

**Technical Paper No. 321**

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**Harvest and Uses of Wild Resources in Tyonek and  
Beluga, Alaska, 2005-2006**

by

**Ronald T. Stanek,**

**Davin L. Holen,**

and

**Crystal Wassillie**

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November 2007

Alaska Department of Fish and Game

Division of Subsistence





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BELUGA, ALASKA, 2005-2006**

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Final Report to Stephen R. Braund & Associates to fulfill obligations under agreement IHP 07-012.

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## ABSTRACT

The report describes patterns in the harvest and use of fish, land and marine mammals, birds, and wild plants by the residents of Tyonek and Beluga, two communities on the western shore of Cook Inlet in southcentral Alaska. It updates baseline information first documented in the 1980s. The Division of Subsistence of the Alaska Department of Fish and Game conducted the research under contract to Stephen R. Braund and Associates. The information will be used in future National Environmental Policy Act permitting evaluations, among other processes, related to the potential development of the PacRim Coal Chuitna Coal Project. The primary data gathering methods were systematic household harvest surveys, which included a mapping component for the study years' harvest and use areas. Seventy-one percent of all year-round households were interviewed in Tyonek, as were 93% in Beluga.

In the 2005-2006 study year, the harvest and use of wild renewable resources were important components of the economy and way of life in Tyonek and Beluga. Most community members participated in wild resource harvesting and processing. Tyonek residents harvested 217 pounds of usable weight per person, and Beluga residents harvested 204 pounds per person. In both communities, salmon were the largest portion of the harvest, but land mammals, other fish, birds, small game, marine invertebrates, and wild plants were also important, as were marine mammals in Tyonek. Most cash employment in the communities was seasonal; many local jobs were connected to providing services in the hunting and fishing guiding industry. Commercial fishing provided cash income as well. During interviews and public meetings, residents of Tyonek and Beluga expressed concerns about the potential effects of development of the Chuitna Coal Project. These included concerns about potential pollution of the Chuitna River, and generally reduced water and air quality. Respondents were also concerned about increasing competition for local fish and wildlife resources from non-local residents and mine development employees.

# **CHAPTER 1. BACKGROUND**

## **INTRODUCTION**

### **STUDY BACKGROUND**

This report describes research and findings about contemporary noncommercial uses of wild resources in Tyonek and Beluga, two communities in southcentral Alaska on the western shore of upper Cook Inlet (Map 1). The purpose of the study was to update baseline information collected in the 1980s. In 2005, Tyonek had a population of 199 people, and Beluga had 21 residents (Alaska Department of Labor and Workforce Development (ADLWD) 2006). The research was conducted by the Division of Subsistence of the Alaska Department of Fish and Game (ADF&G) under contract to Stephen R. Braund and Associates (SRB&A). SRB&A is a consulting firm based in Anchorage, Alaska, that specializes in anthropological, sociocultural, subsistence, and cultural research. SRB&A is under contract to DRven Corporation to conduct subsistence, traditional knowledge, and cultural resource baseline studies for the PacRim Coal Chuitna Coal Project. The goal of the SRB&A research is to make information available for compliance with the Alaska Surface Coal Mining Control and Reclamation Act (ASMCRA: AS 27.21), and to inform future National Environmental Policy Act (NEPA: 40 CFR Parts 1500-15081) permitting processes.

As part of the broader SRB&A project, the ADF&G study presented in this report provides information about subsistence hunting, fishing, and gathering activities by Tyonek and Beluga residents during a 12-month study period from August 1, 2005, through July 31, 2006. It includes demographic and other economic data that are compatible with information collected during previous household surveys. This information updates earlier resource harvest data first documented in the 1980s (Fall et al. 1984; Stanek 1987).

In this study, “subsistence” refers to any harvest or use of fish, wildlife, and wild plants for home use. It also incorporates the noncommercial exchange or sharing of resources, regardless of the regulatory category under which the harvest takes place. This includes removal of fish from commercial catches for home use or sharing, and also fishing with rod and reel gear, an activity that is generally classified in regulations as sport fishing. The information in this report will also be useful for future reviews of fish and game regulatory proposals and other potential subsistence management issues, and in assessing the potential of any future development activities in the area on local hunting, fish, and gathering patterns.

### **STUDY PURPOSE AND OBJECTIVES**

The contract between ADF&G and SRB&A defined the project objectives as follows:

- A. Design a survey instrument to produce updated baseline information about subsistence hunting, fishing, and gathering and other topics compatible with information collected in previous household interviews.
- B. Conduct key respondent interviews to explore key issues in the communities.
- C. Train local residents in administration of the systematic household survey.
- D. Conduct household surveys to record the following information:

1. Demographic information
  2. Household involvement in use, harvest, and sharing of fish, wildlife, and wild plants from August 1, 2005, to July 31, 2006.
  3. Estimates of amount of resources harvested in the study period.
  4. Information about jobs and cash income.
  5. Respondents' assessments of changes in subsistence harvest and use patterns.
  6. Locations of hunting, fishing, and gathering areas and harvests of fish and wildlife in 2005-2006.
- E. Collaboratively review and interpret study findings with the study communities.
- F. Produce a final report.
- G. Communicate study findings to residents in the communities of Tyonek and Beluga as well as the general public.

## **RESEARCH METHODS**

### **Ethical Principles for the Conduct of Research**

The project was guided by research principles adopted by the Alaska Federation of Natives in 1993 and the Interagency Arctic Research Policy Committee on June 28, 1990 (<http://www.ankn.uaf.edu>). These principals emphasize:

1. Community approval of research designs
2. Informed consent
3. Anonymity of study participants
4. Community review of draft study findings
5. Providing study findings to each study community upon completion of the research

### **Systematic Household Surveys**

As noted above, the ADF&G research is part of a broader study being conducted by SRB&A, with two interrelated components. In the first component, SRB&A staff conducted subsistence mapping and traditional ecological knowledge (TEK) interviews in Tyonek and Beluga, in which respondents recalled information about the past 20 years. In the second component, ADF&G, in collaboration with SRB&A, conducted household surveys in both study communities to gather quantitative subsistence resource harvest and use information, as well as harvest location information, for the 12-month period from August 1, 2005, through July 31, 2006. Table 1 lists the project staff.

In accordance with project objectives, the Division of Subsistence used its standard household harvest survey instrument (Appendix A). The survey was designed to systematically gather demographic, resource harvest and use, and employment and income information. The survey

was administered during face-to-face interviews in residents' homes or other convenient locations. For example, in the case of Tyonek, surveys were sometimes conducted at the Nellie Chickalusion Community Center. The survey addressed subsistence uses of salmon and other fish, large land mammals, small game and furbearers, birds, marine mammals, marine invertebrates, and wild plants. In addition to providing quantified harvest data and harvest locations, survey respondents evaluated their subsistence harvests and uses in the study year compared to the last five years. This provided a context for understanding the survey findings. Interviewers also recorded other observations and concerns voiced by survey respondents about potential resource development near their communities. Participation in the survey was voluntary. Confidentiality and anonymity were guaranteed, and respondents were paid no monetary compensation. Participants were informed that individual household information would be combined into community-level summaries.

## **Mapping Methods**

ADF&G used a method of data collection designed to map the locations where members of participating households hunted, fished, and gathered wild resources during the study year. During interviews with a member of each household, the resource hunting, fishing, and gathering areas of each surveyed household were hand-drawn by researchers and/or respondents on 1:250,000 scale, 11" x 17" maps created in ArcGIS 9.1. Two separate maps were created: one for land resources and one for marine resources. Each map had a key listing the codes and color to use when documenting each resource (Appendix B). For Tyonek, the maps were black and white, mainly depicting streams and roads, which are important travel corridors for hunting large land mammals and gathering wild plants. In Beluga, the easily reproduced black and white maps did not show a fine detail of the multitude of lakes and small streams utilized by Beluga residents so a color USGS topographical relief map was employed.

Respondents circumscribed, on the map, the area or areas where hunting, fishing, or gathering of wild resources occurred during the study period. If the exact harvest location was known, harvest locations were documented by a point. Harvest locations were identified and labeled with the species (code), quantity of harvest, and months of harvest.

## **Tyonek: Household Harvest Survey Implementation**

On July 27, 2006, 14 local residents attended a scoping meeting at the Nellie Chickalusion Community Center in Tyonek. At the meeting, presentations by SRB&A and ADF&G researchers provided information to members of the Native Village of Tyonek (NVT) Council and other interested community residents on the project's background and study methods. SRB&A staff had previously completed 37 interviews in Tyonek to document TEK and to map hunting, fishing, and gathering areas used over the last 20 years. Community members were asked to consider whether to support the subsequent ADF&G portion of the study, with the final decision to be made by the NVT Council in the form of a council resolution.

Four days later, on July 31, the NVT Council passed Resolution No. 2006-38, agreeing to participate in the study. On August 1, an ADF&G researcher traveled to Tyonek and began the harvest survey and use area mapping components of the project. SRB&A sent one researcher to assist in the survey implementation. The Subsistence Division and NVT entered into Cooperative Agreement No. COOP#7-0-19 on August 14. This agreement provided funds to the village council to hire two local assistants, and provided funds for transportation for ADF&G and SRB&A researchers. Researchers instructed the local assistants about survey methods and

the project background. In addition, lodging and transportation were arranged through the Tebughna Guest House and NVT Council, respectively.

The first round of interviewing took place over a 14-day period in August and the first week of September. Forty interviews were completed, 18 households could not be contacted, and 8 households declined to participate. During the third week of September, an ADF&G researcher interviewed seven more households and had one more refusal, bringing the total to 47 completed interviews, nine refusals, and ten households that were not contacted. This resulted in a completed sample of 71% of the 66 year-round households in Tyonek. The refusal rate was 16% (Table 2). On average, interviews were completed in just under one hour in Tyonek (Table 3).

### **Beluga: Household Harvest Survey Implementation**

Since there is no local government entity in the community, key community members were contacted during the third week of July to schedule a community meeting to introduce the project. Seventeen community residents attended a public meeting held in Beluga on July 27<sup>th</sup> that introduced the harvest survey and use area mapping component of the fieldwork. Presentations by SRB&A and ADF&G researchers addressed the project background and methods. At the close of this meeting, community members agreed to support the study and said household interviews could begin immediately. With the assistance of key local respondents, researchers compiled a list of year-round community households. These households were subsequently contacted by telephone to arrange interviews. Lodging, meals, transportation, and workspace for researchers were arranged. On August 2, an ADF&G researcher traveled to Beluga and began interviews. This trip and two subsequent visits to Beluga resulted in interviews with 10 of 15 households, and one household declined to participate. Another household representative was interviewed while visiting Anchorage. The harvest survey was later administered to three more households by SRB&A researchers, while they were conducting TEK interviews. All but two of the harvest survey and use area mapping interviews were conducted at community members' personal residences. In total, 14 of 15 year-round Beluga households were interviewed, a sample of 93%. Seven percent declined to be interviewed (Table 2). In Beluga, the average household interview was completed in about 1.38 hours (83 minutes) (Table 3).

## **DATA ANALYSIS AND REVIEW**

### **Survey Data Entry and Analysis**

ADF&G researchers coded household harvest survey forms and maps. The ADF&G data management group used a double data entry method to ensure accuracy. In addition, species and harvest amounts recorded on the survey forms were cross-checked with maps to ensure consistency.

After ADF&G survey coding had been completed, SRB&A cartographers digitized the harvest area maps using ArcGIS 9.1 software. SRB&A gave preliminary maps to ADF&G researchers for verification on November 2. After review and corrections, ADF&G provided SRB&A with a template that was used to produce the maps for this report.

Survey data were analyzed with the Statistical Package of the Social Sciences (SPSS) Version 14. Preliminary tables of harvest, demographic, and economic data were reviewed and verified by the Division researchers who conducted the field interviews. Final tables were then produced for further review in community meetings.

### **Tyonek: Community Review Meeting**

On October 16, researchers Ron Stanek (ADF&G) and Stephen Braund (SRB&A) held a community meeting to present the preliminary harvest survey and TEK findings at the Nellie Chickalusion Community Center in Tyonek. In preparation for the community review meetings, ADF&G researchers created a PowerPoint presentation to show study findings. The one-year harvest area maps were not available for community review by Tyonek residents when this meeting occurred. Although announcements about the planned meeting were posted around the community the week before, only a few residents were able to attend. This was largely a result of severe weather conditions that disrupted the electricity supply to the community, and the death and funeral of a village elder. The regularly scheduled village council meeting and a regional conservation district meeting were consequently postponed. Nevertheless, several key village council members and at-large community members attended the ADF&G and SRB&A meeting. Their review of community harvest information was informative and addressed several outstanding questions about the study findings. Following this review of preliminary harvest data by Tyonek community members, the ADF&G information management group corrected the database and prepared a draft final set of tables showing the survey findings.

### **Beluga: Community Review Meetings**

Owing to the absence of several Beluga key community organizers, a presentation of harvest data was postponed until November 9, 2006. Seven community residents then attended a three-hour meeting in Beluga with a representative from both ADF&G and Stephen R. Braund and Associates. Participants addressed and resolved questions about the use of furbearer species and the number of moose harvested. Draft harvest and use area maps were available for this meeting and reviewed and edited with input from community members. On November 11, a second three-hour meeting for Beluga residents was held at the ADF&G office in Anchorage. Six different Beluga residents attended that meeting, and discussed the results. They provided additional information that refined the preliminary harvest estimates, and the harvest tables were updated with the corrections. Additional comments Beluga residents offered during these meetings have been incorporated into this report.

### **Final Report Organization**

ADF&G researchers prepared this final report. It summarizes the results of the systematic household surveys, and the harvest location-mapping interviews conducted by ADF&G, as well as the information gained in the community meetings. The findings are organized primarily by study community. All tables, figures, and maps referenced in the text appear at the end of the report.



## CHAPTER 2. TYONEK STUDY FINDINGS

### COMMUNITY BACKGROUND

The west Cook Inlet Dena'ina Athabascan community of Tyonek has long been the home of the *Tubughna*, “the beach people.” The current location of the village at *Qaggeyshlat* (“little place between the toes”) dates to 1932, but according to de Laguna (1934:139), *Qaggeyshlat* was formerly an old Dena'ina village site. Two other villages have been called “Tyonek” since the late 19<sup>th</sup> century. The first, called *Tubughnenq'*, was located south of the present village site, near Robert's Creek (*Ch'elehtnu*; also called Tyonek Creek). Because of tidal erosion, in the early 20<sup>th</sup> century the village was moved north to the mouth of Old Tyonek Creek (*Tank'itnu*), known as “second Tyonek.” This site, too, was abandoned due to flooding when Chief Simeon Chickalusion resettled the Tyonek people at the present village site in the early 1930s (Kari and Fall 2003:56-68). Congress created the Tyonek Indian Reservation (also called the “Moquawkie Indian Reservation”) in 1915. The community was incorporated as The Native Village of Tyonek under by-laws ratified by its members on November 27, 1939, by the authority of the federal Indian Reorganization Act of 1934 (Fall et al. 1984:29).

The population of Tyonek today consists primarily of former residents of several Dena'ina communities, including Susitna Station, Kroto Village, Polly Creek, Kustatan, Kenai, and Old Tyonek, and their descendants. In 1918, most of the Dena'ina of Susitna Station died in an influenza pandemic. Consequently, in 1934, almost all of the remaining Susitna Station Dena'ina moved to Tyonek, at the invitation of Chief Chickalusion (Kari and Fall 2003:89-92).

By the 1930s, the Dena'ina at Tyonek had become fully engaged in the Cook Inlet commercial salmon fishery. However, according to Braund and Behnke (1980:181), most Tyonek residents describe the 1930s, 1940s, and 1950s as a period of poverty caused by poor commercial fishing, low fur prices, and generally scarce subsistence resources. In the 1960s, the community benefited from the sale of oil and gas leases on its lands. For additional background on the history of Tyonek, see the West Cook Inlet Ethnographic Overview and Assessment by Stanek, Fall, and Holen (2006).

In 2005, Tyonek remained a predominately Dena'ina Athabascan community of 199 people (ADL 2006). The village itself consists of two parts. The older, core village center has a store, community center, and school with surrounding single family dwellings, mostly dating to the 1960s. There is also a separate residential subdivision consisting of approximately 35 single family homes built around 1980. The NVT Council oversees the operation of water and sewer systems, and maintains the roads, while private companies manage the electrical and telephone systems. No roads connect Tyonek to the state's highway system. Access to the community is primarily by airplane, and the village has a lighted gravel runway. The Tyonek Native Corporation (TNC) owns lands surrounding the village; these lands have a network of gravel roads maintained jointly by TNC and oil and gas companies with developments in the area, including Aurora Gas, LLC, Union Oil Company of California, and Chevron USA. Some of these roads were originally built to extract timber on TNC lands. Tyonek is also connected to the system of roads in and around Beluga by a bridge over the Chuitna River.

## **DEMOGRAPHY, EMPLOYMENT, AND MONETARY INCOME**

### **Demography**

According to survey results, the estimated population of Tyonek in the 2005-2006 study year was 202 people living in 66 permanent households, with an average size of 3 persons and a range of 1 to 9 persons. The average and median age of the population was 30 years; the oldest person was 84 years of age and the youngest was less than one year old. The population was 95% Alaska Native (Table 4). Overall, females comprised 52% of the population (Figure 1; Table 5).

For the entire population, the longest residence in Tyonek was 81 years and the shortest was less than one year; the mean length of residency was 23 years. For household heads, the mean length of residency was 34 years. The majority of Tyonek household heads (73%) were born when their parents lived in Tyonek, and another 13% were born elsewhere in Alaska. Only 10% were born outside Alaska. Information on the place of birth for 4% of the household heads was not provided during the survey (Table 6).

### **Employment Characteristics**

As shown in Table 7, members of an estimated 52 households in Tyonek (79%) held cash-earning jobs in the 2005-2006 study year. An estimated 74 adults (55%) were employed for an average of 9 months; of all employed adults, 51% worked year-round. The largest number of jobs held by any one household was four and the most by any employed adult was three. On average, employed adults held two jobs (Table 7). Nearly all of the jobs held by Tyonek residents (95%) were located in Tyonek (Table 8).

Most jobs held by Tyonek residents in the 2005-2006 study year were in the local government sector (53%), followed by forestry and fishing (14%) and mining (9%), as shown in Table 9. Three employment sectors each provided 6% of jobs: construction; services; and transportation, communications, and utilities. There were no jobs with state government, while the federal government provided 3% of all jobs held by Tyonek residents in the study year.

### **Monetary Income**

There were two broad categories of monetary income for Tyonek residents during the study year (Table 10). The first was cash employment, which includes commercial fishing as well as wage-labor employment, providing an average of \$23,944 per household and \$7,815 per person in the 2005-2006 study year. The second was "other income sources," including the Alaska Permanent Fund dividend, pensions and retirement, social security, and corporation dividends. These other sources collectively provided an average income of \$7,409 per household and \$2,418 per capita for Tyonek households in 2005-2006. In total, the per capita income for Tyonek in the study year was \$10,233, and \$31,353 per household.

### **Annual Purchased Food Costs**

Tyonek households estimated they spend on average \$6,764 annually on the purchase of food. This equates to 20% of their average annual income (Table 11). These figures may be slightly lower than actual costs because survey respondents did not consistently calculate air freight from Anchorage or Kenai to Tyonek into their annual food cost estimates.

## **RESOURCE HARVESTS AND USES**

### **Levels of Participation in Harvest and Use of Wild Resources**

During the 2005-2006 study year, 96% of Tyonek households used wild resources, and 94% successfully harvested at least one type of fish, wildlife, or wild plant resource (Table 12). Seventy-six percent of Tyonek residents attempted to harvest wild resources, and 78% processed wild foods (Table 13; see Appendix A Survey Form). During the 2005-2006 study year, 40% of Tyonek residents hunted birds and wild game and 43% processed those resources, and 58% harvested fish and 59% processed fish. A much smaller percentage trapped or harvested furbearers (18% trapped or hunted furbearers and 14% of residents processed these resources). Participation in gathering and processing plants was much larger as 64% of Tyonek residents gathered plants and 62% processed plants (Table 13).

In the study year, Tyonek households used a variety of resources, averaging nine different wild resources used per household with a maximum of 26 different individual resources used (Table 12). Households attempted to harvest an average of seven different resources, and successfully took an average of six different resources. The largest number of resources any one household attempted to harvest was 24. If households were not successful in the attempt to harvest, other households shared their harvest; an average of four different resources were received and 4.5 given away by each household in Tyonek during the study year. Sharing of subsistence resources therefore is clearly an important factor within the community.

The significance of wild resources in the annual food supply of Tyonek households is demonstrated by the estimated percentages of meat, fish, and birds used annually that originated from wild sources (Table 14). About one-half of residents estimated that 51% or more of the meat, fish, and birds they used annually were derived from wild sources; 26% of households said that 51% or more came from wild resources, and an additional 26% said that 76% or more came from wild resources. Only 11% indicated supplying all of their meat, fish, and birds from wild sources. Very few households, 4%, indicated that they received less than 25% of their meat from wild resources during the study year (Table 14).

Forty-six percent of Tyonek households indicated a decrease in their overall use and harvest of wild resources during the study year compared to the last five years (Table 15). Slightly fewer, 41%, thought their harvest and use had remained about the same, and 13% indicated they had harvested and used more wild resources in 2005-06 than in other recent years (Figure 2).

### **Sharing and Receiving of Wild Resources**

Sharing wild foods was a prominent part of the resource use pattern in Tyonek in the study year, with 91% of households receiving resources and 83% giving resources to other households. As noted above, on average households gave away 5 different wild resources and received 4. The largest number of wild resources given away by any household was 17, while 13 resources was the most received by any household (Table 12).

### **Species Used and the Seasonal Round of Resource Harvests**

In 2005-2006, Tyonek residents used and harvested a variety of wild resources, most of which were available within a relatively short distance of the community (see Map Figures). Typically, individual resources become available for harvest at specific times of the year and are found in

characteristic locations. The annual cycle of resource availability is predictable and allows for the reliable and sustained provision of wild foods for the community.

As in the past, during the study year Tyonek residents began their annual round of resource harvests in the spring as winter ice cleared from local streams and lakes. The rivers and streams usually release their ice burden in April and May before lakes do in May and early June. Winter ice fishing for rainbow trout (*Oncorhynchus mykiss*) comes to an end as lakes thaw. Residents then shifted their fishing efforts to the newly open water of the streams and rivers. Depending on weather conditions in May and early June, Tyonek residents traveled south by skiff to Redoubt Bay (Map 15) where they dug razor clams (*Siliqua patula*) and cockles (*Clinocardium nuttallii*) on exposed sand bars during extreme low tidal cycles.

Eulachon (*Thaleichthys pacificus*), referred to locally as “hooligan,” is one of the first fish resources to become available in Cook Inlet waters. Tyonek residents began eulachon fishing in April, harvesting them in set gill nets on beaches near the village or gathering them by hand when the fish were washed up on the beaches by strong surf. Eulachon fishing continued into May with the timing of this activity depending on weather and tidal conditions.

Black bear (*Ursus americanus*) hunting took place in the spring as bears emerged from their winter hibernation and utilized river corridors and snow-free meadows in search of the first green grass. Bears also appeared on the inlet beaches near Tyonek where they searched for eulachon that had washed ashore. Having spent a winter in hibernation these bears were prized for their long thick winter coats they have yet to shed and their tender muscle.

Spring beaver (*Castor canadensis*) and muskrat (*Ondatra zibethicus*) trapping and hunting began in late winter when beaver appeared in open water areas and along river banks in search of food. Hunting with firearms continued into May if the animals were taken for food. Pelts, having worn thin, are usually not desirable this late in the year.

By regulation, the spring waterfowl season for Tyonek residents began April 2 and continued through May 31 during the study period. Migrating ducks and geese congregate on the Trading Bay flats and near the Beluga and Susitna rivers and were hunted as they move through these areas (Map 14).

Salmon setnet fishing for subsistence uses, targeting Chinook (king) salmon (*Oncorhynchus tshawytscha*), began on May 15 and occurred on the beaches within the Tyonek Subdistrict. Tyonek residents gathering plants picked fresh greens such as fireweed (*Epilobium angustifolium*), cow parsnip (*Heracleum lanatum*), and bluebells (*Mertensia paniculata*) in the spring.

During summer months, beginning in mid-June and extending through August, Tyonek residents were busy with salmon fishing on beaches near the community and tending their smokehouses. Commercial fishing also began in the last week in May and continued throughout the summer on designated open days. In July, Tyonek fishermen used rod and reel gear to harvest salmon in the Chuitna River, where they also fished for rainbow trout and Dolly Varden (*Salvelinus malma*). Berries began to ripen at the end of July and most Tyonek households picked blueberries (*Vaccinium* spp.), currants (*Ribes* spp.), highbush cranberries (*Viburnum edule*), and several other varieties of berries and greens. During July and August, Tyonek hunters attempted to harvest beluga whale (*Delphinapterus leucas*). Federal regulations (50 CFR Part 216, April 6, 2004) allocate two Cook Inlet beluga strikes to Tyonek.

On August 20, 2005, moose (*Alces alces*) seasons opened for both Tier II<sup>1</sup> qualified hunters and general hunt hunters in Game Management Unit (GMU) 16(B), and ran through September 20. Tyonek hunters traveled the road system north and south of the Chuitna River and focused on the area toward the Trading Bay flats. They also traveled by boat to McArthur River for moose, beaver, and porcupine (*Erethizon dorsatum*) hunting, and coho salmon (*Oncorhynchus kisutch*) fishing. During September 2005, heavy rainfall throughout southcentral Alaska affected Tyonek moose hunters by making travel routes to hunting areas impassable and forcing moose to higher elevations. Hunters at the community's annual subsistence moose camp on the Chakachatna River flats were unsuccessful in harvesting a moose. The heavy rains also swelled streams, making rod and reel fishing impossible.

Upland game bird seasons for ruffed grouse (*Bonasa umbellus*), spruce grouse (*Dendragapus canadensis*), and ptarmigan (*Lagopus spp.*) also opened in mid-August. Grouse were the main species taken in early fall, while ptarmigan were taken after freeze-up and throughout the winter months.

A second subsistence waterfowl season for Tyonek residents took place in August. The general waterfowl season opened on September 1 and continued to December 16, but most waterfowl hunting was over by mid- to late October as migrating sandhill cranes (*Grus canadensis*), ducks, and geese moved through the area and freeze-up occurred.

Late fall and winter months were characterized by frozen conditions which, with adequate snowfall, allowed the use of snowmachines on large land areas not accessible during ice-free months. Trapping seasons opened on November 1 and a few trappers laid out their lines and began making sets for marten (*Martes americana*). Between November 15 and February 28, local residents with permits who had not killed a moose in the earlier season participated in a Tier II subsistence moose hunt in GMU 16(B). Moose often remain at higher elevations along Lone Ridge until snow conditions deepen, forcing them to lower areas with less snow around Tyonek and on the Trading Bay Flats (see Map 1).

During the winter months of the study year, short days and cold temperatures limited the extent of resource harvest activities. Residents took advantage of occasional warm weather to harvest wood, fish through the ice in local lakes, and hunt moose and ptarmigan. Furs become prime, long and thick, during winter months, and trappers and hunters traveled over frozen terrain to run their traplines and track larger furbearers such as wolves (*Canis lupis*) and coyotes (*Canis latrans*).

Following the winter solstice, as the length of the light during the day increased, fishers and their families traveled on snowmachines throughout the area to frozen lakes where they fished through the ice for trout, Dolly Varden, and northern pike (*Esox lucius*). Beaver trapping began in late winter as the amount of daylight increased. Firm snow conditions created easy travel by snowmachine, and beaver became more active. By the end of March, long days and warming weather conditions began a new annual cycle with the arrival of spring.

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<sup>1</sup> A "Tier II" hunt occurs when the harvestable surplus of a wildlife population falls below the amount reasonably necessary to provide for subsistence uses, as established by the Alaska Board of Game (AS 16.05.258(b)). In Tier II hunts, the number of available permits is limited, and individuals must answer a set of questions on a Tier II permit application. Those individuals with the highest scores receive permits.

## Harvest Quantities

In the 2005-2006 study year, the estimated resource harvest by Tyonek residents totaled 43,829 pounds in usable weight for the entire community, an average of 664 pounds per household and 217 pounds per person (Tables 12 and 16). The largest quantity harvested by any one household in Tyonek was 7,033 pounds usable weight.

As shown in Figure 3, salmon provided 70% of Tyonek's harvest as estimated in usable pounds, while large land mammals provided 18% and non-salmon fish 5%. Berries and other edible plants and mushrooms contributed 3%, marine mammals 2%, birds 1%, and marine invertebrates and small land mammals less than 1% each.

## USE AND HARVEST CHARACTERISTICS BY RESOURCE CATEGORY

### Salmon

By far, salmon made up the largest quantity of Tyonek residents' wild resource harvest in 2005-2006, with 30,448 usable pounds, more than three times the amount of any other resource category (Figure 3). More households (85%) used salmon than any other resource category (Table 16). Chinook (king) salmon were of primary importance to Tyonek residents with 24,104 pounds (2,014 fish) harvested, or 365 pounds per household (Figure 4). Seventy-two percent of Tyonek households harvested Chinook salmon and 47% gave away some of their catch. Second in importance among salmon was coho (silver) salmon, with 4,762 pounds harvested, 72 pounds per household. Although not a preferred fish for home use, sockeye (red) salmon (*O. nerka*) were taken in small quantities (1,558 total pounds, 24 pounds per household), usually incidental to the taking of Chinook salmon as the runs overlap.

Salmon harvest methods used by Tyonek residents in 2005-2006 included removal from commercial setnets, subsistence setnets, and rod and reel (Tables 17 and 18). The largest portion of the overall salmon harvest (70%, or 25,003 pounds), was taken by subsistence setnet, and almost all the households that fished used this method. Chinook salmon were harvested in the largest numbers by subsistence set nets, with an estimated harvest of 1,737 fish (20,793 pounds). Removal of salmon from commercial setnet harvests while commercial fishing on Tyonek beaches accounted for 11% or an estimated 3,500 pounds of salmon taken for home use, and was reported by seven households (Table 18). This retention for home use usually occurred when commercial fishermen were unable to sell their catch owing to the absence of a buyer or having caught too few fish to economically deliver to market. Salmon was the only resource retained from commercial catches by Tyonek residents in the study year. Rod and reel harvests accounted for an estimated 1,944 pounds of salmon (260 fish), of which 159 were coho salmon and 100 were Chinook salmon (Table 17). The rod and reel coho harvest typically occurs during the fall in conjunction with moose hunting trips while hunters were in camps, or during day trips to the Chuitna River. Chinook salmon were taken by rod and reel during late June and July in the Chuitna River (Map 2).

Tyonek households were asked to compare their 2005-2006 salmon harvests with other recent years' harvests. While 52% indicated their use and harvest of salmon were the same in the study year, 37% thought their use and harvest were less, and 11% said they harvested more in the study year than in recent years (Table 15; Figure 2).

Areas fished by Tyonek residents for salmon in the 2005-2006 study year included the beach from Granite Point north to near the mouth of the Chuitna River, the Chuitna River itself,

McArthur River, and the Chakachatna River (Maps 2 to 4). The inlet beach was most intensively used between May and July; however, some use occurred in April and continued into October with favorable weather conditions.

### **Non-Salmon Fish**

Types of non-salmon fish harvested by Tyonek residents in the study year were primarily freshwater species. Saltwater species occur in the immediate vicinity of Tyonek, but they are usually only taken incidentally in salmon set nets. Unless they travel to lower Cook Inlet, local rod and reel fishermen do not target halibut (*Hippoglossus stenolepis*). Several species such as saffron cod (*Eleginus gracilis*), tomcod (*Microgadus proximus*), and whitefish (*Coregonus* spp.) were taken historically (Fall et al. 1984), but did not appear in the 2005-2006 harvest. Salmon shark (*Lamna ditropis*), starry flounder (*Microstomus pacificus*), and yellowfin sole (*Pleuronectes asper*) are caught incidentally in commercial setnets but were not retained by Tyonek households for home use during the study year. Locations where non-salmon fish were sought included the inlet beaches, drainages of the Chuitna River, Indian Creek (which flows through the community of Tyonek), Nikolai Creek, and McArthur River (Maps 5 to 7).

Eulachon were harvested in the largest quantities of any non-salmon fish. Setnets were placed on the beaches near Tyonek as soon as ice cleared in April or May (Map 6). During the study period, 1,812 pounds (558 gallons) of eulachon were harvested (Table 16). This provided a mean household harvest of 28 pounds. Rainbow trout were taken mostly by rod and reel. Fishing through the ice was a popular activity among Tyonek households during late winter when the days began to lengthen. Fall and spring fishing for rainbow trout was also a common activity at Nikolai Creek and the Chuitna River (Map 7). A total of 171 rainbow trout were harvested, providing 240 total pounds and four pounds per household (Table 16). Additionally, seven steelhead trout were harvested. Dolly Varden were taken in small numbers with an estimated harvest of 21 fish. One household harvested four northern pike in Three-mile Creek.

Assessments of 2005-2006 non-salmon fish harvests by Tyonek households indicated the vast majority of households (73%) thought their use was the same as in other recent years. Sixteen percent thought their uses were less and 11% said their use had increased, as shown in Table 15 and Figure 2). Halibut was the only marine species reported in Tyonek's 2005-2006 harvest, and was taken by one household that caught 119 pounds with rod and reel. In some years, Tyonek residents catch halibut incidentally in commercial or subsistence nets set to harvest salmon.

### **Large Land Mammals**

Three large land mammals are readily available in the Tyonek area: moose, brown bear (*Ursus arctos*), and black bear. All three species were harvested by Tyonek residents in the study year, but only moose and black bear were used for food (Table 16). Areas that Tyonek residents used to hunt large land mammals are depicted in Maps 8, 9, and 10, and extend from north of the Beluga River to Trading Bay Flats and along the McArthur River in south Trading Bay. Although seasonality is not depicted on the map, moose hunting areas shift between the fall season and the winter season as ground conditions change and, correspondingly, transportation methods allow access to areas in winter not accessible when the ground is not frozen. Additionally, a large part of the traditional hunting area south of Nikolai Creek and the Chackachatna River is no longer accessible as bridges built during logging operations in the 1970s are now washed out.

Moose usually provide a large amount of food for Tyonek residents and in the early 1980s more than 30 were harvested per year (Fall et al. 1984). Moose numbers have declined in the area during recent years, however, and hunter success likewise has decreased. In 2005-2006, Tyonek hunters harvested an estimated 17 moose that provided 7,583 pounds to the community harvest or 115 pounds per household (Table 16). While just 19% of Tyonek households harvested moose, 57% hunted moose (Table 16) under either Tier II subsistence or general hunting regulations. Widespread sharing of moose products, including meat, internal organs, the nose, and tongue, is an integral part of the way of life in Tyonek, and 77% of households received moose during the study year.

Black bear meat has not been widely used by Tyonek households in recent years due to a stigma that developed over bears feeding in the local dump. A few hunters, however, hunted black bears in areas away from land refuse facilities and harvested an estimated eight bears for food during the study year. This harvest contributed 489 pounds in edible weight to the community harvest, or seven pounds per household (Table 16). Although two Tyonek households took four brown bears in 2005-2006, none of the meat or fat was consumed. No brown bear products were reported to have been exchanged among households. Brown bear kills are often incidental in that they occur when a bear becomes a nuisance at a fish camp. Sitka black-tailed deer (*Odocoileus columbianus sitkensis*) was the only other large land mammal reported to have been used in 2005-2006. One Tyonek household received deer meat from relatives living in southeast Alaska (Table 16).

Long-term changes in moose numbers and harvests were noted above. However, 59% of Tyonek households interviewed in the survey indicated their use of large land mammals in 2005-2006 had not changed compared to other recent years. Thirty-seven percent of households noted their use was less than in other recent years, and 4% thought their use had increased (Table 15). Moose abundance has been an issue in the area surrounding Tyonek for several years. A Tier II moose hunt permit system has been in place in Game Management Unit 16B since 1990. When asked about their use of large land mammals in “recent years;” (the past five years) residents note that it has been longer than five years since they have had open and reliable opportunities to successfully hunt moose.

### **Small Land Mammals**

Tyonek residents took three species of small land mammals for subsistence use during the study year (Table 16). These harvests included an estimated 14 beavers, 11 porcupines, and 3 snowshoe hares (*Lepus americanus*). These small game species combined contributed 206 pounds to the community harvest, or three pounds per household. Snowshoe hares were once abundant in the area around Tyonek, but habitat changes and cyclical patterns of abundance and scarcity have been responsible for low numbers in recent years. Harvests took place largely incidental to moose hunting or other hunting trips (Map 11) in 2005-06. Some sharing of these resources was reported, especially between hunters and elders who enjoy the meat of small game. For example, while 13% of households harvested beaver, 17% of households consumed the harvest. Additionally, 11% of households harvested porcupine and 6% received porcupine (Table 16).

Two Tyonek households trapped a small number of furbearers for their pelts, including three red foxes, three coyotes, and 38 marten (Table 16). Assessments of furbearer use by surveyed households in Tyonek revealed that 74% of households thought their use in 2005-2006 was the

same as other recent years, while 22% thought they used less, and 4% used more (Table 15 and Figure 2). This is not surprising as very few households recently have been active trappers or hunters of furbearers.

### **Marine Mammals**

Use of marine mammals has long been an important aspect of Tyonek's subsistence use patterns. Typically, one or two beluga are taken annually along with three or four harbor seals (*Phoca vitulina*) (Wolfe et al. 2006). During the 2005-2006 study year, the one harvested beluga provided 700 pounds of food, averaging 11 pounds per household (Table 16). Hunters from three households participated in the hunt. Forty-seven percent of Tyonek households used beluga products. Due to a declining beluga population in Cook Inlet, regulations published by the National Marine Fisheries Service in April 2004 (50 CFR Part 216, pages 17973-17980, April 6, 2004) limited Tyonek to two strikes in the subsistence beluga hunt.

Harbor seals inhabit the waters near Tyonek and two hunters harvested four seals during the study year. Seal products were not widely distributed among households and just two households (4%) received seal (Table 16). Bowhead whale (*Balaena mysticetus*) was used by one household that received gifts from friends residing on the North Slope.

Marine mammal harvest and use assessments found 74% of Tyonek households experiencing no change in 2005-2006 compared to other recent years (Table 15; Figure 2). The remaining 26% of households reported using less than in other recent years. This might be due in part to regulatory restrictions on beluga hunting. Areas where Tyonek residents hunted marine mammals in 2005-2006 included the mouths of the Susitna and Beluga rivers, McArthur River, and the west Cook Inlet shoreline to and including the mouth of McArthur River (Maps 12 and 13).

### **Birds**

During the study year, 45% of Tyonek households hunted birds, and 34% harvested birds (Table 16). Hunters took a total of 628 birds, of which 409 were migratory birds and 219 were upland birds. There were no bird egg harvests. Birds were shared with 13% of households and 23% of households gave away birds. Ducks were most often shared, with 21% of households giving them away and 11% receiving them (Table 16). Assessments of bird harvest and use showed that 67% of Tyonek households noted their bird and egg use remained the same in 2005-2006 as in other recent years. Another 28% thought they used fewer birds and 4% had an increase in bird use (Table 15; Figure 2).

### **MIGRATORY BIRDS**

Migratory bird hunting is an integral part of the subsistence economy in Tyonek. Migratory birds were harvested during the time they arrived in the spring migration and again in late summer until the birds' departure from the area in late fall. Although egg gathering was historically an important aspect of traditional subsistence harvest patterns, residents relate that this activity is rarely practiced anymore.<sup>2</sup> Spring bird hunting and egg gathering were barred by the 1918 Migratory Bird Treaty Act. In 1997, protocol amendments to the migratory bird

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<sup>2</sup> In 2000 there was a reported harvest of 34 eggs in Tyonek. Eggs were harvested and used by 2% of the community (Staneck 2002:45; ADF&G CSIS).

treaties between the United States, Canada, and Mexico allowed the taking of birds and eggs during spring and summer months in Alaska (U.S. Congress 1997). Furthermore, in 2003 a season was implemented for Tyonek residents through federal law (50CFR Part 92). The spring and summer season authorizes Tyonek residents only to take migratory birds and eggs in a portion of GMU 16(B) from April 2 to May 31, and August 1-31. The general fall season for migratory bird hunting opens on September 1 (50 CFR Part 20).

According to the results of the 2005-2006 survey, Tyonek hunters took 409 migratory birds, producing 413 pounds of food for the community (6 pounds per household). Ducks were harvested in the largest numbers among the waterfowl species, with 112 mallards (*Anas platyrhynchos*), 81 northern pintails (*Anas acuta*), 90 green-winged teal (*Anas crecca*), 21 wigeons (*Anas americana*), and 14 unidentified ducks in the harvest. The goose harvest included 59 Canada geese (*Branta canadensis*) and 18 snow geese (*Chen caerulescens*) (Table 16). No migratory bird eggs were harvested during the study year, although Tyonek residents occasionally use gull eggs (*Larus glaucescens*).

Primary hunting areas for migratory birds included the flats at the mouth of the Nikolai River in north Trading Bay on the Trading Bay State Refuge, the flats near McArthur River, the mouth of the Chuitna River, and the Susitna Flats State Refuge north of Beluga (Map 14).

### **Upland Birds**

Upland game birds such as spruce and ruffed grouse and ptarmigan occur throughout the forested and tundra areas around Tyonek. Spruce grouse abundance fluctuates annually and in 2005 was increasing after several years of low numbers. Ruffed grouse were not abundant but have recently moved into the Tyonek area as a result of introductions of the birds to the Matanuska-Susitna Valley. Both spruce and ruffed grouse can be observed on the road system as they pick up small pieces of gravel for grit.

In 2005-2006, 28% of Tyonek households used upland birds, 34% hunted them, and 26% harvested these birds (Table 16). Grouse hunting often takes place in the fall in conjunction with moose hunting trips, although bird hunters also seek out grouse on hunts just for that purpose. Bird hunters took a total of 135 spruce grouse during the study year. In addition, 84 ptarmigan were harvested usually in the winter months when these birds move from higher tundra elevations to open stands of willow near Tyonek and the surrounding area. Some ptarmigan were taken while hunters were snowmachining or tending traplines (Map 14).

### **Marine Invertebrates**

Harvestable numbers of marine invertebrates are not found in the immediate vicinity of Tyonek, but do occur from Redoubt Bay south on the west side of Cook Inlet and on the east shore of Cook Inlet south of Humpy Point (Map 15). With historical kinship connections to the former communities of Kustatan and Polly Creek, and having fished along the west side of Cook Inlet, Tyonek residents have a long history of commercial and subsistence clam harvests. Clamming trips from Tyonek to harvest areas occur annually, involving parties of fishermen usually composed of extended families and friends. These trips typically occur in conjunction with the first warm days of spring and low tidal cycles in late April, May, and June.

In 2005-2006, several trips by six Tyonek households to the clam beaches at Redoubt Bay (Map 14) produced 60 gallons of razor clams, 21 gallons of cockles, and one gallon of littleneck clams (*Protothaca staminea*) (Table 16). These harvests in turn yielded 249 pounds edible weight of

marine invertebrates for the community (four pounds per household). Although only 9% of households harvested clams, 40% of Tyonek households used clams, indicating extensive sharing of this resource.

Of the Tyonek households surveyed in this study, 57% judged their marine invertebrate use in the study year had stayed the same as in other recent years. Another 39% felt their use had declined and 4% said they used more (Table 15; Figure 2).

### **Wild Plants and Berries**

In 2005-2006, 92% of Tyonek households used wild plants and berries, the highest use level of any wild resource category. Seventy percent of all households harvested berries, just slightly lower than household participation in salmon harvesting. An estimated total of 241 gallons of berries were harvested during the survey year, producing 963 pounds of usable weight, or 15 pounds per household. Another 90 gallons of greens and mushrooms yielded 359 pounds of food or five pounds per household (Table 16).

Wood was vital for heating homes and smoking fish in Tyonek. Eighty-five percent of households used and harvested 522 cords of wood, or 8 cords per household. Twenty-three percent of Tyonek households received wood and 38% gave wood to households unable to harvest wood for themselves. Those who were physically able, and who also possessed cutting equipment, provided wood to elder households.

For 67% of Tyonek households, plant and berry use had remained the same in recent years (Table 15). Twenty-six percent of households experienced a decrease in their usage, while 7% of households said they had used more plants and berries than in other recent years. Plant, berry, and wood harvest areas occur throughout the area south of the Beluga River to Trading Bay Flats and along the lower reaches of the McArthur River (Map 16).

### **COMPARISONS WITH OTHER YEARS**

Comprehensive harvest data for Tyonek are available for only one previous year, a 12-month study period in 1983-84 (Fall, Foster, and Stanek 1984). Several other studies of specific resources such as salmon, furbearers, migratory birds, and moose add to the base of knowledge for those resources (Braund and Behnke 1980; Stickney 1980; Stanek 2002; Stanek and Foster 1980; Stanek, Fall, and Foster 1982; Foster 1982a, 1982b).

In 1983-84, Tyonek households harvested 260 pounds of wild resources per person, compared to 217 in 2005-2006. Figure 5 compares estimated harvests in pounds per person for the two study years by resource category. Most of the difference between 1983-84 and 2005-06 harvests results from lower harvests of salmon (187 pounds per person in 1983-84; 151 pounds per person in 2005-2006) and land mammals (56 pounds per person in 1983/84; 41 pounds per person in 2005-2006). Tyonek residents also had lower harvests of marine invertebrates in 2005-2006 than in 1983-84. On the other hand, per capita harvests of fish other than salmon, marine mammals, birds and eggs, and wild plants were slightly higher in 2005-2006 than in the earlier study period.

ADF&G monitors annual subsistence harvests of salmon in the Tyonek Subdistrict through a permit and reporting system. Table 19 presents harvest data for all permit holders in this fishery, regardless of residence, from 1980 through 2005, while Table 20 portrays harvest data for Tyonek permit holders during the same period. Since 1980, the average annual subsistence

salmon harvest for Tyonek residents in this fishery is 1,481 salmon, including 1,248 Chinook. The recent (2000 to 2004) 5-year average is 1,161 salmon, including 983 Chinook (Table 20).

## **TYONEK COMMUNITY COMMENTS AND CONCERNS**

The following section summarizes comments and observations that Tyonek residents offered during the household surveys and community meetings. This report includes these comments to provide a thorough record of the information collected during the research. Opinions represent those of the respondents, and not those of ADF&G or SRB&A.

### **Salmon**

In spring 2006, the Chinook salmon run timing was later than usual. Tyonek residents set their gillnets during the same week in the spring they normally do, but were only catching two or three Chinook salmon a day, in comparison to their usual harvest of 12 to 14 per day. Even when the Chinook salmon arrived, they came in slowly. Many residents who fished at this time took the few fish they caught and pulled their nets from fishing sites before the main run finally arrived. One resident said he pulled his net after harvesting only 20 Chinook salmon, well below his normal catch. With prior commitments to work on other jobs at the end of the fishing season, most fishermen could not wait for the later arrival of the run.

Commercial fishing provides a modest income for some residents of Tyonek. However, in 2006 there were few commercial fishing openings due to low sockeye returns to the Susitna River in 2005. In addition to closures when the Kenai River run is poor, the Tyonek commercial fishery is often closed during the Susitna River salmon sport fishing derby. Timing of sockeye returns to these river systems ranges from late June to late July on the Kenai, to mid- to late July in the Susitna. In the past decade, sockeye returns to the Susitna River have been below the desired escapement goal, while returns to the Kenai and Kasilof rivers have been at or above goals. This has resulted in closures to the Northern District fisheries, which are closest to the Susitna River, and additional fishing time for fisheries targeting runs to the Kenai and Kasilof rivers.

In 2006, sockeye salmon returned several weeks later than usual to the Upper Cook Inlet management area. Where they did return during the last week of July and first week of August, many Central District drift fishermen already had left for the season. Returns were still strong in the Kasilof and Kenai rivers and fishery managers maintained fishing effort within special harvest areas for the maximum time allowed under regulation. Unfortunately, sockeye returns to the Northern District were just above the lower end of the escape goal, requiring closures in the commercial fishery and fishing by hook and release only in the Susitna River sport fishery (Lloyd and Nelson 2006; ADF&G 2006).

### **Moose**

Tyonek residents also observed a decline in the local moose population in 2005-06. One resident said this had an impact on the overall subsistence harvest in terms of pounds of wild meat brought into community households. He doubted that people in Tyonek compensated for the loss of moose by increasing their harvest of other wild resources. They just had to buy more food this past year, which is expensive to transport to Tyonek.

Another resident related a sentiment that was repeated by many households. He joked that “there were more people than moose out there.” He said Tyonek residents traveled towards the Chakachatna River to hunt moose, but too many people from urban areas were hunting there and

local residents felt crowded. The McArthur River is another area commonly used by moose hunters from Tyonek. But one resident noted his family spent a month traveling along the river, yet did not see any moose. With the cost of fuel so high during the study year, this was noted as a serious problem.

A few Tyonek residents attributed the decline in moose harvests to timing of the hunting season. Moose are usually present in the Tyonek area when residents hunt in the fall. In 2005-2006, however, warm weather delayed the movement of moose down from higher elevations until as late as February. When moose remain in higher elevations, they become more difficult and costly for Tyonek residents to access. Gasoline prices have risen sharply in recent years. When gasoline prices were lower, Tyonek residents could afford to spend time hunting moose on the network of roads on Tyonek lands late into the season if the moose did not descend at the usual time. However, with the cost of gasoline at \$5.00 per gallon, Tyonek residents reported spending less time hunting along the road system.

With the local moose population already low, residents expressed concern that any mining activities near Tyonek might contribute to even further reductions in moose numbers. The interruption of seasonal movements of moose consequent to a future mine development in the area was another concern noted by Tyonek residents.

## **Birds**

Tyonek residents made a few comments about avian influenza and human health concerns. Respondents noted some people were discouraged from hunting birds because of the potential for bird flu in the wild populations. One resident attributed a decline in bird hunting to time constraints in that people often worked overtime in the fall in the oil and gas industry, and this work schedule conflicted with participation in the fall migratory bird hunting season.

In addition to migratory birds, ptarmigan were reported to be less abundant during the study year. In the past, residents reported commonly observing spruce grouse and ptarmigan in the past along the roads and hunting there. Tyonek survey respondents said they saw ptarmigan less often both in the spring and winter of 2005-2006.

## **Demographic and Employment Issues**

As one respondent noted above, work in the oil and gas industry has reduced the amount of time some Tyonek residents have to pursue subsistence activities. One resident explained that the schedule for working on Cook Inlet oil rigs is four weeks on, two weeks off. When they are working on the rigs they work seven, 12-hour days. Some residents spent the last eight months on this work schedule, and then took off the coldest part of winter. In addition, several gas line construction projects were underway near Tyonek, and residents worked long hours in summer and fall to complete work on these projects before the onset of winter. This was a factor in failing to contact some residents to conduct the harvest survey, because they were too busy working.

The composition of some households in Tyonek also affected the time family members had to participate in subsistence activities. For example, there were several single parent households in the community. One single mother said that even though fishing is accessible she is too busy working full-time and taking care of her three children to go fishing. In other cases, when one parent from the household was busy working in the oil and gas industry, the other parent was too

busy caring for children, maintaining a household, and working for wages to engage in subsistence activities.

### **Chuitna Coal Project**

Residents' primary concern about the Chuitna River focused on the potential for pollution as a consequence of mine development. The potential effect on coho salmon fishing was particularly concerning. The future of subsistence, sport, and commercial fishing in the Tyonek area was related to several specifics of the proposed project. Residents noticed that an older logging pier had caused the creeks nearby to become cloudy and change course, over time. They thought this was likely caused by siltation from roads and disturbed ground associated with the logging and vehicle travel to the pier. They did not want to see this happen in any Chuitna River area associated with new pier development.

One resident stated that coal dust from the proposed coal conveyor belt circumventing TNC land might be blown into the water by southwest winds. In his view, this would have an effect on people in Tyonek and on the marine environment by releasing toxic chemicals into the water. He also questioned the placement of the dock and trestle and its physical effect on the marine environment; suggesting that it might cause fish and marine mammals to move away from their usual path of travel along the shoreline, and that commercial and personal use fishermen might also be affected by noise and the loss of fish while using the shoreline areas.

The possibility of a road from Anchorage was also a major concern. Tyonek residents said the area they use for subsistence hunting and gathering is rapidly shrinking due to competition from non-local residents. Their activities increasingly have been limited to the village corporation lands south and west of the village where non-shareholders may not trespass.

Residents also noted that services for sport fishers provide an important source of income, and these enterprises could be affected by new development. For example, in 2006, the Tebughna Corporation (the corporation organized by the Native Village of Tyonek) refurbished the guest house to accommodate more sport fishermen. These sport fishermen mainly target coho salmon on the Chuitna River, just downstream from the potential mine development. Services for sport fishers provide an important source of income for the village corporation which provides vital services for community residents, as well as jobs.

### **Respect for Subsistence Resources**

Respect for subsistence resources, especially moose, was the overarching theme in concerns related by residents of Tyonek. In interviews, local residents expressed fear that if large numbers of non-local residents settle in the area for employment opportunities in mining development and operation, they may not show respect for the local subsistence resources on which they depend. Local respondents in Tyonek reported that when the logging operation was at its peak they witnessed some non-local workers shoot moose "for target practice." The shooters then used front end loaders to dispose of the animals. Respondents indicated that they viewed this as extremely disrespectful to the moose and to people in Tyonek who would gladly have taken any of the meat that was not needed by the hunters. But, they reported, the moose were simply buried in pits. One respondent said he found 28 dead moose in the timber camp, but the village harvested none that year. Residents wondered whether if the moose would return, if this is how they are treated. Tyonek residents do not want this behavior repeated.

Residents expressed concern about being displaced from traditional hunting areas by non-local mine workers. In 2006, two hunters from Tyonek came across three dead moose from which only the backstraps and one hindquarter each had been removed. One animal was found near the Nikolai River, and one by the Beluga River (Map 1). In another instance, a Tyonek hunter who works with heavy equipment and travels about the area for his work, reported seeing many moose that were shot and left without the meat being salvaged near Threemile Creek. As noted above, such practices are offensive to Tyonek hunters, especially considering that they are sometimes unable to locate any moose themselves to harvest for their families. They emphasized that while elders did not receive any moose meat in 2005-2006, it was evident that non-local hunters were wasting food. Tyonek residents who were interviewed for this project said they believe these problems will intensify and disrupt their subsistence activities if a road is built or a mine is developed.



## CHAPTER 3. BELUGA STUDY FINDINGS

### COMMUNITY BACKGROUND

The present-day community of Beluga lies within the traditional territory of the Upper Inlet Dena'ina. Dena'ina elder Sava Stephan (*in* Kari and Fall 2003:69-70), described Dena'ina travel between Susitna Station and Tyonek and noted, "They had camps all over there. Always camp at Beluga River mouth." The Dena'ina name for the mouth of the Beluga River is *Nughiltnu Kaq'* ("Mouth of River that Flows Down") and may have been the name generally applied to a Dena'ina camp or village site located at Cottonwood Beach.

"Beluga" is the anglicized version of the Russian name *belukha* for the small white whale. The name "Beluga" appears to have been applied to a Dena'ina village and subsequent community by the area residents who were contacted by the earliest United States Geological Survey (USGS) reconnaissance party in the area, but how this naming occurred is unclear. George H. Eldridge's 1898 field notes (Eldridge 1898:11) contain a portion of a 1895 Dall Expedition map on which Eldridge labeled by hand "Beluga" (River) and marked a site a short distance (about 5 miles) upstream from the mouth. Whether this is a village site, camp, or ford is not clear from the map or the field notes. However, also in 1898, W.C. Mendenhall interviewed Thomas Hanmore, a store keeper at Tyonek, and copied Hanmore's hand drawn map that showed village sites at Kustatan, "Traders Bay" (Trading Bay), Tyonek, and Chuitna, but not at the Beluga River (Mendenhall 1898). The journals of Russian Orthodox priests summarized by Znamenski (2003) also do not mention a community or a stop at Beluga on upper west Cook Inlet in their travels during the mid and late 1800s.

Orth (1971:123) summarizes USGS map references to a former Dena'ina village of "Beluga." A USGS map dated 1933 placed the village along the Beluga River, 5 miles northeast of the present site of Beluga. A 1958 USGS map showed the site of Beluga, with 4 or 5 buildings, at Cottonwood Beach on the northwest shore of Cook Inlet, 8 miles northeast of Tyonek. A life-long resident of the area (H. Kurtz, personal communication, 2006) stated that, "Beluga was [formerly] not where it is now. The village was up on the Beluga River." Kurtz explained that the late Thomas Krause, who lived and fished at Cottonwood Beach, told her that the Beluga River changed its course after a 1932 earthquake, and that the river used to flow right by his fish camp.

At the turn of the 20<sup>th</sup> century, gold miners and USGS reconnaissance missions traveled along the beaches and trails of the northwest shore of Cook Inlet. Geologists Alfred Brooks, George H. Eldridge, and W.C. Mendenhall landed at Tyonek and stopped at Ladd (Chuitna), Threemile Creek, and Beluga (see G.E. Eldridge 1898:Map 3).

In the 1930s and 1940s, commercial fishermen established camps near Beluga at Three Mile Creek, where Louis Kozisek purchased cabins from Ed Madsen, and along Cottonwood Beach, where Thomas Krause, George Viapan, Cecil Kurtz, and Jimmy Brown fished.<sup>3</sup> In the 1950s and 1960s, oil and gas exploration on the west side of Cook Inlet located gas deposits near Beluga. Production began in 1967 (Alaska Oil and Gas Quarterly 2003). Subsequently, a small dispersed settlement of individual households was established. Permanent land ownership

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<sup>3</sup> This information about local history was provided during key respondent interviews with local residents L. Wright, Coleen Simpson, Helen Kurtz, and Emery Jadack (personal communications, 2006).

resulted from federal homestead programs and State of Alaska land disposals. A post office and general store operated in the late 1970s and early 1980s. The school closed in the mid 1980s due to low enrollment of children.

In 2006, Beluga was a dispersed, primarily non-Alaska Native community located 12 miles north of Tyonek. There was a store and gasoline station, but no other centralized community facilities. A mail drop at Beluga was administered through a private contract. A private, mile-long, lighted gravel runway provided the only air access to the community. The runway was maintained by Conoco Phillips Alaska, Inc., Chevron U.S.A. Inc., and the Municipality of Anchorage, Municipal Light and Power Company. A large gas-powered electrical generation plant operated by Chugach Electric Association and the Municipality of Anchorage was located at the north end of the runway. While electrical power from the plant was available to local residents, natural gas was not. Gas production and other service company facilities were located near the runway.

Gravel roads exist throughout much of the immediate surrounding area and provide access to private homes, gas production facilities, the runway, and a gravel barge landing. These roads are serviced by oil and gas companies with facilities in the area. The Beluga road network connects to roads on TNC lands south of the Chuitna River and to Cook Inlet Region Incorporated (CIRI) and State of Alaska lands in the area.

## **DEMOGRAPHY, EMPLOYMENT, AND MONETARY INCOME**

### **Demography**

Population estimates for Beluga vary. The 2000 US Census counted 32 residents (US Census Bureau 2001) while the ADL (2006) reports a population of 21 for both 2005 and 2006. According to ADF&G household survey results, Beluga had an estimated population of 40 people living in 15 year-round households during the 2005-2006 study year (Table 4). Differences between these estimates are due largely to timing of the censuses, and the employment, health, and schooling arrangements of Beluga residents. Several permanent residents interviewed for this study maintained their primary household in Beluga and rented temporary housing in Anchorage. Several others owned homes in Anchorage. Depending on their work schedules, a number of residents commuted to Anchorage or worked there part of the year. (One-third of the jobs held by Beluga residents in 2005-06 were located in Anchorage – see the section on employment below.) When the children in one young family reached school age, the family decided to spend the winter of 2006-2007 in Anchorage, returning home on the weekends and running their family guiding business at Beluga full-time during the summer months. Another household had children in college who maintained their Alaska residency but were absent for most of the year. Several retired households maintained their permanent residences at Beluga, but traveled part of the year or lived part of the year with their children in other communities. There also were part-time and seasonal residents in the Beluga area who were not interviewed for this study. Many of these people live in Anchorage or Kenai and work at the Beluga Power Plant or on the area's network of oil and gas delivery systems. Some own property in the Beluga area.

According to study results, during the 2005-2006 study year, the average household size at Beluga was three persons with a range of one to six persons (Table 4). The average age of the population was 47 years; the oldest person was 78 years of age and the youngest was ten years old. The population included approximately six people under the age of 20. This small number of young school aged residents accounts for the reason residents need to leave the community for

school, as there are too few students to support a school. The median age of Beluga was 54 years. The population was 92% non-Alaska Native. Overall, males made up 51% of the population (Table 21, Fig. 6).

For the entire population, the length of residency in the Beluga area ranged from 3 to 53 years, with a mean of 20 years (Table 4). For household heads, the mean length of residency was 22 years. The majority of Beluga household heads (73%) were born in a state other than Alaska, and another 12% were born outside the United States (Table 6). Those household heads born in Alaska (15%) were born when their parents resided in Beluga (8%), Palmer (4%), or Tyonek (4%).

### **Employment Characteristics**

During the 2005-2006 study year, 71% of Beluga households had at least one member who held a cash-earning job (Table 7). Of all adults, 53% had a job during the study year and 56% were employed year-round. The mean length of employment was nine months. The maximum number of jobs held by any person during the study year was four and the mean was two jobs per employed adult. Sixty-five percent of the jobs held by Beluga residents in the study year were located in Beluga, while 32% were in Anchorage (Table 8).

Most jobs held by Beluga residents (27%) were in the services sector (Table 22), which includes services for the sport fishing and hunting industries. Local lodges and guiding businesses rely heavily on sport fishing in the Chuitna River, which, in the study year, was the only Chinook salmon stream near Beluga where sport fishing regulations allowed the retention of Chinook salmon. Other streams near Beluga, such as the Theodore River (about 10 miles to the northeast), were open only for catch and release of Chinook salmon, but allowed retention of other species (Map 1). Hunters, who come from outside the area for black and brown bear and waterfowl, used local lodges, guides, and transportation during their stay.

Local government supplied the next highest number of jobs (23%) in Beluga in 2005-2006. Forestry and commercial fishing related jobs were 13% of the total, including trapping in the surrounding area. The construction sector accounted for only 10% and manufacturing for 6% of the jobs in Beluga during the study year. The other sectors, including federal and state government, mining, and transportation and communications, each provided 3% (one job) of the total jobs.

### **Monetary Income**

According to this study, Beluga residents had two broad categories of monetary income during the study year (Table 10). One is cash employment, which provided an average of \$17,471 per household and \$6,610 per person. The second was “other income sources” including the Alaska Permanent Fund dividend, pensions and retirement, social security, and corporation dividends. These other sources together provided an average income of \$17,636 per household and \$6,673 per capita in 2005-2006. The two sources of monetary income combined provided an average of \$35,107 per household, or \$13,107 per capita, in the study year.

### **Annual Purchased Food Costs**

In the survey, Beluga households estimated they spent an annual average of \$6,138 on the purchase of food (Table 11). This equates to approximately 18% of the average annual household income. Annual food cost estimates might be slightly lower than actual expenditures

because survey respondents did not consistently include the cost of air freight from Anchorage into the estimates.

## **RESOURCE HARVESTS AND USES**

### **Levels of Participation in Harvest and Use of Wild Resources**

During the 2005-2006 study year, 100% of Beluga households used, attempted to harvest, and harvested at least one type of fish, wildlife, or wild plant resource (Table 12). On the individual level, almost every Beluga resident (95%) participated in at least one resource harvest activity, while only slightly fewer people (92%) processed resources (Table 13). Harvest activities most commonly pursued by Beluga residents included: fishing (89%) and processing fish (92%); gathering plants (76%) and processing plants (78%); and hunting (68%) and processing (81%) game birds and mammals. Fewer Beluga residents (32%) trapped or hunted furbearers, and 30% processed furbearers (Table 13).

Beluga households used a variety of resources, averaging 15 different wild resources, with a household maximum of 30 resources (Table 12). Households attempted to harvest an average of 14 different resources, and the mean harvest during the study year was 12 wild resources harvested. No household attempted to harvest more than 33 wild resources and no household successfully harvested more than 28 different resources.

The significance of wild resources in the annual food supply of Beluga residents was demonstrated by the estimated percentages of meat, fish, and birds used annually that originated from wild sources (Table 14). Almost half (49%) of households estimated that more than 50% of their annual meat, fish, and bird supply came from wild sources, and 14% more said that between 26% and 50% did so. Of all interviewed households in Beluga, 21% said that all their meat, fish, and birds came from harvests of fish and wildlife.

Overall, Beluga residents indicated a decline in their use and harvest of wild resources during the study year compared with other recent years (approximately the last five years). Sixty-four percent of households indicated they harvested and used less, and the other 36% indicated no change (Table 23; Figure 7). No household said they were harvesting and using more wild resources. Household respondents offered several reasons for uses that were lower than usual. One household remarked that, "For health reasons we weren't able to get out as often as usual. We also didn't draw a Tier II moose permit so we couldn't get a moose like we usually do in the winter." Two households had personal injuries that prevented them from getting around as usual. One household attributed its lower use to a reduction in household size because their children left to attend college, while another household had less time owing to the birth of their first child. Two households suffered the death of family members and dealing with these losses precluded their normal harvest of resources. One household enrolled their secondary school age children in Anchorage schools and had to spend more time in town away from home. Finally, one household had employment commitments that reduced the time it normally would have spent hunting and fishing.

### **Sharing and Receiving of Wild Resources**

Sharing of wild resources was a common practice among Beluga residents in the study year, with 100% receiving an average of five different kinds of resources. Also, 86% of households gave away an average of five different resources. The maximum number of types of resources either given away or received was 11 (Table 12). Beluga households form a close-knit but

geographically dispersed community. Sharing is common between those households able to harvest resources, and those with health or other problems that prevent them from hunting or fishing.

### **Species Used and Seasonal Round of Harvests**

In the 2005/2006 study year, Beluga residents used and harvested a variety of wild resources, most of which were available close to the community (see Map Figures). Individual resources typically become available for harvest at specific times of the year and are found in characteristic locations. The annual cycle of resource availability is predictable and allows for the reliable and sustained provision of wild foods for community residents. As in the past, during the study year Beluga residents began their annual cycle of resource harvests in the spring as winter ice cleared from local streams and lakes. Rivers and streams released their ice burden in April and May, before the lakes in May and early June. Free of ice, the rivers became travel and harvest corridors for Beluga residents. Winter ice fishing for rainbow trout and pike came to an end as lakes thawed; however, trout which congregated in open water locations were harvested during this time.

Eulachon is among the first resources to become available in river systems such as the Beluga and the Susitna rivers. Eulachon were harvested in late spring by dipnet in the rivers and setnets on inlet beaches. Brown and black bear hunting took place in the spring months as bears emerged from their winter hibernation and utilized river corridors and snow-free meadows in search of the first green grass. These bears are prized for their long thick coats and tasty meat. Spring beaver and muskrat trapping and hunting began in late winter when beavers appeared in open water areas and along river banks searching for food. Hunting with firearms continued into May if the animals were taken for food. Pelts are usually not desirable this late in the year.

Freshwater fishing includes the taking of pike and rainbow trout. In the Beluga area in recent years, pike have become abundant in Threemile Creek, and have nearly destroyed the local runs of sockeye and coho salmon and trout in this river system. Residents traveled to Threemile Creek to harvest pike during the study year (Map 22). Other lakes outside the Threemile Creek system have not yet been invaded by pike and remain popular for the harvest of trout. Residents fished on these streams during the study year (Map 23). Spring subsistence and commercial salmon fishing took place beginning in May on inlet beaches near Tyonek and Beluga and continued into June (Maps 17&18). Subsistence fishing was not authorized by regulations in the immediate vicinity of Beluga. A few Beluga residents obtained subsistence salmon setnet permits and fished in the Tyonek Subdistrict, located 12 miles south of Beluga (Map 17). This was not a common practice, however, as access to the private land along Tyonek beaches was generally prohibited by the land owner.

Summer months, beginning in mid June and extending through August, were busy with salmon fishing and plant and berry gathering. Residents fished in local streams and rivers including the Chuitna, Threemile, Theodore, Lewis, and Beluga rivers and Lone Creek (Maps 18 & 19). A number of other small streams along the Beluga and Chuitna rivers were also fished for salmon and trout. Tier II subsistence and general hunt moose seasons opened in GMU 16(B) on August 20, 2005.

Upland game bird seasons for ruffed and spruce grouse and ptarmigan opened in mid-August. Grouse were the main species taken in early fall. Ptarmigan were taken after freeze-up and throughout the winter months. The fall waterfowl season opened on September 1 and continued

through December 16. Most waterfowl hunting had concluded by mid- to late October because migrating cranes, ducks, and geese had by then left the area and freeze-up occurred.

Late fall and winter months are characterized by frozen conditions which, with adequate snowfall, allows for the use of snowmachines to access lands and water bodies not accessible during ice-free months. Trapping seasons opened during the study year on November 1 and trappers laid out their lines and began making sets for furbearers. Between November 15 and February 28, a Tier II subsistence moose hunt occurred in GMU 16(B) and local residents holding permits and who had not harvested a moose in the earlier Tier II season hunted during this time. Moose moved to and remained at higher elevations along Lone Ridge until snow cover deepened, forcing them to lower areas with less snow around Beluga and nearby flats (Map 24).

In winter months, short days and cold temperatures usually limit resource harvest activities. However, during the study year Beluga residents took advantage of occasional warm weather to harvest wood, fish through the ice in local lakes, and hunt moose and ptarmigan. Furs are prime during winter months and trappers and hunters traveled over frozen terrain to run their traplines and track larger furbearer species, such as wolves. As day length increased after the new year, fishing for pike and trout through the ice occurred on frozen lakes throughout the area (Maps 22 & 23). By February, the fur of some long-haired furbearers began to singe from abrasion and lost its quality. Beaver trapping began once again in late winter as day length increased, firm snow conditions facilitated travel by snowmachine, and beavers became more active. By the end of March, long days and warming weather conditions ushered in a new annual cycle.

### **Harvest Quantities**

The 2005-2006 harvest of all resource harvests by Beluga residents totaled 8,086 pounds of usable weight. This was an average of 539 pounds per household and 204 pounds per person. The largest quantity any household harvested was 1,583 pounds usable weight (Tables 12 and 24).

As shown in Figure 8, salmon provided 43% of the harvest, more than any other category, while large land mammals and non-salmon fish contributed 30% and 18%, respectively. Berries and other edible plants contributed about 5%, birds contributed 3%, and marine invertebrates and small land mammals each provided less than 1% of the total harvest.

## **USE AND HARVEST CHARACTERISTICS BY RESOURCE CATEGORY**

### **Salmon**

Salmon was the second most widely used resource in Beluga during the study year, with 93% of households using at least one species of salmon. Salmon were harvested by 86% of households and 93% fished for salmon. Eighty-six percent of households harvested salmon and the same percentage also gave some away. Sixty-four percent of Beluga households received salmon in 2005-2006 (Table 24).

Beluga households harvested salmon primarily from the Chuitna River, but also from the Beluga and Theodore rivers, and from commercial nets set on nearby beaches (Maps 17-19). Residents harvested a total of 3,472 pounds of salmon in 2005-2006 (Table 24). The majority of this harvest was coho (silver) salmon, with 1,534 pounds (326 fish) harvested (Figure 9). Chinook (king) salmon provided the next largest amount with 1,272 pounds (106 fish). Sockeye (red)

salmon ranked third at 491 pounds (105 fish). Chum salmon (*Oncorhynchus keta*) and pink salmon (*Oncorhynchus gorbuscha*) were of minor importance in the harvest, with 113 pounds and 62 pounds, respectively, taken by Beluga residents.

Harvest methods used by Beluga residents to obtain salmon for home use included removal from commercial setnets, subsistence setnets, and rod and reel (Table 25). The largest portion of the salmon harvest, (63%, or 2,202 pounds), was taken by rod and reel. Most households (79%) used this method (Table 26). Salmon removed from the commercial setnet harvest accounted for 23% (810 pounds) and was used by 14% of households who fished along Beluga area beaches. Salmon was the only resource removed from commercial setnet catches, with sockeye salmon accounting for 251 pounds or 31% of the total salmon removal. Another 237 pounds of coho salmon, 207 pounds of Chinook salmon, and 113 pounds of chum salmon were also removed for home use (Table 25). Removal from commercial catches played an important part in providing salmon to Beluga households because not everyone had a commercial permit and there was no local subsistence setnet fishery. Commercial fishermen distributed salmon removed from their catch widely to other households in the area. Salmon removed from commercial harvests were provided to several households with elderly and disabled individuals. Subsistence setnet and dipnet methods together were used by only 14% of households to take 13% (459 pounds) of the total harvest of salmon.

Beluga households were asked to compare their 2005-2006 salmon harvests with other recent years' harvests and uses (Table 23; Figure 7). While 50% indicated their uses were the same for the study year and other recent years, 36% thought their use and harvest had declined. Fourteen percent said they had used more in the last five years (Table 23).

### **Non-Salmon Fish**

Non-salmon fish harvested by Beluga residents in 2005-06 were primarily freshwater species (Table 24). Although marine species occur in the immediate vicinity of Beluga, they are usually only taken incidentally in setnets. Species like halibut were not targeted by local rod and reel fisherman except when they traveled out of the area to lower Cook Inlet. Other marine species include salmon shark, starry flounder, and sole, all of which were caught incidentally in commercial set nets but not retained for home use during the study year. One household noted that they usually harvest halibut, rockfish (*Sebastes* spp.), and lingcod (*Ophiodon elongates*) in the lower inlet, but an injury prevented them from most fishing activity in the study year.

Halibut was the only marine species reported taken, by one Beluga household that harvested 54 pounds, giving the community an average harvest of three pounds per household. Halibut was also a widely shared species and was received by 57% of Beluga households (Table 24). Although one household reported using rockfish and Pacific cod, no harvests of these species were reported.

Several species such as saffron cod, tomcod, burbot (*Lota lota*), and whitefish were taken historically (Stanek 1987; Fall et al. 1984), but did not appear in the 2005-2006 harvest. Eulachon ("hooligan") was the only smelt species harvested, by 50% of Beluga households, in the immediate vicinity of the community. In total, an estimated 49 gallons (160 pounds) of eulachon were harvested by dipnet and provided an average of 11 pounds per household and four pounds per capita (Table 24). Dolly Varden were harvested and used by 29% of Beluga households, with an estimated harvest of 50 fish, totaling 71 usable pounds, or five pounds per household. Rainbow trout were taken by 57% of Beluga households, while 21% distributed trout

to 14% of other households. A total of 424 rainbow trout, the largest number of any freshwater fish, were harvested, providing an estimated 594 pounds, an average 40 pounds per household. One Beluga household harvested two steelhead trout (*Oncorhynchus mykiss*). Beluga anglers targeted pike and took 183 fish (550 pounds) during the study year, an average 37 pounds per household. Harvest areas for non-salmon fish are depicted in Maps 20 through 23.

Harvest methods used by Beluga residents to take freshwater fish included rod and reel, ice fishing, and dipnet, with the former two methods accounting for the majority of the harvest. Dipnets were used to harvest eulachon and sockeye salmon. Among all Beluga households, 57% said their 2005-2006 freshwater fish harvests and use were lower than in other recent years. Another 36% thought their use and harvests had not changed (Table 23; Figure 7). One household indicated taking more freshwater fish during the study year. This was due primarily to the elimination of the salmon runs into Threemile Creek.

### **Large Land Mammals**

Beluga households used five species of large land mammals in 2005/2006: black bear, caribou (*Rangifer tarandus*), moose, muskox (*Ovibos moschatus*), and Dall sheep (*Ovis dalli*). Large land mammals provided 2,403 pounds of food, for an average 160 pounds per household and 61 pounds per person. Although low numbers of moose in the area resulted in only three households hunting successfully, moose made up the largest amount of the total pounds harvested with 1,736 pounds or 116 pounds per household. All Beluga households used moose meat with 86% of households receiving moose meat during the study year.

Black bear added moderately to the overall red meat harvest at Beluga with 373 pounds total or 25 pounds per household. Hunters took six black bears and used the meat from all of them. One muskox was taken by a hunter who traveled out of the area, and this contributed 295 pounds to the total community harvest, although muskox meat was reported used by only two Beluga households (14%). Two other large land mammals used by Beluga residents, but not harvested by local hunters, were caribou and Dall sheep. Four households (29%) received caribou, and one household (7%) received sheep meat.

Fifty percent of Beluga survey respondents thought their 2005-2006 harvest and use of large land mammals was the same as other recent years, and 43% said their uses had declined (Table 23; Figure 7). One household (7%) reported using more land mammals in the study year. Several households reported not getting subsistence Tier II moose hunting permits, as they had in previous years.

Fewer moose in the area was a concern of most households. Low hunter success was reflected in the disparity between the high number of households that attempted to harvest moose (64%) and the few (21%) that did harvest a moose. Harvest areas for large land mammals were typically located within a five to ten mile radius of Beluga. However, respondents indicated that in the fall and winter of the study year, their hunting area expanded to a much broader area.

### **Small Land Mammals**

In 2005-2006, small land mammals were a relatively small portion of Beluga residents' total harvest, with five pounds edible weight of snowshoe hares and red squirrels (*Tamiasciurus hudsonicus*) providing less than one pound per household. However, as mentioned above, 36% of Beluga households trapped a variety of furbearers. Furbearers were important for the sale of fur, which is also used in the manufacture of crafts. Marten were harvested in the largest

numbers (126) and were taken by 29% of households. Other furbearers taken included: 38 beavers, 49 red squirrels, 12 weasels (*Mustela erminea*), 11 red foxes (*Vulpes vulpes*), 10 coyotes, 10 muskrats, 6 wolves, 4 land otters (*Lutra canadensis*), and 3 mink (*Mustela vison*). Trappers used snowmachines during winter months to access traplines as far away as Lower Beluga Lake and Mount Susitna (Map 26).

Because furbearers were the primary group of small land mammals taken, and most households did not trap, an assessment of no change in their use and harvest compared to other recent years was indicated by 86% of surveyed Beluga households (Table 23; Figure 7).

### **Marine Mammals**

Beluga households did not hunt or use marine mammals in the 2005-06 study year. Likewise, Beluga households generally have not used these resources in the past and indicated no change in their use patterns in the study year.

### **Birds**

The hunting of abundant populations of both upland game birds and migratory waterfowl ordinarily occurs on the tidal flats, within forests, and tundra areas around Beluga during specific seasons. Upland bird hunting areas encompass habitats where birds can be found seasonally, and grouse and ptarmigan often are taken in conjunction with other activities such as moose hunting and wood cutting. Upland game bird hunting for grouse and ptarmigan occurs by regulated season from August 10 through March 31. Waterfowl, including ducks, geese, cranes, and shorebirds such as common snipe (*Gallinago gallinago*) can be legally taken by Beluga residents during the September 1 to December 16 season. Most waterfowl hunting ends by mid October and occurs on the flats of the Susitna Flats Wildlife Refuge and wetland areas near the community. Hunting for these two categories of species, upland game birds and migratory waterfowl, was typical during the study year (Map 27).

Beluga households' assessments of change indicated that the majority (64%) believed their use of birds in 2005-2006 was about the same as in other recent years, and 29% thought it was lower (Table 23; Figure 7). One household pointed out that:

There were way less ducks and geese around. By the Ivan River well pad, there were less than we usually see. The goldeneye had disappeared from the ponds by the Beluga River. There were goldeneye in those ponds for years. Mallards also were down, as were snow geese. The tundra swans are okay.

### **Migratory Waterfowl**

In the study year, 36% of Beluga households hunted migratory birds; 7% gave away a portion of their harvests and 7% received migratory birds. Despite the relatively easy access to the Susitna Flats State Game Refuge along roads from Beluga, only a modest number of waterfowl were taken by Beluga residents during the study year (Map 27). The 59 birds harvested included 41 ducks, 16 geese, and two sandhill cranes. The majority of ducks harvested were mallards (25) while the geese included 9 Canada geese, and 8 white-fronted geese (*Anser albifrons*). Waterfowl contributed 6 pounds usable weight to the average household harvest (Table 24).

## **Upland Game Birds**

Hunting of upland game birds was important to Beluga households, with 79% hunting grouse and ptarmigan (Table 24). This was due largely to the availability of upland birds throughout much of the year and their accessibility along roads and by snowmachines on frozen, snow-covered ground (Map 27). There was also a good winter survival rate of grouse in 2005 and local hunters reported numbers to be up when compared to recent years. Grouse were often taken by hunters while on their fall moose hunting trips. The harvest of 264 upland birds, including 223 spruce grouse and 38 ptarmigan, contributed significantly to average household food supply with an average of 17 birds and 12 pounds edible weight. Local hunters also took three ruffed grouse, which have recently spread to the area from introductions in the Matanuska - Susitna Valley.

## **Marine Invertebrates**

Although saltwater clams were not harvested in the vicinity of Beluga, residents traveled to clamming areas on the east side of Cook Inlet to harvest 150 gallons (64 pounds usable weight) of razor clams. Razor clams were harvested by 29% of households and distributed to 21% of households, resulting in 50% of Beluga households using razor clams (Table 24). In sandy bottomed lakes around Beluga, freshwater clams (*Anodonta beringiana*) can be found and one household (7%) harvested about one gallon for consumption. The only other shellfish harvested by residents was less than a gallon of cockles taken in Kachemak Bay. Invertebrate use assessments show the majority of Beluga households (62%) thought their use was the same as in other recent years, while 38% reported it had declined (Table 23; Figure 7).

## **Wild Plants and Berries**

The harvest and use of wild plants and wood were significant features of the wild resource patterns among Beluga households. Of the surveyed households, 93% harvested these resources. Fifty percent of Beluga households gave away berries and plants, while 36% of households received plants and berries (Table 24).

During the study year, plant, berry, and wood harvest areas were located primarily along the road and trail systems around Beluga, and most households took some portion of their harvest from the properties they own. Some types of berries and plants can only be found in open marshy areas or at higher elevations, and special trips were made to these locations (Map 28).

Wild plants and berries were harvested in significant quantities, with 81 gallons of berries and 28 gallons of greens and mushrooms providing an average of 30 pounds to the average household harvest (Table 24). The types of berries harvested included blueberries, currants, highbush cranberries, lingonberries or lowbush cranberries (*Vaccinium vitis-idaea*), mossberries (crowberries, *Empetrum nigrum*), and watermelon berries (*Streptopus amplexifolius*), totaling 326 pounds. Greens included 114 pounds of fireweed, bluebells, and fern fiddleheads (species unidentified). Mushrooms, including morels (*Morchella spp.*) and boletus (*Boletus spp.*), also were harvested in small quantities. In addition, a small amount of shelf fungus (species unidentified) was collected for use in making crafts.

Most Beluga households (64%) said their uses and harvests of wild plants had remained the same as in other recent years. However, 21% noticed a decrease in uses, and 14% used more than in other recent years (Table 23; Figure 7).

## **COMPARISONS WITH OTHER YEARS**

Prior years' information on resource harvest and use in Beluga appears in Stanek (1987). In that study, trapper households in the lower western Susitna Basin were surveyed about their overall wild resource harvest and use patterns. Beluga area households were interviewed as part of the lower Susitna subregion sample. Average harvests of 885 pounds per household and 303 pounds per capita were recorded for calendar year 1984. Trapper households in 1984 produced 200 to 300 pounds more resources per household than did non-trappers. These results are comparable to 2005-2006 survey results for Beluga residents overall.

The composition of resource harvests between the two study years shifted to include higher proportions of fish, at 61% in the 2005-2006 sample as compared to 30% fish in 1984. Large land mammals made up 30% of the 2005-2006 total harvest and 58% in the 1984 harvest. Moose numbers in the area were much higher during the 1984 study year compared to 2005-2006. Results from the two studies demonstrate a shift in reliance from land mammals to fish based on resource availability and timing of harvest. During the 1984 study, preservation of large quantities of moose meat depended to a large extent on cold temperatures in winter months. Moose also move from higher elevations to lower areas around Beluga in the late fall and winter when snowfall forces the animals to lower elevations where they are then more accessible to local hunters.

## **BELUGA COMMUNITY COMMENTS AND CONCERNS**

Beluga residents offered the following comments during household interviews and expressed concerns about a multitude of resource management issues. As with the comments from Tyonek households, these do not represent the opinions of ADF&G or SRB&A. They are summarized here as part of the context for understanding contemporary wild resource harvests and issues.

### **Moose**

Every interviewed Beluga household mentioned the low numbers of moose and believed the decline in recent years partially explained the lower than usual harvest levels in 2005-2006. Discussions about moose numbers linked the decline to high populations of wolves and brown bears in the area. One household voiced objections to the way in which Tier II permits are allocated:

It doesn't make any sense that people in town should get a permit. Only a few people here hunt. It isn't fair to locals who use the resources. Nonlocals don't know what they are doing locally, shooting across roads, airstrips, and wounding animals that locals track down or find and try to salvage.

### **Subsistence Salmon Fishing**

Several residents wanted a subsistence setnet fishery on the Cook Inlet beach at Beluga. They reported having had difficulty obtaining salmon for home use by rod and reel fishing, especially with the decline of sockeye and coho in Threemile Creek. They would like to be able to set nets on the beach to catch salmon passing by. There were also requests to allow the harvest of Chinook salmon in subsistence fishing nets because the limit of two fish caught on rod and reel in the streams was insufficient for their annual food requirements.

## **Threemile Creek Pike**

Many households expressed concern about the decline in sockeye and coho salmon in Threemile Creek. The pike reportedly have eaten all the juvenile salmon and trout. Residents and non-local fishers used to obtain their annual catch of sockeye and coho salmon from Threemile Creek. One fisherman noted, “Now there are no reds and only a very few cohos left.” They believed the regulations should be more liberal for taking pike, for example, by allowing the use of “jugs” or juglines, devices with baited hooks suspended from a floating pop-up buoy on lines that can be either free floating or set on anchors.

## **Other Area Streams**

Some respondents mentioned that access to the Chuitna River was considered difficult because of stated confrontations with Tyonek land owners. Respondents also expressed concerns about the lack of State fisheries management of the Lewis and Theodore rivers (Map 1). According to one Beluga resident:

There has been a lack of management in those streams. We wrote lots of letters to Fish and Game. They should be closed to all rod and reel fishing because of the injury to the kings.

## **Water and Air Quality**

During the November 11, 2006 Beluga community meeting, residents emphasized their concerns about water and air quality: “You should measure the amount of water we use,” commented one household. “We and folks in the village (Tyonek) get drinking water out of the Chuit[na] River,” was another comment. Another concern was for air quality:

What’s going to happen when all the coal dust starts blowing around in the winter? It’s going to get into the water and the vegetation, and the animals are going to pick it up.

Some Beluga property owners maintain water rights for domestic usage, and are concerned about losing these rights and quality of the water they depend upon.

## **Survey Methods**

One household remarked that the survey assessment questions did not cover a long enough period because changes in amounts of some resources occurred more than just in recent (last 5) years. Resources like grouse, hares, and moose reportedly take longer to change in their natural cycles: “It would be better to do the survey over a 3-year period because of the fluctuations in use levels and participation.” Respondents therefore may get more of one resource one year and not as much the next. A longer survey would even out these fluctuations.

Another household explained that fall and winter moose hunting areas differed, as did spring and fall black bear hunting areas. These areas should be mapped separately, according to the respondent.<sup>4</sup>

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<sup>4</sup> To protect the hunting areas of local residents ADF&G Division of Subsistence does not publish detailed maps for large land mammal species. Only general hunting areas are represented on maps. Map files representing seasonality do exist and are used for management purposes.

## **Roads and Travel Routes**

During the community meeting in Beluga, participants remarked that snowmachine and four-wheeler trails represented on the USGS base maps used for the survey especially in the proposed mine area were not represented on the maps. These trails become useable in the winter months when travel over frozen ground is possible.<sup>5</sup> Respondents reported that other roads were not represented on the maps, such as the road along the Chuitna River that extends to up to “Tory’s” and beyond to the Superior airstrip. This was reported to be a key access route that local people used for hunting, trapping, and plant gathering.

## **Chuitna Coal Project Development**

Two different households offered the following opinions about development of the Chuitna Coal Project:

If it’s done right, I’m for the project. I have concerns – the main concern would be coal dust management. The trestle with no floor, the winds [would blow the dust out]. What is the quality of the coal? The dust may interfere with game management. I’m concerned about the Beluga [River] watershed. I would like to see economic boom in the area. If permitting and construction are done properly, I would like to see the project happen.

If the coal project goes through, the wildlife will change. Bears and other wildlife will be changed. Dust and conveyor belts cause noise that will affect the animals. Dust will contaminate the land and water.

Another Beluga household felt its plans for the future were in jeopardy. This household maintains a residence in Anchorage for use when they are working there. They are a new household to the Beluga area and are learning a trade from their relatives. This household remarked:

We want to move to Beluga permanently [year-round]. So there is now uncertainty about the move. The development would affect the amount of resources we could use. The development would also affect our game guiding operation and the economy centered on that. The Chuit[na River] is the only river they can catch and keep kings. Jeopardizing that fishery would jeopardize the guiding business which depends on both kings and silvers.

Another household was concerned about impacts to wild resources:

We’re concerned about the availability of resources when the coal mine is developed. Will development run off all the game? Creating access to the area of the mine and how that will impact wildlife there, especially the moose.

Yet another respondent had witnessed coal mining activities in North Dakota and was concerned about the potential damage that the mine might do to the land, stating, “The land can’t be put back the way it was. It will hurt the watershed.”

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<sup>5</sup> ADF&G cartographers could not find files to represent these roads. Several engineering firms were contacted as well as the Kenai Peninsula Borough. No files exist to represent these roads and USGS maps are outdated. Residents therefore had to use their knowledge of roads as they relate to adjacent rivers to mark their routes.

## **Commercial Fishing Industry**

All of the commercial fishermen interviewed were concerned about the impact of coal transport facilities being located in the inlet and their possible effects on the passage of both adult salmon returning to the area and juvenile salmon swimming along the shoreline when migrating to the ocean. Another concern was about potentially more restrictive regulations and the decreased number of days open to commercial salmon fishing in recent years.

## **Property Values and Quality of Life**

Many Beluga residents moved to the area after their retirement. They had purchased property and built homes there because of the low population and pristine surroundings. These residents are concerned that property values and the quality of life will decrease as the mine is developed. Several households admitted to having second thoughts about making further investments in their homes and property. With these new and unexpected issues, some were anxious about the future. Much of their concern focused on the loss of wildlife and the degradation of water quality and the fish resources of the Chuitna River. Respondents mentioned concerns about the intrusion of new people into the area to work on the mine development. They have witnessed the occasional careless incidents of non-local people shooting firearms and indiscriminate killing of wildlife. One resident noted that:

They say that when workers are at the mine site they will not be able to possess firearms and be allowed to hunt. But when they get off work they will be free to do what they like. They will drive the roads and shoot anything they see. They don't know where our homes are and their shots will come right through our place.

## CHAPTER 4. DISCUSSION AND CONCLUSIONS

This chapter summarizes the major findings of the ADF&G Division of Subsistence research conducted in Tyonek and Beluga in 2006. In Tyonek and Beluga, subsistence use and harvest of fish, mammals, birds, and wild plants played a major role in the contemporary economy and way of life in the 2005-2006 study year. Most residents of both communities participated in the harvesting and processing of wild foods. Sharing of resources was common and involved most community households.

In 2005-2006, subsistence harvest levels were substantial, totaling 664 pounds usable weight per household or 217 pounds per person in Tyonek, and 539 pounds per household or 204 pounds per person in Beluga (Table 28). Subsistence harvests were also diverse. On average in the study year, Tyonek households used nine different wild resources, and Beluga households used 15.

Salmon made up the largest portion of harvests for home use in both study communities in 2005-06, but harvests of large land mammals, other fish, small game such as birds and furbearers, marine invertebrates, and wild plants contributed to the total harvest as well. Many households in Tyonek used marine mammals that were harvested by marine mammal hunting specialists in the community.

Areas used by study community residents in 2005-06 were accessed by highway vehicles along a local road system, by skiff along the shore of western Cook Inlet, or by all-terrain vehicles and snowmachines. Generally, Tyonek's hunting, fishing, and gathering areas in 2005-06 closely resembled those used in the late 1970s and early 1980s (Fall et al. 1984).

During the 2005-06 study year, most cash employment in both communities was seasonal and local (Tables 7 & 8). Incomes were relatively low compared to those of larger communities along Alaska's road system. Service jobs dependent upon healthy fish and wildlife populations in the local area provided a large portion of the employment and income for local residents. These included guiding, lodging, and transportation services associated with the guided sport fishing industry (Tables 9 & 22).

Commercial salmon fishing has a long history in the area and continued to be an important source of cash income in the 2005-06 study year. Local residents expressed concerns about the management of the commercial fishery and what they reported to be reduced fishing opportunities.

During interviews and community meetings, residents of Tyonek and Beluga voiced concerns about pollution of the Chuitna River as a consequence of Chuitna Coal Project mine development. They also expressed more general concerns about reduced water and air quality that they fear might accompany mine development.

Residents of both communities were worried about the effects that large numbers of newcomers to the area, attracted by mine development and operations, might have on local natural resource populations. They were also afraid that residents of Tyonek and Beluga would face increasing competition from a growing local population, and competition from more non-local hunters who would take advantage of improved access to the area. They did not want to be "crowded out" of traditional subsistence hunting, fishing, and gathering areas. In short, survey respondents from both communities were uneasy about the future of their communities because of their dependence on healthy wild resource populations and on continued access to traditional hunting, fishing, and gathering areas.

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## REFERENCES CITED

- ADF&G (Alaska Department of Fish and Game). 2006. Sport fishing report for July 18, 2006. Sport Fish Division, Palmer.
- ADF&G (Alaska Department of Fish and Game). 2007. Community Subsistence Information System [CSIS]. Division of Subsistence, Juneau. <http://www.subsistence.adfg.state.ak.us>
- ADLWD (Alaska Department of Labor and Workforce Development). 2006. Vintage 2005 estimates: Table 4.3, Alaska Places by Borough and Census Area 2000-2005. <http://www.labor.state.ak.us>
- Alaska Federation of Native Guidelines for Research. 1993. <http://www.ankn.uaf.edu>
- Alaska Oil and Gas Quarterly. 2003. Alaska's Cook Inlet: Where the action is in 2003. Alaska Oil and Gas Quarterly.
- ASCMCRA (Alaska Surface Coal Mining Control and Reclamation Act). Alaska Statute: AS 27.21. <http://www.dnr.state.ak.us>
- Braund, Stephen R., and Steven R. Behnke. 1980. Lower Cook Inlet petroleum development scenarios sociocultural systems analysis. Alaska OCS Socioeconomic Studies Program, Technical Report No. 47. Prepared for the Bureau of Land Management, Alaska Outer Continental Shelf Office, Anchorage.
- CFR (Code of Federal Regulations). Title 50--Wildlife and Fisheries; Part 92 Migratory Bird Subsistence Harvest in Alaska.
- CFR (Code of Federal Regulations). Title 50--Wildlife and Fisheries; Part 20 Migratory Bird Hunting.
- de Laguna, Frederica. 1934. The archaeology of Cook Inlet, Alaska. University of Pennsylvania Museum, Philadelphia.
- Eldridge, George H. 1898. U.S. Geological Survey traverse book, Alaska Volume I, 9-904, U.S. Geological Survey, Washington DC. U. S. Geological Survey Library, Alaska Technical Data Unit, Anchorage.
- Fall, James A., Dan J. Foster, and Ronald T. Stanek. 1984. The use of fish and wildlife resources in Tyonek, Alaska. Alaska Department of Fish and Game, Division of Subsistence Technical Paper No. 105, Juneau.
- Foster, Dan J. 1982a. Tyonek moose utilization 1981. Alaska Department of Fish and Game, Division of Subsistence Technical Paper No. 26, Juneau.
- Foster, Dan J. 1982b. The utilization of king salmon and the annual round of resource uses in Tyonek, Alaska. Alaska Department of Fish and Game, Division of Subsistence Technical Paper No. 27, Juneau.
- Jadack, Emery. 2006. Personal communication. Anchorage, Alaska. Alaska Department of Fish and Game, Division of Subsistence Data Files, Anchorage.
- Kari, James, and James A. Fall. 2003. Shem Pete's Alaska: The territory of the Upper Cook Inlet Dena'ina, second edition. University of Alaska Press, Fairbanks.
- Kurtz, Helen. 2006. Personal communication. Beluga, Alaska. Alaska Department of Fish and Game, Division of Subsistence Data Files, Anchorage.
- Lloyd, Denby, and Patricia Nelson. 2007. 2006 Upper Cook Inlet commercial salmon fishery season summary. News release issued 1/31/2007. Alaska Department of Fish and Game, Division of Commercial Fisheries. Soldotna.
- Mecklenburg, Catherine, T., Anthony Mecklenburg, and Lyman K. Thorsteinson. 2002. Fishes of Alaska. American Fisheries Society, Bethesda, MD.
- Mendenhall, W. C. 1898. Reconnaissances from Resurrection Bay to the Tanana River. Note Book No. 1. U. S. Geological Survey Library, Alaska Technical Data Unit, Anchorage.
- Morrow, James E. 1980. The freshwater fishes of Alaska. Alaska Northwest Publishing Company, Anchorage.

## REFERENCES CITED (Continued)

- NEPA (National Environmental Protection Act). 40 CFR Parts 1500-15081. Pub. L. 91-190, 42 U.S.C. 4321-4347, January 1, 1970, as amended by Pub. L. 94-52, July 3, 1975, Pub. L. 94-83, August 9, 1975, and Pub. L. 97-258, § 4(b), Sept. 13, 1982. <http://www.epa.gov/compliance/>
- Orth, Donald J. 1971. Dictionary of Alaska place names. United States Geological Survey Professional Paper 567. Government Printing Office, Washington, DC.
- Simpson, Coleen. 2006. Personal communication. Beluga, Alaska. Alaska Department of Fish and Game, Division of Subsistence Data Files, Anchorage.
- Stanek, Ronald T. 2002 Migratory bird subsistence harvest and use assessment, 2000.
- Southcentral Alaska. Prepared for the U.S. Fish and Wildlife Service, Office of Bird Management, Anchorage
- Stanek, Ronald T. 1987. Historical and contemporary trapping patterns in the western Susitna Basin. Alaska Department of Fish and Game, Division of Subsistence Technical Paper No. 134, Juneau.
- Stanek, Ronald T., James A. Fall, and Dan Foster. 1982. Subsistence shellfish use in three Cook Inlet villages, 1981: A preliminary report. Alaska Department of Fish and Game, Division of Subsistence Technical Paper No. 34, Juneau.
- Stanek, Ronald T., James A. Fall, and Davin L. Holen. 2006. Lake Clark National Park and Preserve West Cook Inlet ethnographic overview and assessment. Alaska Department of Fish and Game, Division of Subsistence, Juneau.
- Stanek, Ronald T. and Dan J. Foster. 1980. Tyonek king salmon subsistence fishery: 1980 activities report. Alaska Department of Fish and Game, Division of Subsistence Technical Paper No. 33, Juneau.
- Stickney, Alice A. 1980. Report on the survey conducted in Tyonek, 1980. Alaska Department of Fish and Game, Division of Subsistence Technical Paper No. 35, Juneau.
- United States Census Bureau. 2001. Profiles of general demographic characteristics, Alaska: 2000. U.S. Department of Commerce, Washington, DC.
- United States Congress. 1997. Protocol with Mexico amending the convention for protection of migratory birds and game mammals. 105<sup>th</sup> Congress, 1<sup>st</sup> Session. Treaty Doc. 105-26. U.S. Government Printing Office, Washington, DC.
- Wolfe, Robert J., James A. Fall, and Ronald T. Stanek. 2006. The subsistence harvest of harbor seals and sea lions by Alaska Natives in 2005. Alaska Department of Fish and Game, Division of Subsistence Technical Paper No. 319, Juneau.
- Wright, Louise. 2006. Personal communication. Anchorage, Alaska. Alaska Department of Fish and Game, Division of Subsistence Data Files, Anchorage.
- Znamenski, Andrei A. 2003. Through Orthodox eyes: Russian missionary narratives of travels to the Dena'ina and Ahtna, 1850–1930. University of Alaska Press, Fairbanks.

**APPENDIX A: 2005-2006 HARVEST SURVEY FORM**



TYONEK AND BELUGA COMPREHENSIVE SUBSISTENCE BASELINE UPDATE 2005-2006

COMMERCIAL FISHING - SALMON.

DID MEMBERS OF YOUR HOUSEHOLD PARTICIPATE IN COMMERCIAL SALMON FISHING BETWEEN AUGUST 1, 2005 AND JULY 31, 2006? YES \_\_\_ NO \_\_\_  
 IF YES: PLEASE COMPLETE THE FOLLOWING TABLE (UNITS SHOULD INDICATE INDIVIDUALS, IF POUNDS THEN EDIBLE WEIGHT):  
 IF NO: DID YOU INCIDENTALLY HARVEST SALMON WHILE COMMERCIAL FISHING OTHER SPECIES?

SPECIES	COMMERCIAL FISHED?		REMOVED FOR OWN USE #	GAVE AWAY		UNITS	ID #S OF FISHERS		NOTES:
	Y/N	INCIDENTAL*		TO CREW #	TO OTHERS #		PERMIT HOLDER	CREW	
CHINOOK SALMON 113000001						IND 1			
CHUM SALMON 111000001						IND 1			
SOCKEYE SALMON 115000001						IND 1			
PINK SALMON 114000001						IND 1			
COHO SALMON 112000001						IND 1			
UNKNOWN SALMON 119000001						IND 1			

\* Incidental harvest - Check only if household was not engaged in commercial salmon fishing for that specific resource.

NOTES:

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TYONEK AND BELUGA COMPREHENSIVE SUBSISTENCE BASELINE UPDATE 2005-2006

COMMERCIAL FISHING - NON-SALMON FISH

DID MEMBERS OF YOUR HOUSEHOLD PARTICIPATE IN COMMERCIAL FISHING (OTHER THAN SALMON) BETWEEN AUGUST 1, 2005 AND JULY 31, 2006?

Yes: \_\_\_\_\_; No: \_\_\_\_\_

IF YES: PLEASE COMPLETE THE FOLLOWING TABLE (POUNDS SHOULD INDICATE EDIBLE WEIGHT):

IF NO: DID YOU INCIDENTALLY HARVEST OTHER FISH WHILE COMMERCIAL FISHING FOR SALMON?

SPECIES	COMMERCIAL FISHED?		FOR OWN USE #	TO CREW #	TO OTHERS #	UNITS	ID #'S OF FISHERS		NOTES:
	Y/N	INCIDENTAL					PERMIT HOLDER	CREW	
HALIBUT 121800001						LBS 2			
FLounder 121400000						IND 1			
SPAWN ON KELP 120306001						GAL 4			
HERRING SAC ROE 120304001						GAL 4			
HERRING 120200001						IND 1			
LINSCOD 121606001						IND 1			
PACIFIC (GRAY) COD 121004001						IND 1			
SABLEFISH (BLACK COD) 122800001						IND 1			
UNKNOWN FLOUNDER 121498001						IND 1			
SOLE 123698001						IND 1			
BLACK ROCKFISH* 122602001						IND 1			
RED ROCKFISH** 122604001						IND 1			
UNKNOWN ROCKFISH 122698001						IND 1			

\* BLACK ROCKFISH = DARK DUSKY, BLACK, LIGHT DUSKY, SILVERGRAY, WIDOW, YELLOWTAIL, "SEA BASS" OR "BLACK BASS".

\*\* RED ROCKFISH = YELLOWEYE (RED SNAPPER), ROUGHEYE, PACIFIC OCEAN PERCH, DARK BLOTCHED, HARLEQUIN, NORTH, COPPER, QUILLBACK, ROSETHORN, REDSTRIPE, CANARY, SHORTTRAKER, BLACKQUILL, RED BANDED, TIGER, AND "IDIOTFISH" OR "SHORTSPINE THORNYHEAD".

COMMUNITY ID: \_\_\_\_\_ HH ID: \_\_\_\_\_ COMMERCIAL FISHING - NON-SALMON FINFISH (3B)



TYONEK AND BELUGA COMPREHENSIVE SUBSISTENCE BASELINE UPDATE 2005-2006

COMMERCIAL FISHING - MARINE INVERTEBRATES

DID MEMBERS OF YOUR HOUSEHOLD PARTICIPATE IN COMMERCIAL FISHING FOR MARINE INVERTEBRATES BETWEEN AUGUST 1, 2006 AND JULY 31, 2006?

Yes: \_\_\_\_\_; No: \_\_\_\_\_ IF YES: PLEASE COMPLETE THE FOLLOWING TABLE (POUNDS SHOULD BE EDIBLE WEIGHT):

IF NO: DID YOU INCIDENTALLY HARVEST MARINE INVERTEBRATES WHILE COMMERCIAL FISHING FOR OTHER SPECIES?

SPECIES	COMMERCIAL FISHED?		FOR OWN USE	TO CREW	TO OTHERS	UNITS	SHELLS ONLY?	ID #'S OF FISHERS		NOTES:
	Y/N	INCIDENTAL						#	#	
RAZOR CLAMS 600612001						GAL 4				
PACIFIC LITLLENECK CLAMS (STEAMERS) 600608001						GAL 4				
DUNGENESS CRAB 601004001						IND 1				
KING CRAB 601008881						IND 1				
TANNER CRAB 601012881						IND 1				
OCTOPUS 602200001						IND 1				
SHRIMP 603400001						LBS 2				
SCALLOPS 602680001						LBS 2				

NOTES:

COMMUNITY ID: \_\_\_\_\_ HH ID: \_\_\_\_\_ COMMERCIAL FISHING - MARINE INVERTEBRATES (3C)

TYONEK AND BELUGA COMPREHENSIVE SUBSISTENCE BASELINE UPDATE 2005-2006

NON-COMMERCIAL FISHING: SALMON.

DID MEMBERS OF YOUR HOUSEHOLD TRY TO HARVEST OR USE SALMON BETWEEN AUGUST 1, 2006 AND JULY 31, 2008? YES: \_\_\_\_\_ NO: \_\_\_\_\_  
 IF YES, PLEASE COMPLETE THE FOLLOWING TABLE (UNITS SHOULD INDICATE INDIVIDUALS UNLESS NOTED OTHERWISE. POUNDS SHOULD BE EDIBLE WEIGHT):

SPECIES	NUMBER HARVESTED BY:										GAVE AWAY	RECEIVED	UNITS	NOTES/LOCATIONS OFF MAP				
	USED?	TRIED TO HARVEST	SET			ROD & REEL	OTHER GEAR		Y/N	Y/N					Y/N			
			NET #	SEINE #	#		TYPE	#										
CHINOOK (KING) SALMON 113000000																		
SOCKEYE (RED) SALMON 116000000																		
CHUM (DOG) SALMON 111000000																		
PINK (HUMPY) SALMON 114000000																		
COHO (SILVER) SALMON 112000000																		
SPAWNING REDS 117050000																		
LANDLOCKED SALMON 116000000																		
UNKNOWN SALMON 118000000																		

\*'ROD & REEL' INCLUDES TROLLING IN OPEN WATER

Was your household's harvest and use of salmon typical of recent years? LESS \_\_\_\_\_ SAME \_\_\_\_\_ MORE \_\_\_\_\_

If different (less or more), how and why was it different?

COMMUNITY ID: \_\_\_\_\_ HH ID: \_\_\_\_\_

SALMON (4A)

TYONEK AND BELUGA COMPREHENSIVE SUBSISTENCE BASELINE UPDATE 2005-2006

NON-COMMERCIAL FISHING: NON-SALMON FINFISH.

DID MEMBERS OF YOUR HOUSEHOLD TRY TO HARVEST OR USE FISH OTHER THAN SALMON BETWEEN AUGUST 1, 2005 AND JULY 31, 2006?

Yes: \_\_\_\_\_; No: \_\_\_\_\_

IF YES, PLEASE COMPLETE THE FOLLOWING TABLE (UNITS SHOULD INDICATE INDIVIDUALS UNLESS NOTED OTHERWISE. POUNDS SHOULD BE EDIBLE WEIGHT):

SPECIES	USED?	TRIED TO	ROD &	DIP	HAND	SET	ICE	SEINE	OTHER	UNITS	RECEIVED	GAVE
	Y/N	HARVEST	REEL	NET	LINE	NET	FISHING	#	GEAR		Y/N	AWAY
		Y/N	#	#	#	#	#	#	TYPE	#	Y/N	Y/N
RAINBOW TROUT 126204000										IND 1		
DOLLY VARDEN 126006000										IND 1		
TROUT, UNKNOWN 126298000										IND 1		
STEELHEAD 126206000										IND 1		
GRAYLING 126200000										IND 1		
BURBOT 124800000										IND 1		
NORTHERN PIKE 126498000										IND 1		
ROUND WHITEFISH 126412000										IND 1		
HUMPBACK WHITEFISH 126408000										IND 1		
BROAD WHITEFISH 126404000										IND 1		
LEAST CISCO 126406000										IND 1		
SCULPIN (FRESHWATER) 123000000										IND 1		
BLACKFISH 124600000										IND 1		
LONGNOSE SUCKER 126000000										IND 1		
ARCTIC CHAR 126000000										IND 1		
STICKLEBACKS 123800000										GAL 4		

COMMUNITY ID: \_\_\_\_\_ HH ID: \_\_\_\_\_

NON-SALMON FINFISH (6A)

TYONEK AND BELUGA COMPREHENSIVE SUBSISTENCE BASELINE UPDATE 2005-2006

SPECIES	USED?	TRIED TO HARVEST	ROD & REEL	DIP NET	HAND LINE*	SET NET	ICE FISHING	SEINE	OTHER GEAR		RECEIVED	GAVE AWAY	NOTES
	Y/N	Y/N	#	#	#	#	#	#	TYPE	#	Y/N	Y/N	
Ocean Species													
HOOLIGAN 120404000													
HERRING 120200000													
HALIBUT 121800000													
ROCKFISH 122800000													
SCULPIN (SALTWATER) 123000000													
LINGCOD 121808000													
PACIFIC (GRAY) COD 121004000													
PACIFIC TOMCOD 121008000													
COD, UNK/OWN 121098000													
FLOUNDER 121400000													
OTHER SMELT 120100000													
SPAWN ON KELP 120308000													

Was your household's harvest and use of non-salmon fish typical of recent years? LESS \_\_\_\_\_ SAME \_\_\_\_\_ MORE \_\_\_\_\_  
 If different (less or more), how and why was it different? \_\_\_\_\_

\* Hand line used in open water.

COMMUNITY ID: \_\_\_\_\_ HH ID: \_\_\_\_\_

NON-SALMON FINFISH (6A)

TYONEK AND BELUGA COMPREHENSIVE SUBSISTENCE BASELINE UPDATE 2005-2006

NON-COMMERCIAL FISHING: MARINE INVERTEBRATES [SHELLFISH].

DID MEMBERS OF YOUR HOUSEHOLD TRY TO HARVEST OR USE MARINE INVERTEBRATES  
 BETWEEN AUGUST 1, 2006 AND JULY 31, 2006? YES: \_\_\_\_\_ NO: \_\_\_\_\_

IF YES, PLEASE COMPLETE THE FOLLOWING TABLE (UNITS SHOULD INDICATE INDIVIDUALS UNLESS NOTED OTHERWISE. POUNDS SHOULD BE EDIBLE WEIGHT):

SPECIES	USED?		TRIED TO HARVEST		HARVESTED		RECEIVED		GAVE AWAY		NOTES/LOCATION OFF MAP
	Y/N	Y/N	Y/N	Y/N	#	UNITS	Y/N	Y/N	Y/N	Y/N	
RAZOR CLAMS 500812002						GAL 4					
COCKLES 500898002						GAL 4					
BUTTER CLAMS 500802002						GAL 4					
FRESHWATER CLAMS 500804002						GAL 4					
LITTLENECK CLAMS (STEAMERS) 500808002						GAL 4					
PINKNECK (SURF) CLAMS 500810002						GAL 4					
HORSE CLAMS (GAPER) 500806002						GAL 4					
MUSSELS 502098002						GAL 4					
UNKNOWN CLAMS 500898002						GAL 4					
SCALLOPS 502898002						LBS 2					
DUNGENESS CRAB 501004002						IND 1					
KING CRAB 501008992						IND 1					
TANNER CRAB, BAIRD (SNOW CRAB) 501012022						IND 1					
UNKNOWN CRABS 501098002						IND 1					

Was your household's harvest and use of marine invertebrates typical of recent years? LESS \_\_\_\_\_ SAME \_\_\_\_\_ MORE \_\_\_\_\_

If different (less or more), how and why was it different?

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TYONEK AND BELUGA COMPREHENSIVE SUBSISTENCE BASELINE UPDATE 2005-2006

LARGE LAND MAMMALS.  
 DID MEMBERS OF YOUR HOUSEHOLD TRY TO HARVEST OR USE LARGE LAND MAMMALS BETWEEN AUGUST 1, 2005 AND JULY 31, 2006? YES: \_\_\_\_\_ NO: \_\_\_\_\_  
 IF YES, PLEASE COMPLETE THE FOLLOWING TABLE (UNITS SHOULD BE INDIVIDUALS):

SPECIES	USED? Y/N	TRIED TO HARVEST Y/N	HARVESTED					RECEIVED Y/N	GAVE AWAY Y/N	NOTES/LOCATION OFF MAP
			TOTAL #	FOR FOOD (MEAT/FAT) #	FOR FAT ONLY #	HIDE ONLY #	UNITS			
MOOSE 211800000										
CARIBOU 211000000										
BLACK BEAR 210600000										
BROWN BEAR 210600000										
DALL SHEEP 212200000										

Was your household's harvest and use of large land mammals typical of recent years? LESS \_\_\_\_\_ SAME \_\_\_\_\_ MORE \_\_\_\_\_

If different (less or more), how and why was it different?

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COMMUNITY ID: \_\_\_\_\_ HH ID: \_\_\_\_\_ LARGE LAND MAMMALS (10A)

TYONEK AND BELUGA COMPREHENSIVE SUBSISTENCE BASELINE UPDATE 2005-2006

MARINE MAMMALS.

DID MEMBERS OF YOUR HOUSEHOLD TRY TO HARVEST OR USE MARINE MAMMALS BETWEEN AUGUST 1, 2005 AND JULY 31, 2006? YES: \_\_\_\_\_ NO: \_\_\_\_\_  
 IF YES, PLEASE COMPLETE THE FOLLOWING TABLE (UNITS ARE INDIVIDUALS. POUNDS SHOULD BE EDIBLE WEIGHT.):

SPECIES	USED?		TRIED TO HARVEST?		SALVAGE?*	NUMBER HARVESTED			TOTAL #	UNITS	RECEIVED		GAVE AWAY	NOTES/LOCATIONS OFF MAP
	Y/N	Y/N	Y/N	Y/N		FOR FOOD #	FOR HIDE ONLY #	Y/N			Y/N	Y/N		
BELUGA WHALE										IND				
301602000										1				
HARBOR SEAL										IND				
300806040										1				
FRESHWATER SEAL										IND				
300808000										1				
STELLER SEA LION										IND				
301200000										1				
SEA OTTER										IND				
301000000										1				
										IND				
										1				

\* Use includes meat and/or oil, and/or fur.

\*\* For animal found dead or incidentally caught in a subsistence net.

Was your household's harvest and use of marine mammals typical of recent years?  
 If different (less or more), how and why was it different?

LESS \_\_\_\_\_ SAME \_\_\_\_\_ MORE \_\_\_\_\_



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COMMUNITY ID: \_\_\_\_\_ HH ID: \_\_\_\_\_

MARINE MAMMALS (12A)

TYONEK AND BELUGA COMPREHENSIVE SUBSISTENCE BASELINE UPDATE 2005-2006

SMALL LAND MAMMALS/FURBEARERS.

DID MEMBERS OF YOUR HOUSEHOLD TRY TO HARVEST OR USE SMALL LAND MAMMALS/FURBEARERS BETWEEN AUGUST 1, 2005 AND JULY 31, 2006? YES:\_\_\_ NO:\_\_\_

IF YES, PLEASE COMPLETE THE FOLLOWING TABLE (UNITS SHOULD INDICATE INDIVIDUALS).

SPECIES	USED?		TRIED TO HARVEST		NUMBER HARVESTED				RECEIVED		GAVE AWAY		NUMBER SOLD	AVERAGE PRICE	NOTES/LOCATION OFF MAP
	Y/N		Y/N		FOOD #	FUR ONLY #	FOOD & FUR #	TOTAL #	UNITS	Y/N	Y/N				
RED FOX 220804000									IND 1						
BEAVER 220200000									IND 1						
COYOTE 220400000									IND 1						
SNOWSHOE HARE 221004000									IND 1						
LAND OTTER 221200000									IND 1						
LYNX 221800000									IND 1						
MARMOT 221800000									IND 1						
MARTEN 222000000									IND 1						
MINK 222200000									IND 1						
MUSKRAT 222400000									IND 1						
PORSUPINE 222600000									IND 1						
WEASEL 223000000									IND 1						
WOLF 223200000									IND 1						
WOLVERINE 223400000									IND 1						
TREE SQUIRREL (RED) 222804000									IND 1						
PARKA SQUIRREL (GROUND) 222802000									IND 1						

Was your household's harvest and use of small land mammals typical of recent years? LESS SAME MORE

If different (less or more), how and why was it different?

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TYONEK AND BELUGA COMPREHENSIVE SUBSISTENCE BASELINE UPDATE 2005-2006

BIRDS AND EGGS.

DID MEMBERS OF YOUR HOUSEHOLD TRY TO HARVEST OR USE BIRDS OR EGGS BETWEEN AUGUST 1, 2006 AND JULY 31, 2008? YES: \_\_\_\_\_ NO: \_\_\_\_\_  
 IF YES, PLEASE COMPLETE THE FOLLOWING TABLE (UNITS SHOULD BE INDIVIDUALS).

SPECIES	USED? Y/N	TRIED TO HARVEST Y/N	NUMBER HARVESTED BY SEASON (MONTHS)												RECEIVED Y/N	GAVE AWAY Y/N		
			SPRING			SUMMER			FALL			WINTER						
			A	M	J	J	A	J	S	O	N	D	J	F	M	UNIT		
GOLDENEYE (COPPERHEAD) 410210980																IND		
BUFFLEHEAD (BUTTERBALL) 410202000																IND		
MALLARD 410214000																IND		
PINTAIL 410220000																IND		
AMERICAN WIGEON 410236000																IND		
SHOVELER 410230000																IND		
GREEN WINGED TEAL 410232000																IND		
SCAUP 410228000																IND		
CANVASBACK 410204000																IND		
COMMON MERGANSER 410218000																IND		
RED-BREASTED MERGANSER 410218000																IND		
SCOTER 410228000																IND		
GADWELL 410208000																IND		
DUCKS, UNKNOWN 410299000																IND		

COMMUNITY ID: \_\_\_\_\_ HH ID: \_\_\_\_\_

BIRDS (15A)



TYONEK AND BELUGA COMPREHENSIVE SUBSISTENCE BASELINE UPDATE 2005-2006

SPECIES	USED? Y/N	TRIED TO HARVEST Y/N	NUMBER HARVESTED BY SEASON (MONTHS)												RECEIVED Y/N	GAVE AWAY Y/N	
			SPRING			SUMMER			FALL			WINTER					
			A	M	J	J	A	S	O	N	D	J	F	M	UNIT		
DUCK EGGS 430200000															IND 1		
GULL EGGS 431212000															IND 1		
TERN EGGS 431226000																	
UNKNOWN EGGS 439900000																	

Was your household's harvest and use of birds and eggs typical of recent years? LESS SAME MORE

If different (less or more), how and why was it different?

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COMMUNITY ID: \_\_\_\_\_ HH ID: \_\_\_\_\_ BIRDS (15A)

TYONEK AND BELUGA COMPREHENSIVE SUBSISTENCE BASELINE UPDATE 2005-2006

WILD PLANTS.

DID MEMBERS OF YOUR HOUSEHOLD TRY TO HARVEST OR USE WILD PLANTS OR BERRIES (INCLUDING FIREWOOD) BETWEEN AUGUST 1, 2005 AND JULY 31, 2006? YES: \_\_\_ NO: \_\_\_

IF YES, PLEASE COMPLETE THE FOLLOWING TABLE (POUNDS SHOULD INDICATE EDIBLE WEIGHT).

SPECIES	USED?	TRIED TO HARVEST	AMOUNT HARVESTED	RECEIVED	GAVE AWAY	WHAT KIND WERE USED (EITHER HARVESTED OR RECEIVED) FOR BOTH BERRIES AND PLANTS IN 2005
	Y/N					
BERRIES 601000000			UNIT GAL 4			
PLANTS/GREENS/MUSHROOMS 602000000			UNIT GAL 4			
WOOD 604000000			CORDS 6			

Was your household's harvest and use of wild plants typical of recent years?  
If different (less or more), how and why was it different?

LESS \_\_\_ SAME \_\_\_ MORE \_\_\_



COMMUNITY ID: \_\_\_ HH ID: \_\_\_

PLANTS (17A)











**APPENDIX B. 2005-2006 BASELINE SUBSISTENCE SURVEY  
MAP RULES**

**Appendix B.**–2005-2006 Baseline Subsistence Survey Map Rules.

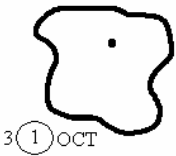
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Please be consistent when labeling maps. Label the feature (point, line, or polygon) with the ADF&G map resource code (e.g., moose = 4), harvest amount (circled), and the month(s). Record the harvest amount in the appropriate unit (see survey form), but do not write the units on the map. Indicate the month using the first three letters, e.g., OCT or NOV-MAR.

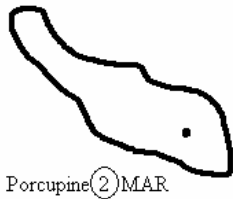
Use the assigned pen colors. Do NOT use pencil. It is very hard to see.



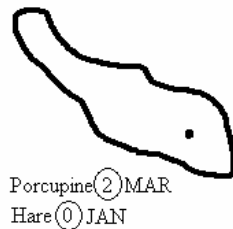
This polygon represents zero caribou (ADF&G map resource code for caribou = 3) in October. In other words, the respondent went caribou hunting, but did not get any.



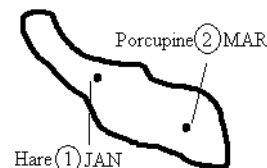
This example shows the same area where the respondent hunted caribou in October, except this time they got one. The point indicates the harvest location. You can write the information next to the point if there is no additional information for that polygon. You do not need to label both the point and the polygon in this example.



For small land mammals, replace the ADF&G map resource code with the species name. Here, the respondent harvested two porcupines in March. Since there is only one point within the polygon, both porcupines were harvested there.



If a feature is used for more than one resource, list each resource on its own line. Do the same for different months (if not a range). In this example, the respondent hunted porcupine in March and got two. During January, they looked for hare in this area, but did not harvest any.



If there are multiple harvest locations within a single polygon, write the amount harvested next to each point. If the months differ by harvest location, also note the months next to each point. Like the previous example, the respondent got two porcupines in March, but they also harvested a hare in January.

Indicate trap lines on map by drawing a line. When digitized, these will be buffered into a polygon.

Please indicate fish harvests using points. ADF&G uses points, not polygons, for fishing areas. Be sure to record the species, harvest amount, and month. Use the ADF&G map resource code.

- A (250) JUL This example shows a point where the respondent harvested 250 sockeye salmon (ADF&G map resource code for sockeye salmon = A) in July.
  
- 1 (10) JAN-FEB At this point, the respondent harvested 10 Dolly Varden (ADF&G map resource code for Dolly Varden = 1) and 5 lake trout (ADF&G map resource code for lake trout = 3) during January and February.  
3 (5) JAN-FEB



**APPENDIX C. CONVERSION FACTORS FOR TYONEK AND  
BELUGA, 2006**

**Appendix C.**–Conversion Factors for Tyonek and Beluga, 2006.

Resource	Reported Units	Conversion to lbs
Chum Salmon	Ind	5.25
Coho Salmon	Ind	4.71
Chinook Salmon	Ind	11.97
Pink Salmon	Ind	2.52
Sockeye Salmon	Ind	4.68
Landlocked Salmon	Ind	1.50
Spawning Sockeye	Ind	2.18
Herring	Gal	6.00
Herring Sac Roe	Gal	7.00
Herring Spawn on Kelp	Gal	7.00
Smelt	Gal	3.25
Eulachon (hooligan, candlefish)	Gal	3.25
Pacific Cod (gray)	Ind	3.20
Walleye Pollock (whiting)	Ind	1.40
Unknown Cod	Ind	3.20
Flounder	Ind	3.00
Unknown Flounder	Ind	3.00
Lingcod	Ind	4.00
Unknown Greenling	Ind	1.00
Halibut	Lbs	1.00
Black Rockfish	Ind	1.50
Red Rockfish	Ind	4.00
Unknown Rockfish	Ind	3.07
Sablefish (black cod)	Ind	3.10
Unknown Shark	Ind	9.00
Unknown Sole	Ind	1.00
Wolffish	Ind	0.50
Blackfish	Ind	0.07
Burbot	Ind	2.50
Char	Ind	1.40
Dolly Varden	Ind	1.40
Dolly Varden-saltwater	Ind	1.40
Grayling	Ind	0.70
Pike	Ind	3.00
Sucker	Ind	0.70
Rainbow Trout	Ind	1.40
Steelhead	Ind	1.40
Unknown Trout	Ind	1.40
Broad Whitefish	Ind	4.00
Least Cisco	Ind	0.40
Humpback Whitefish	Ind	1.75
Round Whitefish	Ind	1.00
Black Bear	Ind	58.00
Brown Bear	Ind	150.00
Caribou	Ind	150.00
Moose	Ind	540.00
Muskox	Ind	275.00
Dall Sheep	Ind	104.00
Beaver	Ind	8.75
Snowshoe Hare	Ind	2.00
Lynx	Ind	4.00

-continued-

Appendix C.–Page 2 of 2.

Resource	Reported Units	Conversion to lbs
Marmot	Ind	8.00
Muskrat	Ind	0.50
Porcupine	Ind	8.00
Parka Squirrel (ground)	Ind	0.50
Tree Squirrel	Ind	0.50
Harbor Seal	Ind	56.00
Steller Sea Lion	Ind	200.00
Beluga	Ind	700.00
Bufflehead	Ind	0.40
Canvasback	Ind	1.10
Unknown Goldeneye	Ind	0.80
Mallard	Ind	1.00
Northern Pintail	Ind	0.80
Scaup	Ind	0.90
Northern Shoveler	Ind	0.60
Green Winged Teal	Ind	0.30
American Wigeon	Ind	0.70
Unknown Ducks	Ind	0.83
Lesser Canada Geese	Ind	1.20
Unknown Canada Geese	Ind	2.12
Snow Geese	Ind	2.30
White-fronted Geese	Ind	2.40
Unknown Geese	Ind	2.40
Tundra Swan (whistling)	Ind	6.00
Sandhill Crane	Ind	8.40
Unknown Loon	Ind	3.00
Spruce Grouse	Ind	0.70
Ruffed Grouse	Ind	0.70
Unknown Grouse	Ind	0.70
Ptarmigan	Ind	0.70
Gull Eggs	Ind	0.30
Tern Eggs	Ind	0.05
Butter Clams	Gal	3.00
Freshwater Clams	Gal	3.00
Horse Clams (Gaper)	Gal	4.45
Pacific Littleneck Clams (Steamers)	Gal	3.00
Pinkneck Clams	Gal	3.00
Razor Clams	Gal	3.00
Unknown Clams	Gal	3.00
Unknown Cockles	Gal	3.00
Dungeness Crab	Ind	0.70
Tanner Crab, Bairdi	Ind	1.60
Unknown Tanner Crab	Ind	1.60
Unknown Crab	Ind	1.57
Unknown Mussels	Gal	1.50
Octopus	Ind	4.00
Unknown Scallops	Gal	1.00
Shrimp	Gal	1.00
Berries	Gal	4.00
Plants/Greens/Mushrooms	Gal	4.00

Source: ADF&G 2007



## **TABLES**

**Table 1.**—Project staff, Tyonek and Beluga study, 2005-2006.

Field Research Lead	Ron Stanek, David Holen, Alaska Department of Fish and Game (ADF&G)
Field Research Staff	Stephanie Shivley, Stephen R. Braund and Associates (SRB&A)
ADF&G Program Manager	James Fall, ADF&G
SRB&A Project Lead	Stephen Braund, SRB&A
Data Management Leads	Brian Davis & David Koster, ADF&G
Programmers	Jeannie Heltzel, ADF&G Crystal Brien (Wassillie), ADF&G
Data Entry	Heather Bishop, ADF&G
Cartography	Iris A. Prophet, SRB&A Paul B. Lawrence, SRB&A Raena K. Schraer, SRB&A Davin Holen, ADF&G

**Table 2.**—Sample achievement, Tyonek and Beluga study, 2005-2006.

	Beluga	Tyonek
Number of Dwelling Units	15	68
Interview Goal	15	68
Households Interviewed	14	47
Households Failed to Contact	0	10
Households Declined to be Interviewed	1	9
Moved/Non-Resident Households *	0	2
Total Households Attempted to Interview	15	66
Final Estimate of Permanent Households	15	66
Percentage Interviewed	93%	71%
Refusal Rate	7%	16%
Interview Weighting Factor	1.07	1.40
Sampled Population	37	144
Estimated Population	40	202

\* Non-resident households had not lived in the community for at least 3 months during the study year and were not included in the interview goal.

**Table 3.**—Average length of interviews, Tyonek and Beluga study, 2005-2006.

Community	Number of Surveys	Length of Interviews (hours)		
		Mean	Maximum	Minimum
Beluga	14	1.38	3.00	0.58
Tyonek	47	0.58	1.50	0.15
Total	61	0.98	3.00	0.15

**Table 4.**—Demographic characteristics of households, Tyonek and Beluga, 2005-2006.

Characteristics	Beluga	Tyonek
Sampled Households	14	47
Number of Households in the	15	66
Percentage of Households Sampled	93%	71%
Household Size		
Mean	3	3
Minimum	1	1
Maximum	6	9
Sample	37	144
Estimated Community Population	40	202
Age (years)		
Mean	47	30
Minimum	10	0*
Maximum	78	84
Median	54	30
Length of Residency - Population		
Mean	20	23
Minimum	3	0*
Maximum	53	81
Length of Residency - Household		
Mean	22	34
Minimum	3	1
Maximum	53	81
Males		
Number	20	98
Percentage	51%	49%
Females		
Number	19	104
Percentage	49%	51%
Alaska Native		
Households (Either Head)		
Number	1	65
Percentage	7%	98%
Estimated Population		
Number	3	192
Percentage	8%	95%

\* Minimum household age and minimum length of residency of 0 indicates newborn in 2005.

Source: ADF&G, Division of Subsistence, Household Survey, 2006.

**Table 5.**—Population profile, Tyonek, August 2006.

AGE	MALE		FEMALE		TOTAL	
	NUMBER	PERCENT	NUMBER	PERCENT	NUMBER	PERCENT
0 - 4	8	9%	6	5%	14	7%
5-9	10	10%	15	15%	25	13%
10-14	10	10%	14	14%	24	12%
15 - 19	8	9%	7	7%	15	8%
20 - 24	3	3%	4	4%	7	3%
25 - 29	6	6%	10	9%	15	8%
30 - 34	3	3%	7	7%	10	5%
35 - 39	7	7%	6	5%	13	6%
40 - 44	8	9%	7	7%	15	8%
45 - 49	11	11%	1	1%	13	6%
50 - 54	8	9%	10	9%	18	9%
55 - 59	7	7%	1	1%	8	4%
60 - 64	1	1%	3	3%	4	2%
65 - 69	1	1%	1	1%	3	1%
70 - 74	3	3%	0	0%	3	1%
75 - 79	1	1%	0	0%	1	1%
80 - 84	0	0%	3	3%	3	1%
85 - 89	0	0%	0	0%	0	0%
90 - 94	0	0%	0	0%	0	0%
95 - 99	0	0%	0	0%	0	0%
100 - 104	0	0%	0	0%	0	0%
Missing	1	1%	8	8%	10	5%
TOTAL	98	100%	104	100%	202	100%

Source: ADF&G, Division of Subsistence, Household Survey, 2006.

**Table 6.**—Place of birth of residents, Tyonek and Beluga study, 2005-2006.

Birthplace	Percentage of Household Heads	
	Beluga	Tyonek
Unknown	0%	4%
Anchorage	0%	12%
Beluga	8%	0%
Nome	0%	1%
Palmer	4%	0%
Tyonek	4%	73%
Other United States	73%	10%
Outside the United States	12%	0%

Note: "birthplace" means the residence of the parents of the individual when the individual was born.

Source: ADF&G, Division of Subsistence Household Survey, 2006.

**Table 7.**—Employment characteristics, Tyonek and Beluga study, 2005-2006.

Characteristics		Beluga	Tyonek
All Adults			
	Number	36	135
	Mean Weeks Employed	21	21
Employed Adults			
	Number	19	74
	Percentage	53%	55%
Jobs			
	Number	33	93
	Mean	2	2
	Minimum	1	1
	Maximum	4	3
Months Employed			
	Mean	9	9
	Minimum	2	0
	Maximum	12	12
	Percent Employed Year-Round	56%	51%
	Mean Weeks Employed	39	38
HOUSEHOLDS			
	Number	15	66
Employed			
	Number	11	52
	Percentage	71%	79%
Jobs per Employed Household			
	Mean	3	2
	Minimum	1	1
	Maximum	8	4
Employed Adults			
	Minimum	1	1
	Maximum	4	3
	Mean	1	1
	Employed Households	1	1
	Total Households	2	1
	Mean Person Weeks of Employment	51	43

Source: ADF&G, Division of Subsistence, Household Survey, 2006.

**Table 8.**—Location of jobs, Tyonek and Beluga study, 2005-2006.

Location of Job	Beluga (Estimated 33 jobs)		Tyonek (Estimated 93 jobs)	
	Number	Percentage	Number	Percentage
Beluga	21	65%	1	2%
Tyonek	0	0%	88	95%
Study Area Subtotals	21	65%	90	97%
Anchorage	11	32%	0	0%
Other Kenai-Cook Inlet Census Area	0	0%	1	2%
Prudhoe Bay	0	0%	1	2%
Foreign	1	3%	0	0%
Totals:	33	100%	93	100%

**Table 9.**—Employment by industry, Tyonek, 2005-2006.

	Jobs	Households*	Individuals*	Percentage of Employment Income
Estimated Total Number*	93	52	74	
<b>Federal Government</b>	3%	4%	4%	3%
Executive, Administrative and Managerial	2%	2%	2%	3%
Natural Scientists and Mathematicians	0%	0%	0%	0%
Social Scientists, Social Workers, Religious Workers and Lawyers	0%	0%	0%	0%
Technologists and Technicians, Except Health	0%	0%	0%	0%
Administrative Support Occupations, Including Clerical	2%	2%	2%	0%
Service Occupations	0%	0%	0%	0%
Construction and Extractive Occupations	0%	0%	0%	0%
Transportation and Material Moving Occupations	0%	0%	0%	0%
Handlers, Equipment Cleaners, Helpers and Laborers	0%	0%	0%	0%
<b>State Government</b>	0%	0%	0%	0%
Executive, Administrative and Managerial	0%	0%	0%	0%
Teachers, Librarians, and Counselors	0%	0%	0%	0%
Administrative Support Occupations, Including Clerical	0%	0%	0%	0%
Service Occupations	0%	0%	0%	0%
Mechanics and Repairers	0%	0%	0%	0%
Construction and Extractive Occupations	0%	0%	0%	0%
Transportation and Material Moving Occupations	0%	0%	0%	0%
Handlers, Equipment Cleaners, Helpers and Laborers	0%	0%	0%	0%
<b>Local Government</b>	53%	74%	66%	42%
Executive, Administrative and Managerial	8%	11%	9%	9%
Construction and Extractive Occupations	0%	0%	0%	0%
Social Scientists, Social Workers, Religious Workers and Lawyers	0%	0%	0	0%
Teachers, Librarians, and Counselors	2%	2%	2%	2%
Health Diagnosing and Treating Practitioners	2%	2%	2%	3%
Registered Nurses, Pharmacists, Dietitians, Therapists and PAs	0%	0%	0%	0%
Health Technologists and Technicians	6%	9%	8%	0%
Technologists and Technicians, Except Health	0%	0%	0%	0%
Marketing and Sales Occupations	0%	0%	0%	0%
Administrative Support Occupations, Including Clerical	11%	15%	13%	10%
Service Occupations	3%	4%	4%	2%
Agricultural, Forestry and Fishing Occupations	2%	2%	2%	0%
Mechanics and Repairers	0%	0%	0%	0%
Construction and Extractive Occupations	9%	13%	11%	15%
Precision Production Occupations	2%	2%	2%	0%
Production Working Occupations	0%	0%	0%	0%
Transportation and Material Moving Occupations	0%	0%	0%	0%
Handlers, Equipment Cleaners, Helpers and Laborers	11%	15%	13%	2%
<b>Agriculture, Forestry &amp; Fishing</b>	14%	17%	17%	4%
Service Occupations	0%	0%	0%	0%
Agricultural, Forestry and Fishing Occupations	14%	17%	17%	4%
Precision Production Occupations	0%	0%	0%	0%
Handlers, Equipment Cleaners, Helpers and Laborers	0%	0%	0%	0%
<b>Mining</b>	9%	11%	9%	26%
Service Occupations	0%	0%	0%	0%
Construction and Extractive Occupations	8%	9%	8%	21%
Precision Production Occupations	0%	0%	0%	0%
Handlers, Equipment Cleaners, Helpers and Laborers	2%	2%	2%	5%

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**Table 9.**—Page 2 of 2.

	Jobs	Households*	Individuals*	Percentage of Employment Income
Construction	6%	9%	8%	12%
Executive, Administrative and Managerial	0%	0%	0%	0%
Service Occupations	0%	0%	0%	0%
Mechanics and Repairers	2%	2%	2%	7%
Construction and Extractive Occupations	2%	2%	2%	4%
Transportation and Material Moving Occupations	0%	0%	0%	0%
Handlers, Equipment Cleaners, Helpers and Laborers	3%	4%	4%	2%
Manufacturing	0%	0%	0%	0%
Executive, Administrative and Managerial	0%	0%	0%	0%
Precision Production Occupations	0%	0%	0%	0%
Transportation, Communication & Utilities	6%	9%	8%	7%
Executive, Administrative and Managerial	0%	0%	0%	0%
Technologists and Technicians, Except Health	0%	0%	0%	0%
Administrative Support Occupations, Including Clerical	0%	0%	0%	0%
Service Occupations	0%	0%	0%	0%
Mechanics and Repairers	0%	0%	0%	0%
Construction and Extractive Occupations	2%	2%	2%	4%
Transportation and Material Moving Occupations	0%	0%	0%	0%
Handlers, Equipment Cleaners, Helpers and Laborers	5%	6%	6%	3%
Wholesale Trade	0%	0%	0%	0%
Mechanics and Repairers	0%	0%	0%	0%
Retail Trade	3%	4%	4%	4%
Executive, Administrative and Managerial	2%	2%	2%	2%
Marketing and Sales Occupations	0%	0%	0%	0%
Service Occupations	2%	2%	2%	2%
Handlers, Equipment Cleaners, Helpers and Laborers	0%	0%	0%	0%
Services	6%	9%	8%	3%
Executive, Administrative and Managerial	0%	0%	0%	0%
Teachers, Librarians, and Counselors	2%	2%	2%	2%
Natural Scientists and Mathematicians	0%	0%	0%	0%
Writers, Artists, Entertainers, and Athletes	0%	0%	0%	0%
Social Scientists, Social Workers, Religious Workers and Lawyers	0%	0%	0%	0%
Health Diagnosing and Treating Practitioners	0%	0%	0%	0%
Health Technologists and Technicians	0%	0%	0%	0%
Technologists and Technicians, Except Health	0%	0%	0%	0%
Administrative Support Occupations, Including Clerical	0%	0%	0%	0%
Service Occupations	5%	6%	6%	1%
Agricultural, Forestry and Fishing Occupations	0%	0%	0%	0%
Production Working Occupations	0%	0%	0%	0%
Mechanics and Repairers	0%	0%	0%	0%
Handlers, Equipment Cleaners, Helpers and Laborers	0%	0%	0%	0%
Transportation and Material Moving Occupations	0%	0%	0%	0%
Miscellaneous Occupations	0%	0%	0%	0%

\* Estimated number of households and individuals only include adults who were employed during the study period.

Source: ADF&G, Division of Subsistence, Household Survey, 2006.

**Table 10.**—Comparison of income from sources other than employment, Tyonek and Beluga study, 2005-2006.

Income Type	Beluga	Tyonek
AFDC (Aid to Families with Dependent Children)	\$0	\$1,800
Pension / Retirement	\$105,000	\$6,000
Social Security	\$103,000	\$22,763
Energy Assistance	\$0	\$5,849
Food Stamps	\$0	\$5,892
Unemployment	\$0	\$27,834
Native Corp. Dividend	\$11,000	\$166,744
Dividend / Interest	\$0	\$120
Alaska Permanent Fund	\$27,909	\$111,203
Total income from other sources	\$246,909	\$348,205
Mean household income from other sources	\$17,636	\$7,409
Per capita income from other sources	\$6,673	\$2,418
Income from employment:	\$244,588	\$1,125,349
Mean household income from employment	\$17,471	\$23,944
Per capita income from employment	\$6,610	\$7,815
Total community Income	\$491,497	\$1,473,554
Total mean household income	\$35,107	\$31,352
Total per capita income	\$13,284	\$10,233

Source: ADF&G, Division of Subsistence, Household Surveys, 2006.

**Table 11.**—Estimated annual cost of purchasing food, Tyonek and Beluga study, 2005-2006.

	Mean Household Cost of Annual Food Purchase	Cost of Food per Capita	Percentage of Annual Cash Income Spent on Food
Beluga	\$6,138	\$2,323	17%
Tyonek	\$6,764	\$2,141	20%

**Table 12.**–Resource harvest and use characteristics, Tyonek and Beluga study, 2005-2006.

	Beluga	Tyonek
Mean Number of Resources Used Per Household	15.3	9.0
Minimum	3.0	0.0
Maximum	30.0	26.0
95 % Confidence Limit (+/-)	8.7%	10.2%
Median	12.0	8.0
Mean Number of Resources Attempted To Harvest Per Household	14.0	7.0
Minimum	2.0	0.0
Maximum	33.0	24.0
95 % Confidence Limit (+/-)	11.1%	11.8%
Median	11.0	6.0
Mean Number of Resources Harvested Per Household	11.9	6.1
Minimum	2.0	0.0
Maximum	28.0	24.0
95 % Confidence Limit (+/-)	11.2%	12.4%
Median	10.5	5.5
Mean Number of Resources Received Per Household	5.0	4.0
Minimum	1.0	0.0
Maximum	11.0	13.0
95 % Confidence Limit (+/-)	10.3%	12.2%
Median	4.0	3.0
Mean Number of Resources Given Away Per Household	5.2	4.5
Minimum	0.0	0.0
Maximum	11.0	17.0
95 % Confidence Limit (+/-)	11.8%	16.1%
Median	5.0	3.0
Mean Household Harvest, Pounds	539	664
Minimum	4	0
Maximum	1,583	7,033
Total Pounds Harvested	8,086	43,829
Community Per Capita Harvest, Pounds	204	217
Percentage Using Any Resource	100%	96%
Percentage Attempting To Harvest Any Resource	100%	94%
Percentage Harvesting Any Resource	100%	94%
Percentage Receiving Any Resource	100%	91%
Percentage Giving Away Any Resource	86%	83%
Number of Households In Sample	14	47
Number of Resources Available	128	127

Source: ADF&amp;G, Division of Subsistence, Household Survey, 2006.

**Table 13.**—Participation in the harvest and processing of wild resources, Tyonek and Beluga study, 2005-2006.

			Beluga	Tyonek
Total Number of People			40	202
BIRDS / GAME	Hunt	Number	27	80
		Percentage	68%	40%
		Missing	0	0
		Missing %	0%	0%
	Process	Number	32	87
		Percentage	81%	43%
		Missing	0	8.4
		Missing %	0%	4%
FISH	Fish	Number	35	118
		Percentage	89%	58%
		Missing	0	0
		Missing %	0%	0%
	Process	Number	36	119
		Percentage	92%	59%
		Missing	0	8
		Missing %	0%	4%
FURBEARERS	Hunt or Trap	Number	13	37
		Percentage	32%	18%
		Missing	0	8
		Missing %	0%	4%
	Process	Number	12	28
		Percentage	30%	14%
		Missing	0	8
		Missing %	0%	4%
PLANTS	Gather	Number	30	129
		Percentage	76%	64%
		Missing	0	8
		Missing %	0%	4%
	Process	Number	31	126
		Percentage	78%	62%
		Missing	0	8
		Missing %	0%	4%
ANY RESOURCE	Attempt	Number	38	154
		Percent	95%	76%
	Process	Number	36	157
		Percent	92%	78%

Source: ADF&G, Division of Subsistence, Household Survey, 2006.

**Table 14.**—Households' estimates of the percentage of meat, fish, and birds they used from wild resources, Tyonek and Beluga study, 2005-2006.

Percentage	Beluga				Tyonek			
	% of Households	Lbs/Person	Average # of Resources Used Per HH		% of Households	Lbs/Person	Average # of Resources Used Per HH	
			HH	Average Length of Residency (years)			HH	Average Length of Residency (years)
None (0%)	0%				4%	9	4	44
1% - 25%	36%	17	8	20	4%	0	1	29
26% - 50%	14%	17	13	23	23%	12	5	15
51% - 75%	7%	30	12	42	26%	45	9	24
76% - 99%	21%	72	24	15	26%	80	13	18
All (100%)	21%	67	22	18	11%	67	12	45
Missing	0%				4%	5	14	54

Source: ADF&G, Division of Subsistence Household Surveys, 2006.

**Table 15.**—Comparison of household's harvests and uses in the 2005-2006 study year with other recent years, Tyonek.

Resource	Estimated Households		No Response		Valid Responses		Less		Same		More	
	number	percentage	number	percentage	number	percentage	number	percentage	number	percentage	number	percentage
Salmon	66	1	2%	65	98%	24	37%	34	52%	7	11%	
Non-Salmon Finfish	66	3	4%	63	96%	10	16%	46	73%	7	11%	
Marine Invertebrates	66	1	2%	65	98%	25	39%	37	57%	3	4%	
Large Land Mammals	66	1	2%	65	98%	24	37%	38	59%	3	4%	
Furbearers	66	1	2%	65	98%	14	22%	48	74%	3	4%	
Marine Mammals	66	1	2%	65	98%	17	26%	48	74%	0	0%	
Birds and Eggs	66	1	2%	65	98%	18	28%	44	67%	3	4%	
Wild Plants	66	1	2%	65	98%	17	26%	44	67%	4	7%	
Overall	66	1	2%	65	98%	29	46%	27	41%	8	13%	
Any Resource	66	1	2%	65	98%	48	74%	63	98%	20	30%	

Source: ADF&G, Division of Subsistence Household Survey, 2006.

**Table 16.**—Estimated harvest and use of fish, game, and plant resources, Tyonek, 2005-2006.

Resource Name	Percentage of Households						Pounds Harvested			Amount Harvested*			95% Conf	
	Use	Att	Harv	Recv	Give	Total	Mean HH	Per capita	Total	Mean HH	Harvest	Limit (+/-)	Harvest	
All Resources	95.7%	93.6%	93.6%	91.5%	83.0%	43829.2	664.1	216.7					21.9%	
Fish	87.2%	76.6%	74.5%	59.6%	66.0%	32556.7	493.3	161.0					20.7%	
Salmon	85.1%	76.6%	74.5%	38.3%	61.7%	30447.5	461.3	150.6	3367.4	Ind	51.0		21.2%	
Chum Salmon	0%	2.1%	0%	0%	0%	0	0	0	0	Ind	0		0%	
Coho Salmon	68.1%	59.6%	57.4%	25.5%	40.4%	4762.1	72.2	23.6	1011.1	Ind	15.3		35.6%	
Chinook Salmon	85.1%	74.5%	72.3%	29.8%	46.8%	24104.0	365.2	119.2	2013.7	Ind	30.5		20.6%	
Pink Salmon	6.4%	6.4%	6.4%	0%	0%	17.7	0.3	0.1	7.0	Ind	0.1		63.3%	
Sockeye Salmon	34.0%	31.9%	31.9%	10.6%	17.0%	1557.5	23.6	7.7	332.8	Ind	5.0		36.6%	
Landlocked Salmon	0%	0%	0%	0%	0%	0	0	0	0	Ind	0		0%	
Spawnouts	2.1%	2.1%	2.1%	0%	2.1%	6.1	0.1	0	2.8	Ind	0		108%	
Spawning Sockeye	2.1%	2.1%	2.1%	0%	2.1%	6.1	0.1	0	2.8	Ind	0		108%	
Non-Salmon Fish	57.4%	31.9%	27.7%	42.6%	29.8%	2109.3	32.0	10.4					46.0%	
Herring	0%	0%	0%	0%	0%	0	0	0	0	Gal	0		0%	
Herring Roe	2%	0%	0%	2%	2%	0	0	0	0	Gal	0		0%	
Herring Sac Roe	0%	0%	0%	0%	0%	0	0	0	0	Gal	0		0%	
Herring Spawn on Kelp	2%	0%	0%	2%	2%	0	0	0	0	Gal	0		0%	
Eulachon (hooligan, candlefish)	44.7%	21.3%	19.1%	31.9%	17.0%	1811.8	27.5	9.0	557.5	Gal	8.4		50.7%	
Cod	2%	0%	0%	2%	2%	0	0	0	0	Ind	0		0%	
Pacific Cod (gray)	0%	0%	0%	0%	0%	0	0	0	0	Ind	0		0%	
Pacific Tom Cod	2%	0%	0%	2%	2%	0	0	0	0	Ind	0		0%	
Walleye Pollock (whiting)	0%	0%	0%	0%	0%	0	0	0	0	Ind	0		0%	
Flounder	0%	0%	0%	0%	0%	0	0	0	0	Ind	0		0%	
Greenling	0%	0%	0%	0%	0%	0	0	0	0	Ind	0		0%	
Lingcod	0%	0%	0%	0%	0%	0	0	0	0	Ind	0		0%	
Halibut	14.9%	4.3%	2.1%	14.9%	2%	5.6	0.1	0	5.6	Lbs	0.1		107.7%	
Rockfish	0%	0%	0%	0%	0%	0	0	0	0	Ind	0		0%	
Sablefish (black cod)	0%	0%	0%	0%	0%	0	0	0	0	Ind	0		0%	
Sculpin	0%	0%	0%	0%	0%	0	0	0	0	Ind	0		0%	
Shark	0%	0%	0%	0%	0%	0	0	0	0	Ind	0		0%	
Sole	0%	0%	0%	0%	0%	0	0	0	0	Ind	0		0%	
Stickleback (needlefish)	0%	0%	0%	0%	0%	0	0	0	0	Ind	0		0%	
Wolffish	0%	0%	0%	0%	0%	0	0	0	0	Ind	0		0%	
Blackfish	0%	0%	0%	0%	0%	0	0	0	0	Ind	0		0%	
Burbot	0%	0%	0%	0%	0%	0	0	0	0	Ind	0		0%	

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Table 16.—Page 2 of 4.

Resource Name	Percentage of Households				Pounds Harvested			Amount Harvested*		95% Conf Limit (+/-) Harvest		
	Use	Att	Harv	Recv	Give	Total	Mean HH	Per capita	Total		Mean HH	
Dolly Varden-saltwater	0%	0%	0%	0%	0%	0	0	0	0	Ind	0	0%
Grayling	0%	0%	0%	0%	0%	0	0	0	0	Ind	0	0%
Northern Pike	2.1%	2.1%	2.1%	0%	0%	12.6	0.2	0.1	4.2	Ind	0.1	108%
Sucker	0%	0%	0%	0%	0%	0	0	0	0	Ind	0	0%
Trout	27.7%	19.1%	14.9%	8.5%	17.0%	249.7	3.8	1.2	178.3	Ind	2.7	51.3%
Rainbow Trout	21.3%	14.9%	14.9%	6.4%	12.8%	239.8	3.6	1.2	171.3	Ind	2.6	51.8%
Steelhead	6.4%	4.3%	4.3%	2.1%	6.4%	9.8	0.1	0.0	7.0	Ind	0.1	76.8%
Unknown Trout	4.3%	4.3%	0%	0%	2.1%	0	0	0	0	Ind	0	0%
Whitefish	0%	0%	0%	0%	0%	0	0	0	0	Ind	0	0%
Land Mammals	83.0%	57.4%	31.9%	76.6%	51.1%	8277.7	125.4	40.9				35.2%
Large Land Mammals	83.0%	57.4%	19.1%	76.6%	42.6%	8071.7	122.3	39.9				36.0%
Black Bear	4.3%	6.4%	4.3%	0%	2.1%	488.7	7.4	2.4	8.4	Ind	0.1	75.3%
Brown Bear	4.3%	4.3%	4.3%	0%	0%	0	0	0	4.2	Ind	0.1	79.5%
Caribou	0%	0%	0%	0%	0%	0	0	0	0	Ind	0	0%
Deer	2.1%	0.0%	0.0%	2.1%	0.0%	0	0	0	0.0	Ind	0.0	0.0%
Moose	83%	57%	19%	77%	43%	7583	115	37.5	17	Ind	0	37%
Dall Sheep	0.0%	0.0%	0.0%	0.0%	0.0%	0	0	0	0.0	Ind	0.0	0.0%
Small Land Mammals	25.5%	29.8%	17.0%	8.5%	14.9%	206.1	3.1	1.0	0.0	Ind	0.0	43.4%
Beaver	17.0%	17.0%	13%	4%	11%	111	2	0.5	14	Ind	0	50%
Coyote	2.1%	2.1%	2%	0%	0%	0	0	0	3	Ind	0	108%
Fox	2.1%	2.1%	2%	0%	0%	0	0	0	3	Ind	0	108%
Red Fox	2.1%	2.1%	2.1%	0%	0.0%	0	0	0	2.8	Ind	0	108%
Hare	2.1%	2.1%	2.1%	0%	2.1%	6	0	0	2.8	Ind	0	108%
Snowshoe Hare	2.1%	2.1%	2%	0%	2%	6	0	0	3	Ind	0	108%
Land Otter	2%	2%	2%	0%	0%	0	0	0	3	Ind	0	108%
Lynx	0%	0%	0%	0%	0%	0	0	0	0	Ind	0	0%
Marmot	0.0%	0.0%	0.0%	0%	0.0%	0	0	0	0.0	Ind	0.0	0.0%
Marten	4%	4%	4%	0%	2%	0	0	0	38	Ind	1	93%
Mink	0%	0%	0%	0%	0%	0	0	0	0	Ind	0	0%
Muskrat	0.0%	0.0%	0.0%	0.0%	0.0%	0	0	0	0.0	Ind	0.0	0.0%
Porcupine	19.1%	19%	11%	6%	9%	90	1	0.4	11	Ind	0	48%
Squirrel	2%	0%	0%	0%	0%	0	0	0	0	Ind	0	0%
Parka Squirrel (ground)	0.0%	0%	0%	0%	0%	0	0	0	0	Ind	0	0%

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Table 16.—Page 3 of 4.

Resource Name	Percentage of Households					Pounds Harvested			Amount Harvested*			95% Conf Limit (+/-) Harvest
	Use	Att	Harv	Recv	Give	Total	Mean HH	Percapita	Total	Mean HH	Harvest	
Wolf	0%	0%	0%	0%	0%	0	0	0	0	Ind	0	0%
Wolverine	0.0%	0.0%	0.0%	0.0%	0.0%	0	0	0	0.0	Ind	0.0	0%
Marine Mammals	46.8%	6.4%	4.3%	42.6%	27.7%	857.3	13.0	4.2	4.2	Ind	0.1	100.3%
Seal	10.6%	6.4%	4.3%	4.3%	6.4%	157.3	2.4	0.8	4.2	Ind	0.1	75.3%
Harbor Seal (saltwater)	10.6%	6.4%	4.3%	4.3%	6.4%	157.3	2.4	0.8	4.2	Ind	0.1	75.3%
Sea Otter	0%	0%	0%	0%	0%	0	0	0.0	0	Ind	0	0%
Steller Sea Lion	0.0%	0.0%	0.0%	0.0%	0.0%	0	0	0	0.0	Ind	0	0.0%
Whale	46.8%	6.4%	2.1%	42.6%	27.7%	700.0	10.6	3.5	1.0	Ind	0	107.7%
Belukha	46.8%	6.4%	2.1%	42.6%	27.7%	700.0	10.6	3.5	1.0	Ind	0.0	107.7%
Bowhead	2.1%	0.0%	0.0%	2.1%	2.1%	0	0	0	0.0	Ind	0.0	0.0%
Birds and Eggs	38.3%	44.7%	34.0%	12.8%	23.4%	566.1	8.6	2.8	409	Ind	6	34.3%
Migratory Birds	32%	28%	26%	11%	21%	413	6	2.0	325.8	Ind	4.9	40%
Ducks	31.9%	27.7%	25.5%	11%	21.3%	238.6	3.6	1.2	0	Ind	0	36%
Bufflehead	0%	0%	0%	0%	0%	0	0	0	0	Ind	0	0%
Canvasback	2%	2%	2%	0%	2%	8	0	0	7	Ind	0	108%
Gadwall	0%	0%	0%	0%	0%	0	0	0	0	Ind	0	0%
Goldeneye	0.0%	2.1%	0.0%	0.0%	0.0%	0	0	0	0.0	Ind	0.0	0.0%
Mallard	26%	21%	21%	9%	17%	112	2	0.6	112	Ind	2	36%
Merganser	0%	0%	0%	0%	0%	0	0	0	0	Ind	0	0%
Northern Pintail	19%	15%	15%	6%	15%	65	1	0.3	81	Ind	1	43%
Scaup	0%	0%	0%	0%	0%	0	0	0	0	Ind	0	0%
Scoter	0.0%	0.0%	0.0%	0.0%	0.0%	0	0	0	0.0	Ind	0.0	0.0%
Northern Shoveler	0.0%	0.0%	0.0%	0.0%	0.0%	0	0	0	0.0	Ind	0.0	0.0%
Teal	12.8%	12.8%	12.8%	2%	8.5%	27.0	0.4	0.1	89.9	Ind	1.4	46%
Green Winged Teal	12.8%	12.8%	12.8%	2%	8.5%	27.0	0.4	0.1	89.9	Ind	1.4	46%
Wigeon	2.1%	2.1%	2.1%	0.0%	2.1%	14.7	0.2	0.1	21.1	Ind	0.3	108%
American Wigeon	2.1%	2.1%	2.1%	0.0%	2.1%	14.7	0.2	0.1	21.1	Ind	0.3	108%
Unknown Ducks	4.3%	4.3%	2.1%	2.1%	2.1%	11.7	0.2	0.1	14.0	Ind	0.2	107.7%
Geese	14.9%	14.9%	14.9%	2%	12.8%	127.0	1.9	0.6	77.2	Ind	1.2	46.8%
Canada Geese	14.9%	14.9%	14.9%	2.1%	12.8%	85.0	1.3	0.4	59.0	Ind	0.9	48.1%
Lesser Canada Geese (taverner/parvipes)	10.6%	10.6%	10.6%	0%	10.6%	52.2	0.8	0.3	43.5	Ind	0.7	51.6%
Unknown Canada Geese	4%	4%	4%	2%	2%	33	0	0.2	15	Ind	0	98%
Snow Geese	6%	6%	6%	0%	4%	42	1	0.2	18	Ind	0	70%

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Table 16.—Page 4 of 4.

Resource Name	Percentage of Households				Pounds Harvested			Amount Harvested*			95% Conf	
	Use	Att	Harv	Recv	Give	Total	Mean HH	Percapita	Total	Mean HH	Harvest	Limit (+/-)
Crane	2%	2%	2%	0%	2%	47	1	0.2	6	Ind	0	108%
Sandhill Crane	2%	2%	2%	0%	2%	47	1	0.2	6	Ind	0	108%
Shorebirds	0%	0%	0%	0%	0%	0	0	0	0	Ind	0	0%
Common Snipe	0%	0%	0%	0%	0%	0	0	0	0	Ind	0	0%
Seabirds & Loons	0%	0%	0%	0%	0%	0	0	0	0	Ind	0	0%
Other Birds	27.7%	34.0%	25.5%	4.3%	14.9%	153.3	2.3	0.8	219.1	Ind	3.3	44.8%
Upland Game Birds	27.7%	34.0%	25.5%	4.3%	14.9%	153.3	2.3	0.8	219.1	Ind	3.3	44.8%
Grouse	26%	28%	23%	4%	13%	94	1	0.5	135	Ind	2	39%
Spruce Grouse	26%	25.5%	23%	4%	13%	94	1	0.5	135	Ind	2	39%
Ruffed Grouse	0%	0%	0%	0%	0%	0	0	0	0	Ind	0	0%
Unknown Grouse	0%	2%	0%	0%	0%	0	0	0	0	Ind	0	0%
Ptarmigan	11%	17%	11%	0%	6%	59	1	0.3	84	Ind	1	59%
Bird Eggs	0%	0%	0%	0%	0%	0	0	0.0	0	Ind	0	0%
Marine Invertebrates	40.4%	9%	9%	34.0%	6%	249	4	1.2	0	Ind	0	65%
Clams	40%	9%	9%	34%	6%	185	3	0.9	62	Gal	1	61%
Butter Clams	9%	0%	0%	9%	0%	0	0	0	0	Gal	0	0%
Freshwater Clams	0.0%	0.0%	0.0%	0.0%	0.0%	0.0	0.0	0	0.0	Gal	0	0%
Horse Clams (Gaper)	0%	0%	0%	0%	0%	0	0	0	0	Gal	0	0%
Pacific Littleneck Clams (Steamers)	2.1%	2.1%	2.1%	0.0%	2.1%	4.2	0.1	0	1.4	Gal	0.0	108%
Pinkneck Clams	0.0%	0%	0%	0.0%	0%	0	0	0	0	Gal	0	0%
Razor Clams	36.2%	6.4%	6.4%	31.9%	4.3%	181.1	2.7	0.9	60.4	Gal	0.9	62%
Unknown Clams	2.1%	0.0%	0.0%	2.1%	0.0%	0.0	0.0	0	0.0	Gal	0.0	0%
Cockles	4%	2%	2%	2%	2%	63	1	0.3	21	Gal	0	108%
Crabs	0%	0%	0%	0%	0%	0	0	0	0	Ind	0	0%
Mussels	0%	0%	0%	0%	0%	0	0	0	0	Gal	0	0%
Octopus	0%	0%	0%	0%	0%	0	0	0	0	Ind	0	0%
Scallops	0%	0%	0%	0%	0%	0	0	0	0	Gal	0	0%
Shrimp	0%	0%	0%	0%	0%	0.0	0.0	0	0.0	Gal	0.0	0%
Vegetation	91.5%	91.5%	91.5%	38.3%	63.8%	1322.8	20.0	6.5	0	Gal	0.0	23.8%
Berries	74.5%	70.2%	70.2%	21.3%	38.3%	963	15	4.8	240.8	Gal	3.6	26.6%
Plants/Greens/Mushrooms	31.9%	27.7%	27.7%	8.5%	10.6%	359	5	1.8	89.9	Gal	1.4	48.5%
Wood	85.1%	85.1%	85.1%	23.4%	38.3%	0	0	0	522.4	Crtd	7.9	13.6%

\* Amount of resource harvested is individual units (Ind), unless otherwise specified. Wood is estimated in cords (crd). Source: ADF&G, Division of Subsistence Household Surveys, 2006.

**Table 17.**—Estimated salmon harvest by gear type, Tyonek, 2005-2006.

Resource	Removed from																					
	Harvest						Subsistence Methods															
	Units	Total	HH Mean	Commercial Catch	Total	HH Mean	Setnet	Total	HH Mean	Seine	Total	HH Mean	Other	Total	HH Mean	Subsistence Gear	Total	HH Mean	Rod and Reel	Total	HH Mean	Any Method
Salmon	Lbs	471.8	7.1	2,635.8	39.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2,635.8	39.9	259.8	3.9	3,367.4	51.0		
Chum Salmon	Lbs	3,500.1	53.0	25,003.0	378.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	25,003.0	378.8	1,944.4	29.5	30,447.5	461.3		
Coho Salmon	Lbs	271.0	4.1	581.4	8.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	581.4	8.8	158.7	2.4	1,011.1	15.3		
Chinook Salmon	Lbs	1,276.5	19.3	2,738.2	41.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2,738.2	41.5	747.4	11.3	4,762.1	72.2		
Pink Salmon	Lbs	176.9	2.7	1,737.1	26.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1,737.1	26.3	99.7	1.5	2,013.7	30.5		
	Lbs	2,117.9	32.1	20,792.7	315.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	20,792.7	315.0	1,193.4	18.1	24,104.0	365.2		
	Lbs	2.8	0.0	2.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.8	0.0	1.4	0.0	7.0	0.1		
	Lbs	7.1	0.1	7.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7.1	0.1	3.5	0.1	17.7	0.3		
Sockeye Salmon	Lbs	21.1	0.3	311.7	4.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	311.7	4.7	0.0	0.0	332.8	5.0		
Landlocked Salmon	Lbs	98.6	1.5	1,459.0	22.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1,459.0	22.1	0.0	0.0	1,557.5	23.6		
Spawning Sockeye	Lbs	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
	Lbs	0.0	0.0	2.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.8	0.0	0.0	0.0	2.8	0.0		
	Lbs	0.0	0.0	6.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.1	0.1	0.0	0.0	6.1	0.1		

Source: ADF&G, Division of Subsistence, Household Survey, 2006.

**Table 18.**—Percentage of Tyonek households harvesting salmon by gear type and species, 2005-2006.

RESOURCE	Removed from											
	Commercial Catch						Subsistence Methods					
	Commercial Catch	Setnet	Seine	Other	Subsistence Gear	Any Method	Rod and Reel	Any Method	Any Method			
Salmon	10.6%	70.2%	0%	0%	70.2%	21.3%	72.3%					
Chum Salmon	0%	0%	0%	0%	0%	0%	0%					
Coho Salmon	10.6%	40.4%	0%	0%	40.4%	21.3%	57.4%					
Chinook Salmon	8.5%	70.2%	0%	0%	70.2%	12.8%	72.3%					
Pink Salmon	2%	2.1%	0%	0%	2.1%	2.1%	6.4%					
Sockeye Salmon	4.3%	27.7%	0%	0%	27.7%	0%	31.9%					
Landlocked Salmon	0%	0%	0%	0%	0%	0%	0%					
Spawning Sockeye	0%	2.1%	0%	0%	2.1%	0%	2.1%					
Unknown Salmon	0%	0%	0%	0%	0%	0%	0%					

Source: ADF&G, Division of Subsistence, Household Survey 2006.

**Table 19.**—Tyonek Subdistrict subsistence salmon harvests, 1980 - 2005.

Year	Permits		Reported Salmon Harvest					Total
	Issued	Returned	Chinook	Sockeye	Coho	Chum	Pink	
1980	67		1,757	235	0	0	0	1,992
1981	70		2,002	269	64	32	15	2,382
1982	69		1,590	310	113	4	14	2,031
1983	75		2,665	187	59	6	0	2,917
1984	75		2,200	266	79	23	3	2,571
1985	76		1,472	164	91	10	0	1,737
1986	65		1,676	203	223	46	50	2,198
1987	64	61	1,610	166	149	24	10	1,959
1988	47	42	1,587	91	253	12	8	1,951
1989	49	47	1,250	85	115	1	0	1,451
1990	42	37	781	66	352	12	20	1,231
1991	57	54	902	20	58	0	0	980
1992	57	44	907	75	234	19	7	1,242
1993	62	54	1,370	57	77	17	19	1,540
1994	58	49	770	85	101	22	0	978
1995	70	55	1,317	45	153	15	0	1,530
1996	73	49	1,039	68	137	7	21	1,272
1997	70	42	639	101	137	8	0	885
1998	74	49	1,027	163	64	2	1	1,257
1999	77	54	1,230	144	94	11	32	1,511
2000	60	59	1,157	63	87	0	6	1,313
2001	84	58	976	172	49	6	4	1,207
2002	101	71	1,080	209	115	4	9	1,417
2003	87	74	1,183	111	44	10	7	1,355
2004	97	75	1,345	93	130	0	0	1,568
2005	78	66	982	61	139	2	0	1,184
5-Year Average	89	69	1,113	129	95	4	4	1,346
10-Year Average	80	60	1,066	119	100	5	8	1,297
All Years Average	69	55	1,327	135	120	11	9	1,602

Source: ADF&amp;G, Division of Subsistence, Alaska Subsistence Fisheries Database, 2006.

**Table 20.**—Subsistence salmon harvests by Tyonek residents in the Tyonek Subdistrict, 1980 - 2005.

YEAR	Number of Permits		Reported Salmon Harvest					Total
	Issued	Returned	Chinook	Sockeye	Coho	Chum	Pink	
1980		42	1,757	235	0	0	0	1,992
1981		70	2,002	269	64	15	32	2,382
1982		49	1,590	310	113	4	14	2,031
1983		60	2,665	187	59	6	0	2,917
1984		55	2,200	266	79	23	3	2,571
1985		30	1,067	50	56	10	0	1,183
1986		55	1,529	200	223	46	50	2,048
1987		49	1,610	166	149	24	10	1,959
1988		40	1,587	91	253	12	8	1,951
1989		36	1,250	85	115	1	0	1,451
1990		27	781	66	352	12	20	1,231
1991		32	896	20	48	0	0	964
1992		38	901	75	210	19	7	1,212
1993		37	1,215	48	77	11	18	1,369
1994		30	659	78	101	22	0	860
1995		41	1,244	44	153	15	0	1,456
1996		34	934	68	137	7	21	1,167
1997		22	578	34	33	8	0	653
1998	55	36	891	43	23	1	0	958
1999	50	42	1,119	56	19	3	10	1,207
2000	46	45	1,059	42	25	0	6	1,132
2001	50	34	806	98	35	5	2	946
2002	81	52	948	189	85	4	9	1,235
2003	66	56	1,126	97	39	10	6	1,278
2004	75	57	1,154	75	120	0	0	1,349
2005	59	48	881	15	100	0	0	996
<hr/>								
5-Year								
Average	66	49	983	95	76	4	3	1,161
10-Year								
Average	60	43	950	72	62	4	5	1,092
All								
Years								
Average	60	43	1,248	112	103	10	8	1,481

Source: ADF&G, Division of Subsistence, Alaska Subsistence Fisheries Database, 2006.

**Table 21.**—Population profile, Beluga, August 2006.

AGE	MALE		FEMALE		TOTAL	
	NUMBER	PERCENT	NUMBER	PERCENT	NUMBER	PERCENT
0 - 4	0	0%	0	0%	0	0%
5-9	0	0%	0	0%	0	0%
10-14	1	5%	2	11%	3	8%
15 - 19	2	11%	1	6%	3	8%
20 - 24	1	5%	1	6%	2	5%
25 - 29	1	5%	1	6%	2	5%
30 - 34	0	0%	1	6%	1	3%
35 - 39	1	5%	0	0%	1	3%
40 - 44	0	0%	0	0%	0	0%
45 - 49	0	0%	1	6%	1	3%
50 - 54	2	11%	2	11%	4	11%
55 - 59	3	16%	4	22%	8	19%
60 - 64	4	21%	1	6%	5	14%
65 - 69	2	11%	1	6%	3	8%
70 - 74	0	0%	1	6%	1	3%
75 - 79	1	5%	1	6%	2	5%
80 - 84	0	0%	0	0%	0	0%
85 - 89	0	0%	0	0%	0	0%
90 - 94	0	0%	0	0%	0	0%
95 - 99	0	0%	0	0%	0	0%
100 - 104	0	0%	0	0%	0	0%
Missing	1	5%	1	6%	2	5%
TOTAL	20	100%	19	100%	40	100%

Source: ADF&G, Division of Subsistence, Household Survey, 2006.

**Table 22.**—Employment by industry, Beluga, 2005-2006.

	Jobs	Households*	Individuals*	Percentage of Employment Income
Estimated Total Number*	33	11	19	
<b>Federal Government</b>	3%	7%	6%	0%
Executive, Administrative and Managerial	0%	0%	0%	0%
Natural Scientists and Mathematicians	0%	0%	0%	0%
Social Scientists, Social Workers, Religious Workers and Lawyers	0%	0%	0%	0%
Technologists and Technicians, Except Health	0%	0%	0%	0%
Administrative Support Occupations, Including Clerical	3%	7%	6%	0%
Service Occupations	0%	0%	0%	0%
Construction and Extractive Occupations	0%	0%	0%	0%
Transportation and Material Moving Occupations	0%	0%	0%	0%
Handlers, Equipment Cleaners, Helpers and Laborers	0%	0%	0%	0%
<b>State Government</b>	3%	7%	6%	0%
Executive, Administrative and Managerial	3%	7%	6%	0%
Teachers, Librarians, and Counselors	0%	0%	0%	0%
Administrative Support Occupations, Including Clerical	0%	0%	0%	0%
Service Occupations	0%	0%	0%	0%
Mechanics and Repairers	0%	0%	0%	0%
Transportation and Material Moving Occupations	0%	0%	0%	0%
Handlers, Equipment Cleaners, Helpers and Laborers	0%	0%	0%	0%
<b>Local Government</b>	23%	29%	28%	4%
Executive, Administrative and Managerial	3%	7%	6%	0%
Social Scientists, Social Workers, Religious Workers and Lawyers	0%	0%	0%	0%
Teachers, Librarians, and Counselors	10%	7%	11%	3%
Health Diagnosing and Treating Practitioners	0%	0%	0%	0%
Registered Nurses, Pharmacists, Dietitians, Therapists and PAs	0%	0%	0%	0%
Health Technologists and Technicians	0%	0%	0%	0%
Technologists and Technicians, Except Health	0%	0%	0%	0%
Marketing and Sales Occupations	0%	0%	0%	0%
Administrative Support Occupations, Including Clerical	0%	0%	0%	0%
Service Occupations	0%	0%	0%	0%
Agricultural, Forestry and Fishing Occupations	0%	0%	0%	0%
Mechanics and Repairers	0%	0%	0%	0%
Construction and Extractive Occupations	0%	0%	0%	0%
Precision Production Occupations	0%	0%	0%	0%
Production Working Occupations	0%	0%	0%	0%
Transportation and Material Moving Occupations	0%	0%	0%	0%
Handlers, Equipment Cleaners, Helpers and Laborers	10%	14%	11%	2%
<b>Agriculture, Forestry &amp; Fishing</b>	13%	29%	22%	10%
Service Occupations	0%	0%	0%	0%
Agricultural, Forestry and Fishing Occupations	13%	29%	22%	10%
Precision Production Occupations	0%	0%	0%	0%
Handlers, Equipment Cleaners, Helpers and Laborers	0%	0%	0%	0%
<b>Mining</b>	3%	7%	6%	2%
Service Occupations	3%	7%	6%	2%
Construction and Extractive Occupations	0%	0%	0%	0%
Precision Production Occupations	0%	0%	0%	0%
Handlers, Equipment Cleaners, Helpers and Laborers	0%	0%	0%	0%

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**Table 22.**—Page 2 of 2.

	Jobs	Households*	Individuals*	Percentage of Employment Income
Construction	10%	14%	17%	5%
Executive, Administrative and Managerial	3%	7%	6%	0%
Service Occupations	0%	0%	0%	0%
Mechanics and Repairers	0%	0%	0%	0%
Construction and Extractive Occupations	0%	0%	0%	0%
Transportation and Material Moving Occupations	0%	0%	0%	0%
Handlers, Equipment Cleaners, Helpers and Laborers	6%	7%	11%	5%
Manufacturing	6%	7%	11%	0%
Executive, Administrative and Managerial	6%	7%	11%	0%
Precision Production Occupations	0%	0%	0%	0%
Transportation, Communication & Utilities	3%	7%	6%	41%
Executive, Administrative and Managerial	0%	0%	0%	0%
Technologists and Technicians, Except Health	0%	0%	0%	0%
Administrative Support Occupations, Including Clerical	0%	0%	0%	0%
Service Occupations	0%	0%	0%	0%
Mechanics and Repairers	0%	0%	0%	0%
Construction and Extractive Occupations	3%	7%	6%	41%
Transportation and Material Moving Occupations	0%	0%	0%	0%
Handlers, Equipment Cleaners, Helpers and Laborers	0%	0%	0%	0%
Wholesale Trade	0%	0%	0%	0%
Mechanics and Repairers	0%	0%	0%	0%
Retail Trade	0%	0%	0%	0%
Executive, Administrative and Managerial	0%	0%	0%	0%
Marketing and Sales Occupations	0%	0%	0%	0%
Service Occupations	0%	0%	0%	0%
Handlers, Equipment Cleaners, Helpers and Laborers	0%	0%	0%	0%
Services	27%	52%	46%	30%
Executive, Administrative and Managerial	3%	7%	6%	0%
Natural Scientists and Mathematicians	0%	0%	0%	0%
Writers, Artists, Entertainers, and Athletes	0%	0%	0%	0%
Social Scientists, Social Workers, Religious Workers and Lawyers	0%	0%	0%	0%
Teachers, Librarians, and Counselors	0%	0%	0%	0%
Health Diagnosing and Treating Practitioners	0%	0%	0%	0%
Health Technologists and Technicians	0%	0%	0%	0%
Technologists and Technicians, Except Health	0%	0%	0%	0%
Administrative Support Occupations, Including Clerical	0%	0%	0%	0%
Service Occupations	6%	14%	11%	7%
Agricultural, Forestry and Fishing Occupations	10%	14%	17%	17%
Production Working Occupations	0%	0%	0%	0%
Mechanics and Repairers	3%	7%	6%	0%
Handlers, Equipment Cleaners, Helpers and Laborers	3%	7%	6%	0%
Transportation and Material Moving Occupations	0%	0%	0%	0%
Miscellaneous Occupations	2%	2%	2%	5%

**Table 23.**—Comparison of household's harvests and uses in the 2005-2006 study year with other recent years, Beluga.

Resource	Estimated Households		No Response		Valid Responses		Less		Same		More	
	number	percentage	number	percentage	number	percentage	number	percentage	number	percentage	number	percentage
Salmon	15		0	0%	15	100%	5	36%	8	50%	2	14%
Non-Salmon Finfish	15		0	0%	15	100%	9	57%	5	36%	1	7%
Marine Invertebrates	15		1	7%	14	93%	5	38%	9	62%	0	0%
Large Land Mammals	15		0	0%	15	100%	6	43%	8	50%	1	7%
Furbearers	15		0	0%	15	100%	1	7%	13	86%	1	7%
Marine Mammals	15		1	7%	14	93%	0	0%	14	100%	0	0%
Birds and Eggs	15		0	0%	15	100%	4	29%	10	64%	1	7%
Wild Plants	15		0	0%	15	100%	3	21%	10	64%	2	14%
Overall	15		0	0%	15	100%	10	64%	5	36%	0	0%
Any Resource	15		0	0%	15	100%	13	86%	15	100%	6	43%

**Table 24.**—Estimated harvest and use of fish, game, and plant resources, Beluga, 2005–2006.

Resource Name	Percentage of Households				Pounds Harvested			Amount Harvested*			95% Conf	
	Use	Att	Harv	Recv	Give	Total	Mean HH	Per capita	Total	Mean HH	Limit (+/-)	Harvest
All Resources	100.0%	100.0%	100.0%	100.0%	85.7%	8085.8	539.1	204.0				13.5%
Fish	92.9%	92.9%	85.7%	85.7%	85.7%	4905.7	327.0	123.7				13.3%
Salmon	92.9%	92.9%	85.7%	64.3%	85.7%	3471.8	231.5	87.6	583.0	Ind	38.9	14.2%
Chum Salmon	7.1%	7.1%	7.1%	0%	7.1%	112.5	7.5	2.8	21.4	Ind	1.4	58%
Coho Salmon	92.9%	78.6%	78.6%	42.9%	71.4%	1534.1	102.3	38.7	325.7	Ind	21.7	11.5%
Chinook Salmon	92.9%	92.9%	85.7%	42.9%	71.4%	1271.6	84.8	32.1	106.2	Ind	7.1	22.1%
Pink Salmon	21.4%	21.4%	21.4%	0%	0%	62.1	4.1	1.6	24.6	Ind	1.6	49.9%
Sockeye Salmon	57.1%	42.9%	35.7%	21.4%	35.7%	491.4	32.8	12.4	105.0	Ind	7.0	26.3%
Landlocked Salmon	0%	0%	0%	0%	0%	0	0	0	0	Ind	0	0%
Spawnouts	0%	0%	0%	0%	0%	0	0	0	0	Ind	0	0%
Spawning Sockeye	0%	0%	0%	0%	0%	0	0	0	0	Ind	0	0%
Non-Salmon Fish	85.7%	71.4%	71.4%	64.3%	42.9%	1433.9	95.6	36.2				22.1%
Herring	0%	0%	0%	0%	0%	0	0	0	0	Gal	0	0%
Herring Roe	0%	0%	0%	0%	0%	0	0	0	0	Gal	0	0%
Herring Sac Roe	0%	0%	0%	0%	0%	0	0	0	0	Gal	0	0%
Herring Spawn on Kelp	0%	0%	0%	0%	0%	0	0	0	0	Gal	0	0%
Eulachon (hooligan, candlefish)	57.1%	50.0%	50.0%	14.3%	35.7%	160.2	10.7	4.0	49.3	Gal	3.3	24.3%
Cod	7.1%	0%	0%	7.1%	0%	0	0	0	0	Ind	0	0%
Pacific Cod (gray)	7.1%	0%	0%	7.1%	0%	0	0	0	0	Ind	0	0%
Pacific Tom Cod	0%	0%	0%	0%	0%	0	0	0	0	Ind	0	0%
Walleye Pollock (whiting)	0%	0%	0%	0%	0%	0	0	0	0	Ind	0	0%
Flounder	0%	0%	0%	0%	0%	0	0	0	0	Ind	0	0%
Greenling	0%	0%	0%	0%	0%	0	0	0	0	Ind	0	0%
Lingcod	0%	0%	0%	0%	0%	0	0	0	0	Ind	0	0%
Halibut	57.1%	7.1%	7.1%	57.1%	7.1%	53.6	3.6	1.4	53.6	Lbs	3.6	58%
Rockfish	7.1%	0%	0%	7.1%	0%	0	0	0	0	Ind	0	0%
Sablefish (black cod)	0%	0%	0%	0%	0%	0	0	0	0	Ind	0	0%
Sculpin	0%	0%	0%	0%	0%	0	0	0	0	Ind	0	0%
Shark	0%	0%	0%	0%	0%	0	0	0	0	Ind	0	0%
Sole	0%	0%	0%	0%	0%	0	0	0	0	Ind	0	0%
Stickleback (needlefish)	0%	0%	0%	0%	0%	0	0	0	0	Ind	0	0%
Wolffish	0%	0%	0%	0%	0%	0	0	0	0	Ind	0	0%
Blackfish	0%	0%	0%	0%	0%	0	0	0	0	Ind	0	0%
Burbot	0%	0%	0%	0%	0%	0	0	0	0	Ind	0	0%

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Table 24. –Page 2 of 4.

Resource Name	Percentage of Households				Pounds Harvested			Amount Harvested*		95% Conf Limit (+/-) Harvest		
	Use	Att	Harv	Recv	Give	Total	Mean HH	Per capita	Total		Mean HH	
Dolly Varden-saltwater	0%	0%	0%	0%	0%	0	0	0	0	Ind	0	0%
Grayingling	0%	0%	0%	0%	0%	0	0	0	0	Ind	0	0%
Northern Pike	71.4%	57.1%	57.1%	21.4%	21.4%	549.6	36.6	13.9	183.2	Ind	12.2	20.5%
Sucker	0%	0%	0%	0%	0%	0	0	0	0	Ind	0	0%
Trout	71.4%	57.1%	57.1%	14.3%	21.4%	597.0	39.8	15.1	426.4	Ind	28.4	30.5%
Rainbow Trout	71.4%	57.1%	57.1%	14.3%	21.4%	594.0	39.6	15.0	424.3	Ind	28.3	30.7%
Steelhead	7.1%	7.1%	7.1%	0%	0%	3.0	0.2	0.1	2.1	Ind	0.1	58%
Unknown Trout	0%	0%	0%	0%	0%	0	0	0	0	Ind	0	0%
Whitefish	0%	0%	0%	0%	0%	0	0	0	0	Ind	0	0%
Land Mammals	100.0%	64.3%	42.9%	92.9%	57.1%	2409	161	61	0	Ind	0	27.7%
Large Land Mammals	100.0%	64.3%	35.7%	92.9%	50.0%	2403.2	160.2	60.6	0	Ind	0	27.7%
Black Bear	42.9%	28.6%	28.6%	28.6%	28.6%	372.9	24.9	9.4	6.4	Ind	0.4	27.2%
Brown Bear	0%	21.4%	0%	0%	0%	0	0	0	0	Ind	0	0%
Caribou	29%	0%	0%	29%	0%	0	0	0	0	Ind	0	0%
Moose	100.0%	64%	21%	85.7%	43%	1735.7	115.7	43.8	3.2	Ind	0.2	30.7%
Muskox	14.3%	7.1%	7.1%	7.1%	7.1%	295	20	7	1.1	Ind	0.1	22%
Dall Sheep	7.1%	7.1%	0%	7.1%	0%	0	0	0	0	Ind	0	0%
Small Land Mammals	42.9%	42.9%	35.7%	7.1%	14.3%	5.4	0.4	0.1	0	Ind	0	57.7%
Beaver	28.6%	28.6%	21.4%	7.1%	0%	0.0	0.0	0.0	37.5	Ind	2.5	49.2%
Coyote	21.4%	21.4%	21.4%	0%	0%	0	0	0	9.6	Ind	0.6	36.0%
Fox	28.6%	28.6%	28.6%	0%	7%	0	0	0	10.7	Ind	0.7	26.0%
Red Fox	28.6%	28.6%	28.6%	0%	7.1%	0	0	0	10.7	Ind	0.7	26.0%
Hare	7.1%	7.1%	7.1%	0%	0%	4.3	0	0	2.1	Ind	0.1	58%
Snowshoe Hare	7.1%	7.1%	7.1%	0%	0%	4.3	0.3	0.1	2.1	Ind	0.1	58%
Land Otter	14.3%	14.3%	7.1%	0%	0%	0	0	0	4.3	Ind	0.3	57.7%
Lynx	0%	7.1%	0%	0%	0%	0	0	0	0	Ind	0	0%
Marmot	0%	0%	0%	0%	0%	0	0	0	0	Ind	0	0%
Marten	35.7%	35.7%	28.6%	7.1%	0%	0	0	0	126.4	Ind	8.4	42.9%
Mink	7.1%	7.1%	7.1%	0%	0%	0	0	0	3.2	Ind	0.2	58%
Muskrat	7.1%	7.1%	7.1%	0%	0%	0	0	0	10.7	Ind	0.7	58%
Porcupine	7.1%	7.1%	7.1%	0%	0%	0	0	0	6.4	Ind	0.4	58%
Squirrel	21.4%	21.4%	21.4%	0%	0%	1.1	0.1	0.0	49.3	Ind	3.3	57.7%
Parka Squirrel (ground)	0%	0%	0%	0%	0%	0	0	0	0	Ind	0	0%

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Table 24.—Page 3 of 4.

Resource Name	Percentage of Households				Pounds Harvested			Amount Harvested*		95% Conf Limit (+/-) Harvest		
	Use	Att	Harv	Recv	Give	Total	Mean HH	Per capita	Total		Mean HH	
Wolf	28.6%	35.7%	28.6%	0%	7.1%	0	0	0	6.4	Ind	0.4	27.2%
Wolverine	7.1%	21.4%	0%	7.1%	0%	0	0	0	0	Ind	0	0%
Marine Mammals	0%	0%	0%	0%	0%	0	0	0	0	Ind	0	0%
Seal	0%	0%	0%	0%	0%	0	0	0	0	Ind	0	0%
Harbor Seal (saltwater)	0%	0%	0%	0%	0%	0	0	0	0	Ind	0	0%
Sea Otter	0%	0%	0%	0%	0%	0	0	0	0	Ind	0	0%
Steller Sea Lion	0%	0%	0%	0%	0%	0	0	0	0	Ind	0	0%
Whale	0%	0%	0%	0%	0%	0	0	0	0	Ind	0	0%
Belukha	0%	0%	0%	0%	0%	0	0	0	0	Ind	0	0%
Birds and Eggs	78.6%	78.6%	78.6%	14.3%	21.4%	266.7	17.8	6.7				21.4%
Migratory Birds	35.7%	35.7%	35.7%	7.1%	7.1%	82.2	5.5	2.1	58.9	Ind	3.9	27.9%
Ducks	28.6%	28.6%	28.6%	7.1%	0%	35.9	2.4	0.9	40.7	Ind	2.7	32.1%
Bufflehead	0%	0%	0%	0%	0%	0	0	0	0	Ind	0	0%
Canvasback	0%	0%	0%	0%	0%	0	0	0	0	Ind	0	0%
Gadwall	0%	0%	0%	0%	0%	0	0	0	0	Ind	0	0%
Goldeneye	0%	0%	0%	0%	0%	0	0	0	0	Ind	0	0%
Mallard	28.6%	28.6%	28.6%	7.1%	0%	24.6	1.6	0.6	24.6	Ind	1.6	31.2%
Merganser	0%	0%	0%	0%	0%	0	0	0	0	Ind	0	0%
Northern Pintail	14.3%	14.3%	14.3%	0%	0%	6.9	0	0	8.6	Ind	0.6	40.6%
Scaup	0%	0%	0%	0%	0%	0	0	0	0	Ind	0	0%
Scoter	0%	0%	0%	0%	0%	0	0	0	0	Ind	0	0%
Northern Shoveler	0%	0%	0%	0%	0%	0	0	0	0	Ind	0	0%
Teal	7.1%	7.1%	7.1%	7.1%	0%	0.6	0	0	2.1	Ind	0.1	58%
Green Winged Teal	7.1%	7.1%	7.1%	7.1%	0%	0.6	0	0	2.1	Ind	0.1	58%
Wigeon	7.1%	7.1%	7.1%	0%	0%	3.8	0	0	5.4	Ind	0.4	58%
American Wigeon	7.1%	7.1%	7.1%	0%	0%	3.8	0.3	0.1	5.4	Ind	0.4	58%
Unknown Ducks	0%	0%	0%	0%	0%	0	0	0	0	Ind	0	0%
Geese	28.6%	35.7%	28.6%	0%	7.1%	28.3	1.9	0.7	16.1	Ind	1.1	33.7%
Canada Geese	21.4%	35.7%	21.4%	0%	0%	10.3	0.7	0.3	8.6	Ind	0.6	33.0%
Lesser Canada Geese (taverner/parvipes)	21.4%	35.7%	21.4%	0%	0%	10.3	0.7	0.3	8.6	Ind	0.6	33.0%
Unknown Canada Geese	0%	0%	0%	0%	0%	0	0	0	0	Ind	0	0%
Snow Geese	0%	7%	0%	0%	0%	0	0	0	0	Ind	0	0%
White-fronted Geese	14.3%	14.3%	14.3%	0%	7.1%	18.0	1.2	0.5	7.5	Ind	0.5	39.7%

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Table 24.—Page 4 of 4.

Resource Name	Percentage of Households					Pounds Harvested			Amount Harvested*			95% Conf Limit (+/-) Harvest
	Use	Att	Harv	Recv	Give	Total	Mean HH	Per capita	Total	Mean HH	Harvest	
Sandhill Crane	7.1%	28.6%	7.1%	0%	0%	18.0	1.2	0.5	2.1	Ind	0.1	57.7%
Shorebirds	0%	0%	0%	0%	0%	0	0	0	0	Ind	0	0%
Common Snipe	0%	0%	0%	0%	0%	0	0	0	0	Ind	0	0%
Seabirds & Loons	0%	0%	0%	0%	0%	0	0	0	0	Ind	0	0%
Other Birds	78.6%	78.6%	78.6%	7.1%	21.4%	184.5	12.3	4.7	263.6	Ind	17.6	23.3%
Upland Game Birds	78.6%	78.6%	78.6%	7.1%	21.4%	184.5	12.3	4.7	263.6	Ind	17.6	23.3%
Grouse	78.6%	78.6%	78.6%	0%	21.4%	158.3	10.6	4.0	226.1	Ind	15.1	26.6%
Spruce Grouse	78.6%	78.6%	78.6%	0%	21.4%	156.0	10.4	3.9	222.9	Ind	14.9	26.5%
Ruffed Grouse	14.3%	21.4%	14.3%	0%	0%	2	0	0	3.2	Ind	0.2	41.7%
Unknown Grouse	0%	0%	0%	0%	0%	0	0	0	0	Ind	0	0%
Ptarmigan	42.9%	50.0%	35.7%	7.1%	0%	26.3	1.8	0.7	37.5	Ind	2.5	27.0%
Bird Eggs	0%	0%	0%	0%	0%	0	0	0	0	Ind	0	0%
Marine Invertebrates	50.0%	35.7%	35.7%	21.4%	21.4%	65.6	4.4	1.7	0	Ind	0	42.0%
Clams	50.0%	35.7%	35.7%	21.4%	21.4%	64.3	4.3	1.6	150.0	Gal	10.0	42.9%
Butter Clams	0%	0%	0%	0%	0%	0	0	0	0	Gal	0	0%
Freshwater Clams	7.1%	7.1%	7.1%	0%	0%	3	0	0	1.1	Gal	0.1	58%
Horse Clams (Gaper)	0%	0%	0%	0%	0%	0	0	0	0	Gal	0	0%
Pacific Littleneck Clams (Steamers)	0%	0%	0%	0%	0%	0	0	0	0	Gal	0	0%
Pinkneck Clams	0%	0%	0%	0%	0%	0	0	0	0	Gal	0	0%
Razor Clams	50.0%	28.6%	28.6%	21.4%	21.4%	61.1	4.1	1.5	148.9	Gal	9.9	45.4%
Unknown Clams	0%	0%	0%	0%	0%	0	0	0	0	Gal	0	0%
Cockles	7.1%	7.1%	7.1%	0%	0%	1.3	0.1	< 0.1	0.4	Gal	0.0	58%
Crabs	0%	0%	0%	0%	0%	0	0	0	0	Ind	0	0%
Mussels	0%	0%	0%	0%	0%	0	0	0	0	Gal	0	0%
Octopus	0%	0%	0%	0%	0%	0	0	0	0	Ind	0	0%
Scallops	0%	0%	0%	0%	0%	0	0	0	0	Gal	0	0%
Shrimp	0%	0%	0%	0%	0%	0	0	0	0	Gal	0	0%
Vegetation	92.9%	92.9%	92.9%	35.7%	50.0%	439.3	29.3	11.1	0	Gal	0	11.4%
Berries	92.9%	92.9%	92.9%	35.7%	50.0%	325.7	21.7	8.2	81.4	Gal	5.4	11.7%
Plants/Greens/Mushrooms	42.9%	42.9%	42.9%	7.1%	21.4%	113.6	7.6	2.9	28.4	Gal	1.9	29.2%
Wood	78.6%	78.6%	78.6%	7.1%	28.6%	0	0	0	66.4	Crd	4.4	13.6%

\* Amount of resource harvested is individual units (Ind), unless otherwise specified. Wood is estimated in cords (crd).  
Source: ADF&G, Division of Subsistence Household Surveys, 2006.

**Table 25.**—Estimated salmon harvest by gear type, Beluga, 2005-2006.

Resource	Harvest Units	Removed from												
		Commercial Catch						Subsistence Methods						
		Total	HH Mean	HH Mean	Total	HH Mean	HH Mean	Total	HH Mean	HH Mean	Total	HH Mean	HH Mean	
Salmon	143.7	9.6	41.8	2.8	0.0	0.0	12.9	0.9	54.6	3.6	384.6	25.6	583.0	38.9
Chum Salmon	810.3	54.0	399.1	26.6	0.0	60.2	4.0	459.2	30.6	2,202.3	146.8	3,471.8	231.5	
	21.4	1.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	21.4	1.4
	112.5	7.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	112.5	7.5
Coho Salmon	50.4	3.4	13.9	0.9	0.0	0.0	0.0	0.0	13.9	0.9	261.4	17.4	325.7	21.7
	237.2	15.8	65.6	4.4	0.0	0.0	0.0	0.0	65.6	4.4	1,231.3	82.1	1,534.1	102.3
Chinook Salmon	17.3	1.2	27.9	1.9	0.0	0.0	0.0	0.0	27.9	1.9	61.1	4.1	106.2	7.1
	207.2	13.8	333.5	22.2	0.0	0.0	0.0	0.0	333.5	22.2	731.0	48.7	1,271.6	84.8
Pink Salmon	1.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	23.6	1.6	24.6	1.6
	2.7	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	59.4	4.0	62.1	4.1
Sockeye Salmon	53.6	3.6	0.0	0.0	0.0	12.9	0.9	12.9	0.9	38.6	2.6	105.0	7.0	
	250.7	16.7	0.0	0.0	0.0	60.2	4.0	60.2	4.0	180.5	12.0	491.4	32.8	
Landlocked Salmon	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Spawning Sockeye	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	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, Household Survey, 2006.

**Table 26.**—Percentage of Beluga households harvesting salmon by gear type and species, 2--5-2006.

RESOURCE	Removed from Commercial Catch	Subsistence Methods			Subsistence Gear		Any Method
		Setnet	Seine	Other	Any Method	Rod and Reel	
Salmon	14.3%	14.3%	0%	7.1%	14.3%	78.6%	85.7%
Chum Salmon	7.1%	0%	0%	0%	0%	0%	7.1%
Coho Salmon	14.3%	7.1%	0%	0%	7.1%	78.6%	78.6%
Chinook Salmon	14.3%	14.3%	0%	0%	14.3%	71.4%	85.7%
Pink Salmon	7.1%	0%	0%	0%	0%	14.3%	21.4%
Sockeye Salmon	14.3%	0%	0%	7.1%	7.1%	14.3%	35.7%
Landlocked Salmon	0%	0%	0%	0%	0%	0%	0%
Spawning Sockeye	0%	0%	0%	0%	0%	0%	0%
Unknown Salmon	0%	0%	0%	0%	0%	0%	0%

Source: ADF&G, Division of Subsistence, Household Survey 2006.

**Table 27.**—Subsistence salmon harvests by Beluga residents in the Tyonek Subdistrict, 1993 - 2005.

YEAR	Number of Permits		Reported Salmon Harvest					Total
	Issued	Returned	Chinook	Sockeye	Coho	Chum	Pink	
1993		1	31	0	0	0	0	31
1994	0							
1995	0							
1996	0							
1997	0	1	0	0	32	0	0	32
1998	1	0						
1999	2	1	5	0	41	0	0	46
2000	2	2	13	0	0	0	0	13
2001	4	3	6	20	10	1	2	39
2002	2	2	2	0	27	0	0	29
2003	0							
2004	0							
2005	0							

Note: There is no record of any subsistence permits issued to Beluga residents prior to 1993. Prior to 1990, only residents of Tyonek were eligible to receive subsistence salmon permits for the Tyonek Subdistrict.

Source: ADF&G, Division of Subsistence, Alaska Subsistence Fisheries Database, 2006.

**Table 28.**—Comparison of selected study findings for Tyonek and Beluga, 2005-2006.

	Beluga	Tyonek
<b>Demography</b>		
Population	40	202
Percentage Alaska Native	8.1%	95.1%
Percentage of Household Heads Born in Alaska	12.5%	85.7%
Average Length of Residency, HH Heads (yrs)	22	34
<b>Cash Economy</b>		
Percentage of Jobs Located in Community	41.9%	76.9%
Average Number of Months Employed	8.9	8.8
Percentage of Employed Adults Working Year-Round	61.1%	51.9%
Average Household Income	\$17,470.54	\$23,943.60
Per Capita Income	\$6,610.48	\$7,814.92
<b>Resource Harvest and Use</b>		
Per Capita Harvest, Lbs Usable Weight	204.0	216.7
Average HH Harvest, Lbs Usable Weight	539.1	664.1
Number of Resources Used by 50% or More of HHs	13.0	5.0
Average # of Resources Used per HH	15.3	9.0
Average # of Resources Attempted to Harvest per HH	14.0	7.0
Average # of Resources Harvested per HH	11.9	6.1
Average # of Resources Received per HH	5.0	4.0
Average # of Resources Given Away per HH	5.2	4.5
Percentage of Total Harvest taken by Top 25% of HHs	61.5%	71.1%
Percentage of HHs taking 70% of harvest	35.7%	26.1%
Per Capita Harvest of lowest 50% of HHs	39.8	46.5
Percent of Total Harvest taken by Lowest 50% of HHs	19.5%	21.3%
Average # of Resources Used by Lowest 50% of HHs	5.8	4.9
Average # of Resources Used by Top 25% of HHs	22.2	11.6

Source: ADF&G, Division of Subsistence Household Survey, 2006.



## **FIGURES**

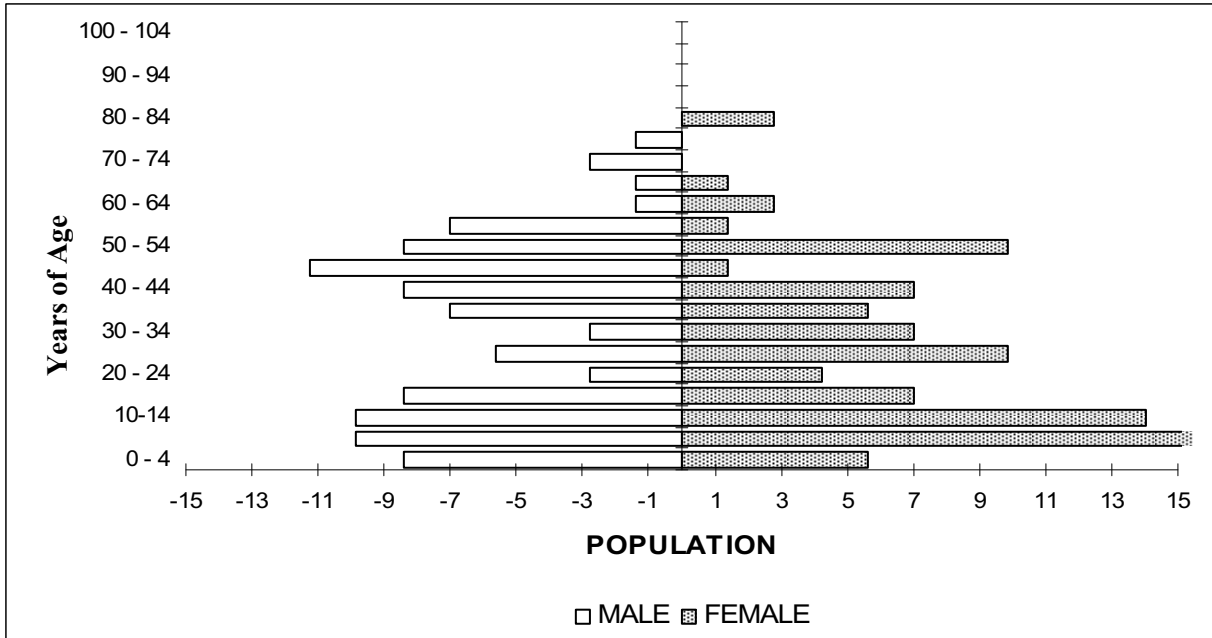


Figure 1.—Population profile, Tyonek, August 2006.

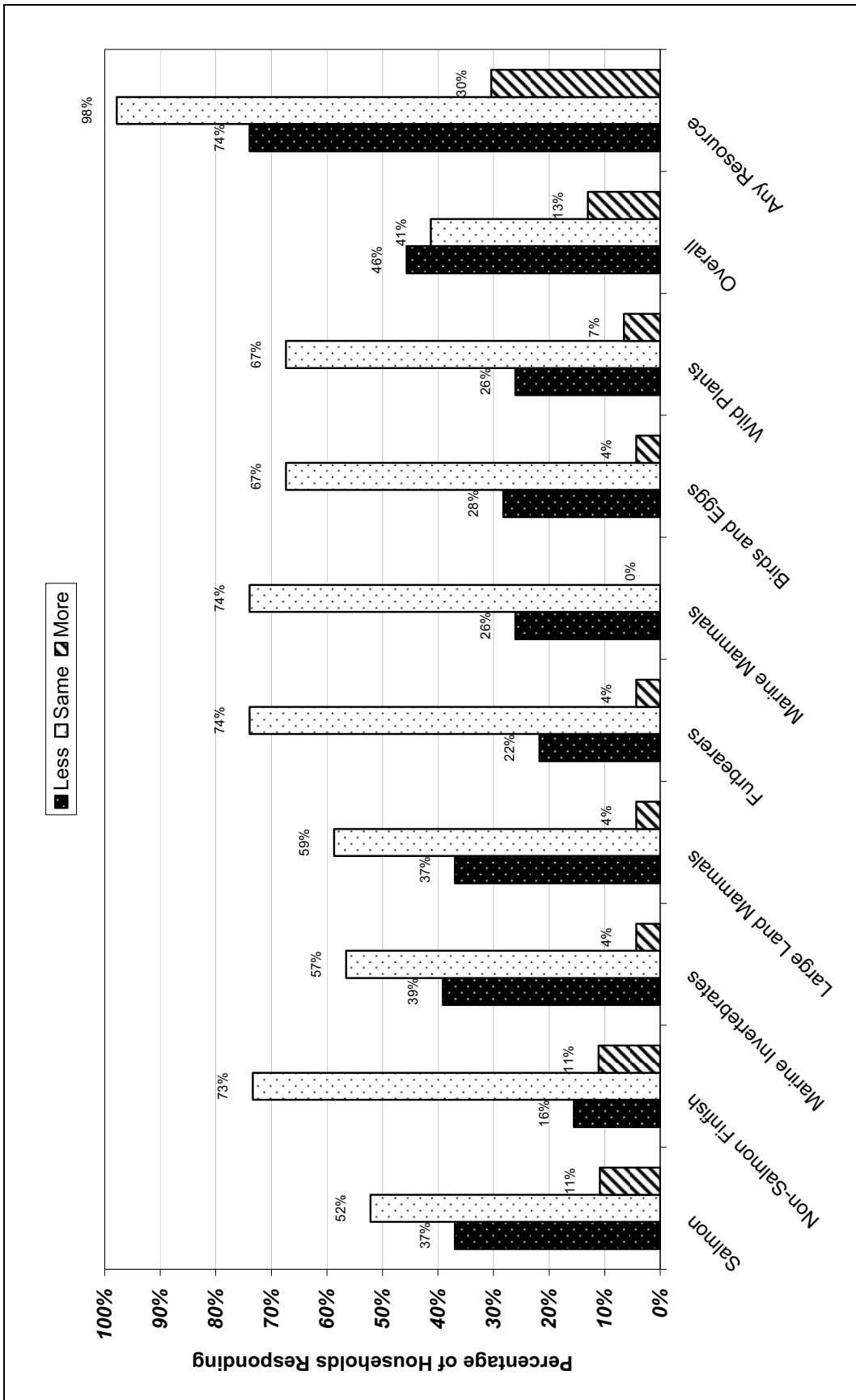
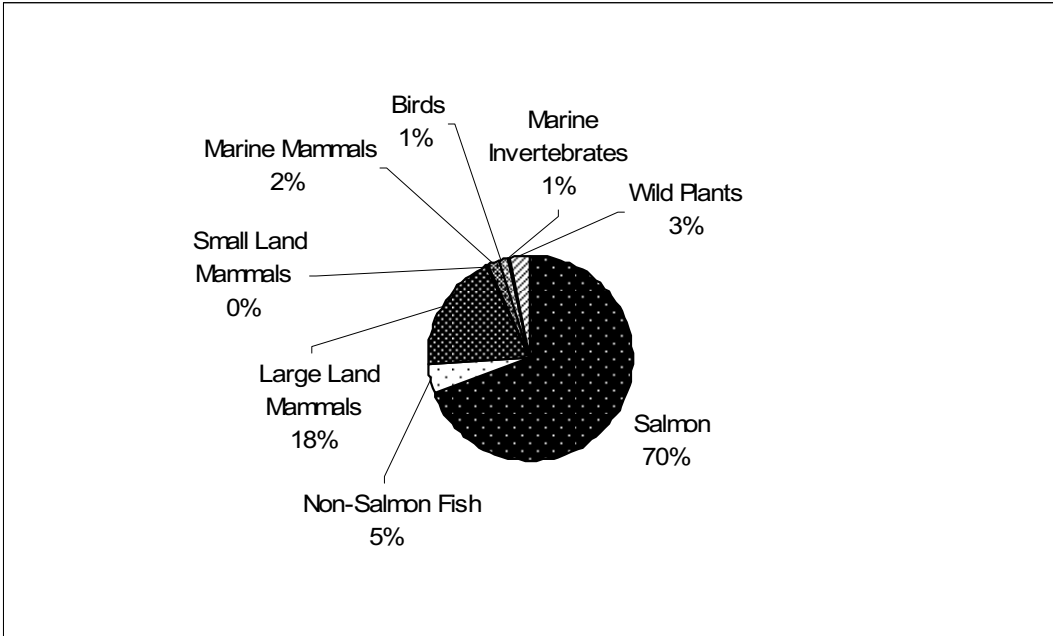
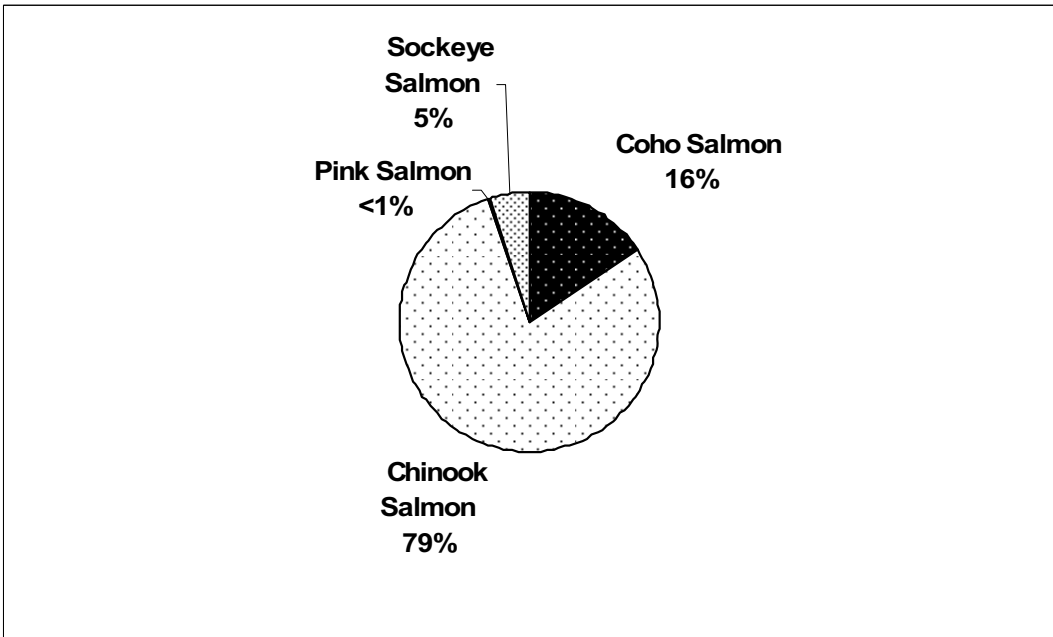


Figure 2.—Tyonek households' assessments of harvests and uses of wild resources in 2005-2006 compared to "recent years" .



**Figure 3.**—Wild resource harvests by category, Tyonek , 2005-2006.



**Figure 4.**—Percentage of pounds of salmon harvested by species, Tyonek, 2005-2006.

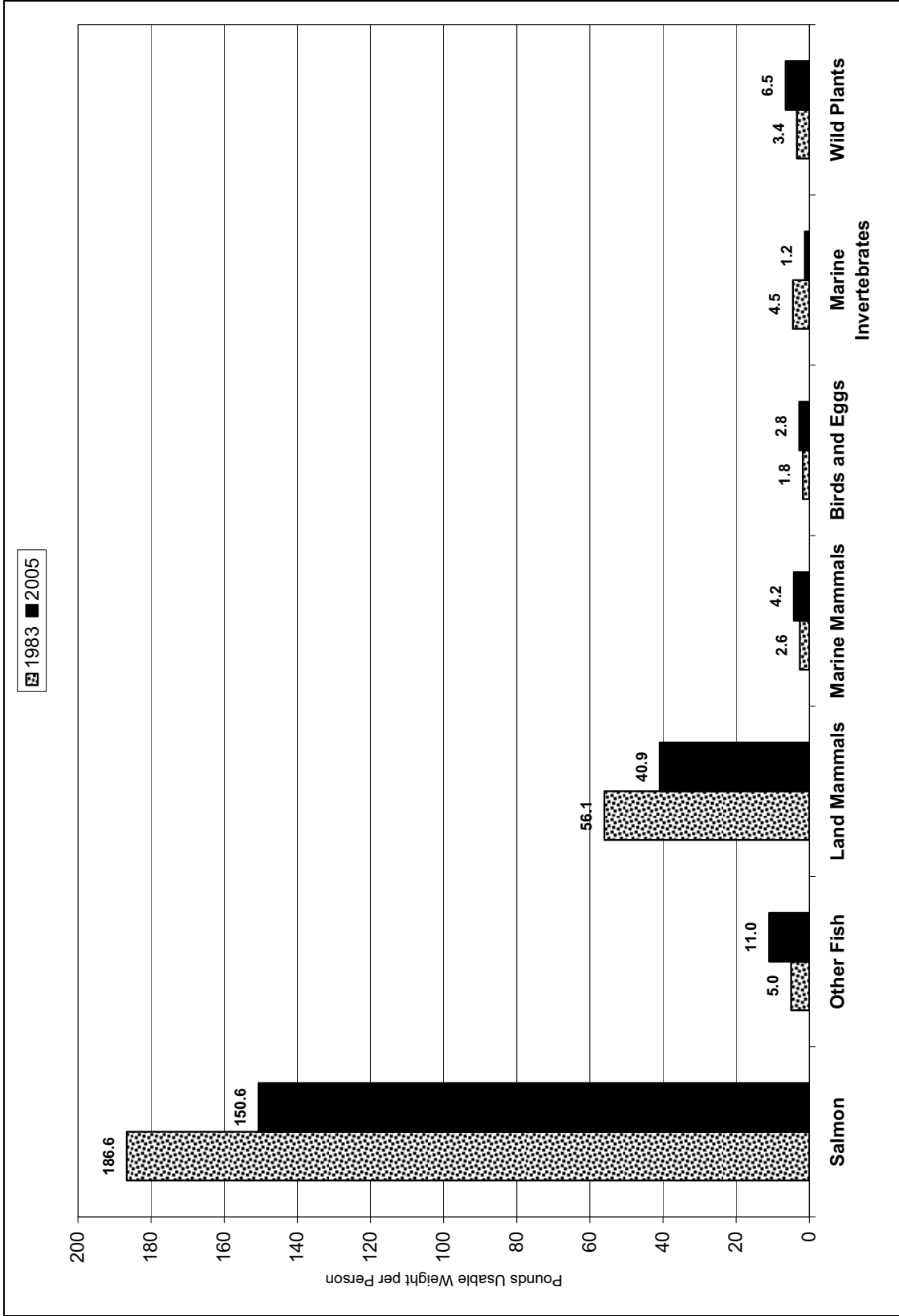
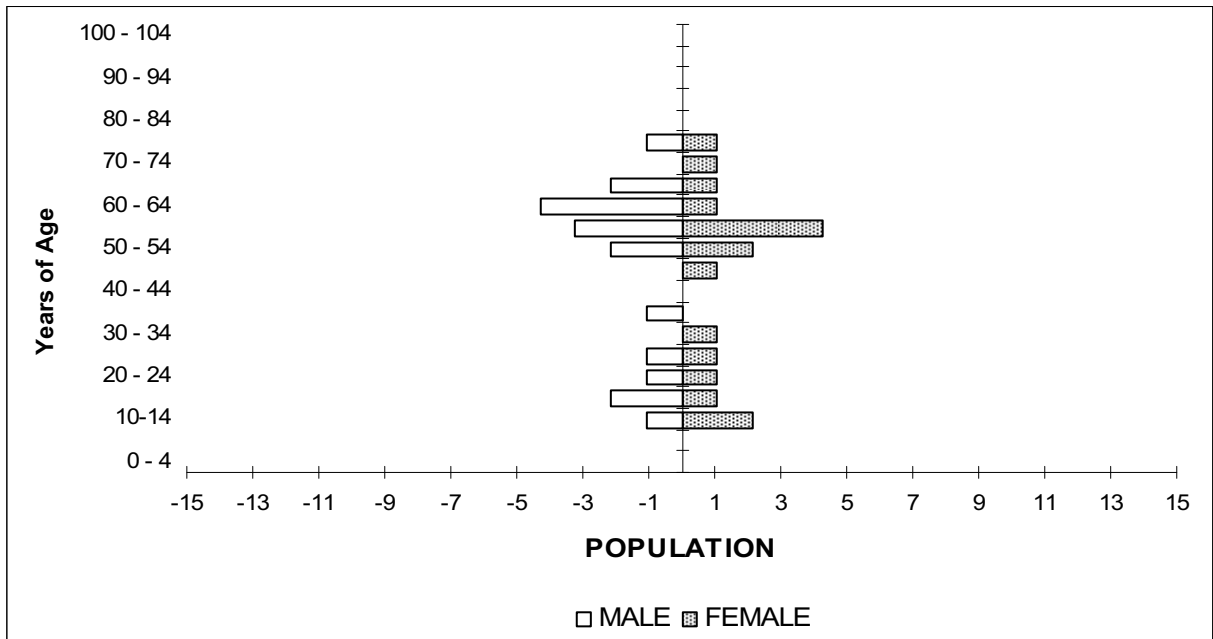


Figure 5.—Tyonek wild resource harvests by category in pounds usable weight per person, 1983-84 and 2005-2006.



**Figure 6.**—Population profile, Beluga, August 2006.

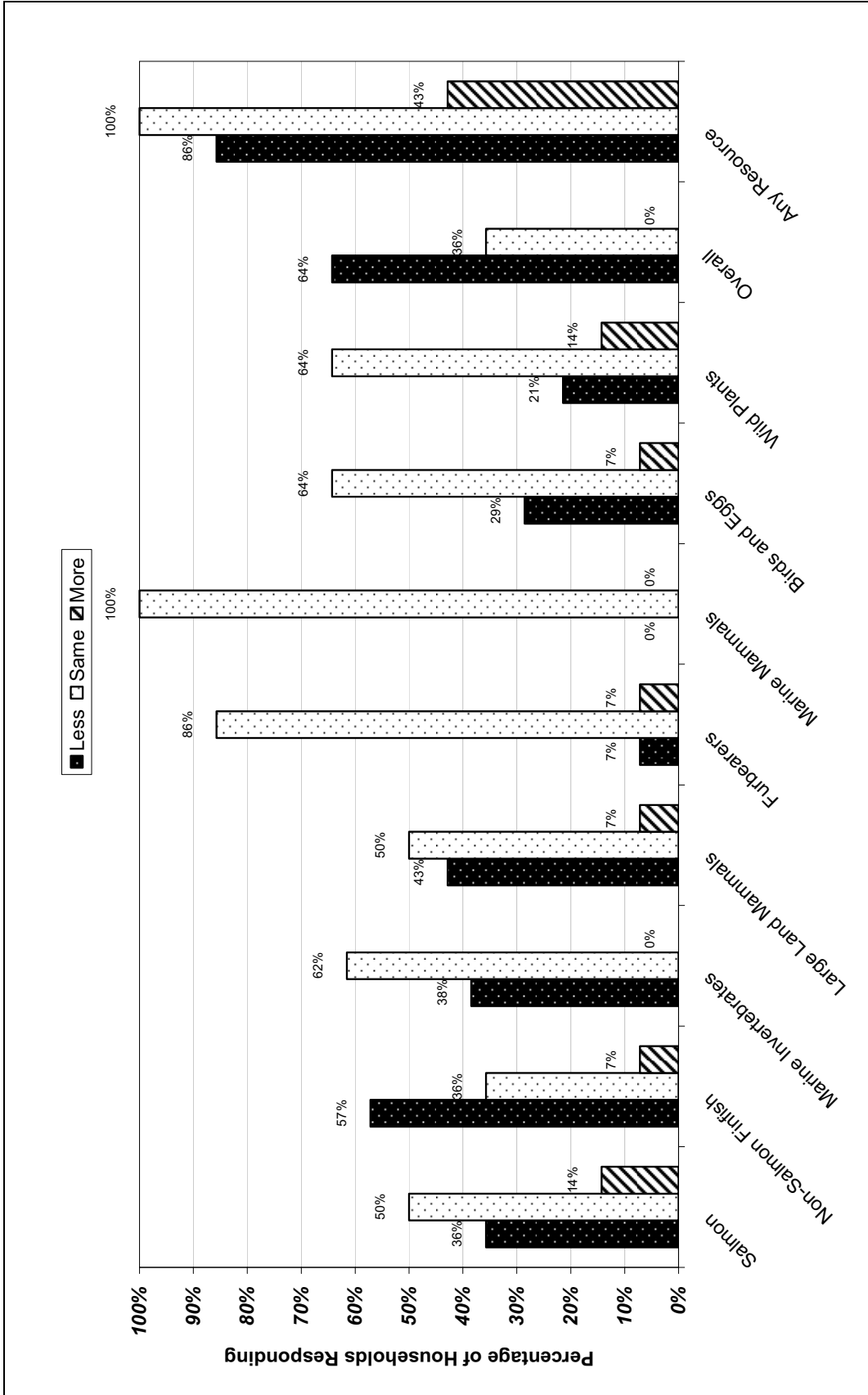
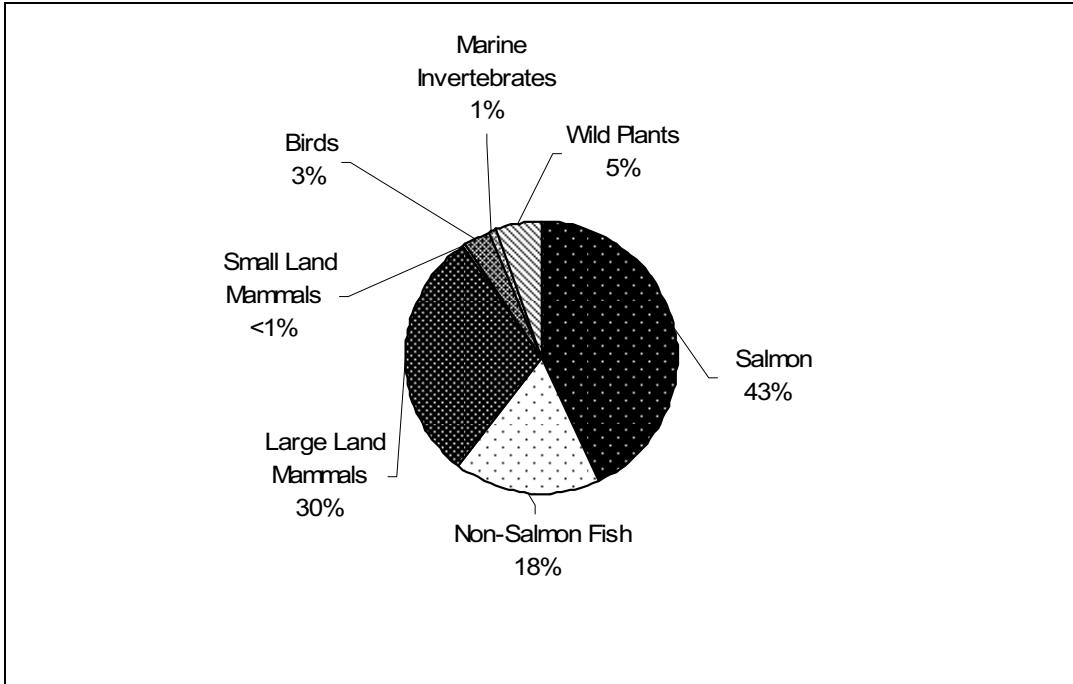
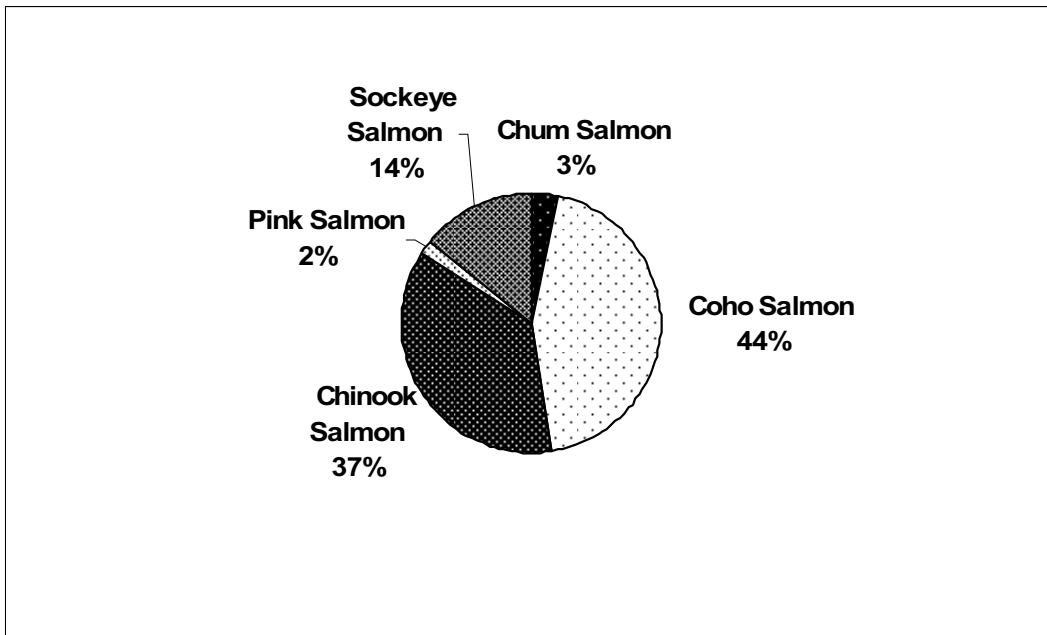


Figure 7.—Beluga households' assessments of harvests and uses of wild resources in 2005-2006 compared to "recent years".

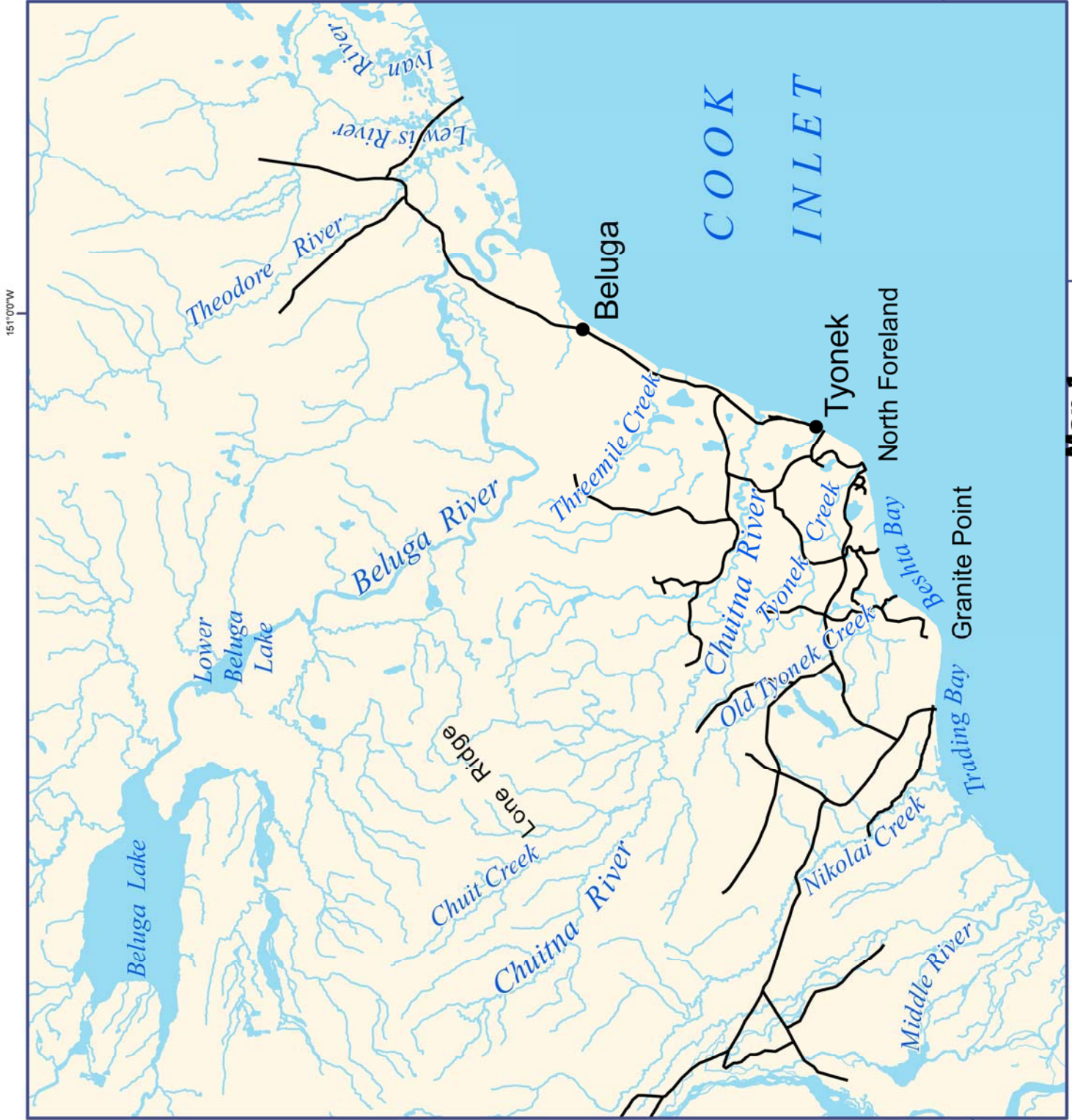


**Figure 8.**—Wild resource harvests by category, Beluga residents, 2005-2006.



**Figure 9.**—Percentage of pounds of salmon harvested by species, Beluga, 2005-2006.

## **MAPS**



● Community  
 — Road

Roads shown are primarily main gravel roads. Additional roads and trails exist beyond those depicted here.

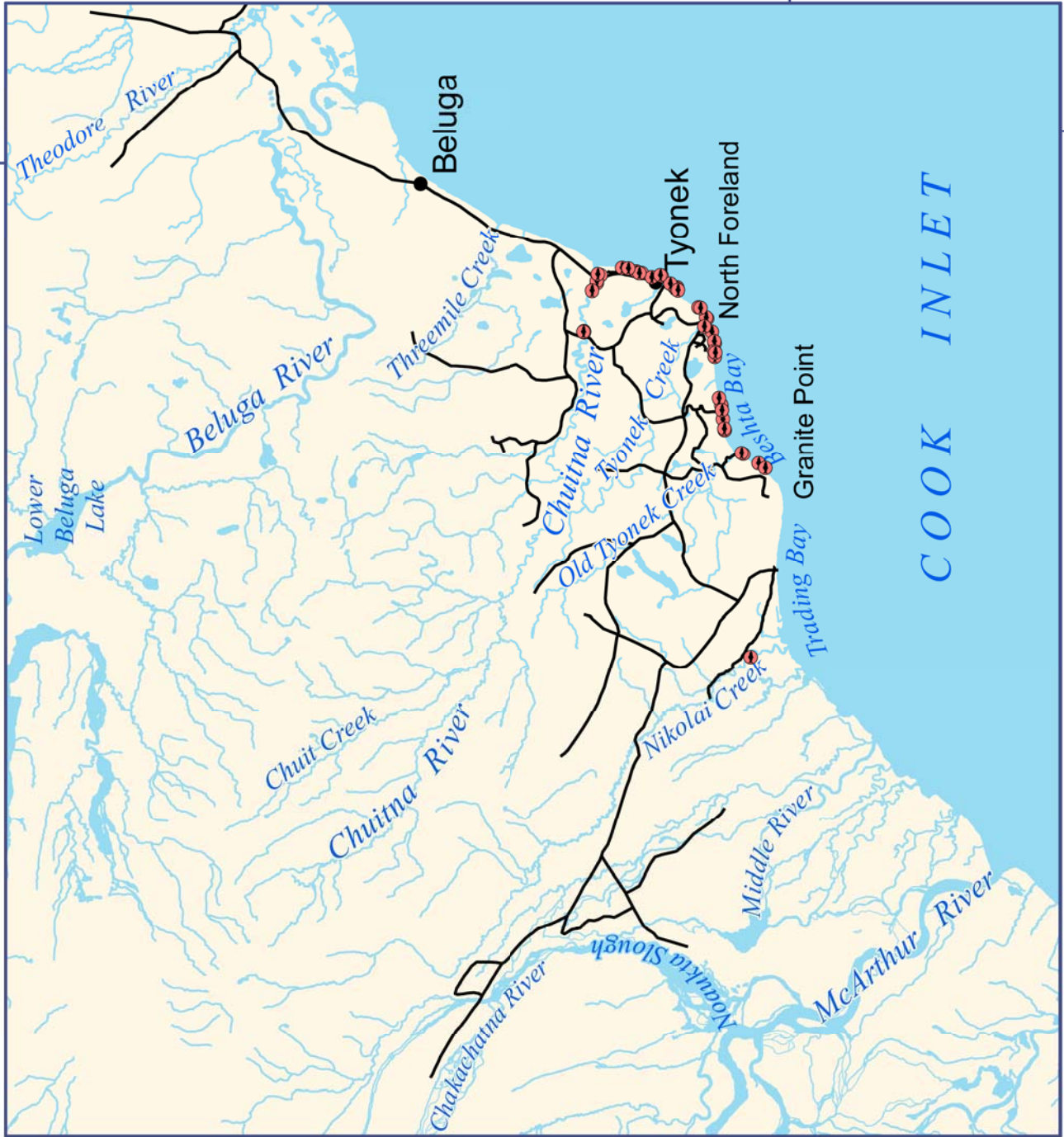
SCALE: 1:300,000  
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PacRim Coal, through Stephen R. Braund & Associates, provided funding to ADF&G for this study. Stephen R. Braund & Associates, funded by PacRim Coal, digitized the data and prepared the GIS maps.

Source:  
 Division of Subsistence, ADF&G Household Interviews, 2006.  
 See Division of Subsistence Technical Paper No. 321, Update of Wild Resource Harvest and Use Information for Tyonek and Beluga, Alaska, 2005/2006 for background on sample sizes and mapping methods.

Map Projection: UTM Zone 5N, MAD83

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**Tyonek Chinook Salmon Harvest Area**

- Tyonek Chinook Salmon Harvest Area
- Community
- Road

Roads shown are primarily main gravel roads. Additional roads and trails exist beyond those depicted here.

Resource harvest areas change over time. The area represented here is for the year August 1, 2005 through July 31, 2006. For subsistence use information during the 20 year period from 1987-2006 for this community see Stephen R. Braund & Associates Subsistence Use Areas and Traditional Knowledge Study for Tyonek and Beluga, Alaska, 2006.

**SCALE: 1:300,000**

0 1.25 2.5 5 Miles

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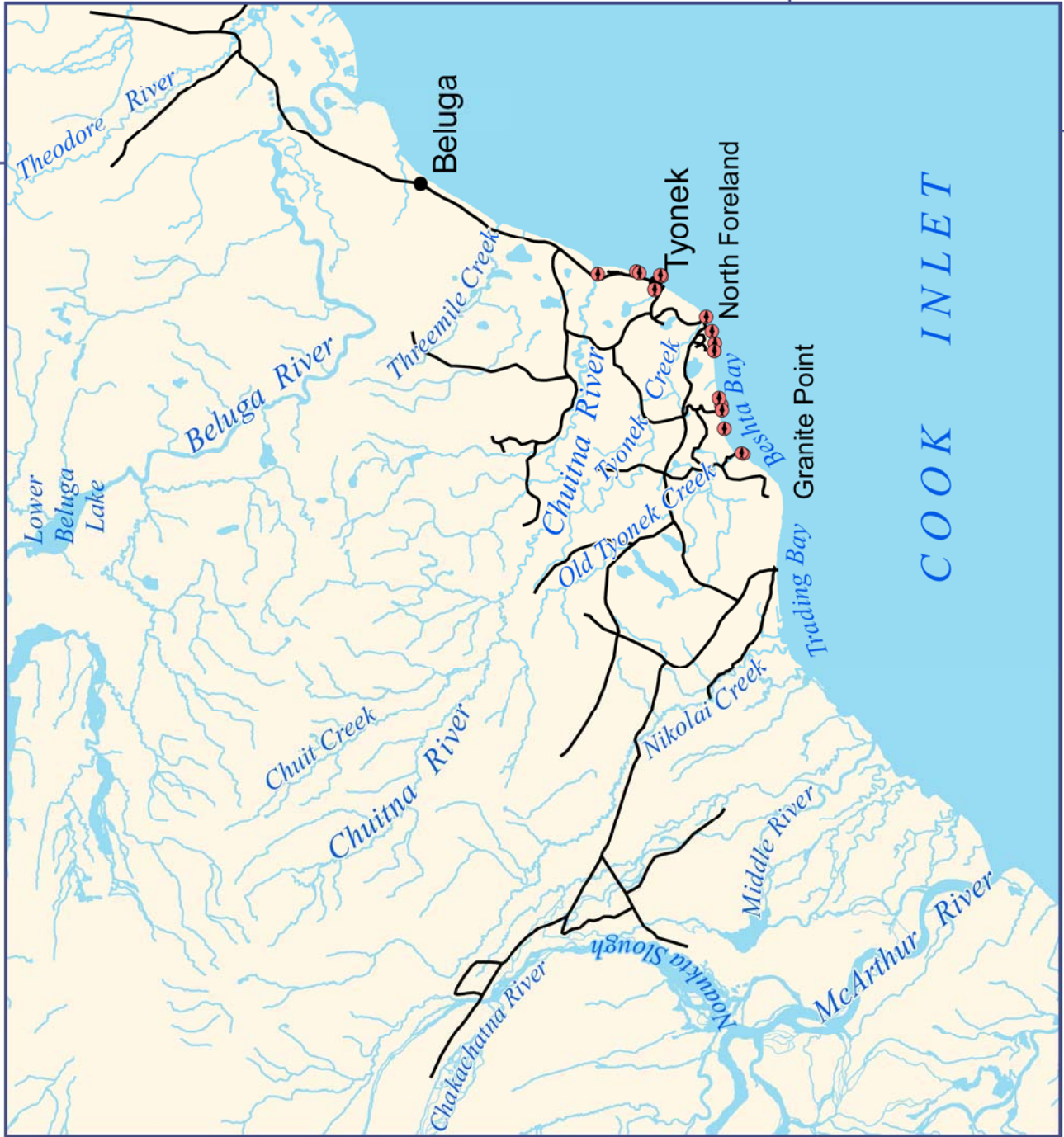
Map Projection: UTM Zone 5N, NAD83

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151°00'W

61°00'N

MAP 2



**Tyonek Sockeye Salmon Harvest Area**

Community

Road

Roads shown are primarily main gravel roads. Additional roads and trails exist beyond those depicted here.

Resource harvest areas change over time. The area represented here is for the year August 1, 2005 through July 31, 2006. For subsistence use information during the 20 year period from 1987-2006 for this community see Stephen R. Braund & Associates Subsistence Use Areas and Traditional Knowledge Study for Tyonek and Beluga, Alaska, 2006.

SCALE: 1:300,000

0 1.25 2.5 5 Miles

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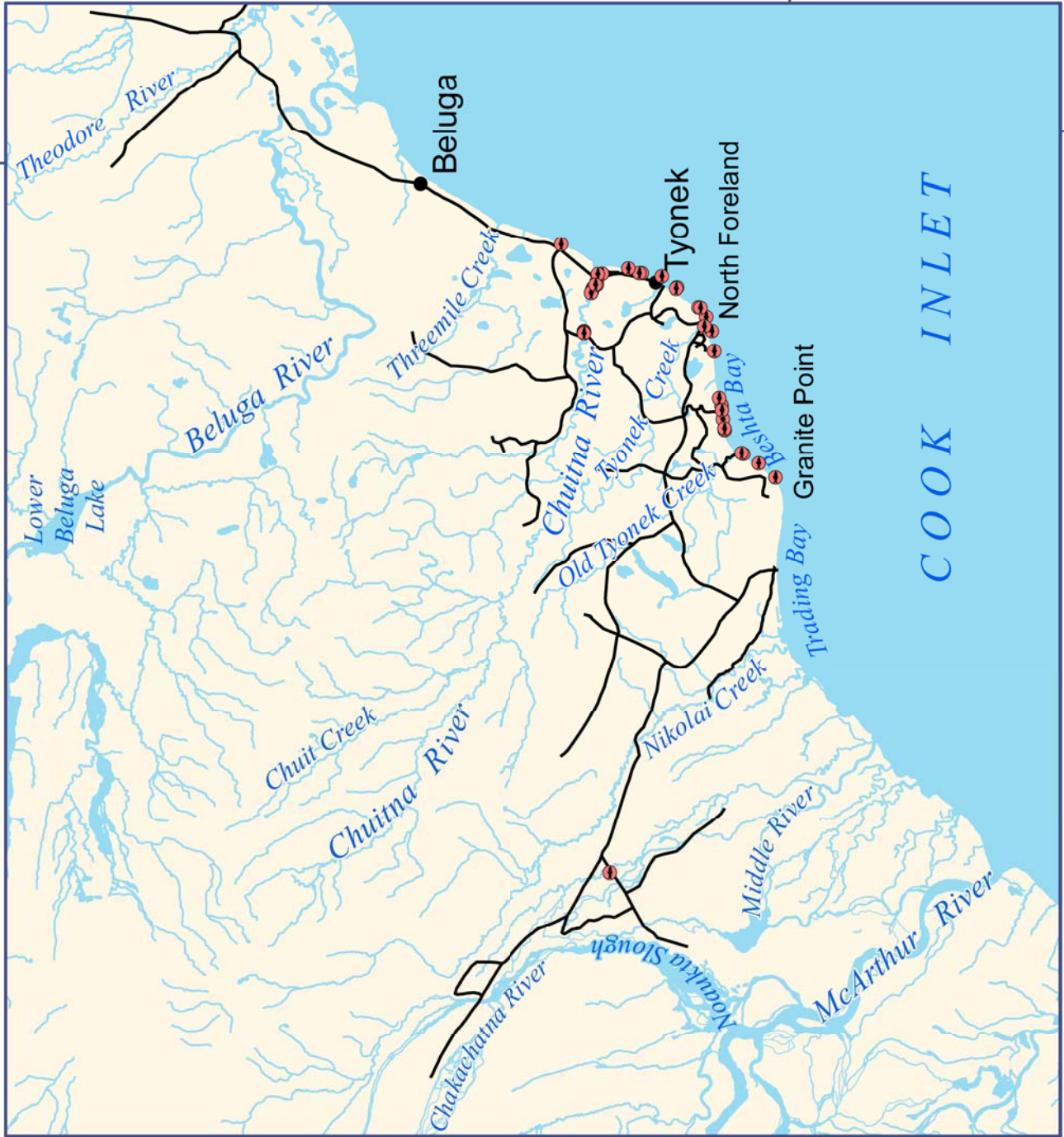
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Division of Subsistence, ADF&G Household Interviews, 2006.  
See Division of Subsistence Technical Paper No. 321, Update of Wild Resource Harvest and Use Information for Tyonek and Beluga, Alaska, 2005/2006 for background on sample sizes and mapping methods.

Map Projection: UTM Zone 5N, NAD83

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151°00'W

61°00'N



**Tyonek Coho Salmon Harvest Area**

Community

Road

Roads shown are primarily main gravel roads. Additional roads and trails exist beyond those depicted here.

Resource harvest areas change over time. The area represented here is for the year August 1, 2005 through July 31, 2006. For subsistence use information during the 20 year period from 1987-2006 for this community see Stephen R. Braund & Associates Subsistence Use Areas and Traditional Knowledge Study for Tyonek and Beluga, Alaska, 2006.

SCALE: 1:300,000

0 1.25 2.5 5 Miles

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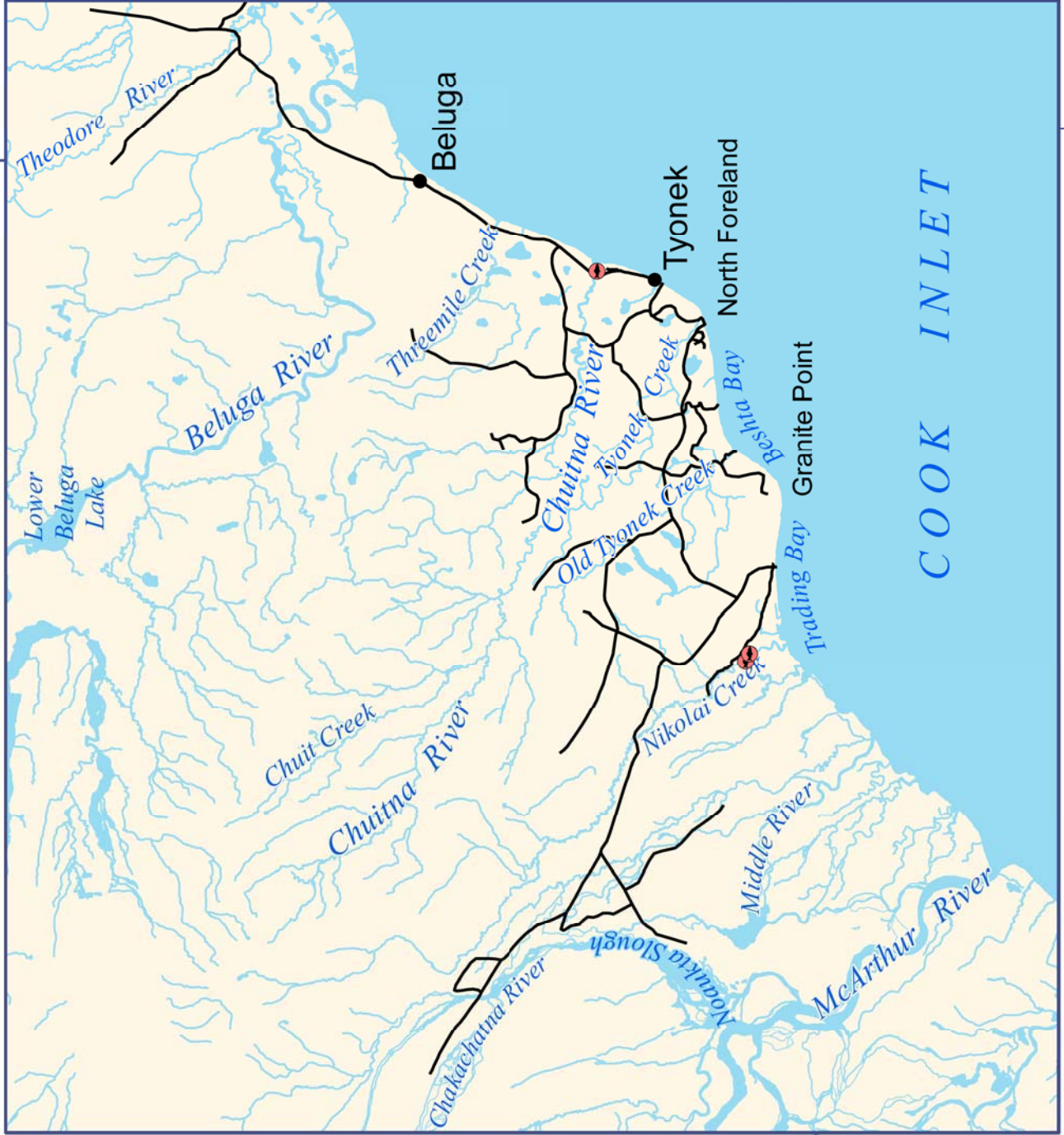
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See Division of Subsistence Technical Paper No. 321, Update of Wild Resource Harvest and Use Information for Tyonek and Beluga, Alaska, 2005/2006 for background on sample sizes and mapping methods.

Map Projection: UTM Zone 5N, NAD83

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151°00'W

61°00'N



**Tyonek Dolly Varden Harvest Area**

**Community**

**Road**

Roads shown are primarily main gravel roads. Additional roads and trails exist beyond those depicted here.

Resource harvest areas change over time. The area represented here is for the year August 1, 2005 through July 31, 2006. For subsistence use information during the 20 year period from 1987-2006 for this community see Stephen R. Braund & Associates Subsistence Use Areas and Traditional Knowledge Study for Tyonek and Beluga, Alaska, 2006.

**SCALE: 1:300,000**

0 1.25 2.5 5 Miles

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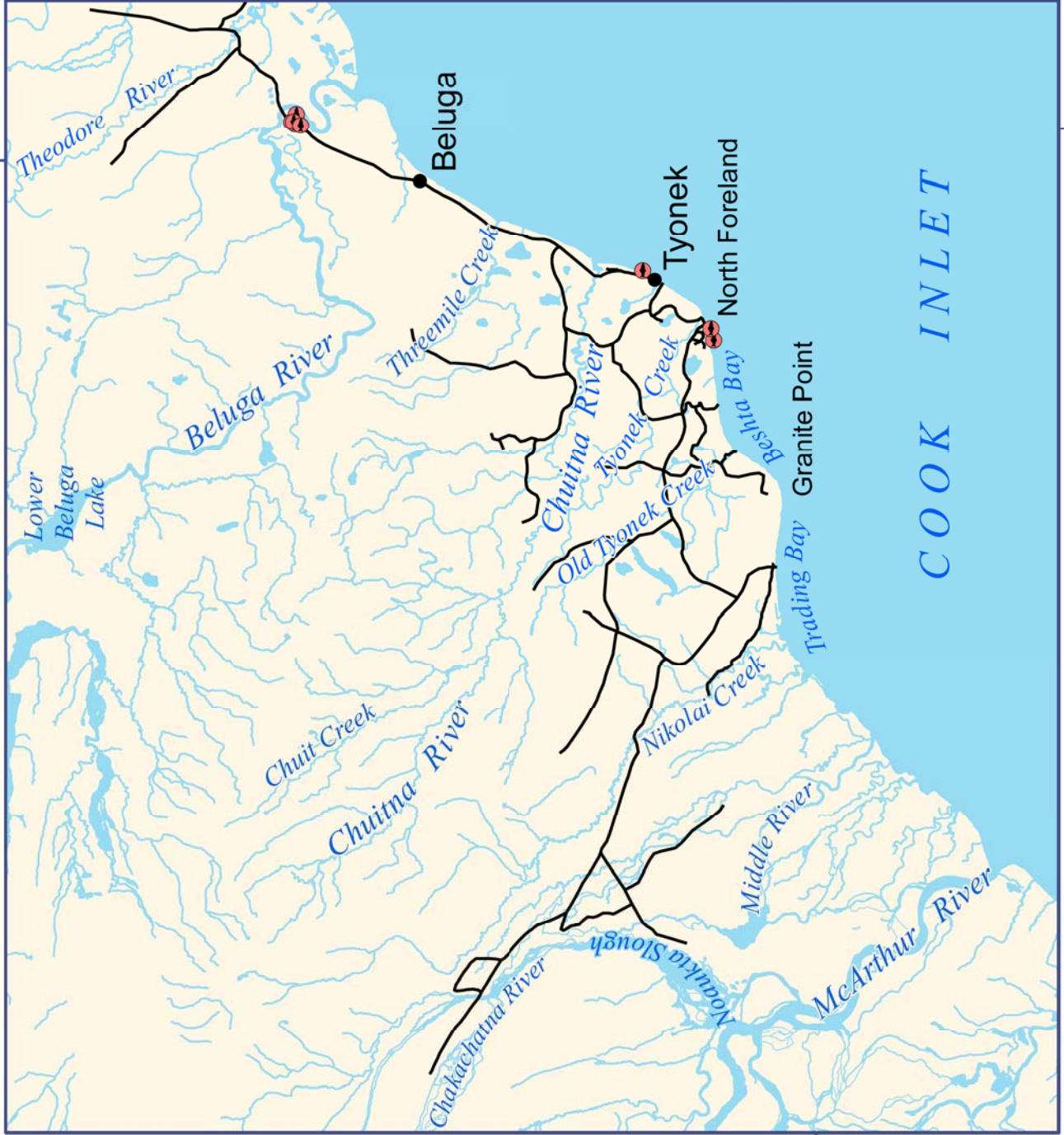
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See Division of Subsistence Technical Paper No. 321, Update of Wild Resource Harvest and Use Information for Tyonek and Beluga, Alaska, 2005/2006 for background on sample sizes and mapping methods.

**Map Projection:** UTM Zone 5N, NAD83

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151°00'W

61°00'N



- Tyonek Eulachon Harvest Area
- Community
- Road

Roads shown are primarily main gravel roads. Additional roads and trails exist beyond those depicted here.

Resource harvest areas change over time. The area represented here is for the year August 1, 2005 through July 31, 2006. For subsistence use information during the 20 year period from 1987-2006 for this community see Stephen R. Braund & Associates Subsistence Use Areas and Traditional Knowledge Study for Tyonek and Beluga, Alaska, 2006.

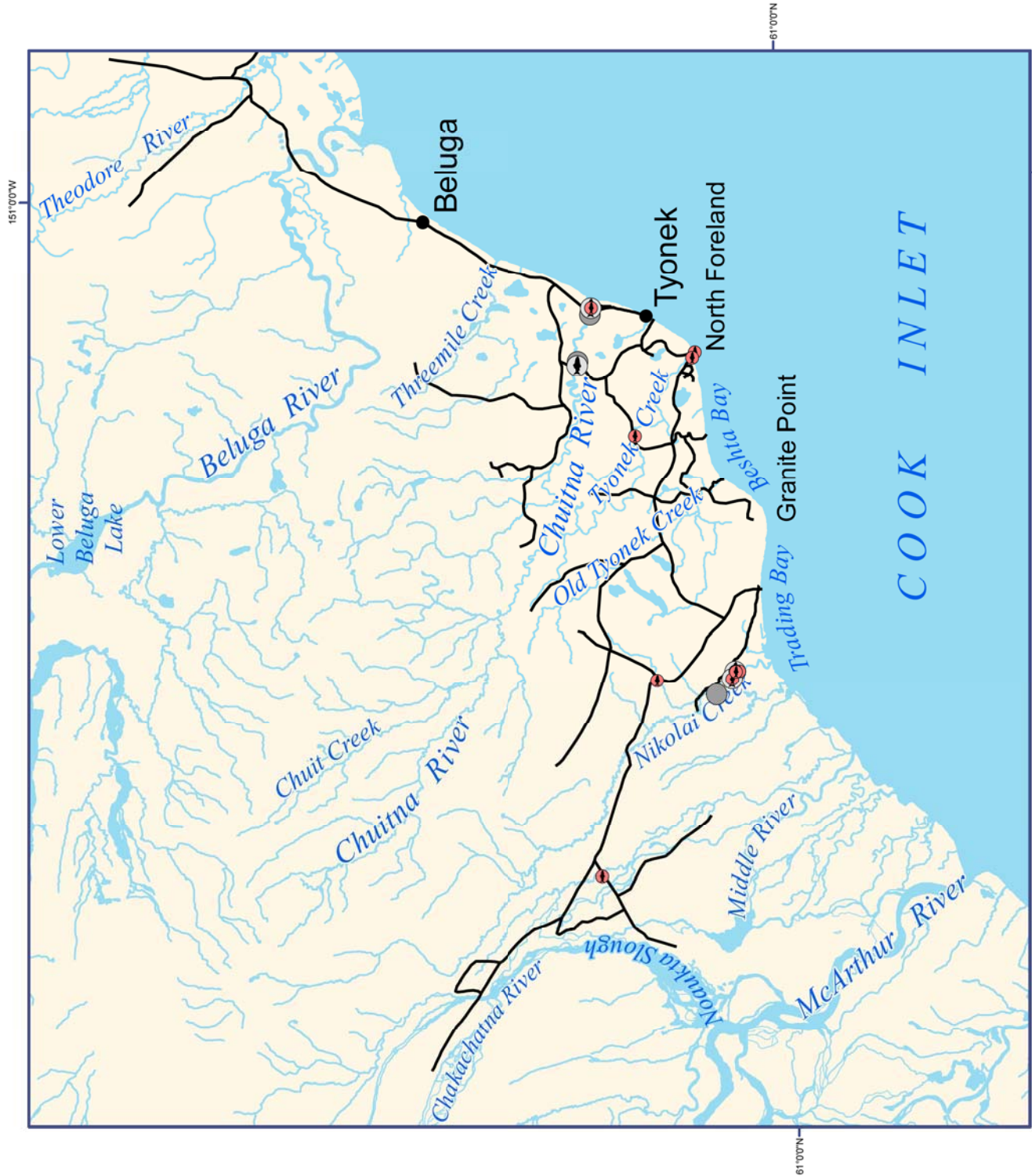
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Map Projection: UTM Zone 5N, NAD83

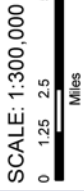
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- Tyonek Rainbow Trout Harvest Area
- Tyonek Steelhead Trout Harvest Area
- Tyonek Trout Harvest Area
- Community
- Road

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Resource harvest areas change over time. The area represented here is for the year August 1, 2005 through July 31, 2006. For subsistence use information during the 20 year period from 1987-2006 for this community, see Stephen R. Braund & Associates Subsistence Use Areas and Traditional Knowledge Study for Tyonek and Beluga, Alaska, 2006.

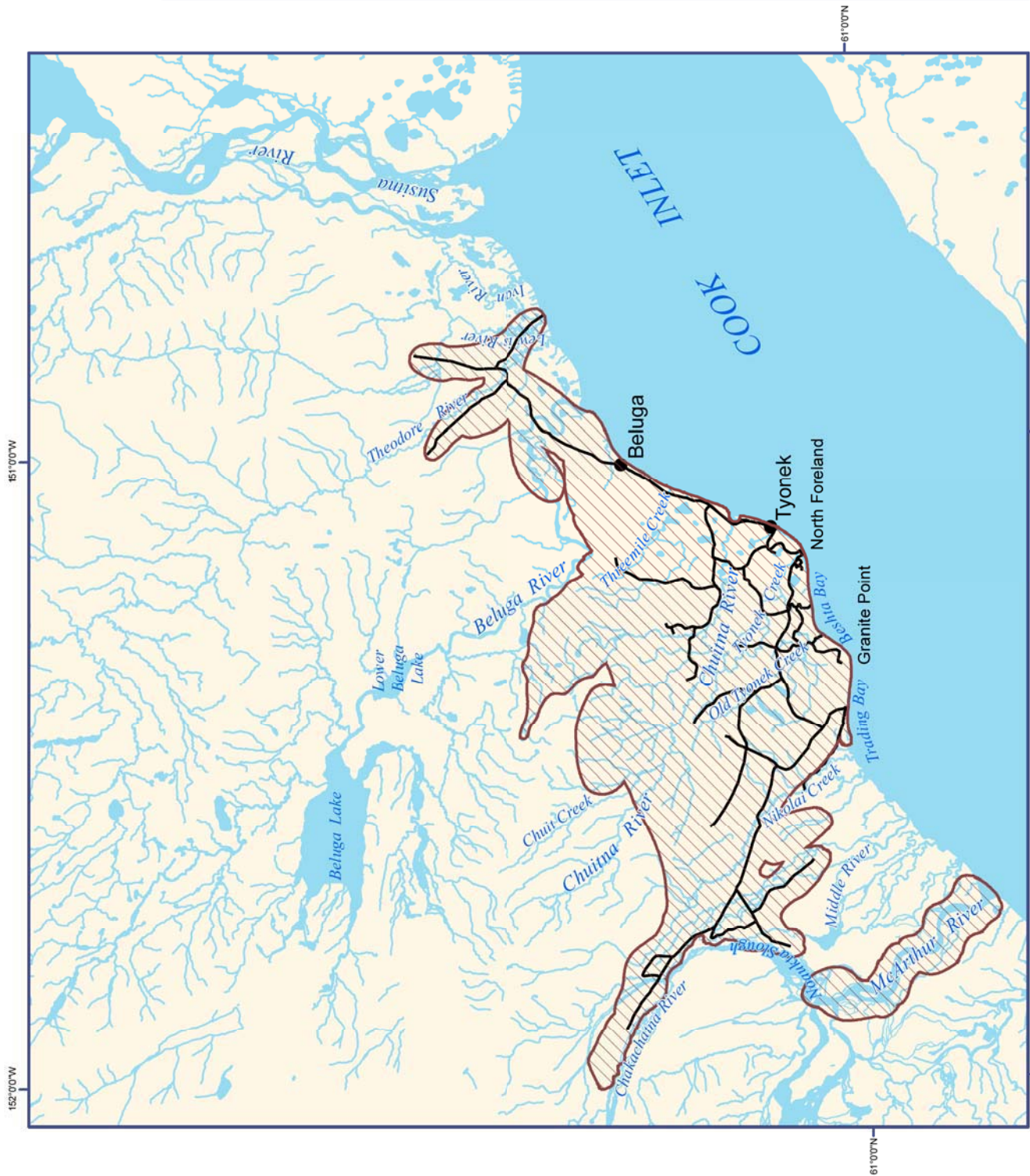


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Tyonek Moose Hunting Area

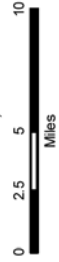
Community

Road

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Resource harvest areas change over time. The area represented here is for the year August 1, 2005 through July 31, 2006. For subsistence use information during the 20 year period from 1987-2006 for this community see Stephen R. Braund & Associates Subsistence Use Areas and Traditional Knowledge Study for Tyonek and Beluga, Alaska, 2006.

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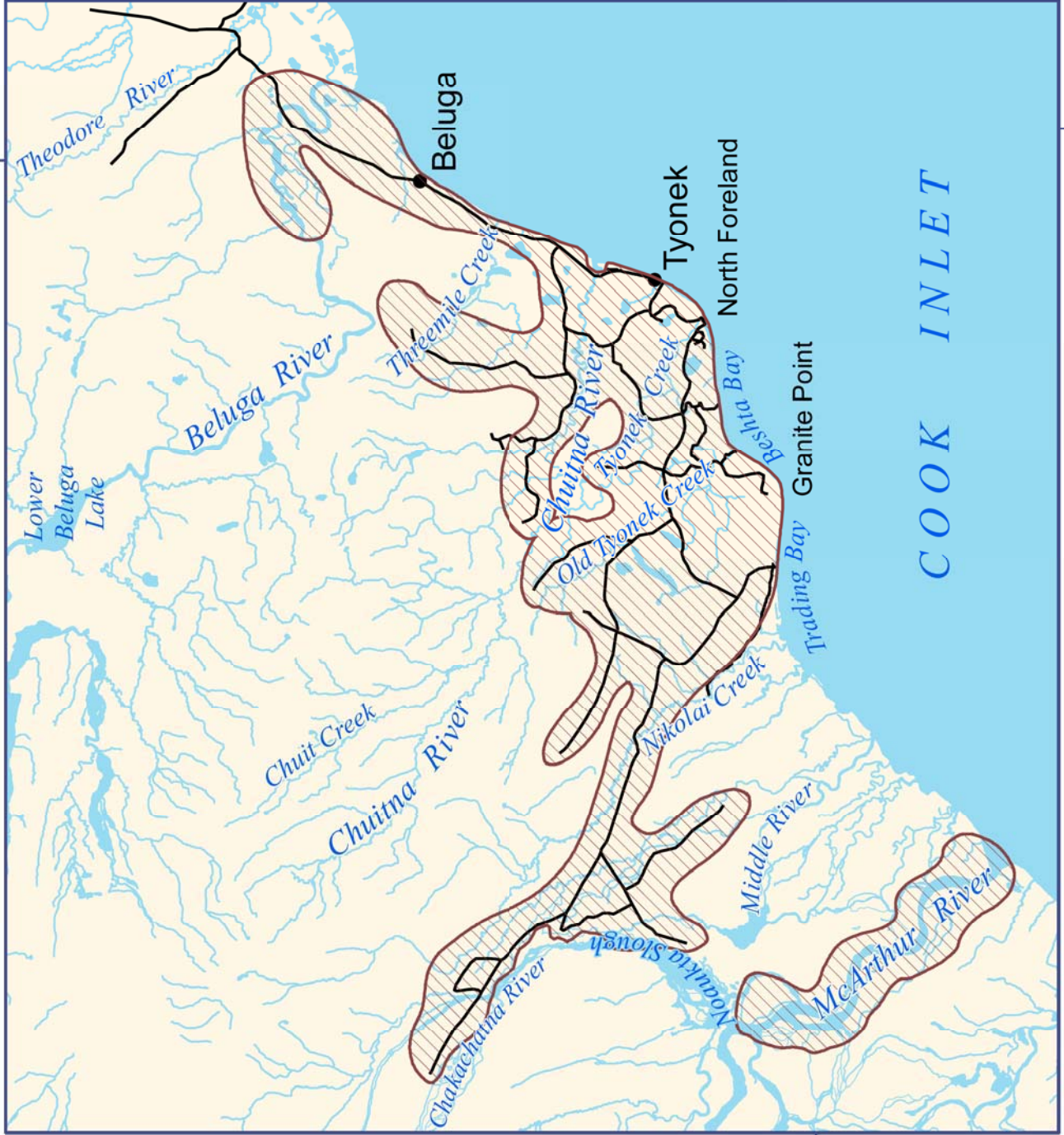


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Map Projection: UTM Zone 5N, NAD83

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Tyonek Brown Bear Hunting Area

Community

Road

Roads shown are primarily main gravel roads. Additional roads and trails exist beyond those depicted here.

Resource harvest areas change over time. The area represented here is for the year August 1, 2005 through July 31, 2006. For subsistence use information during the 20 year period from 1987-2006 for this community see Stephen R. Braund & Associates Subsistence Use Areas and Traditional Knowledge Study for Tyonek and Beluga, Alaska, 2006.

SCALE: 1:300,000



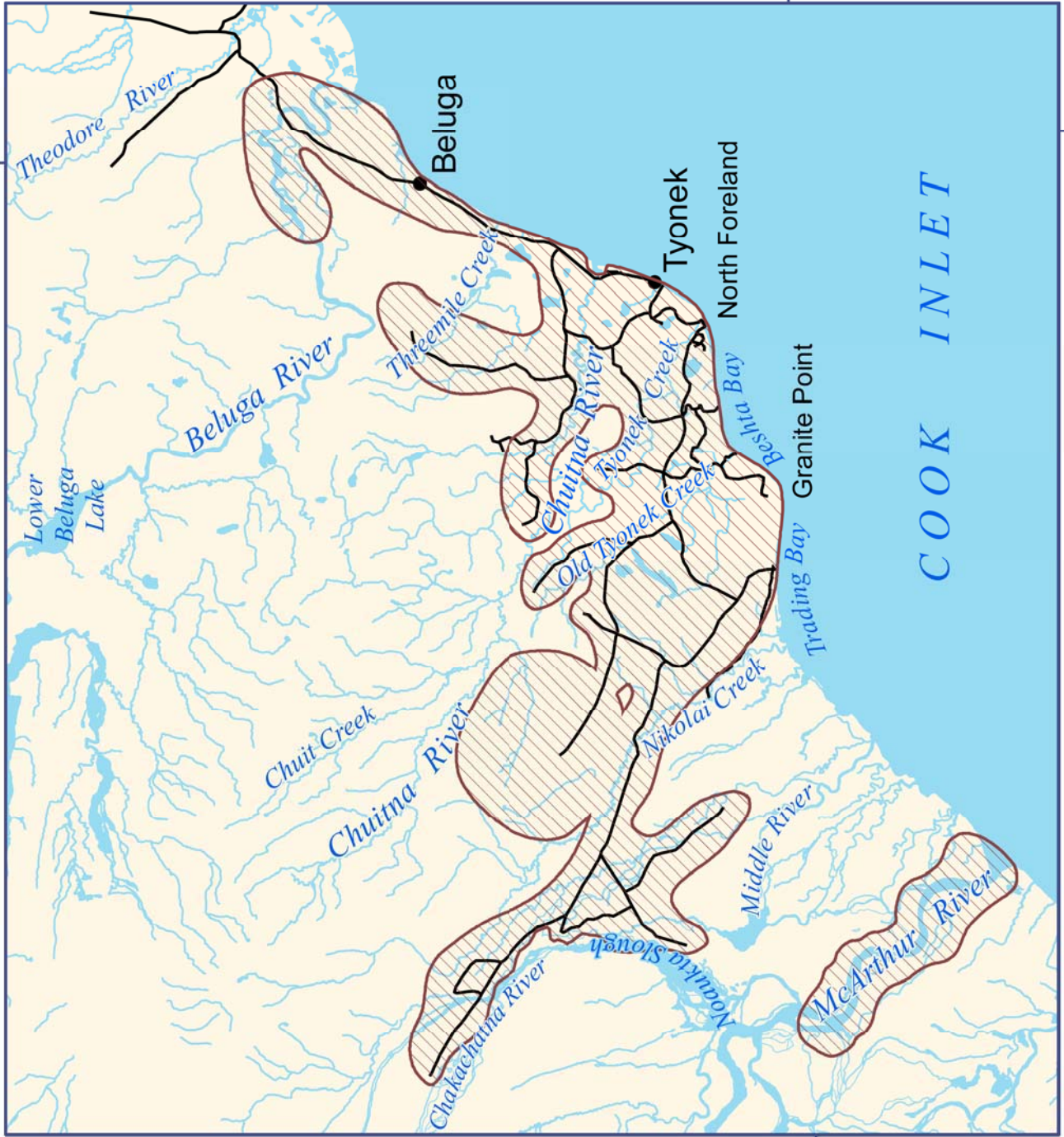
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Source:

Division of Subsistence, ADF&G Household Interviews, 2006. See Division of Subsistence Technical Paper No. 321, Update of Wild Resource Harvest and Use Information for Tyonek and Beluga, Alaska, 2005/2006 for background on sample sizes and mapping methods.

Map Projection: UTM Zone 5N, NAD83

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 Tyonek Black Bear Hunting Area

 Community

 Road

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Resource harvest areas change over time. The area represented here is for the year August 1, 2005 through July 31, 2006. For subsistence use information during the 20 year period from 1987-2006 for this community see Stephen R. Braund & Associates Subsistence Use Areas and Traditional Knowledge Study for Tyonek and Beluga, Alaska, 2006.

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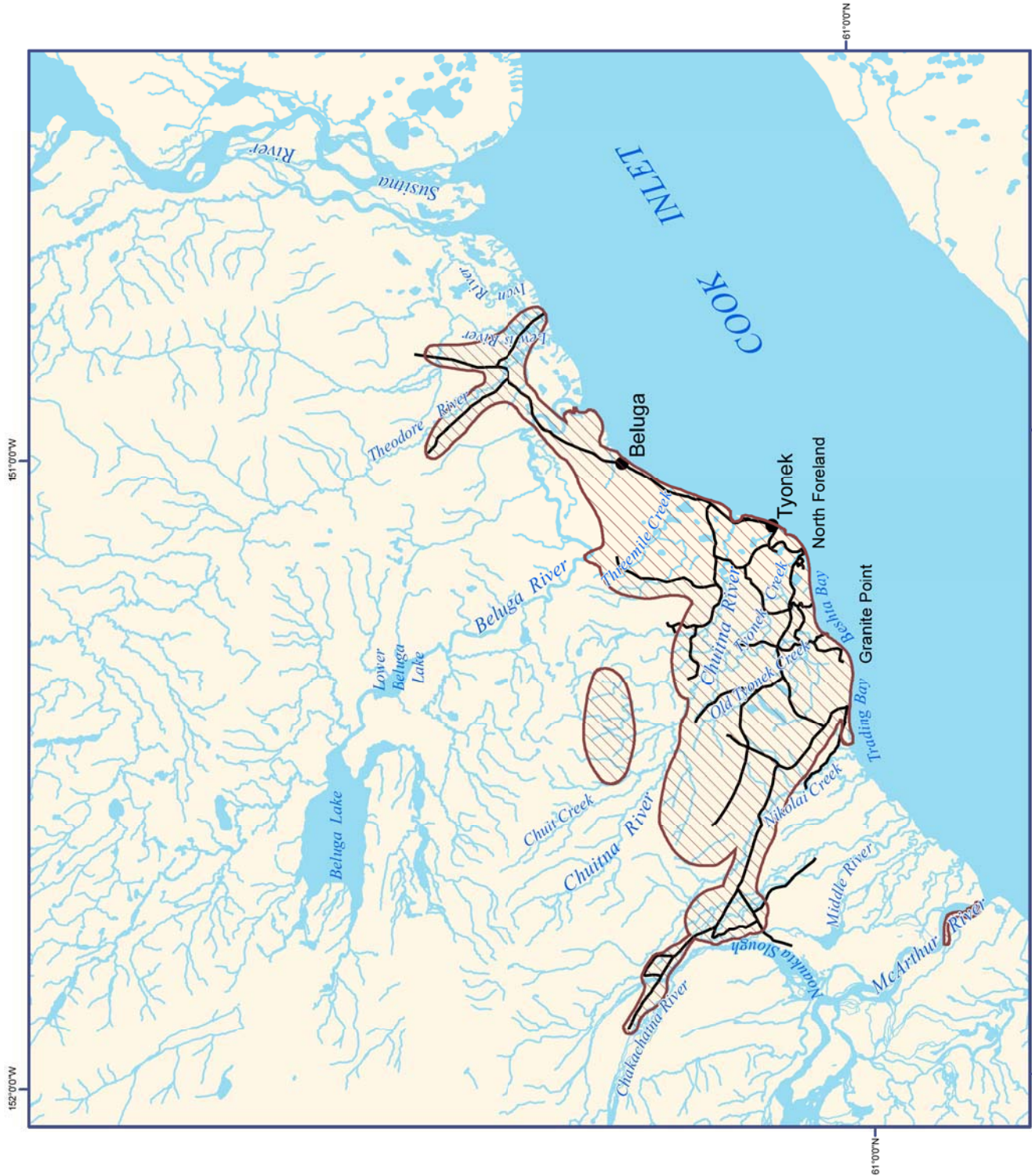



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Source:  
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Map Projection: UTM Zone 5N, NAD83

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 Tyonek Small Land Mammal Hunting Area

 Community

 Road

Roads shown are primarily main gravel roads. Additional roads and trails exist beyond those depicted here.

Resource harvest areas change over time. The area represented here is for the year August 1, 2005 through July 31, 2006. For subsistence use information during the 20 year period from 1987-2006 for this community see Stephen R. Braund & Associates Subsistence Use Areas and Traditional Knowledge Study for Tyonek and Beluga, Alaska, 2006.

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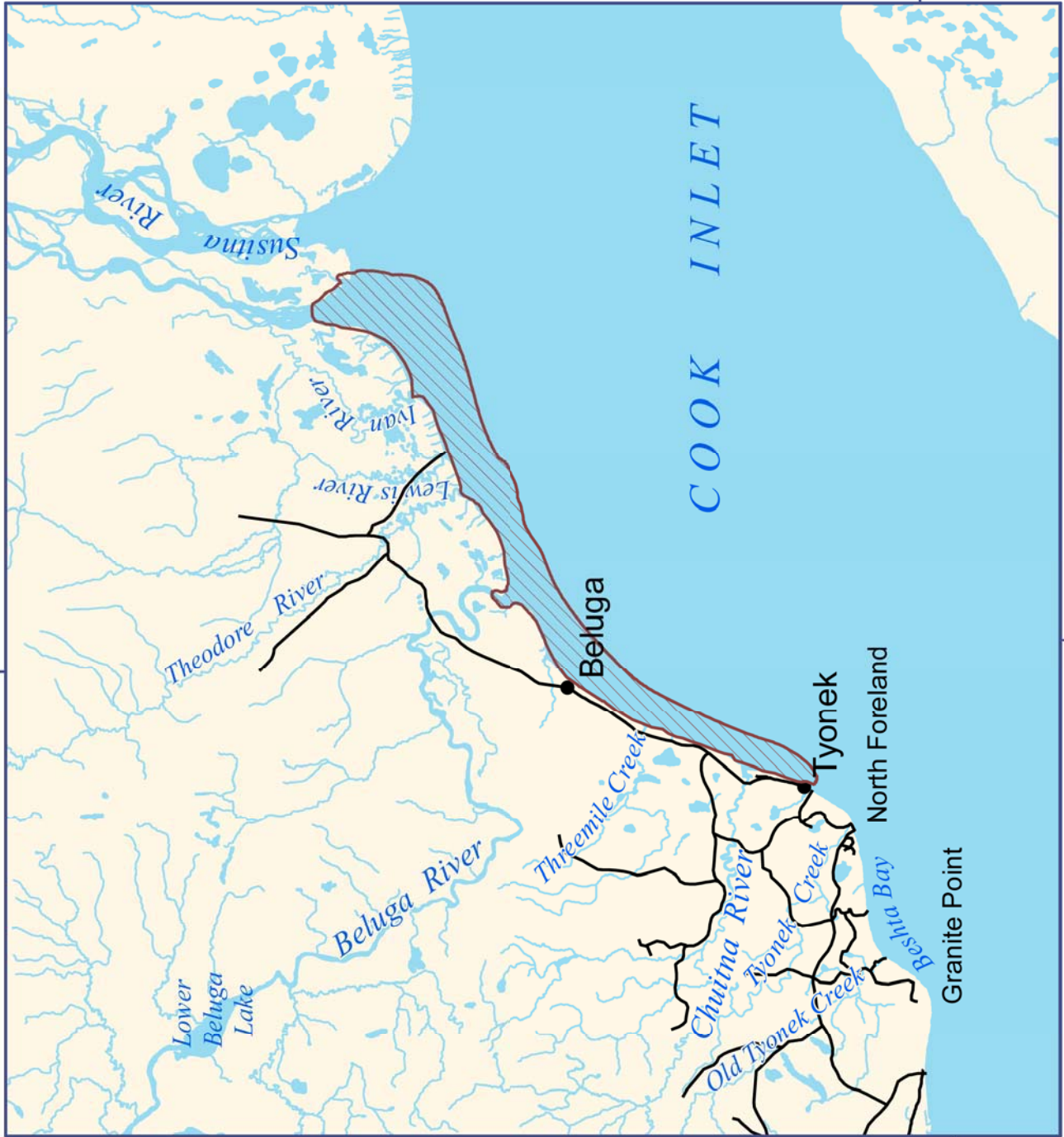




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Source:  
Division of Subsistence, ADF&G Household Interviews, 2006.  
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Map Projection: UTM Zone 5N, NAD83

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-  Tyonek Beluga Hunting Area
-  Community
-  Road

Roads shown are primarily main gravel roads. Additional roads and trails exist beyond those depicted here.

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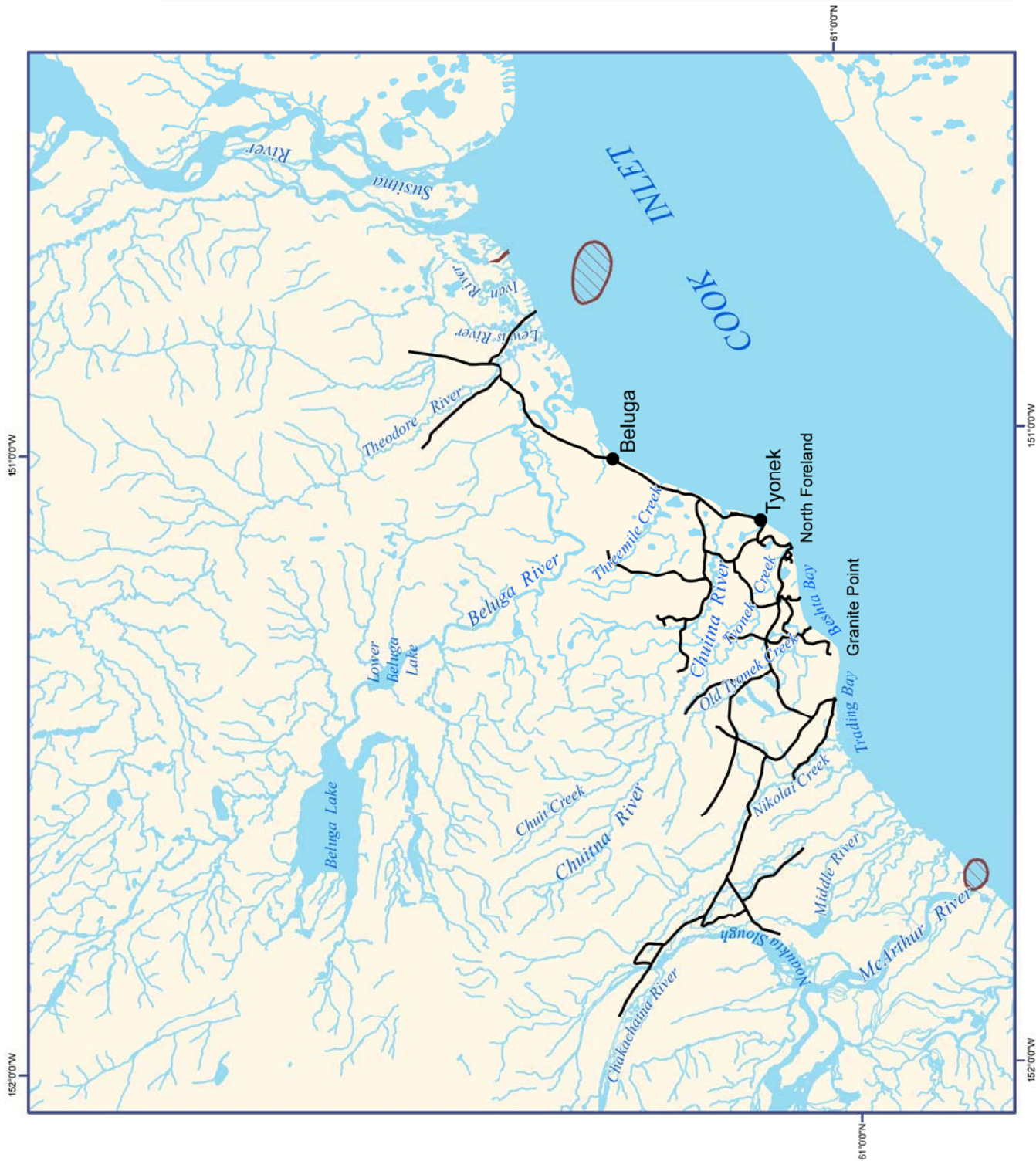
SCALE: 1:300,000  
 0 1.25 2.5 5  
 Miles

PacRim Coal, through Stephen R. Braund & Associates, provided funding to ADF&G for this study. Stephen R. Braund & Associates, funded by PacRim Coal, digitized the data and prepared the GIS maps.

Source:  
 Division of Subsistence, ADF&G Household Interviews, 2006.  
 See Division of Subsistence Technical Paper No. 321, Update of Wild Resource Harvest and Use Information for Tyonek and Beluga, Alaska, 2005/2006 for background on sample sizes and mapping methods.

Map Projection: UTM Zone 5N, NAD83

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 Anchorage, Alaska 99510  
 907-276-8222 907-276-6117 (fax) srb@adfg.state.ak.us



Tyonek Seal Hunting Area

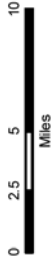
Community

Road

Roads shown are primarily main gravel roads. Additional roads and trails exist beyond those depicted here.

Resource harvest areas change over time. The area represented here is for the year August 1, 2005 through July 31, 2006. For subsistence use information during the 20 year period from 1987-2006 for this community see Stephen R. Braund & Associates Subsistence Use Areas and Traditional Knowledge Study for Tyonek and Beluga, Alaska, 2006.

SCALE: 1:450,000

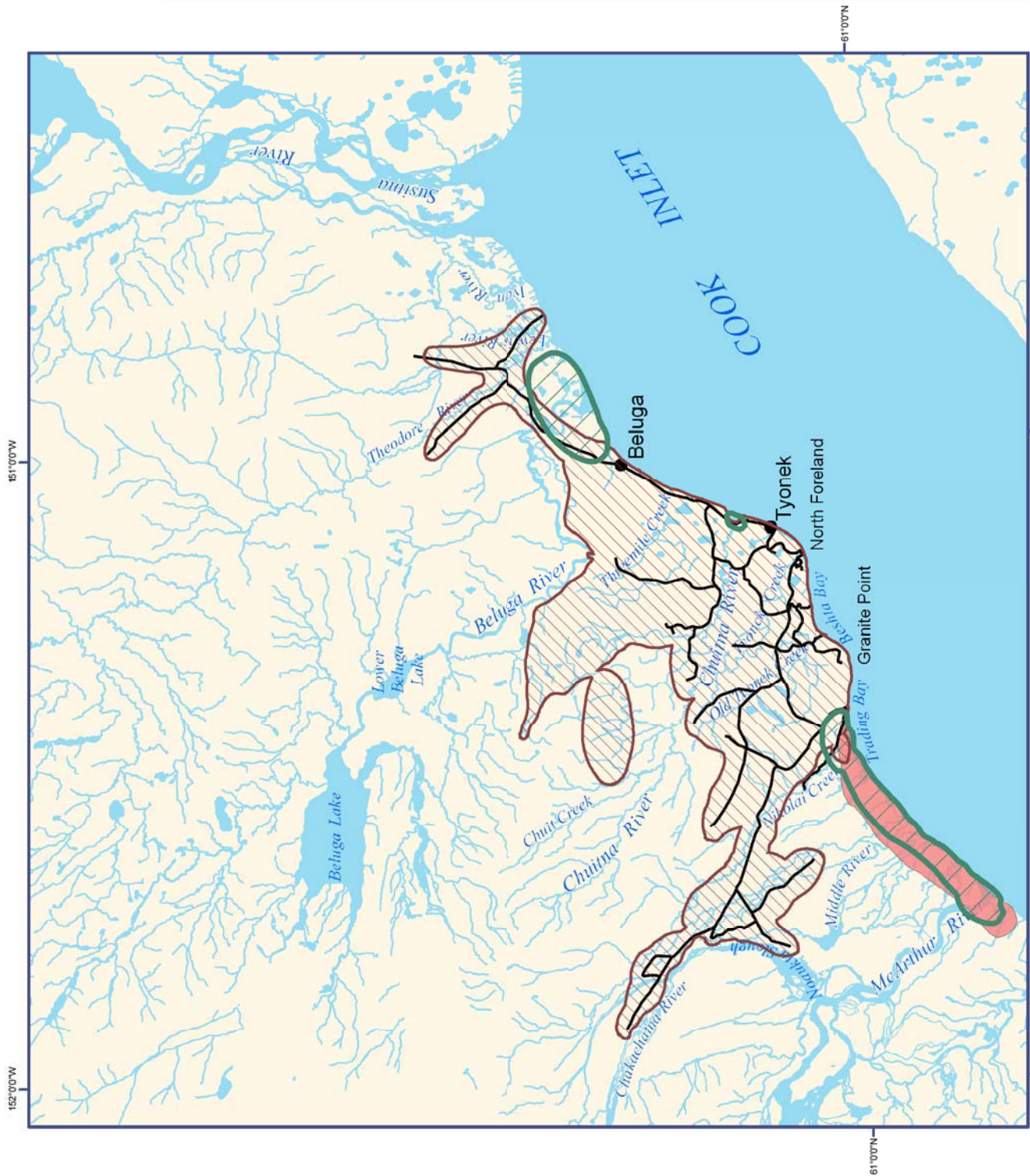


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Source: Division of Subsistence, ADF&G Household Interviews, 2006. See Division of Subsistence Technical Paper No. 321, Update of Wild Resource Harvest and Use Information for Tyonek and Beluga, Alaska, 2005/2006 for background on sample sizes and mapping methods.

Map Projection: UTM Zone 5N, NAD83

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- Tyonek Egg Harvesting Area
- Tyonek Upland Bird Harvesting Area
- Tyonek Waterfowl Harvesting Area

- Community
- Road

Roads shown are primarily main gravel roads. Additional roads and trails exist beyond those depicted here.

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SCALE: 1:450,000  
 0 2.5 5 10  
 Miles

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 Division of Subsistence, ADF&G Household Interviews, 2006.  
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Map Projection: UTM Zone 5N, NAD83

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 907-276-8222 907-276-6177 (fax) srb@aakadna.net

151°00'W

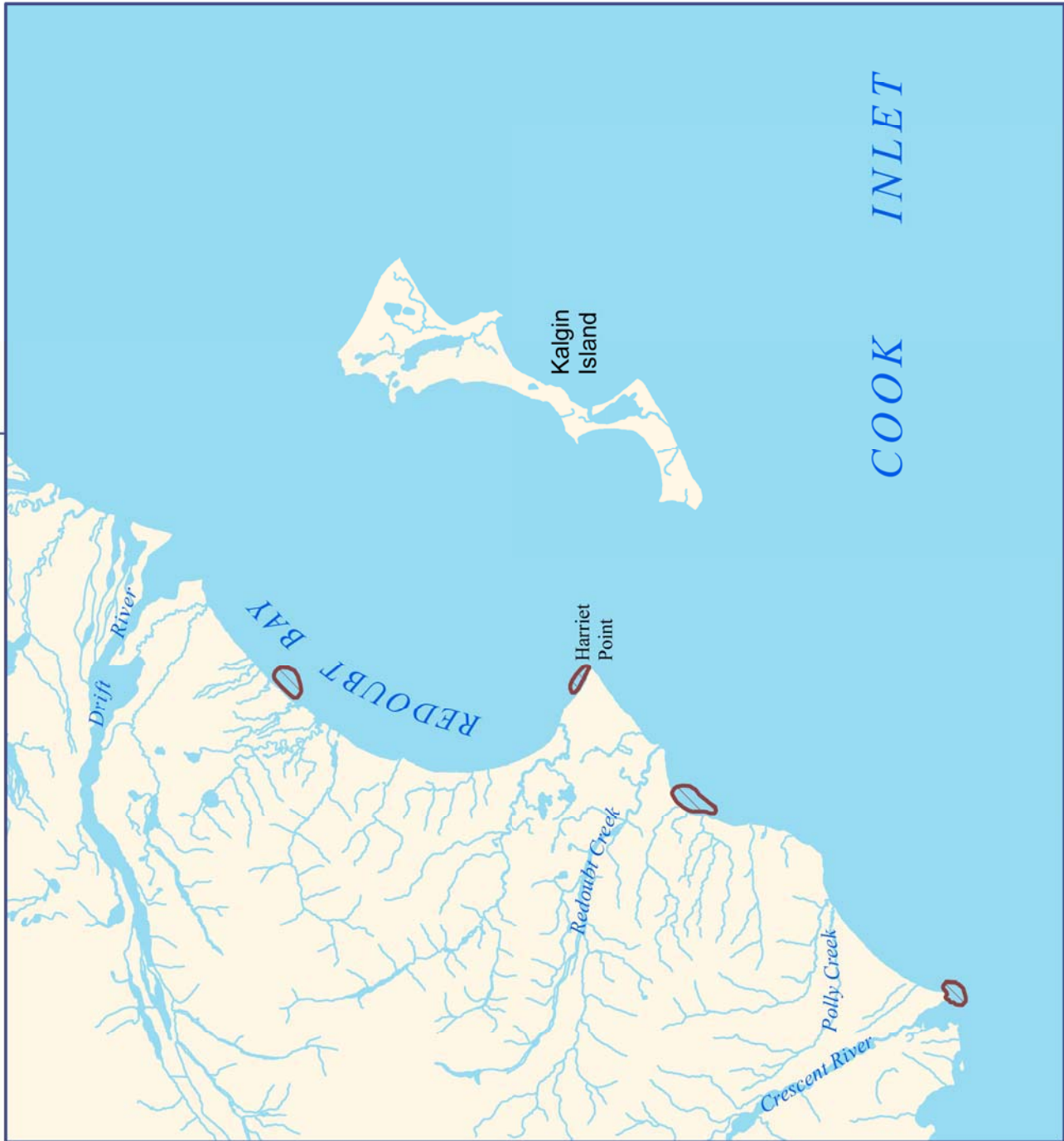
152°00'W

61°00'N

61°00'N

151°00'W

152°00'W



Tyonek Clam Harvest Area

Community

Road

Roads shown are primarily main gravel roads. Additional roads and trails exist beyond those depicted here.

Resource harvest areas change over time. The area represented here is for the year August 1, 2005 through July 31, 2006. For subsistence use information during the 20 year period from 1987-2006 for this community, see Stephen R. Braund & Associates Subsistence Use Areas and Traditional Knowledge Study for Tyonek and Beluga, Alaska, 2006.

SCALE: 1:300,000



PacRim Coal, through Stephen R. Braund & Associates, provided funding to ADF&G for this study. Stephen R. Braund & Associates, funded by PacRim Coal, digitized the data and prepared the GIS maps.

Source:  
Division of Subsistence, ADF&G Household Interviews, 2006.

See Division of Subsistence Technical Paper No. 321, Update of Wild Resource Harvest and Use Information for Tyonek and Beluga, Alaska, 2005/2006 for background on sample sizes and mapping methods.

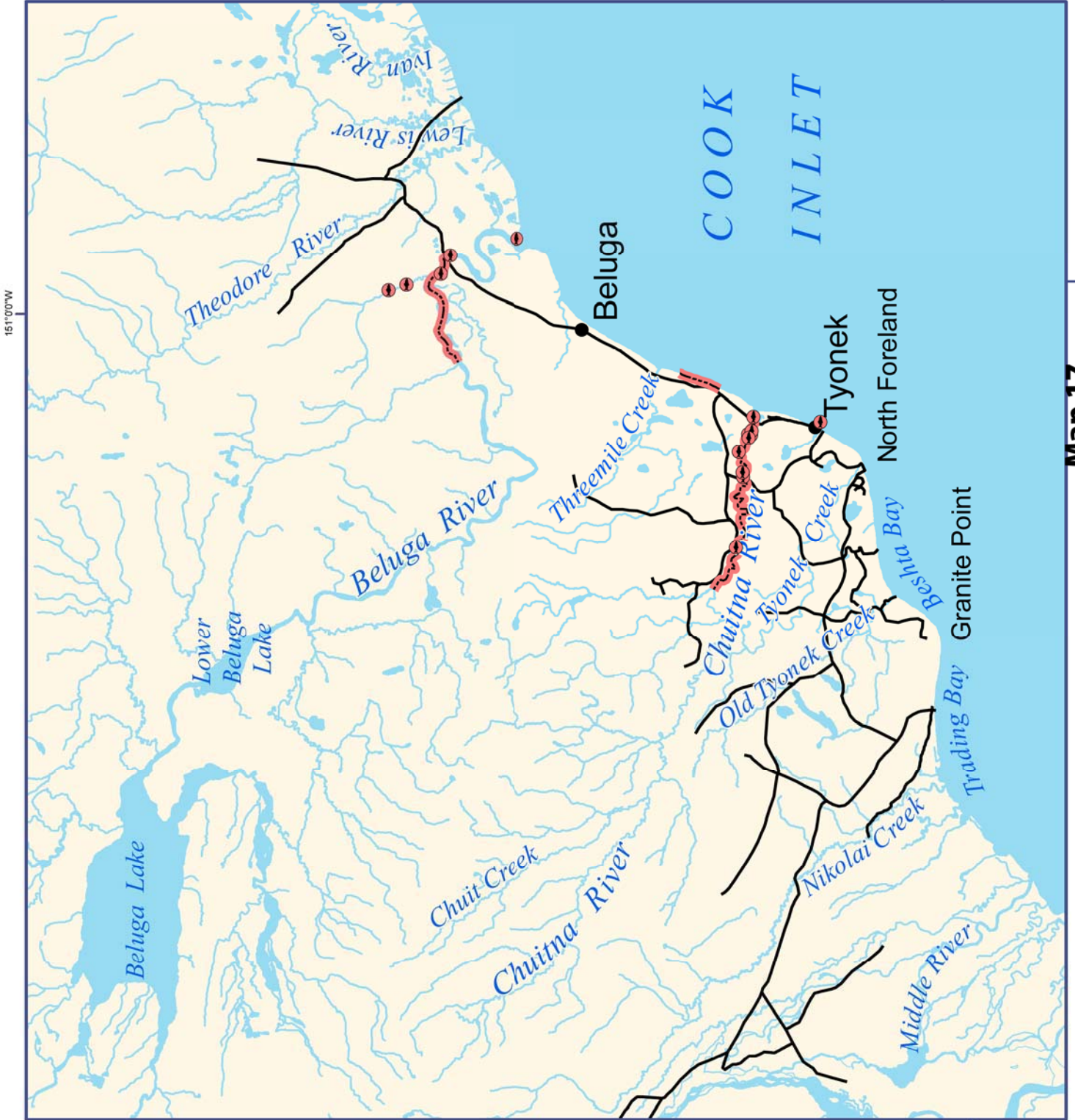
Map Projection: UTM Zone 5N, NAD83

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907-276-8222 907-276-6117 (fax) srb@alaska.net

152°00'W

152°00'W





Beluga Chinook Salmon Harvest Area

Beluga Chinook Salmon Harvest Area

Community

Road

Roads shown are primarily main gravel roads. Additional roads and trails exist beyond those depicted here.

Resource harvest areas change over time. The area represented here is for the year August 1, 2005 through July 31, 2006. For subsistence use information during the 20 year period from 1987-2006 for this community, see Stephen R. Braund & Associates Subsistence Use Areas and Traditional Knowledge Study for Tyonek and Beluga, Alaska, 2005.

SCALE: 1:300,000

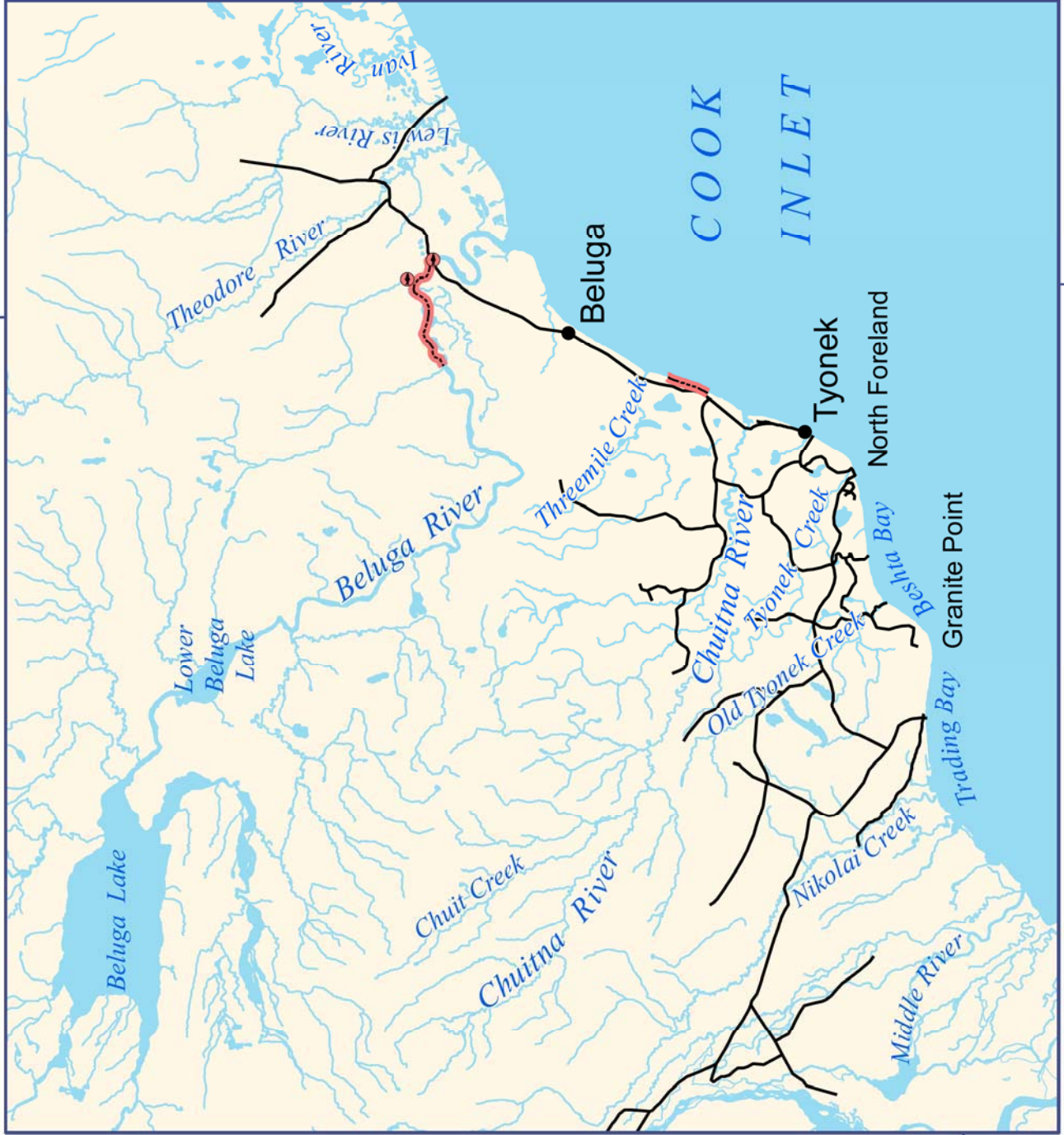


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Source: Division of Subsistence, ADF&G Household Interviews, 2006. See Division of Subsistence Technical Paper No. 321, Update of Wild Resource Harvest and Use Information for Tyonek and Beluga, Alaska, 2005/2006 for background on sample sizes and mapping methods.

Map Projection: UTM Zone 5N, MAD83

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 907-276-8222 907-276-6117 (fax) srb@alaska.net



- Beluga Sockeye Salmon Harvest Area
- Beluga Sockeye Salmon Harvest Area

- Community
- Road

Roads shown are primarily main gravel roads. Additional roads and trails exist beyond those depicted here.

Resource harvest areas change over time. The area represented here is for the year August 1, 2005 through July 31, 2006. For subsistence use information during the 20 year period from 1987-2006 for this community see Stephen R. Braund & Associates Subsistence Use Areas and Traditional Knowledge Study for Tyonek and Beluga, Alaska, 2006.

SCALE: 1:300,000  
 0 1.25 2.5 5 Miles

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Source: Division of Subsistence, ADF&G Household Interviews, 2006. See Division of Subsistence Technical Paper No. 321, Update of Wild Resource Harvest and Use Information for Tyonek and Beluga, Alaska, 2005/2006 for background on sample sizes and mapping methods.

Map Projection: UTM Zone 5N, NAD83

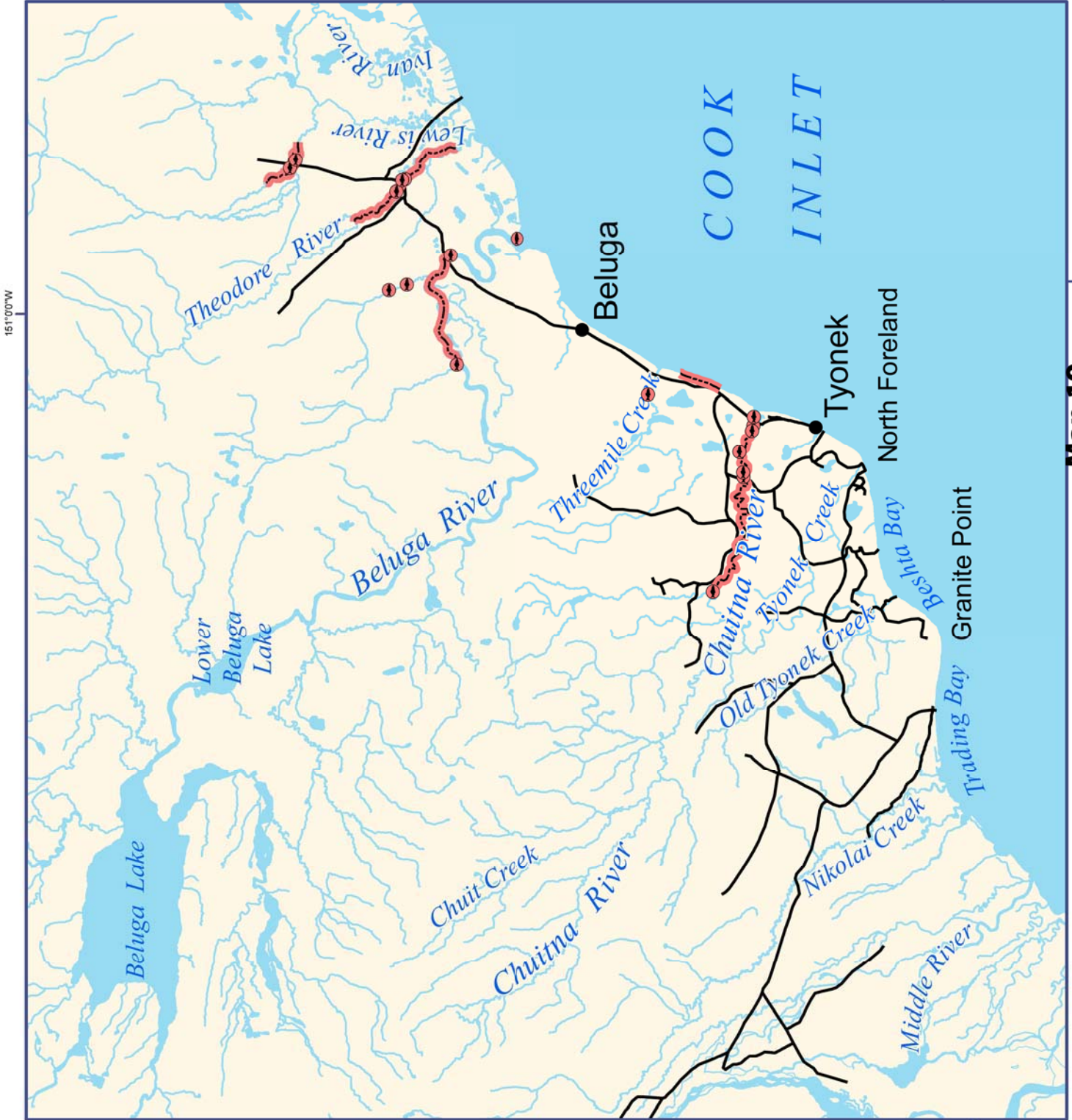
Prepared by Stephen R. Braund & Associates  
 P.O. Box 1480  
 Anchorage, Alaska 99510  
 907-276-8222, 907-276-6117 (fax) srbra@adfga.net

151°00'W

61°00'N

61°00'N

151°00'W



Beluga Coho Salmon Harvest Area

Beluga Coho Salmon Harvest Area

Community

Road

Roads shown are primarily main gravel roads. Additional roads and trails exist beyond those depicted here.

Resource harvest areas change over time. The area represented here is for the year August 1, 2005 through July 31, 2006. For subsistence use information during the 20 year period from 1987-2006 for this community, see Stephen R. Braund & Associates Subsistence Use Areas and Traditional Knowledge Study for Tyonek and Beluga, Alaska, 2005.

SCALE: 1:300,000



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Source: Division of Subsistence, ADF&G Household Interviews, 2006. See Division of Subsistence Technical Paper No. 321, Update of Wild Resource Harvest and Use Information for Tyonek and Beluga, Alaska, 2005/2006 for background on sample sizes and mapping methods.

Map Projection: UTM Zone 5N, MAD83

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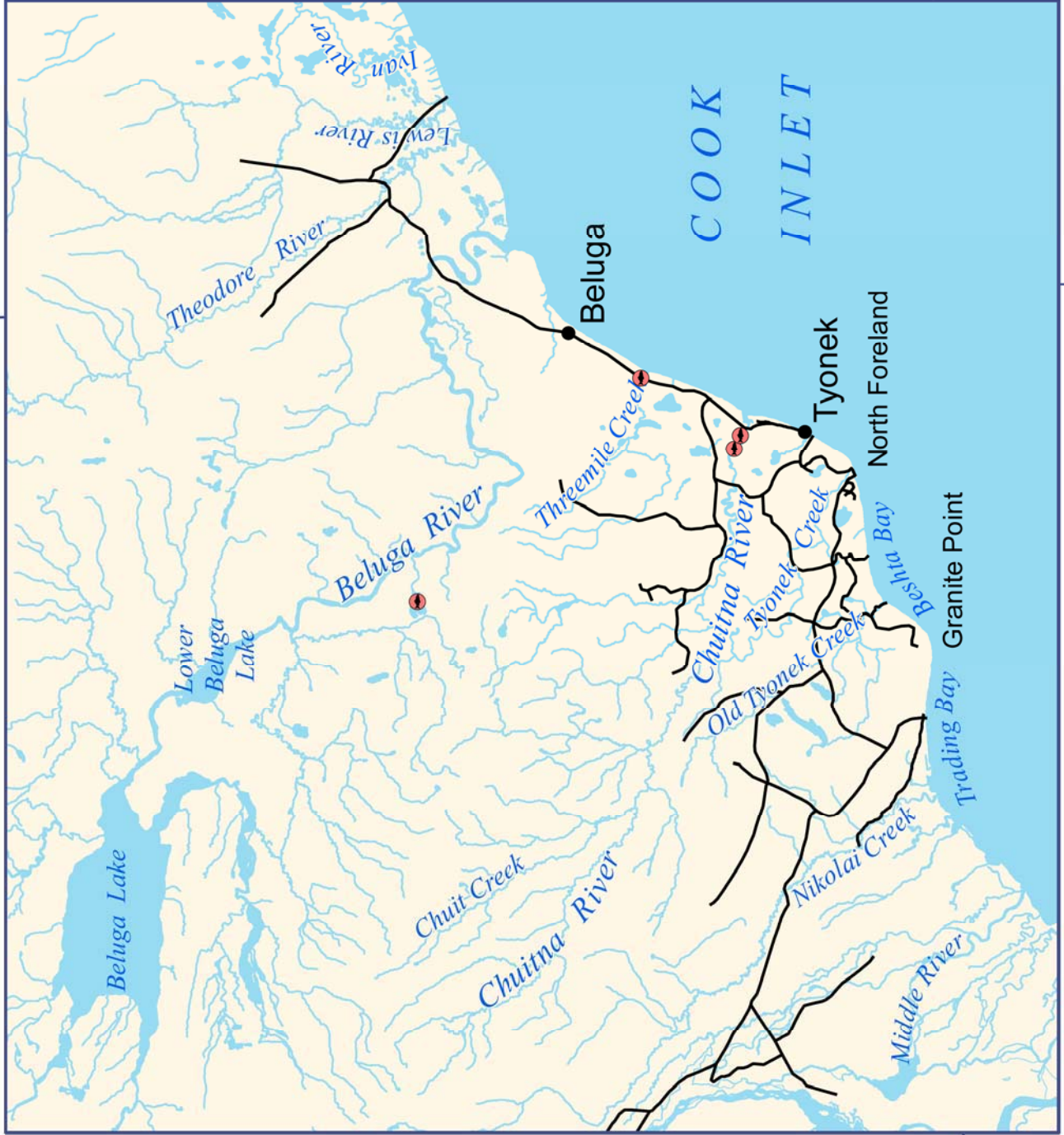
151°00'W

61°00'N

151°00'W

Map 19

61°00'N



Beluga Dolly Varden Harvest Area

Community  
Road

Roads shown are primarily main gravel roads. Additional roads and trails exist beyond those depicted here.

Resource harvest areas change over time. The area represented here is for the year August 1, 2005 through July 31, 2006. For subsistence use information during the 20 year period from 1987-2006 for this community see Stephen R. Braund & Associates Subsistence Use Areas and Traditional Knowledge Study for Tyonek and Beluga, Alaska, 2006.

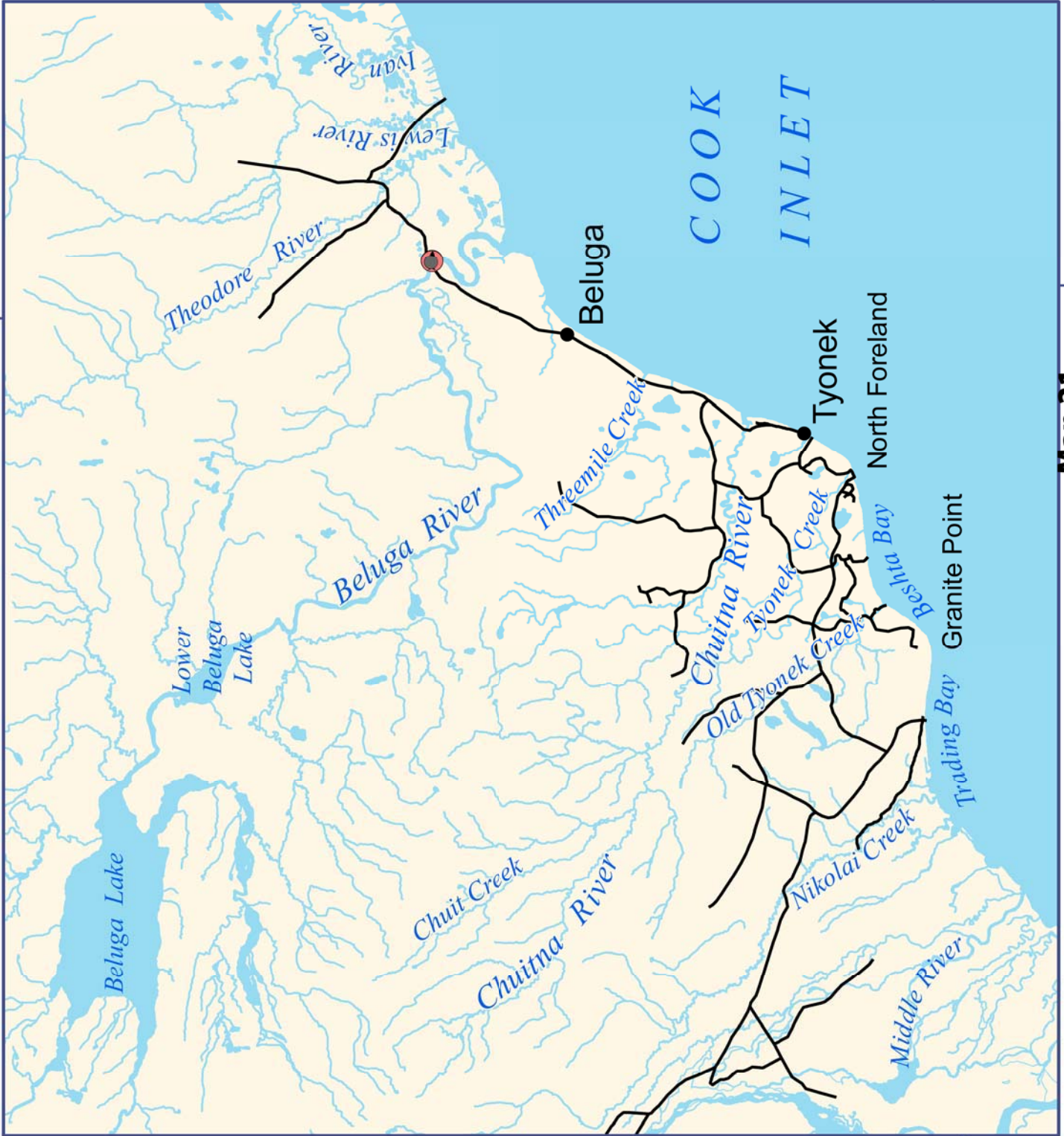
SCALE: 1:300,000  
0 1.25 2.5 5 Miles


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Source:  
Division of Subsistence, ADF&G Household Interviews, 2006.  
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Map Projection: UTM Zone 5N, NAD83

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-  Beluga Eulachon Harvest Area
-  Beluga Smelt Harvest Area

-  Community
-  Road

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SCALE: 1:300,000

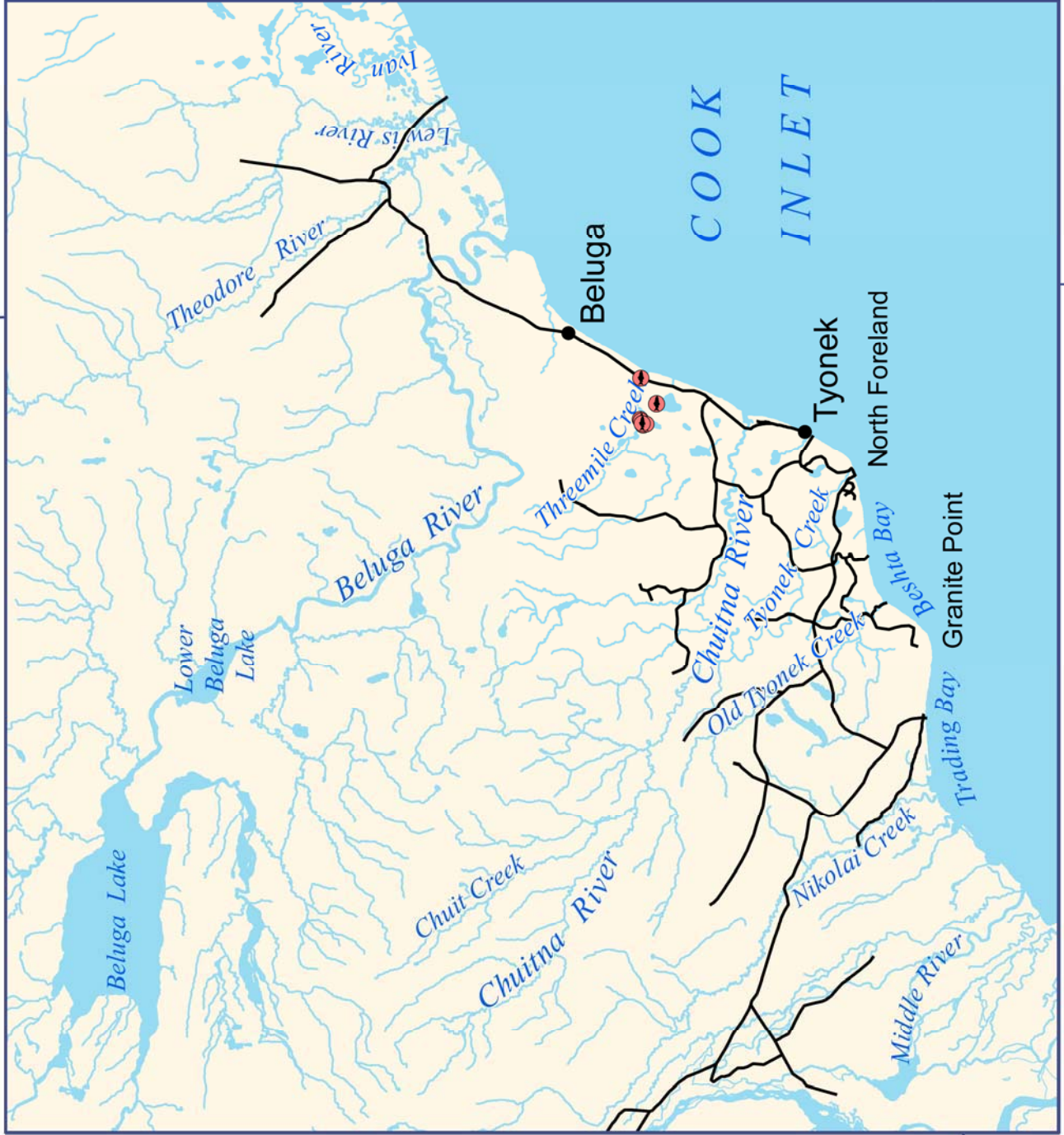


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Map Projection: UTM Zone 5N, NAD83

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Beluga Northern Pike Harvest Area



Community



Road



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Resource harvest areas change over time. The area represented here is for the year August 1, 2005 through July 31, 2006. For subsistence use information during the 20 year period from 1987-2006 for this community see Stephen R. Braund & Associates Subsistence Use Areas and Traditional Knowledge Study for Tyonek and Beluga, Alaska, 2006.

SCALE: 1:300,000

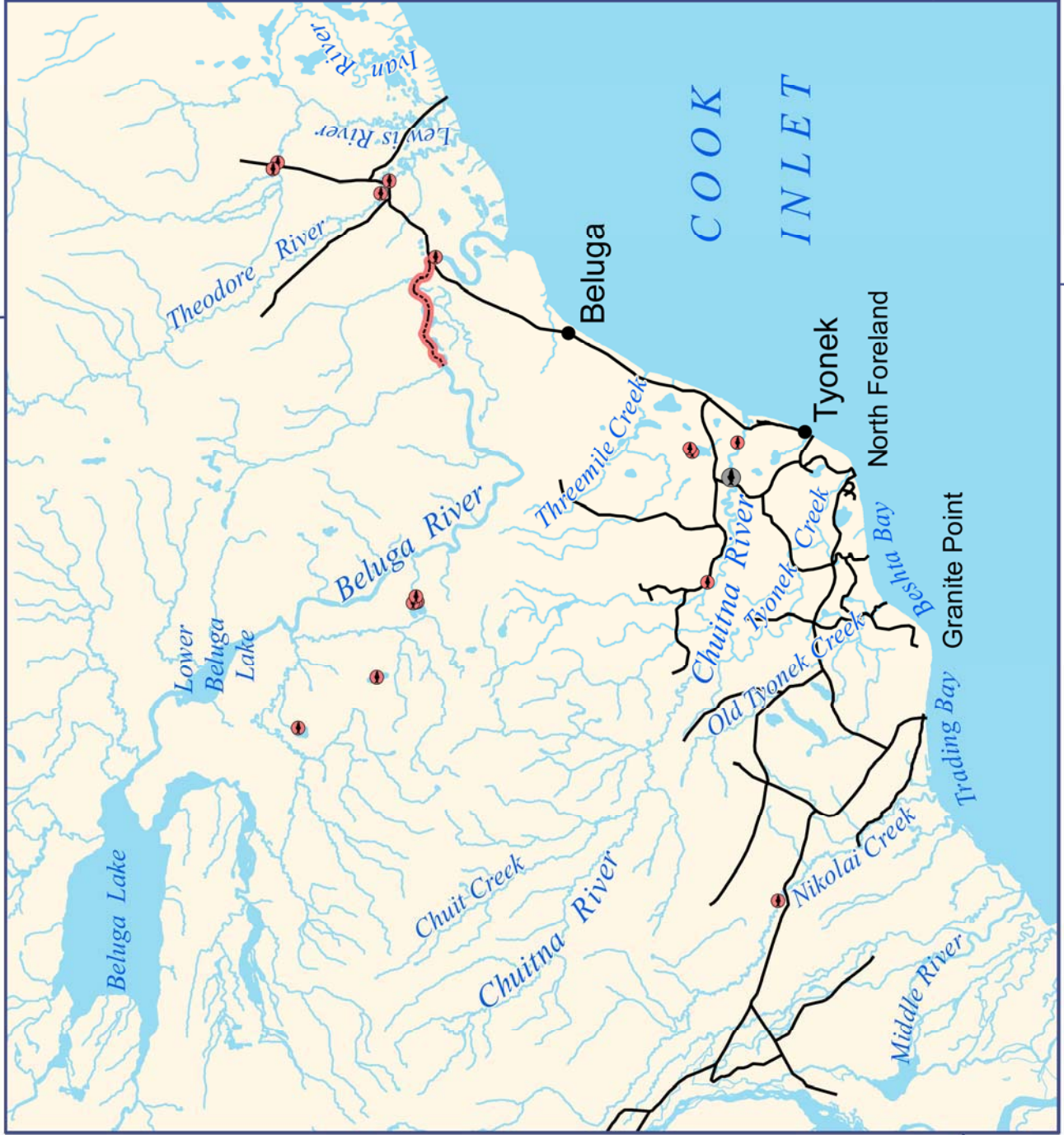


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Map Projection: UTM Zone 5N, NAD83

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 907-276-8222 907-276-6117 (fax) srbra@adfga.net



- Beluga Rainbow Trout Harvest Area
- Beluga Steelhead Trout Harvest Area
- Beluga Rainbow Trout Harvest Area
- Community
- Road

Roads shown are primarily main gravel roads. Additional roads and trails exist beyond those depicted here.

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SCALE: 1:300,000  
 0 1.25 2.5 5 Miles

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Map Projection: UTM Zone 5N, NAD83

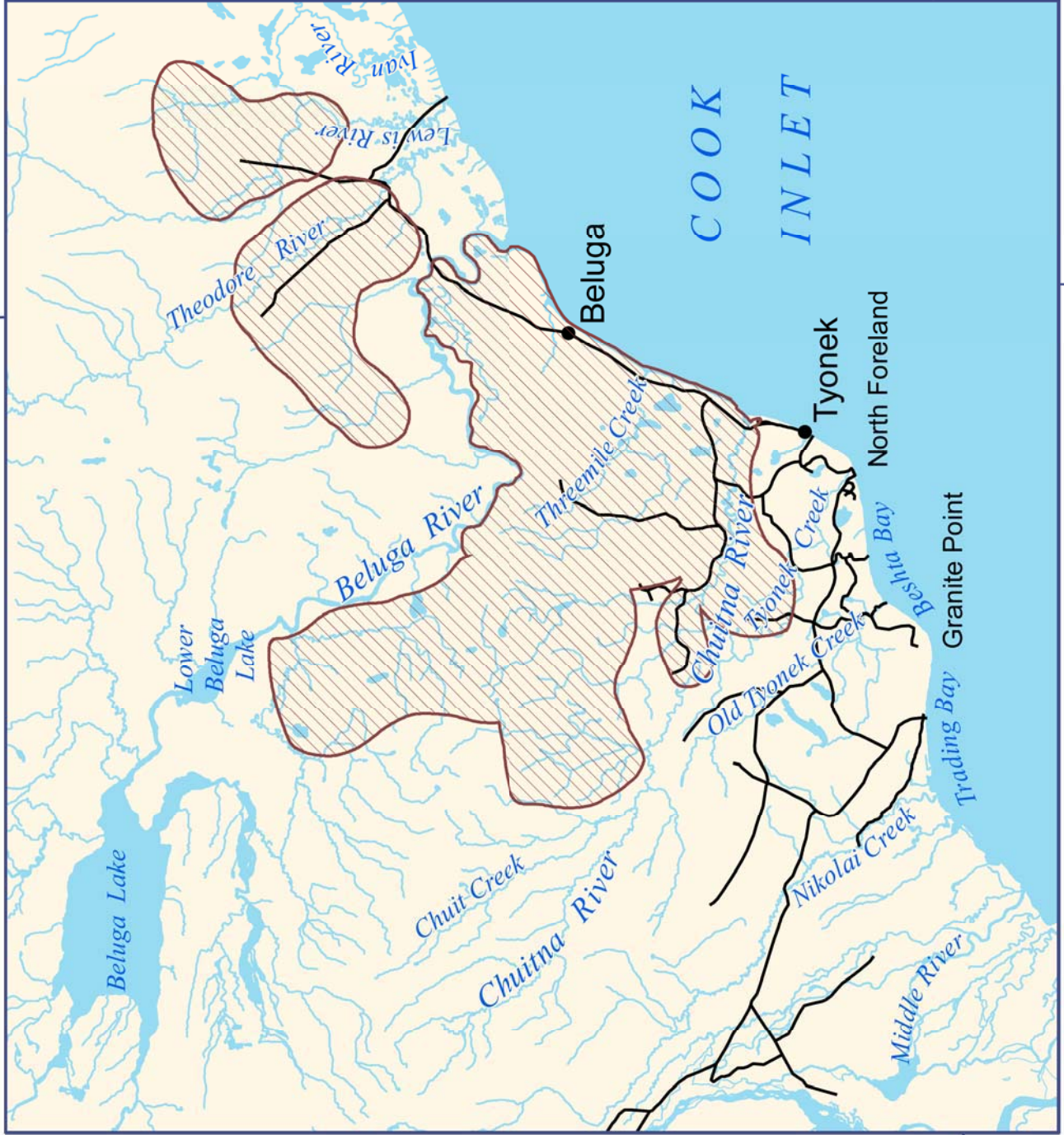
Prepared by Stephen R. Braund & Associates  
 P.O. Box 1480  
 Anchorage, Alaska 99510  
 907-276-8222, 907-276-6117 (fax) srb@adfg.state.ak.us

151°00'W

61°00'N

61°00'N

151°00'W



151°00'W

61°00'N

61°00'N

151°00'W

Beluga Moose Hunting Area

Community

Road

Roads shown are primarily main gravel roads. Additional roads and trails exist beyond those depicted here.

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SCALE: 1:300,000

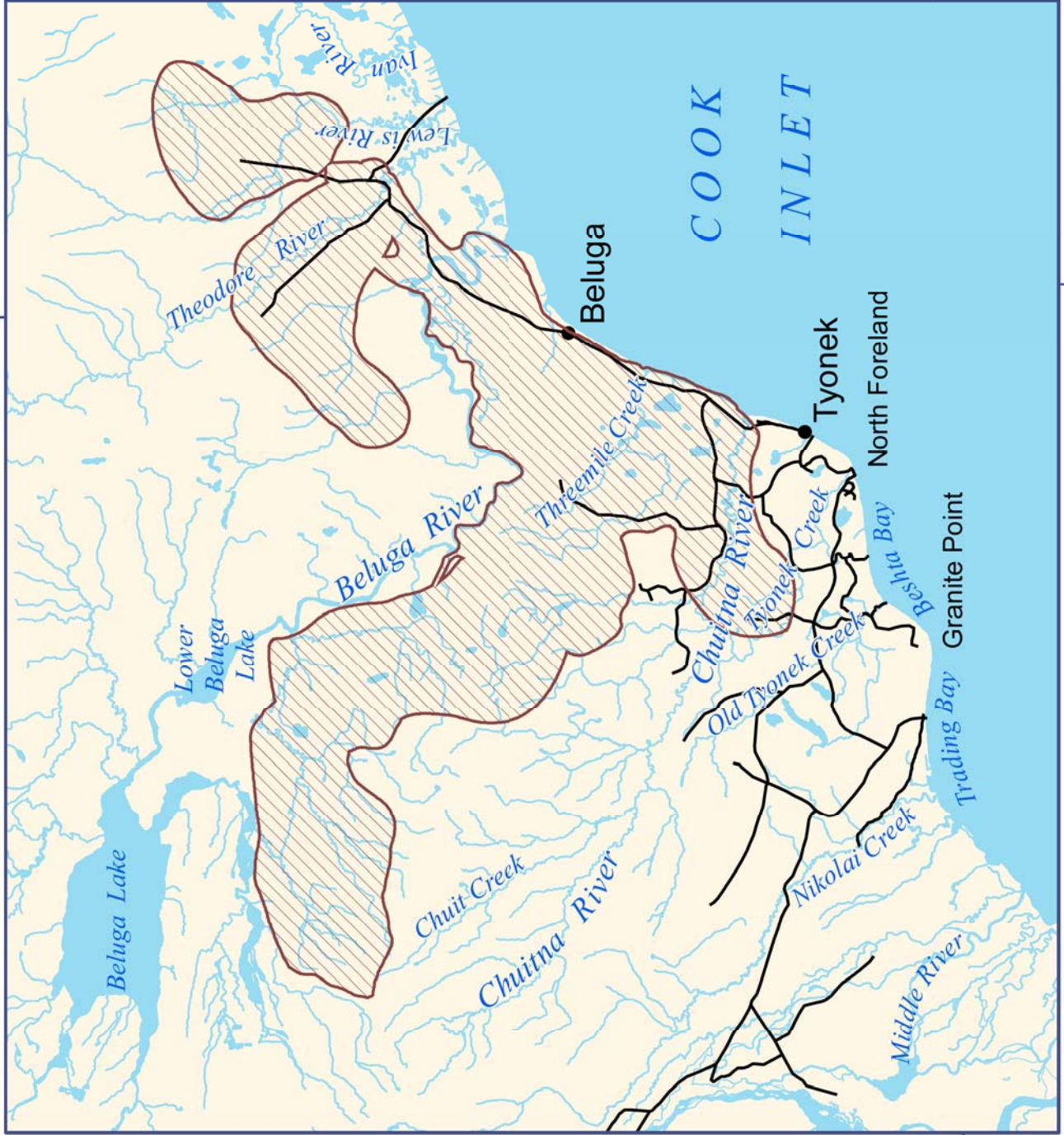


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Map Projection: UTM Zone 5N, NAD83

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Beluga Black Bear Hunting Area

Community

Road

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SCALE: 1:300,000



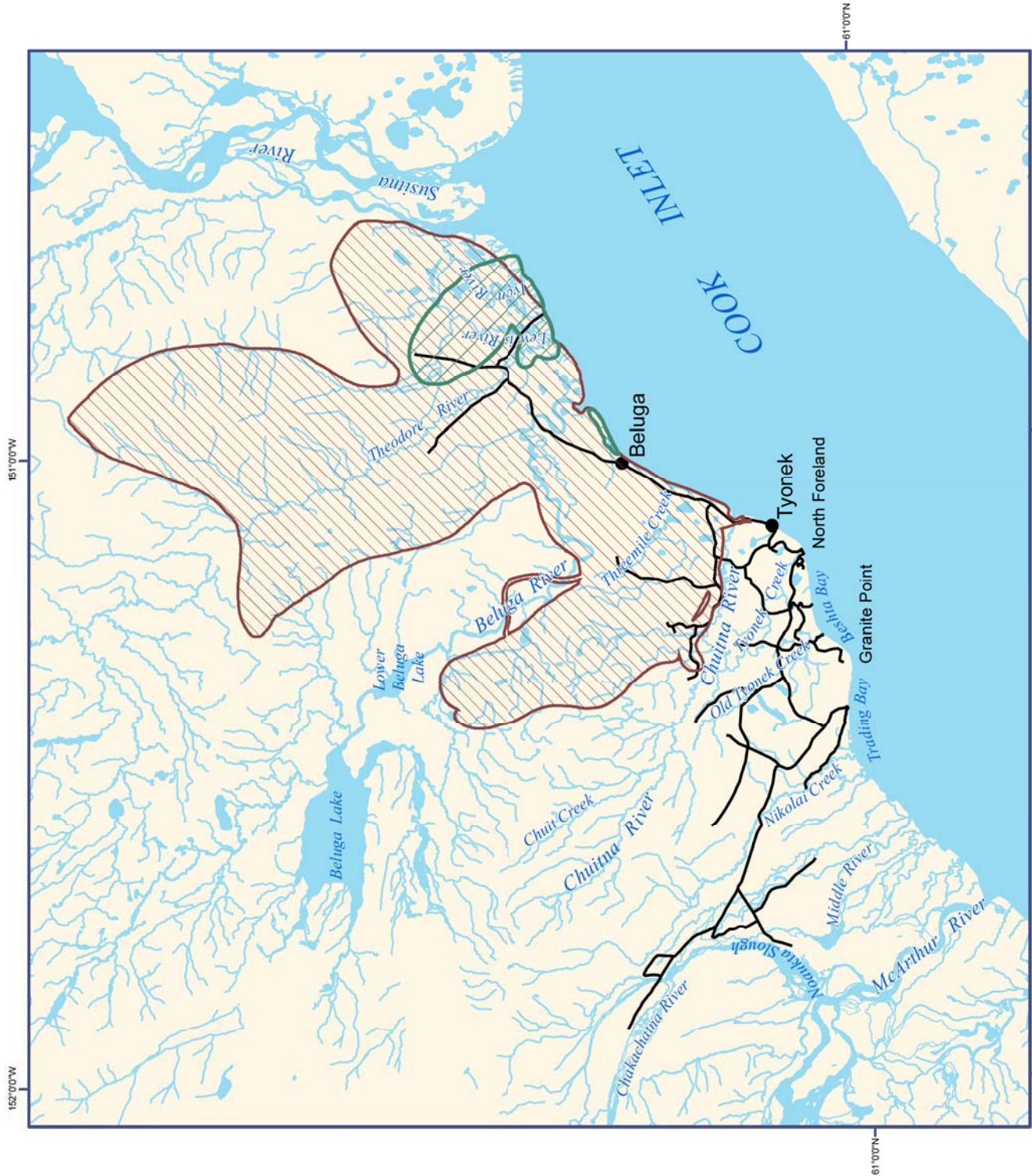
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Source:  
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Map Projection: UTM Zone 5N, NAD83

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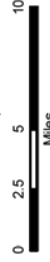
-  Beluga Upland Bird Harvesting Area
-  Beluga Waterfowl Harvesting Area

-  Community
-  Road

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Resource harvest areas change over time. The area represented here is for the year August 1, 2005 through July 31, 2006. For subsistence use information during the 20 year period from 1987-2006 for this community see Stephen R. Braund & Associates Subsistence Use Areas and Traditional Knowledge Study for Tyonek and Beluga, Alaska, 2006.

SCALE: 1:450,000



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Source:  
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Map Projection: UTM Zone 5N, NAD83

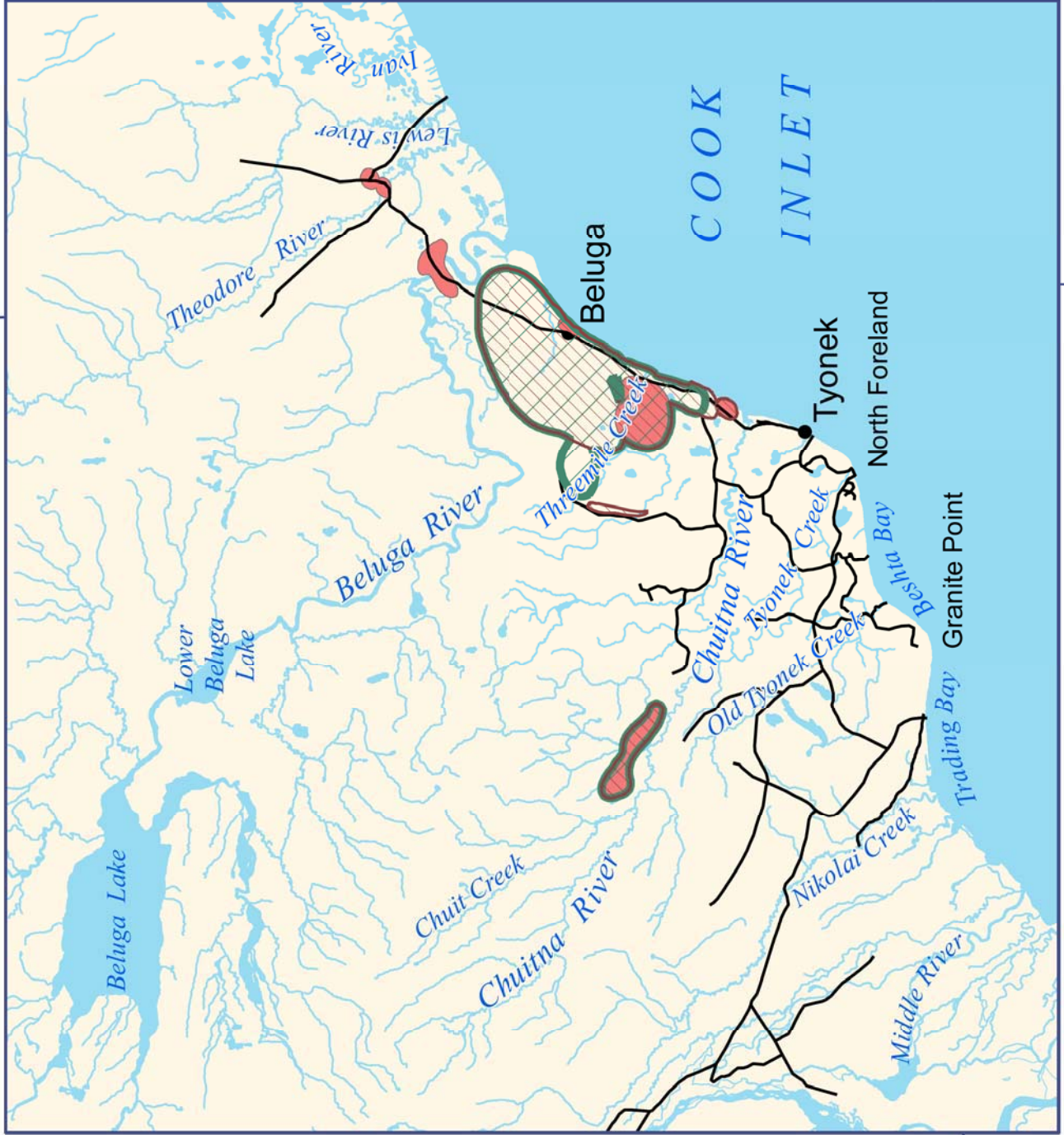
Prepared by Stephen R. Braund & Associates  
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Anchorage, Alaska 99510  
907-276-8222 907-276-6117 (fax) srb@adfg.state.ak.us

151°00'W

152°00'W

61°00'N

61°00'N



-  Beluga Berry Gathering Area
-  Beluga Plant Gathering Area
-  Beluga Wood Gathering Area

-  Community
-  Road

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SCALE: 1:300,000  
 0 1.25 2.5 5 Miles

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