Brown Bears on the Northern Seward Peninsula, Alaska: Traditional Knowledge and Subsistence Uses in Deering and Shishmaref

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ABSTRACT

This report describes traditional knowledge and subsistence uses of brown bear by residents of Deering and Shishmaref, two small, predominantly Iñupiaq communities on the northern Seward Peninsula in Alaska. Topics covered include observations of historic and contemporary brown bear abundance, natural history of bears, human and bear interactions, subsistence hunting and use, harvest estimates, and Iñupiaq cultural rules regarding bears. The information in this report was gathered through individual interviews with 41 residents of Deering and Shishmaref during spring 1998. Those interviewed ranged in age from their early 20s to early 80s and included both men and women. The project was funded by the National Park Service.

This study found that Deering and Shishmaref shared a common cultural view of brown bears. In both communities, there was a widespread respect for bears and a general belief that these animals must be treated appropriately. In Deering, a small group of men actively hunted brown bears for subsistence uses. The community's average annual harvest was estimated by local residents to be three to ten bears. Most bear hunting took place in spring and fall with some residents participating in den hunting. In Shishmaref, researchers found no one who regularly hunted brown bears for subsistence uses although this had been more common, at least among some families, in past decades. Shishmaref hunters were generally more interested in polar bears.

Middle-aged and older people in both Deering and Shishmaref widely agreed that brown bears were more common now than when they were growing up. The contemporary 1990s brown bear population was viewed by most residents as either stable or increasing. Deering and Shishmaref residents retain a detailed body of information on the natural history and lore of brown bears, including their diet, origin, behavior, denning habits, relationship with other bears and other predators, and interactions with humans. Residents followed several traditional Iñupiaq rules regarding treatment of brown bears, such as not talking about bears in a disrespectful way or boasting about one's hunting ability.

Patterns of brown bear use in Deering and Shishmaref are compared with other northwest Alaska communities where similar research was conducted a decade ago. Shishmaref was found to have more in common with patterns previously described for coastal communities in the region, such as Point Hope, Kivalina, and Shaktoolik, where brown bears were rarely hunted for food and other uses. Deering was found to have more in common with patterns previously described for inland riverine communities in northwest Alaska, such as Noorvik, Selawik, and Shungnak, where brown bears were actively hunted. The average annual brown bear harvest in Deering was similar to that of other bear-hunting communities in northwest Alaska.

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ACKNOWLEDGMENTS

The graciousness and good humor of Deering and Shishmaref residents made this project a pleasure to work on. A sensitive topic at times, many people in Deering and Shishmaref nevertheless shared with me, a stranger to many, their knowledge of and experience with bears. For their stories and knowledge I have deep respect and for their time and patience I am immensely grateful. My heartfelt thanks to all who welcomed me into their homes, sharing their lives and their meals.

Fred Tocktoo of the National Park Service was a delightful colleague during our week's stay in Shishmaref, serving as guide, translator, and fellow researcher. Don Callaway and Ken Adkisson of the National Park Service provided vision and financial support for this project and showed a genuine interest in its progress. Jake Olanna of Kawerak, Inc. pointed me in the right direction. John Sinnok of Shishmaref and Ruth Sampson and Jonas Ramoth of Kotzebue took the time to provide the Iñupiaq names for bears. Peter Rob generously created the map. Elizabeth Andrews, Bob Wolfe, and Jim Magdanz of the Alaska Department of Fish and Game offered encouragement and insightful advice, as they have for many years in many endeavors. I appreciated it all.

INTRODUCTION

This study explored the relationship between people and brown bears in two northern Seward Peninsula communities in Alaska, Deering and Shishmaref. Topics covered in this project included observations of historic and contemporary brown bear abundance, natural history of bears, human and bear interactions, subsistence hunting and use, harvest estimates, traditional rules, attitudes toward bears, and changing patterns of use. Similar research had been conducted in other northwest Alaska communities in 1987-88 by staff of the Division of Subsistence, Alaska Department of Fish and Game (Loon and Georgette 1989). The current project was intended to supplement that earlier research by focusing on communities near or within the Bering Land Bridge National Preserve that had not been included in the previous study. The National Park Service funded this project and provided staff assistance for the field work in Shishmaref.

Additional impetus for this project came from public concern in the region about increasing numbers of brown bears. Researchers were interested in exploring whether northern Seward Peninsula residents had observed an increasing bear population or a growing number of troublesome encounters between humans and bears. Researchers were also interested in disseminating information on recent regulatory changes allowing for a more liberal subsistence harvest of brown bears.

Deering and Shishmaref are small, predominantly Iñupiaq communities located in the arctic tundra environment of the northern Seward Peninsula in Alaska (Fig. 1). In 1997, Deering had an estimated population of 158 while Shishmaref's population was 542 (Alaska Department of Labor 1998) (Table 1). Both communities had mixed subsistence-cash economies with wild food harvests a major component of the culture and economy. Estimated annual wild food harvests in Deering and Shishmaref were 672 and 838 pounds per person respectively (Scott, Paige, Jennings, and Brown 1997). Deering's wild food harvest was fairly evenly divided among fish, land mammals, and marine mammals, while Shishmaref's harvest was predominantly marine mammals with smaller proportions of fish and land mammals. Both Deering and Shishmaref had active reindeer herders during the time of this research.

Despite their relative proximity (about 95 miles), Deering and Shishmaref had different geographic and ecological characteristics that shaped their patterns of brown bear use. Located on a barrier island along the exposed coast north of the Bering Strait, Shishmaref is a sea-oriented community with access to walrus, polar bears, and seals. Shishmaref residents traditionally spent much of the year along the coast engaged in marine harvest activities (Ray 1964). An inlet

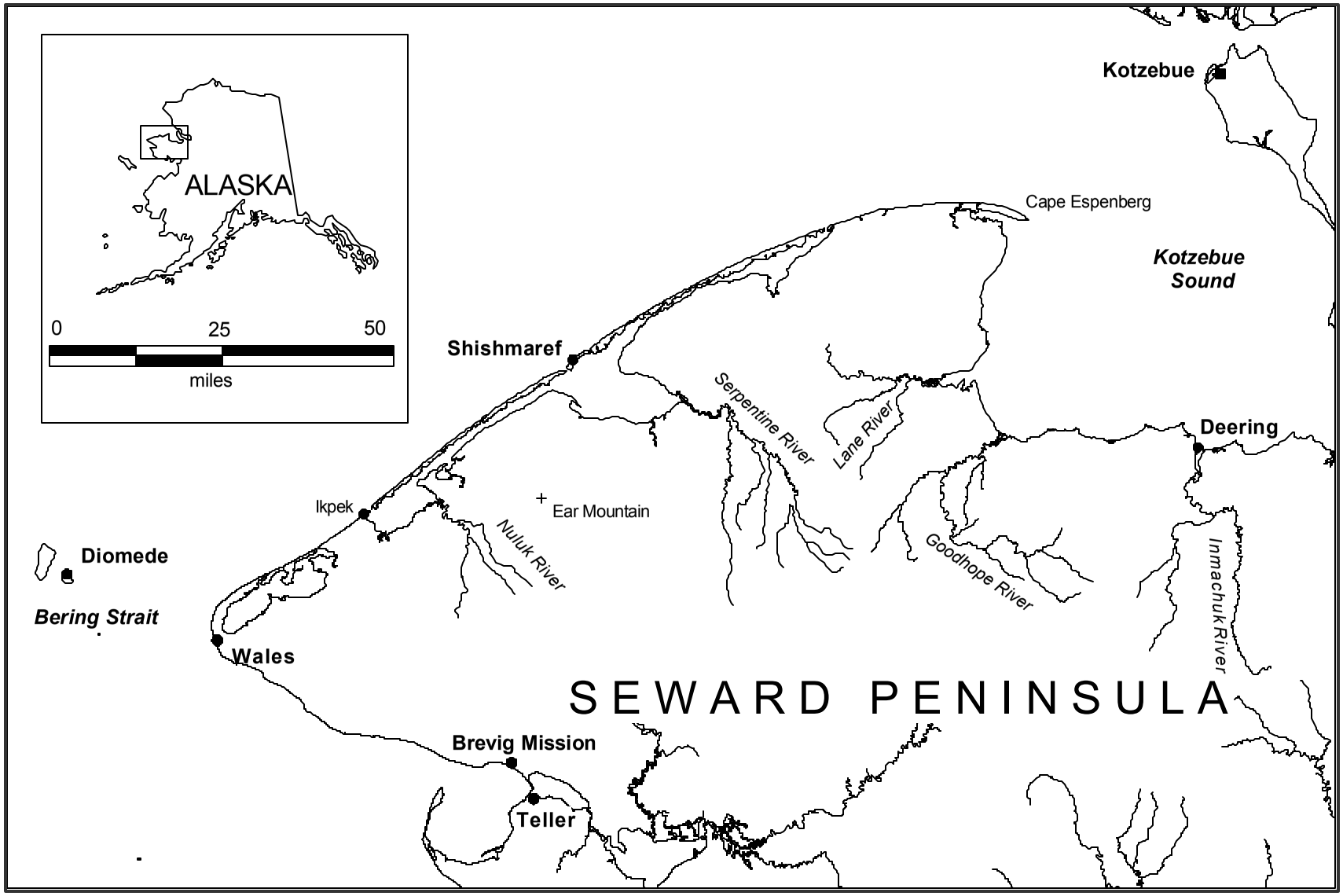

Fig. 1. Northern Seward Peninsula region.

TABLE 1. POPULATION ESTIMATES AND INTERVIEW SAMPLES FOR STUDY COMMUNITIES

Community	1997 Population*	Estimated Number of Households*	Interviews with Men	Interviews with Women	Total Interviews
Deering	158	44	9	6	15
Shishmaref	542	140	23	3	26

*Source: Alaska Department of Labor 1998

separates Shishmaref from upland areas frequented by brown bears, particularly for denning. These upland areas are most accessible to Shishmaref hunters by snowmachine during months of snow cover, a time of year when brown bears are unlikely to be encountered. The rivers near Shishmaref, such as Serpentine and Arctic, support only small—but growing—runs of salmon. Forty years ago these rivers had very few salmon (Fred Tocktoo, pers. comm., 1999).

Deering, on the other hand, is located along the sheltered coast of southern Kotzebue Sound. Seals are available in the vicinity, but the marine mammal species of the open ocean, such as polar bear and walrus, are seldom found in Deering's hunting area. Upland areas frequented by brown bears and other large game are considerably closer to the community than in the Shishmaref area and are not separated from the community by water. Deering residents can readily access these upland areas with trucks or all-terrain vehicles along a mining road in summer or with snowmachines in winter. The Inmachuk River near Deering supports a large chum salmon run that likely attracts bears seasonally. Although Deering residents traditionally spent considerable time harvesting resources along the coast, inland areas and resources also featured prominently in their subsistence activities.

METHODOLOGY

Data for this study were gathered primarily through interviews with local residents of Deering and Shishmaref. Because researchers sought to interview a cross-section of residents in terms of age, gender, and use of bear, two survey protocols were designed: a longer, more thorough one for particularly knowledgeable or experienced key respondents, and a shorter one for those less knowledgeable and experienced (Appendix A). Every respondent was not asked every question. Rather, the researchers used their judgment and discretion to guide the interviews in the most productive manner, depending on the respondent's time and expertise and on

TABLE 2. INTERVIEW SAMPLE BY AGE, BY COMMUNITY

	Deering				Shishmaref			
	Men		Women		Men		Women	
Age of Respondent	Long Interview	Short Interview	Long Interview	Short Interview	Long Interview	Short Interview	Long Interview	Short Interview
20s		1		1		1		
30s	1	1			1	4		1
40s	2			1	1	4	1	
50s	1			1	4	3		
60s	1	2			1			
70s			1		3	1	1	
80s			2*					

* One of these interviews took place in Nome with a former Deering resident.
Note: Interviews and discussions with school classes are not included in this table.

information already gathered from others. Interviews, lasting from ten minutes to three hours, generally took place in the respondent's home, although some occurred at a work place or informally on the street. Most of the interviews took place in English. Portions of some interviews in Shishmaref took place in Iñupiaq with the assistance of a translator. Susan Georgette of the Division of Subsistence, Alaska Department of Fish and Game, conducted the interviews in both communities, with Shishmaref-born Fred Tocktoo of the National Park Service assisting with interviews in Shishmaref. Notes were taken by hand during the interviews, then later entered into a word processing program. Respondents' names were removed from the field notes to protect confidentiality.

A total of 41 people were interviewed for this study, ranging in age from early 20s to early 80s. Fourteen of these interviews took place in Deering February 19-21, 1998, of which seven were "long" interviews and seven "short" interviews. In addition, one former resident of Deering was interviewed in February 1998 in Nome, where she then resided. In Shishmaref, 26 interviews were conducted April 13-17, 1998. Twelve of these were "long" interviews and fourteen were "short" interviews. Tables 1 and 2 summarize the interviewed samples in the study communities. At the time of the research, Deering had only one male resident over the age of 70, accounting for the absence of this group in the interview sample. Because of his poor health, this elderly man was not interviewed, although researchers interviewed his wife.

In both communities, the researchers also gave presentations about the project to school classes and elicited information from the students about their knowledge of and experience with bears. In Deering, presentations were given to the high school class, the junior high class, and the

4th-6th grade class. In Shishmaref, presentations were given to a 10th grade class and a 3rd grade class.

The researchers believe that a representative sample of residents was interviewed in each community. Using a delphi process to select respondents, researchers were able to interview nearly all active and former bear hunters, with the exception of two or three in each community who were unavailable or who declined to be interviewed. Researchers also interviewed a variety of people in each community who did not hunt or use bears.

FINDINGS

The following narrative, divided into twelve topics, summarizes the information collected in this project. In most cases, information from Deering and Shishmaref is presented jointly under each heading. Although the two communities shared similarities in their perspectives on bears, there were also notable differences in their bear hunting and use. These are discussed below.

Historic Brown Bear Population

Middle-aged and older people interviewed in both Deering and Shishmaref widely agreed that brown bears were not common on the northern Seward Peninsula when they were growing up. These respondents ranged in age from their mid-40s to their early 80s, with their observations corresponding to a period from roughly the 1920s to the 1960s. Several respondents said that brown bears were so rare when they were growing up that they did not remember their parents or grandparents telling them much about bears or instructing them on what to do if they encountered one. One woman in her early 80s recalled only two brown bear experiences from her childhood, memorable for their rarity, despite traveling on the land often with her parents.

Nearly everyone said that they did not know why there were so few bears in past decades. One Deering man in his 60s observed simply that animals "come and go" and that bears were no different than moose, hares, or other wildlife in this regard. An Alaska Department of Fish and Game report attributed these historically low bear numbers to the dispersed population of miners and prospectors inhabiting remote areas of the Seward Peninsula in the early 20th century (Smith, Nelson, and Ballard 1990). These miners and prospectors often viewed bears as a menace, and frequently killed them on sight. A biologist with the Alaska Department of Fish and Game

speculated that reindeer herders might have also contributed to a reduction in bear numbers in the early 20th century by killing bears that threatened the herds (Jim Dau, pers. comm., 2001). Reindeer herding first began on the Seward Peninsula in 1892 in the Teller area, expanding to other parts of the peninsula over the next two decades. Reindeer on the Seward Peninsula peaked in number around the late 1920s (Stern, Arobio, Naylor, and Thomas 1980).

In Shishmaref, respondents frequently said that brown bears were rare along the coast when they were growing up. Because Shishmaref people traditionally spent much of their time along the coast, they seldom crossed paths with brown bears until recent years when bears began frequenting the coast. Three respondents (age 60+) believed that in their youth bears might have been fairly common in the upland areas away from the coast, but people did not often travel in these areas during the times of year when bears were most likely to be encountered.

Following is a representative selection of comments from the interviews, summarizing the knowledge and observations of respondents age 40s to 80s:

- There were hardly any bears when I was growing up. I don't know why. *Deering*
- I never heard much about bears growing up. My dad had reindeer. I had to help him. We didn't see bears then. I don't know why. *Deering*
- There are more bears now than when I was growing up. *Deering*
- Long ago there were some, but not so many. Not that many when I was a little boy. Just once in awhile we saw them when squirrel hunting above Ikpek. *Shishmaref*
- We spent a lot of time growing up near Ikpek, Nuluk [about 40 miles southwest of Shishmaref]. As I recall, we used to see bears occasionally. But there's a lot more bears now. *Shishmaref*
- Long ago there were never any bears. At the mouth of Serpentine there never used to be any tracks at all. Now we see them. Last year while *ugruk* [bearded seal] hunting we saw two bears on the beach. We didn't really used to see them on the beach. There weren't many bears around when we were kids. I don't know why we're seeing more. *Shishmaref*
- Growing up we never encountered them. People usually used to just get bears from the mountains in April and May. They used to not be around here on the coast. Used to be only polar bears around here. *Shishmaref*
- It seems like there are more bears now. Maybe we didn't go far enough back [into the mountains] with dogteams. The snow is soft. It was hard to travel in those days. Now with snowmachines we go farther back. Maybe we see more bears. *Shishmaref*

Contemporary Brown Bear Abundance

Interviewed residents in both Deering and Shishmaref widely agreed that brown bears on the northern Seward Peninsula were more common now than in earlier decades in this century. In Deering, most people interviewed believed that this increased brown bear population has been stable in recent years. A smaller number thought the bear population was continuing to increase, and one thought there were fewer bears now than ten years ago. In Shishmaref, the predominant view was that brown bears have been increasing over the past decade or more. A few believed the contemporary bear population was stable, and none thought it was decreasing. Several people in Shishmaref commented that there were starting to be too many bears, and were concerned about the safety of women and children and about damage to cabins and camps. Rarely, however, did anyone advocate eliminating bears from the area.

Some respondents who believed the bear population was increasing offered reasons for this. Many others said they did not know. Of those offering reasons, several said that forest or tundra fires were driving bears to the west. Others said that more food was available for bears to eat, including reindeer, caribou, muskox, moose, and marine mammal carcasses. In Shishmaref, several respondents said that bears were increasing because people did not hunt them much anymore now that people had more food choices and "lots to eat." A Deering resident believed that the bear population began increasing several years ago after the passing away of a local miner who frequently shot bears. One Shishmaref resident thought that bears might be following caribou into the area or migrating from other places such as Nome. He said, "I've tracked bears for 30 miles and not been able to catch up with them. I know they can move when they want to."

Respondents who travel extensively on the land also had other observations of the bear population. In both Deering and Shishmaref, some observed that the population seemed to be mostly small and medium-sized bears, with big bears harder to find than before. Another commented that the bear population varied from year to year, depending on the availability of food. When food is abundant, the sows have twins or triplets. This hunter once even saw a sow with four cubs. Other hunters said that bear mortality is high because male bears kill cubs or smaller bears. One Deering hunter thought that brown bears had become more dispersed in the past five years, in contrast to previous years when they had been more concentrated in the central Seward Peninsula, near reindeer calving areas.

In Shishmaref, people cited a variety of evidence supporting the observation that bears were increasing. Most commonly mentioned was that bear tracks were now seen in places where they were rarely seen before. Others said brown bears were now hibernating along the lagoon and the

coast, something unheard of in the past. A scarcity of moose made other hunters believe that bear numbers were increasing. One hunter said that when only a few bears are around, people normally see tracks but do not often see bears. When people start seeing bears, there are more bears around.

With particularly knowledgeable hunters, researchers also inquired about black bears, even though neither Deering nor Shishmaref had typical black bear habitat; both were located in a tundra environment. Deering hunters described black bears as "very rare" or "stray," but considered them very good eating. One Deering hunter reported seeing a large black bear by the Goodhope River last year, the first black bear he had seen in 15 years. He tried to get it but it got away. Another hunter had seen black bears in the timber about 40 miles southeast of Deering.

For the most part, Shishmaref hunters said they had never heard of people sighting black bears in the local area. One hunter said he might have seen tracks of a black bear near Goodhope River several years ago, but he did not have the opportunity to track it to find out.

Following is a representative selection of respondents' comments on brown bear abundance:

- The bear population seems to be holding pretty even right now. It's just right. Some people might say there are too many, others say there are not enough. I think it's just right. *Deering*

- The bear population seems stable, but I wouldn't know for sure. *Deering*

- Bears have increased quite a bit over this way. Tundra fires pushed them over. We've seen more bears around. There are more than there used to be. *Deering*

- There is never too many bears. Ten years ago there were quite a few bears. All over the place. We used to go out 20 miles and see five or six bears. Now we might barely see three. *Deering*

- Bears really have increased. People don't hunt them anymore. People's tastes change. I haven't been eating them since my folks died. We've cooked bear meat but it doesn't taste the same without my folks. We got more reindeer, so there's more food for the bears. With the caribou coming back, bears might be increasing. *Shishmaref*

- Bears are all over. There are starting to be too many. I don't know why there's more bears, but I always think that the forest fires are pushing them over. *Shishmaref*

- Every spring we see bear tracks. Always seems like there's two cubs. Rarely one. Bear populations are about the same number or a little more. *Shishmaref*

- It seems like there are more bears. People go moose hunting and can't find moose. Then they see a bear. The bears are scaring the moose. *Shishmaref*

- Anywhere now we see bears. Even on the beach. It's no good when you're berrypicking. But I don't play with them. There are more now because nobody kills them. Nobody hunts them. *Shishmaref*

- It seems now that there's a lot more bear activity in the past five years. When traveling, we used to see bear tracks once in awhile in the spring, but now we see them a lot. Up the coast there are starting to be more bears between here and Espenberg. I think the bear increase has a lot to do with fires. There's always more game that comes this way with fires. *Shishmaref*

- Bears kind of gradually increased over the last ten years. Six or seven years ago we started seeing more bears. *Shishmaref*

- The transplanted muskox might be a factor for bears increasing in number. More food for the bears. More food than just reindeer. The caribou are getting closer to Shishmaref all the time, too. *Shishmaref*

- There are more and more bears nowadays because people don't hunt them. There are more up by Singik. In the summertime they are always along the coast. There are more dead things on the beach [for bears to eat]. *Shishmaref*

Natural History of Brown Bears

Deering and Shishmaref residents offered a wide range of observations about the natural history of brown bears, including their diet, habitat, reproduction, behavior, and interaction with other animals. Deering hunters in particular were experienced with brown bears, while Shishmaref hunters, although familiar with brown bears, generally focused more on polar bears. High school students in both communities had rudimentary knowledge of brown bear natural history, particularly the animal's diet and winter hibernation. In Deering, some high school students were familiar with the location of one bear den.

In Deering, the Iñupiaq name for brown bear is *akłaq* and in Shishmaref *akłak*. In Shishmaref, a brown bear cub is called *akłaizaaq* or *piazaaq* in Iñupiaq, the latter a generic name for a young animal. In Deering, a brown bear cub is similarly known in Iñupiaq as *akłaiyaaq* or *piayaaq*, the latter a generic name for a young animal as well.

According to respondents, brown bears eat a variety of food including reindeer, caribou, moose, muskox, walrus and seal carcasses, squirrels, fish, berries, roots, and grass. Their diet varies with the time of year and with the availability of resources. If food is abundant, the sows have twins or triplets.

In Deering, residents said that a medium-sized bear killed the one-, two-, and three-year-old muskoxen in a herd a few miles from town. Bears also killed at least two adult muskoxen. One hunter came across an adult moose killed by a bear and another had seen a bear knock down a reindeer with one blow. Some residents commented that bears feed mostly on salmon and berries, while others said that bears follow reindeer herds or muskox. One Deering resident described brown bear movements in the area as follows:

> After the ice goes out, bears look along the beaches to the west for dead animals. There are also bears in the mountains then looking for food. When fish begin appearing, bears start being near the river.

Other Deering residents also mentioned that they see brown bears upriver in the fall, feeding on salmon. Most of these sightings occur along a 25–mile road up the Inmachuk River that is used often by local residents with trucks or all-terrain vehicles. Bears are seen more frequently in spring and fall than in summer. Although bears feed on washed-up marine mammal carcasses, Deering residents said this mainly occurs along the coast further west, and people therefore do not often see bears on the beach in the local vicinity. A Deering hunter described his experience with bears feeding on meat:

> One time I got a bear after it had been out of its den for four days. It had already killed a moose on the second day. The bear had chunks of moose in its stomach that were this big [three inches]. Bears eat big chunks of meat.

In Shishmaref, several respondents mentioned that big brown bears can kill moose. One resident said that he once came across a moose killed by a bear, and brought it home for dog food. Another hunter had witnessed a bear killing a moose:

> The bear killed an adult moose down in the soft snow. It's interesting to watch a bear kill a moose. It drove it into the soft snow. Then it grabbed the moose's neck with its teeth and shook the daylights out of it. The moose went down. Then the bear stood on all fours on the moose's ribs, right on its heart. When the moose's head moved, the bear grabbed its throat and shook like crazy. Then it stood on its heart again. They're smart. Those bears are smart.

Some hunters had seen brown bears kill calves of muskox and moose. One Shishmaref resident said that in recent years hunters have found dead moose along the river in the fall, killed by bears. Another Shishmaref resident said:

> I've started noticing that brown bears are killing moose. Second one I've seen. The whole carcass was buried with sod and grass. One was near Lane River in

> the summer and one was back here. The whole thing was covered, like a human did it. Lot of it was tundra sod. The bears come back and eat them eventually.

One Shishmaref resident commented that it seemed like there were not many fish in the local area for bears. Another described the early spring movements of bears as follows:

> They dig their dens on Ear Mountain [about 24 miles south of Shishmaref]. After they come out of their dens they move down into the gulches. They follow down the creeks with willows. It's a natural tendency to follow. They get wind of reindeer calving areas and haul calves down into the willows.

Many respondents in both Deering and Shishmaref had encountered bear dens in their travels. In general, Deering residents seemed to come across bear dens more often than Shishmaref residents. Interviewed hunters in Deering said there were many bear dens in the local river valleys, while Shishmaref hunters typically said they found only a small number. Whether differences in bear denning habitat, human travel patterns, or other factors account for this is not known.

Bear dens were described as often being on high river banks, possibly because the ground was soft and easy to dig there. Bears also den high in the mountains. Respondents described bear dens as "clean," "real nice," and "roomy." One Deering hunter said, "We go look at every one we find." A Shishmaref elder reported that old-timers said that bears make a thin place for a window above them in the den. Another Deering resident related his knowledge of bear dens:

> There are four or five bear holes we know about. We know about bear holes all over. We crawl into them. The opening is small but inside you can stand up in some of them. They are soft and real clean. The bears bring in grass, leaves, willows. I don't know if they use the same ones more than once. There's one out at Six-Mile they use every year. I don't know which ones use it. The dens are along the rivers and in the mountains.

Bears were said to start denning in late October or early November. They emerge from their dens in March or April, perhaps as late as May in some years. A Deering hunter observed that "big loners" come out first, around March 15-20. Female bears with cubs come out around April 15, about the same time that reindeer calves are born. A Shishmaref hunter similarly said that big male bears come out first, followed by females with cubs two or three weeks later. One Shishmaref resident thought that bears come out earlier now than they used to. He said:

> When I was growing up, I remember we used to talk about them coming out in May but now they come out in April.

Another Shishmaref hunter said:

> The bears come out in late April when the weather gets warm. It depends on the weather when they come out. It's controlled by heat, by sun. Like squirrels, they like to hibernate as long as they can.

Some residents believed that bears with young will use the same den for two consecutive years. Others believed that bears do not use the same den twice. Interviewed residents had never encountered a "winter bear," except for a Deering respondent who came across and killed a bear in February about four years ago. This hunter said:

> That February bear I got must have smelled caribou. Caribou are pretty new to this area. They've been coming the last ten years. That might be why the bear was out in February.

Another Deering hunter who had heard about the incident said:

> Maybe it was an early riser. Maybe it didn't get enough to eat in falltime, but it was in good condition.

In both Deering and Shishmaref, residents said they usually see two cubs with a sow, rarely one and occasionally three. Young bears stay with the sow for two or three years. Several respondents in both communities said that male bears kill and eat smaller or younger bears. In Deering, one hunter said:

> One time I was watching from a hillside, waiting and waiting. I saw a sow and cubs walk up the creek quite a ways. There was a male bear fishing about a mile from them. I think they walked in the creek like that to hide their scent.

A Shishmaref resident observed:

> Once I saw a family of bears running away. About 15 or 30 minutes later, a big male bear came by hot on their trail. It was near Nuluk. The mother would stand up and look backward. They were apparently running away from the male bear. It was the last part of August, maybe 1988 or '89.

Another Shishmaref resident said:

> I have seen two bears fight. One sow and one boar. The sow brought her cubs up to Ear Mountain, then went and fought with the male. The sow won. Finally the big old fellow decided to stay away. We watched them for about an hour. Those boars will kill bear cubs.

A Deering resident observed:

> I've never seen a dead bear killed by another bear. But I've seen signs of where bears fight. It's real bad where they fight. Blood all over. I don't know why

> they fight. They fight near the end of the season, around April 15. There are usually big tracks. Seems like they are bears of equal size. I've only seen it a couple of times. It's rare. You can tell by the tracks what happened.

When asked about brown bears' relationship with other predators, several respondents brought up wolverines. "Wolverines are one animal that won't back away from a bear," one respondent said. In Shishmaref, two residents related stories of wolverines' ferocity with polar bears, which was believed to be equally pertinent to brown bears. In one of these accounts—actually witnessed—a lone wolverine suffocated a polar bear by jumping on it, getting hold of the bear's head, and wrapping its legs around the bear's neck. In the other story, a wolverine drove a polar bear off a kill by jumping on its head and biting off its nose. In regards to brown bear, one Deering hunter said:

> Wolverines and bears fight over food. *Akłaq* [brown bear] will go. He hates to go but he will walk away slowly. He won't stay there with a wolverine. The tracks will tell you.

A Shishmaref hunter said:

> When miners first come around, one miner was walking around up there. He hears growling. Over the hill he sees a brown bear with its face torn up, it eyes gouged out. The miner took pity on it so he shot it. Then he started wondering what caused that. A while later he came across a wolverine just dragging along. That must have been what did it. The bear must have had a lucky hit and broke the wolverine's back.

Wolves and bears, people said, are never seen together. "Wolves here, bears there," a Deering resident remarked. Respondents said that red and white foxes follow bears to eat their scraps. A Deering resident observed that eagles return in the spring about the same time that bears emerge from hibernation.

Respondents offered other bits of local knowledge. Two Deering residents said that bears were healthy animals and that they rarely, if ever, came across a sick bear. Several other residents commented on bears' speed. "Bears are fast," one person said. "They run fast for about a hundred yards, then slow down." Other observations included:

- Bears are smart. If you track them, they will make a circle and come around behind you. *Deering*
- My grandmother says that when there's fog, bears come out [of their dens]. People see bear tracks after fog. Maybe the damp cold gets in their bones. That's how fog feels. Maybe it wakes them up. *Deering*

- I've walked by a sleeping bear only two or three feet away. They don't know. That's what elders say. One thing I learned about hunting bear is that if they want to sleep they will sleep. *Deering*

- Brown bears are getting a black color to them. I caught one that had almost jet black legs and a brown back. Two bears I got were real light brown. One miner thought he saw a polar bear. It was a real light brown bear with the sun shining on it and it looked silver. The color of brown bears has been varying the past few years. *Deering*

- Those bears inland are wilder than those bears on the ocean. *Shishmaref*

- Don't go after a brown bear with a white spot on its side and don't go after a polar bear with a black spot on its side. These have tough bone and are hard to die. Just leave them alone. *Shishmaref*

In Shishmaref, several knowledgeable residents agreed that bears were left-handed. This knowledge seemed to be derived primarily from watching polar bears, but was believed to apply to brown bears as well. In Deering, one hunter had heard that bears were left-handed, while others, including some elders, had never been told that. One Shishmaref resident said:

> Bears use their left hands. When polar bears are hunting seals, they cover their nose with their right hand and have their left hand ready to kill a seal.

Another Shishmaref hunter said:

> It's traditional information that all bears are left-handed. It's true for all bears, especially polar bears. If you ever get close, don't dodge to the left. Dodge to the right and away. They can move easily to the left so go to the right.

Traditional Iñupiaq Rules

Most respondents—from teenagers to elders—were familiar with one or more traditional rules regarding treatment of brown bears. Virtually everyone interviewed talked about bears with respect. None of the respondents considered bears simply a nuisance or advocated eliminating them from the area, although some people believed there were too many. This respectful attitude towards bears was true in both Deering and Shishmaref.

The most commonly mentioned and widely known traditional rule was that a person should not speak inappropriately about bears. Many respondents believed that bears can hear what a person says, even from a long distance away. Respondents said that a person should not talk about bears in a funny or mean way, should not brag or boast about one's hunting ability or

physical skills, and should not even mention one's intentions to hunt. Violating these rules places a person in danger of injury from bears.

In describing this rule, Deering and Shishmaref residents said:

- The only law is don't talk about it when you're going to hunt bears or wolves. Don't say you're going to go hunt. That is mostly true for the fur animals. Say you're going to hunt for something else or you're going to go for a ride. *Deering*

- You're not supposed to brag about bears. You're not supposed to brag that you can get one when you go out hunting and you're not supposed to brag when you come back with one. *Deering*

- My dad told me that no matter how far away, animals can read your mind. *Shishmaref*

- Old folks say you don't talk about bears, white or brown, because they can hear you. Old people say don't talk about killer whale, polar bear, brown bear, wolf, wolverine, the big teeth ones. Don't talk smart or big. *Shishmaref*

Middle and high school students in Deering were also familiar with this traditional rule. One of the middle school students said, "If you talk about bears, they can hear it a long ways away." Another one said:

> They always say don't talk funny about bears or say "I'm not scared of bears." Because bears can hear you. Bears might come if you say that. They always tell us not to play with bears. Like shoot at them.

One of the Deering high school students related a story he had learned from an elder about the proper treatment of bears:

> A boy bragged he could run faster than a bear. He went out with his grandparents, and had to go to the bathroom. He squatted in the willows, and a big bear came and hunched over him, put his paws over him. Then the bear got up and the boy ran back to his grandparents. He never boasted again.

A second traditional rule commonly mentioned by respondents was that brown bears should be treated with respect and not bothered unless necessary. In Shishmaref especially, respondents often said they were taught to leave bears alone. Shishmaref residents ranging in age from their 30s to 70s said:

- My father taught me not to shoot at them. Leave them alone.

- Show bears respect and don't bother them. We don't need to shoot them unless we're going to eat them. That's how we were raised. The elders taught us to respect all kinds of game, whether swimming, flying, or on all fours. Take what you need. Don't take more than you need.

- My grandpa told me not to play with bears. Both my grandpas tell me not to waste game, not to kill things and leave them.

In Deering, one hunter summarized traditional rules about bears by saying:

> Don't talk about shooting a bear. The elders said don't talk mean about a bear. If you see a bear, elders said to leave it alone. Let it go away. If it's not hungry, it won't bother you. Let them stay out there. If you're not hunting, just let them go. Elders said to have respect for bears.

A middle school student in Deering similarly said:

> My mom told me to leave bears alone. That's all I know about what people used to say about bears.

Previous research by Division of Subsistence staff (Loon and Georgette 1989) found that removing the hyoid bone from beneath the bear's tongue prior to butchering and leaving it in the field was a common practice in some communities in northwest Alaska, such as Shungnak, Noorvik, Selawik, and Noatak. In this project, one interviewed hunter in Deering was familiar with this practice while others in Deering and Shishmaref had not heard of it. One Shishmaref resident said, "That's something new. Probably for respect to the spirit of the bear so it doesn't come back and bother you."

In the same previous research, researchers also found that some local residents in communities such as Shungnak, Selawik, and Noorvik were uncomfortable with the mere mention of *akłaq* (brown bear), often referring to bears in Iñupiaq as simply "that animal." These residents felt that it might invite harm to speak directly about bears at all, given the keen hearing of these animals. In Deering and Shishmaref, this practice did not seem widespread, although it was likely common in the past. No Shishmaref respondent cautioned about speaking aloud the name of brown bear. In Deering, one resident said:

> Lots of attitudes about bears have really changed. When I was small, we didn't talk about bears at all. Now we talk about them quite a bit. Some elders don't like talking about bears. But I don't mind talking about them.

Another Deering resident said:

> I've heard that from somewhere that you're not supposed to talk about bears, but not from elders. I never heard that from people around here.

Human and Bear Encounters

In both Shishmaref and Deering, many residents in their interviews related stories, sometimes in great detail, of their bear sightings and bear encounters. These covered a wide range of experiences, including being charged by bears, having bears peer into cabin windows, finding motherless cubs, mistaking bears for other animals, and observing bear behavior. In Deering especially, nearly everyone including school-aged children had seen bears on more than one occasion. Many of these sightings occurred along a 25-mile mining road that people frequently traveled in trucks or on all-terrain vehicles south from Deering. In Shishmaref, bear sightings were less common unless one traveled often by boat or, in the spring, by snowmachine. Many schoolchildren in Shishmaref, as well as some adults, had never seen a brown bear. Because of its location on a barrier island, Shishmaref did not have as ready access to brown bear habitat as Deering.

The predominant attitude in both Deering and Shishmaref was that bears generally did not bother people if people did not bother bears. One woman said, "When people never bother them, I don't think those bears do anything." Interviewed residents often described situations in which they or others in the community saw a brown bear while berrypicking or traveling, and simply let the bear go on its way. In Deering, bears were occasionally seen in the tundra not far from town, but even then people usually did not pursue them. Neither village felt they had problems with bears coming into or too close to town.

Many interviewed residents said that bears were afraid of people, running off at the sound of a boat, snowmachine, or all-terrain vehicle. A Shishmaref resident said, "Bears are scared of people and stay away when we're at camp." One Deering resident said:

> Bears are good. They keep city people out of the country. Bears are good for the country. Bears are getting smart. They take off before you get close to them.

Other residents felt that bears were getting braver and showing less fear. One Shishmaref man said:

> Bears are getting tame. They probably think, "These humans don't hunt us anymore so we don't have to be afraid of them." Bears are getting closer.

In both Deering and Shishmaref, most people were familiar with what to do if they encountered a bear. To deter a bear, residents said a person should stand still, refrain from staring at it, make noise, or build a fire. Some people suggested that it was good to keep a dog at camp to warn of nearby bears. Others occasionally shot rifles in the direction of an approaching bear to frighten it away. Elders advised women to bare their breasts to bears to make them run away. A few hunters said it was important not to be fearful around bears. The following is a representative selection of people's advice on dealing with bear encounters:

- If you encounter a bear, don't run from them. Bears smell fear. They can tell if you're not afraid. If they smell fear, they won't run away. *Deering*

- If bears come at you, you should drop and play dead, or make lots of noise if they are far away. My dad used to tell us to make sure you see the bear first before they see you. *Deering*

- When I was growing up, elders used to tell me that if you see a bear, don't try to get it mad. Holler, make lots of noise so they go away. Or make a fire. Don't bother bears. *Deering*

- They always tell us, our parents and grandparents, if we should be in a bear's way in the country and we have no way to kill it, no gun or anything, they tell us to stand right, stand straight, don't move. Sometimes bears are hungry. If a bear doesn't go away, a woman should tear her parkie open and show her breasts to the bear. The bear will run away. *Deering*

- Our parents used to tell us if we see a bear, make a little fire quick. Bears are scared of smoke, of fire. When we camp, we always see bears, but they don't bother us. *Deering*

- I carry a gun. I walk around in the valleys, looking for bones. I shoot my .22 pistol before I walk down a valley. I find places where reindeer are buried. If I hadn't shot my pistol, the bear would have been waiting for me. *Deering*

- Around here you can see far and see a bear coming. Here we watch for them and get away before they get too close. *Deering*

- You're really not supposed to stare at them. It gets them agitated. You're supposed to act nonchalant. *Shishmaref*

- Our parents never really told us what to do [around a bear]. Just have to be cautious, especially if it has cubs. Don't try running away from it or make sudden movements. Don't agitate it. Treat it like a wild animal. *Shishmaref*

- They used to tell us to be careful when picking berries. You have to carry something [e.g., a rifle]. Brown bears are unpredictable. More unpredictable than a polar bear. *Shishmaref*

In Deering, children and teenagers were also familiar with dealing with bear encounters. Even many of the younger children knew to stand still, not move, and make noise if they saw a bear. Some older students knew that a person could make a fire to keep a bear away. Middle and high school students said their parents do not let them ride all-terrain vehicles on the road when a bear is sighted. Several students told stories about watching bears with their parents or relatives, and letting the bears go on their way.

Although Deering and Shishmaref residents felt that bears for the most part did not bother people, they also recognized that bears could at times be dangerous and attack humans. These aggressive animals were usually small bears, hungry bears, or bears with cubs. Respondents also recognized that brown bears could at times be unpredictable. Several representative comments by respondents follow:

- The big bears avoid people. The big ones live long because they know people are dangerous. They don't like people. It's the small bears that attack. The only bears that attack are young ones and ones with cubs. Sometimes the young ones are hungry and that is why they attack. Some of them feed on things that wash up on shore. Sometimes not much washes up and they are hungry. *Deering*

- We see bears once in awhile by Pingu while berrypicking. They don't bother people unless they're really hungry. We just leave them alone. *Deering*

- Juvenile bears are the ones bothering people's camps. They don't care. The old ones stay away from people. *Shishmaref*

- Bears won't normally attack you unless they have cubs. But you never know. You can't predict them. Some are just mean. *Shishmaref*

Deering and Shishmaref residents said they try to drive away bears that stay around camps or threaten property. This meets with mixed success. One Shishmaref resident explained:

> The single ones you can't really drive away. You can drive them ten miles and they're back in two hours. But you can drive sows and cubs away. They will go away once they hear you.

Occasionally hunters kill bears that are breaking into cabins or camps. Often these bears are hard to track down. As one hunter said, "When we try to get bears that are damaging cabins, they know we're coming and are not around." Others agreed that bears know when they are being hunted and avoid people.

Under certain conditions, state law allows the killing of bears and other game animals in defense of life and property, a legal category of kill popularly known as "DLP." When asked about DLP bear kills near their communities, both Deering and Shishmaref residents said it was unusual for local residents to have to shoot bears in defense of life and property. Many interviewed Deering residents related a story of the only DLP bear taken in recent years, noteworthy in its rarity. One Deering resident described the event as follows:

> One time six people were out by the point. Two adults and four children. They were chased by a bear and had to climb the lighthouse. The bear couldn't climb the ladder. They were lucky the lighthouse was there. The people were stuck up there for an hour. The bear lay down and waited. Someone went out looking for the people. The bear came running full pace to town. Three guys were at the edge of town waiting with guns. People shot the bear and distributed the meat. It was a young two-year-old bear. Probably just left its mother.

About the same event, another Deering resident said:

> The only DLP was one a few years ago at the lighthouse. People made the mistake of running from the bear, so the bear chased them like prey. People had to shoot that bear. But that was definitely an exception, a DLP bear like that. It was a young bear, maybe two or three years old.

In Shishmaref, residents likewise had little reason to shoot brown bears in defense of life and property. Other than to protect reindeer (see section below), Shishmaref residents generally knew of only one or two instances when bears had been killed in defense of life and property.

Origin of Bears

Two elders interviewed for this project related a story describing the origin of bears in the Shishmaref area. Both of these elders are from Shishmaref, but one has lived in Deering for many years. The story as told by these two elders varied in the details, but in essence was the same: bears were originally the offspring of a woman and a dog.

In one version, a girl was living with her grandfather along the coast near Singizat, about 25 miles southwest of Shishmaref. Just the grandfather, granddaughter, and a big male dog were living there. When the girl became a teenager, her grandfather told her that someday a man would come and she would be able to marry. But as time went by and no one came around, the girl started wondering whether her grandfather was telling a lie. They met nobody, even though they always went to the beach to look for something to eat, like a dead seal. The dog wanted to

follow the girl. One time the grandfather started wondering why his daughter and the dog stayed in the house a long time and did not come out. Later, he worried when he saw that his daughter was getting a big belly, wondering how that could be when she did not have a husband. One day he heard a noise in the stormshed and discovered that his daughter had given birth to four puppies, two white and two brown. She cared for them like humans, nursing them and feeding them. When the puppies grew too big to handle, the girl tied them outside. She put them on rope because there was no chain in those days. The puppies grew fat and big, and soon were bigger than the dog. They were eating too much. One time the grandfather went outside to feed them and was gone for a long time. Wondering what had happened, the girl went to check on him. She found her grandfather dead, killed by the puppies. From then on, she hated the puppies. She couldn't handle them. She refused to feed them and told them they were no good and had to take care of themselves. The two white ones she sent north, where they became polar bears, and the two brown ones she sent inland, where they became brown bears.

The other version of the story was similar in its outcome, but different in its emphasis and details. In this telling, a girl who lived along the coast with her parents didn't want to get married, even though her parents were getting old and wanted her to find a husband to hunt for them and help care for them. The family had an old dog that lived in the stormshed. At one point, the girl's father said, "You want to have that old dog for a husband?" The girl got scared and ran to the cache to get away from the dog, but the dog chewed down the cache and the girl fell. Later the girl gave birth to two little white animals with no tails and two little brown animals with no tails. As they grew, the girl talked to them and taught them how to talk. She told them they could do anything to their grandfather because he had made her go to that dog. She didn't say that in front of him. One day when he was old, her father went outside to use the bathroom. Those little animals chewed him up and killed him. When they got big, the two brown ones went inland and became brown bears and the two white ones went to the ocean and became polar bears.

One implication of both stories is that bears are related to humans. One of the elders ended her story by saying, "This is why the old folks say you don't talk about bears, white or brown. Because they can hear you." The other elder ended her story by saying:

> That's why some people don't like to eat them. Because of the story. But if people are hungry, maybe they eat them. They always say don't talk funny about bears because bears can hear you. Maybe that's why they can hear.

Other respondents also mentioned or alluded to this story in discussing the relationship between people and bears. One Shishmaref resident in his 70s related a much condensed version

of the second story and prefaced it by saying, "The old-timers said that bears come from humans." Another Shishmaref man in his 50s thought these stories accounted for the effectiveness of a woman exposing her breasts to deter a bear:

> Maybe the bears do that out of respect. Maybe because they were breast-fed as cubs in that old story. They didn't hurt their mother.

A Shishmaref man in his 40s said, "The old people say that bears are our cousins, that we are related to them. That is one of the reasons they hear and understand so well." This resident explained that many traditional healers learned about human bone structure from examining bear carcasses, both polar and brown, saying:

> A bear's structure and its ability to stand up are related to humans. It makes me think of human bodies. People didn't have cadavers so they did the next best thing. They learned from bears.

Medicinal Uses of Brown Bear

A few people, particularly in Deering, were familiar with medicinal uses of bear. Others had heard about such uses from friends or relatives in communities along the Kobuk River or elsewhere where medicinal uses of bear were more common. Some people had never heard of such uses. In Deering, a few residents personally made use of bear for health and healing. One man in Deering said:

> The fat is good for arthritis and for knee joints. I cut up the fat and put it in the freezer in half-gallon bags. It's real white fat. Shave the fat off and rub it in your hands and it feels good. Or rub it on your joints.

Another Deering resident described his medicinal experiences with bear:

> Old people say when you get sick, make bear stew. It helps you get good. I know that for a fact. I did it, and it helped me get better. I learned that from the elders. I used to send bear fat to Kotzebue for the old people. It helps with arthritis. But I haven't had any to send lately.

Brown Bear Hunting and Use

Perhaps the most notable difference between Deering and Shishmaref was in their hunting and use of bears. In Deering a small group of men actively hunted bears, while in Shishmaref researchers found no one who regularly hunted brown bears for food. However, many Shishmaref men actively hunted polar bears, which were regularly found on the ocean ice near Shishmaref. Deering, in contrast, was located in the more protected embayment of Kotzebue Sound where polar bears were rarely sighted. Shishmaref for the most part was more sea-oriented than Deering, perhaps accounting in part for their different brown bear hunting practices. The brown bear hunting practices of each community are discussed separately below. A discussion of den hunting is presented in the following section.

Deering

In Deering, interviewed residents estimated that four to six local men regularly hunt brown bears for subsistence. Some hunters said that even decades ago only a few people hunted brown bears, not much different than the current number. Those who hunted bears typically said they learned from their fathers when they were young teenagers. One Deering man said:

> I first hunted them with my dad when I was 14. He used a .25-35, that was the biggest gun he had. I held the shotgun in case the bear charged. We hunted bears with a dog team in the spring and fall.

Hunters in Deering said that most bear hunting takes place in the spring and fall. In the spring hunters travel by snowmachine, while in the fall they travel by all-terrain vehicles and by foot. Some hunters prefer smaller bears while others prefer larger bears. The following are five descriptions by Deering men about their seasonality and preferences in bear hunting:

- I hunt bears every year. But this year I didn't have time to hunt them. I prefer to hunt them in the falltime. I follow them until they go into their dens. I go on a four-wheeler in the fall, then walk. I look for a big, fat, round one. I leave the small ones alone because they will be bigger next year. One bear a year is about right for us. We share the meat around town.
- People prefer smaller bears for eating. They are better eating. Bears are better for eating in the fall. They are better for eating when they've been eating berries and greens.

- I prefer a male bear in falltime and a female in springtime. I leave them alone if they are with cubs that are small. I got one big cub one year, a cub as big as its mother. There were two big cubs with the mother. It was good eating.
- I would get a bear every year if I could. I didn't get one last year but I got one the fall before. Spring ones are good. They're kind of hard to get in the fall because it's harder to get around.
- Fall or spring is a good time to get bears. I don't shoot ones with cubs. It varies whether I get big ones or small ones. Sometimes big ones, sometimes small ones.

Hunting brown bears required considerable skill. Hunters recognized that bears were smart and difficult to catch. One Deering hunter said:

> If you track them, they will make a circle and come around behind you. That's happened to me. When I hunt them, I get up on a hill where I can see all around. Bears can sense when they're hunted and are hard to find.

Hunting brown bears also required precision shooting. Hunters used a range of rifle calibers in bear hunting, including .22-250, .243, and .30-06. Because of a bear's size and strength, a carefully placed shot was essential to kill it quickly. Injured bears were widely regarded as dangerous, so hunters did their utmost not to wound bears. One hunter said he "drops bears in one shot," shooting them in the neck. Another Deering resident said:

> I use a .22-250 to hunt bears. It's a flat-shooting rifle. They drop dead with one shot. I shoot them in the ear. Or in the neck. The spine is a good shot, too. Anywhere else on a bear there's a lot of muscle. Their skull in the front is real thick.

Most Deering hunters skin and butcher bears in the field, bringing in the meat and hide. The hides are used for camp mattresses, rugs, or cushions for chairs or sleds. One hunter thought bears were fairly easy to skin, but difficult to scrape. Another Deering hunter said:

> I cut off the head because it's a subsistence bear, stretch and dry the hide. One year I used the hide on a sled. It was really soft. You can wrap it around you and it's really warm. The hides are tough. I scrape the fat off with an upside-down shovel or piece of angle iron.

Deering hunters typically distribute the meat to other interested households in the community, particularly elders. Interviewed residents prepared bear meat in a variety of ways. Some made bear jerky while others roasted it in a Dutch oven then cut and fried it as a steak. Another person parboiled the meat, then baked or roasted it with sauce like spare ribs. Several

people commented that bear meat needed to be well-cooked, like pork. Some people, however, dried the meat. One Deering woman said:

> We eat the bear meat and bones. It's good to pick on the bones. We eat the feet sometimes, too. They have big feet. We don't eat bears a lot. It's just a once-in-awhile thing for something different. We get tired of eating moose all the time when we have no reindeer.

Another Deering resident said:

> Bear fat makes good bread. Add it to bread like lard or butter. Doughnuts fried in bear fat would be good. An old woman used to fry doughnuts in seal oil and give me a bag. Real good. I like bear ribs. I like bear stew. Some people dry bear meat.

Deering residents were not uniformly interested in hunting or eating bears. While some residents actively hunted bears for subsistence or appreciated bear meat, others in the community, including some elders, had never hunted or eaten bears and had no interest in doing so. The most common reason for this was that bear meat was not a food they had grown up with. In some cases, women who did not grow up eating bear meat started eating it after they married men who were bear hunters. The following three statements by Deering residents summarize the views of those who did not eat bears:

- I've never eaten bear. Some people do. I don't know why I don't eat them. I didn't grow up eating bears.
- My cousin doesn't like to eat bears. But her parents and grandparents ate bears. She doesn't like to eat bears because they eat people or kill people.
- One of [the men working with my husband] shot a bear. I couldn't chew it. I put it in my mouth and I couldn't eat it. I think of it as dog food. I didn't have it growing up. But now I can eat it.

Deering residents unanimously agreed that most young people did not like to eat bear meat. One resident said, "Kids don't like to eat bear meat because bears eat dead animals. Kids are picky eaters." Students at the school said they would not like to eat bear meat because it did not sound good. A young woman in her 20s said that bears were not something she would want to eat. "I guess by the time I grew up we were modern," she explained. One Deering man said:

> I would eat bears but my kids won't eat it. I don't know why. They don't like the idea of eating bear so they don't eat it. Once we were out of meat, so I fooled the kids. All we had was bear meat so we cooked bear and told them it was pork chops. They ate it.

One Deering hunter has been passing on his hunting skills to younger relatives, but not all of them want to go bear hunting. He said:

> I've been teaching my nephews to hunt. I ask older kids to go bear hunting with me, but none of them want to go. Some of them are still afraid of bears.

Shishmaref

In Shishmaref, none of the respondents regularly hunted brown bears for food. A few people ate brown bear on rare occasions, while many others had never tasted it. Some people remembered their parents or grandparents eating brown bear or remembered having eaten it during their childhood. One Shishmaref resident said:

> No one eats brown bears in Shishmaref. We didn't grow up eating them. But Grandpa said he used to eat them. They didn't have hamburger in the store then. They ate what was available. Deering people eat them more than us, I think.

Another Shishmaref resident said:

> Long ago my uncle killed two brown bears by Ear Mountain. We were squirrel hunting. They [used to] eat those brown bears, somewhere around 1950s before the law.

Polar bear hunting has a long and active tradition in Shishmaref, and several people said they grew up eating polar bear, not brown bear. Others said that bear fat was of little interest because Shishmaref had ample access to seals and seal oil, the preferred source of oil and fat by most northwest Alaska Iñupiat. For example, one Shishmaref resident said:

> We have seals here. We don't need bear fat. Not like in the inland areas or the interior where people use bear fat.

Two other Shishmaref residents said:

- We grew up eating polar bear meat, but I never remember eating brown bear. But I hear they are good from people who eat them up Ambler way and in the interior.
- My dad hunted polar bears every year. He loved that meat. But he didn't hunt brown bears that much. I've never tasted bear meat. I've never shot a brown bear.

Shishmaref residents whose parents hunted brown bears recalled some of the things their parents had told them about bears, many of which were similar to what Deering hunters said. One Shishmaref resident recalled:

> I tasted [brown bear] as a kid long, long ago one time. I remember tasting it. My dad had got a bear in the spring. He never used to go after brown bears much. But he got one once when I was just a little boy. He used to say that bears were good when they first come out or in late fall.

Two other residents said:

- When I was a kid, we used to eat bear meat sometimes. We used to eat it roasted. You have to cook it good. My dad used to eat bear feet. When he got a bear, the first thing he wanted was bear feet.
- My dad used to say that the time to get them was when they first come out in the spring. Once they start eating squirrels, they taste like squirrels. They taste like what they eat.

Shishmaref hunters also offered advice on shooting bears. Because bears were large, strong, and potentially dangerous, it was important to shoot accurately and under the proper circumstances. One man recalled:

> My dad used to say to never shoot at a bear from below, like if it's running up a mountain and you're below. Once you shoot them, they roll into a ball and it will come right towards you.

Another hunter described where to aim when shooting a bear:

> Their fur is opening up where their heart is beating. That's where you can tell to shoot, when they stand up. It's hard to get them from the front. They've got thick skulls. You have to wait until they turn to the side unless you have a big caliber rifle, an elephant gun.

Many interviewed Shishmaref residents had never shot a brown bear. Some had killed them on rare occasions. Those who had shot brown bears often described the circumstances under which these kills took place. In one case, a Shishmaref man shot a charging brown bear that refused to yield despite attempts to frighten it away. This happened many years ago, and was the only brown bear killed by this hunter. In another case, a Shishmaref man and his traveling partner used .30-30s to shoot four brown bears they came across many years ago while traveling by dog team to Teller. He described what they did after shooting the bears:

> We dress up all of them. Real fat ones. They'd just come out of their dens. We line them up. Put willows over them. We take the hides. We can't carry all of

> it. After we get back to Shishmaref, after two weeks, we try to go up there to get meat for dog food. When we get there, there's nothing but bones left. Foxes. We went all that way for nothing.

One elder described an incident in the 1950s when she and her husband heard a bear cub crying after its mother had been killed. The elder described the story this way:

> "Kill it! I don't like to hear it [crying]," I said. But my husband wanted to bring it home and tie it up. I said, "No, kill it." My grandfather always say that when animals got no mama be sure to kill them. They'll starve anyway. So my husband killed it.

This cub was the only brown bear killed by this Shishmaref resident during his life, although he frequently hunted polar bears. Another resident also remembered an incident with a bear cub many years ago in which hunters had killed a sow before realizing it had a cub. The men had tied the cub up and sent it somewhere, but the respondent did not remember where.

In Shishmaref, brown bears were also killed by reindeer herders to protect reindeer (see section below) and by non-Native teachers interested in bear hunting. A few interviewed residents commented that non-Native teachers were the only local people interested in bear hunting. In the late 1990s, one Shishmaref resident was working as a hunting guide in the local area, guiding a handful of clients every year in successful bear hunts.

Den Hunting

Many, but not all, interviewed residents in Deering and Shishmaref had heard that brown bears were once hunted in their dens. According to these stories, den hunting typically involved crawling into a den to kill a hibernating bear or annoying a sleeping bear with a stick until it came charging out of its den. The most common piece of knowledge among respondents was that bears in a den will not attack a person. One elder said:

> I've heard about people hunting them in dens. People go in and shoot them. Just like that. They just look at you in the den. They're not sleeping, but they don't do anything. They don't bother you.

Two Shishmaref elders related their knowledge of den hunting in the past:

- I've heard stories that before big rifles were introduced, people used to crawl into bear dens and shoot them with .22s. They'd feel around and see how

many there were, then shoot them in the ear. You had to make sure you got them all.

- Long ago, when people had no rifle, only a bow and arrow or knife, in winter time they crawled inside dens, checked the bears by feeling them, see how many there are. The bears never wake up. They killed them, then tied Eskimo rope, *ugruk* rope, to the bear and got someone to help them pull it out. They found the pounding heart of the bears and killed them. They killed the cubs. Some with one, two, three cubs. I never hear of four. Scary!

A Shishmaref resident briefly described two instances of people hunting denning bears by poking them with a stick until they came charging out:

> You can wake bears up by putting a long willow with branches into their hole. They'll come out charging. Those two old men did that. The bear came out real mad. The bear was two or three feet away from one of them when the other man shot it. It was the same with a man at Deering. He had a .22 automatic. They were poking a bear inside a hole. He just stood over the hole. He shot it in the head with a .22 magnum. Real close. Shot it in the back of its head as it came out the hole. They even say you can go in their dens and they won't attack.

A Shishmaref man was familiar with one technique of den hunting that no one else mentioned. This technique involved shuffling one's feet in a certain manner so as not to disturb the bears. He described it as follows:

> There was one technique our elders had, especially when bears were about ready to den, when people walked around a lot in the hills. You can go into a den. You have to drag your feet, shuffle your feet, not touch the walls of the den. You can pet the bear, see its eyes when you get used to [the dark]. Get your gun and shoot it. The sound of the gun is like the sound of ice cracking when it's freezing. If more than one bear, you can get them all. That must have been something. You'd have to have a brave heart. One guy did that one time and thought he got all the bears. He started walking out regular and another bear he hadn't seen got him.

Two recent accounts of den hunting were described by those interviewed. These both occurred in Deering within the past 15 years. A Deering hunter described one of these cases:

> Six miles up the road there's a bear den. [Three of us] were out together. The bear had just come out. I had seen it earlier behind a willow on top of the den. I stopped and unhitched the sled. I first shot a round but the bear didn't come out. So I crawled in the den with a .30-06 and shot it. That was a mistake! I couldn't hear for three days. It was light enough to see in the den. The bear was looking at me when I shot it. That was about 13 years ago. Elders say bears don't bother you in the den. That's what elders say. That's what I go on. That's the only

> time I got a bear in a den. I remember it was March 12. That's the earliest I'd ever seen a bear come out. We tried to pull the bear out with a rope but it got caught in its hole. I told my buddy to go in there and get it out. He wouldn't go in there. So I crawled in. It was big enough for me and the bear. Real clean. In the old days, people used to crawl in dens and shoot bears with a .22. I guess it's a quieter gun to use in a den.

The second instance of den hunting had certain similarities to the first, including the deafening gunshot and the difficulty in extracting a dead bear from its den. A hunter described this case as follows:

> One time six or seven years ago, we found a den. It was December. We poked the bear with sticks but we couldn't get it to wake up. So my friend crawled in there with a flashlight and made the mistake of shooting it in the den. He almost went deaf! The den entrance was covered with grass and brush. It had frozen and we could see where the opening was. It was hard to get the bear out of there. The opening isn't very big. We tied a rope around it and pulled it with our snowmachines, but it was hard to get out. We were lucky there was only one bear in there. We couldn't tell beforehand if there was one or more than one.

Harvest Estimates

Respondents in Deering and Shishmaref were asked to estimate the average annual brown bear harvest in their community. Hunters were also asked to estimate their own brown bear harvests, either during their lifetimes or in the past ten years. Table 3 summarizes hunters' responses to these questions. Harvest estimates from other sources, including sealing records and community-based harvest surveys, were also examined and compared to information from hunter interviews. Deering and Shishmaref bear harvests are discussed separately below.

Deering

Of the Deering residents interviewed, five had killed brown bears. One hunter estimated that he shot three brown bears in the past ten years, while another said he killed five in the past ten years and about 12 over his lifetime (Table 3). Two other hunters estimated their lifetime brown bear takes at 15 and 20 bears respectively. One interviewed hunter in Deering had shot one brown bear in his life, while others had killed none. Based on these estimates of personal harvest, Deering residents have killed a minimum of 51 brown bears over the past 20 to 40 years. Most of

TABLE 3. ESTIMATES BY INTERVIEWED HUNTERS OF PERSONAL AND COMMUNITY BROWN BEAR HARVESTS: DEERING AND SHISHMAREF

Deering

	Age	Typical Annual Community Brown Bear Harvest (1990s)	Personal Brown Bear Harvest
Hunter 1	60s	-	none
Hunter 2	60s	-	1 in life
Hunter 3	60s	no more than 6	-
Hunter 4	50s	3 for subsistence	12 in life; 5 in past 10 years
Hunter 5	40s	less than 10	20 in life
Hunter 6	40s	4 to 10	15 in life
Hunter 7	30s	none last year	3 in past 10 years

Shishmaref

	Age	Typical Annual Community Brown Bear Harvest (1990s)	Personal Brown Bear Harvest
Hunter 1	70s	none	1 in life
Hunter 2	70s	-	4 in life*
Hunter 3	70s	none	1 in life
Hunter 4	70s	-	1 in life
Hunter 5	60s	none	1 in life
Hunter 6	50s	"hard to say"	-
Hunter 7	50s	-	none
Hunter 8	50s	-	none
Hunter 9	50s	none	none
Hunter 10	50s	none	-
Hunter 11	40s	none	none
Hunter 12	40s	-	none
Hunter 13	30s	-	1 in life
Hunter 14	30s	none in most years	none
Hunter 15	30s	less than 1	none
Hunter 16	20s	not even 1	none

*All four shot on one occasion with one other hunter.

these bears were taken for subsistence with a smaller but unknown number taken to protect reindeer. Deering residents estimated that the community catches an average of three to ten brown bears annually. Bear hunters in Deering often said that given the opportunity they would catch one brown bear each year.

Records kept by the Alaska Department of Fish and Game show a considerably smaller harvest of bears in Deering than those reported by respondents. Brown bear sealing records for the 35-year period from 1961-96 show a reported harvest of only two bears by Deering residents (Alaska Department of Fish and Game 1998). A subsistence brown bear hunt, initiated in 1992, shows an additional reported harvest of three bears from 1992-98. These five bears are about ten percent of the personal harvest of 51 bears described in interviews by five individual hunters for a similar time period. Because these five hunters account for only a portion of the bears taken by Deering residents during the past three decades, the reported harvest is even a smaller percentage of the actual harvest.

A community-based harvest survey conducted in Deering by the Division of Subsistence in 1995 provides another source of information on Deering's brown bear harvests. This survey covered a full range of resource species for a 12-month period beginning in 1994; 84 percent of Deering households were surveyed. Results from this survey showed a harvest of four brown bears by Deering residents during the study year (Scott et al. 1997). This falls within the range of three to ten bears that hunters in the current project estimated as the community's annual bear harvest.

Shishmaref

In Shishmaref, many interviewed residents said they had never killed a brown bear. Six hunters said they had shot a brown bear on one or two occasions in their lives, most of which took place many years ago by hunters now in their 60s and 70s (Table 3). Shishmaref residents nearly universally said that no brown bears are taken for subsistence by Shishmaref residents in a typical year, although some are killed by reindeer herders or by non-Native sport hunters. The following summarizes respondents' comments about Shishmaref's brown bear harvest:

- I've never shot one. No need to.
- I never hunt them. I got no use for them. We don't eat them. One time in my early days I got one bear. I was duck hunting with my brother. I didn't know what to do with

it. I gave the hide to my in-laws. I'm not sure what they did with it. It was long ago, maybe 40 years ago. I've never tasted brown bear.

- I really have no idea [how many bears Shishmaref gets in a year]. I never hear anything like that. The only people interested in bears is the white teachers.

- I've never shot a bear. Never used a bear. I don't think my parents did. I don't think any bears are taken by Shishmaref most years.

- Not even one a year is taken in Shishmaref. The only people that hunt them are the ones that buy tickets to hunt them. White people go crazy for the bears. The teachers. Reindeer herders shoot them or try to drive them off. That's the truth. The reindeer herders shoot them.

- I got one bear one time when I was working near Wales. It was in the 1950s. I skin it, dry it, give it to my boss.

- I shot one brown bear long ago. We were camping at Pinguk River.

- I've never had much interest in bears myself. It's not in my blood to be hunting brown bears. I had an opportunity to get a bear, but looking at it was enough for me.

Records kept by the Alaska Department of Fish and Game show that 23 brown bears were sealed by Shishmaref residents during the 36-year period 1961-97 (Alaska Department of Fish and Game 1998). This is a higher brown bear harvest than might be expected given the information provided by respondents, and contrasted with Deering where sealing records showed a considerably lower harvest than that described by respondents. Of the 23 bears sealed, three were killed in defense of life and property. A review of the sealing records indicates that about 75 percent of the remaining brown bears were taken by reindeer herders or by non-Native Shishmaref residents, primarily teachers. Twenty-five percent were taken by local Native residents, of which three were killed under unknown circumstances, one was killed for the hide, and one was killed in 1961 by a locally well-known subsistence bear hunter, now deceased. Because most of Shishmaref's sealed bears were likely taken primarily for the hide and not for the food (although some of the meat might have been salvaged), this harvest information is not inconsistent with the information from respondents that little subsistence brown bear hunting occurs in Shishmaref.

Community-based harvest surveys conducted in Shishmaref by the Division of Subsistence in 1989 and 1995 provide another source of information on Shishmaref's brown bear harvests. In the 1989 survey, which interviewed 18 percent of households, no brown bears were reported taken during the 12-month study year (Conger and Magdanz 1990). In the 1995 survey, which

interviewed 32 percent of households, two brown bears were reported harvested by surveyed households. Expanded to unsurveyed households, the estimated community harvest in 1995 was six brown bears, with a range between two and thirteen bears (Scott et al. 1997). Harvest estimates for resources harvested by a few households, such as brown bear, are less precise than estimates for resources harvested widely, because the few households that actually harvested a brown bear may be over represented or under represented in the random draw of surveyed households. Based on reports from key respondents about the typical harvest levels of brown bears in Shishmaref, it is possible that the actual number of bears harvested in Shishmaref in 1995 was closer to two bears than six bears. That is, it is possible that most, if not all, successful hunters happened to be surveyed in 1995. One of the harvested bears was reported taken by a non-Native household, and the other bear was reported harvested by a Native resident.

Reindeer Herding and Bears

Both Deering and Shishmaref had locally-owned reindeer herds during the time of this research. In 1998, one family in Deering and two families in Shishmaref owned herds, with many other community residents having helped with herding at some point during their lives. In Shishmaref, researchers interviewed one reindeer herding family, while the other one was not available. In Deering, members of the reindeer herding family were either unavailable or declined to be interviewed. However, at least four other interviewed Deering residents had worked for herders at some point.

Everyone knowledgeable about reindeer herding agreed that bears kill reindeer, especially fawns. Interviewed residents gave similar descriptions of bears preying on fawns, such as the following two observations:

- When we're out watching reindeer, we find big mounds of reindeer fawns. The most I've seen is eight fawns covered with grass and leaves in one pile. Then half a mile away there's another pile of five fawns. That's what bears do. *Deering*

- Bears will kill fawns. They eat one or two of them, then stockpile ten or twelve. Cover them with tundra and grass. I think they go back to them eventually. One of the bears we caught last year had two fawns in its stomach. I always check the stomach. *Shishmaref*

One Deering hunter said bears kill 20 to 30 reindeer fawns in one day. Another Deering man said that bears chase reindeer for miles to tire them out. Some of those interviewed thought bears followed reindeer herds. One elder said, "For reindeer, bears are no good."

Reindeer herders at times feel compelled to kill bears to protect their reindeer. The extent to which this occurs was difficult to estimate. Herders and others in the communities seemed reluctant to discuss the specifics of these bear kills, and the researcher did not press for details during interviews. State regulations specify certain procedures for reporting bears taken in defense of life and property (DLP), including a detailed justification of the kill and the surrender of the skull and hide to a representative of the Alaska Department of Fish and Game. According to respondents, some residents have been questioned or fined by enforcement officials over bear kills in the past. Because of perceived difficulties with the complex reporting requirements, it is likely that many, if not most, bears killed by herders to protect reindeer go unreported under the DLP procedures.

Nearly everyone interviewed spoke about bears with respect, and no one seemed inclined to shoot bears on sight. Those who worked in herding said they try first to drive away bears preying on fawns and, if that proves unsuccessful, they then resort to shooting them. One Deering resident said he had shot a couple bears while watching reindeer, and another one said he had shot one to protect reindeer when he used to help with herding. Another Deering resident, who also hunted bears for subsistence, said:

> We'd kill bears if they killed reindeer. I always took the bears even when I shot them for reindeer. I never left them there.

An elder in Deering said that in years when reindeer were close by, people brought her bear that had been killed to protect the herds. When estimating his subsistence harvest of brown bear, another Deering resident did not include the bears he had killed while reindeer herding, saying:

> That's not counting ones I get when we're out watching reindeer. Those we just cover up and leave there.

In the end, this project did not obtain a full picture of the relationship between bears and reindeer herding. Some herders were not interviewed as part of the project, and, as stated above, the researcher did not press for details concerning the number and disposition of bears killed to protect reindeer.

Hunting Regulations

For most of the past 30 years, state general hunting regulations in Deering and Shishmaref have limited the harvest of brown bears to one every four years and have required, among other things, the purchase of a $25 tag prior to bear hunting. In 1992, Deering became part of the newly established Northwest Alaska Brown Bear Management Area created by the Alaska Board of Game to accommodate subsistence brown bear hunting with regulations more consistent with customary and traditional practices. Since mid-1992, the state subsistence brown bear hunt in the Northwest Alaska Brown Bear Management Area has had a bag limit of one bear every year, no tag fee, and a requirement that the meat be salvaged for human consumption. The hide is not required to be salvaged or sealed unless it leaves the management area, at which time the Alaska Department of Fish and Game removes the head and front claws. In 1998, the brown bear management area was expanded to include Shishmaref as well as most of the Seward Peninsula and eastern Norton Sound. The expanded management area took effect after the field work was completed for this project, so Shishmaref residents were not yet eligible to hunt under these new regulations during the time of this study.

Several Deering and Shishmaref residents interviewed for this project commented on the hunting regulations for brown bears. In general, people who hunted bears or who had killed them in defense of life and property were knowledgeable about bear regulations. Those who did not hunt bears were generally not familiar with the regulations, although this was not the case with everyone.

In Deering, bear hunters were familiar with bear hunting regulations and seemed satisfied with the subsistence bear hunt, feeling that this hunt accommodated their hunting traditions much better than the previous state general hunting regulations. One hunter said:

> One bear every four years discouraged me from bear hunting. Then I found out about the one bear every year. That works well for me. One bear a year is about right.

Two other Deering hunters also felt favorably about the subsistence bear hunt:

- I heard about the new subsistence bear hunting regulations. But I didn't believe it. I didn't know if I should believe it. I didn't want any trouble from Fish and Game. Bear regulations are good how they are. One a year is enough. It takes three hours of butchering. Even if I come across more than one, I only get one. There's always another guy to get another.

- The new subsistence regulations will make bears more of a food source. The one bear every four years discouraged people from hunting. They worried about the tags and having the hides around. But people still went out and did what they wanted.

In Shishmaref, three interviewed residents felt that a bag limit of one bear every four years was too restrictive, especially with the growing number of bears in the area. As opportunity allowed, researchers explained the new subsistence bear hunt to Shishmaref residents. People generally seemed pleased with the more liberal regulations, and at least two people expressed some interest in trying bear hunting and seeing if they liked bear meat. For the most part, however, those in Shishmaref who did not hunt bears did not feel that regulations discouraged them from doing so. One Shishmaref man said:

> I don't know what the brown bear regulations are. The regulations don't have any effect on why I don't hunt bears.

DISCUSSION

In most respects, Deering and Shishmaref shared similar perspectives on brown bears. There was a common cultural view about brown bear expressed by respondents in both communities. Perhaps foremost among these was a widespread respect for bears and a general belief that these animals must be treated appropriately. Most respondents were familiar with a cultural rule against bragging about bear hunting or talking about bears in a funny or mean way. Human interactions with brown bears were guided by a relatively complex body of information about brown bears learned within the community, including details as diverse as the cleanliness of bear dens, the proper response to a bear encounter, shot placements for efficient bear kills, and the origins of brown and polar bears in the region.

Deering and Shishmaref residents age 40 years or older nearly universally agreed that brown bears were more common in recent decades than when they were growing up. In both communities, most residents thought the contemporary 1990s brown bear population was either stable or increasing. Shishmaref residents more frequently commented that there were "too many" bears, while for the most part Deering residents did not express this concern. In both Deering and Shishmaref, there was considerable uniformity in people's views on the appropriate responses to a bear encounter.

In other respects, Deering and Shishmaref diverged. Most notably, a small group of men in Deering actively hunted brown bears for food, while researchers found no one in Shishmaref who regularly hunted brown bears for subsistence uses. A sea-oriented community, Shishmaref hunters were more interested in polar bears—a fairly common animal near Shishmaref but rare near Deering—and many men actively hunted these. Some of Shishmaref's traditional knowledge of polar bears applied as well to brown bears, such as the animal's left-handedness and its relationship with wolverines.

In both communities, certain individuals were quite knowledgeable about brown bears, whether or not they hunted them. These were typically men or women age 40 or older who had learned about bears from their parents and grandparents and had gained first-hand knowledge by traveling extensively on the land. These individuals offered specific information about many natural and cultural aspects of bears.

In both Deering and Shishmaref, beliefs and use patterns regarding brown bears generally seemed stable over the lifetimes of living adults. None of the interviewed individuals—whether in their 30s or 80s—described significant changes in their own patterns of use or beliefs. Those who had grown up hunting bears continued to do so, while those who did not hunt bears now generally did not do so more frequently earlier in their lives.

Gauging changes over a longer time period was more difficult. In Shishmaref, some respondents said their deceased parents or grandparents hunted brown bears more than they themselves have, but that even then it was neither a common food nor a frequent activity. Others said that, like themselves, their parents and grandparents never hunted brown bears. In Deering, some respondents said that even among their parents' and grandparents' generations bear hunting was a specialized activity in which only some people participated, as is still the case in Deering today. It may be that brown bear hunting patterns on the northern Seward Peninsula varied not only by community, but by family group, perhaps depending on the seasonal cycle followed by each family. Families that historically spent more time inland might have hunted brown bears as a source of fat to a greater extent than coastal families who relied on marine mammals for oil. In addition, because these animal can be dangerous, brown bear hunting might have always been a specialty of certain families, both historically and today, with this use pattern being passed on within those families. Additional research on the historic origins, mobility, and use patterns of Deering and Shishmaref families would be needed to explore this further.

In previous research conducted by the Division of Subsistence, coastal communities in northwest Alaska, such as Unalakleet, Shaktoolik, Kivalina, and Point Hope, were found to rarely hunt brown bears for food (Loon and Georgette 1989). Hunters in these communities said brown

bears in coastal areas frequently feed on sea mammal carcasses washed up along the shore, giving the meat an unpleasant odor and undesirable taste. In addition, these communities have typically had ample access to seals and seal oil, and therefore did not traditionally depend as much on fat from land mammals, such as bears, as inland communities. Like Shishmaref, residents of other coastal communities likely encounter brown bears more often now than they did in past decades when bears were less common along the coast. In some coastal communities, particularly in Norton Sound, many local residents have started regarding brown bears primarily as a nuisance because of the damage the animals do to cabins and food caches.

In the same previous research, the use of brown bear for food was found to be prevalent in riverine communities in northwest Alaska, such as Noorvik, Shungnak, and Selawik. Bear hunting in these communities typically took place in spring and fall. Hunters followed certain prescribed practices to show the bear respect, including speaking carefully about bears, being humble about one's bear hunting activities, removing the hyoid bone during butchering, and in some cases leaving the skull in an appropriate place. Bear fat was particularly prized and used like seal oil or butter. Elders valued bear fat as a remedy for curing illnesses and sores. Residents of these communities were knowledgeable about a wide range of ecological and cultural aspects of bears, including that the animals were left-handed, that they did not fight in their dens, and that a person should not run from a bear encounter.

Brown bear use in Shishmaref generally had more in common with the patterns described above for the other coastal communities in the region. In particular, Shishmaref residents rarely hunted brown bears for food in the 1990s, although this was more common at least among some families earlier in the century. In contrast to some coastal communities, however, Shishmaref residents did not primarily regard brown bears as a nuisance.

Deering, on the other hand, generally had more in common with the patterns described above for riverine communities in the region. In particular, Deering had a core group of active bear hunters whose hunting practices and knowledge generally resembled those of other bear hunting communities in the region. However, because some households in Deering did not have a tradition of hunting or using brown bears, it is likely that bear use in Deering is not as pervasive as in inland riverine communities in northwest Alaska. The average annual brown bear harvest in Deering estimated by respondents (three to ten bears) was similar to that of other bear-hunting communities in northwest Alaska, whose annual harvests generally ranged from two to six bears (Loon and Georgette 1989).

The subsistence brown bear hunt established in northwest Alaska in the early 1990s substantially accommodates Deering's subsistence bear hunting practices. Hunters generally

seemed satisfied with this hunt. This hunt, now extended to most of the Seward Peninsula, will better meet the needs of any Shishmaref hunter who might be interested in harvesting brown bears for food.

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APPENDIX A: INTERVIEW GUIDES

Interview Guide for Local Knowledge of Brown Bear Project

Deering and Shishmaref

We are trying to learn more about how people in Deering and Shishmaref hunt and use brown bears and how this has changed over time. We are also interested in people's observations of brown bear populations and behavior now and in the past. We would like to find out if existing hunting regulations are appropriate for subsistence uses of bear in the area. This information will help protect subsistence uses and help biologists better manage bear populations.

Participation in this interview is voluntary. The interview is confidential, and no names will be used in any summary or report.

BEAR HUNTING AND USE

- Have you ever taken or used brown bears?
- Have you taken or used brown bears in the past 10 years?

HUNTERS

- Could you talk about your hunting practices such as:
  - months or seasons of year
  - methods
  - circumstances (directed or opportunistic)
  - areas
  - age/gender preferences
  - how your and your community's hunting might have changed
  - how attitudes towards bears might have changed
- How many brown bears have you caught in the past 10 years? In your lifetime?
- Have you shot bears to protect your life and property? If so, what were the circumstances? About how many over your lifetime?
- Could you estimate how many bears the village caught (hunting and DLP) in the past year? Was this more or less than usual?
- How often in the past two or three years have bears been seen near the village? How has this changed over time? How do people deal with this?
- Do people hunt denning bears? Did they used to?

- Which parts of the bear do you normally bring back to the village? What do you use them for?

- When out in the country, how often do you encounter bears? Has this increased or decreased? Where and when do you most often see bears?

- Do you ever see black bears?

USERS

- Could you talk about:
  - which parts you use (meat, fat, fur, teeth, bones, claws, organs)
  - how you use them (food, medicine, tools, clothing, bedding)
  - how you prepare them (cook it well?)
  - where you get them
  - frequency of use (how often in past 10 years and in lifetime, how recently)
  - what age/sex of bear you prefer
  - which season is best
  - how your and your community's uses might have changed over time
  - how attitudes towards bears might have changed

- Could you estimate how many bears the village caught (hunting and DLP) in the past year? Was that more or less than usual?

TRADITIONAL LAWS

- Do you know of any traditional Iñupiaq laws that people should follow when dealing with bears? Are there special ways to show respect for bears? Should a person:
  - be cautious about their hunting plans?
  - remove the hyoid bone (qupilgua)?
  - place the skull someplace special?
  - not talk openly about bears?
  - share with others in a particular way?

- What happens if a person does not follow these rules? Has observance of these rules changed over time?

HISTORICAL INFORMATION

- Do you remember your parents, grandparents, or other elders talking about brown bears? What did they say (about bear behavior, numbers, how they should be treated, trade)?

- How were bears hunted and used long ago? (denning bears hunted?)

NATURAL HISTORY

- What could you tell me about bear behavior?
  - what they eat in each season
  - where they are found at different seasons (habitat)
  - where and when they hibernate and their behavior then
  - how they impact other animals (ecological relationships)
  - do you see bears in winter
  - are they left-handed
  - their likes and dislikes (other animals, colors, weather, noise)
  - their senses and powers
  - temperament (aggressive, curious, shy, fearful, fearless)

- Have you noticed any changes in bear behavior over time? For example, are bears more or less aggressive than before? Are they seen in different areas than before?

- Have you noticed any changes in their health, size, or condition? Any changes in their cubs?

- What could you tell me about how the number of brown bears has changed over time (past 100 years)?

- What do you think makes the number of bears increase or decrease? (Weather, environment, washed-up carcasses, human hunting, food supply, mining, reindeer, other?)

- What should people do when they encounter a bear?

- What are the Iñupiaq names for the different sizes, ages, sex, (or other features) of bears?

HUNTING REGULATIONS

- What do you think of the current bear hunting and DLP regulations? [Describe if necessary] About the sale of bear parts regulation?

- Do you have suggestions for improvements to the hunting or DLP regulations?

Short Interview Guide on Brown Bears

Deering and Shishmaref

We are trying to learn more about how people in Deering and Shishmaref hunt and use brown bears and how this has changed over time. We are also interested in people's observations of brown bear populations and behavior now and in the past. We would like to find out if existing hunting regulations are appropriate for subsistence uses of bears in the area. This information will help protect subsistence uses and contribute to better wildlife management.

Participation in this interview is voluntary. The interview is confidential, and no names will be used in any summary or report.

- Have you ever taken a brown bear? Y N (If no, explore why.)
- Have you taken a brown bear in the past ten years? Y N
- If yes, what generally are your hunting practices for brown bears (time of year, methods, areas, frequency, circumstances, age/gender preferences, DLP)? Have these changed over time?

- Have you ever used brown bears for food or materials? Y N (If no, explore why.)
- Have you used brown bears for food or materials in the past ten years? Y N
- If yes, what generally are your uses of brown bear (parts used, how used, how often, and from whom)? Have your uses of brown bear changed over time?

- Do you know of any traditional Iñupiaq laws that people should follow when dealing with bears? Are there special ways to show respect for bears? Has observance of these rules changed over time?

- What can you tell me about the bear population in your area? How has this changed?

- What can you tell me about bear behavior? (such as food, temperament, likes and dislikes, preferred habitat, response to people or other things)

- What do you think of the current bear hunting and DLP regulations? [Describe if necessary]