

**Technical Paper No. 334**

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# **Subsistence Harvests and Uses of Black Bears and Mountain Goats in Prince William Sound**

by

**William E. Simeone**

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May 2008

Alaska Department of Fish and Game

Division of Subsistence



## Symbols and Abbreviations

The following symbols and abbreviations, and others approved for the *Système International d'Unités* (SI), are used without definition in the reports of the Divisions of Subsistence. All others, including deviations from definitions listed below, are noted in the text at first mention, as well as in the titles or footnotes of tables, and in figure or figure captions.

<b>Weights and measures (metric)</b>		<b>General</b>		<b>Measures (fisheries)</b>	
centimeter	cm			fork length	FL
deciliter	dL	Alaska Administrative Code	AAC	mid-eye-to-fork	MEF
gram	g	all commonly accepted abbreviations	e.g., Mr., Mrs., AM, PM, etc.	mid-eye-to-tail-fork	METF
hectare	ha			standard length	SL
kilogram	kg			total length	TL
kilometer	km				
liter	L	professional titles	e.g., Dr., Ph.D., R.N., etc.		
meter	m				
milliliter	mL	at	@		
millimeter	mm	compass directions:			
		east	E		
		north	N	alternate hypothesis	H <sub>A</sub>
		south	S	base of natural logarithm	<i>e</i>
		west	W	catch per unit effort	CPUE
		copyright	©	coefficient of variation	CV
		corporate suffixes:		common test statistics (F, t, $\chi^2$ , etc.)	
		Company	Co.	confidence interval	CI
		Corporation	Corp.	correlation coefficient (multiple)	R
		Incorporated	Inc.	correlation coefficient (simple)	r
		Limited	Ltd.	covariance	cov
		District of Columbia	D.C.	degree (angular)	°
		et alii (and others)	et al.	degrees of freedom	df
		et cetera (and so forth)	etc.	expected value	<i>E</i>
		exempli gratia	e.g.	greater than	>
		(for example)		greater than or equal to	≥
		Federal Information Code	FIC	harvest per unit effort	HPUE
		id est (that is)	i.e.	less than	<
		latitude or longitude	lat. or long.	less than or equal to	≤
		monetary symbols (U.S.)	\$, ¢	logarithm (natural)	ln
		months (tables and figures): first three letters	Jan., ..., Dec	logarithm (base 10)	log
		registered trademark	®	logarithm (specify base)	log <sub>2</sub> , etc.
		trademark	™	minute (angular)	'
		United States (adjective)	U.S.	not significant	NS
		United States of America (noun)	USA	null hypothesis	H <sub>0</sub>
		U.S.C.	United States Code	percent	%
		U.S. state	use two-letter abbreviations (e.g., AK, WA)	probability	P
				probability of a type I error (rejection of the null hypothesis when true)	$\alpha$
				probability of a type II error (acceptance of the null hypothesis when false)	$\beta$
				second (angular)	"
				standard deviation	SD
				standard error	SE
				variance	
				population	Var
				sample	var

<b>Weights and measures (English)</b>				
cubic feet per second	ft <sup>3</sup> /s			
foot	ft			
gallon	gal			
inch	in			
mile	mi			
nautical mile	nmi			
ounce	oz			
pound	lb			
quart	qt			
yard	yd			

<b>Time and temperature</b>				
day	d			
degrees Celsius	°C			
degrees Fahrenheit	°F			
degrees kelvin	K			
hour	h			
minute	min			
second	s			

<b>Physics and chemistry</b>				
all atomic symbols				
alternating current	AC			
ampere	A			
calorie	cal			
direct current	DC			
hertz	Hz			
horsepower	hp			
hydrogen ion activity (negative log of)	pH			
parts per million	ppm			
parts per thousand	ppt,			
	‰			
volts	V			
watts	W			

***TECHNICAL PAPER NO. 334***

**SUBSISTENCE HARVESTS AND USES OF BLACK BEARS AND  
MOUNTAIN GOATS IN PRINCE WILLIAM SOUND**

by

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## ABSTRACT

This report updates information on the subsistence harvests and use of black bears *Ursus americanus* and mountain goats *Oreamnos americanus* in Prince William Sound. Key respondent interviews were conducted in the communities of Chenega Bay, Cordova, and Valdez. A single resident of Tatitlek was interviewed in Anchorage. Data on black bear and mountain goat harvests were also compiled using the Alaska Department of Fish and Game, Division of Subsistence's Community Subsistence Information System and the Division of Wildlife Conservation's harvest database "WinfoNet." Based on information gathered in interviews as well as quantitative data, it appears that black bears are no longer an important source of subsistence food in Prince William Sound communities, having been replaced by Sitka black-tailed deer *Odocoileus columbianus sitkensis*. Although black bears have declined in importance, mountain goats continue to be a highly-esteemed source of subsistence food, according to these same sources. The primary factors identified by respondents as shaping their contemporary subsistence harvests are the publicity focused on Prince William Sound after the *Exxon Valdez* oil spill, and the improvements in transportation that have made the Sound more accessible to tourists as well as sport hunters and fishers.

Keywords: black bears, *Ursus americanus*, mountain goats, *Oreamnos americanus*, Sitka black-tailed deer, *Odocoileus columbianus sitkensis*, Prince William Sound subsistence, Chenega Bay, Cordova, Tatitlek, Valdez.

## INTRODUCTION

### BACKGROUND

In 2005, due to issues of concern to residents of Prince William Sound, a collaborative research project was developed between the Alaska Department of Fish and Game (ADF&G) Division of Subsistence, the Chugach Regional Resources Commission (CRRC), and the U.S. Forest Service. This project was designed to update information about subsistence uses of black bears *Ursus americanus* and mountain goats *Oreamnos americanus* in the Prince William Sound communities of Cordova, Tatitlek, and Chenega Bay (Figure 1). Table 1 presents population data for the project communities as recorded in the 2000 federal census. Cordova is located in Game Management (GMU) 6, subunit C (GMU 6C), while Tatitlek and Chenega Bay are located in GMU 6D. A review of the pertinent literature began in 2006, and field research was conducted in 2007, beginning with a trip to Cordova in February of that year. This was followed by a trip to Chenega Bay in March and trip to Valdez in August.

Both the Alaska Board of Game and the multiagency Federal Subsistence Board (FSB) recognize customary and traditional uses of black bears and mountain goats in GMU 6. Under federal regulations, Valdez has been designated as nonrural by the FSB; however, Valdez residents are eligible to hunt for subsistence purposes under state regulations. The Valdez nonsubsistence area is located within GMU 6D. Although Whittier is outside the Municipality of Anchorage nonsubsistence area, there is no Federal subsistence priority for the residents of Whittier to harvest black bears in GMU 6. Whittier residents have a positive customary and traditional use determination for mountain goats in GMU 6 and can obtain federal hunting permits for this species.

Unit 6 is divided into 4 subunits: 6A, 6B, 6C, and 6D. Each subunit has different federal subsistence hunting regulations for the harvest of black bears and mountain goats. In subunit 6A, rural residents of Yakutat and residents of subunits 6C and 6D (except for the residents of Whittier, noted above) may harvest one black bear from September 1 to June 30. In the remainder of Unit 6, rural residents of subunits 6C and 6D (except residents of Whittier) may harvest one black bear from September 1 to June 30.

Federal subsistence regulations for the harvest of mountain goats in subunit 6A apply to rural residents of subunits 5A and 6C, as well as to rural residents of Chenega Bay and Tatitlek. Federal regulations also apply to rural residents of subunits 6C and 6D. The federal harvest limit in subunits 6A and 6B is one goat, and it may be taken by state registration permit only. There is no federal open season for mountain goats in subunit 6C. In subunit 6D, the harvest limit is also one goat and it may be taken by federal registration permit only. Federal hunting seasons for mountain goats are the same across Unit 6: August 20–January 31.

Under state regulations, both residents and nonresidents are eligible to hunt black bears and mountain goats in GMU 6; nonresident goat hunters must be accompanied by a guide. For black bears, the harvest limit is one bear, and it may be taken in any of the subunits. In 6A and 6B, the open season for black bears is August 20–June 30; in 6C, the open season is September 1–June 30; and in 6D, the season is September 1–June 10. For mountain goats, the harvest limit is one male goat: the taking of nannies or kids is prohibited. Like the black bear hunts, open seasons for mountain goats varies among subunits. In 6A and 6B, the season is August 20–January 31; in 6C, open season is October 7–January 31; and in 6D, the open season is September 15–January 31 or October 1–October 20 if hunting in a special registration hunt.

The indigenous people traditionally inhabiting the Chugach were the Alutiiq of Prince William Sound and the Eyak Indians of the Copper River Delta. The primary sources for ethnographic information on the harvest and use of black bears and mountain goats in Prince William Sound are Birket-Smith and de Laguna (1938), Birket-Smith (1953), and de Laguna (1956). Regarding black bears, Birket-Smith (1953:38), who conducted ethnographic research in Prince William Sound in the 1930s, wrote that Chugach hunters took bears in the spring while the bears were still in their dens. Various methods were used for killing bears, including snares, deadfalls, bows and arrows, and traps. Bear meat was often dried or salted for winter use. Birket-Smith (1953:37) also wrote that the Alutiiq hunted mountain goats more often than any other terrestrial mammal. The preferred hunting time was August and September, but mountain goats were taken in the winter as well.

Black bear management and conservation is of concern to wildlife managers because of historically high harvests, which may be due in part to convenient and improving access into Prince William Sound from population centers through Whittier and Valdez (Fall 2006). Since 1997 black bear harvests have increased in Prince William Sound because of the increased number of transporters who take hunters into remote areas of the Sound, and because of the increased efficiency and mileage of modern boat engines (Fall 2006). Most black bears in GMU 6D are taken by Alaska residents who do not live in Prince William Sound (Crowley 2002a and 2002b).

This project was originally to be conducted in collaboration with the Chugach Regional Resources Commission (CRRC). The CRRC was to help introduce the project to members of each study community; to help obtain necessary approvals; to prepare and schedule community scoping meetings; to work with tribal governments; to identify and hire research assistants in Chenega Bay, Tatitlek, and Cordova; to provide comments on the draft final report; and to help schedule community review meetings. However, unavoidable events made the collaboration unfeasible.

## **OBJECTIVES**

The 5 objectives of this research project as described in the investigation plan were

1. Review and summarize the literature on subsistence uses of black bears and mountain goats in the Prince William Sound area
2. Compile data on subsistence and nonsubsistence harvests of black bears and mountain goats in GMU 6
3. Describe [2005] subsistence harvest and use patterns of black bears and mountain goats in GMU 6, including number of hunters, numbers of each species harvested, locations of hunting and harvest, hunting methods, use patterns (including any uses in crafts), and sharing of products
4. Collect and discuss traditional ecological knowledge about patterns and trends in black bear and mountain goat populations in the Prince William Sound area
5. Identify factors that were shaping contemporary subsistence uses of black bears and mountain goats in 2005 by rural communities of the Prince William Sound area that traditionally used these resources for subsistence purposes

## **METHODS**

In order to meet the project objectives, data were gathered from several sources. To meet the first objective, reviewing and summarizing existing literature on the subsistence use of black bears and mountain goats in Prince William Sound, the author and other researchers identified and reviewed relevant sources on the ethnography of black bear and mountain goat subsistence hunting and uses in Prince William Sound and key sources on the biology and populations of these species in GMU 6 and especially GMU 6D. ADF&G staff prepared an annotated bibliography based on the literature review (Appendix A).

To meet Objective 2, data on subsistence and nonsubsistence harvests of black bears and mountain goats were compiled using the ADF&G Division of Wildlife Conservation harvest database WinfoNet, and the ADF&G Division of Subsistence Community Subsistence Information System (CSIS). A 20-year time period, from 1986 to 2006 was selected for data analysis. This period was chosen because it includes both the 1989 *Exxon Valdez* oil spill and the reestablishment of Chenega Bay as a community, following its destruction in the 1964 Great Alaska Earthquake.

The third, fourth, and fifth objectives were met by interviewing key respondents (people who have special knowledge or access to members of the population) who lived in Cordova, Chenega Bay, and Tatitlek. To describe current subsistence harvest and use patterns 11 key respondent interviews were conducted for this project. Seven key respondents were interviewed in Cordova. Goat hunters who lived in Cordova were selected from lists provided by the ADF&G Division of Wildlife Conservation and the Native Village of Eyak. These lists yielded 50 names. This list was edited to include the names of those who reported that they had hunted, then again to those hunters who had harvested a goat in either subunit 6C or 6D. Thirteen names fit both criteria, and an attempt was made to contact all 13. The same method was used to develop the list of black bear hunters, which yielded a list of 9 names who had hunted bears in either subunit 6C or 6D. There was considerable duplication of names on the mountain goat hunter list and the black bear hunter list. The interviews were conducted either at the ADF&G Cordova office or at the offices of the Native Village of Eyak.

Some, but not all, of the respondents agreed to have their interview recorded on a digital voice recorder. Although a protocol was used to guide the interviews, the interviews were conducted in an open-ended format, in order to facilitate discussion. Each hunter was asked to depict on a map the areas in which he or she hunted black bears and the areas in which he or she hunted mountain goats. For each area depicted, the years hunted, months hunted, and hunting methods were discussed. Hunters were asked a series of questions about where they hunted, how they reached the hunting area, their opinions about black bear and goat populations, their opinions about changes in habitat, whether the animals had expanded or contracted their ranges, the sharing of meat in their communities, whether or not competition for animals has increased, and how they used the hide and other parts of the animals they harvested.

During the trip to Cordova, the researcher learned of a death in Tatitlek, so the decision was made not to travel to the village at that time. In spring 2007, another attempt was made to go to Tatitlek, but there was no accommodation in the village at that time. In addition, 3 attempts were made to contact the Tatitlek Village Council. As a result, only one respondent from Tatitlek, who lived in Anchorage at the time of this research, could be interviewed. At the request of this respondent, the interview was not digitally recorded. During spring 2007, two Chenega Bay residents were interviewed in Chenega Bay. This interview followed the same format as those conducted in Cordova, and both interviews were digitally recorded. In August 2007, a third interview was conducted with a former resident of Chenega Bay who was living in Valdez at the time of this research. This interview was not recorded, at the request of the respondent.

## **RESULTS AND DISCUSSION**

### **REVIEW AND SUMMARIZE THE LITERATURE ON SUBSISTENCE USES OF BLACK BEARS AND MOUNTAIN GOATS IN THE PRINCE WILLIAM SOUND AREA**

The first objective of this project was to conduct a literature review on subsistence uses of black bears and mountain goats in the Prince William Sound area. This review was conducted by Philippa Coiley-Kenner of ADF&G, and included available sources of information about the subsistence harvest and uses of black bears and mountain goats in Prince William Sound. This review is attached to this report as Appendix A.

### **COMPILE DATA ON SUBSISTENCE AND NONSUBSISTENCE HARVESTS OF BLACK BEARS AND MOUNTAIN GOATS IN GMU 6**

Figures 3 and 4 provide data on black bear harvests in GMU 6 for the years 1986–2006. These data show that harvests by Alaska residents not living in GMU 6 and by nonresidents of the state increased, while harvests by local residents remained relatively unchanged. Figure 4 shows the percentage of black bear harvests in GMU 6 by place of residence. Between 1986 and 2006, nonresident hunters (those living outside of Alaska) accounted for 31% of the harvest, while residents of GMU 6 accounted for 11%. The remainder of harvest (58%) was taken by Alaska residents who lived outside of GMU 6. Figure 4 also shows that hunters from Anchorage took 26% of all black bears harvested in GMU 6 during that 21-year period, residents of the Matanuska-Susitna Valley accounted for 17% of the harvest, residents from other parts of the state accounted for 14%, and residents of Prince William Sound accounted for 12%. Figure 5 indicates that the majority (85%) of black bears harvested in GMU 6 between 1986 and 2006 were harvested in GMU 6D, while Figure 6 shows that most black bears were harvested in spring; e.g., the months of March, April, and May.

Estimates of black bear harvests by residents of Chenega Bay, Cordova, and Tatitlek were recorded in systematic household surveys conducted by the Division of Subsistence (CSIS 2007). Table 2 summarizes survey data from household surveys conducted in several years between 1984 and 2003. In 2003, which was the last year household surveys were conducted, Chenega Bay residents did not report the harvest of any black bears, Cordova residents reported taking an estimated 35 bears, and Tatitlek residents reported taking a single bear. Sealing<sup>1</sup> records indicate a range of between zero and nine black bears harvested annually in GMU 6D by residents of Cordova between 1980 and 2003, with an annual average of about 3 per year (D. Crowley, personal communication, 2005). Sealing records from 2005 to 2006 show that Chenega Bay residents harvested no black bears, Tatitlek residents reported harvesting one bear in each year, and Cordova residents reported taking a total of 37 bears for 2005 and 2006 combined (ADF&G WinfoNet 2007). Most of Cordova's black bear harvest occurred in GMU 6C, but virtually all of the harvest by Chenega Bay and Tatitlek residents occurred in GMU 6D (Stratton and Chisum 1986; Stratton 1990b).

Figure 7 provides data on resident GMU and nonlocal Alaska resident mountain goat harvests in GMU 6 for the years 1986–2006. On average, resident hunters harvested 39 goats per year while nonresident hunters harvested 27 goats. Between 1986 and 2006, hunters reported taking a total of 1,405 goats in GMU 6. Of this total harvest, residents of Prince William Sound harvested 20%, residents from other parts of the state took 39%, and hunters who lived outside of Alaska took 41% (Figure 8). Between 1986 and 2006, more than 65% of the total mountain goat harvest by residents of Prince William Sound took place in GMU 6D (Figure 9), but residents of the subunit accounted for only 16% of the harvest (Figure 10). According to state registration permit records (5 AAC 85.040), goat harvests in GMU 6D in the resident open season hunt, which included both general and subsistence hunts, ranged from 38 to 93 animals from the 1996–1997 through 2000–2001 regulatory years. During that time, most successful hunters were nonlocal Alaska residents (Crowley 2002b:94-95).

As noted earlier, under state regulations anyone was eligible for registration permits to hunt mountain goats in GMU 6, regardless of residency. All hunting was conducted under combined general and subsistence hunting regulations. Nonresidents of the state had to have hunted with a guide (AS 16.05.407). Under federal regulations only rural residents of GMUs 6D and 6C could obtain goat hunting permits for 6D. The management strategy used by both state and federal agencies in GMU 6 was based on small geographic units called mountain goat registration permit hunt areas, or RGs (registration-goat, see Crowley 2002b:73). Hunting seasons and harvest quotas varied depending on the RG and regulatory system. For example, in GMU 6D the state season for RGs 242 through 266 was September 15–January 31, while the season for RG 248 was October 1–October 10. Under federal regulations the season for all RGs in GMU 6D was August 20–January 31 (USFWS OSM 2007).

Table 3 provides data on estimated harvests and uses of mountain goats based on Division of Subsistence household surveys. Chenega Bay's harvests ranged from zero to two goats per year.

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<sup>1</sup> Under 5 AAC 92.165 all bears taken by hunters must be sealed. Sealing means taking the skull and skin (with the claws and evidence of sex attached) of the harvested bear to a designated "sealing officer." The sealing officer administers a survey to discover when, where and how the bear was taken, measures the skull and may pull a small tooth or take other biological samples. Then the officer locks a metal or plastic seal on both the hide and skull. The seals must remain in the skin until the tanning process begins, and on the skull, unless it is cleaned for display.

For Cordova, estimates ranged from zero to thirty-nine goats. For Tatitlek, annual harvest estimates ranged from zero to six goats. In 2005 and 2006, under state permit regulations, the residents of Chenega and Tatitlek reported no harvest of goats, while Cordova residents reported harvesting 13 goats in 2005 and 7 in 2006.

### **DOCUMENT CURRENT SUBSISTENCE HARVEST AND USE PATTERNS OF BLACK BEARS AND MOUNTAIN GOATS IN GMU 6, INCLUDING THE NUMBER OF HUNTERS, HARVEST NUMBERS, HUNTING AND HARVEST LOCATIONS, HUNTING METHODS, USE PATTERNS (INCLUDING ANY USES IN CRAFTS), AND SHARING**

Information in this section of the report was based primarily on key respondent interviews. Interviews with residents of Chenega Bay, Tatitlek, and Cordova indicated that while black bears were once an important subsistence resource, they were seldom harvested in present times. In the 1940s and 1950s, black bears were an important subsistence food. A Chenega Bay hunter explained that few people ate bear meat, and that there were only about 3 households in Chenega Bay that ate the meat. He said:

There's a couple households here that claim that canning the bear meat is the way to go. I've never canned it, so I don't know. But we get some of the young ones ... if someone is sharing one, and it's a young one, I'll take it.

According to the single Tatitlek resident interviewed for this report, households in Tatitlek used to compete to see who could get the first bear in the spring. The Alutiiq living in Chenega Bay and Tatitlek took black bears in the spring by crawling into the dens and shooting the bears. The meat was then often dried or salted for winter use. A resident of Chenega Bay born in the late 1940s said that when he was young he hunted bears while commercial fishing in Esther Island Passage and Island Bay. Another Chenega resident recalled that in the 1930s hunters took black bears during the summer as well as in winter when the bears were in their dens.

Key respondents said that prior to the 20<sup>th</sup> century, bears figured prominently in the Alutiiq culture of Prince William Sound. Bear fur was used for boots, mittens, bedding, and coats; black bear intestines were used to make rain gear; and the bones were used to make tools, such as awls and chisels. During the early part of the 20<sup>th</sup> century, both Chenega and Tatitlek residents hunted black bears for their meat and fat. Bears were hunted mainly in the spring and fall, when they were out of their dens, but they were also taken during the winter in their dens. In an interview conducted in 1990, an elder from Tatitlek recalled:

Spring was the best time we used to hunt bear because they were in better shape. They were fat and had better-tasting meat, right after hibernation. We used to go to certain places: Lagoon, Galena Bay, and Jacks Bay. We went to the beach and waited for a bear to come out of the sleeping area. If you were lucky you got one. Had to sneak after it in the brush, or the bear would come down on the beaches and eat kelp. That was the easiest way. Older days we used to go out in the wintertime and look for bear dens. Only once I remember getting a bear out of the den in the wintertime. Go in there, shoot the bear, drag it out (Stratton 1990a).

An elder from Tatitlek said killing a bear in the den left a scent and the bears would not use that den for years, so most hunters killed them after they came out. Active dens were considered a valuable resource and a good hunter might return to the same den year after year (Stratton 1990b:46).

According to the elders, almost every part of the bear was used. If a person wanted to use the stomach he or she had to split it open, then clean and boil it. People also ate the heart, liver, kidneys, tongue, feet, and fat. Bear grease was jarred or rendered and sometimes eaten with smoked or dried salmon (Stratton 1990b:46).

Various taboos were associated with black bears. One elder said “don’t go look for bear den when your wife is pregnant. Men with pregnant wives won’t catch a bear in the den.” The same elder said that black bears were unusual animals, different from any other, because they can fool people. He explained that black bears do not always die after being shot, and their bodies are not always there when the hunter tries to retrieve them (Stratton 1990b:46).

Prior to the March 27, 1964, Great Alaska Earthquake, residents of the old village of Chenega hunted black bears throughout much of western Prince William Sound. Key respondents said that Chenega residents hunted bears on Bainbridge Island, Prince of Wales Passage, around the village of Old Chenega on Chenega Island, Knight Island, Dangerous Passage, and Jackpot Bay. According to one resident interviewed for this project, Jackpot Bay was considered a “hot spot” for black bears because of the many salmon streams in the area. Other places mentioned for hunting black bears included Whale Bay, Culross Passage, Port Nellie Juan Bay, and Unakwik Inlet (Figure 11). Tatitlek residents were reported to have hunted black bears around Port Fidalgo, on Glacier Island, and on Columbia Island (Figure 12) (Stratton 1990b). According to one resident of Chenega Bay, the black bears in the vicinity of Columbia Glacier were blue in color.

As 2007 harvest numbers indicate, few families in Chenega Bay or Tatitlek harvested or used black bears that year, although a key respondent said that Tatitlek residents harvested a bear for the village’s culture week festival, called *Peksulineq*<sup>2</sup>, in spring 2007. A man from Chenega Bay observed that Sitka black-tailed deer have replaced black bears as the primary land mammal resource taken for subsistence purposes. A Cordova key respondent commented that bear meat was darker than goat meat and was similar to king salmon because it was very rich and full of fat. He further stated that most Native people would not eat bears because they looked too much like humans, and because some are afraid of trichinosis.

A major issue for key respondents regarding the harvest of black bears in Prince William Sound was not competition between nonlocal and local hunters, but rather that nonlocal black bear hunters trespassed on Native lands when hunting bears. The one Tatitlek resident interviewed for this project observed that if a nonlocal hunter shot and wounded a black bear on the beach, and if the bear ran inland onto Native property, the hunter had to trespass in order to track the bear. During the interview, this person described hunting lodges in Irish Cove and Snug Corner Cove that catered to nonlocal bear hunters and that did not stop their clients from trespassing on private, Native-owned lands.

Cordova residents interviewed for this project said black bears were more often taken opportunistically, during the spring, when boating or fishing. One person noted that bears were easily hunted from a boat because they did not expect danger from the water. He said that in the

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<sup>2</sup> Tatitlek holds their *Peksulineq* festival every year during the first week of May. The festival includes a culture camp in which many aspects of traditional Alutiiq culture are taught. Organizers try to offer traditional foods, such as salmon, black bear meat, sea lion meat, seal meat, and halibut.

past, bears were easy to sneak up on because people were using oars instead of outboard motors. At the time of the interview, he said that hunters were reducing noise by using electric trolling motors to sneak up on black bears.

Cordova residents reported harvesting black bears throughout much of eastern Prince William Sound. Specific areas mentioned included Port Fidalgo, St. Matthews Bay, Port Gravina, Olsen Bay, Sheep Bay, Simpson Bay, around the mouth of the Rude River, Heney Ridge (for spring black bears), Ibeck Creek, along the Eyak River, the upper Glacier River, Sheridan Glacier, and Alaganik (Figure 13).

Based on key respondent interviews, it appeared that black bear meat could be shared, but since many interviewees said most people did not like to eat bear meat it was not widely shared. One interviewee from Cordova said he preferred spring bear meat over the fall meat, and that he gave most of the meat away. Another respondent from Cordova observed that in recent years more bears were killed “in town,” especially if the wild berry crop was poor and the bears went into town. This person also noted that residents used to better tolerate bears in town, but more recently, at the time of the interview, they tended to shoot bears in defense of life or property.

In contrast to black bear meat, this project found that the meat of mountain goats was still widely valued by residents of GMU 6. One Tatitlek man described goat meat as being like “gold” and consumed by everyone. While goat meat was described as highly-prized by Chenega Bay and Tatitlek residents, reported harvests have been low. As was noted earlier, state and federal wildlife management strategies for goats in GMU 6 included dividing the GMU into smaller geographic subunits and distributing hunting pressure through a registration permit system (Crowley 2002b:73). Tatitlek hunters attributed their low harvest reports in part to difficulties in obtaining these registration permits (Simeone and Miraglia 2000:82; Stratton 1990b:116, 119; see below for further discussion of this issue).

Ethnographic sources indicated that goat hunting had a long tradition among the Alutiiq and Eyak peoples. Birket-Smith (1953) wrote that the Alutiiq hunted mountain goats more than any other terrestrial mammal. Likewise, the Eyak were said to hunt goats extensively (Birket-Smith and de Laguna 1938). Goats were used not only as a major source of meat, but parts were also used in shamanistic performances; furthermore, the hooves were used as rattles, goat horns were heated and made into ladles, goat hides were used for clothing, the hair used in baskets, intestines were used, and the fat rendered (Birket-Smith and de Laguna 1938; Birket-Smith 1953).

A traditional practice in Tatitlek and Chenega Bay was to hold a barbecue called a *mangiq* on the beach after a successful goat hunt (Stratton 1990b:48). The preferred hunting time was August and September, but goats were taken in the winter as well. Photographs shown to the author during an interview for this project showed that in Tatitlek during the 1940s and 1950s hunters killed 3 or 4 goats at one time. Hunters either climbed to reach the goats or shot them from skiffs, hoping the goats would fall into the water or onto the beach where they could be easily retrieved. A Chenega Bay hunter recalled that it was unsafe to leave goat meat out overnight because brown bears *Ursus arctos* were abundant and would steal it from the hunters.

In 1990, an elder from Tatitlek described goat hunting in the 1930s and 1940s and talked about how groups of men would initiate a hunt to obtain meat for the village. At the end of his statement he noted that in the 1990s, instead of sharing the meat as they did in the 1930s and 1940s, hunters kept the meat to themselves:

My dad was a goat hunter. He started in the fall time, didn't hunt in the summer. Hunted in late fall until the snow brought them down. Old timers knew where the goats were. If they were down [from the mountain], they shot them from the boat. My dad let me goat hunt when I was 11 years old. This one goat, we climbed up after it ... Father helped me calm down, had to be calm before I could shoot. We used to go with a skiff to hunt in Fidalgo, Landlock Bay, or Jack's Bay. I loved to climb. Earlier days had more goat, always had goat meat, used to salt it.

You climb the mountain after you see the goat. Got five goats one time. We didn't pack them down because the mountain is straight up and down. After we shot them we cut the windpipe and blew into the lungs then tied up the lungs. Rolled the goats down to the river, when they got to the river they floated out to the lagoon. We brought them home and salted them for the winter.

We use the stomach lining of the goat, wash it and hang it up to dry. We put it on toast in the oven. It's white like tallow. Used to be 4 or 5 guys go hunting and bring goat into the village. Now [1990] if anyone gets it, they hide and store it and don't share. Years ago we used to get goat, hang it in the wood shop and freeze it, or salt it, or smoke it, and dry it. A lot of times I remember they hung it up like beef, just kept it there. Now, no matter what we have it goes into the deep freeze (Stratton 1990a).

At the time of the single Tatitlek person interviewed for this report, goat meat was widely shared throughout the village and between family members in different villages. At that time, when someone killed a goat in Tatitlek he or she was expected to share it with every household within the community, and hunters often sent meat to relatives and friends living in other communities. Older and former goat hunters received the best pieces, while less-favored pieces of meat went to young people who were physically able to hunt, but, for some reason, did not. The ribs and the front and rear quarters were considered to be the best parts of the goat. The respondent noted that today few of the older hunters were capable of hunting for goats, and, for those that could, it was their responsibility to make sure that those who were unable to hunt received some meat. Describing patterns in the late 1980s in Tatitlek, Stratton (1990b:119) noted that, "In addition to the highly-prized meat, goat fat was also utilized. The fat was washed, cleaned, hung, cut into strips, and dried. The fat was eaten with dry fish. Meat not eaten fresh was frozen."

In 2006–2007, Tatitlek goat hunters who owned skiffs hunted close to home while those with larger boats traveled throughout Prince William Sound. Goat hunting areas used by Tatitlek residents included Copper Mountain, the mountains surrounding Fish Bay, and the mountains at the head of Port Fidalgo (Figure 14).

Chenega Bay residents reported hunting goats in a large area of western Prince William Sound. This area included Bainbridge Passage, Whale Bay, Port Nellie Juan Island, parts of Kings Bay, Auk Bay, (where the goats come down close to the water), Icy Bay, and all of the capes on the outer coast toward Seward, including Cape Puget, Cape Junken, and Cape Fairfield (Figure 15).

Contemporary hunting methods included accessing hunting areas in skiffs and climbing to the goats. A Chenega Bay resident related that he was occasionally dropped off on the beach and picked up later. In addition, goats were taken on the beach (Simeone and Miraglia 2000:82; Stratton and Chisum 1986:40; Stratton 1990b:119). After a goat was killed, hunters often packed

out as much of the animal as they could. One man from Chenega Bay who was interviewed for this report said:

I brought back the hides oh, I brought back everything. The stomach lining, that is real good delicacy, too. We don't eat all of the organs, but that stomach lining was... so, of all the organs I took the heart and the stomach lining, and then I took the hide and the head just for my personal, just because I ... just to show I got it.

Although this person brought back the head, interviewees related that it was a traditional practice to leave the head at the kill site, positioned so that it faced the mountain.

One Chenega Bay hunter reported goat hunting in October, when the snow drove the goats to a lower altitude. But, he continued, that time of year could be dangerous because hunters could become “stuck there for a week in horrible weather and that's right when the weather gets crummy.” He further stated, “So it's risky, but that's when I go get them is October.”

Goat meat was also prized by interviewees in Cordova. Goat meat was reported to be canned, people ate the tongues as well, and mountain goat hair was given to craftspeople living in Southeast Alaska so they could weave blankets, especially blankets in the Chilkat style. But mountain goat hunting was viewed largely as a sport. According to one Cordova resident:

No one talked about subsistence goat hunting in Cordova: that was what Tatitlek people did. It was always a sport harvest in Cordova. Biologists assumed that Tatitlek people would take between 6 and 7 goats a year, no matter what.

A Cordova man described some of the techniques he used to hunt goats. In November and December goats could be located on the ridges that the wind had cleared of snow. Hunters looked for individual tracks or a goat trail. Using his binoculars, the hunter followed the tracks or the trail in order to locate the goats. He then tried to distinguish the females (nannies) from the males (billies). This person said he preferred to harvest billy goats that were 2–3 years old. According to this man, goat hunting in the winter usually required crampons and an ice axe or straight stick, but that in late December, the goats often moved off the peaks and into the timber, where they were more accessible. This man noted that goats were hard to kill because their lungs are immediately beneath their chests, and to be effective, shots had to be precise. He added that the hunter had to plan for the location of the goat after it was shot as it could fall into a crevice or off a cliff, making it impossible to retrieve.

Based on returned hunting permits, Cordova residents reported harvesting 7 goats in 2006. Most of these animals were taken in GMU 6C, in the mountains just north of the Copper River Highway, an area that has been used by Cordova residents for a number of years. Because this area was accessible by motor vehicle, most hunts were conducted in a single day. One hunter reported that in 2006 he hunted near McKinley Peak. He waited until November, when the goats moved into the timber. On the day of the hunt, he drove 18 miles to reach the base of the mountain, then used an all terrain vehicle (ATV), and then walked. He was able to harvest a goat in a single day of hunting.

Key respondents observed a recent increase in mountain goat abundance near Cordova (see below for further discussion of mountain goat populations). As a result, Cordova goat hunters more often hunted goats in the mountains north of the Copper River Highway. Hunting areas mentioned included Pyramid Peak, McKinley Peak, Scott Glacier drainage, Ibeck Creek, Heney Ridge, and the peaks above Power Creek. Other Prince William Sound areas that have been

hunted by Cordova residents since 1970 include Gravina Bay, St. Matthews Bay, Simpson Bay, Sheep Bay, and Bear Trap Bay at the head of Port Gravina (Figure 16). No one from Cordova reported hunting in Port Fidalgo, which was considered the area customarily used by residents of Tatitlek.

### **COLLECT AND DISCUSS TRADITIONAL ECOLOGICAL KNOWLEDGE ABOUT PATTERNS AND TRENDS IN BLACK BEAR AND MOUNTAIN GOAT POPULATIONS IN THE PRINCE WILLIAM SOUND AREA**

Key respondents reported a difference of opinion on the abundance of black bears within Prince William Sound. Some hunters believed that black bear numbers had increased because moderate winters enabled female bears to have more and larger cubs. One respondent said that when female black bears had 3 cubs, it was an indication that the population was healthy. Some of those interviewed commented that bears had become a nuisance because they were preying on moose and goats. On the other hand, some of those interviewed thought there were fewer bears now than in the past. Those who thought there were fewer bears attributed the decline to increased hunting pressure due to better access to Prince William Sound through the Anton Anderson Memorial Tunnel (Whittier tunnel), which formerly was open only to railroad traffic, but since 2000 has provided vehicle access to Prince William Sound from the population centers of Anchorage, the Kenai Peninsula, Matanuska-Susitna Borough and the Fairbanks North Star Borough.

One resident of Cordova, who had been hunting bears for the 5 or 6 years before his interview, described his view of the situation in Prince William Sound<sup>3</sup>. According to this respondent, publicity surrounding the *Exxon Valdez* oil spill brought increased attention to the Sound by nonresidents of Prince William Sound. Many more people were using the area, either as tourists, hunters, or fishers, and as a result, there were fewer bears and more nonresident hunters. He said that he no longer saw black bears in Port Gravina and Columbia Bay, and that the bears were “thinning out.” He added that during the spring there were many hunting camps, and more so since the Whittier tunnel opened. This person went on to say that guided hunting occurred at Windy Bay on Hawkins Island, and on Montague Island, the latter of which, according to this respondent, had the highest concentration of guided hunters in the area. This respondent suggested that to reduce hunting pressure by nonresidents of Prince William Sound, commercial hunting should be prohibited on Montague Island. The only relief this person saw was the absence of marine gas stations in Prince William Sound; since most pleasure boats with gasoline engines had a 200-mile range, they could travel as far as Chenega Bay but not as far as Montague Island. The presence of a gas station could extend the range of these boats, according to the interviewee. There were 2 marinas in Whittier, but both were full and there was a long wait for a slip. According to this respondent, the shortage of gasoline and slip spaces inhibited the increase of boat access to hunting areas; even so, he did not think that lack of marina space would curb the influx of hunters into Prince William Sound.

A person from Chenega Bay provided some perspectives on the local black bear population. He believed there were plenty of bears, but that the bear population shifted more rapidly than most people understood. According to this resident, bear abundance was cyclic and dependent on the

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<sup>3</sup> Note that many of these same observations were made by others interviewed for this project and by residents interviewed by the ADF&G Division of Subsistence during research on the effects of the *Exxon Valdez* oil spill on subsistence activities in Prince William Sound (Fall and Utermohle 1999; Fall 2006).

severity of the winter and the ready availability of food in the spring. “These bears that start waking up will get a head start because there’ll be a bunch of carcasses they can munch on.” He also thought bears would prey heavily on deer and that the abundance of these 2 animals fluctuated greatly.

Other interviewees from Cordova also provided their thoughts on bear behavior:

1. Black bears will eat deer if it is possible for them to get the deer, but they are not a normal predator of deer.
2. Brown bears will dig black bears out of their dens in order to eat them.
3. Opinions varied on the black bear populations of Hawkins and Hinchinbrook islands. One respondent said there were no black bears on Hawkins or Hinchinbrook islands. However, another person said that he observed the expansion of black bears onto Hinchinbrook and Hawkins islands:

Yeah. I think what’s happening is the bigger bears are pushing the smaller ones out, and they’re just working their way over to Hawkins Island. We never used to hardly ever see black bear on Hawkins. We’ve seldom seen brown bear, but now [if you kill a deer] you have to retrieve it immediately, because a brown bear knows that sound [of a gun shot] and they make a beeline, so you gotta race the bear. And it’s really bad out on Montague Island and in Jackalof Bay. You shoot a deer, you have to get out because you’ve got a bear hot on your trail.

4. On Evans, Chenega, and Knight islands in western Prince William Sound, more black bears are found among the deer because there are fewer brown bears.
5. Black and brown bears have been seen in the strawberry patches on Cape Yakataga.
6. Since there are salmonberries in Icy Bay, both black and brown bears can be found there. There are many black and brown bears near the Bering River, but they are not seen together.
7. Most black bears are observed on the sunny sides of mountains, but they do not den on the sunny sides. After they emerge, black bears proceed to the beaches.
8. Brown bears on Hawkins and Hinchinbrook islands emerge from hibernation 3 months earlier than those further inland.
9. Black bears go into hibernation earlier than brown bears.
10. Brown bears are most often seen at higher altitudes, on the mountains, while black bears are often on the beaches.
11. In the Rude River drainage, when coho salmon *Oncorhynchus kisutch* are running, brown bears are seen in the snow.
12. During a mild winter brown bears will get restless and come out of their dens.

The following comments on bears were provided by an elder from Chenega Bay:

1. In the 1930s and 1940s, Alutiiq from Chenega Bay often took black bears opportunistically while they were hunting for river otters *Lontra canadensis*. During otter hunting trips, they often found bear dens built of spruce boughs and covered with snow. They probed the depth with a pole into the den, and if the pole moved, there was a bear in

the den. This interviewee further noted that, after crawling into the den, one of the men found it was full of “daddy longlegs” [*Opiliones* sp.] that apparently wintered with the bears. The man had to cinch his collar so the daddy longlegs would not get into his shirt.

2. Some older black bears den earlier and prefer high-altitude dens, on cliffs or at the tree line, while younger bears den later in the year and at lower altitudes, closer to salt water. The Chenega Bay elder believed the later-denning bears did not get enough to eat and thus could not begin hibernation earlier. In the spring, he saw black bear trails on the mountains at high altitudes. When the bears emerged from hibernation, they ate grass.
3. When black bears eat deer in the fall, the deer hair clogs their digestive system so they do not defecate. When hunters kill bears in the fall they find deer hair in the bears’ systems. The interviewee thought that this may have been intentional on the part of the bears, so they may better store fat for the coming winter.
4. Brown bears have expanded their range to Whale Bay, Jackpot Bay, Eshamy Lagoon, Nellie Juan Bay, and the bays east of and behind Chenega Bay.
5. Black and brown bears do not get along.
6. Near Tatitlek, brown bears are occupying dens once used by black bears.
7. He has observed an increase in the abundance of brown bears, wolves *Canis lupus*, and coyotes *Canis latrans*. When he was young, he rarely saw wolves in Prince William Sound; but he did see many wolverines *Gulo gulo*.

Key respondents reported differences of opinion on the abundance of mountain goats, depending on where they lived. A Chenega Bay resident who spent considerable time in western Prince William Sound believed there were fewer goats. He related the decline was to the presence of brown bears and eagles *Haliaeetus* sp. and/or *Aquila* sp., which he believed preyed on goats, but he also said that the increased presence of humans was affecting goat abundance.

Cordova hunters, on the other hand, believed that mountain goat populations in their area (subunit 6C, Eastern Prince William Sound) had increased. One Cordova resident said there were more goats than ever before. He summarized the history of goat populations in eastern Prince William Sound thus: when the Copper River and Northwestern Railway was in operation at the beginning of the 20<sup>th</sup> century, commercial hunting for goats was allowed, and abundance declined. After the railroad ceased operation, the abundance of goats rebounded for a while, then was reduced by severe winters and an increase in the local wolf population, and, at the time of interview, was increasing.

One hunter interviewed for this project, a lifelong resident of Cordova, said that prior to 1960 the mountain goat population had been high. But heavy snows, severe winters, and the appearance of wolves around Cordova in the 1960s “decimated” the goat population in GMU 6C, the area most hunted by Cordova residents. He related that goats were easy prey for wolves in the winter. He noted that as the goat abundance declined, restrictions were placed on harvests and eventually no harvest was allowed in the vicinity of Cordova. As a result, he believed that hunters in Cordova shifted to other areas in Prince William Sound.

A Cordova resident provided his perceptions of the changes in the mountain goat abundance near Cordova. He explained that, in the 1960s, the goat population in GMU 6C was healthy, and he called the area from about Mile 7 to 27 on the Copper River Highway the “goat range:”

They [the goat population] went out farther ... there are goat ranges all over, but the ones I hunted were the closer ones to town. At that point in time, you'd be able to look up and see up to 30–60 goats to a herd, and 100 goats in a big herd. You'd see smaller ones, but the predators became pretty strong. We had some tough winters, a lot of snow. Between the tough winters, lots of snow, and the predator's increase in population...basically, the wolf, and, I would have to say, maybe the coyotes, could probably pull a goat down, if the pack was large enough. Mainly the wolf did a big dent in our goat population...When I was young, I think there were two goats that you could take per year. That slowly went to one goat, and as time went on, the whole highway area [in GMU] 6C was shut down, so we ended up having to move out into the [Prince William] sound. So I actively watched the goats, their patterns, and studied them quite a lot, and was able to know where they would be before we'd take off the next day. And as time went on, the herds just literally shrunk, and they shrunk fast. And before they shut the seasons down, those herds that you would see way back in the far back ranges, where there'd be 100 goats, those would turn into 15 or 20 goats. And the goats that were out farther years ago ... there used to be herds of 20–30 ... those would turn into maybe one family, or individual goats. Typically, goats hang out in groups, so the mothers and the kids would hang out and the billies would always sit up high and stay away on higher grounds. Anyways, they just dwindled away to hardly anything.

As the local abundance of goats declined, Cordova residents said they hunted more often in GMU 6D, particularly in Port Gravina and Saint Matthew's Bay (Figure 16). They told of easy, single day hunts:

None of my hunts I spent overnight. I like the day hunts. I didn't feel...I wasn't that comfortable spending the nights out in the woods. I didn't feel like carrying 40 pounds in and carrying all the meat out, because we carried everything out with us: we didn't leave no scraps behind; we brought everything out.

### **IDENTIFY FACTORS THAT ARE SHAPING CONTEMPORARY SUBSISTENCE USES OF BLACK BEARS AND MOUNTAIN GOATS BY THE RURAL COMMUNITIES OF THE PRINCE WILLIAM SOUND AREA THAT TRADITIONALLY USE THESE RESOURCES FOR SUBSISTENCE PURPOSES**

The primary issue raised by many of those interviewed for this project was the increased presence of nonresidents hunting in Prince William Sound. This factor shaped their contemporary subsistence uses because they saw residents as competing directly for scarce resources with nonresidents, and they observed that the presence of large numbers of nonresidents frightened the game and made the animals more difficult to find. Some residents of Prince William Sound expressed uneasiness about killing game in front of tourists. Although reportedly less important as a source of subsistence food for most residents of Prince William Sound, the black bear population was seen to attract large numbers of nonlocal hunters, who created problems such as trespassing on private Native lands. A respondent from Chenega Bay said:

But you get a lot of this Whittier crowd now that the road is there and boat launches are a lot heavier used, and now they're coming south. So what I think is

going on is they're starting to go, "Hey, there's Native land down here that's not hunted as heavy," and they're hunting it, and trespassing, too, on Chugach and Chenega land, for sure.

All because of that road to Whittier. What happens is you've got these guides doing the goat thing and of course they're going to see bear tracks and see bears too, and they're going to go, "Hey, well, we can also go bear hunting down here," and so you know the more an area gets learned about, the sooner a resource gets exploited.

None of the respondents interviewed in Cordova mentioned problems with goat hunters, perhaps because they perceived that the abundance of goats was increasing in areas east of Cordova where they hunted and where there was little competition from nonresident hunters. Also, state registration permits for 6C were available only in Cordova, and only on a first-come, first-served basis. Between 1986 and 2006, only 10% of the total goat harvest in GMU 6 occurred in 6C (Figure 9).

Respondents from Chenega Bay and Tatitlek did raise issues concerning goats. While they thought the goat population in western Prince William Sound (GMU 6D) was healthy, and conceded that hunting opportunities were available, they also brought up the issue of competition from nonresidents. And, as discussed earlier, registration permit data showed that between 1986 and 2006, over 65% of the total GMU 6 mountain goat harvest occurred in the 6D subunit, but only 16% of that harvest was by residents of the subunit (Figure 10).

In Tatitlek and Chenega Bay, mountain goats were reported to be an important subsistence resource. According to the Tatitlek resident interviewed for this report, he thought there were few restrictions on the harvest of mountain goats in the 1940s and 1950s and people hunted when they wanted since the season was open year round. Young men could be taught how to hunt goats. In this person's view, however, because of regulations that limited the number of registration permits, the then-difficulty in physically obtaining a registration permit from either Cordova or Valdez, and a restrictive bag limit of one goat per hunter, the young men no longer hunted as they were taught and therefore could not provide for the village like their fathers did. According to the Tatitlek respondent at the time of his interview, young people enjoyed goat hunting because of the element of risk, the prestige associated with making a successful goat hunt, and because everyone in the village liked the meat.

As discussed earlier, the management strategy used by both state and federal agencies in GMU 6 was based on small hunt areas and a registration permit system (Crowley 2002b:73). Both state and federal managers set a mountain goat harvest quota for each RG (Table 4). Although the boundaries for federal and state RGs were identical, the harvest quotas were different (see Table 4), and they could change every year depending on changes in the local goat population. When the quota was reached, the hunt was closed. Under the state system, registration permits for GMU 6D had to be obtained in person in either Cordova or Valdez, and permits were issued on a first-come, first-served basis. Federal permits could be obtained in Cordova and each fall, a biologist from the U.S. Forest Service visited Chenega Bay and Tatitlek to issue hunting permits, which were also available through the Tatitlek IRA Council office.

An issue raised by the Tatitlek respondent was that Tatitlek residents preferred to hunt nearer their homes, in RGs 242, 243, 244 and 245 (Figure 2), but those hunts were often closed by managers before Tatitlek hunters had a chance to obtain a permit or to harvest a goat. According

to this interviewee, Tatitlek hunters had difficulties obtaining permits because they had to travel to Cordova or Valdez. And if they did obtain a state permit, the harvest quota was often reached in their preferred RG before they had a chance to use their permit. As a result, this person said that Tatitlek residents did not always report their goat harvests. The solution suggested by those interviewed was to reserve a number of permits for residents of Tatitlek and Chenega Bay. In addition, this person suggested that permits be transferable, so someone else in the village may use them if the original permittee is unable to hunt. Furthermore, the interviewee suggested that the permits should be usable in any RG in GMU 6D. At the same time, it should be pointed out that federal subsistence harvest quotas for RGs located near Tatitlek were often not reached (Milo Burcham, personal communication).

The potential for overhunting small, discrete goat populations was another problem described by a respondent from Chenega Bay. This person described a small population of goats he saw in Culross Passage in western Prince William Sound. He thought such a small population would be particularly vulnerable to hunters.

There's not a whole bunch of them. That's what I'm saying: if someone went and shot those, which these guys that are guiding now out of Whittier, [they] are gonna pop those and there will never be goats in there. It probably takes 30 years for something to freeze up and they cross the ice or they...somehow there's immigration, and I don't think goats are big time-distance travelers. They probably stay in the proximity. And they've got a low biotic potential, too, so you shoot one nanny off and it's like toast for 5 years.

This respondent then pointed out that the increased presence of hunters and hunting guides would affect mountain goat populations in western Prince William Sound. He feared that the abundance of goats would eventually decline because of overhunting. Asked what would happen if, for example, a large number of goats were killed on Bainbridge Island, he replied:

I don't think they'd migrate, don't think it would repopulate itself very well. The thing is, if you live in proximity of a resource, I think you're more likely to be a steward of the land, and want that to be harvestable [in] perpetuity, but if you don't live there, like a bunch of rich doctors on a charter boat or whatever, they're just going to go "blam blam blam" because they're never going to come back again. So maybe two or three of us [from Chenega Bay] would go, and there could be one down here near the shore on Bainbridge in the winter. We might shoot it, but we're not going to go shoot all six of them off of the whole area there. Just because we know better. But other people that don't live here [and don't] know the resource wouldn't, you know...

## **SUMMARY AND CONCLUSION**

Between 1986 and 2006, almost 90% of all black bear harvests in GMU 6 were by nonresidents of Prince William Sound residents, either Alaska residents who lived outside of GMU 6 or hunters who resided outside of Alaska altogether. Most of these bears were harvested in GMU 6D. ADF&G sealing records and survey data show that the residents of Chenega Bay, Tatitlek and Cordova took very few black bears. In interviews for this project, key respondents in Cordova reported taking black bears on occasion, when boating or fishing in the spring, and the key respondent for Tatitlek reported harvesting a single black bear for the annual *Peksulineq* festival in 2007. While historical and ethnographic accounts indicated that black bears were once

a major subsistence staple for residents of Prince William Sound communities, according to local residents Sitka black-tailed deer have replaced black bears in importance.

Key respondents interviewed for this project had diverse opinions about Prince William Sound black bear populations. Some thought the population was increasing because of mild winters and the abundance of food while others thought the abundance was declining, at least in specific areas, because of hunting pressure from nonresidents of Prince William Sound. One person thought that black bear populations were healthy at the time of his interview, but that that severe winters and a decline in deer numbers would quickly reduce the abundance of bears. Most respondents believed the brown bear population was expanding and that their presence was dangerous for deer and goat hunters.

Mountain goat hunting and meat was highly regarded by the residents of the Prince William Sound communities interviewed for this project. Although goat hunting was a traditional activity for Cordova residents, most respondents interviewed for this project seemed to regard it largely as a sport activity. In Tatitlek and Chenega Bay, goat hunting was considered a subsistence activity and was well integrated into the local culture. Respondents there reported some prestige connected with a successful goat hunt, and said the meat was widely shared in a systematic manner so that elders who had once hunted goat received the best parts of the animals while those who could hunt, but did not, received less desirable pieces of meat.

Respondents generally agreed that there were more goats, but one respondent thought small, discrete populations of goats would be vulnerable to overharvest. Respondents believed that in western Prince William Sound (GMU 6D) predators, specifically brown bears, eagles, and humans, had increased pressures on the goat populations. An elder from Chenega Bay observed that there were more wolves and coyotes in Prince William Sound in present times than in the 1920s and 1930s. In those decades he never saw any of these predators in the Sound.

In general, hunters preferred to hunt close to home. Cordova hunters reported hunting primarily in the RGs east of Cordova, along the north side of the Copper River Highway. Tatitlek goat hunters reported hunting on Copper Mountain, the mountains surrounding Fish Bay, and the mountains at the head of Port Fidalgo. Chenega Bay hunters did not harvest any goats in the years of this project. Respondents did say that they once hunted goats throughout much of western Prince William Sound, but that in recent years they have stopped hunting for goats on the seaward capes between Prince William Sound and Resurrection Bay.

For all key respondents, a major issue was the increased presence of nonresident hunters, fishers and boaters in Prince William Sound. Many of those interviewed believed the increased traffic was a direct result of the *Exxon Valdez* oil spill and the resulting media coverage. They also believed that the influx of nonresidents was facilitated by construction of the Whittier tunnel, which provided access from the state's population centers. The presence of nonresidents of Prince William Sound had a direct effect on their subsistence hunting because of competition for fish and game. Residents also claimed that the presence of so many nonresidents of Prince William Sound scared the game, and made it more difficult to hunt. In addition, the presence of tourists in such areas as the Columbia Glacier had an inhibiting effect on the hunting activities of residents.

The overriding issue for Tatitlek hunters, according to the resident interviewed, was obtaining a permit to hunt goats in the RGs close to home. Under state regulations, registration permits to hunt in GMU 6D were available only in Cordova and Valdez, and they had to be applied for in

person, and were issued on a first-come, first-served basis. If a Tatitlek hunter did obtain a state permit, the quotas often were reached in the RG he or she wanted to hunt before the hunter had a chance to use the permit. The Tatitlek respondent did report that federal permits were easier to obtain because they are limited to rural residents of GMU 6; however, the harvest quotas were smaller.

## **RECOMMENDATIONS**

Tatitlek and Chenega Bay respondents interviewed for this project made several suggestions regarding black bears and mountain goats. Because of the reported difficulty in obtaining permits to hunt mountain goats in the vicinity of Tatitlek, one solution they offered was to reserve a number of permits Tatitlek and Chenega Bay hunters. A Chenega Bay elder suggested that 2 permits could be reserved for each community, which could be done under 5 AAC 92.072 "Community subsistence harvest hunt and permit conditions," in which the Alaska Board of Game establishes a community harvest hunt area. A similar community quota could be established under federal regulations as well. In addition, the respondents recommended that both state and federal permits be transferable so that if someone obtained a permit but was unable to use it, someone else in the village could use it. The respondents also recommended that these permits be usable in any RG within in GMU 6D.

## **ACKNOWLEDGEMENTS**

Thanks go to the key respondents for their time and expertise, as well as to Dave Crowley and Mark King for their general assistance in Cordova. Davin Holen made the maps. Several drafts of the report were read by Elizabeth Andrews, Jim Fall, and Bridget Easley. The U.S. Forest Service provided support for this project in the amount of \$56,950 under agreement AG-0109-C-05-0054.

## LITERATURE CITED

- ADF&G (Alaska Department of Fish and Game). 2007. Community Subsistence Information System. Division of Subsistence, Juneau. <http://www.subsistence.adfg.state.ak.us/CSIS>. Accessed in 2007.
- ADF&G (Alaska Department of Fish and Game). 2007. Harvest data from the department's web-based database called WinfoNet. Division of Wildlife Conservation, Anchorage. Accessed in 2007.
- Birket-Smith, K. 1953. The Chugach Eskimo. Nationalmuseets Publikationsfond, Kobenhavn.
- Birket-Smith, K. and F. de Laguna. 1938. The Eyak Indians of the Copper River Delta, Alaska. Levin & Munksgaard, E. Munksgaard, Copenhagen.
- Crowley, D. W. 2002a. Black bear management report. Game Management Unit 6. Pages 123–140 in Bear management report of survey-inventory activities, 1 July 1998–30 June 2001. C. Healy, editor. Project 17.0. Alaska Department of Fish and Game, Division of Wildlife Conservation, Juneau.
- Crowley, D. W. 2002b. Mountain goat management report. Game Management Unit 6. Pages 73–98 in Mountain goat management report of survey-inventory activities, 1 July 1998–30 June 2001. C. Healy, editor. Alaska Department of Fish and Game, Division of Wildlife Conservation, Juneau.
- de Laguna, F. 1956. Chugach prehistory: the archaeology of Prince William Sound. University of Washington Press, Seattle, Washington.
- Fall, James A., editor. 2006. Update of the status of subsistence uses in *Exxon Valdez* oil spill area communities, 2003. Alaska Department of Fish and Game, Division of Subsistence, Technical Paper 312, Juneau.
- Fall, James A., and C. J. Utermohle. 1999. Subsistence harvest and uses in eight communities ten years after the *Exxon Valdez* oil spill. Alaska Department of Fish and Game, Division of Subsistence, Technical Paper 252, Juneau.
- Simeone, William, and R. A. Miraglia. 2000. An ethnography of Chenega Bay and Tatitlek, Alaska. Alaska Department of Fish and Game, Division of Subsistence, Anchorage.
- Stratton, L. 1990a. *Unpublished*. Field notes. Alaska Department of Fish and Game, Division of Subsistence, Anchorage.
- Stratton, L. 1990b. Resource harvest and use in Tatitlek, Alaska. Alaska Department of Fish and Game, Division of Subsistence, Technical Paper 181, Juneau.
- Stratton, L., and E. B. Chisum. 1986. Resource use patterns in Chenega, Western Prince William Sound: Chenega in the 1960s and Chenega Bay 1984–1986. Alaska Department of Fish and Game, Division of Subsistence, Technical Paper No. 139, Juneau.
- United States Census Bureau. 2001. Profiles of general demographic characteristics, 2000 census of population and housing: Alaska. U.S. Department of Commerce. Washington, D.C.
- USFWS OSM (United States Fish and Wildlife Service Office of Subsistence Management). 2007. Subsistence management regulations for the harvest of wildlife on federal public lands in Alaska. United States Department of the Interior. Anchorage.

## **TABLES AND FIGURES**

**Table 1.**—Estimated population of the project communities, 2000.

Community	Total population		Alaska Native population	
	People	Households	People	Percent of total
Chenega Bay	86	22	67	77.9%
Cordova	2,454	958	368	15.0%
Tatitlek	107	38	91	85.0%
<b>Totals</b>	<b>2,647</b>	<b>1,018</b>	<b>526</b>	<b>19.9%</b>

Source: US Census Bureau 2001.

**Table 2.**—Estimated harvests and uses of black bears, federally-eligible rural communities of GMU 6.

Study year	Community	Percentage of households					Estimated number harvested	Estimated usable pounds harvested			
		Using	Hunting	Harvesting	Receiving	Giving		Total	Per household	Per capita	CI (+/- 95%)
1984	Chenega	50.0	31.3	6.3	50.0	6.3	1	58.0	3.6	1.0	0
1985	Chenega	68.8	37.5	37.5	43.8	31.3	12	616.0	36.3	10.2	16
1989	Chenega	5.6	0.0	0.0	5.6	5.6	0	0.0	0.0	0.0	
1990	Chenega	38.9	27.8	27.8	16.7	16.7	6	338.0	16.1	4.4	33
1991	Chenega	33.3	22.2	16.7	22.2	16.7	4	213.0	9.7	2.6	50
1992	Chenega	39.1	26.1	26.1	26.1	21.7	15	852.0	32.8	9.4	39
1993	Chenega	17.4	30.4	8.7	17.4	13.0	2	141.0	5.0	1.4	50
1997	Chenega	26.7	20.0	13.3	20.0	6.7	3	162.0	7.7	2.8	78
2003	Chenega	12.5	0.0	0.0	12.5	6.3	0	0.0	0.0	0.0	
1985	Cordova	6.8	7.3	2.9	4.4	1.5	37	1,441.0	1.7	0.6	72
1988	Cordova	4.9	7.8	2.0	2.9	3.2	18	891.0	1.0	0.4	100
1991	Cordova	3.0	3.0	2.0	1.0	2.0	16	450.0	0.6	0.2	125
1992	Cordova	4.9	0.0	0.0	4.9	0.0	0	0.0	0.0	0.0	
1993	Cordova	3.8	3.8	1.9	1.9	1.9	18	1,055.0	1.1	0.4	133
1997	Cordova	11.8	11.9	4.7	7.1	5.1	43	2,472.9	3.0	1.0	67
2003	Cordova	10.1	8.1	2.7	8.1	3.4	35	2,034.7	2.2	0.8	94
1987	Tatitlek	5.3	5.3	5.3	0.0	5.3	2	95.0	3.1	0.8	100
1988	Tatitlek	42.9	14.3	14.3	33.3	14.3	8	464.0	16.6	4.6	50
1989	Tatitlek	4.5	4.5	4.5	0.0	4.5	1	74.0	2.6	0.7	100
1990	Tatitlek	11.8	11.8	5.9	5.9	0.0	2	96.0	3.4	0.8	100
1991	Tatitlek	26.3	5.3	5.3	21.1	15.8	1	82.0	3.1	0.8	200
1993	Tatitlek	0.0	5.0	0.0	0.0	0.0	0	0.0	0.0	0.0	
1997	Tatitlek	6.3	0.0	0.0	6.3	0.0	0	0.0	0.0	0.0	0
2003	Tatitlek	20.0	8.0	4.0	20.0	4.0	1	62.6	2.3	0.9	55

Source: Fall 2006.

**Table 3.**—Estimated harvests and uses of mountain goats, federally-eligible rural communities of GMU 6.

Study year	Community	Percentage of Households					Estimated number harvested	Estimated usable pounds harvested			
		Using	Hunting	Harvesting	Receiving	Giving		Total	Per household	Per capita	CI (+/- 95%)
1984	Chenega	6.3	37.5	6.3	6.3	6.3	2	145.0	9.1	2.5	0
1985	Chenega	31.3	12.5	6.3	25.0	6.3	2	154.0	9.1	2.5	50
1989	Chenega	38.9	11.1	11.1	27.8	16.7	2	169.0	8.1	2.3	50
1990	Chenega	0.0	11.1	0.0	0.0	0.0	0	0.0	0.0	0.0	
1991	Chenega	0.0	5.6	0.0	0.0	0.0	0	0.0	0.0	0.0	
1992	Chenega	39.1	0.0	0.0	39.1	13.0	0	0.0	0.0	0.0	
1993	Chenega	8.7	4.3	0.0	8.7	4.3	0	0.0	0.0	0.0	
1997	Chenega	20.0	6.7	6.7	20.0	6.7	1	102.0	4.8	1.7	115
2003	Chenega	25.0	12.5	6.3	25.0	12.5	1	90.6	4.5	1.6	93
1985	Cordova	5.8	3.9	1.5	4.4	0.5	17	901.0	1.1	0.4	100
1988	Cordova	2.5	1.1	0.9	1.6	0.9	8	599.0	0.7	0.3	162
1991	Cordova	2.0	0.0	0.0	2.0	1.0	0	0.0	0.0	0.0	
1992	Cordova	2.4	2.4	0.0	2.4	0.0	0	0.0	0.0	0.0	
1993	Cordova	1.0	1.0	0.0	1.0	0.0	0	0.0	0.0	0.0	
1997	Cordova	9.5	5.5	4.0	5.5	3.6	39	2,860.0	3.5	1.1	84
2003	Cordova	10.8	2.7	1.4	9.5	2.7	16	1,158.4	1.3	0.5	127
1987	Tatitlek	15.8	5.3	0.0	15.8	0.0	0	0.0	0.0	0.0	
1988	Tatitlek	52.4	23.8	9.5	47.6	9.5	3	193.0	6.9	1.9	66
1989	Tatitlek	4.5	0.0	0.0	4.5	0.0	0	0.0	0.0	0.0	
1990	Tatitlek	0.0	23.5	0.0	0.0	0.0	0	0.0	0.0	0.0	
1991	Tatitlek	42.1	21.1	21.1	26.3	21.1	6	412.0	15.3	3.8	50
1993	Tatitlek	40.0	20.0	15.0	25.0	15.0	6	406.0	14.5	4.2	50
1997	Tatitlek	37.5	25.0	18.8	18.8	18.8	5	367.0	13.6	4.5	73
2003	Tatitlek	40.0	12.0	4.0	36.0	28.0	1	78.3	2.9	1.1	55

Source: Fall 2006.

**Table 4.**—Harvest quotas for goats, state and federal registration permit subareas in GMU 6D, 2007–2008.

State RGs	Quota	Federal RGs	Quota
RG 242	28 goats	RG 242	2 goats
RG 243	closed	RG 243	4 goats
RG 244	9 goats	RG 244	2 goats
RG 245 <sup>1</sup>	7 goats	RG 245	n/a
RG 248 <sup>1</sup>	6 goats	RG 248	n/a
RG 249	16 goats	RG 249	4 goats
RG 252	13 goats	RG 252	1 goat
RG 266	11 goats	RG 266	4 goats

<sup>1</sup> RGs 245 and 248 are outside the Chugach National Forest.

Sources: ADF&G 2007; USFWS OSM 2007.

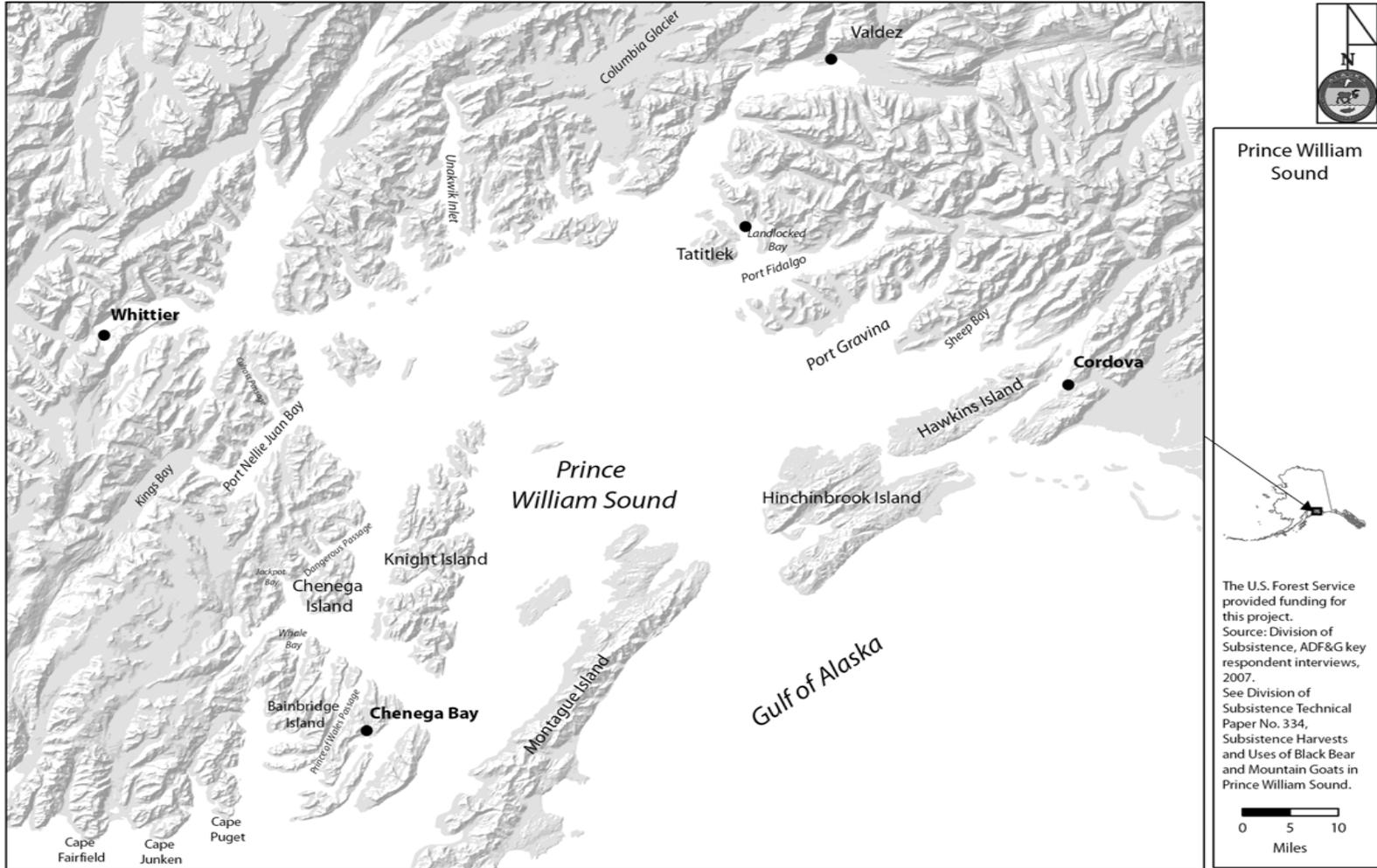


Figure 1.-Map of Prince William Sound, Alaska, area.

Prince William Sound

The U.S. Forest Service provided funding for this project.  
 Source: Division of Subsistence, ADF&G key respondent interviews, 2007.  
 See Division of Subsistence Technical Paper No. 334, Subsistence Harvests and Uses of Black Bear and Mountain Goats in Prince William Sound.

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Division of Subsistence - Alaska Department of Fish and Game

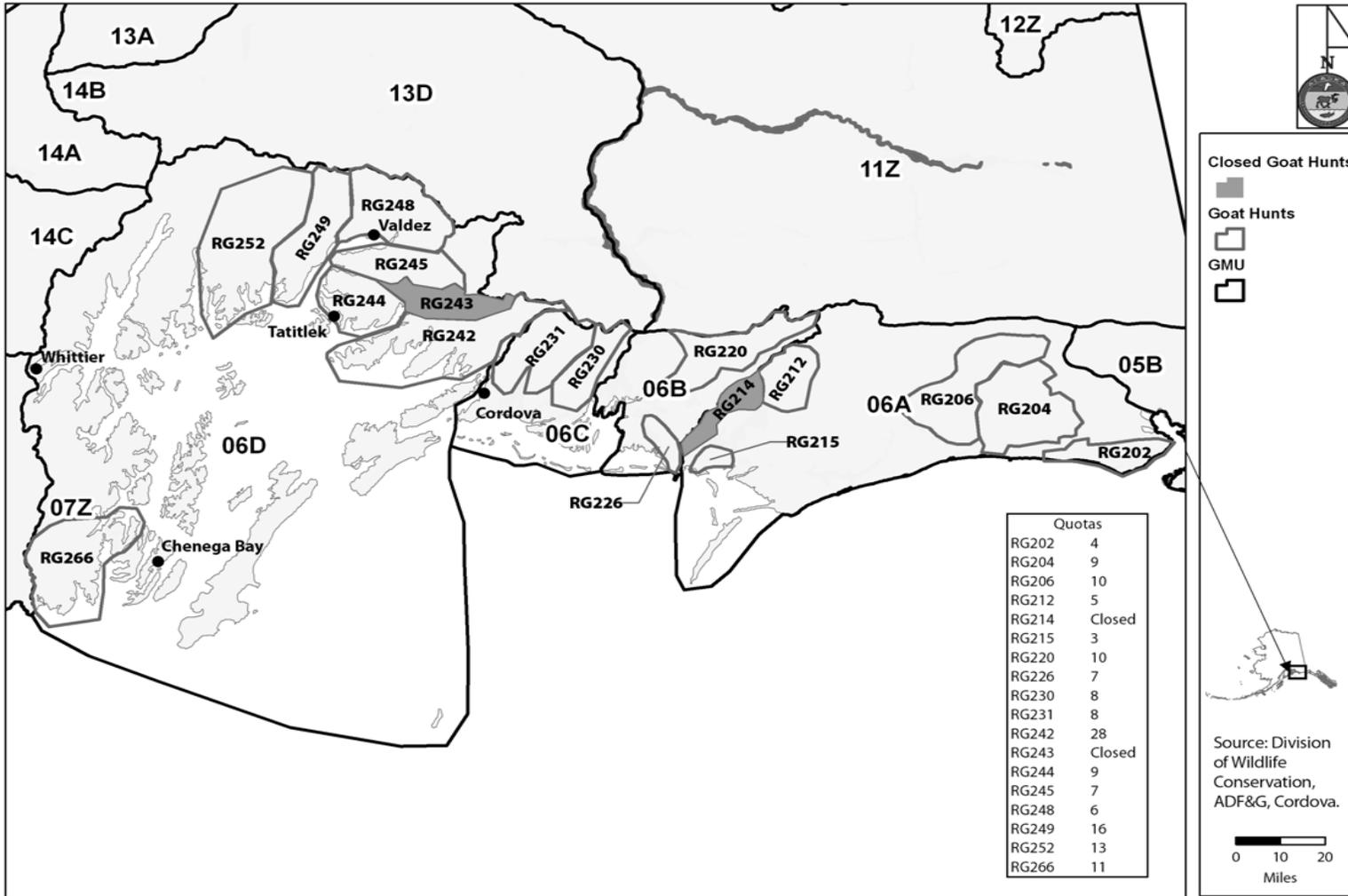
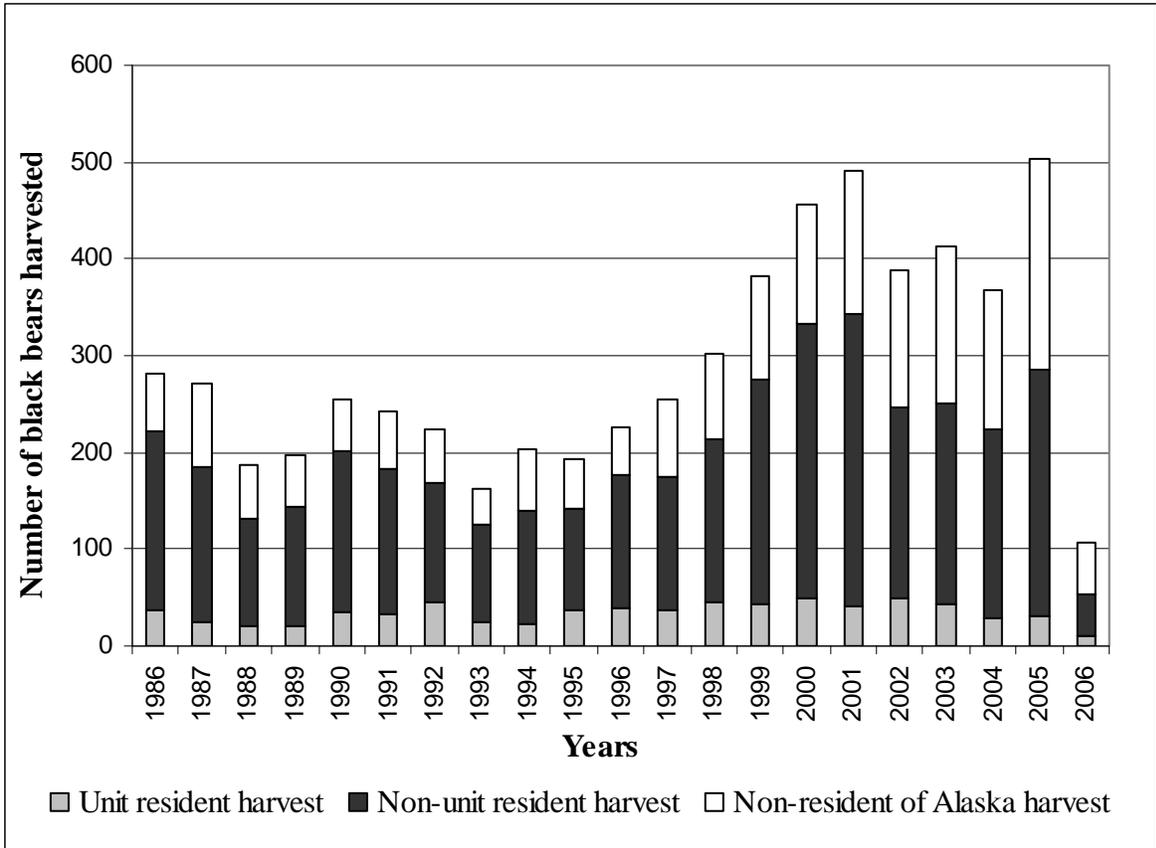
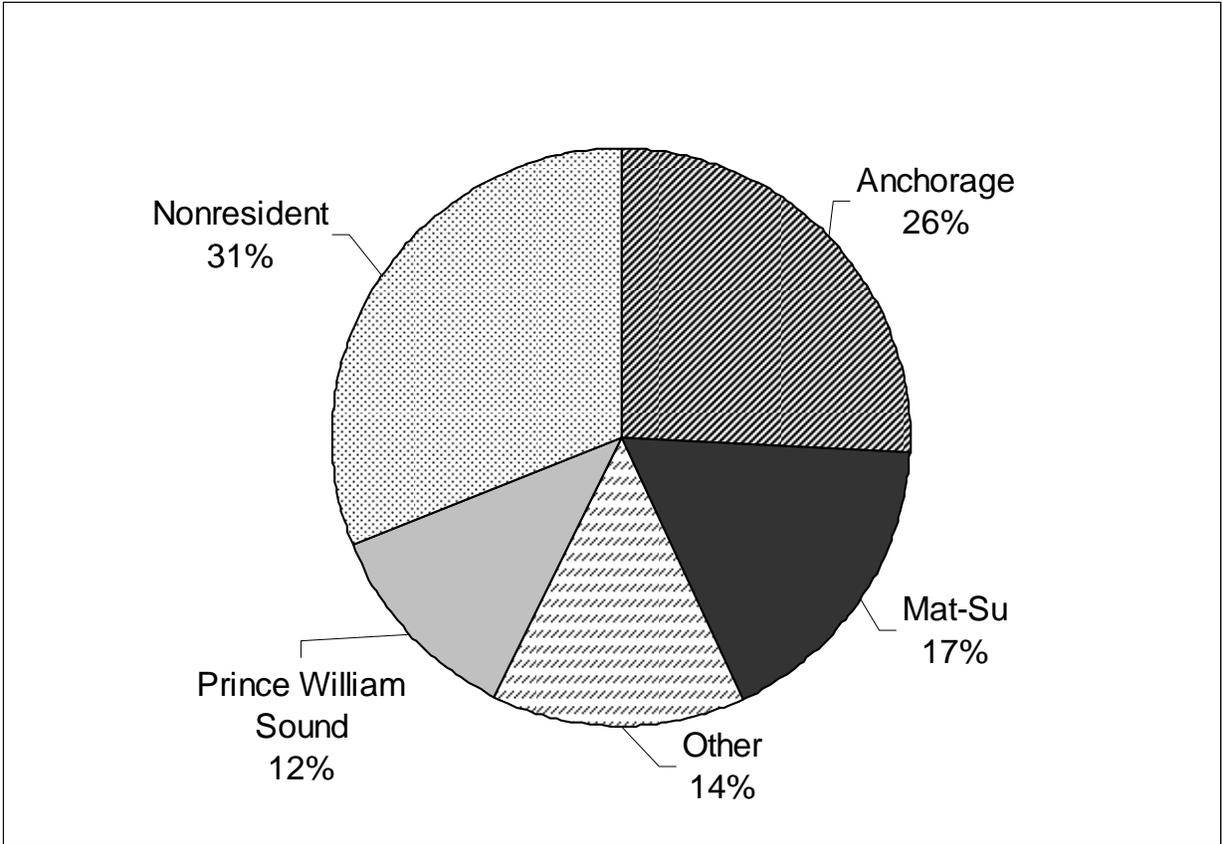


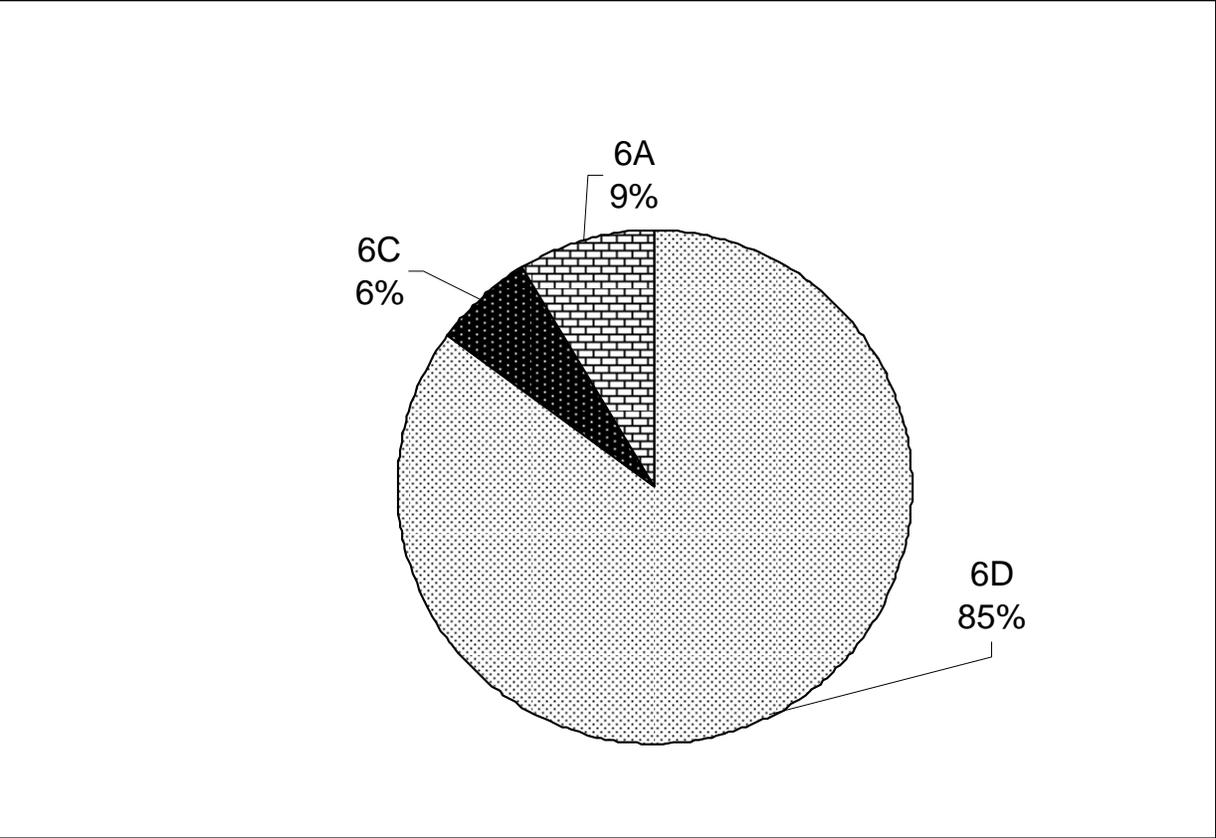
Figure 2.—Game management units and mountain goat registration hunt areas, regulatory year 2007–2008.



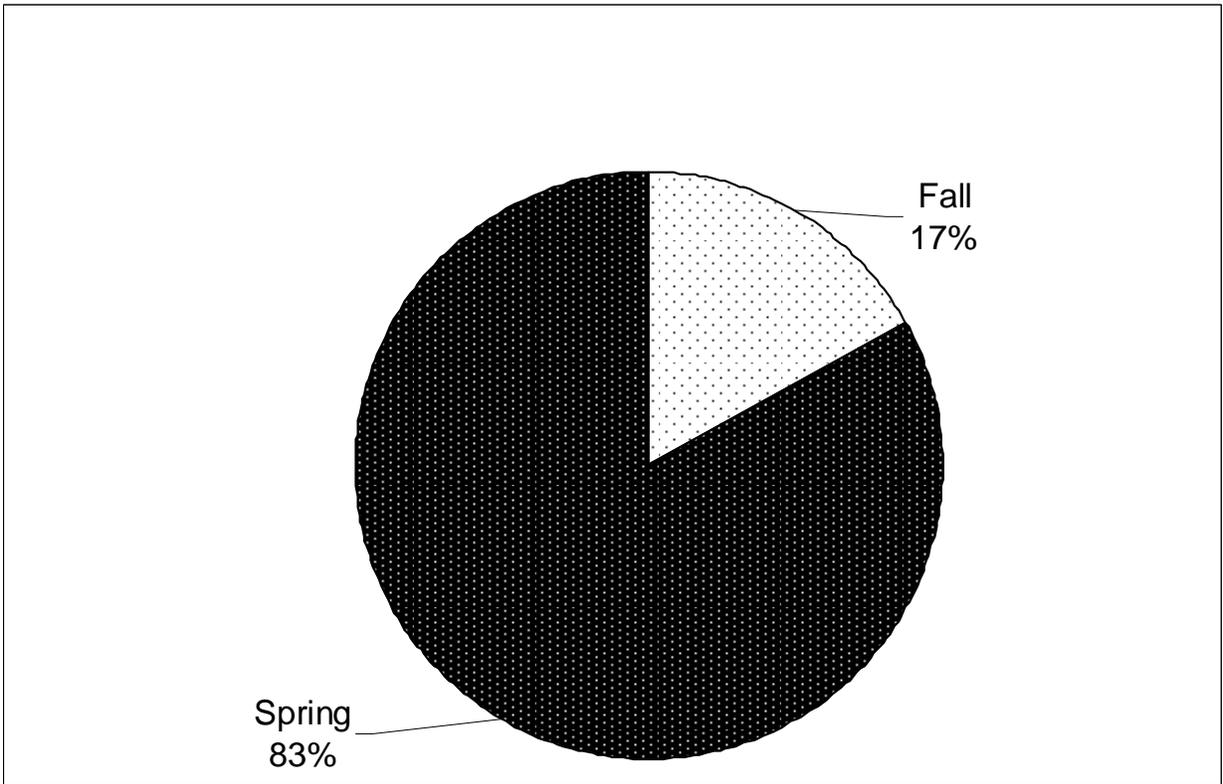
**Figure 3.**—Harvests of black bears, GMU 6, by place of residence, 1986–2006.



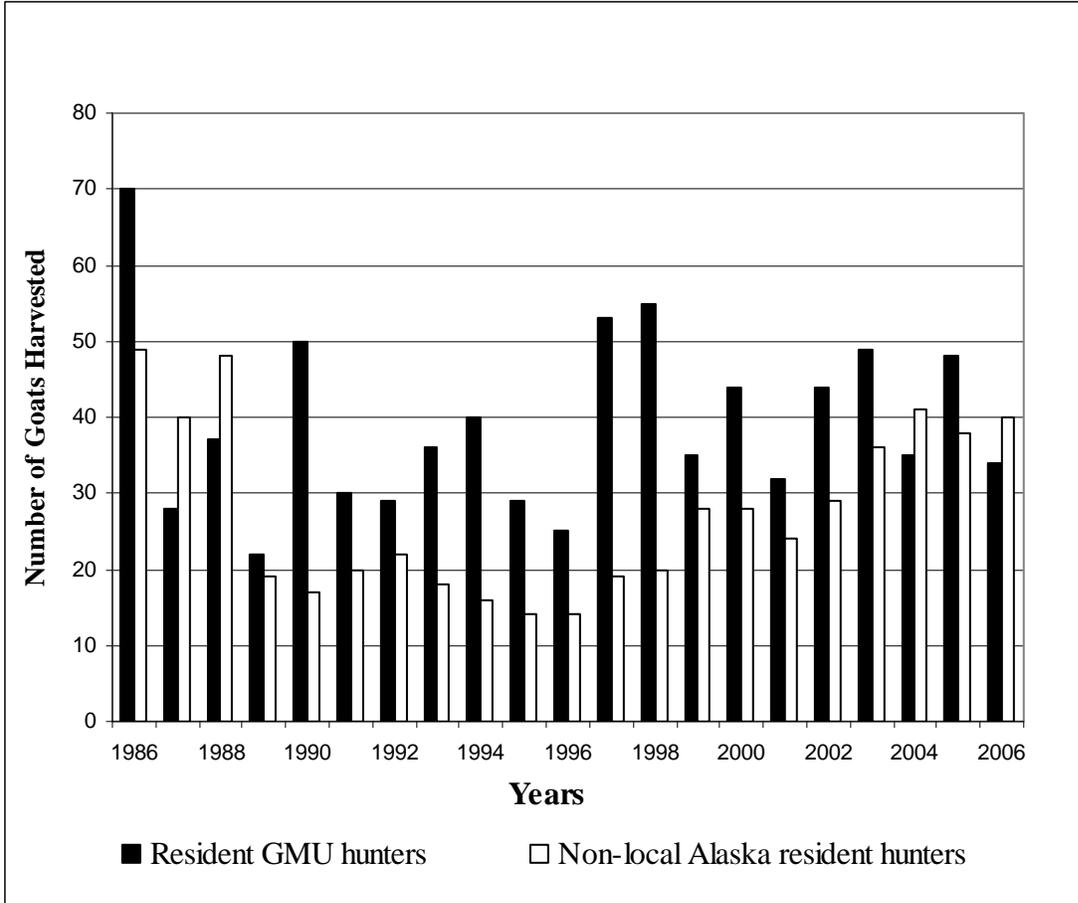
**Figure 4.**—Percentage of total black bears harvested by place of residence, GMU 6, 1986–2006.



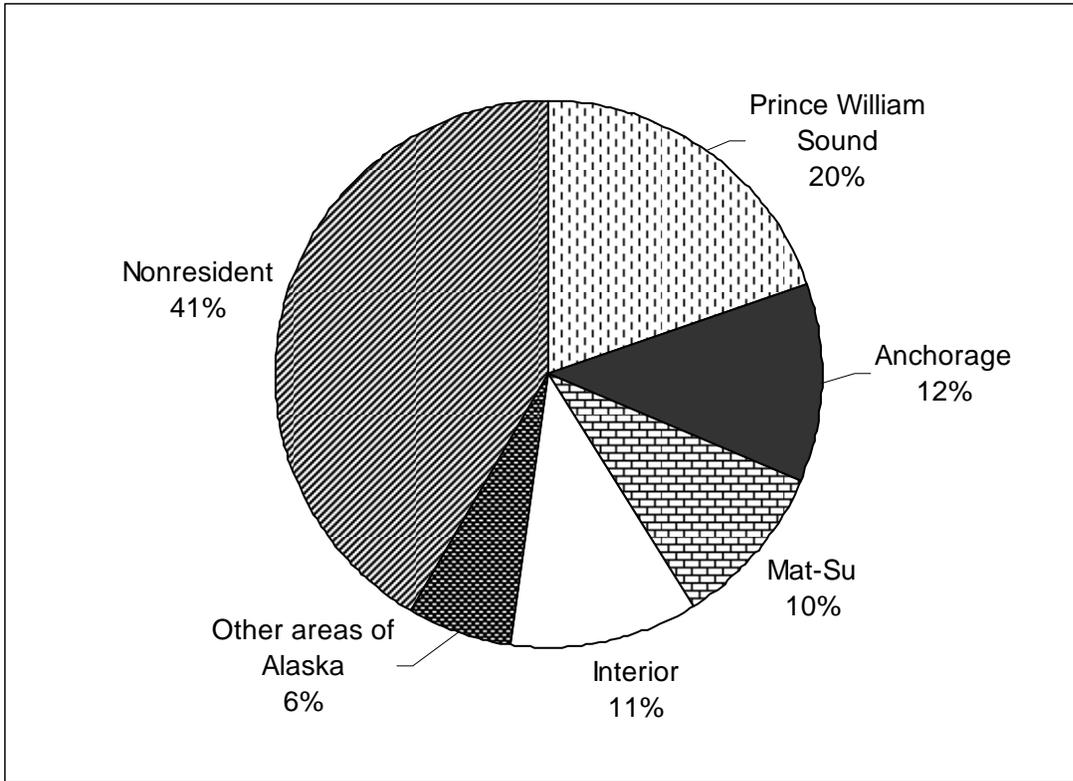
**Figure 5.**—Percentage of black bear hunters by subunit, GMU 6, 1986–2006.



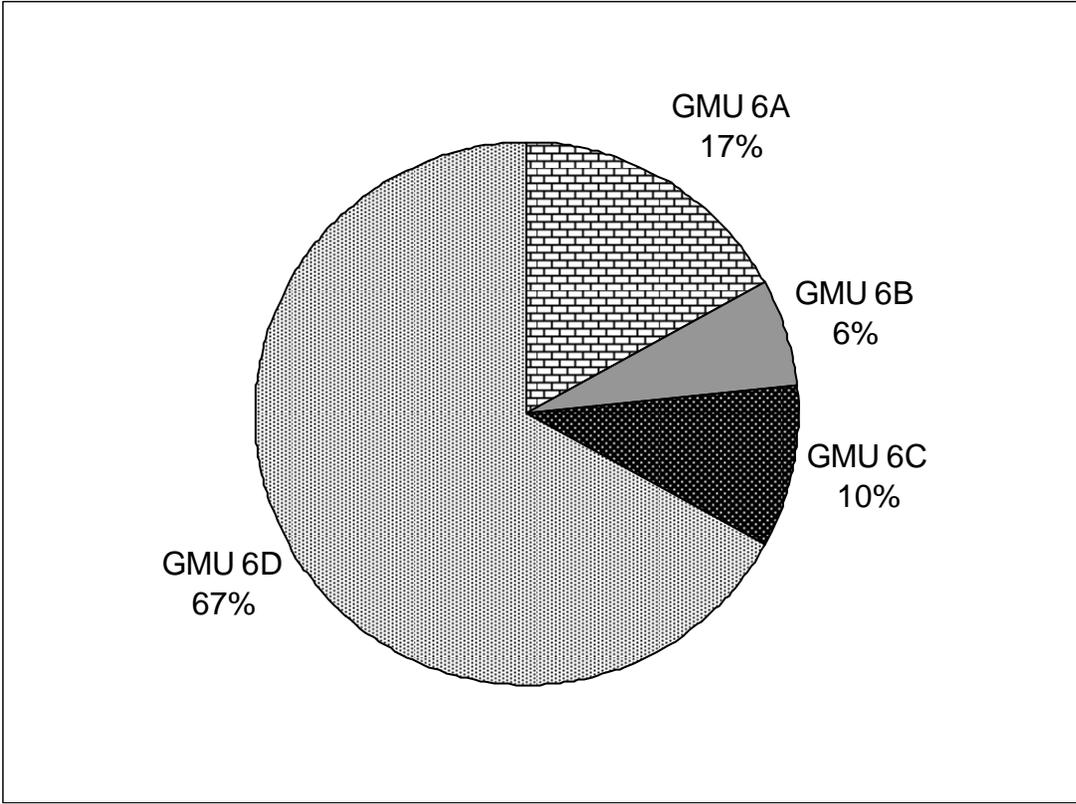
**Figure 6.**—Percentage of spring and fall black bear hunts, GMU 6, 1986–2006.



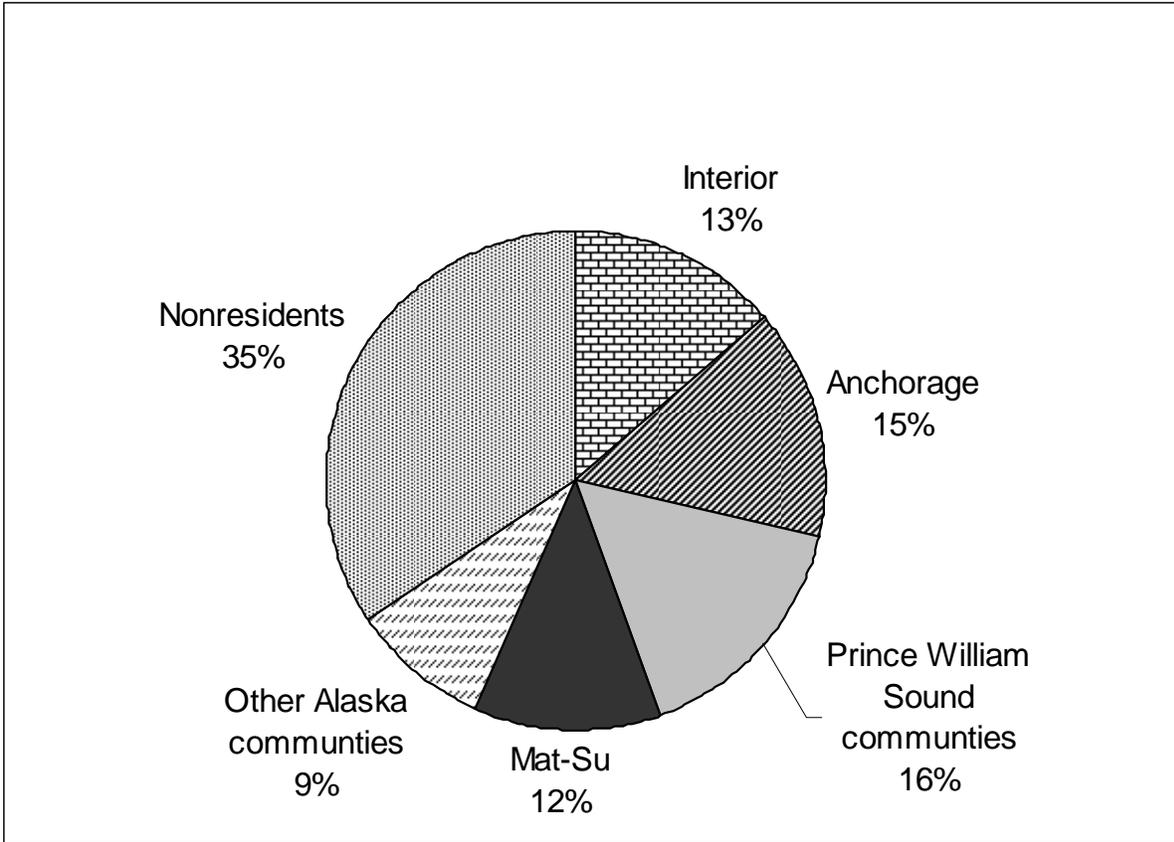
**Figure 7.**—Number of successful mountain goat hunters by place of residence, GMU 6, 1986–2006.



**Figure 8.**—Percentage of successful mountain goat hunters by place of residence for all of GMU6, 1986–2006.



**Figure 9.**—Percentage of successful mountain goat hunters by GMU 6 subunit, 1986–2006.



**Figure 10.**—Percentage of successful mountain goat hunters and their community of residence, GMU 6D, 1986–2006.

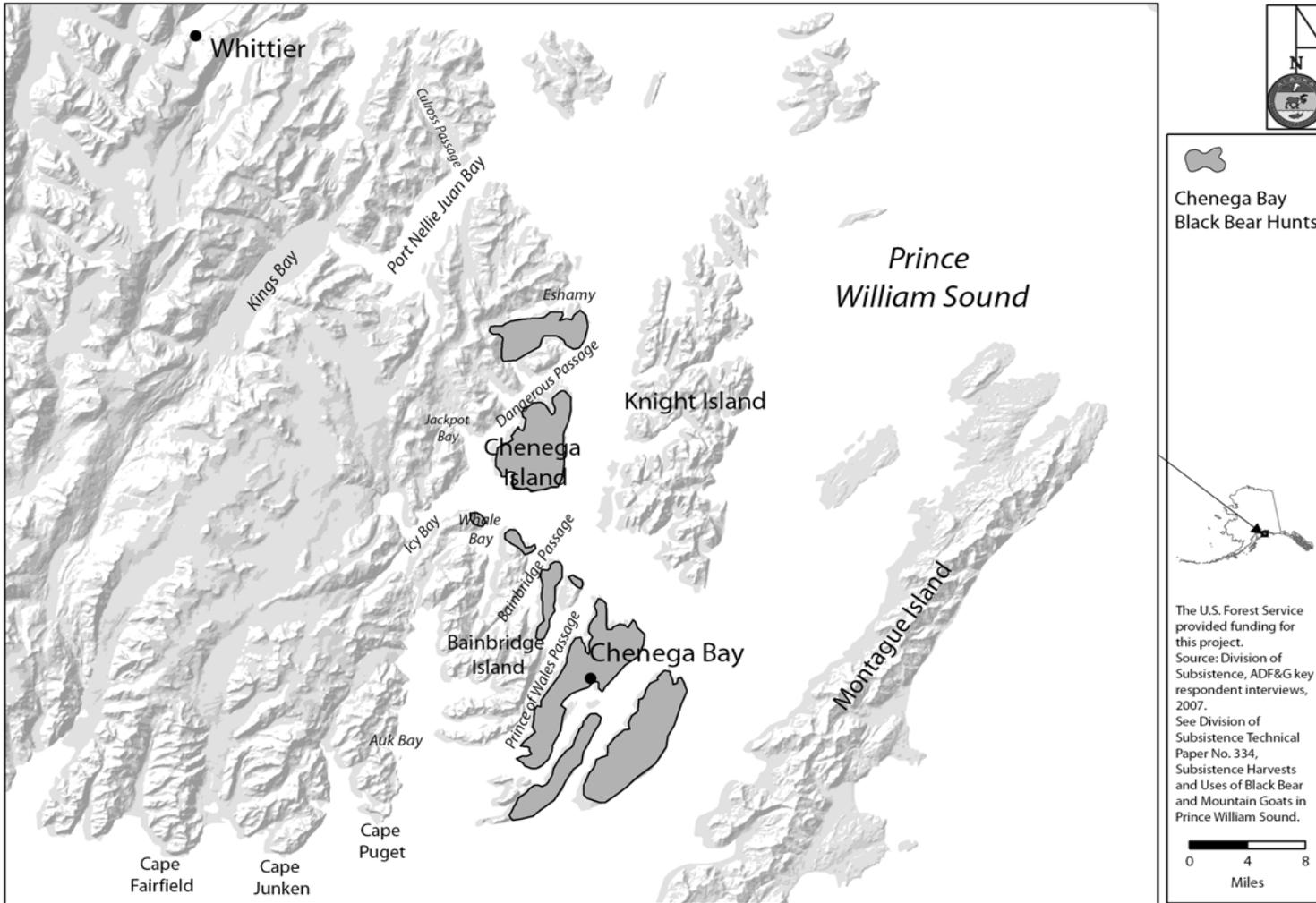


Figure 11.-Map of Chenega Bay black bear hunting areas.

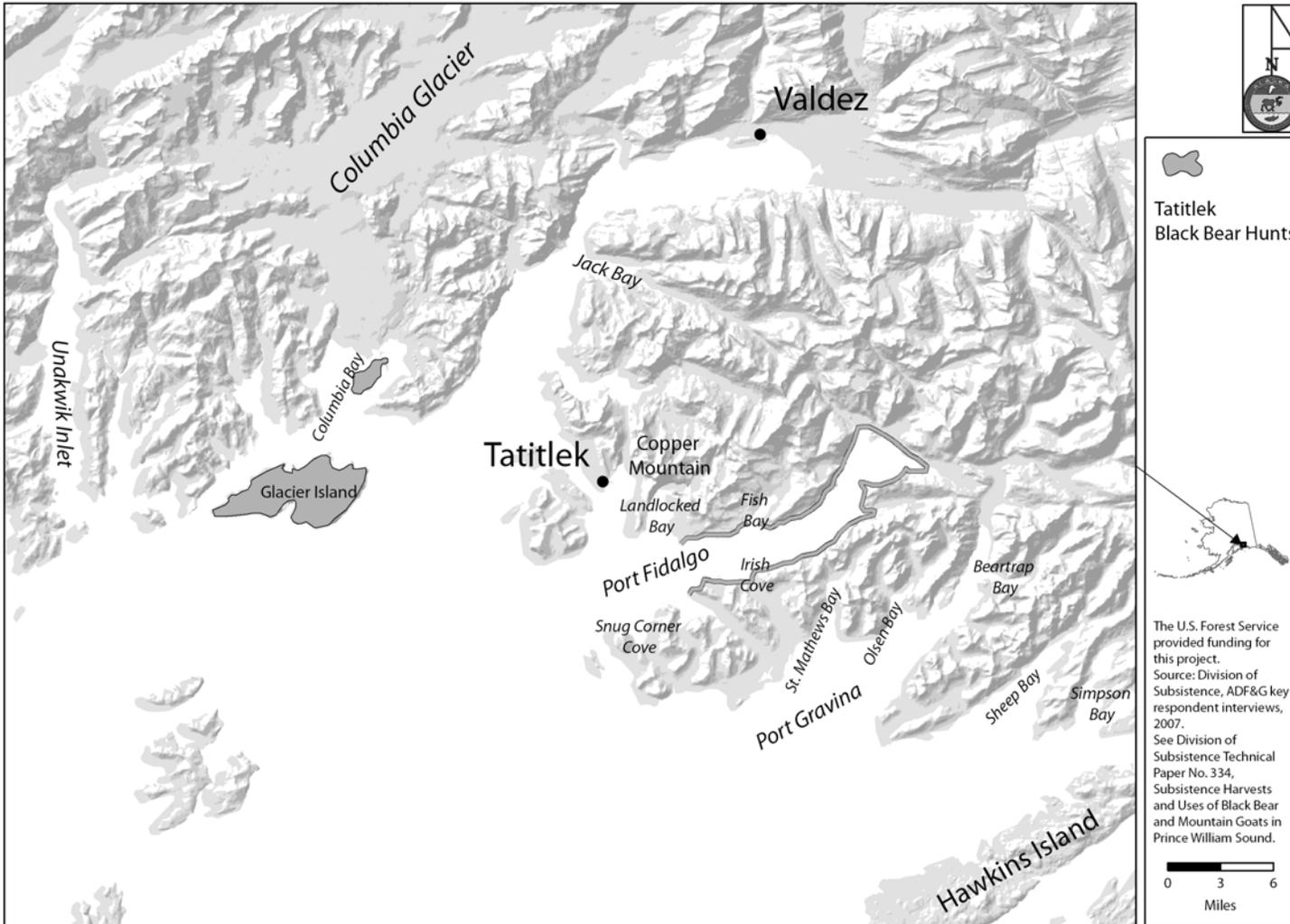


Figure 12.—Map of Tatitlek black bear hunting areas.

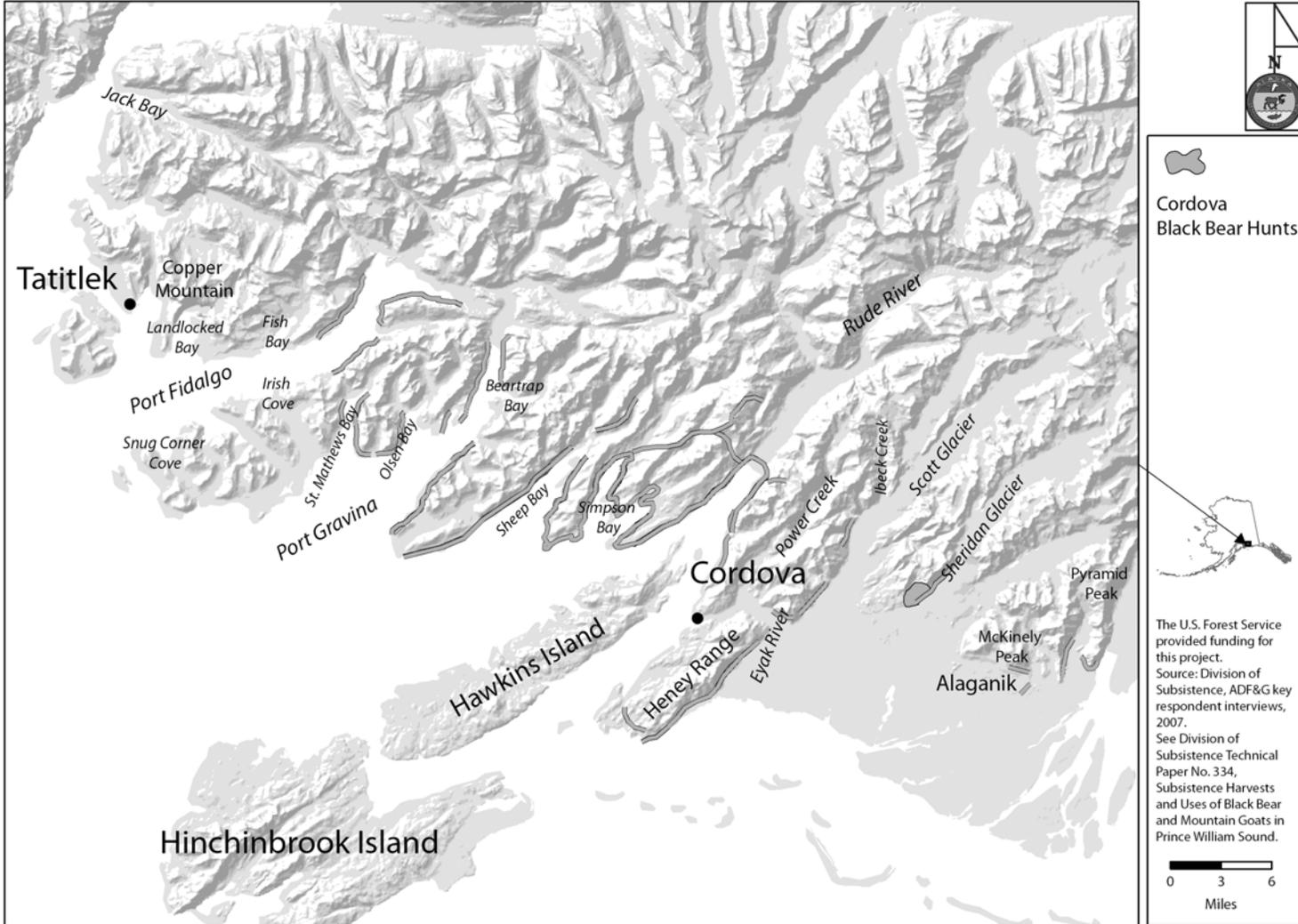


Figure 13.—Map of Cordova black bear hunting areas.

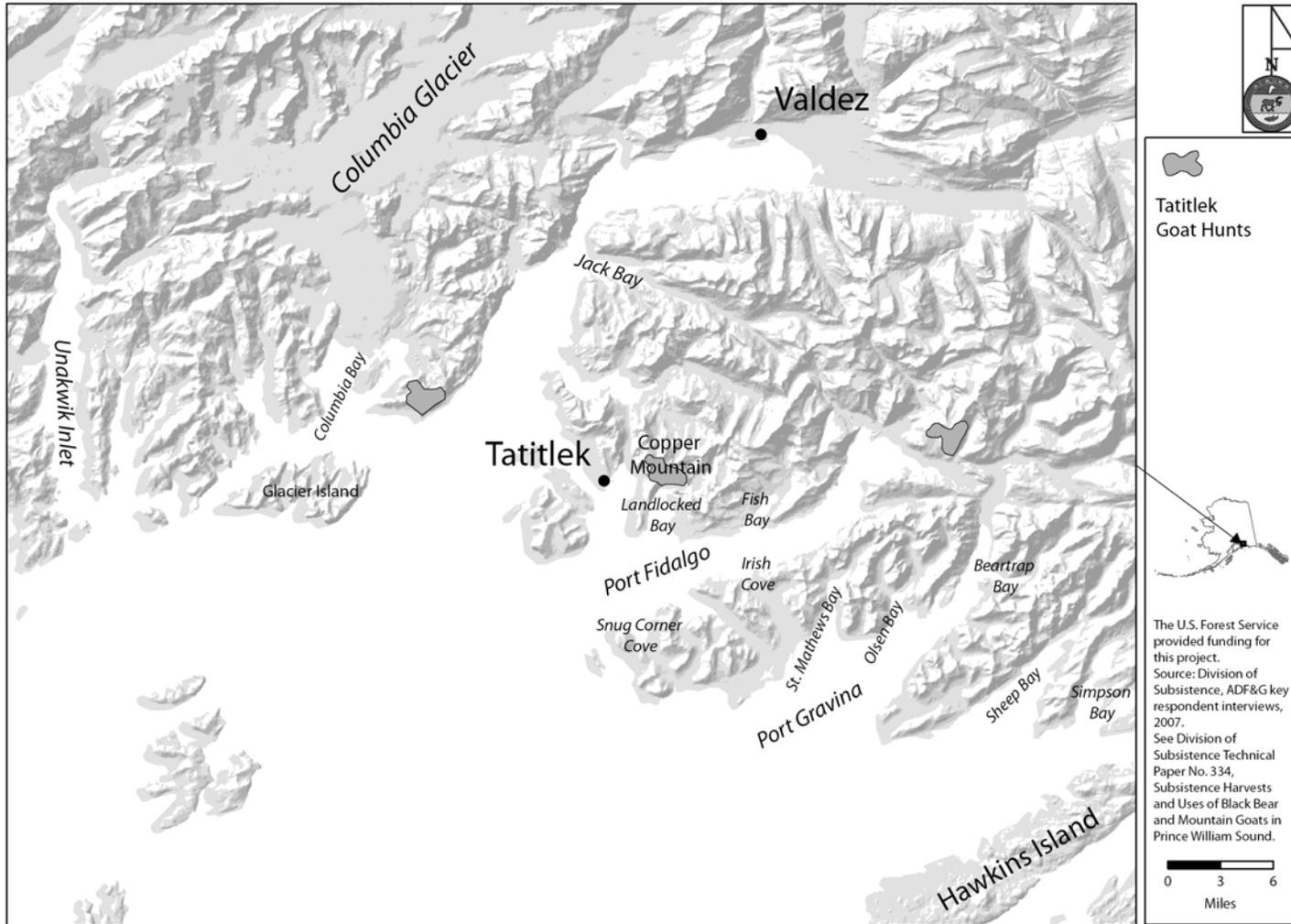


Figure 14.-Map of Tattilek mountain goat hunting areas.

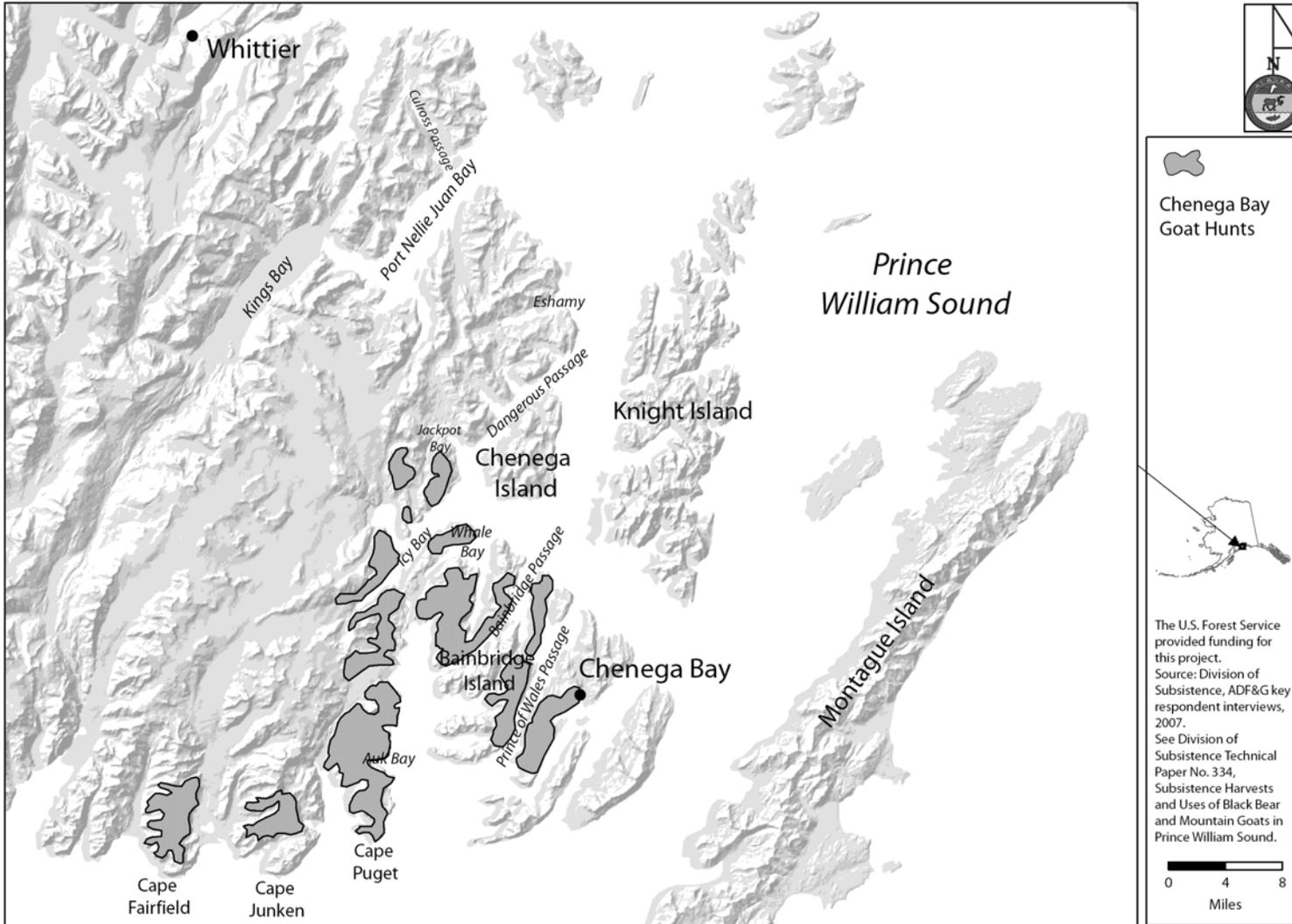


Figure 15.—Map of Chenega Bay mountain goat hunting areas.

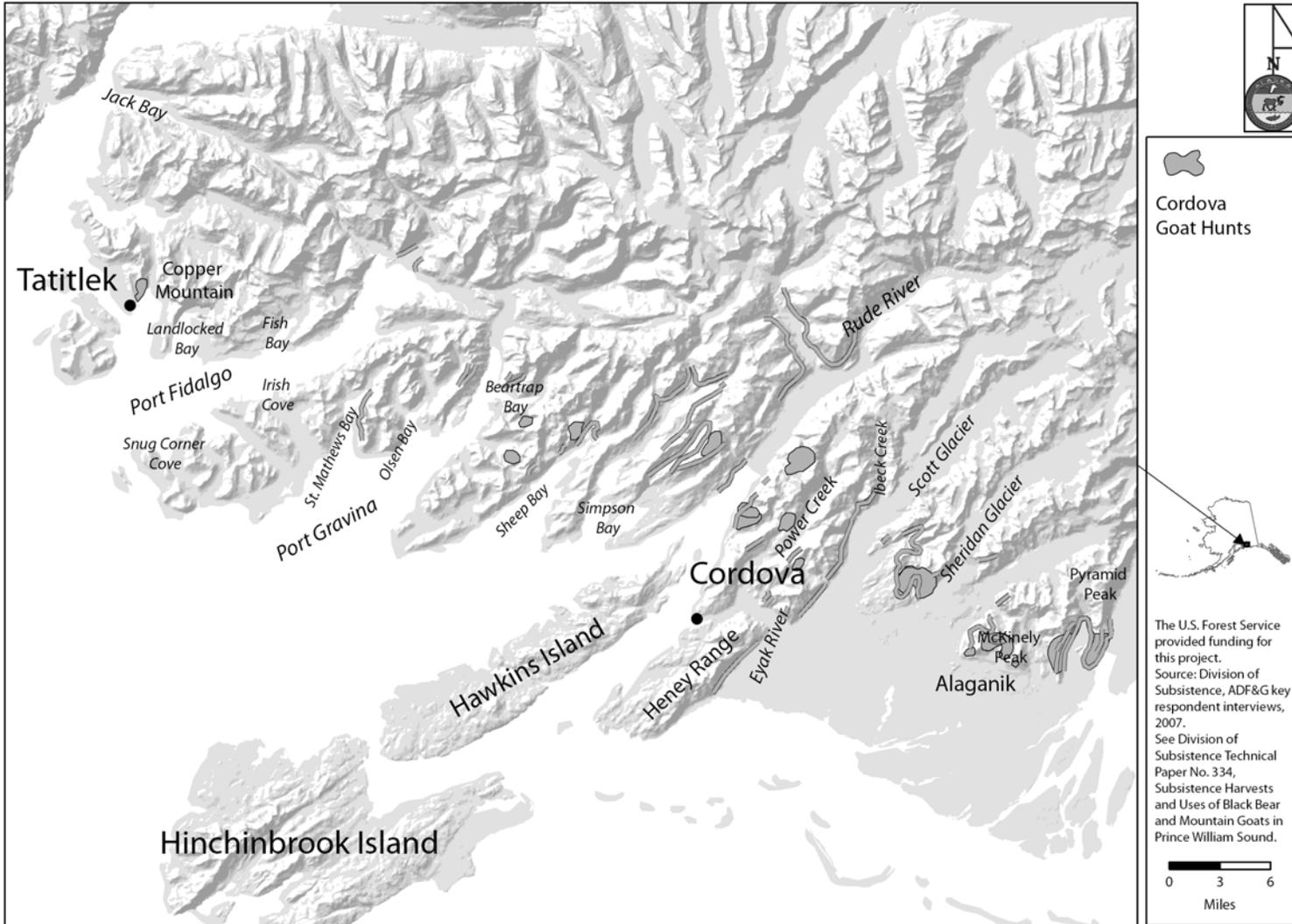


Figure 16.—Map of Cordova mountain goat hunting areas.

**APPENDIX A.**  
**LITERATURE REVIEW: SUBSISTENCE USES OF BLACK**  
**BEARS AND MOUNTAIN GOATS IN**  
**PRINCE WILLIAM SOUND**

**LITERATURE REVIEW**

**Subsistence Uses of Black Bears and Mountain Goats  
in Prince William Sound**

by

Philippa Coiley-Kenner

Forest Service Contract No. AG-0109-C-05-0054

Division of Subsistence  
Alaska Department of Fish and Game  
Anchorage

April 12, 2006

**LITERATURE REVIEW**  
**WITH SELECTED ABSTRACTS**

**Birket-Smith, Kaj**

1953 The Chugach Eskimo. National Museum. Copenhagen.

Territory and Tribes. Alukarmiut, in Sheep Bay. Atyarmiut, in Gravina Bay from Gravina Point to Humphries Hole. "It was told that they ate so many goats that their beards were bristling with goat fat. The same joke was told of the Alukarmiut and the Tatitlarmiut" (p. 20).

Tatitlarmiut, from Porcupine Point to the northwest side of the entrance to Port Valdez (p.20).

In former days: "In some parts of the Sound, notably among the Alukarmiut, Atyarmiut and Tatitlarmiut on the mainland, mountain goat was a favourite game," while "the meat of marine mammals made up the staple food" (p. 23).

"In autumn sea lions were a favourite game, and mountain goats were hunted wherever they occurred, i.e. especially on the mainland in the northeastern and northern parts of the Sound" (p.23).

"Sea lion and mountain goat were still hunted during the winter, as were also seals, and bears were taken in their dens, but there can be no doubt that the winter, when storms and blizzards often made hunting excursions impossible, was a hard time, and people had to a great extent to live on the provisions stored away in their caches" (p. 23).

In 1933: In fall ducks and geese are harvested... "Bear, i.e. the black species, which is probably the only living here, are likewise hunted, as are also mountain goats at Bainbridge and Port Wells. August is considered the best month for this kind of hunting. The bear meat is often dried and salted for winter use" (p. 24).

"Spring is the main season for herring fishing, and bears are poked out of the dens and shot, because at this time of the year their meat has not yet acquired the fishy taste that attaches to it later when to a great extent they feed upon salmon" (p. 24).

In 1933: Hunting of Land Mammals. "The hunting of land animals fell far behind the hunting of sea mammals both economically and socially. One big terrestrial animal, the mountain goat,

was pursued regularly. Besides some small carnivores and rodents were taken for the sake of their fur more than for their meat. Black and brown bears, wolves, etc. seem to have been killed more occasionally” (p. 37).

“Mountain goats were preferably shot in August and September, and the Chugach were, in fact, experts in this kind of hunt during which, according to Petroff (1888:145), they evinced a ‘skill, daring and perseverance equaling those of any Swiss or Tyrolean chamois-hunter.’ The bones of mountain goat—which were never used for tools—were left on the spot under a rock, but were not buried” (p. 37-38)

“In the winter, bears were attacked in their dens. They were also taken in snares fastened to a tree cut halfway through, and when the bear was caught, the tree would be pulled down by its movements and act as a drag to prevent its escape. It was then killed with arrows.” Another snaring method for catching bear is described and a method using deadfall. “According to Paul Eliah only bears killed by spears of deadfalls were eaten, but not those taken in snares” (p. 38).

On bear hunts the hunter carried leaves and roots of certain ferns including *Polypodium vulgare* and the dried veins from the under side of a bear’s tongue. These were chewed and blown on a bear and immediately would have a soothing effect. Before killing a bear, a hunter repeated, “We do this because we need you—not for fun”. “The skull (and maybe the bones) were buried at the place where the bear was killed, facing inland so that the remains might turn into a new bear” (p. 38).

Preparation of Food. “Hunters used to cook mountain-goat meat in the stomach of the animal, after it had been turned inside out” (p. 43).

Houses. Descriptions of houses used in the past included this description: “The bedding, consisting of mountain-goat or bear skins, was rolled up during the day. Blankets were of cormorant skins” (p. 54).

Men’s Dress. “Cook noticed a few woolen blankets similar to those of the Nootka [Source: Cook and Kings 1785 II 368, *A Voyage to the Pacific Ocean...in the years 1776-80*. London 1785]. It must be assumed that they were traded from the Yakutat. After the arrival of Russians the Chugach learned to weave blankets of mountain-goat wool themselves” (p. 64).

Women’s Occupations. “According to Stepan, skins of mountain goats to be used for bedding are simply dried in the sun and scraped in order to remove the fat and meat fibres, whereas Makari maintained that they were soaked in urine before scraping, and the long hairs were removed so that only the wool was left. Such skins were also used for clothing. Stepan said that bear skins were stretched until dry; this was done on a wooden frame consisting of two long and

curved pieces of wood connected with two shorter boards. This implement can still be seen in Chenega [in 1933]. After drying, the skin was washed in water mixed with froth from boiled bear's fat and spruce bark. It was then scraped with the woman's knife, rubbed between the hands, and dried once more" (p. 75).

Customary Law. "Each tribe had its own customary hunting grounds, but apparently there was no sharp boundaries between them and nothing to prohibit a party from hunting where it pleased, just as anybody was allowed to take copper and stone for implements wherever he found it." There were several exceptions to this, such as villages and sometimes tribes had their own salmon places and trapping areas from where they would chase away intruders. "Family hunting territories were not known" (p. 95-96).

"The rather intricate rules for the division of game so well known from most other Eskimo do not seem to have been in force among the Chugach. The meat was always common property, being divided equally between the villagers, and just as the inhabitants of a house hunted together so they ate their meals in common. There were no special cuts or sections, and neither chiefs nor whale killers received a greater share than anybody else" (p. 95-96).

Social Life. Festivals. "The first time he killed a seal or a sea lion, a sea otter, a bear or even a ground squirrel he had to fast for three days, and the meat was distributed among the villagers. Makari expressly stated that this did not apply to the killing of the first mountain goat" (p. 110).

Legends and Myths. The Mountain Goat Hunt in Sheep Bay (Paul Eliah). "The people from Port Wells and Chenega came to Sheep Bay and had a big meeting in the smoke house. It was winter. They were getting ready to hunt mountain goat next day." There was competition between the visitors and the people of Sheep Bay. One hunter from Sheep Bay raced up the mountain, and using arrows, shot 4 goats. "That is why the others are all afraid of the men from Sheep Bay: they are so swift" (p. 145).

Legends and Myths. The Man Who Married a Bear (Stepan). This is how people found out that bears sleep in their dens all winter. While hunting, a man from "Nunaqtuyaq" was seized by a bear in its den. The she-bear made him her husband. They had three cubs. In summer the man turned into a bear and went with his family to get fish. "People used to go around the creeks looking for the first bears to come down." The man asked them not to kill his family. All summer they did not hunt bears in that region. The next fall they saw the three cubs and they did not kill them. But the mother and all the cubs were killed near Canoe Pass on Hawkins Island, and so they did not hunt near Canoe Pass anymore, and in the winter had a great feast in honour of the man's wife and three children. Their heads were brought home, set in the smoke house, people dressed in beads and expensive furs and danced (p. 152).

Legends and Myths. The Woman Who Married a [Brown] Bear (Stepan) (p. 153).

Legends and Myths. Why the Brown Bears are Hostile towards Men (Makari) (p. 154).

Legends and Myths. How Raven Tricked the [Brown] Bears (Paul Eliah) (p. 165).

Legends and Myths. The Bear that Escaped (Paul Eliah). A man and his wife, escaping fighting at Fidalgo, Gravina, or Sheep Bay, go up to the mountains and find a black bear den where they live for four or five years. They have three children... (p. 166).

Legends and Myths. Raven, the [Brown] Bears, and the Whales (Makari) (p. 170).

### **Burcham, Milo**

2006 March 28, 2006. Personal Communication. US Forest Service, Cordova.

Goat in GMU 6D. The federal subsistence goat hunt began around 1990/91. Crowley determines the allowable harvest. Some are reserved for subsistence, 17 goats this year with little variation from year to year. There is not heavy use of the subsistence quota and Milo suggested that there is more harvest than is reported (not uncommon in rural Alaska). In the future he hopes to work more closely with the communities of Chenega Bay and Tatitlek. Milo suggested two contacts in the villages that would be good to talk to: Gary Kompkoff of Tatitlek and Pete Kompkoff of Chenega Bay.

There are two pieces of recent research into goats that are applicable. One was a Forest Service study three years ago in GMU 6C: Mountain Goat Response to Helicopter Overflights in Alaska. Wildlife Society Bulletin, 2005, Volume 33-2 pp. 688-699. Teresa Paquet, Forest Service Permit Administrator, at 754-2314, is finding an electronic copy that she will send on to me.

The second applicable piece of research are winter habitat surveys within the winter motorized use area, over two years. The results are published final reports that Milo is e-mailing to me. I found the 2003 report at the Chugach Forest website, but was not able to review it.

Chuck Miller at OSM in Anchorage, 786-3863, maintains the harvest records. I called him and left messages, March 28 and April 14, 2006. He has not returned my calls.

### **Bercham, Milo**

- 2004 Winter Mountain Goat Surveys in Areas of Motorized Use on the Cordova Ranger District. Final Report. Chugach National Forest. USDA Forest Service, Alaska Region. December 2004.
- 2005 Winter Mountain Goat Surveys in Areas of Motorized Use on the Cordova Ranger District. Draft Report. Chugach National Forest. USDA Forest Service, Alaska Region. December 2005.

**Clark, Donald W.**

- 1984a Prehistory of the Pacific Eskimo Region. In Handbook of North American Indians. Volume 5: Arctic, David Damas, editor, pp. 136-148. Washington: Smithsonian Institution.
- 1984b Pacific Eskimo: Historical Ethnography. In Handbook of North American Indians. Volume 5: Arctic, David Damas, editor, pp. 185-197. Washington: Smithsonian Institution.

**Crowley, Chuck**

- 1984a March 28, 2006 Personal communication, second conversation. Alaska Department of Fish and Game, Division of Wildlife Conservation, Cordova.

The regulation of goat is probably more complex than what is reported in Stratton's Chenega Bay report from the mid 1980s. Chuck has the reported harvests of black bear and mountain goat in excel tables that he is e-mailing to me.

**Davis, Nancy Yaw**

- 1984 Contemporary Pacific Eskimo. In Handbook of North American Indians. Volume 5: Arctic, David Damas, editor, pp. 198-204. Washington: Smithsonian Institution.

**DeLaguna, Frederica**

- 1956 Chugach Prehistory: The Archaeology of Prince William Sound, Alaska. University of Washington Publications in Anthropology, Vol. 13. Seattle: University of Washington Press.

Animal Bones From the Palugvik Midden. Dr. Magnus Degerbol of the Zoological Museum of the University of Copenhagen identified the faunal remains at Palugvik. Of a total of 1,474

bones recovered, 766 were sea mammal bones. Out of 243 land mammal bones 7 were of indeterminate origin, assumed to be goat. There were 39 bear bones (p. 52).

Other occupation sites in Prince William Sound probably submerged or washed away due to sinking of land. De Laguna determined that Palugvik had sunk as much as four feet (p. 52).

**Fall, James A., and Charles J. Utermohle, editors**

1995 Investigation of the Sociocultural Consequences of Outer Continental Shelf Development in Alaska. I. Introduction. OCS Study MMS 95-010, US Department of the Interior, Minerals Management Service. Anchorage.

“Land mammals represented only 12.4 percent of the total harvest in 1991/92, as compared to about 20 percent prior to the spill (Table IV-18). Sixty seven percent of households attempted to harvest land mammals in 1991/92 (Fig. IV-10). The land mammal harvest of 42.7 pounds per person, consisted almost entirely of deer at 39.9 pounds per person, with black bear providing a minor portion of the total (Table IV-19). Land mammal harvests dropped dramatically the year after the oil spill, and have risen somewhat in each subsequent year (Table IV-17, Fig. IV-12).” (p. IV-8)

“An interesting pattern was noted for many resources harvested by Tatitlek residents regarding resource sharing. In 1991/92, fourteen resources were given away by more households than harvested them: coho salmon, black cod, gray cod, lingcod, halibut, herring spawn on kelp, red rockfish, black bear, porpoise, sea lion, harbor seal, scoters, king crab, and Tanner crab (Table V-15). This illustrates a pattern in which these resources were given away to households who then redistributed portions of what they received to other households.” (p. V-8)

“The land mammal harvest by Tatitlek hunters in 1993/94 consisted entirely of deer (about 106 animals, 47.6 pounds per person) and mountain goats (about 6 animals harvested, 4.2 pounds per person) (Table V-23). Unlike previous years, there was no black bear harvest or use reported for 1993/94. As in other post-spill years, most Tatitlek households (73.3 percent) believed their uses of land mammals have declined since the spill (Fig. V-12). However, fewer point to the spill as the cause of this decline than with some other resources (Table I-74). As in the previous study year, most respondents (62.5 percent) said deer populations were lower than the year before the oil spill (Table V-33, Fig. V-16).” (p. V-17)

**Goldstein, Michael I., and Aaron J. Poe, Erin Cooper, Don Youkey, Bridget A. Brown, and Trent McDonald**

2007 Mountain Goat Response to Helicopter Overflights in Alaska. Wildlife Society Bulletin, 2005, Volume 33-2 pp. 688-699.

**Haggarty, James C., Christopher B. Wooley, Jon M. Erlandson, and Aron Crowell**

- 1991 The 1990 Exxon Cultural Resource Program: Site Protection and Maritime Cultural Ecology in Prince William Sound and the Gulf of Alaska. Anchorage: Exxon Shipping Company and Exxon Company USA.

**Hassen, Harold**

- 1978 The Effect of European and American Contact on the Chugach Eskimo of Prince William Sound, Alaska, 1741-1930. Unpublished Ph.D. Dissertation. University of Wisconsin, Milwaukee.

**Lewis, Jon**

- 1993b Bears Escape Injury. Alaska's Wildlife 25(1):8-9.

**Mobley, Charles M., James C. Haggarty, Charles J. Utermohle, Morley. Eldridge, Richard E. Reanier, Aron Crowell, Bruce A. Ream, David R. Yesner, Jon M. Erlandson, and Paul E. Buck**

- 1990 The 1989 Exxon Valdez Cultural Resource Program. Anchorage: Exxon Shipping Company and Exxon Company USA.

**Stratton, Lee**

- 1989 Subsistence Uses in Cordova, a Coastal Community of Southcentral Alaska. Alaska Department of Fish and Game, Division of Subsistence, Technical Paper No. 153. Juneau.

Chugach Eskimo Subsistence Activities. "Mountain goats, hunted more than any other terrestrial mammal by the Chugach Eskimo, were hunted wherever they occurred. The Chugach preferred to hunt them in August and September, although they also hunted goat in the winter months. Chugach hunters took black and brown bears occasionally in the spring when the bears were still in their dens. They were also taken in snares fastened to a tree cut half way through, and in deadfalls. Other Chugach bear harvest methods included bows and arrows, and traps. Bear meat was often dried and salted for winter use. The Chugach most commonly cooked both fish and meat in baskets of boiling water heated with stones. Meat was also roasted on a preheated flat stone, or a spit beside the fire. Of the furbearers that the Chugach harvested, weasels were taken in deadfalls, and traps were used to catch mink and land otter (Birket-Smith 1953:23-24, 37-38, 43)." (p. 22)

Eyak Material Culture. "Eyak clothing reflected dependence on the natural resources. Shirts were made of seal and duck skins. The Eyak sewed bear and seal intestines together to make

waterproof garments. Muskrat and beaver hides were made into mittens and gloves (Birket-Smith and de Laguna 1938:65-68).

“Household items were also made from available resources. A lamp consisted of a clam shell filled with seal oil or pitch. The Eyak made multiple use baskets of spruce roots. Eating implements were made of wood, goat horn, or eagle beaks tied to sticks. The Eyak used mountain goat and bear skins for sleeping robes (Birket-Smith and de Laguna 1938:76, 81, 88).” (p. 15)

Seasonal Round. “Shellfish, including clams, crab, and shrimp, are available throughout the year, as are rockfish, halibut, and seal. As the fishing season winds down, the hunting season begins. Deer are taken August through December, the duration of the legal season. Black bears are hunted in the fall before they enter their winter dens. Goat, moose, small game, and waterfowl are taken in September and October, with seasons on some species running into winter.” (p. 60)

Deer. “Smaller boats, such as skiffs, pleasure craft, and inflatables were used to reach primarily Hawkins Island and sometimes Hinchinbrook Island to hunt deer. Commercial fishing boats were able to travel further, to Montague Island, Green Island, and elsewhere in Prince William Sound. Commercial boats often allowed larger hunting parties, and more comfortable trips of longer duration than the smaller craft. Skiff hunts were more commonly one day or overnight trips, while hunters taking larger boats might be gone a weekend or longer. One hunting party used a commercial fishing boat to reach the island, a skiff to get to shore, and a three-wheeler on the island. Another group went in a commercial fishing boat, and took a three wheeler and a snowmachine with them.

“The long five month deer season allowed hunters to take deer in conjunction with other harvesting activities. Respondents mentioned harvesting deer as well as grouse, waterfowl, furbearers, clams, goats, or crab on their hunting trips.” (p. 115)

Black Bear. “Hunting regulations for GMU 6 black bear in 1985 allowed one bear per hunter, between September 1 and June 30. Fifteen of the households surveyed attempted to harvest black bear in 1985. Six (40 percent) of those hunting black bear were successful. All successful households used bear meat, while three of the six successful hunters salvaged the hide. Road hunting and combinations of highway vehicle and hiking were the most common modes of transportation. Black bear contributed 348 pounds to the total sample harvest, or a household average of 1.7 pounds. In addition to hunting on or near the road system, Cape Yakataga east of Cordova and Port Gravina in Prince William Sound were also hunted. Not all hunters salvaged much bear meat. A few hunted for the meat, pursuing spring bears or those that had been feeding on berries. Others hunted for trophies.

“Most respondents who salvaged meat froze it or gave it away. One respondent made sausage out of most of his bear harvest. Another reported that he corned the bear meat. One respondent made his bear meat into mincemeat.” (p. 117)

Mountain Goat. “In 1985, all mountain goat hunting in GMU 6 required a registration permit. The annual bag limit was one goat per hunter. Seasons varied depending on the specific area hunted.

“Goats were hunted in the Prince William Sound and Cape Yakataga area by eight of the surveyed households. Three (37.5 percent) were successful. Areas that Cordova hunters reported hunting goat in 1985, and other recent years as well, included St. Matthews Bay, McKinley Peak, Port Fidalgo, Port Bainbridge, and Cape Yakataga. Survey respondents most often reported foot/auto as the transportation mode used (three hunters), followed by two who used aircraft. Goat contributed 210 pounds to the total harvest, or a mean of one pound per household.

“An extrapolated goat harvest figure estimated 13 goats (range 1 to 25 goats), somewhat higher than harvest ticket reports indicated. According to harvest ticket data, in 1985, 5 goats were taken in GMU 6 by Cordova residents. In 1983, 13 goats were harvested. In 1984, the goat harvest was 9, and in 1986, 19 goats.” (p. 118-119)

Furbearers. “Locally harvested resources were used by some trappers for trap bait. Trappers mentioned using herring and bear carcasses. One trapper mentioned giving furbearer carcasses to friends who used them as bait in shrimp pots.” (p. 125)

Case 3. “This family of five moved into the Cordova area from the southeast United States in 1983 when the household was transferred by the Federal Aviation Administration. This case illustrates the 17 percent of the population surveyed that resided two years or less in Cordova at the time of the survey.

“The family enjoyed the hunting and fishing opportunities available in the area, and were eager to become better acquainted with the methods and locations. They learned about harvesting, going fishing and hunting with people they met through church and their employment.

“In the summer of 1985, the husband took a week off from work to crew on a commercial salmon seiner. He brought two salmon home. In addition, members of the household fished for salmon with rod and reel, harvesting one king and 24 silvers in 1985. The household angled successfully for Dolly Varden, trout, and herring as well. The herring was used for halibut bait. They were given some sockeye salmon and halibut. The salmon was put up in two ways:

canned plain, and smoked and canned. The household head also bartered some mechanic work for resources, particularly crab.

“The husband hunted for deer, moose, brown bear, black bear, goat, and waterfowl, but was only successful in taking a brown bear. The meat was not used. He received a deer, and was given some moose meat as well. The family hunted for rabbit and grouse together successfully.

“The entire household picked berries, gathering a total of ten gallons of salmonberries. They took smaller amounts of blueberries and nagoonberries.

“While the household harvest was just over 350 pounds, the per capita take was 71 pounds. Over 50 percent of the households surveyed had a per capita harvest of under 100 pounds. Those households residing shorter lengths of time in Cordova were not as familiar with the area, and were less likely to own equipment such as a skiff or boat which were associated with higher harvests.” (p. 130)

Case 4. “An example of a second generation Cordova household, this family consisted of a couple in their thirties with two children in grade school. Typical of those who have resided in the area for a longer period of time, they were very active and successful resource harvesters. The head of household and his spouse grew up in the Cordova area. He currently works full time for a local utility. Earlier, he was a commercial fisherman, but got out of the fishery when it was less lucrative. As was characteristic of long-term residents, harvesting activities had changed over time.

“Through the spring and summer, he and his children angled for rockfish, halibut, trout, and silver salmon in the evening and on weekends. In May, he subsistence gillnetted for reds and kings during openings that coincided with a weekend.

“He considered deer hunting his meat hunt. With one or two other hunters, he went over to Hawkins Island with a boat or skiff. The time of year varied, as did his success rate. He preferred to hunt early, before the first frost. Some years, he has taken two deer, others he gets five, as he did in 1985. He did not own a boat suitable for open water, so relied on being invited to hunt with others. Although he usually hunted on weekends, sometimes he hunted with commercial fishermen friends who stayed out longer, and he used vacation time. In an average year, he went deer hunting on four separate occasions.

“Moose hunting was an activity that involved the extended family. His brother and brother-in-law usually went with him, in a truck out the Copper River Highway. In a good year, they have each gotten a moose. In a less successful year, they split whatever they took evenly. If they were not all able to hunt in GMU 6C, they took his river skiff over to GMU 6B.

“Goat hunting was a priority activity for the household head every fall, although some years he has gone later, in late November or early December. Familiarity with the area helped him decide each year where to hunt. He hunted on weekends, going out whenever the weather was suitable. Although temperatures in the Cordova area are fairly moderate throughout the year, the precipitation is often heavy, and storms are common. He and his partner, another avid goat hunter, hunted until they both got a goat, which in some years has taken as many as three weekends. Because the areas he hunted required only a highway vehicle, and occasionally a three wheeler for access, it is not an expensive activity. All the meat was brought home, but Case 4 says he hunted goat ‘for the sport of it’.

“In previous years, he has hunted brown and black bear. Over time, he says he shot one of each. He no longer hunts them, as he has the trophies he wanted, and he felt that there is better quality meat than bear.

“During the study year, this household harvested one goat, 5 deer, one moose, and an array of salmon, halibut, rockfish, and trout. The household harvest was approximately 1000 pounds, or 250 pounds per capita.” (p 130-131)

### **Stratton, Lee**

1990 Resource Harvest and Use in Tatitlek, Alaska. Alaska Department of Fish and Game, Division of Subsistence, Technical Paper No. 181. Juneau.

Bear. “Prior to the 20th century, bear fur figured prominently in the Chugach material culture. Bear fur, including brown bear fur, was used in the construction of boots and mittens. The Chugach utilized bear skins for bedding and coats. Rainwear was crafted from intestines sewn together. Intestines for rain gear had to be taken from bears taken in the spring, as there was less likelihood of perforations from salmon bones at that time of year. Archaeological evidence documents that bones were used to make tools; a brown bear mandible was made into a drill rest. Other bear parts were made into awls and chisels (Birket-Smith 1953:54, 65, 67-68; de Laguna 1956:124,187,191,235). Black bear furs were traded in the 18th and 19th centuries with the Russians (Merck 1980:123).

“Bear hunting in the 1900s has focused almost exclusively on black bears. Several methods were employed, depending on the season of harvest. Harvesting of bears from their dens occurred in the late fall or winter, approximately a month after the bears went into their dens. One hunter described being lowered into the den head first by other hunters, from a hole dug in top of the den. Methods of provoking the bear to come out of the den included smoking it out, taking a stick and poking the bear, or alternately, wounding them. Smoking the bear out involved tossing a smoldering object, such as an old boot, into the den, but was not recommended by some hunters because they said it damages the den, and bears would not use

the den for several years. An elder said that killing a bear in the den left a scent, and also caused bears to discontinue use of the den for years. Most hunters shot them when they came out. Active dens were considered a valuable resource, and a good hunter might farm a den, returning to it over the years. Others hunters respected a hunter's territory when he was farming a den.

Another major type of bear hunt occurred during the spring, right after hibernation. Hunters watched lagoons or bays, waiting for bears to come out of their dens, in search of kelp or grass to eat. Bear hunters ran skiffs along the coastline, looking for bear on the grassy slopes, or in the early morning on the beach eating seaweed. Spring bears were prized because they did not taste fishy.

“The third type of hunt occurred in the fall, when the bears could be found at salmon streams, feeding. Skiffs were used to patrol the shoreline, or get to salmon streams where the hunter hid himself and waited for the bear to come for fish. Skiffs were also used for transporting the bear back to the village, or to the family at fish camp. In the mid 1900s, bear meat was valuable. If a bear was sighted, the hunter or hunters went after it. When a bear was taken, everybody in the village received a piece of bear meat.

“In addition to the usual meat that was salvaged, a variety of other bear parts were recovered depending on the season. In the 1900s, the hide was very rarely saved. The stomach, used for storage of other subsistence foods, was only recovered if the bear was eating grass. There would be no perforations in the stomach then. Bear heart, liver, kidney, tongues, feet, and fat were commonly brought home to be eaten.

“Bear meat was eaten fresh, but also preserved when the temperatures warmed up. Any meat left over from winter was canned in the spring. Bear grease was jarred, or rendered. Respondents mentioned that smoked or dried salmon was eaten with bear fat instead of seal oil sometimes. Bear feet were boiled and eaten fresh. Bear fat was also roasted over an open fire and eaten.

Historic site work documents bear use at Nuchek, at sites in Constantine Harbor, and Anderson Bay. Excavations at Palugvik site on Hawkins Island revealed substantial numbers of bear bones (de Laguna 1956:45).

“Goat. The Chugach peoples' historical use of mountain goat has been well documented by ethnographic accounts and Archaeological evidence. Mountain goat meat was a favored and often hunted source of food by the Chugach bands of the northern and northeastern sound. In the 18th and 19th centuries, the Chugach utilized goat skins for bedding, and also learned from the Russians about using goat wool to make blankets. Birket-Smith reports that the Chugach cooked mountain goat meat in the goat's stomach, which had been turned inside out (Birket-Smith 1953:23, 38, 43, 54, 64).

“Goat hunting occurred largely in the fall and winter. While there was occasionally a goat low enough that hunters could shoot the goat from the skiff or boat, picking the animal off a slope

near the water, most goat hunts required considerably more effort. Often, the goat were located the day before. Early the next morning, the hunters climbed the steep mountain sides to get to the goat. Once the animal was shot, one hunter recalled blowing air into the goat's wind pipe, filling the lungs with air. The lungs were then tied off, and the goat was rolled down to the river, then floated to the lagoon or the boat.

“After a successful goat hunt, there was often a barbecue, or mungyuk on the beach. In addition to the meat, goat fat was also cooked over an open fire, by wrapping the goat tallow on a stick and roasting it. Goat meat was dried, smoked, salted, or frozen for use in the winter. The stomach liner fat from the goat was also put up. First, the Chugach washed it, then hung it to dry.

“Goat hunting locations in the 1900s have included Long Bay, Port Fidalgo, Galena Bay, Jacks Bay, Sumner Bay, Port Wells and the Silver Lake area. Some hunters reported taking goat in the southwestern sound when they lived in Chenega. Goat hunting has tapered off somewhat as deer have become more plentiful near the village. Archaeological evidence from a site in the Tatitlek peoples' territory in Port Fidalgo substantiates historic use of goat.” (p. 45-49)

Black Bear. “In 1988-89, 14 percent of those surveyed hunted and took black bear, bringing an estimated 8 bears into the village. This was an increase from the previous year, when two black bears were harvested. It is possible that the survey sample differences account for the change, however. Hunters shared their 1988-89 harvest with additional households, so that 43 percent of the village reported using black bear. Like marine mammal meat, bear meat may be brought in by the hunters and left on the beach, with an invitation to any villagers to come get some meat. The women take knives down and cut off portions for their households.

“Black bear hunting occurred in the fall at salmon streams, in the spring on grassy slopes, and opportunistically as the occasion arose. While some people, particularly village elders, still described a craving for the meat, others indicated that they had their fill of bear meat in earlier years, or they found it less desirable than venison.” (p. 115)

Mountain Goat. “Several households hunted goat in 1988-89, but only two (9.5 percent of the population) were successful. The single hunter in 1987-88 was unsuccessful. Harvested goat were distributed widely, as over half (52 percent) of Tatitlek households reported eating goat meat. This may also reflect goat harvests by former residents of Tatitlek that were shared with relatives in the village. Although goat meat was shared, the harvests were so limited, that respondents indicated the hunters distributed the meat, rather than leaving it on the beach for people to get.

“Goat hunting regulations have become increasingly complex since the mid 1970s. Until 1976, there was a two goat bag limit in GMU 6 (Table 25), and a season that varied between four and

six months in length. The bag limit was reduced to one goat in 1976. Starting in 1980, goat hunts became more area specific, with a mixture of registration and draw permits in GMU 6. The main impact on Tatitlek residents was the registration permit provision requiring a hunter to acquire a permit from a Fish and Game office, and successful hunters to report in person at the Fish and Game office afterwards. These requirements mandated two trips to Cordova to take one goat, making it prohibitively expensive to hunt goats legally near the village. In addition, under registration hunt management, hunt areas were often closed much sooner than the regulatory season suggested, when area harvest quotas were met. Guides, outfitters, and non-local hunters were hunting areas near Tatitlek in the early fall, before the village hunters went out. In 1987, a subsistence hunt which reserved a few goats in specified areas for rural Prince William Sound residents made permits more accessible to village residents, and ensured that a few goats were still available in the winter hunt.

“Goat hunting was much the same in the 1980s as described for earlier periods. Skiffs or boats were used to access an area where the goats were. Occasionally, the goats were shot from the boat, but more often, hunters climbed up the mountain after spotting a goat to shoot it. Goat hunting occurred in Port Fidalgo, behind the village, and in Valdez Arm.

In addition to the highly prized meat, goat fat was also utilized. The fat was washed, cleaned, hung, cut into strips, and dried. The fat was eaten with dry fish. Meat not eaten fresh was frozen.” (p. 115-119).

### **Stratton, Lee**

- 1991 Cordova: A 1988 Update on Resource Harvests and Uses. Alaska Department of Fish and Game, Division of Subsistence Technical Paper No. 204. Juneau.

### **Stratton, Lee and Evelyn B. Chisum**

- 1986 Resource Use Patterns in Western Prince William Sound: Chenega in the 1960s and Chenega Bay 1984-86. Alaska Department of Fish and Game, Division of Subsistence Technical Paper No. 139. Juneau.

Chenega 1960s. “No Chenega residents reported taking or using brown bear at any time. Black bear, however, were taken and used extensively during the 1960s. The meat, stomach, and fat (“white bear oil”) were used. Like deer hunting, almost all households were involved in harvesting bears. The estimated annual village harvest of 41 bears represented about 2, 378 pounds of meat or about 170 pounds of bear meat per households.

“Bear hunting was often combined with other harvest activities such as salmon fishing, trapping, and bottom fishing. They were also harvested opportunistically. A bear hunt consisted of one or more men going out in a commercial fishing boat for one or several days. The hunters usually returned home at night instead of camping out. Often, the undertaking was a one day trip to a pre-selected site. Some bears were harvested in the spring, often when still in their dens or when

just emerging. Although the meat was considered more desirable in the spring, most bear were taken in the fall. In the fall, bears could be found relatively easily along salmon creeks. Fall also offered more time for hunting. One respondent indicated that the fishy fall meat had to be cooked longer in order to have a palatable taste. Black bear meat was most commonly eaten fresh. However, a few households reported salting and canning bear.

“Bear hunting areas were extensive because bear were hunted in conjunction with other activities. The bear population on Chenega Island itself was reported to be healthy during the 1960s by respondents.” (p. 138)

Goat. “Three quarters of the households indicated that at least one person in the household successfully hunted goats during the 1960s. Goat were more difficult to obtain than bears or deer. Respondents estimated a village harvest of about 21 goats, contributing 1,470 pounds to the annual village harvest, or an average of 105 pounds per household. Goat hunting involved more planning than either deer or bear hunting, and often involved hunting parties. Two or more men went to a pre-selected spot where goat had been sighted, usually taking a commercial boat. A goat hunt often involved camping for two or more days, and sometimes up to a week, until one or more goats were taken.

“Goats were sometimes spotted on a cliff from the boat, and under optimal circumstances, they could be shot from the boat. They then fell from the cliff into the water. More often, however, hunters climbed up to the goats’ grazing area. Goats were therefore considered the most difficult big game to get.

“Hunters considered fall and winter months prime goat hunting time. While winter hunts often involved less climbing, since snow brought the goats down closer to the water, fall meat was preferred. The goats were fat and the meat at its best in fall. Goat hunting areas as shown in Figure 11 included Cape Puget, Icy Bay, Port Wells, Cape Junken, prince of Wales pass, Knight Island, and Port Bainbridge, among other areas.” (p. 138-142)

Chenega 1984-85. Bear. “Ten black bears were harvested by six Chenega Bay households during the period covered by the recent survey, up from a single bear the preceding year. Several hunters mentioned that spring hunts are preferred for denning or emerging bears since the taste of spring meat is favored over fall meat. As the survey was conducted in March and April, some bear hunting was still occurring in 1985-86. A couple of the harvested bears were nuisance bears, taken right in the village during the summer. Most hunting occurred on Evans and Knight islands with some effort on Bainbridge Island (Figure 21).” (p. 82)

Goat. “One Chenega Bay household successfully hunted goat. One other household hunted goat unsuccessfully. Regulatory restrictions were mentioned at constraints in 1984-85, as goat were on drawing permit. The following year the hunt was put on registration, which still required

obtaining a permit. Several respondents expressed an interest in goat hunting during the first survey, but only two households hunted in 1985-86. Goat hunters used the Port Bainbridge area (Figure 20).” (p. 82)

**Stratton, Lee, James A. Fall and Philippa A. Coiley**

1996 An Update on Subsistence Harvests in Chenega Bay and Tatitlek in the Year Following the Exxon Valdez Oil Spill. Alaska Department of Fish and Game, Division of Subsistence Technical Paper 199. Juneau.

“More specifically, there were notable drops in participation at Chenega Bay in such activities as fishing for halibut (75.0 percent of households in 1984/85, 81.3 percent in 1985/86, 38.9 percent in 1989/90), red rockfish (56.3 percent in 1984/85 and 1985/86, 22.2 percent in 1989/90), smelt (31.3 percent in 1985/86, none in 1989/90), and shrimp (31.3 percent in 1985/86, 4.5 percent in 1989/90); hunting black bear (31.3 percent in 1984/85, 37.5 percent in 1985/86, none in 1989/90), harbor seals (75.0 percent in 1984/85, 56.3 percent in 1985/86, 22.2 percent in 1989/90), sea lion (56.3 percent in 1984/85, 43.8 percent in 1985/86, 11.1 percent in 1989/90), and ducks (56.3 percent in 1984/85, 68.8 percent in 1985/86, 11.1 percent in 1989/90); and gathering clams (50.0 percent in 1984/85, 87.5 percent in 1985/86, none in 1989/90), cockles (18.8 percent in 1984/85, 37.5 percent in 1985/86, none in 1989/90), and octopus (37.5 percent in 1985/86, 5.6 percent in 1989/90) (Scott et al. 1995).” (p. 99)

“During the 1980s, the largest percentage of the edible land mammal harvest in Chenega Bay and Tatitlek has been Sitka black-tailed deer. Black bears, mountain goats, and small game are taken more occasionally for subsistence. In Tatitlek, every interviewed household used deer in 1987/88 and 1988/89, as did 91 percent in 1989/90. In 1988/89, deer harvests accounted for 92.7 percent of the total community take of land mammals at Tatitlek. Most Chenega Bay households also used deer throughout the 1980s, including 81.3 percent of the sampled households in 1984/85 (the first year of the resettled village's existence), 100 percent in 1985/86, and 88.9 percent in 1989/90. Of the total harvest of land mammals at Chenega Bay in 1985/86, 70.6 percent was deer.” (p. 163)

“Advisory bulletins issued by the Department of Fish and Game suggested that hunters might choose to avoid hunting deer and black bear in the Prince William Sound area due to the potential effects of oiling on these animals, their populations, and their habitats.” (p. 184)

“The effects of the oil spill on subsistence uses will likely persist well beyond the first year after the Exxon Valdez hit Bligh Reef. It appears that as long as residents of Chenega Bay and Tatitlek believe that significant amounts of oil remain in their environment, many will continue to refrain from using certain subsistence foods. The following report from Gail Evanoff (1990) of Chenega Bay appeared in October 1990, more than 18 months after the spill. The report indicated that people of the village,

Have eaten only a small fraction of the foods they ordinarily live on daily. They reported that indications from wildlife around them make the people very uncomfortable, and they are afraid to harvest subsistence food. An abnormal seal liver, ordinarily firm, was soft and runny. The arm of a starfish fell apart when pulled from the rocks. They have reported several dead eagles and sea gulls, a dead bear and a blind sea lion found during the past month, highly unusual occurrences prior to the spill.

For the people of Chenega Bay and Tatitlek, who had long relied on their observations of the natural environment for survival, these signs more than a year after the spill continued to warn of danger. They continued to respond in a culturally appropriate way -- with caution. As long as these signs last and people are not confident in their own abilities to interpret and understand their environment, recovery from the Exxon Valdez disaster will remain incomplete.” (p. 197)