Char	0.0	0.0	0.0	0.0	10.0	102.0	0.0	0.0	112.0
Arctic Char	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Brook Trout	0.0	0.0	0.0	0.0	10.0	0.0	0.0	0.0	10.0
Dolly Varden	0.0	0.0	0.0	0.0	0.0	102.0	0.0	0.0	102.0
Lake Trout	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Trout	0.0	29.3	0.0	0.0	11.7	306.8	0.0	0.0	347.7
Rainbow Trout	0.0	19.3	0.0	0.0	11.7	241.8	0.0	0.0	272.7
Steelhead	0.0	10.0	0.0	0.0	0.0	65.0	0.0	0.0	75.0
Unknown Trout	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Whitefish	0.0	209.3	84.5	0.0	0.0	15.0	0.0	0.0	308.8
Round Whitefish	0.0	0.0	0.0	0.0	0.0	15.0	0.0	0.0	15.0
Humpback Whitefish	0.0	104.2	84.5	0.0	0.0	0.0	0.0	0.0	188.7
Least Cisco	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Broad Whitefish	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Unknown Whitefish	0.0	105.1	0.0	0.0	0.0	0.0	0.0	0.0	105.1
Burbot	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Blackfish	0.0	0.0	0.0	11.7	0.0	0.0	0.0	0.0	11.7
Sucker	0.0	9.0	0.0	0.0	0.0	0.0	0.0	0.0	9.0
Smelt	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rainbow Smelt	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Unknown Non-Salmon F	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Source: ADF&G Division of Subsistence and BBNA, harvest calendars and household surveys, 2002 & 2003

Table 20. Estimated Harvest of Nonsalmon Freshwater Fish in Numbers by Gear, Iliamna, October 1, 2002 - September 30, 2003

Resource	Estimated Number of Fish Harvested								Total Harvest
	Handline	Gillnet	Seine	Dipnet	Rod&Reel	Ice Fishing	Setline	Unknown	
Non-Salmon Fish									
Pike	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Grayling	57.1	23.3	0.0	0.0	45.9	96.8	0.0	20.5	243.5
Char	314.5	0.0	0.0	0.0	10.5	150.3	0.0	43.1	518.4
Arctic Char	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Brook Trout	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Dolly Varden	314.5	0.0	0.0	0.0	10.5	150.3	0.0	43.1	518.4
Lake Trout	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Trout	26.9	0.0	0.0	0.0	35.6	55.3	0.0	39.8	157.7
Rainbow Trout	26.9	0.0	0.0	0.0	35.6	55.3	0.0	39.8	157.7
Steelhead	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Unknown Trout	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Whitefish	16.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	16.2
Round Whitefish	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Humpback Whitefish	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Least Cisco	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Broad Whitefish	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Unknown Whitefish	16.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	16.2
Burbot	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Blackfish	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sucker	0.0	350.0	0.0	0.0	0.0	0.0	0.0	0.0	350.0
Smelt	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rainbow Smelt	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Unknown Non-Salmon F	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Source: ADF&G Division of Subsistence and BBNA, harvest calendars and household surveys, 2002 & 2003

Table 21. Estimated Harvest of Nonsalmon Freshwater Fish in Numbers by Gear, Kokhanok, October 1, 2002 - September 30, 2003

Resource	Estimated Number of Fish Harvested								Total Harvest
	Handline	Gillnet	Seine	Dipnet	Rod&Reel	Ice Fishing	Setline	Unknown	
Non-Salmon Fish									
Pike	59.1	4.8	0.0	9.6	0.0	38.4	0.0	0.0	111.9
Grayling	132.9	0.0	0.0	0.0	4.8	0.0	0.0	11.0	148.7
Char	608.5	160.8	0.0	0.0	397.5	57.6	0.0	82.2	1306.6
Arctic Char	2.4	0.0	0.0	0.0	0.0	48.0	0.0	0.0	50.4
Brook Trout	0.0	0.0	0.0	0.0	4.8	0.0	0.0	2.4	7.2
Dolly Varden	385.1	93.6	0.0	0.0	377.1	9.6	0.0	61.5	926.9
Lake Trout	221.0	67.2	0.0	0.0	15.6	0.0	0.0	18.3	322.2
Trout	670.6	62.4	0.0	0.0	463.3	43.2	0.0	40.9	1280.3
Rainbow Trout	670.6	62.4	0.0	0.0	458.5	24.0	0.0	40.9	1256.3
Steelhead	0.0	0.0	0.0	0.0	4.8	19.2	0.0	0.0	24.0
Unknown Trout	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Whitefish	99.1	13.1	0.0	0.0	14.4	0.0	0.0	0.0	126.6
Round Whitefish	91.9	10.7	0.0	0.0	14.4	0.0	0.0	0.0	117.0
Humpback Whitefish	7.3	2.4	0.0	0.0	0.0	0.0	0.0	0.0	9.7
Least Cisco	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Broad Whitefish	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Unknown Whitefish	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Burbot	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Blackfish	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sucker	0.0	76.8	0.0	0.0	0.0	0.0	0.0	0.0	76.8
Smelt	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rainbow Smelt	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Unknown Non-Salmon F	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Source: ADF&G Division of Subsistence and BBNA, harvest calendars and household surveys, 2002 & 2003

Table 22. Estimated Harvest of Nonsalmon Freshwater Fish in Numbers by Gear, Levelock, October 1, 2002 - September 30, 2003

Resource	Estimated Number of Fish Harvested								Total Harvest
	Handline	Gillnet	Seine	Dipnet	Rod&Reel	Ice Fishing	Setline	Unknown	
Non-Salmon Fish									
Pike	0.0	55.5	0.0	0.0	87.1	38.3	0.0	0.0	180.9
Grayling	0.0	14.5	0.0	0.0	38.5	49.1	0.0	10.4	112.5
Char	0.0	6.7	0.0	0.0	7.8	3.1	0.0	0.0	17.5
Arctic Char	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Brook Trout	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Dolly Varden	0.0	6.7	0.0	0.0	3.9	3.1	0.0	0.0	13.6
Lake Trout	0.0	0.0	0.0	0.0	3.9	0.0	0.0	0.0	3.9
Trout	0.0	112.6	0.0	0.0	73.2	49.1	0.0	20.8	255.7
Rainbow Trout	0.0	112.6	0.0	0.0	73.2	49.1	0.0	20.8	255.7
Steelhead	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Unknown Trout	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Whitefish	0.0	181.7	0.0	0.0	1.3	0.0	0.0	0.0	183.0
Round Whitefish	0.0	0.0	0.0	0.0	1.3	0.0	0.0	0.0	1.3
Humpback Whitefish	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Least Cisco	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Broad Whitefish	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Unknown Whitefish	0.0	181.7	0.0	0.0	0.0	0.0	0.0	0.0	181.7
Burbot	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Blackfish	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sucker	0.0	52.8	0.0	0.0	0.0	0.0	0.0	0.0	52.8
Smelt	0.0	0.0	0.0	0.0	0.0	2631.0	0.0	0.0	2631.0
Rainbow Smelt	0.0	0.0	0.0	0.0	0.0	2631.0	0.0	0.0	2631.0
Unknown Non-Salmon F	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Source: ADF&G Division of Subsistence and BBNA, harvest calendars and household surveys, 2002 & 2003

Table 23. Estimated Harvest of Nonsalmon Freshwater Fish in Numbers by Gear, Newhalen, October 1, 2002 - September 30, 2003

Resource	Estimated Number of Fish Harvested								Total Harvest
	Handline	Gillnet	Seine	Dipnet	Rod&Reel	Ice Fishing	Setline	Unknown	
Non-Salmon Fish									
Pike	269.4	0.0	0.0	0.0	15.9	0.0	0.0	14.5	299.8
Grayling	493.5	4.4	0.0	0.0	40.2	29.0	0.0	144.2	711.3
Char	1636.6	42.0	0.0	0.0	68.1	35.8	0.0	371.9	2154.4
Arctic Char	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Brook Trout	544.6	0.0	0.0	0.0	0.0	0.0	0.0	57.9	602.5
Dolly Varden	734.3	42.0	0.0	0.0	39.2	35.8	0.0	169.1	1020.4
Lake Trout	357.7	0.0	0.0	0.0	29.0	0.0	0.0	144.8	531.5
Trout	1217.8	60.8	0.0	0.0	57.6	29.0	0.0	46.5	1411.7
Rainbow Trout	928.1	60.8	0.0	0.0	57.6	29.0	0.0	46.5	1122.0
Steelhead	289.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	289.7
Unknown Trout	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Whitefish	328.8	14.5	0.0	0.0	0.0	0.0	0.0	14.5	357.7
Round Whitefish	183.9	0.0	0.0	0.0	0.0	0.0	0.0	14.5	198.4
Humpback Whitefish	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Least Cisco	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Broad Whitefish	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Unknown Whitefish	144.8	14.5	0.0	0.0	0.0	0.0	0.0	0.0	159.3
Burbot	55.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	55.0
Blackfish	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sucker	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Smelt	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rainbow Smelt	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Unknown Non-Salmon F	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Source: ADF&G Division of Subsistence and BBNA, harvest calendars and household surveys, 2002 & 2003



Table 24. Estimated Harvest of Nonsalmon Freshwater Fish in Numbers by Gear, Nondalton, October 1, 2002 - September 30, 2003

Resource	Estimated Number of Fish Harvested								Total Harvest
	Handline	Gillnet	Seine	Dipnet	Rod&Reel	Ice Fishing	Setline	Unknown	
Non-Salmon Fish									
Pike	0.0	5.9	0.0	0.0	0.0	0.0	0.0	1.2	7.2
Grayling	276.8	0.0	0.0	0.0	166.2	0.0	0.0	52.4	495.3
Char	215.0	0.0	0.0	0.0	3.7	2.4	1.2	1.2	223.5
Arctic Char	71.4	0.0	0.0	0.0	0.0	1.2	0.0	0.0	72.5
Brook Trout	24.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24.6
Dolly Varden	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.2
Lake Trout	117.9	0.0	0.0	0.0	3.7	1.2	1.2	1.2	125.2
Trout	165.7	14.3	0.0	0.0	274.0	0.0	0.0	0.0	454.0
Rainbow Trout	165.7	0.0	0.0	0.0	274.0	0.0	0.0	0.0	439.7
Steelhead	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Unknown Trout	0.0	14.3	0.0	0.0	0.0	0.0	0.0	0.0	14.3
Whitefish	165.4	6.1	0.0	0.0	12.2	0.0	1.2	6.0	190.9
Round Whitefish	9.8	0.0	0.0	0.0	4.9	0.0	0.0	2.4	17.1
Humpback Whitefish	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Least Cisco	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Broad Whitefish	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Unknown Whitefish	155.6	6.1	0.0	0.0	7.3	0.0	1.2	3.6	173.8
Burbot	5.0	0.0	0.0	0.0	0.0	0.0	1.2	2.4	8.6
Blackfish	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sucker	9.8	93.0	0.0	0.0	0.0	0.0	0.0	0.0	102.8
Smelt	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rainbow Smelt	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Unknown Non-Salmon F	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Source: ADF&G Division of Subsistence and BBNA, harvest calendars and household surveys, 2002 & 2003

Table 25. Estimated Harvest of Nonsalmon Freshwater Fish in Numbers by Gear, Pedro Bay, October 1, 2002 - September 30, 2003

Resource	Estimated Number of Fish Harvested								Total Harvest
	Handline	Gillnet	Seine	Dipnet	Rod&Reel	Ice Fishing	Setline	Unknown	
Non-Salmon Fish									
Pike	0.0	0.0	0.0	0.0	0.0	2.0	0.0	0.0	2.0
Grayling	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Char	34.0	10.0	0.0	0.0	119.6	0.0	0.0	35.0	198.6
Arctic Char	0.0	6.0	0.0	0.0	0.0	0.0	0.0	0.0	6.0
Brook Trout	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Dolly Varden	26.0	0.0	0.0	0.0	73.9	0.0	0.0	35.0	134.9
Lake Trout	8.0	4.0	0.0	0.0	45.7	0.0	0.0	0.0	57.7
Trout	19.0	16.0	0.0	0.0	56.1	0.0	0.0	3.0	94.1
Rainbow Trout	19.0	16.0	0.0	0.0	56.1	0.0	0.0	3.0	94.1
Steelhead	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Unknown Trout	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Whitefish	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Round Whitefish	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Humpback Whitefish	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Least Cisco	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Broad Whitefish	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Unknown Whitefish	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Burbot	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Blackfish	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sucker	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Smelt	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rainbow Smelt	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Unknown Non-Salmon F	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Source: ADF&G Division of Subsistence and BBNA, harvest calendars and household surveys, 2002 & 2003

Table 26. Estimated Harvest of Nonsalmon Freshwater Fish in Numbers by Gear, Port Alsworth, October 1, 2002 - September 30, 20

Resource	Estimated Number of Fish Harvested								Total Harvest
	Handline	Gillnet	Seine	Dipnet	Rod&Reel	Ice Fishing	Setline	Unknown	
Non-Salmon Fish									
Pike	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Grayling	0.0	0.0	0.0	0.0	1.1	0.0	0.0	0.0	1.1
Char	0.0	0.0	0.0	0.0	13.9	0.0	0.0	0.0	13.9
Arctic Char	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Brook Trout	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Dolly Varden	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Lake Trout	0.0	0.0	0.0	0.0	13.9	0.0	0.0	0.0	13.9
Trout	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rainbow Trout	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Steelhead	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Unknown Trout	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Whitefish	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Round Whitefish	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Humpback Whitefish	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Least Cisco	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Broad Whitefish	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Unknown Whitefish	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Burbot	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Blackfish	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sucker	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Smelt	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rainbow Smelt	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Unknown Non-Salmon F	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Source: ADF&G Division of Subsistence and BBNA, harvest calendars and household surveys, 2002 & 2003

Table 27. Estimated Harvest of Nonsalmon Freshwater Fish in Pounds by Gear, Igiugig, October 1, 2002 - September 30, 2003

Resource	Estimated Pounds of Fish Harvested								Total Harvest
	Handline	Gillnet	Seine	Dipnet	Rod&Reel	Ice Fishing	Setline	Unknown	
Non-Salmon Fish	0.0	440.4	147.9	0.8	67.4	672.0	0.0	0.0	1328.5
Pike	0.0	64.9	0.0	0.0	0.0	39.2	0.0	0.0	104.1
Grayling	0.0	4.9	0.0	0.0	37.1	45.5	0.0	0.0	87.5
Char	0.0	0.0	0.0	0.0	14.0	142.8	0.0	0.0	156.8
Arctic Char	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Brook Trout	0.0	0.0	0.0	0.0	14.0	0.0	0.0	0.0	14.0
Dolly Varden	0.0	0.0	0.0	0.0	0.0	142.8	0.0	0.0	142.8
Lake Trout	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Trout	0.0	41.0	0.0	0.0	16.3	429.5	0.0	0.0	486.8
Rainbow Trout	0.0	27.0	0.0	0.0	16.3	338.5	0.0	0.0	381.8
Steelhead	0.0	14.0	0.0	0.0	0.0	91.0	0.0	0.0	105.0
Unknown Trout	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Whitefish	0.0	316.1	147.9	0.0	0.0	15.0	0.0	0.0	478.9
Round Whitefish	0.0	0.0	0.0	0.0	0.0	15.0	0.0	0.0	15.0
Humpback Whitefish	0.0	182.4	147.9	0.0	0.0	0.0	0.0	0.0	330.3
Least Cisco	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Broad Whitefish	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Unknown Whitefish	0.0	133.7	0.0	0.0	0.0	0.0	0.0	0.0	133.7
Burbot	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Blackfish	0.0	0.0	0.0	0.8	0.0	0.0	0.0	0.0	0.8
Sucker	0.0	13.5	0.0	0.0	0.0	0.0	0.0	0.0	13.5
Smelt	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rainbow Smelt	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Unknown Non-Salmon F	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Source: ADF&G Division of Subsistence and BBNA, harvest calendars and household surveys, 2002 & 2003

Table 28. Estimated Harvest of Nonsalmon Freshwater Fish in Pounds by Gear, Iliamna, October 1, 2002 - September 30, 2003

Resource	Estimated Pounds of Fish Harvested								Total Harvest
	Handline	Gillnet	Seine	Dipnet	Rod&Reel	Ice Fishing	Setline	Unknown	
Non-Salmon Fish	538.4	541.3	0.0	0.0	96.7	355.6	0.0	130.4	1662.5
Pike	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Grayling	40.0	16.3	0.0	0.0	32.1	67.7	0.0	14.3	170.5
Char	440.2	0.0	0.0	0.0	14.7	210.5	0.0	60.3	725.7
Arctic Char	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Brook Trout	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Dolly Varden	440.2	0.0	0.0	0.0	14.7	210.5	0.0	60.3	725.7
Lake Trout	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Trout	37.7	0.0	0.0	0.0	49.9	77.4	0.0	55.8	220.8
Rainbow Trout	37.7	0.0	0.0	0.0	49.9	77.4	0.0	55.8	220.8
Steelhead	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Unknown Trout	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Whitefish	20.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	20.5
Round Whitefish	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Humpback Whitefish	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Least Cisco	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Broad Whitefish	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Unknown Whitefish	20.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	20.5
Burbot	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Blackfish	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sucker	0.0	525.0	0.0	0.0	0.0	0.0	0.0	0.0	525.0
Smelt	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rainbow Smelt	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Unknown Non-Salmon F	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Source: ADF&G Division of Subsistence and BBNA, harvest calendars and household surveys, 2002 & 2003

Table 29. Estimated Harvest of Nonsalmon Freshwater Fish in Pounds by Gear, Kokhanok, October 1, 2002 - September 30, 2003

Resource	Estimated Pounds of Fish Harvested								Total Harvest
	Handline	Gillnet	Seine	Dipnet	Rod&Reel	Ice Fishing	Setline	Unknown	
Non-Salmon Fish	2153.7	456.0	0.0	26.9	1222.8	248.6	0.0	180.1	4288.1
Pike	165.4	13.4	0.0	26.9	0.0	107.5	0.0	0.0	313.3
Grayling	93.0	0.0	0.0	0.0	3.4	0.0	0.0	7.7	104.1
Char	851.9	225.1	0.0	0.0	556.5	80.6	0.0	115.1	1829.2
Arctic Char	3.3	0.0	0.0	0.0	0.0	67.2	0.0	0.0	70.5
Brook Trout	0.0	0.0	0.0	0.0	6.7	0.0	0.0	3.3	10.0
Dolly Varden	539.1	131.0	0.0	0.0	527.9	13.4	0.0	86.1	1297.6
Lake Trout	309.4	94.1	0.0	0.0	21.8	0.0	0.0	25.7	451.0
Trout	938.8	87.3	0.0	0.0	648.6	60.5	0.0	57.3	1792.5
Rainbow Trout	938.8	87.3	0.0	0.0	641.8	33.6	0.0	57.3	1758.9
Steelhead	0.0	0.0	0.0	0.0	6.7	26.9	0.0	0.0	33.6
Unknown Trout	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Whitefish	104.5	14.9	0.0	0.0	14.4	0.0	0.0	0.0	133.9
Round Whitefish	91.9	10.7	0.0	0.0	14.4	0.0	0.0	0.0	117.0
Humpback Whitefish	12.7	4.2	0.0	0.0	0.0	0.0	0.0	0.0	16.9
Least Cisco	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Broad Whitefish	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Unknown Whitefish	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Burbot	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Blackfish	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sucker	0.0	115.2	0.0	0.0	0.0	0.0	0.0	0.0	115.2
Smelt	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rainbow Smelt	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Unknown Non-Salmon F	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Source: ADF&G Division of Subsistence and BBNA, harvest calendars and household surveys, 2002 & 2003

Table 30. Estimated Harvest of Nonsalmon Freshwater Fish in Pounds by Gear, Levelock, October 1, 2002 - September 30, 2003

Resource	Estimated Pounds of Fish Harvested								Total Harvest
	Handline	Gillnet	Seine	Dipnet	Rod&Reel	Ice Fishing	Setline	Unknown	
Non-Salmon Fish	0.0	642.8	0.0	0.0	385.6	872.4	0.0	36.4	1937.2
Pike	0.0	155.4	0.0	0.0	243.9	107.3	0.0	0.0	506.6
Grayling	0.0	10.1	0.0	0.0	27.0	34.3	0.0	7.3	78.7
Char	0.0	9.3	0.0	0.0	10.9	4.3	0.0	0.0	24.5
Arctic Char	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Brook Trout	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Dolly Varden	0.0	9.3	0.0	0.0	5.5	4.3	0.0	0.0	19.1
Lake Trout	0.0	0.0	0.0	0.0	5.5	0.0	0.0	0.0	5.5
Trout	0.0	157.7	0.0	0.0	102.5	68.7	0.0	29.1	358.0
Rainbow Trout	0.0	157.7	0.0	0.0	102.5	68.7	0.0	29.1	358.0
Steelhead	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Unknown Trout	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Whitefish	0.0	231.0	0.0	0.0	1.3	0.0	0.0	0.0	232.3
Round Whitefish	0.0	0.0	0.0	0.0	1.3	0.0	0.0	0.0	1.3
Humpback Whitefish	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Least Cisco	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Broad Whitefish	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Unknown Whitefish	0.0	231.0	0.0	0.0	0.0	0.0	0.0	0.0	231.0
Burbot	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Blackfish	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sucker	0.0	79.3	0.0	0.0	0.0	0.0	0.0	0.0	79.3
Smelt	0.0	0.0	0.0	0.0	0.0	657.8	0.0	0.0	657.8
Rainbow Smelt	0.0	0.0	0.0	0.0	0.0	657.8	0.0	0.0	657.8
Unknown Non-Salmon F	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Source: ADF&G Division of Subsistence and BBNA, harvest calendars and household surveys, 2002 & 2003

Table 31. Estimated Harvest of Nonsalmon Freshwater Fish in Pounds by Gear, Newhalen, October 1, 2002 - September 30, 2003

Resource	Estimated Pounds of Fish Harvested								Total Harvest
	Handline	Gillnet	Seine	Dipnet	Rod&Reel	Ice Fishing	Setline	Unknown	
Non-Salmon Fish	5518.9	165.4	0.0	0.0	248.8	110.9	0.0	741.8	6785.9
Pike	754.3	0.0	0.0	0.0	44.6	0.0	0.0	40.6	839.4
Grayling	345.5	3.1	0.0	0.0	28.1	20.3	0.0	101.0	497.9
Char	2291.2	58.8	0.0	0.0	95.4	50.1	0.0	520.7	3016.1
Arctic Char	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Brook Trout	762.4	0.0	0.0	0.0	0.0	0.0	0.0	81.1	843.5
Dolly Varden	1028.0	58.8	0.0	0.0	54.9	50.1	0.0	236.8	1428.5
Lake Trout	500.8	0.0	0.0	0.0	40.6	0.0	0.0	202.8	744.1
Trout	1704.9	85.1	0.0	0.0	80.7	40.6	0.0	65.1	1976.4
Rainbow Trout	1299.4	85.1	0.0	0.0	80.7	40.6	0.0	65.1	1570.8
Steelhead	405.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	405.5
Unknown Trout	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Whitefish	368.1	18.4	0.0	0.0	0.0	0.0	0.0	14.5	401.0
Round Whitefish	183.9	0.0	0.0	0.0	0.0	0.0	0.0	14.5	198.4
Humpback Whitefish	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Least Cisco	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Broad Whitefish	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Unknown Whitefish	184.2	18.4	0.0	0.0	0.0	0.0	0.0	0.0	202.6
Burbot	55.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	55.0
Blackfish	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sucker	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Smelt	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rainbow Smelt	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Unknown Non-Salmon F	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Source: ADF&G Division of Subsistence and BBNA, harvest calendars and household surveys, 2002 & 2003



Table 32. Estimated Harvest of Nonsalmon Freshwater Fish in Pounds by Gear, Nondalton, October 1, 2002 - September 30, 2003

Resource	Estimated Pounds of Fish Harvested								Total Harvest
	Handline	Gillnet	Seine	Dipnet	Rod&Reel	Ice Fishing	Setline	Unknown	
Non-Salmon Fish	954.2	183.9	0.0	0.0	519.3	3.4	4.4	51.1	1716.4
Pike	0.0	16.6	0.0	0.0	0.0	0.0	0.0	3.4	20.1
Grayling	193.8	0.0	0.0	0.0	116.3	0.0	0.0	36.7	346.7
Char	301.0	0.0	0.0	0.0	5.2	3.4	1.7	1.7	312.9
Arctic Char	99.9	0.0	0.0	0.0	0.0	1.7	0.0	0.0	101.6
Brook Trout	34.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	34.4
Dolly Varden	1.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.7
Lake Trout	165.1	0.0	0.0	0.0	5.2	1.7	1.7	1.7	175.3
Trout	232.0	20.0	0.0	0.0	383.6	0.0	0.0	0.0	635.6
Rainbow Trout	232.0	0.0	0.0	0.0	383.6	0.0	0.0	0.0	615.6
Steelhead	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Unknown Trout	0.0	20.0	0.0	0.0	0.0	0.0	0.0	0.0	20.0
Whitefish	207.7	7.8	0.0	0.0	14.2	0.0	1.5	7.0	238.2
Round Whitefish	9.8	0.0	0.0	0.0	4.9	0.0	0.0	2.4	17.1
Humpback Whitefish	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Least Cisco	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Broad Whitefish	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Unknown Whitefish	197.9	7.8	0.0	0.0	9.3	0.0	1.5	4.5	221.1
Burbot	5.0	0.0	0.0	0.0	0.0	0.0	1.2	2.4	8.6
Blackfish	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sucker	14.7	139.5	0.0	0.0	0.0	0.0	0.0	0.0	154.3
Smelt	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rainbow Smelt	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Unknown Non-Salmon F	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Source: ADF&G Division of Subsistence and BBNA, harvest calendars and household surveys, 2002 & 2003

Table 33. Estimated Harvest of Nonsalmon Freshwater Fish in Pounds by Gear, Pedro Bay, October 1, 2002 - September 30, 2003

Resource	Estimated Pounds of Fish Harvested								Total Harvest
	Handline	Gillnet	Seine	Dipnet	Rod&Reel	Ice Fishing	Setline	Unknown	
Non-Salmon Fish	74.2	36.4	0.0	0.0	246.0	5.6	0.0	53.2	415.4
Pike	0.0	0.0	0.0	0.0	0.0	5.6	0.0	0.0	5.6
Grayling	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Char	47.6	14.0	0.0	0.0	167.4	0.0	0.0	49.0	278.0
Arctic Char	0.0	8.4	0.0	0.0	0.0	0.0	0.0	0.0	8.4
Brook Trout	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Dolly Varden	36.4	0.0	0.0	0.0	103.4	0.0	0.0	49.0	188.8
Lake Trout	11.2	5.6	0.0	0.0	64.0	0.0	0.0	0.0	80.8
Trout	26.6	22.4	0.0	0.0	78.6	0.0	0.0	4.2	131.8
Rainbow Trout	26.6	22.4	0.0	0.0	78.6	0.0	0.0	4.2	131.8
Steelhead	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Unknown Trout	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Whitefish	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Round Whitefish	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Humpback Whitefish	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Least Cisco	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Broad Whitefish	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Unknown Whitefish	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Burbot	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Blackfish	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sucker	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Smelt	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rainbow Smelt	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Unknown Non-Salmon F	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Source: ADF&G Division of Subsistence and BBNA, harvest calendars and household surveys, 2002 & 2003

Table 34. Estimated Harvest of Nonsalmon Freshwater Fish in Pounds by Gear, Port Alsworth, October 1, 2002 - September 30, 200

Resource	Estimated Pounds of Fish Harvested								Total Harvest
	Handline	Gillnet	Seine	Dipnet	Rod&Reel	Ice Fishing	Setline	Unknown	
Non-Salmon Fish	0.0	0.0	0.0	0.0	20.1	0.0	0.0	0.0	20.1
Pike	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Grayling	0.0	0.0	0.0	0.0	0.7	0.0	0.0	0.0	0.7
Char	0.0	0.0	0.0	0.0	19.4	0.0	0.0	0.0	19.4
Arctic Char	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Brook Trout	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Dolly Varden	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Lake Trout	0.0	0.0	0.0	0.0	19.4	0.0	0.0	0.0	19.4
Trout	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rainbow Trout	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Steelhead	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Unknown Trout	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Whitefish	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Round Whitefish	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Humpback Whitefish	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Least Cisco	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Broad Whitefish	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Unknown Whitefish	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Burbot	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Blackfish	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sucker	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Smelt	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rainbow Smelt	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Unknown Non-Salmon F	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Source: ADF&G Division of Subsistence and BBNA, harvest calendars and household surveys, 2002 & 2003

Table 35. Percentage of Estimated Harvest of Nonsalmon Freshwater Fish i by Gear Type, Igiugig, October 1, 2002 - September 30, 2003

Resource	Percentage of Estimated Pounds of Fish Harvested							
	Handline	Gillnet	Seine	Dipnet	Rod&Reel	Ice Fishing	Setline	Unknown
Non-Salmon Fish	0.0%	33.1%	11.1%	0.1%	5.1%	50.6%	0.0%	0.0%
Pike	0.0%	62.3%	0.0%	0.0%	0.0%	37.7%	0.0%	0.0%
Grayling	0.0%	5.6%	0.0%	0.0%	42.4%	52.0%	0.0%	0.0%
Char	0.0%	0.0%	0.0%	0.0%	8.9%	91.1%	0.0%	0.0%
Arctic Char								
Brook Trout	0.0%	0.0%	0.0%	0.0%	100.0%	0.0%	0.0%	0.0%
Dolly Varden	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	0.0%	0.0%
Lake Trout								
Trout	0.0%	8.4%	0.0%	0.0%	3.4%	88.2%	0.0%	0.0%
Rainbow Trout	0.0%	7.1%	0.0%	0.0%	4.3%	88.6%	0.0%	0.0%
Steelhead	0.0%	13.3%	0.0%	0.0%	0.0%	86.7%	0.0%	0.0%
Unknown Trout								
Whitefish	0.0%	66.0%	30.9%	0.0%	0.0%	3.1%	0.0%	0.0%
Round Whitefish	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	0.0%	0.0%
Humpback Whitefish	0.0%	55.2%	44.8%	0.0%	0.0%	0.0%	0.0%	0.0%
Least Cisco								
Broad Whitefish								
Unknown Whitefish	0.0%	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Burbot								
Blackfish	0.0%	0.0%	0.0%	100.0%	0.0%	0.0%	0.0%	0.0%
Sucker	0.0%	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Smelt								
Rainbow Smelt								

Note: blank cells indicate no harvest of that resource.

Source: ADF&G Division of Subsistence and BBNA, harvest calendars and household surveys, 2002 & 2003

Table 36. Percentage of Estimated Harvest of Nonsalmon Freshwater Fish by Gear Type, Iliamna,  
October 1, 2002 - September 30, 2003

Resource	Percentage of Estimated Pounds of Fish Harvested							
	Handline	Gillnet	Seine	Dipnet	Rod&Reel	Ice Fishing	Setline	Unknown
Non-Salmon Fish	32.4%	32.6%	0.0%	0.0%	5.8%	21.4%	0.0%	7.8%
Pike								
Grayling	23.4%	9.6%	0.0%	0.0%	18.8%	39.7%	0.0%	8.4%
Char	60.7%	0.0%	0.0%	0.0%	2.0%	29.0%	0.0%	8.3%
Arctic Char								
Brook Trout								
Dolly Varden	60.7%	0.0%	0.0%	0.0%	2.0%	29.0%	0.0%	8.3%
Lake Trout								
Trout	17.1%	0.0%	0.0%	0.0%	22.6%	35.1%	0.0%	25.3%
Rainbow Trout	17.1%	0.0%	0.0%	0.0%	22.6%	35.1%	0.0%	25.3%
Steelhead								
Unknown Trout								
Whitefish	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Round Whitefish								
Humpback Whitefish								
Least Cisco								
Broad Whitefish								
Unknown Whitefish	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Burbot								
Blackfish								
Sucker	0.0%	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Smelt								
Rainbow Smelt								

Note: blank cells indicate no harvest of that resource.

Source: ADF&G Division of Subsistence and BBNA, harvest calendars and household surveys, 2002 & 2003

Table 37. Percentage of Estimated Harvest of Nonsalmon Freshwater Fish by Gear Type, Kokhanok, October 1, 2002 - September 30, 2003

Resource	Percentage of Estimated Pounds of Fish Harvested							
	Handline	Gillnet	Seine	Dipnet	Rod&Reel	Ice Fishing	Setline	Unknown
Non-Salmon Fish	50.2%	10.6%	0.0%	0.6%	28.5%	5.8%	0.0%	4.2%
Pike	52.8%	4.3%	0.0%	8.6%	0.0%	34.3%	0.0%	0.0%
Grayling	89.4%	0.0%	0.0%	0.0%	3.2%	0.0%	0.0%	7.4%
Char	46.6%	12.3%	0.0%	0.0%	30.4%	4.4%	0.0%	6.3%
Arctic Char	4.7%	0.0%	0.0%	0.0%	0.0%	95.3%	0.0%	0.0%
Brook Trout	0.0%	0.0%	0.0%	0.0%	66.9%	0.0%	0.0%	33.1%
Dolly Varden	41.5%	10.1%	0.0%	0.0%	40.7%	1.0%	0.0%	6.6%
Lake Trout	68.6%	20.9%	0.0%	0.0%	4.8%	0.0%	0.0%	5.7%
Trout	52.4%	4.9%	0.0%	0.0%	36.2%	3.4%	0.0%	3.2%
Rainbow Trout	53.4%	5.0%	0.0%	0.0%	36.5%	1.9%	0.0%	3.3%
Steelhead	0.0%	0.0%	0.0%	0.0%	20.0%	80.0%	0.0%	0.0%
Unknown Trout								
Whitefish	78.1%	11.2%	0.0%	0.0%	10.8%	0.0%	0.0%	0.0%
Round Whitefish	78.5%	9.2%	0.0%	0.0%	12.3%	0.0%	0.0%	0.0%
Humpback Whitefish	75.1%	24.9%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Least Cisco								
Broad Whitefish								
Unknown Whitefish								
Burbot								
Blackfish								
Sucker	0.0%	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Smelt								
Rainbow Smelt								

Note: blank cells indicate no harvest of that resource.

Source: ADF&G Division of Subsistence and BBNA, harvest calendars and household surveys, 2002 & 2003

Table 38. Percentage of Estimated Harvest of Nonsalmon Freshwater Fish by Gear Type, Levelock, October 1, 2002 - September 30, 2003

Resource	Percentage of Estimated Pounds of Fish Harvested							
	Handline	Gillnet	Seine	Dipnet	Rod&Reel	Ice Fishing	Setline	Unknown
Non-Salmon Fish	0.0%	33.2%	0.0%	0.0%	19.9%	45.0%	0.0%	1.9%
Pike	0.0%	30.7%	0.0%	0.0%	48.1%	21.2%	0.0%	0.0%
Grayling	0.0%	12.9%	0.0%	0.0%	34.2%	43.6%	0.0%	9.2%
Char	0.0%	38.0%	0.0%	0.0%	44.5%	17.5%	0.0%	0.0%
Arctic Char								
Brook Trout								
Dolly Varden	0.0%	48.9%	0.0%	0.0%	28.6%	22.5%	0.0%	0.0%
Lake Trout	0.0%	0.0%	0.0%	0.0%	100.0%	0.0%	0.0%	0.0%
Trout	0.0%	44.0%	0.0%	0.0%	28.6%	19.2%	0.0%	8.1%
Rainbow Trout	0.0%	44.0%	0.0%	0.0%	28.6%	19.2%	0.0%	8.1%
Steelhead								
Unknown Trout								
Whitefish	0.0%	99.4%	0.0%	0.0%	0.6%	0.0%	0.0%	0.0%
Round Whitefish	0.0%	0.0%	0.0%	0.0%	100.0%	0.0%	0.0%	0.0%
Humpback Whitefish								
Least Cisco								
Broad Whitefish								
Unknown Whitefish	0.0%	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Burbot								
Blackfish								
Sucker	0.0%	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Smelt	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	0.0%	0.0%
Rainbow Smelt	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	0.0%	0.0%

Note: blank cells indicate no harvest of that resource.

Source: ADF&G Division of Subsistence and BBNA, harvest calendars and household surveys, 2002 & 2003

Table 39. Percentage of Estimated Harvest of Nonsalmon Freshwater Fish by Gear Type , Newhalen,  
October 1, 2002 - September 30, 2003

Resource	Percentage of Estimated Pounds of Fish Harvested							
	Handline	Gillnet	Seine	Dipnet	Rod&Reel	Ice Fishing	Setline	Unknown
Non-Salmon Fish	81.3%	2.4%	0.0%	0.0%	3.7%	1.6%	0.0%	10.9%
Pike	89.9%	0.0%	0.0%	0.0%	5.3%	0.0%	0.0%	4.8%
Grayling	69.4%	0.6%	0.0%	0.0%	5.7%	4.1%	0.0%	20.3%
Char	76.0%	1.9%	0.0%	0.0%	3.2%	1.7%	0.0%	17.3%
Arctic Char								
Brook Trout	90.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	9.6%
Dolly Varden	72.0%	4.1%	0.0%	0.0%	3.8%	3.5%	0.0%	16.6%
Lake Trout	67.3%	0.0%	0.0%	0.0%	5.4%	0.0%	0.0%	27.2%
Trout	86.3%	4.3%	0.0%	0.0%	4.1%	2.1%	0.0%	3.3%
Rainbow Trout	82.7%	5.4%	0.0%	0.0%	5.1%	2.6%	0.0%	4.1%
Steelhead	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Unknown Trout								
Whitefish	91.8%	4.6%	0.0%	0.0%	0.0%	0.0%	0.0%	3.6%
Round Whitefish	92.7%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	7.3%
Humpback Whitefish								
Least Cisco								
Broad Whitefish								
Unknown Whitefish	90.9%	9.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Burbot	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Blackfish								
Sucker								
Smelt								
Rainbow Smelt								

Note: blank cells indicate no harvest of that resource.

Source: ADF&G Division of Subsistence and BBNA, harvest calendars and household surveys, 2002 & 2003



Table 40. Percentage of Estimated Harvest of Nonsalmon Freshwater Fish by Gear Type, Nondalton, October 1, 2002 - September 30, 2003

Resource	Percentage of Estimated Pounds of Fish Harvested							
	Handline	Gillnet	Seine	Dipnet	Rod&Reel	Ice Fishing	Setline	Unknown
Non-Salmon Fish	55.6%	10.7%	0.0%	0.0%	30.3%	0.2%	0.3%	3.0%
Pike	0.0%	82.9%	0.0%	0.0%	0.0%	0.0%	0.0%	17.1%
Grayling	55.9%	0.0%	0.0%	0.0%	33.5%	0.0%	0.0%	10.6%
Char	96.2%	0.0%	0.0%	0.0%	1.6%	1.1%	0.5%	0.5%
Arctic Char	98.4%	0.0%	0.0%	0.0%	0.0%	1.6%	0.0%	0.0%
Brook Trout	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Dolly Varden	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Lake Trout	94.2%	0.0%	0.0%	0.0%	2.9%	1.0%	1.0%	0.9%
Trout	36.5%	3.1%	0.0%	0.0%	60.4%	0.0%	0.0%	0.0%
Rainbow Trout	37.7%	0.0%	0.0%	0.0%	62.3%	0.0%	0.0%	0.0%
Steelhead								
Unknown Trout	0.0%	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Whitefish	87.2%	3.3%	0.0%	0.0%	6.0%	0.0%	0.6%	2.9%
Round Whitefish	57.1%	0.0%	0.0%	0.0%	28.6%	0.0%	0.0%	14.3%
Humpback Whitefish								
Least Cisco								
Broad Whitefish								
Unknown Whitefish	89.5%	3.5%	0.0%	0.0%	4.2%	0.0%	0.7%	2.1%
Burbot	58.4%	0.0%	0.0%	0.0%	0.0%	0.0%	13.9%	27.7%
Blackfish								
Sucker	9.6%	90.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Smelt								
Rainbow Smelt								

Note: blank cells indicate no harvest of that resource.

Source: ADF&G Division of Subsistence and BBNA, harvest calendars and household surveys, 2002 & 2003

Table 41. Percentage of Estimated Harvest of Nonsalmon Freshwater Fish i by Gear Type, Pedro Bay, October 1, 2002 - September 30, 2003

Resource	Percentage of Estimated Pounds of Fish Harvested							
	Handline	Gillnet	Seine	Dipnet	Rod&Reel	Ice Fishing	Setline	Unknown
Non-Salmon Fish	17.9%	8.8%	0.0%	0.0%	59.2%	1.3%	0.0%	12.8%
Pike	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	0.0%	0.0%
Grayling								
Char	17.1%	5.0%	0.0%	0.0%	60.2%	0.0%	0.0%	17.6%
Arctic Char	0.0%	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Brook Trout								
Dolly Varden	19.3%	0.0%	0.0%	0.0%	54.8%	0.0%	0.0%	26.0%
Lake Trout	13.9%	6.9%	0.0%	0.0%	79.2%	0.0%	0.0%	0.0%
Trout	20.2%	17.0%	0.0%	0.0%	59.6%	0.0%	0.0%	3.2%
Rainbow Trout	20.2%	17.0%	0.0%	0.0%	59.6%	0.0%	0.0%	3.2%
Steelhead								
Unknown Trout								
Whitefish								
Round Whitefish								
Humpback Whitefish								
Least Cisco								
Broad Whitefish								
Unknown Whitefish								
Burbot								
Blackfish								
Sucker								
Smelt								
Rainbow Smelt								

Note: blank cells indicate no harvest of that resource.

Source: ADF&G Division of Subsistence and BBNA, harvest calendars and household surveys, 2002 & 2003

Table 42. Percentage of Estimated Harvest of Nonsalmon Freshwater Fish in Pounds, Port Alsworth, October 1, 2002 - September 30, 2003

Resource	Percentage of Estimated Pounds of Fish Harvested							
	Handline	Gillnet	Seine	Dipnet	Rod&Reel	Ice Fishing	Setline	Unknown
Non-Salmon Fish	0.0%	0.0%	0.0%	0.0%	100.0%	0.0%	0.0%	0.0%
Pike								
Grayling	0.0%	0.0%	0.0%	0.0%	100.0%	0.0%	0.0%	0.0%
Char	0.0%	0.0%	0.0%	0.0%	100.0%	0.0%	0.0%	0.0%
Arctic Char								
Brook Trout								
Dolly Varden								
Lake Trout	0.0%	0.0%	0.0%	0.0%	100.0%	0.0%	0.0%	0.0%
Trout								
Rainbow Trout								
Steelhead								
Unknown Trout								
Whitefish								
Round Whitefish								
Humpback Whitefish								
Least Cisco								
Broad Whitefish								
Unknown Whitefish								
Burbot								
Blackfish								
Sucker								
Smelt								
Rainbow Smelt								

Note: blank cells indicate no harvest of that resource.

Source: ADF&G Division of Subsistence and BBNA, harvest calendars and household surveys, 2002 & 2003

Table 43. Percentage of Estimated Harvest of Nonsalmon Freshwater Fish in Pounds by Gear Type, Study Communities, October 1, 2002 - September 30, 2003

Community	Percentage of Estimated Pounds of Fish Harvested							
	Handline	Gillnet	Seine	Dipnet	Rod&Reel	Ice Fishing	Setline	Unknown
Igiugig	0.0%	33.1%	11.1%	0.1%	5.1%	50.6%	0.0%	0.0%
Iliamna	32.4%	32.6%	0.0%	0.0%	5.8%	21.4%	0.0%	7.8%
Kokhanok	50.2%	10.6%	0.0%	0.6%	28.5%	5.8%	0.0%	4.2%
Levelock	0.0%	33.2%	0.0%	0.0%	19.9%	45.0%	0.0%	1.9%
Newhalen	81.3%	2.4%	0.0%	0.0%	3.7%	1.6%	0.0%	10.9%
Nondalton	55.6%	10.7%	0.0%	0.0%	30.3%	0.2%	0.3%	3.0%
Pedro Bay	17.9%	8.8%	0.0%	0.0%	59.2%	1.3%	0.0%	12.8%
Port Alsworth	0.0%	0.0%	0.0%	0.0%	100.0%	0.0%	0.0%	0.0%
All	50.9%	13.6%	0.8%	0.2%	15.5%	12.5%	0.0%	6.6%

Source: ADF&G and BBNA Harvest Calendars and Surveys, 2002/2003

Table 44. Percentage of Estimated Harvest of Nonsalmon Freshwater Fish in Pounds by Gear and Species, All Study Communities, October 1, 2002 - September 30, 2003

Resource	Percentage of Estimated Pounds of Fish Harvested							
	Handline	Gillnet	Seine	Dipnet	Rod&Reel	Ice Fishing	Setline	Unknown
Non-Salmon Fish	50.9%	13.6%	0.8%	0.2%	15.5%	12.5%	0.0%	6.6%
Pike	51.4%	14.0%	0.0%	1.5%	16.1%	14.5%	0.0%	2.5%
Grayling	52.3%	2.7%	0.0%	0.0%	19.0%	13.1%	0.0%	13.0%
Char	61.8%	4.8%	0.0%	0.0%	13.9%	7.7%	0.0%	11.7%
Arctic Char	57.2%	4.7%	0.0%	0.0%	0.0%	38.2%	0.0%	0.0%
Brook Trout	88.3%	0.0%	0.0%	0.0%	2.3%	0.0%	0.0%	9.4%
Dolly Varden	53.8%	5.2%	0.0%	0.0%	18.6%	11.1%	0.0%	11.4%
Lake Trout	66.8%	6.8%	0.0%	0.0%	10.6%	0.1%	0.1%	15.6%
Trout	52.5%	7.4%	0.0%	0.0%	24.3%	12.1%	0.0%	3.8%
Rainbow Trout	50.3%	7.5%	0.0%	0.0%	26.9%	11.1%	0.0%	4.2%
Steelhead	74.5%	2.6%	0.0%	0.0%	1.2%	21.7%	0.0%	0.0%
Unknown Trout	0.0%	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Whitefish	46.6%	39.1%	9.8%	0.0%	2.0%	1.0%	0.1%	1.4%
Round Whitefish	81.9%	3.1%	0.0%	0.0%	5.9%	4.3%	0.0%	4.9%
Humpback Whitefish	3.7%	53.7%	42.6%	0.0%	0.0%	0.0%	0.0%	0.0%
Least Cisco								
Broad Whitefish								
Unknown Whitefish	49.8%	48.3%	0.0%	0.0%	1.2%	0.0%	0.2%	0.6%
Burbot	94.4%	0.0%	0.0%	0.0%	0.0%	0.0%	1.9%	3.7%
Blackfish	0.0%	0.0%	0.0%	100.0%	0.0%	0.0%	0.0%	0.0%
Sucker	1.7%	98.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Smelt	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	0.0%	0.0%
Rainbow Smelt	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	0.0%	0.0%

Note: blank cells indicate that no harvests occurred for that species.

Source: ADF&G Division of Subsistence, and BBNA, harvest calendars and household surveys, 2002 & 2003

Table 45. Estimated Number of Households Harvesting Fish by Gear Type, Igiugig, October 1, 2002 - September 30, 2003

Resource	Estimated Number of Households								Total Household
	Handline	Gillnet	Seine	Dipnet	Rod&Reel	Ice Fishing	Setline	Unknown	
Non-Salmon Fish	0.0	4.5	1.1	1.1	8.9	7.8	0.0	0.0	12.3
Pike	0.0	3.3	0.0	0.0	0.0	3.3	0.0	0.0	5.6
Grayling	0.0	2.2	0.0	0.0	4.5	3.3	0.0	0.0	8.9
Char	0.0	0.0	0.0	0.0	1.1	4.5	0.0	0.0	4.5
Arctic Char	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Brook Trout	0.0	0.0	0.0	0.0	1.1	0.0	0.0	0.0	1.1
Dolly Varden	0.0	0.0	0.0	0.0	0.0	4.5	0.0	0.0	4.5
Lake Trout	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Trout	0.0	3.3	0.0	0.0	7.8	5.6	0.0	0.0	12.3
Rainbow Trout	0.0	3.3	0.0	0.0	7.8	5.6	0.0	0.0	12.3
Steelhead	0.0	1.1	0.0	0.0	0.0	1.1	0.0	0.0	2.2
Unknown Trout	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Whitefish	0.0	4.5	1.1	0.0	0.0	2.2	0.0	0.0	6.7
Round Whitefish	0.0	0.0	0.0	0.0	0.0	2.2	0.0	0.0	2.2
Humpback Whitefish	0.0	3.3	1.1	0.0	0.0	0.0	0.0	0.0	4.5
Least Cisco	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Broad Whitefish	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Unknown Whitefish	0.0	2.2	0.0	0.0	0.0	0.0	0.0	0.0	2.2
Burbot	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Blackfish	0.0	0.0	0.0	1.1	0.0	0.0	0.0	0.0	1.1
Sucker	0.0	2.2	0.0	0.0	0.0	0.0	0.0	0.0	2.2
Smelt	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rainbow Smelt	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Unknown Non-Salmon F	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Source: ADF&G Division of Subsistence and BBNA, harvest calendars and household surveys, 2002 & 2003

Table 46. Estimated Number of Households Harvesting Fish by Gear Type, Iliamna, October 1, 2002 - September 30, 2003

Resource	Estimated Number of Households								Total Household
	Handline	Gillnet	Seine	Dipnet	Rod&Reel	Ice Fishing	Setline	Unknown	
Non-Salmon Fish	4.3	2.2	0.0	0.0	17.2	12.9	0.0	2.2	28.0
Pike	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Grayling	4.3	2.2	0.0	0.0	15.1	10.8	0.0	2.2	23.7
Char	4.3	0.0	0.0	0.0	2.2	12.9	0.0	2.2	19.4
Arctic Char	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Brook Trout	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Dolly Varden	4.3	0.0	0.0	0.0	2.2	12.9	0.0	2.2	19.4
Lake Trout	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Trout	2.2	0.0	0.0	0.0	10.8	8.6	0.0	2.2	19.4
Rainbow Trout	2.2	0.0	0.0	0.0	10.8	8.6	0.0	2.2	19.4
Steelhead	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Unknown Trout	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Whitefish	2.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.2
Round Whitefish	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Humpback Whitefish	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Least Cisco	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Broad Whitefish	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Unknown Whitefish	2.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.2
Burbot	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Blackfish	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sucker	0.0	2.2	0.0	0.0	0.0	0.0	0.0	0.0	2.2
Smelt	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rainbow Smelt	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Unknown Non-Salmon F	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Source: ADF&G Division of Subsistence and BBNA, harvest calendars and household surveys, 2002 & 2003

Table 47. Estimated Number of Households Harvesting Fish by Gear Type, Kokhanok, October 1, 2002 - September 30, 2003

Resource	Estimated Number of Households								Total Household
	Handline	Gillnet	Seine	Dipnet	Rod&Reel	Ice Fishing	Setline	Unknown	
Non-Salmon Fish	30.6	9.7	0.0	1.6	14.5	4.8	0.0	6.4	37.0
Pike	9.7	3.2	0.0	1.6	0.0	1.6	0.0	0.0	12.9
Grayling	6.4	0.0	0.0	0.0	1.6	0.0	0.0	3.2	11.3
Char	19.3	4.8	0.0	0.0	11.3	4.8	0.0	6.4	32.2
Arctic Char	1.6	0.0	0.0	0.0	0.0	3.2	0.0	0.0	4.8
Brook Trout	0.0	0.0	0.0	0.0	1.6	0.0	0.0	1.6	3.2
Dolly Varden	14.5	4.8	0.0	0.0	9.7	1.6	0.0	4.8	29.0
Lake Trout	14.5	3.2	0.0	0.0	4.8	0.0	0.0	3.2	20.9
Trout	20.9	8.0	0.0	0.0	12.9	3.2	0.0	4.8	30.6
Rainbow Trout	20.9	8.0	0.0	0.0	12.9	1.6	0.0	4.8	30.6
Steelhead	0.0	0.0	0.0	0.0	1.6	1.6	0.0	0.0	3.2
Unknown Trout	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Whitefish	6.4	3.2	0.0	0.0	1.6	0.0	0.0	0.0	9.7
Round Whitefish	3.2	3.2	0.0	0.0	1.6	0.0	0.0	0.0	8.0
Humpback Whitefish	3.2	1.6	0.0	0.0	0.0	0.0	0.0	0.0	3.2
Least Cisco	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Broad Whitefish	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Unknown Whitefish	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Burbot	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Blackfish	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sucker	0.0	1.6	0.0	0.0	0.0	0.0	0.0	0.0	1.6
Smelt	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rainbow Smelt	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Unknown Non-Salmon F	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Source: ADF&G Division of Subsistence and BBNA, harvest calendars and household surveys, 2002 & 2003



Table 48. Estimated Number of Households Harvesting Fish by Gear Type, Levelock, October 1, 2002 - September 30, 2003

Resource	Estimated Number of Households								Total Household
	Handline	Gillnet	Seine	Dipnet	Rod&Reel	Ice Fishing	Setline	Unknown	
Non-Salmon Fish	0.0	8.0	0.0	0.0	14.0	18.0	0.0	2.0	24.0
Pike	0.0	4.0	0.0	0.0	6.0	2.0	0.0	0.0	12.0
Grayling	0.0	4.0	0.0	0.0	8.0	4.0	0.0	2.0	16.0
Char	0.0	2.0	0.0	0.0	6.0	2.0	0.0	0.0	8.0
Arctic Char	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Brook Trout	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Dolly Varden	0.0	2.0	0.0	0.0	4.0	2.0	0.0	0.0	6.0
Lake Trout	0.0	0.0	0.0	0.0	4.0	0.0	0.0	0.0	4.0
Trout	0.0	8.0	0.0	0.0	12.0	4.0	0.0	2.0	20.0
Rainbow Trout	0.0	8.0	0.0	0.0	12.0	4.0	0.0	2.0	20.0
Steelhead	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Unknown Trout	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Whitefish	0.0	4.0	0.0	0.0	2.0	0.0	0.0	0.0	6.0
Round Whitefish	0.0	0.0	0.0	0.0	2.0	0.0	0.0	0.0	2.0
Humpback Whitefish	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Least Cisco	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Broad Whitefish	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Unknown Whitefish	0.0	4.0	0.0	0.0	0.0	0.0	0.0	0.0	4.0
Burbot	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Blackfish	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sucker	0.0	4.0	0.0	0.0	0.0	0.0	0.0	0.0	4.0
Smelt	0.0	0.0	0.0	0.0	0.0	16.0	0.0	0.0	16.0
Rainbow Smelt	0.0	0.0	0.0	0.0	0.0	16.0	0.0	0.0	16.0
Unknown Non-Salmon F	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Source: ADF&G Division of Subsistence and BBNA, harvest calendars and household surveys, 2002 & 2003

Table 49. Estimated Number of Households Harvesting Fish by Gear Type, Newhalen, October 1, 2002 - September 30, 2003

Resource	Estimated Number of Households								Total Household
	Handline	Gillnet	Seine	Dipnet	Rod&Reel	Ice Fishing	Setline	Unknown	
Non-Salmon Fish	40.0	4.1	0.0	0.0	18.4	1.0	0.0	2.0	42.0
Pike	8.2	0.0	0.0	0.0	4.1	0.0	0.0	1.0	13.3
Grayling	30.7	1.0	0.0	0.0	6.1	1.0	0.0	2.0	32.8
Char	29.7	3.1	0.0	0.0	7.2	1.0	0.0	2.0	31.8
Arctic Char	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Brook Trout	7.2	0.0	0.0	0.0	0.0	0.0	0.0	1.0	8.2
Dolly Varden	28.7	3.1	0.0	0.0	7.2	1.0	0.0	2.0	30.7
Lake Trout	6.1	0.0	0.0	0.0	1.0	0.0	0.0	2.0	7.2
Trout	40.0	3.1	0.0	0.0	12.3	1.0	0.0	1.0	41.0
Rainbow Trout	40.0	3.1	0.0	0.0	12.3	1.0	0.0	1.0	41.0
Steelhead	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0
Unknown Trout	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Whitefish	5.1	1.0	0.0	0.0	0.0	0.0	0.0	1.0	7.2
Round Whitefish	5.1	0.0	0.0	0.0	0.0	0.0	0.0	1.0	6.1
Humpback Whitefish	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Least Cisco	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Broad Whitefish	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Unknown Whitefish	1.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	2.0
Burbot	2.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.0
Blackfish	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sucker	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Smelt	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rainbow Smelt	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Unknown Non-Salmon F	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Source: ADF&G Division of Subsistence and BBNA, harvest calendars and household surveys, 2002 & 2003

Table 50. Estimated Number of Households Harvesting Fish by Gear Type, Nondalton, October 1, 2002 - September 30, 2003

Resource	Estimated Number of Households								Total Household
	Handline	Gillnet	Seine	Dipnet	Rod&Reel	Ice Fishing	Setline	Unknown	
Non-Salmon Fish	36.9	13.3	0.0	0.0	19.2	1.5	3.0	7.4	44.3
Pike	0.0	1.5	0.0	0.0	0.0	0.0	0.0	1.5	3.0
Grayling	32.5	0.0	0.0	0.0	10.3	0.0	0.0	5.9	36.9
Char	14.8	0.0	0.0	0.0	3.0	1.5	1.5	1.5	19.2
Arctic Char	1.5	0.0	0.0	0.0	0.0	1.5	0.0	0.0	3.0
Brook Trout	1.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.5
Dolly Varden	1.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.5
Lake Trout	11.8	0.0	0.0	0.0	3.0	1.5	1.5	1.5	17.7
Trout	16.2	1.5	0.0	0.0	14.8	0.0	0.0	0.0	25.1
Rainbow Trout	16.2	0.0	0.0	0.0	14.8	0.0	0.0	0.0	23.6
Steelhead	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Unknown Trout	0.0	1.5	0.0	0.0	0.0	0.0	0.0	0.0	1.5
Whitefish	23.6	5.9	0.0	0.0	4.4	0.0	1.5	4.4	28.0
Round Whitefish	5.9	0.0	0.0	0.0	3.0	0.0	0.0	1.5	10.3
Humpback Whitefish	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Least Cisco	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Broad Whitefish	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Unknown Whitefish	23.6	5.9	0.0	0.0	3.0	0.0	1.5	3.0	28.0
Burbot	3.0	0.0	0.0	0.0	0.0	0.0	1.5	3.0	5.9
Blackfish	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sucker	3.0	8.9	0.0	0.0	0.0	0.0	0.0	0.0	11.8
Smelt	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rainbow Smelt	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Unknown Non-Salmon F	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Source: ADF&G Division of Subsistence and BBNA, harvest calendars and household surveys, 2002 & 2003

Table 51. Estimated Number of Households Harvesting Fish by Gear Type, Pedro Bay, October 1, 2002 - September 30, 2003

Resource	Estimated Number of Households								Total Household
	Handline	Gillnet	Seine	Dipnet	Rod&Reel	Ice Fishing	Setline	Unknown	
Non-Salmon Fish	8.5	2.8	0.0	0.0	9.9	1.4	0.0	1.4	17.0
Pike	0.0	0.0	0.0	0.0	0.0	1.4	0.0	0.0	1.4
Grayling	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Char	8.5	2.8	0.0	0.0	8.5	0.0	0.0	1.4	15.6
Arctic Char	0.0	1.4	0.0	0.0	0.0	0.0	0.0	0.0	1.4
Brook Trout	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Dolly Varden	7.1	0.0	0.0	0.0	8.5	0.0	0.0	1.4	12.8
Lake Trout	2.8	1.4	0.0	0.0	1.4	0.0	0.0	0.0	4.3
Trout	7.1	1.4	0.0	0.0	8.5	0.0	0.0	1.4	15.6
Rainbow Trout	7.1	1.4	0.0	0.0	8.5	0.0	0.0	1.4	15.6
Steelhead	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Unknown Trout	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Whitefish	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Round Whitefish	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Humpback Whitefish	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Least Cisco	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Broad Whitefish	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Unknown Whitefish	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Burbot	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Blackfish	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sucker	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Smelt	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rainbow Smelt	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Unknown Non-Salmon F	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Source: ADF&G Division of Subsistence and BBNA, harvest calendars and household surveys, 2002 & 2003

Table 52. Estimated Number of Households Harvesting Fish by Gear Type, Port Alsworth, October 1, 2002 - September 30, 2003

Resource	Estimated Number of Households								Total Household
	Handline	Gillnet	Seine	Dipnet	Rod&Reel	Ice Fishing	Setline	Unknown	
Non-Salmon Fish	0.0	0.0	0.0	0.0	31.0	0.0	0.0	0.0	31.0
Pike	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Grayling	0.0	0.0	0.0	0.0	10.3	0.0	0.0	0.0	10.3
Char	0.0	0.0	0.0	0.0	31.0	0.0	0.0	0.0	31.0
Arctic Char	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Brook Trout	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Dolly Varden	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Lake Trout	0.0	0.0	0.0	0.0	31.0	0.0	0.0	0.0	31.0
Trout	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rainbow Trout	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Steelhead	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Unknown Trout	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Whitefish	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Round Whitefish	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Humpback Whitefish	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Least Cisco	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Broad Whitefish	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Unknown Whitefish	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Burbot	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Blackfish	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sucker	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Smelt	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rainbow Smelt	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Unknown Non-Salmon F	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Source: ADF&G Division of Subsistence and BBNA, harvest calendars and household surveys, 2002 & 2003

Table 53. Timing of Harvests of Freshwater Fish in Numbers of Fish by Month, Igiugig, October 2002 through September 2003

Resource	Number of Fish Harvested													Total
	October	November	December	January	February	March	April	May	June	July	August	September	Unknown	
Non-Salmon Fish	87.1	122.2	0.0	151.0	88.0	228.0	132.0	4.0	69.0	0.0	38.0	16.0	16.1	951.4
Pike	0.0	9.1	0.0	0.0	1.0	3.0	11.0	0.0	12.0	0.0	0.0	0.0	1.1	37.2
Grayling	0.0	0.0	0.0	19.0	16.0	31.0	5.0	0.0	14.0	0.0	32.0	8.0	0.0	125.0
Char	0.0	0.0	0.0	38.0	15.0	43.0	6.0	0.0	0.0	0.0	5.0	5.0	0.0	112.0
Arctic Char	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Brook Trout	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.0	5.0	0.0	10.0
Dolly Varden	0.0	0.0	0.0	38.0	15.0	43.0	6.0	0.0	0.0	0.0	0.0	0.0	0.0	102.0
Lake Trout	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Trout	2.6	1.3	0.0	90.0	51.0	145.0	30.0	0.0	12.0	0.0	1.0	3.0	11.8	347.7
Rainbow Trout	2.6	1.3	0.0	60.0	26.0	125.0	30.0	0.0	12.0	0.0	1.0	3.0	11.8	272.7
Steelhead	0.0	0.0	0.0	30.0	25.0	20.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	75.0
Unknown Trout	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Whitefish	84.5	100.1	0.0	4.0	5.0	6.0	80.0	0.0	26.0	0.0	0.0	0.0	3.2	308.8
Round Whitefish	0.0	0.0	0.0	4.0	5.0	6.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	15.0
Humpback Whitefish	84.5	0.0	0.0	0.0	0.0	0.0	75.0	0.0	26.0	0.0	0.0	0.0	3.2	188.7
Least Cisco	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Broad Whitefish	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Unknown Whitefish	0.0	100.1	0.0	0.0	0.0	0.0	5.0	0.0	0.0	0.0	0.0	0.0	0.0	105.1
Burbot	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Blackfish	0.0	11.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	11.7
Sucker	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.0	5.0	0.0	0.0	0.0	0.0	9.0
Smelt	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rainbow Smelt	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Unknown Non-Salmon Fish	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Source: ADF&G Division of Subsistence and BBNA, harvest calendars and household surveys, 2002 & 2003

Table 54. Timing of Harvests of Freshwater Fish in Numbers of Fish by Month, Iliamna, October 2002 through September 2003

Resource	Number of Fish Harvested												Total	
	October	November	December	January	February	March	April	May	June	July	August	September		Unknown
Non-Salmon Fish	0.0	0.0	96.4	34.5	54.9	381.2	266.0	0.0	0.0	7.0	72.3	373.3	0.0	1285.7
Pike	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Grayling	0.0	0.0	34.2	4.3	12.9	117.4	14.0	0.0	0.0	0.0	37.3	23.3	0.0	243.5
Char	0.0	0.0	39.4	15.1	42.0	187.4	224.0	0.0	0.0	0.0	10.5	0.0	0.0	518.4
Arctic Char	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Brook Trout	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Dolly Varden	0.0	0.0	39.4	15.1	42.0	187.4	224.0	0.0	0.0	0.0	10.5	0.0	0.0	518.4
Lake Trout	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Trout	0.0	0.0	22.8	15.1	0.0	60.3	28.0	0.0	0.0	7.0	24.5	0.0	0.0	157.7
Rainbow Trout	0.0	0.0	22.8	15.1	0.0	60.3	28.0	0.0	0.0	7.0	24.5	0.0	0.0	157.7
Steelhead	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Unknown Trout	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Whitefish	0.0	0.0	0.0	0.0	0.0	16.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	16.2
Round Whitefish	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Humpback Whitefish	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Least Cisco	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Broad Whitefish	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Unknown Whitefish	0.0	0.0	0.0	0.0	0.0	16.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	16.2
Burbot	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Blackfish	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sucker	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	350.0	0.0	350.0
Smelt	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rainbow Smelt	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Unknown Non-Salmon Fish	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Source: ADF&G Division of Subsistence and BBNA, harvest calendars and household surveys, 2002 & 2003

Table 55 . Timing of Harvests of Freshwater Fish in Numbers of Fish by Month, Kokhanok, October 2002 through September 2003

Resource	Number of Fish Harvested													Total
	October	November	December	January	February	March	April	May	June	July	August	September	Unknown	
Non-Salmon Fish	138.9	8.3	22.6	172.8	88.3	306.5	657.6	847.2	544.8	156.0	86.4	21.6	0.0	3051.0
Pike	0.0	0.0	0.0	0.0	0.0	13.5	96.0	0.0	2.4	0.0	0.0	0.0	0.0	111.9
Grayling	0.0	0.0	0.0	0.0	9.8	42.9	7.2	4.8	84.0	0.0	0.0	0.0	0.0	148.7
Char	65.3	0.0	10.7	22.1	15.9	218.2	187.2	475.2	136.8	122.4	33.6	19.2	0.0	1306.6
Arctic Char	2.4	0.0	0.0	0.0	0.0	0.0	4.8	43.2	0.0	0.0	0.0	0.0	0.0	50.4
Brook Trout	0.0	0.0	2.4	0.0	0.0	0.0	0.0	4.8	0.0	0.0	0.0	0.0	0.0	7.2
Dolly Varden	61.8	0.0	7.1	20.8	14.7	78.5	141.6	427.2	88.8	55.2	31.2	0.0	0.0	926.9
Lake Trout	1.2	0.0	1.2	1.2	1.2	139.7	40.8	0.0	48.0	67.2	2.4	19.2	0.0	322.2
Trout	71.3	2.4	11.9	62.5	62.5	28.2	362.4	276.0	319.2	28.8	52.8	2.4	0.0	1280.3
Rainbow Trout	71.3	2.4	11.9	62.5	62.5	28.2	343.2	271.2	319.2	28.8	52.8	2.4	0.0	1256.3
Steelhead	0.0	0.0	0.0	0.0	0.0	0.0	19.2	4.8	0.0	0.0	0.0	0.0	0.0	24.0
Unknown Trout	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Whitefish	2.4	5.9	0.0	88.3	0.0	3.7	4.8	14.4	2.4	4.8	0.0	0.0	0.0	126.6
Round Whitefish	2.4	5.9	0.0	85.8	0.0	3.7	0.0	14.4	0.0	4.8	0.0	0.0	0.0	117.0
Humpback Whitefish	0.0	0.0	0.0	2.5	0.0	0.0	4.8	0.0	2.4	0.0	0.0	0.0	0.0	9.7
Least Cisco	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Broad Whitefish	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Unknown Whitefish	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Burbot	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Blackfish	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sucker	0.0	0.0	0.0	0.0	0.0	0.0	0.0	76.8	0.0	0.0	0.0	0.0	0.0	76.8
Smelt	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rainbow Smelt	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Unknown Non-Salmon Fish	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Source: ADF&G Division of Subsistence and BBNA, harvest calendars and household surveys, 2002 & 2003



Table 56. Timing of Harvests of Freshwater Fish in Numbers of Fish by Month, Levelock, October 2002 through September 2003

Resource	Number of Fish Harvested													Total
	October	November	December	January	February	March	April	May	June	July	August	September	Unknown	
Non-Salmon Fish	85.1	32.2	0.0	1377.2	775.9	297.5	0.0	658.7	9.3	78.0	91.0	28.6	0.0	3433.5
Pike	11.5	0.0	0.0	23.0	15.3	0.0	0.0	44.0	0.0	58.5	2.6	26.0	0.0	180.9
Grayling	0.0	1.2	0.0	30.7	9.2	9.2	0.0	45.3	0.0	1.3	15.6	0.0	0.0	112.5
Char	0.0	0.0	0.0	3.1	0.0	0.0	0.0	6.7	0.0	3.9	3.9	0.0	0.0	17.5
Arctic Char	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Brook Trout	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Dolly Varden	0.0	0.0	0.0	3.1	0.0	0.0	0.0	6.7	0.0	1.3	2.6	0.0	0.0	13.6
Lake Trout	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.6	1.3	0.0	0.0	3.9
Trout	4.6	6.9	0.0	3.1	15.3	30.7	0.0	101.3	9.3	13.0	68.9	2.6	0.0	255.7
Rainbow Trout	4.6	6.9	0.0	3.1	15.3	30.7	0.0	101.3	9.3	13.0	68.9	2.6	0.0	255.7
Steelhead	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Unknown Trout	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Whitefish	57.5	24.2	0.0	0.0	0.0	0.0	0.0	100.0	0.0	1.3	0.0	0.0	0.0	183.0
Round Whitefish	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.3	0.0	0.0	0.0	1.3
Humpback Whitefish	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Least Cisco	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Broad Whitefish	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Unknown Whitefish	57.5	24.2	0.0	0.0	0.0	0.0	0.0	100.0	0.0	0.0	0.0	0.0	0.0	181.7
Burbot	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Blackfish	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sucker	11.5	0.0	0.0	0.0	0.0	0.0	0.0	41.3	0.0	0.0	0.0	0.0	0.0	52.8
Smelt	0.0	0.0	0.0	1317.4	736.0	257.6	0.0	320.0	0.0	0.0	0.0	0.0	0.0	2631.0
Rainbow Smelt	0.0	0.0	0.0	1317.4	736.0	257.6	0.0	320.0	0.0	0.0	0.0	0.0	0.0	2631.0
Unknown Non-Salmon Fish	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Source: ADF&G Division of Subsistence and BBNA, harvest calendars and household surveys, 2002 & 2003

Table 57. Timing of Harvests of Freshwater Fish in Numbers of Fish by Month, Newhalen, October 2002 through September 2003

Resource	Number of Fish Harvested													Total
	October	November	December	January	February	March	April	May	June	July	August	September	Unknown	
Non-Salmon Fish	47.5	89.5	932.8	871.9	877.7	884.9	407.9	451.4	410.8	2.9	2.9	2.9	6.8	4989.9
Pike	0.0	0.0	0.0	81.6	87.4	90.3	12.1	12.1	12.1	1.4	1.4	1.4	0.0	299.8
Grayling	5.5	0.0	217.7	94.1	94.1	94.1	65.7	71.4	68.6	0.0	0.0	0.0	0.0	711.3
Char	13.3	33.2	234.3	441.2	441.2	445.6	168.5	200.3	168.5	0.5	0.5	0.5	6.8	2154.4
Arctic Char	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Brook Trout	0.0	0.0	0.0	162.2	162.2	162.2	38.6	38.6	38.6	0.0	0.0	0.0	0.0	602.5
Dolly Varden	13.3	33.2	234.3	166.6	166.6	166.6	74.3	83.0	74.3	0.5	0.5	0.5	6.8	1020.4
Lake Trout	0.0	0.0	0.0	112.5	112.5	116.8	55.5	78.7	55.5	0.0	0.0	0.0	0.0	531.5
Trout	28.7	56.4	480.8	119.7	119.7	119.7	159.3	165.1	159.3	1.0	1.0	1.0	0.0	1411.7
Rainbow Trout	28.7	56.4	480.8	119.7	119.7	119.7	62.8	68.6	62.8	1.0	1.0	1.0	0.0	1122.0
Steelhead	0.0	0.0	0.0	0.0	0.0	0.0	96.6	96.6	96.6	0.0	0.0	0.0	0.0	289.7
Unknown Trout	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Whitefish	0.0	0.0	0.0	116.8	116.8	116.8	2.4	2.4	2.4	0.0	0.0	0.0	0.0	357.7
Round Whitefish	0.0	0.0	0.0	63.7	63.7	63.7	2.4	2.4	2.4	0.0	0.0	0.0	0.0	198.4
Humpback Whitefish	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Least Cisco	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Broad Whitefish	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Unknown Whitefish	0.0	0.0	0.0	53.1	53.1	53.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	159.3
Burbot	0.0	0.0	0.0	18.3	18.3	18.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	55.0
Blackfish	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sucker	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Smelt	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rainbow Smelt	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Unknown Non-Salmon Fish	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Source: ADF&G Division of Subsistence and BBNA, harvest calendars and household surveys, 2002 & 2003

Table 58. Timing of Harvests of Freshwater Fish in Numbers of Fish by MOnth, Nondalton, October 2002 through September 2003

Resource	Number of Fish Harvested													
	October	November	December	January	February	March	April	May	June	July	August	September	Unknown	Total
Non-Salmon Fish	57.8	210.3	164.3	57.1	122.5	315.1	86.8	29.3	124.7	226.1	81.1	7.4	0.0	1482.4
Pike	0.0	0.0	0.0	0.0	5.9	0.0	1.2	0.0	0.0	0.0	0.0	0.0	0.0	7.2
Grayling	2.6	76.2	69.7	14.3	61.8	116.5	61.1	13.4	44.0	25.8	2.5	7.4	0.0	495.3
Char	0.0	0.0	2.6	1.2	5.9	110.6	2.4	0.0	4.9	36.9	59.0	0.0	0.0	223.5
Arctic Char	0.0	0.0	0.0	0.0	0.0	72.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	72.5
Brook Trout	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24.6	0.0	0.0	24.6
Dolly Varden	0.0	0.0	0.0	0.0	0.0	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.2
Lake Trout	0.0	0.0	2.6	1.2	5.9	36.9	2.4	0.0	4.9	36.9	34.4	0.0	0.0	125.2
Trout	55.2	134.1	89.4	34.5	47.6	33.3	2.4	8.6	22.0	9.8	17.2	0.0	0.0	454.0
Rainbow Trout	55.2	134.1	89.4	34.5	33.3	33.3	2.4	8.6	22.0	9.8	17.2	0.0	0.0	439.7
Steelhead	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Unknown Trout	0.0	0.0	0.0	0.0	14.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	14.3
Whitefish	0.0	0.0	0.0	0.0	1.2	48.8	19.6	7.3	29.3	82.3	2.5	0.0	0.0	190.9
Round Whitefish	0.0	0.0	0.0	0.0	1.2	0.0	2.4	0.0	2.4	11.1	0.0	0.0	0.0	17.1
Humpback Whitefish	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Least Cisco	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Broad Whitefish	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Unknown Whitefish	0.0	0.0	0.0	0.0	0.0	48.8	17.1	7.3	26.9	71.3	2.5	0.0	0.0	173.8
Burbot	0.0	0.0	2.6	0.0	0.0	5.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.6
Blackfish	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sucker	0.0	0.0	0.0	7.1	0.0	0.0	0.0	0.0	24.4	71.3	0.0	0.0	0.0	102.8
Smelt	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rainbow Smelt	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Unknown Non-Salmon Fish	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Source: ADF&G Division of Subsistence and BBNA, harvest calendars and household surveys, 2002 & 2003

Table 59 . Timing of Harvests of Freshwater Fish in Numbers of Fish by Month, Pedro Bay, October 2002 through September 2003

Resource	Number of Fish Harvested													Total
	October	November	December	January	February	March	April	May	June	July	August	September	Unknown	
Non-Salmon Fish	60.0	49.0	15.0	0.0	0.0	60.0	0.0	1.0	0.0	20.6	36.6	52.6	0.0	294.7
Pike	0.0	2.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.0
Grayling	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Char	23.0	17.0	5.0	0.0	0.0	52.0	0.0	1.0	0.0	20.6	32.0	48.0	0.0	198.6
Arctic Char	0.0	6.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.0
Brook Trout	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Dolly Varden	21.0	3.0	3.0	0.0	0.0	52.0	0.0	1.0	0.0	6.9	16.0	32.0	0.0	134.9
Lake Trout	2.0	8.0	2.0	0.0	0.0	0.0	0.0	0.0	0.0	13.7	16.0	16.0	0.0	57.7
Trout	37.0	30.0	10.0	0.0	0.0	8.0	0.0	0.0	0.0	0.0	4.6	4.6	0.0	94.1
Rainbow Trout	37.0	30.0	10.0	0.0	0.0	8.0	0.0	0.0	0.0	0.0	4.6	4.6	0.0	94.1
Steelhead	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Unknown Trout	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Whitefish	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Round Whitefish	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Humpback Whitefish	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Least Cisco	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Broad Whitefish	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Unknown Whitefish	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Burbot	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Blackfish	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sucker	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Smelt	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rainbow Smelt	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Unknown Non-Salmon Fish	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Source: ADF&G Division of Subsistence and BBNA, harvest calendars and household surveys, 2002 & 2003

Table 60. Timing of Harvests of Freshwater Fish in Number of Fish by Month, Port Alsworth, October 2002 through September 2003

Resource	Number of Fish Harvested													Total
	October	November	December	January	February	March	April	May	June	July	August	September	Unknown	
Non-Salmon Fish	0.0	0.0	0.0	0.0	6.2	1.2	1.1	6.4	0.0	0.0	0.0	0.0	0.0	14.9
Pike	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Grayling	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1	0.0	0.0	0.0	0.0	0.0	1.1
Char	0.0	0.0	0.0	0.0	6.2	1.2	1.1	5.3	0.0	0.0	0.0	0.0	0.0	13.9
Arctic Char	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Brook Trout	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Dolly Varden	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Lake Trout	0.0	0.0	0.0	0.0	6.2	1.2	1.1	5.3	0.0	0.0	0.0	0.0	0.0	13.9
Trout	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rainbow Trout	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Steelhead	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Unknown Trout	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Whitefish	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Round Whitefish	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Humpback Whitefish	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Least Cisco	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Broad Whitefish	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Unknown Whitefish	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Burbot	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Blackfish	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sucker	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Smelt	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rainbow Smelt	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Unknown Non-Salmon Fish	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Source: ADF&G Division of Subsistence and BBNA, harvest calendars and household surveys, 2002 & 2003

Table 61 . Timing of Harvests of Freshwater Fish in Pounds of Fish by Month, Igiugig, October 2002 through September 2003

Resource	Pounds of Fish Harvested													Total
	October	November	December	January	February	March	April	May	June	July	August	September	Unknown	
Non-Salmon Fish	151.5	155.4	0.0	196.5	111.4	299.3	222.3	6.0	113.2	0.0	30.8	16.8	25.2	1328.5
Pike	0.0	25.5	0.0	0.0	2.8	8.4	30.8	0.0	33.6	0.0	0.0	0.0	3.0	104.1
Grayling	0.0	0.0	0.0	13.3	11.2	21.7	3.5	0.0	9.8	0.0	22.4	5.6	0.0	87.5
Char	0.0	0.0	0.0	53.2	21.0	60.2	8.4	0.0	0.0	0.0	7.0	7.0	0.0	156.8
Arctic Char	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Brook Trout	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7.0	7.0	0.0	14.0
Dolly Varden	0.0	0.0	0.0	53.2	21.0	60.2	8.4	0.0	0.0	0.0	0.0	0.0	0.0	142.8
Lake Trout	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Trout	3.6	1.8	0.0	126.0	71.4	203.0	42.0	0.0	16.8	0.0	1.4	4.2	16.6	486.8
Rainbow Trout	3.6	1.8	0.0	84.0	36.4	175.0	42.0	0.0	16.8	0.0	1.4	4.2	16.6	381.8
Steelhead	0.0	0.0	0.0	42.0	35.0	28.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	105.0
Unknown Trout	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Whitefish	147.9	127.3	0.0	4.0	5.0	6.0	137.6	0.0	45.5	0.0	0.0	0.0	5.6	478.9
Round Whitefish	0.0	0.0	0.0	4.0	5.0	6.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	15.0
Humpback Whitefish	147.9	0.0	0.0	0.0	0.0	0.0	131.3	0.0	45.5	0.0	0.0	0.0	5.6	330.3
Least Cisco	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Broad Whitefish	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Unknown Whitefish	0.0	127.3	0.0	0.0	0.0	0.0	6.4	0.0	0.0	0.0	0.0	0.0	0.0	133.7
Burbot	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Blackfish	0.0	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.8
Sucker	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.0	7.5	0.0	0.0	0.0	0.0	13.5
Smelt	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rainbow Smelt	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Unknown Non-Salmon Fish	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Source: ADF&G Division of Subsistence and BBNA, harvest calendars and household surveys, 2002 & 2003

Table 62. Timing of Harvests of Freshwater Fish in Pounds of Fish by Month, Iliamna, October 2002 through September 2003

Resource	Pounds of Fish Harvested													
	October	November	December	January	February	March	April	May	June	July	August	September	Unknown	Total
Non-Salmon Fish	0.0	0.0	111.1	45.2	67.8	449.5	362.6	0.0	0.0	9.8	75.1	541.3	0.0	1662.5
Pike	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Grayling	0.0	0.0	24.0	3.0	9.0	82.2	9.8	0.0	0.0	0.0	26.1	16.3	0.0	170.5
Char	0.0	0.0	55.2	21.1	58.8	262.3	313.6	0.0	0.0	0.0	14.7	0.0	0.0	725.7
Arctic Char	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Brook Trout	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Dolly Varden	0.0	0.0	55.2	21.1	58.8	262.3	313.6	0.0	0.0	0.0	14.7	0.0	0.0	725.7
Lake Trout	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Trout	0.0	0.0	31.9	21.1	0.0	84.4	39.2	0.0	0.0	9.8	34.3	0.0	0.0	220.8
Rainbow Trout	0.0	0.0	31.9	21.1	0.0	84.4	39.2	0.0	0.0	9.8	34.3	0.0	0.0	220.8
Steelhead	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Unknown Trout	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Whitefish	0.0	0.0	0.0	0.0	0.0	20.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	20.5
Round Whitefish	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Humpback Whitefish	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Least Cisco	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Broad Whitefish	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Unknown Whitefish	0.0	0.0	0.0	0.0	0.0	20.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	20.5
Burbot	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Blackfish	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sucker	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	525.0	0.0	525.0
Smelt	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rainbow Smelt	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Unknown Non-Salmon Fish	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Source: ADF&G Division of Subsistence and BBNA, harvest calendars and household surveys, 2002 & 2003

Table 63 . Timing of Harvests of Freshwater Fish in Pounds of Fish by Month, Kokhanok, October 2002 through September 2003

Resource	Pounds of Fish Harvested													Total
	October	November	December	January	February	March	April	May	June	July	August	September	Unknown	
Non-Salmon Fish	193.6	9.3	31.6	208.5	116.7	416.4	1051.7	1184.6	708.1	216.5	121.0	30.2	0.0	4288.1
Pike	0.0	0.0	0.0	0.0	0.0	37.8	268.8	0.0	6.7	0.0	0.0	0.0	0.0	313.3
Grayling	0.0	0.0	0.0	0.0	6.9	30.0	5.0	3.4	58.8	0.0	0.0	0.0	0.0	104.1
Char	91.4	0.0	15.0	30.9	22.3	305.5	262.1	665.3	191.5	171.4	47.0	26.9	0.0	1829.2
Arctic Char	3.3	0.0	0.0	0.0	0.0	0.0	6.7	60.5	0.0	0.0	0.0	0.0	0.0	70.5
Brook Trout	0.0	0.0	3.3	0.0	0.0	0.0	0.0	6.7	0.0	0.0	0.0	0.0	0.0	10.0
Dolly Varden	86.5	0.0	10.0	29.2	20.6	109.8	198.2	598.1	124.3	77.3	43.7	0.0	0.0	1297.6
Lake Trout	1.7	0.0	1.7	1.7	1.7	195.6	57.1	0.0	67.2	94.1	3.4	26.9	0.0	451.0
Trout	99.8	3.3	16.6	87.5	87.5	39.5	507.4	386.4	446.9	40.3	73.9	3.4	0.0	1792.5
Rainbow Trout	99.8	3.3	16.6	87.5	87.5	39.5	480.5	379.7	446.9	40.3	73.9	3.4	0.0	1758.9
Steelhead	0.0	0.0	0.0	0.0	0.0	0.0	26.9	6.7	0.0	0.0	0.0	0.0	0.0	33.6
Unknown Trout	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Whitefish	2.4	5.9	0.0	90.1	0.0	3.7	8.4	14.4	4.2	4.8	0.0	0.0	0.0	133.9
Round Whitefish	2.4	5.9	0.0	85.8	0.0	3.7	0.0	14.4	0.0	4.8	0.0	0.0	0.0	117.0
Humpback Whitefish	0.0	0.0	0.0	4.3	0.0	0.0	8.4	0.0	4.2	0.0	0.0	0.0	0.0	16.9
Least Cisco	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Broad Whitefish	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Unknown Whitefish	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Burbot	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Blackfish	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sucker	0.0	0.0	0.0	0.0	0.0	0.0	0.0	115.2	0.0	0.0	0.0	0.0	0.0	115.2
Smelt	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rainbow Smelt	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Unknown Non-Salmon Fish	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Source: ADF&G Division of Subsistence and BBNA, harvest calendars and household surveys, 2002 & 2003



Table 64 . Timing of Harvests of Freshwater Fish in Pounds of Fish by Month, Levelock, October 2002 through September 2003

Resource	Pounds of Fish Harvested													Total
	October	November	December	January	February	March	April	May	June	July	August	September	Unknown	
Non-Salmon Fish	129.0	41.2	0.0	423.8	254.8	113.8	0.0	575.3	13.1	189.7	120.1	76.4	0.0	1937.2
Pike	32.2	0.0	0.0	64.4	42.9	0.0	0.0	123.2	0.0	163.8	7.3	72.8	0.0	506.6
Grayling	0.0	0.8	0.0	21.5	6.4	6.4	0.0	31.7	0.0	0.9	10.9	0.0	0.0	78.7
Char	0.0	0.0	0.0	4.3	0.0	0.0	0.0	9.3	0.0	5.5	5.5	0.0	0.0	24.5
Arctic Char	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Brook Trout	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Dolly Varden	0.0	0.0	0.0	4.3	0.0	0.0	0.0	9.3	0.0	1.8	3.6	0.0	0.0	19.1
Lake Trout	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.6	1.8	0.0	0.0	5.5
Trout	6.4	9.7	0.0	4.3	21.5	42.9	0.0	141.9	13.1	18.2	96.5	3.6	0.0	358.0
Rainbow Trout	6.4	9.7	0.0	4.3	21.5	42.9	0.0	141.9	13.1	18.2	96.5	3.6	0.0	358.0
Steelhead	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Unknown Trout	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Whitefish	73.1	30.7	0.0	0.0	0.0	0.0	0.0	127.2	0.0	1.3	0.0	0.0	0.0	232.3
Round Whitefish	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.3	0.0	0.0	0.0	1.3
Humpback Whitefish	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Least Cisco	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Broad Whitefish	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Unknown Whitefish	73.1	30.7	0.0	0.0	0.0	0.0	0.0	127.2	0.0	0.0	0.0	0.0	0.0	231.0
Burbot	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Blackfish	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sucker	17.3	0.0	0.0	0.0	0.0	0.0	0.0	62.0	0.0	0.0	0.0	0.0	0.0	79.3
Smelt	0.0	0.0	0.0	329.4	184.0	64.4	0.0	80.0	0.0	0.0	0.0	0.0	0.0	657.8
Rainbow Smelt	0.0	0.0	0.0	329.4	184.0	64.4	0.0	80.0	0.0	0.0	0.0	0.0	0.0	657.8
Unknown Non-Salmon Fish	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Source: ADF&G Division of Subsistence and BBNA, harvest calendars and household surveys, 2002 & 2003

Table 65. Timing of Harvests of Freshwater Fish in Pounds of Fish by Month, Newhalen, October 2002 through September 2003

Resource	Pounds of Fish Harvested													Total
	October	November	December	January	February	March	April	May	June	July	August	September	Unknown	
Non-Salmon Fish	62.7	125.3	1153.6	1229.3	1245.5	1259.7	541.1	597.8	543.1	6.1	6.1	6.1	9.5	6785.9
Pike	0.0	0.0	0.0	228.4	244.7	252.8	33.8	33.8	33.8	4.1	4.1	4.1	0.0	839.4
Grayling	3.9	0.0	152.4	65.9	65.9	65.9	46.0	50.0	48.0	0.0	0.0	0.0	0.0	497.9
Char	18.6	46.4	328.0	617.7	617.7	623.8	235.9	280.5	235.9	0.7	0.7	0.7	9.5	3016.1
Arctic Char	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Brook Trout	0.0	0.0	0.0	227.1	227.1	227.1	54.1	54.1	54.1	0.0	0.0	0.0	0.0	843.5
Dolly Varden	18.6	46.4	328.0	233.2	233.2	233.2	104.1	116.2	104.1	0.7	0.7	0.7	9.5	1428.5
Lake Trout	0.0	0.0	0.0	157.5	157.5	163.6	77.7	110.2	77.7	0.0	0.0	0.0	0.0	744.1
Trout	40.2	78.9	673.1	167.6	167.6	167.6	223.0	231.1	223.0	1.4	1.4	1.4	0.0	1976.4
Rainbow Trout	40.2	78.9	673.1	167.6	167.6	167.6	87.9	96.0	87.9	1.4	1.4	1.4	0.0	1570.8
Steelhead	0.0	0.0	0.0	0.0	0.0	0.0	135.2	135.2	135.2	0.0	0.0	0.0	0.0	405.5
Unknown Trout	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Whitefish	0.0	0.0	0.0	131.3	131.3	131.3	2.4	2.4	2.4	0.0	0.0	0.0	0.0	401.0
Round Whitefish	0.0	0.0	0.0	63.7	63.7	63.7	2.4	2.4	2.4	0.0	0.0	0.0	0.0	198.4
Humpback Whitefish	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Least Cisco	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Broad Whitefish	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Unknown Whitefish	0.0	0.0	0.0	67.5	67.5	67.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	202.6
Burbot	0.0	0.0	0.0	18.3	18.3	18.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	55.0
Blackfish	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sucker	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Smelt	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rainbow Smelt	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Unknown Non-Salmon Fish	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Source: ADF&G Division of Subsistence and BBNA, harvest calendars and household surveys, 2002 & 2003

Table 66. Timing of Harvests of Freshwater Fish in Pounds of Fish by Month, Nondalton, October 2002 through September 2003

Resource	Pounds of Fish Harvested													
	October	November	December	January	February	March	April	May	June	July	August	September	Unknown	Total
Non-Salmon Fish	79.1	241.0	180.2	70.6	136.0	351.0	77.3	30.7	141.8	292.0	111.5	5.2	0.0	1716.4
Pike	0.0	0.0	0.0	0.0	16.6	0.0	3.4	0.0	0.0	0.0	0.0	0.0	0.0	20.1
Grayling	1.8	53.4	48.8	10.0	43.3	81.6	42.8	9.4	30.8	18.1	1.7	5.2	0.0	346.7
Char	0.0	0.0	3.7	1.7	8.3	154.8	3.4	0.0	6.8	51.6	82.6	0.0	0.0	312.9
Arctic Char	0.0	0.0	0.0	0.0	0.0	101.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	101.6
Brook Trout	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	34.4	0.0	0.0	34.4
Dolly Varden	0.0	0.0	0.0	0.0	0.0	1.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.7
Lake Trout	0.0	0.0	3.7	1.7	8.3	51.6	3.4	0.0	6.8	51.6	48.2	0.0	0.0	175.3
Trout	77.3	187.7	125.1	48.3	66.6	46.6	3.4	12.0	30.8	13.8	24.1	0.0	0.0	635.6
Rainbow Trout	77.3	187.7	125.1	48.3	46.6	46.6	3.4	12.0	30.8	13.8	24.1	0.0	0.0	615.6
Steelhead	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Unknown Trout	0.0	0.0	0.0	0.0	20.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	20.0
Whitefish	0.0	0.0	0.0	0.0	1.2	62.0	24.2	9.3	36.6	101.7	3.1	0.0	0.0	238.2
Round Whitefish	0.0	0.0	0.0	0.0	1.2	0.0	2.4	0.0	2.4	11.1	0.0	0.0	0.0	17.1
Humpback Whitefish	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Least Cisco	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Broad Whitefish	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Unknown Whitefish	0.0	0.0	0.0	0.0	0.0	62.0	21.8	9.3	34.2	90.6	3.1	0.0	0.0	221.1
Burbot	0.0	0.0	2.6	0.0	0.0	5.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.6
Blackfish	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sucker	0.0	0.0	0.0	10.7	0.0	0.0	0.0	0.0	36.7	106.9	0.0	0.0	0.0	154.3
Smelt	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rainbow Smelt	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Unknown Non-Salmon Fish	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Source: ADF&G Division of Subsistence and BBNA, harvest calendars and household surveys, 2002 & 2003

Table 67. Timing of Harvests of Freshwater Fish in Pounds of Fish by Month, Pedro Bay, October 2002 through September 2003

Resource	Pounds of Fish Harvested													Total
	October	November	December	January	February	March	April	May	June	July	August	September	Unknown	
Non-Salmon Fish	84.0	71.4	21.0	0.0	0.0	84.0	0.0	1.4	0.0	28.8	51.2	73.6	0.0	415.4
Pike	0.0	5.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.6
Grayling	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Char	32.2	23.8	7.0	0.0	0.0	72.8	0.0	1.4	0.0	28.8	44.8	67.2	0.0	278.0
Arctic Char	0.0	8.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.4
Brook Trout	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Dolly Varden	29.4	4.2	4.2	0.0	0.0	72.8	0.0	1.4	0.0	9.6	22.4	44.8	0.0	188.8
Lake Trout	2.8	11.2	2.8	0.0	0.0	0.0	0.0	0.0	0.0	19.2	22.4	22.4	0.0	80.8
Trout	51.8	42.0	14.0	0.0	0.0	11.2	0.0	0.0	0.0	0.0	6.4	6.4	0.0	131.8
Rainbow Trout	51.8	42.0	14.0	0.0	0.0	11.2	0.0	0.0	0.0	0.0	6.4	6.4	0.0	131.8
Steelhead	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Unknown Trout	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Whitefish	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Round Whitefish	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Humpback Whitefish	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Least Cisco	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Broad Whitefish	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Unknown Whitefish	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Burbot	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Blackfish	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sucker	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Smelt	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rainbow Smelt	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Unknown Non-Salmon Fish	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Source: ADF&G Division of Subsistence and BBNA, harvest calendars and household surveys, 2002 & 2003

Table 68. Timing of Harvests of Freshwater Fish in Pounds of Fish by Month, Port Alsworth, October 2002 through September 2003

Resource	Pounds of Fish Harvested													Total
	October	November	December	January	February	March	April	May	June	July	August	September	Unknown	
Non-Salmon Fish	0.0	0.0	0.0	0.0	8.7	1.7	1.5	8.2	0.0	0.0	0.0	0.0	0.0	20.1
Pike	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Grayling	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	0.0	0.0	0.0	0.0	0.0	0.7
Char	0.0	0.0	0.0	0.0	8.7	1.7	1.5	7.5	0.0	0.0	0.0	0.0	0.0	19.4
Arctic Char	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Brook Trout	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Dolly Varden	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Lake Trout	0.0	0.0	0.0	0.0	8.7	1.7	1.5	7.5	0.0	0.0	0.0	0.0	0.0	19.4
Trout	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rainbow Trout	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Steelhead	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Unknown Trout	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Whitefish	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Round Whitefish	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Humpback Whitefish	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Least Cisco	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Broad Whitefish	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Unknown Whitefish	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Burbot	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Blackfish	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sucker	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Smelt	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rainbow Smelt	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Unknown Non-Salmon Fish	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Source: ADF&G Division of Subsistence and BBNA, harvest calendars and household surveys, 2002 & 2003

Table 69. Assessment of Harvests and Uses of Freshwater Fish Compared to Other Recent Years

	Responses	Number and Percent <sup>2</sup> of Households							
		Less		Same		More		Never Use	
Igiugig	10	8	80.0%	1	10.0%	1	10.0%		0
Iliamna <sup>1</sup>	0	n.a.		n.a.		n.a.			n.a.
Kokhanok	16	7	43.8%	9	56.3%	0	0.0%		0
Levelock	11	5	50.0%	5	50.0%	0	0.0%		1
Newhalen	26	13	50.0%	11	42.3%	2	7.7%		0
Nondalton	29	8	27.6%	18	62.1%	3	10.3%		0
Pedro Bay	7	6	85.7%	1	14.3%	0	0.0%		0
Port Alsworth	24	2	10.0%	18	90.0%	0	0.0%		4

<sup>1</sup> Post-season surveys were not administered in Iliamna.

<sup>2</sup> Percent based on number ever using (sum of less, same, and more minus "never use")

Source: ADF&G Division of Subsistence and BBNA, household surveys, 2003

Table 70. Reasons for Less Uses of Freshwater Fish Compared to Other Recent Years

	Responses	Number and Percent <sup>2</sup> of Households with Less Use		Reasons for Less Use <sup>3</sup>									
				Weather Conditions		Less Effort		Personal/Less Need		Scarce Resources		Missing	
Igiugig	10	8	80.0%	4	50.0%	2	25.0%		0.0%		0.0%	2	25.0%
Iliamna <sup>1</sup>	0	n.a.											
Kokhanok	16	7	43.8%	1	14.3%	2	28.6%	2	28.6%		0.0%	2	28.6%
Levelock	11	5	50.0%	2	40.0%		0.0%	2	40.0%		0.0%	1	20.0%
Newhalen	26	13	50.0%	10	76.9%		0.0%		0.0%	2	15.4%	1	7.7%
Nondalton	29	8	27.6%		0.0%		0.0%		0.0%		0.0%	8	100.0%
Pedro Bay	7	6	85.7%	3	50.0%		0.0%	3	50.0%	2	33.3%	1	16.7%
Port Alsworth	24	2	10.0%	1	50.0%		0.0%		0.0%	1	50.0%		0.0%

<sup>1</sup> Post-season surveys were not administered in Iliamna.

<sup>2</sup> Percent based on number ever using (sum of less, same, and more minus "never use")

<sup>3</sup> Percent based on number with less use; households could give more than one reason.

Source: ADF&G Division of Subsistence and BBNA, household surveys, 2003

Table 71. Were Household Needs for Freshwater Fish Met During Study Year?

	Responses	Number of Households			Percentage of Households		
		Yes	No	Don't Know	Yes	No	Don't Know
Igiugig	10	6	3	1	60.0%	30.0%	10.0%
Iliamna <sup>1</sup>	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Kokhanok	16	14	2	0	87.5%	12.5%	0.0%
Levelock	11	6	4	1	54.5%	36.4%	9.1%
Newhalen	26	19	6	1	73.1%	23.1%	3.8%
Nondalton	29	26	3	0	89.7%	10.3%	0.0%
Pedro Bay	7	3	4	0	42.9%	57.1%	0.0%
Port Alsworth	24	23	0	1	95.8%	0.0%	4.2%

<sup>1</sup> Post-season household surveys were not administered in Iliamna.

Source: ADF&G Division of Subsistence and BBNA, household surveys, 2003



Table 72. Reasons Household Needs for Freshwater Fish Not Met During Study Year

	Responses	Households Not Meeting Needs		Reasons for Not Meeting Needs <sup>2</sup>								
		Number	Percent	Weather Conditions		Less Effort		Personal	Less Harvest/Receive		missing	
Igiugig	10	3	30.0%	2	66.7%	1	33.3%	0.0%		0.0%	0	0.0%
Iliamna <sup>1</sup>	0	n/a	n/a									
Kokhanok	16	2	12.5%		0.0%		0.0%	2	100.0%		0.0%	0.0%
Levelock	11	4	36.4%		0.0%		0.0%		0.0%	1	25.0%	3 75.0%
Newhalen	26	6	23.1%	3	50.0%		0.0%	2	33.3%		0.0%	1 16.7%
Nondalton	29	3	10.3%		0.0%		0.0%		0.0%	1	33.3%	2 66.7%
Pedro Bay	7	4	50.0%	1	25.0%		0.0%	1	25.0%	2	50.0%	0.0%
Port Alsworth	24	0	0									

<sup>1</sup> Post-season household surveys were not administered in Iliamna.

<sup>2</sup> Percent based on number not meeting needs.

Source: ADF&G Division of Subsistence and BBNA, household surveys, 2003

Table 73 . Estimated Harvests of Nonsalmon Freshwater Fish, Pounds Usable Weight perCapita, Study Communities, All Study Years

Community	Trout/char	Dolly Varden	Lake	Rainbow	Unknown			Whitefish					Black-		Total		
	Total	Arctic char	trout	trout	Steelhead	Trout	Pike	Grayling	Sucker	Total	Cisco	Humpback	Round	Smelt		Burbot	fish
<b>Igiugig</b>																	
1973	50.2	9.9		40.3			30.9	16.7	5.1	38.2						141.1	
1983	13.0		7.1	5.9			13.7	3.0		35.3		35.3			13.2	78.1	
1992	26.5	3.6	0.9	21.2		0.7	17.5	1.7	6.9	35.6		35.5	0.2	1.5	0.0	89.8	
<b>Iliamna</b>																	
1973	16.1	14.4	0.3	1.4			1.3	2.2		0.8						20.4	
1983	20.4	0.9	0.3	1.4		17.8	2.8	0.3	1.5	1.1		0.4	0.8			26.1	
1991	46.1	24.0	1.5	18.8		1.9	3.4	4.0	13.2	1.7			1.7		0.5	69.0	
<b>Kokhanok</b>																	
1973	32.1	15.5	5.6	11.0			4.1	1.0		19.6						56.8	
1983	53.1	37.7	0.3	15.0			12.2	0.0		32.1			32.1		0.0	97.4	
1992	44.5	12.7	0.2	15.7		15.8	3.5	1.2	0.1	44.9	0.1	7.2	37.6	8.5		102.6	
<b>Levelock</b>																	
1973	7.6	0.7	6.8				9.5	1.2		15.4				13.8		47.5	
1988	7.2	1.7	1.9	3.6			16.4	2.1	1.4	20.0			20.0	5.2	2.5	0.0	54.8
1992	5.8	0.2	0.0	5.0		0.6	16.2	0.9	1.8	17.5	0.3	17.2		13.7	0.6	0.1	56.5
1996	9.7			8.9	0.9		7.8	1.8		3.7		3.7		9.9		32.9	
<b>Newhalen</b>																	
1973	61.4	21.8	10.0	29.6			8.9	5.6		0.4						76.3	
1983	23.3	5.6	1.6	2.5		13.6	0.4	0.6		2.7		2.6	0.2		0.1	27.1	
1991	24.3	11.7	1.0	10.3		1.3	6.1	2.6	1.4	2.7		1.0	1.7			37.2	
<b>Nondalton</b>																	
1973	15.3		13.2	1.7		0.4	5.4	8.5		11.1						40.3	
1980	17.3		13.4	1.9		2.1	1.0	4.8		3.8				0.2		27.2	
1981	15.7		6.9	3.7		5.1	2.5	11.4		6.3				0.2		36.1	
1983	54.2	12.0	22.5	18.1		1.7	13.9	43.8	9.5	51.3	0.0	47.7	3.6		2.1	174.6	
<b>Pedro Bay</b>																	
1973	64.6	22.9	40.0	1.7			0.1									64.7	
1982	67.6	21.3	42.2	4.1			0.8	0.3								68.7	
1996	13.8	7.4	1.6	1.8		3.1			0.1							14.0	
<b>Port Alsworth</b>																	
1983	5.7		5.7				0.7	2.5		1.7		1.0	0.7		0.9	11.6	

Source: Scott et al. 2001 for all years but 2002; for 2002: ADF&G and BBNA, Harvest Calendars and Household Surveys, 2002/2003

Table 74. Estimated Harvests of Nonsalmon Freshwater Fish by Decade in Pounds Usable Weight, Study Communities

	1973/74		Mid 1980s		Mid 1990s <sup>2</sup>		2002/2003	
	Total lbs	Per Capita	Total lbs	Per Capita	Total lbs	Per Capita	Total lbs	Per Capita
Igiugig	5,464	141.3	5,440	78.1	4,201	89.8	1,329	30.6
Iliamna	1,279	20.5	4,544	32.4	6,750	69.0	1,663	20.4
Kokhanok	4,414	54.4	13,982	97.4	17,785	102.6	4,288	29.4
Levelock	3,747	47.6	5,965	54.8	6,237	56.4	1,937	26.9
Newhalen	5,198	71.7	3,394	27.1	5,865	37.2	6,786	47.9
Pedro Bay	1,828	45.7	4,246	68.8	878	14.0	415	6.3
Subtotal	21,931	58.8	37,571	57.9	41,716	64.3	16,418	30.0
Nondalton	5,132	34.0	7,174	36.1	7,174	36.1	1,716	11.8
Port Alsworth <sup>1</sup>			880	11.6	880	11.6	20	0.2
Regional Totals	27,063	51.6	45,625	49.4	49,770	53.9	18,154	23.3

<sup>1</sup> Port Alsworth was not surveyed in 1974

<sup>2</sup> There are no harvest estimates for Nondalton or Port Alsworth for the 1990s; values for for the 1980s are used for the

Table 75. Estimated Harvests of Nonsalmon Freshwater Fish in Pounds Usable Weight by Species by Decade, All Study Communities Combined

Resource <sup>1</sup>	1973/74 <sup>2</sup>			Mid 1980s			Mid 1990s <sup>3</sup>			2002/2003		
	Total lbs	Per Capita	% of total	Total lbs	Per Capita	% of total	Total lbs	Per Capita	% of Total	Total lbs	Per Capita	% of Total
Arctic Grayling	2,631	5.0	9.7%	3,143	3.4	6.9%	3,666	4.0	7.4%	1,286	1.7	7.1%
Northern Pike	3,811	7.3	14.1%	5,521	6.0	12.1%	5,063	5.5	10.2%	1,789	2.3	9.9%
Dolly Varden	5,194	9.9	19.2%	9,528	10.3	20.9%	8,065	8.7	16.2%	4,887	6.3	26.9%
Lake Trout	2,478	4.7	9.2%	5,401	5.8	11.8%	2,289	2.5	4.6%	1,476	1.9	8.1%
Rainbow Trout	5,685	10.8	21.0%	8,651	9.4	19.0%	11,999	13.0	24.1%	5,602	7.2	30.9%
Whitefish	5,983	11.4	22.1%	11,133	12.0	24.4%	13,349	14.5	26.8%	1,505	1.9	8.3%
Sucker	200	0.4	0.7%	363	0.4	0.8%	2,060	2.2	4.1%	887	1.1	4.9%
Burbot		0.0	0.0%	1,311	1.4	2.9%	219	0.2	0.4%	64	0.1	0.4%
Blackfish		0.0	0.0%	4	0.0	0.0%	6	0.0	0.0%	1	0.0	0.0%
Smelt	1,082	2.1	4.0%	570	0.6	1.2%	3,054	3.3	6.1%	658	0.8	3.6%
Totals	27,063	51.6	100.0%	45,625	49.4	100.0%	49,770	53.9	100.0%	18,154	23.3	100.0%

<sup>1</sup> Dolly Varden includes Arctic char and brook trout; rainbow trout includes steelhead and unknown trout.

<sup>2</sup> Region totals do not include Port Alsworth for 1973/74

<sup>3</sup> Because no estimates for the 1990s for Nondalton or Port Alsworth are available, estimates from the 1980s are used.

Sources: Gasbarro and Utermohle 1974; Scott et al. XXXX; ADF&G and BBNA, harvest calendars and household surveys 2002 & 2003.





## **APPENDIX A**

### ***Training Manual for Collecting Subsistence Harvest Information***





**Subsistence Fisheries Assessment: Kvichak River Watershed Resident Species**  
Training Manual for Collecting Subsistence Harvest Information

Prepared by Division of Subsistence, ADF&G  
October 29, 2002

For more information contact:

Molly Chythklook or Ted Krieg  
Division of Subsistence  
ADFG  
PO Box 1030  
Dillingham, AK 99576  
Phone: 842-5925  
Fax: 842-5514

Hans Nicholson or Karen Pletnikoff  
Natural Resources Department  
BBNA  
PO Box 310  
Dillingham, AK 99576  
Phone: 1-800-478-5257  
Fax: 842-5932

E-mail: [molly\\_chythklook@fishgame.state.ak.us](mailto:molly_chythklook@fishgame.state.ak.us)  
E-mail: [theodore\\_krieg@fishgame.state.ak.us](mailto:theodore_krieg@fishgame.state.ak.us)

E-mail: [hnicholson@bbna.com](mailto:hnicholson@bbna.com)  
E-mail: [kpletnikoff@bbna.com](mailto:kpletnikoff@bbna.com)

### Background

The Bristol Bay Native Association (BBNA), and the Alaska Department of Fish and Game (ADF&G) are working together on a project called *Subsistence Fisheries Assessment: Kvichak River Watershed Resident Species (No. FIS 02-034)*. This project is funded by the Fisheries Information Service, Office of Subsistence Management, US Fish and Wildlife Service. One goal of this project is to document subsistence harvests of nonsalmon fish for a one year time period. This will be achieved by the use of calendars that households will be given to record the amount of fish they caught, date of harvest, gear type, and location of harvest. Another goal is to document Traditional Ecological Knowledge about nonsalmon fish. See the **Investigation Plan** for the project for more background and detail. This manual only covers procedures for collecting subsistence harvest information.

Currently there are no subsistence harvest assessment programs for nonsalmon fish in the study communities. Updated information is desirable for several reasons. First, the most recent data for most communities are eight or more years old. Second, with recent relatively low returns of sockeye salmon to the Kvichak system, it is important to understand how freshwater fish may be used to compensate for below-desired salmon harvests.

#### Key Principles of Subsistence Research:

Before conducting any research that involves human subjects, interviewers need to be aware of several **key ethical principles**. These include:

- Informed consent: participation in this project is voluntary. People from whom you request information need to be informed about the project and agree to participate. This means they are informed who you are, who you work for, why you are collecting the information, and how the information will be used. They need also to know that they don't need to talk with you if they don't want to. Nevertheless, be positive and encouraging when you introduce the project.
- Confidentiality is essential. Respect people's privacy. Do not discuss personal information, such as harvest numbers, with people who are not part of the project. Keep notes and records secure.

- Note: **under state law, subsistence permit records are confidential.**

### **Methods for Collecting Subsistence Harvest Information on nonsalmon fish**

To start out you need to review the provided **household tracking sheet**. This is the most recent list of households that BBNA and the Subsistence Division have for your community. The name listed with the **household ID number (HHID)** is considered to be the head of the household and is only used to identify the household. The freshwater fish (FWF) harvesting data that will be recorded is for all of the people that live in that household. If you know of households that are not on the list they should be added (give them HHID numbers that begin with 100). If two households have combined they should be considered as one HHID number. Delete one of the two HHID numbers for the households that are now combined and write on the tracking sheet next to the HHID number that is being deleted: "combined with HHID Number \_\_\_\_." Do not include seasonal residents on the list, only those households that consider your community to be their permanent residence should be included. Do not include teachers unless they stay in the community during the summer. If a household has **moved** write the community that they moved to in the "**No Contact or Moved**" column. If you don't know where they moved to just write "moved."

**Dates** are very important for this project, be sure to write down the date that the calendar was given to each household and the dates that the calendars are collected. When you send in the calendars (see below) after you have collected them from each household at the end of each three month period you will need to send a copy of the household tracking sheet with the calendars. You must keep the original until the end of the project.

You should **attempt to contact each household on three separate occasions** when you know that they are in the village. If the household refuses to participate, that is okay, although we would like everyone to participate, participation in the FWF project is voluntary. Thank the household for their time and on the tracking sheet write the date under the "**Refused**" column on the line for that household.

Each time you try to contact a household on different days when you know that they are in the village write down the date in the "**Contact Attempts**" column. If you are not able to talk to them by the third try write "**no contact**" in the "**No Contact or Moved**" column. Contact attempts include: talking to a household and setting up a time to meet them and when you arrive at the household the person you need to talk to isn't available or no one is home and/or they make an excuse and ask you to come back later. If after three of these "contacts" you do not get their consent to participate, you can write them down as a "no contact." If you have documented three contact attempts with dates in the appropriate column you will be paid the initial contact fee for the household.

If at any time a household that refused or was a no contact decides that they want to participate, by all means, welcome them with open arms, explain the project and get them started on filling out their calendar. Use the same procedures described below to record FWF data up to that point in time. Please remember that keeping an accurate household list is very important to the success of the project and so that you can get paid for the work that you do.

**Contact each household in your community in person.** The best person to talk to is the wife, husband, or whoever is identified as the primary FWF harvester, but remember that the harvests of all members of the household should be recorded. Introduce yourself, explain the project to them and your role in it. It is important to explain to the household that by recording their harvests it will show the importance of freshwater fish as a subsistence food for their community. Explain that the data that is collected for all households is **confidential** and only HHID numbers will be attached to the calendars. HHID numbers are only used for tracking purposes and the names of those participating are strictly confidential. When the data is released in a report it will be the harvest for the entire community and not by individual household. Be polite and try to answer all questions. If you run into a question that you can't answer it is okay to say "I don't know but I'll talk to BBNA or ADFG Subsistence Division and get the answer for you." When you obtain their verbal informed consent to participate in the project and provide you with information give them a calendar and continue with the procedures below.

**The survey period covered by the calendars starts on October 1, 2002.** After the household agrees to participate they need to be prompted to record their harvests between Oct. 1 and the date they are given the calendar so that the all of their FWF harvests from Oct. 1 on have been recorded. They can summarize the harvests for that time period or record specific data, if they remember, on the calendar. Also tell the household the following information and write it in the spaces provided on the first calendar: **the date that you will return to collect the calendar** (about January 1, 2003 for the first calendar), **your (Assistant's) name**, and your **phone number**. Each Household should be given at least three calendars to start out, more for households that think they will need more to record their harvests during the three month period.

Remind the household that when **recording the number of fish** that were caught it is best to record individual fish. Buckets can be used for smelt and blackfish but the size of the bucket will need to be recorded. If another container such as a bag is used for smelt, and individual fish aren't counted, an estimated number should be given.

**When returning to the household to collect calendars** you will need to make sure that you have extra calendars with you in case the household cannot find theirs. If they have lost their calendar they will have to try to remember as best they can what they caught for the past three month period. All of the same information will be collected through recall except date of harvests (although an approximation of timing might be possible). You should also ask if all of the harvests of all of the members of the household have been recorded. After you review the calendar conduct **a short interview** to clarify anything written on the calendar that you do not understand and to record important information. General questions to ask are: How did your fishing go? How was the harvest? Did you notice any changes or anything unusual about the fish, or the environment while fishing? Of course all responses will have to be recorded on the calendar or in a notebook.

Remember, if you obtain a harvest estimate, make sure to record the estimated harvest on their calendar. Put the estimates in the notes section of the calendar and record additional important information there or in your notebook.

Here are the basic instructions to give fishers for recording harvests:

- Record harvests by ANY gear type (nets, hook and line, rod and reel, spear, and etc.)
- The calendar should **not** be used to record salmon harvests.
- **Do not** record fish that are not kept for subsistence use or sharing, fish taken to feed dogs is a subsistence use.
- **Do not** record fish that was given to you. The household that caught the fish will need to record them (so harvests are not counted twice).

### **Notes and Notebooks**

You should keep a notebook with you whenever you are on the job. Do not rely on the calendar to record important information. There probably will not be enough room!! Make sure you date all your notes and record the HH ID number with the notes so the notes can be attached to the correct calendar. Keep a **record** of every visit with each household. Keep these records in a notebook. Make sure that everything you learned is documented either in your notebook or on forms. The notebooks will be part of the permanent record of the project.

### **Quarterly Reports**

You will be given envelopes to send in the calendars, notes, and a copy of the tracking sheet at the end of each three month period. Make sure that the calendars and notes are safely mailed and not lost.

### What You Need For this Project:

- Copy of subsistence regulations booklet/Bristol Bay handout
- Blank nonsalmon subsistence harvest calendars
- Household tracking sheet for your community (different color of each three month period)
- Sampling Problem Report sheet (to record any problems encountered i.e. the number of times it takes to collect the calendar and get the household started on the next calendar)
- Payment Request sheet (to submit to BBNA to get paid after the calendars have been collected and sent in)
- Lead pencils (less messy than ink when you are recording information on the limited space of the calendar that you may need to change as you talk to the informants)
- Notebook
- Investigation Plan (14 pages)
- Envelopes to return calendars
- This training manual
- Project description, one page for each household
- Expanding folder to carry your paperwork

### **Traditional Ecological Knowledge (TEK) Interviews**

When: April 2003  
Why: Lack of accessible traditional knowledge on use patterns, ecology, and population trends for freshwater fish.  
Who: ADFG and BBNA staff assisted by Local Research Assistants.  
How: Two to three key respondent will be identified and interviewed in each village. The Assistants will help set up and conduct these interviews.

ADF&G Division of Subsistence and BBNA Natural Resources Department staff will travel to communities probably in April 2003 to train the local research assistants and conduct TEK interviews. We will have a set of questions called a protocol to document traditional knowledge of fish to help guide the interviews. Interviews will be audio taped with the permission of the respondent. Transcriptions or detailed notes from each interview will be key-worded and entered into an AskSam database. AskSam allows the user to retrieve information in the database by entering the key words. Summaries of key findings will appear in a final report.

### **Interviews/fourth quarter calendar collection**

When: October 2003  
Why: Supplement calendars  
Document sharing  
Obtain information from households that did not keep calendars.  
Who: Local Research Assistants assisted by ADFG and BBNA staff.  
How: Households that kept calendars will be interviewed when the final calendar is collected other households will be visited also. Participation will be voluntary

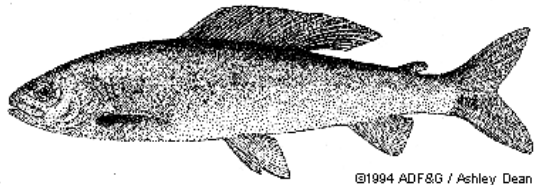
ADF&G Division of Subsistence and BBNA Natural Resources Department staff will travel to communities to train local research assistants and work with them to complete interviews at the time of the fourth quarter calendar collection. Households that did not participate in the project by recording their FWF harvests on the calendars will also be contacted for the interview.

## **APPENDIX B**

### ***Harvest Calendar***

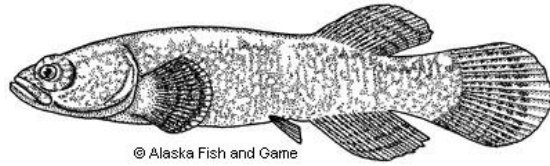






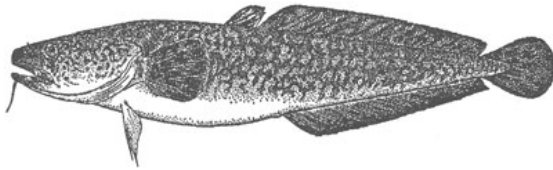
Arctic Grayling

©1994 ADF&G / Ashley Dean

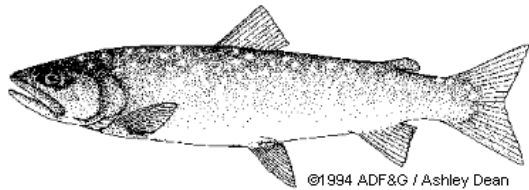


Blackfish

© Alaska Fish and Game

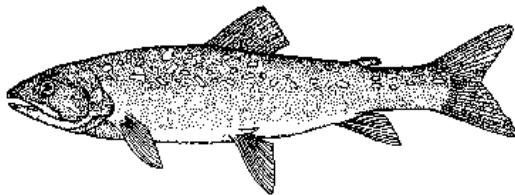


Burbot

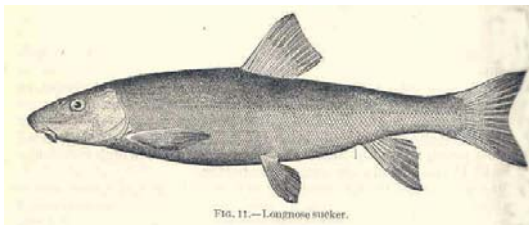


Dolly Varden

©1994 ADF&G / Ashley Dean

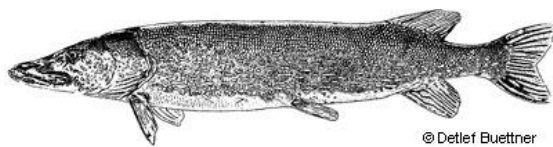


Lake Trout



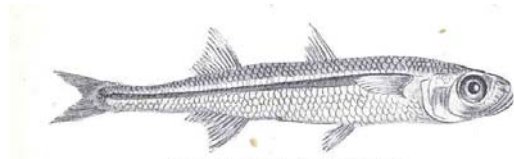
Longnose Sucker

FIG. 11.—Longnose sucker.



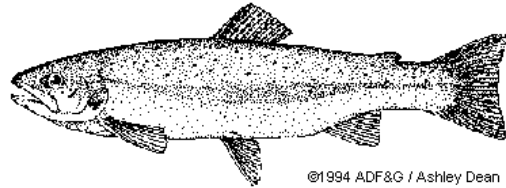
Northern Pike

© Detlef Buettner



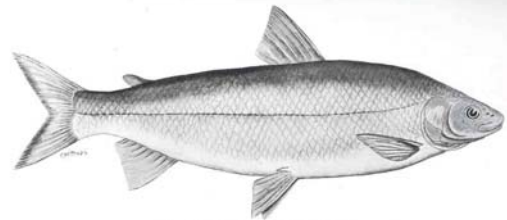
Rainbow Smelt

FIG. 31. — *Atherina Riessii*, (gr. nat., da Borsieri)



Rainbow Trout

©1994 ADF&G / Ashley Dean

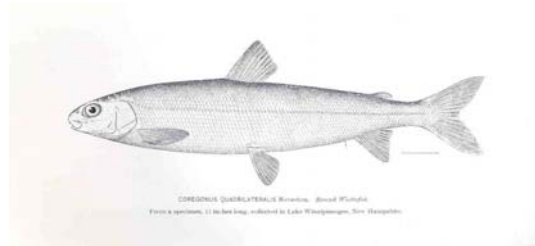


Broad (Lake) Whitefish

Common Whitefish. (*Coregonus clupeaformis*.)

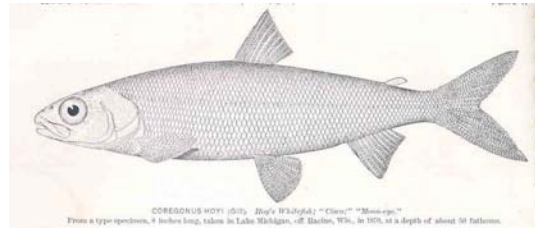


Humpback Whitefish



Round Whitefish

*COREGONUS QUADRIATERALIS* Swinhoe, Round Whitefish.  
From a specimen, 11 inches long, collected in Lake Washington, Nov. 1880.



Least Cisco

*COREGONUS HOYI* (Steind.) Hoyle's Whitefish. "Cisco." "Moose-eye."  
From a type specimen, 4 inches long, taken in Lake Michigan, off Mackinac, Wis., in 1851, at a depth of about 50 fathoms.



**APPENDIX C**

*Post-Season Survey*





**NON-COMMERCIAL FISHING: NON-SALMON FINFISH.**

DID MEMBERS OF YOUR HOUSEHOLD TRY TO HARVEST OR USE FRESHWATER FISH OTHER THAN SALMON BETWEEN OCTOBER 2002 AND SEPTEMBER 2003? YES: \_\_\_\_\_ NO: \_\_\_\_\_  
 IF YES, PLEASE COMPLETE THE FOLLOWING TABLE (IF COLLECTED IN POUNDS SHOULD INDICATE EDIBLE WEIGHT):

SPECIES	USED? Y/N	TRIED TO HARVEST Y/N	NUMBER HARVESTED BY:									UNITS	RECEIVED Y/N	GAVE AWAY Y/N
			SEE CALENDARS	HANDLINE #	GILLNET #	SEINE #	DIPNET #	ROD & REEL #	ICE FISHING #	OTHER TYPE #				
PIKE												IND		
125400002												1		
GRAYLING												IND		
125200002												1		
RAINBOW TROUT												IND		
126204002												1		
STEELHEAD												IND		
126206002												1		
LAKE TROUT												IND		
125010002												1		
DOLLY VARDEN												IND		
125006012												1		
MOUNTAIN/BROOK TROUT												IND		
												1		
TROUT - UNKNOWN												IND		
126299002												1		
BURBOT "LING COD"												IND		
124800002												1		
BLACK FISH												GAL		
124600002												4		
LONGNOSE SUCKER												IND		
126000002												1		

SPECIES	USED? Y/N	TRIED TO HARVEST Y/N	NUMBER HARVESTED BY:									UNITS	RECEIVED Y/N	GAVE AWAY Y/N
			SEE CALENDARS	HANDLINE #	GILLNET #	SEINE #	DIPNET #	ROD & REEL #	ICE FISHING #	OTHER TYPE #				
ROUND WHITEFISH "CANDLEFISH" 126412002												IND		
												1		
HUMPBACK WHITEFISH												IND		
126408002												1		
LEAST CISCO												IND		
126406062												1		
BROAD (LAKE) WHITEFISH												IND		
126410002												1		
UNKNOWN WHITEFISH												IND		
126499002												1		
RAINBOW SMELT												GAL		
120406002												4		

**HOW DID YOUR HARVEST/USE OF FRESHWATER FISH IN THE OCTOBER 2002 TO SEPTEMBER 2003 STUDY YEAR COMPARE TO OTHER RECENT YEARS?**

Less  About the same  More  Never used

If your harvest/use was different, why?

---

---

---

**WERE YOUR HOUSEHOLD'S NEEDS FOR FRESHWATER FISH MET DURING THE OCTOBER 2002 TO SEPTEMBER 2003 STUDY YEAR?**

Yes  No  Don't know

If your needs were not met, why?

---

---

---

**DO YOU HAVE ANY COMMENTS OR SUGGESTIONS ABOUT THE FRESHWATER FISH HARVEST CALENDAR PROJECT?**

---

---

---

---

**DO YOU HAVE OTHER QUESTIONS, COMMENTS, OR CONCERNS THAT YOU'D LIKE TO SHARE WITH US?**

---

---

---

---

**INTERVIEW SUMMARY:**

---

---

---

---

---

---

---

## **APPENDIX D**

### ***Protocol for Collecting Traditional Ecological Knowledge***





## **Kvichak Watershed Freshwater Fish TEK Project Interview Protocol**

We are going to discuss freshwater fish in the Lake Clark – Iliamna Lake area, including the tributaries of these lakes.

### **Past**

When did you start fishing in the area?

How did you fish in the past and what technology did you use?

Were there specific areas that were known as good fishing locations? (Map these and get traditional place names.)

### **Knowledge Systems**

What kinds of freshwater fish are located in the Kvichak Watershed? What are the local names for these species? Are there names for certain fish associated with the stream or river where they are located?

What can you tell me about the seasonal movements of species including timing of runs into and out of lakes and locations in the river? Is there a difference between males and females?

Where does each species spend the winter?

Where does each species spend the summer?

Do you know where each species spawns?

What does each species eat?

### **Present**

Are there places today that are known as good fishing locations? (Map these and get local contemporary place names.)

How do you fish today, how has this changed from the past?

What do you look for in selecting an area to fish for each species?

Are some types of freshwater fish preferred over others? Does this preference differ between communities in the area?

Are some areas known for producing a single species of freshwater fish or are there always a variety of species available in an area?

### **Preservation and Storage**

How is the catch normally preserved for each species (freezing, drying, smoking, canning)?

How has this changed?

Are there differences in the quality of spring fish versus fall fish? Does this influence your taking of certain species only at certain times of the year?

Are there differences in quality of fish at different locations?

What do you do with the bones and skin of the fish? Why do you do this?

### **Transition and the Future**

Are your fishing locations changing? How are they changing? What do you attribute the changes to?

Are there natural factors that are changing such as seasons, water levels, water temperature, gravel bars, and silt?

Have you noticed a change in the size or health of certain species?

Are fish populations declining, and why?

Are there streams that no longer have fish that used to have fish?

If fish populations are declining what will you do?

### **Species Interaction and Conservation**

Are there animals that affect the abundance and distribution of species (especially whitefish)?

Were there ways in the past of regulating these interactions?

What is the difference now in regulating these interactions?

Is there an interaction between salmon and freshwater fish species? Can the decline of one tell you about the future of the other?

How would people make sure in the past that there were enough fish?

## APPENDIX E

### *Conversion Factors*

Species	Lbs/Fish	Source
Arctic Grayling	0.70	Scott et al. 2001
Burbot	1.00	Scott et al. 2001
Blackfish	6.0 lbs/gallon; .07 individual fish; 40 fish/gallon	Scott et al. 2001
Longnose Sucker	1.5	Scott et al. 2001
Northern Pike	2.80	Scott et al. 2001
Rainbow Smelt	6.0 lbs/gallon; 0.25 individual fish; 24 fish/gallon	Fall & Morris 1987
Char		Scott et al. 2001
Dolly Varden	1.40	Scott et al. 2001
Lake Trout	1.40	Scott et al. 2001
Trout		Scott et al. 2001
Rainbow Trout	1.40	Scott et al. 2001
Steelhead	1.40	Scott et al. 2001
Unknown Trout	1.40	Scott et al. 2001
Whitefish		Scott et al. 2001
Round Whitefish	1.00	Scott et al. 2001
Humpback Whitefish	1.75	Scott et al. 2001
Least Cisco	0.40	Scott et al. 2001
Broad Whitefish	4.00	Scott et al. 2001
Unknown Whitefish	calculate study value based on all known white fish	Scott et al. 2001



The U.S. Fish and Wildlife Service, Office of Subsistence Management conducts all programs and activities free from discrimination on the basis of sex, color, race, religion, national origin, age, marital status, pregnancy, parenthood, or disability. For information on alternative formats available or this publication please contact the Office of Subsistence Management to make necessary arrangements. Any person who believes she or he has been discriminated against should write to: Office of Subsistence Management, 3601 C Street, Suite 1030, Anchorage, AK 99503; or O.E.O., U.S. Department of Interior, Washington, D.C. 20240.