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*ALASKA DEPARTMENT OF FISH & GAME*

*DIVISION OF WILDLIFE CONSERVATION*

# REGION II
# BRIEFING BOOK

February 2009

*Our mission is to conserve and enhance Alaska's wildlife and habitats and to provide for a wide range of public uses and benefits.*

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# REGION II OVERVIEW

# Southcentral Alaska

### Grant Hilderbrand, Regional Supervisor

## *DESCRIPTION*

Region II covers approximately 140,750 square miles of Southcentral Alaska, an area slightly larger than the states of Ohio, Indiana and Illinois combined. The region extends from Icy Bay and the Canada border on the east, through Prince William Sound, across the Kenai and Alaska peninsulas, and to the west through Bristol Bay, to Cape Newenham. It includes the Kodiak Archipelago, the Aleutian Islands, Hagemeister Island, and the Pribilof and Walrus Islands. The region extends north to the Alaska Range.

More than half the state's population resides in the Southcentral Alaska, much of it in Anchorage and the communities of Palmer and Wasilla. Portions of the Kenai Peninsula are also largely developed, particularly around Kenai, Soldotna, Seward, and Homer. Overall, the human population in Southcentral Alaska is growing.

Region II is organized into eleven Game Management Units (GMUs). Area biologists or assistants are located in Cordova, Glennallen, Palmer, Anchorage, Soldotna, Homer, Kodiak, King Salmon, and Dillingham.

Ten research biologists are working on projects involving brown bears, moose, caribou, wolves, furbearers, sheep, and habitat quality in Region II. The Moose Research Center on the Kenai Peninsula is the focal point for studies on moose and caribou foraging ecology and physiology as it has been for 40 years.

Our lands and refuges shop consists of six seasonal and full-time wildlife biologists with responsibilities for managing visitor programs as McNeil River State Game Sanctuary and Round Island. The staff addresses wildlife issues at an additional 24 special areas in Southcentral Alaska.

Area management biologists and researchers receive technical and administrative support from their respective program technicians and the regional office in Anchorage. The regional staff includes the regional supervisor, management coordinator, research coordinator, lands and refuges coordinator, administrative manager and their support staffs. There is also a biometrician, GIS specialist, wildlife planner, information officer and four wildlife technicians.

## *PERSONNEL*

There have been several personnel changes in the regional staff since the last Southcentral Board of Game meeting in March of 2007. Coleen Greenshields is our new Administration Officer I and Patricia Howard is our new Administrative Assistant II. Ed Weiss joined our Lands shop, filling the vacancy created by the retirement of John Hechtel. Doug Hill now serves as the Sanctuary and Refuge Manager for McNeil River, replacing Larry Aumiller.

Tom Lohuis left his position as Director of the Moose Research Center (MRC) to take on the position of regional sheep biologist and John Crouse took over Tom's duties at the MRC. Mike Harrington moved from the information center into a Research Technician IV position and Nick Demma was brought on as a permanent, full-time Wildlife Biologist II, focusing largely on southwest Alaska caribou issues. Joey Lindberg filled the Fish and Wildlife Technician III vacancy in the Anchorage information center created by Mike Harrington's move to the research shop.

Finally, Mark Burch came to the region from Sport Fish Division to fill the position of Planner III vacated by Cindi Jacobson's move to the Assistant Director position.

# GAME MANAGEMENT UNIT 6

# Prince William Sound

### Area Biologist: Dave Crowley, Cordova

## *DESCRIPTION*

Unit 6 includes 10,140 square miles in Prince William Sound and eastward along the North Gulf Coast to Icy Bay. Mountainous terrain with glaciers and icefields above 3,000 feet elevation are dominant physical features. Spruce/hemlock temperate rain forest is the most important cover at lower elevation. Extensive wetlands are found on the Copper and Bering river deltas and Yakataga State Game Refuge. Endemic wildlife in Unit 6 was supplemented by the introduction of deer (1916) and moose (1949). Both have expanded into suitable habitat throughout the unit.

Cordova, Valdez, Whittier and Seward serve as gateway cities for resource users. Prince William Sound is a popular destination for Anchorage and Fairbanks hunters because of reasonably priced air and water access. The road to Whittier has increased access for hunters and other user groups in western Prince William Sound.

Commercial activity has altered wildlife habitat in the sound. Twenty years after the Exxon Valdez oil spill (EVOS), most wildlife species are listed as recovered or recovering. The EVOS Trustee Council protected approximately 205,000 acres of land in Prince William Sound, much of which was slated for logging, through purchase and conservation easements. This conserved critical habitat for bears, mountain goats, deer and other species that depend on mature, coastal rainforests. Clear-cut logging occurred on state lands in eastern 6A for three decades, impacting bear habitat and winter range of mountain goats.

The dusky Canada goose is a species of management concern in Unit 6. Uplifting of the Copper River Delta during the 1964 earthquake caused habitat succession, which has ultimately increased predation and decreased dusky productivity. A long-term decline in the dusky population has prompted a series of management actions on breeding and wintering grounds by the Pacific Flyway Council to conserve the species and avoid listing under the Endangered Species Act. These actions include severe harvest restrictions, habitat enhancement and predator management where feasible.

## *BLACK BEAR*

**STATUS:** Black bear populations in Unit 6 appear stable. Harvest statistics and incidental observations indicate harvest levels are appropriate, with the exception of Unit 6D (Prince William Sound). The highest densities are in western 6D where brown bears occur at very low density. Black bear harvest averaged 580 during the last three years in Unit 6, with about 85% of the harvest occurring in Unit 6D.

**MANAGEMENT/RESEARCH ACTIVITIES:** Impressions of population trends are based upon incidental observations and harvest statistics, including sex composition, age structure, and harvest density.

**ISSUES:** Black bear harvest increased substantially beginning in the late 1990s in Unit 6D. The harvest nearly tripled from an average of 185 bears to 485. Bears in 6D are vulnerable to harvest along beaches and snow-free slopes in the spring, with limited refugia available between the coastline and glacier-shrouded alpine. In 2001 the Department raised concerns over harvest sustainability, to which the Board responded with season and methods restrictions. Over the last three cycles the Board prohibited shooting bears from boats, shortened the season by 20 days, required a bear baiting clinic for baiting in Unit 6D, and rejected other proposals that would have liberalized bear hunting. The bag limit in 6D has been one bear per regulatory year since 1969. Hunter participation has continued to increase resulting in record high harvests and concern over sustainability.

## *BROWN BEAR*

**STATUS:** Brown bear populations are stable in Unit 6. The estimated population is approximately 900 bears. Average hunter harvest in Unit 6 during the last three years was 59 bears, 30% of which were females. An additional seven bears were reported killed in defense of life or property. Average male skull size was 24 inches. Harvest levels were sustainable.

During the 1980s and early 1990s, over-harvest caused a population decline in 6D, where boat access to bears gained popularity with hunters. In 1994-95, the season in Unit 6D was shortened by four weeks, which reduced harvest and allowed the population to recover. In the remainder of Unit 6 where access is more difficult, the Board adopted a one-bear-per-year bag limit beginning in 1997-98. Harvest increased by approximately 10 bears in 6A but had little effect on harvest in 6B and C.

As a result of population decline on Montague Island (Unit 6D) the fall hunting season was closed beginning 1990-91, followed by a year-round closure in 1994-95. Based on spring track and den surveys, the population was on an upward trend by 2001-02. As the bear population increased, deer hunters began reporting frequent encounters with aggressive bears. In response, the Board opened a registration hunt on Montague Island during 2001-02, the objective being a limited take of problem bears at popular hunting areas and cabins. Although only 17 bears have been harvested (including DLPs) since the hunt opened, reports by hunters and other cabin-users of aggressive bears have nearly ceased. The track and den index has increased substantially during the last seven years.

**MANAGEMENT/RESEARCH ACTIVITIES:** Annual surveys of tracks and dens in the alpine during late April provide indicators of the population trend on Montague and Hinchinbrook islands. Population trends in the remainder of Unit 6 are based upon incidental observations, population modeling, and harvest statistics including sex composition, skull size, age and successful hunter effort.

**ISSUES:** The cumulative predation of brown bears and wolves on moose is a continuing issue in Units 6A and B. Liberalized seasons and bag limits for brown bears have apparently had little effect on predation. Brown bears are also an important predator of dusky Canada goose nests prior to moose calving in Unit 6C. Because brown bear populations are robust in these areas we believe that we can provide additional hunting opportunity in the spring.

## *DEER*

**STATUS:** Deer numbers have fluctuated Unit 6D following severe and mild winter cycles. The severe winters of 1998-99 and 1999-00 reduced a high-density population by approximately 56% based on pellet group densities. The population had recovered to a relatively high density until the last two winters, which had heavy snow lasting well into spring. Except for Hawkins and eastern Hinchinbrook Islands, most of Prince William Sound currently has low deer densities. The reported harvest dropped from 2,600 during 2006-07 to 1,300 during 2007-08.

**MANAGEMENT/RESEARCH ACTIVITIES:** We conduct annual deer pellet-group surveys on five islands in Unit 6D. Repeated-measures analysis is used on transect data to detect changes in trend. Because snow depth and duration are the primary factors affecting population size, we annually calculate a snow index from data collected at a weather station in western Prince William Sound. Using pellet group densities and the snow index we can more accurately predict population trends. We annually conduct a hunter questionnaire survey to estimate harvest and hunter effort, and to collect comments from hunters.

**ISSUES:** Population declines caused by severe winters usually result in proposals calling for reduced seasons and bag limits. However, the Board and Division have consistently supported maintaining status quo because: 1) hunter harvest has little impact on deer population compared to winter mortality, 2) harvest is adequately self-regulating in that low populations result in fewer deer harvested, and 3) temporarily low deer density allows winter range to recover from high density browsing.

## *MOUNTAIN GOAT*

**STATUS:** Mountain goat populations in Unit 6 are generally stable, although a few areas declined by 10-15% during the last two winters of heavy snow. The total population was about 4,100 goats in 2008. Average harvest over the last three years was 78 goats with 19-25% nannies. Overall harvest rate was 2.3%; many hunt areas are underutilized because of difficult access.

Goats had been declining until the mid-1990s, when the population bottomed out at 3,000. Closures of some hunt areas, alternating open hunt areas, and conservative quotas reversed the population trend and allowed recovery to former levels in most areas.

**MANAGEMENT/RESEARCH ACTIVITIES:** In cooperation with the U.S. Forest Service, we attempt to conduct aerial surveys in hunt areas every 2-3 years. Hunting

throughout the unit is by registration permit only Aug. 20-Jan. 31. Hunts are closed by emergency order if maximum allowable harvest is reached. Nannies are weighted in the harvest by counting them as two. Weighted maximum allowable harvest of declining populations was set at less than 3.5 percent of goats estimated from surveys. Weighted allowable harvest for stable or increasing groups was set at 5% of the population estimate.

**ISSUES:** Guided, nonresident hunters are taking most of the harvest quota in two registration hunts (RG249 and RG252) west of Valdez arm. The Forest Service currently permits six guides to operate in the two areas. The number of hunts permitted to guides exceeds harvest quota. We are discussing options with the Forest Service to reduce guide use in those areas. A benefit of guided goat hunts is that fewer nannies are harvested (21% nannies in Unit 6 compared to 35% in Unit 7). Goat populations are sensitive to female harvest, therefore we continue to encourage and educate hunters to conserve nannies.

## *MOOSE*

**STATUS:** The current estimate of moose population in Unit 6 is 1,220 (range 1,090 – 1,330). The average harvest over the last three years was 156 moose. Moose populations are regulated to keep numbers below estimated carrying capacity during severe winters. However, predation by brown bears and wolves has restricted harvest quotas in Units 6A and 6B during the last decade.

Unit 6A is divided into two hunt areas: Unit 6A(east), Icy Bay to Cape Suckling, and 6A(west), Cape Suckling to Katalla. Both areas have a management objective of 300-350 moose. The 6A(east) population declined to 230 moose with 7% calves by 2007. Hunting in Unit 6A(east) is by general season for spike-fork/50 bulls. The population in 6A (west) was stable at 275 moose with 7% calves during 2007. Hunting for bull moose in 6A(west) is by registration permit for residents (20 bulls), and drawing permit for nonresidents (5 bulls). Antlerless moose hunting is by drawing permit for residents only, however, we have not held an antlerless hunt since 2005 because the population was below objective.

The population in Unit 6B increased slightly to 240 moose with 13% calves by 2007, but remains below our objective of 300-350 moose. Moose hunting in 6B is open to residents only by registration permit. Unit 6B is a controlled use area, with non-motorized hunt opening Sept. 1, and no same-day motorized season opening Sept. 5. An antlerless hunt has not been held since 1999.

In contrast to Units 6A and 6B, which have both brown bear and wolf predation, Unit 6C does not have significant wolf predation. Hunters and trappers have relatively easy access to wolves in 6C, keeping wolf numbers down to 3–6 wolves in two packs. During the mid-2000s we were allowing the moose population in 6C to gradually increase toward our new management objective of 400 moose. During several mild winters that precluded surveys because of lack of snow, the population increased rather rapidly, peaking at 560 moose by early 2007. Heavy cow and bull harvest reduced it to 430 moose by 2008. Hunting is by state drawing permit (25% of bull quota) for residents only, and by federal

subsistence drawing permit (75% and 100% of bull and antlerless quota, respectively) for local residents only.

**MANAGEMENT/RESEARCH ACTIVITIES:** We conduct annual aerial censuses to determine population size and productivity. Poor weather and lack of snow accumulation on the coast usually delays censuses until after bulls have dropped antlers, precluding good estimates of bull:cow ratios.

**ISSUES:** Brown bears and wolves in 6A and 6B are limiting moose productivity, which has declined steadily since the late 1980s.

## *FURBEARERS*

**STATUS:** Beavers, coyotes, lynx, marten, mink, muskrats, river otters, wolverines and wolves are present in Unit 6. Density of individual species is variable, depending upon a variety of ecological factors. Beavers are abundant in all units except 6D. They are particularly plentiful on the deltas of the Copper and Bering rivers. Coyotes are abundant throughout Unit 6. Lynx are generally scarce except during years when they disperse from Units 11 and 13 as prey populations decline. Mink and land otters are common to abundant. Muskrats and wolverines are stable at low densities. There were 136 otters, 55 beavers, 122 marten and 20 wolverines reported taken during 2007-08.

Wolves inhabit the mainland throughout Unit 6. They have not become established on the major islands in Unit 6D, where deer would be adequate prey. The wolf population in Unit 6 was low during the early and mid-20$^{th}$ century. By the 1970s numbers began to increase, particularly in Units 6A, 6B, and 6C, where moose were well established. They probably peaked in the mid 1980s. The population declined during the late 1980s and stabilized at a lower density during the 1990s. Forest Service research, incidental observations, and harvest records indicate a population of about 60-65 wolves in 11 packs. Wolf hunting season in Unit 6 is Aug.10–Apr. 30, limit five wolves, and trapping season is Nov.10–Mar. 31, no limit. Reported harvest during 2007-08 was seven wolves. Little to no trapping effort occurs in 6A and 6B because of difficult access during winter.

**MANAGEMENT/RESEARCH ACTIVITIES:** Furbearer abundance is monitored by staff observations, trapper questionnaires, and hunters. Trends in harvest for six species are monitored through mandatory sealing. We periodically conduct a monitoring project for river otters in Prince William Sound, using techniques developed in the western sound by ADF&G and University of Alaska Fairbanks.

# GAME MANAGEMENT UNITS 7 & 15

# Kenai Peninsula

**Area Biologist: Jeff Selinger, Soldotna**
**Assistant Area Biologist: Thomas McDonough, Homer**

## *DESCRIPTION*

The Kenai Peninsula is comprised of the western portion of Subunit 6D and Units 7 and 15. Units 7 and 15 cover approximately 8,400 square miles and are home to more than 50,000 residents. Management for Units 7 and 15 is conducted from field offices in Soldotna and Homer. There are six active advisory committees on the peninsula, representing hunting and trapping interests for Units 6, 7, 14, 15 and 16. Most committee meetings are held during fall, winter and spring months to address public concerns and Board of Game proposals. While most of their time is spent on Board proposals, they encourage open public participation on resource-related issues.

Major habitat changes occurred on the peninsula due to a spruce bark beetle infestation. The infestation peaked in the late 1990s, resulting in many stands exhibiting greater than 90 percent mortality. The impact of this infestation on wildlife species is unknown. Forestry practices may be beneficial when done properly through ground scarification. However, improper techniques will result in large expanses of blue-joint grass, creating habitat that is unproductive for moose.

## *BLACK BEARS*

**STATUS:** Black bears are difficult to count because of the dense habitat in which they live. Populations appear to be abundant throughout suitable habitat on the peninsula. In portions of 15A, bear densities were estimated in 1991 at 205 bears/1000 $km^2$ for areas within the 1947 burn and 265/1000 $km^2$within the 1969 burn. These studies did not estimate the density of juvenile bears so they are considered conservative estimates. If numbers from the 1991 study were extrapolated to available habitat on the Kenai, the results produce an estimate of about 3,000-4,000 black bears in Units 7&15. Densities along the coastal areas are likely much higher than those calculated in 15A. The popularity of black bear hunting and number of bears harvested has increased over the past decade. The proportion of female bears in the harvest has remained low.

**MANAGEMENT OBJECTIVE:** Maintain a harvest where the average proportion of females during the most recent three consecutive years does not exceed 40 percent.

**MANAGEMENT/RESEARCH ACTIVITIES:** Research on the peninsula began in 1977 as part of a comprehensive predator-prey study. Numerous reports have been published increasing our understanding of black bear ecology and management.

**ISSUES:** Non-resident hunting along the outer coast of 15C has increased greatly during the past 10 years. However, the harvest appears to be sustainable and there are no management concerns at this time. Bears attracted to the improper disposal of garbage and other attractive nuisances at residents and waste transfer sites throughout the Kenai Peninsula continue to be an issue. Defense-of-life-or-property kills occur periodically but the ADF&G is making strides in working with communities and other groups in curbing this problem.

## *BROWN BEARS*

**STATUS:** A census for brown bears has never been conducted on the Kenai Peninsula, but anecdotal evidence suggests there is a healthy brown bear population. Dense cover over most of the range makes it impractical to use traditional census techniques and recent techniques based on DNA analysis are cost prohibitive at this time. We believe the population is relatively stable, but are concerned about the increase of bear/human conflicts.

**MANAGEMENT OBJECTIVE:** Maintain a healthy brown bear population while reducing bear/human conflicts and defense of life and property kills.
Maintain an annual human-caused mortality rate that does not exceed 20 bears (of which no more than eight are females older than 1 year.

**MANAGEMENT/RESEARCH ACTIVITIES:** In 1984, representatives of the U. S. Fish & Wildlife Service, U.S. Forest Service, National Park Service, and ADF&G formed an Interagency Brown Bear Study Team (IBBST) to discuss brown bear management and research needs on the Kenai Peninsula and to coordinate joint studies. IBBST-sponsored studies have included salmon stream and bear habitat inventories and a draft brown bear management plan. The IBBST has created a "cumulative effects" model to evaluate the impacts of human actions throughout brown bear habitat on the Kenai. In 1995, ADF&G initiated a study to identify critical components of brown bear habitat, estimate survival rates of adult females, and model the brown bear population to verify previous estimates.

During the fall of 1999 ADF&G initiated a brown bear planning effort. The result was the development of a Conservation Strategy (completed in June 2000) by "stakeholders" to ensure the long-term viability of brown bears on the Kenai. Thirteen stakeholders were appointed to represent public, private, and government interests. These stakeholders listened to and gathered a wealth of information about brown bears, their habitat, and their interactions with humans. Recommendations were categorized into four main chapters focused on reducing impacts to brown bears. These chapters included bear-human interactions, land planning, public education, and future research.

In addition to the IBBST, other committees have been active with issues relating to brown bears. The Kenai Brown Bear Committee (KBBC) is composed of agency and non-agency representatives and focuses on providing consistent messages and educational material to the public. The Russian River Leadership Team is composed of representatives from the U.S. Forest Service, Kenai National Wildlife Service, and the Alaska Department of Fish and Game. This group addresses specific brown bear issues relating to the Russian River sockeye fishery. Also, the Alaska Department of Fish and

Game has initiated and will continue to be an active participant in the Wildlife Conservation Community Program (WCCP). This program's main focus is to minimize the access for bears to human-generated food (garbage), by making bear resistant garbage containers available locally, and to allow the purchase of the containers at a reduced rate to individuals living in target areas across the Kenai Peninsula.

**ISSUES:** Human encroachment into bear habitat is an important issue affecting brown bear management on the peninsula. Human pressures through recreation, development, waste management, and forestry practices are the primary concerns at this time. Bear-human conflicts and defense-of-life-or-property (DLP) kills have increased in the past 20 years. There were 8, 12, 23, 23, and 33 DLPs in each of the past five years, respectively (2004-2008).

## *MOUNTAIN GOAT*

**STATUS:** The goat population increased steadily in the 1980s and peaked in the early 1990s. Since the early 1990s, the population has steadily declined. The cause of the decline is unknown, but is likely due to several different factors such as severe winters, declining habitat quality, and some periods of overharvest.

**MANAGEMENT OBJECTIVES:** Monitor population trends, maintain a low proportion of nannies in the harvest, and adjust hunting according to conservative assessments of minimum population size and population trends. It is the Department's objective to achieve harvest goals using a drawing permit hunt system.

**MANAGEMENT/RESEARCH ACTIVITIES:** Surveys are conducted annually in selected hunt areas. We attempt to survey every hunt area on a 3-5-year rotation. The Kenai Mountains are divided into 35 hunt/survey areas. Four are located in Kenai Fjords National Park and have not been open to hunting since the park was established in 1980.

Since the late 1970s, hunting has been managed by permit. Harvest quotas and permit allocation are conservatively based on the most recent survey information. Access varies from easy (by goat hunting standards) to very difficult, and variable weather complicates accessibility. We determine the number of permits to be issued by lottery for the Aug. 10-Oct. 15 drawing season based on population size, population trend, age of survey data, past harvest rates, and accessibility. If the allowable harvest during the drawing season is not achieved in a particular hunt area, and there is little chance of over-harvest from a second hunt, we reopen individual hunts to a Nov. 1-30 registration permit.

**ISSUES:** As the goat population continues to decline, we will continue to restrict the number of permits issued in some hunt areas or even close hunts when populations are reduced to low levels.

## *MOOSE*

**STATUS:** Historical records and reports suggest moose were relatively abundant through most of the 20th century with the most recent peak estimated at 15,000 in 1971. A scarcity of wolves from about 1913 to 1961 and a wildfire in the northern portion of Unit 15 created about 500 square miles of excellent moose habitat. Three consecutive severe winters, beginning in 1971, and a rapidly growing wolf population, caused the moose to decline to about 6,000-7,000 by 1975. A 135-square-mile fire in 1969 also contributed to the initial decline because of the vast amount of winter habitat burned. The overall population remained stable at low numbers until the late 1970s then started to increase slightly. By 1983, the estimated population was about 8,000 animals, and remained relatively stable until the late 1990s. Severe winters with record snow accumulations occurred in 1994-95, 1998-99 and 1999-2000. Reduced browse availability and low recruitment appears to have reduced the population. There are currently 5,000-6,000 moose on the peninsula.

The selective harvest (spike/fork-50 inch) regulation has been in place on the peninsula since 1987. Initially, hunting effort and harvest declined then rebounded as hunters became accustomed to the new strategy. Bull-to-cow ratios increased after the antler restrictions were adopted, but recently (2008) data suggest they may have decreased in certain areas. Most of Unit 15B was a permit hunt well before the antler restriction started, therefore, the harvest has been relatively low compared to 15A and 15C.

**MANAGEMENT OBJECTIVES:** Maintain a healthy population with a minimum post hunting bull:cow ratio of 15:100 in Units 7 and 15, with the exceptions of Skilak Loop Wildlife Management Area and 15B East.

1. Skilak Loop: Maintain the resident moose population at approximately 130 countable animals, or a density of 1.8-2.0 moose per square mile. Maintain the bull:cow ratio at a minimum 40:100. Counted moose in excess of 130 will be available for harvest. In addition to the resident population, moose from the surrounding areas commonly winter in SLWMA. Habitat will be managed to provide for 130 resident moose, plus 170 additional wintering moose.

2. 15B East: Maintain a population of moose with a bull:cow ratio of 40:100 and provide for the opportunity to harvest a large bull under aesthetically pleasing hunting conditions.

**MANAGEMENT/RESEARCH ACTIVITIES:** Fall composition surveys are conducted during years when we have suitable conditions. Our objective is to survey each area at least once every five years. The most recent censuses were completed in February 2002 in sub-unit 15C produced an estimate of 2,981 moose (95% confidence interval: 2,508-3,454). The recent survey in sub-unit 15A in February 2008 produced an estimate of 1,670 moose (95% confidence interval:1405-1934). The last survey done in sub-unit 15B in February 2001 produced an estimate of 958 moose (95% confidence interval: 777-1,139). There has never been a census completed for Unit 7.

**ISSUES:** Federally managed subsistence hunting became an issue on the Kenai in 1995 when the newly established regional advisory council won Federal Subsistence Board approval for a subsistence moose hunt. In May 2000, a proposal by the Kenaitze Tribe increased the rural designation to include all federal lands on the Kenai Peninsula. The most contentious proposal was for an any-bull season for rural residents. The Federal Subsistence Board eventually passed a subsistence moose season for qualified rural residents that is longer than the state's general season. However, subsistence hunters were restricted to the same antler restrictions as general season hunters. Recently the 9th U.S. Federal Court of Appeals upheld the antler restrictions as reasonable.

Since 2006, there has been a federal subsistence season from Oct. 20-Nov.10 on federally qualified lands in sub-units 15B and 15C. During the 2008 federal subsistence meetings, the Federal Subsistence Board created a subsistence moose season for residents of Hope and Cooper Landing. Residents of these communities were granted a federal subsistence moose season on federal lands in GMU 7 and 15B with season dates Aug.10–Sep. 20. The spike/fork 50" or 3 brow tine on at least one side antler restriction still applies to this new hunt

Loss of habitat through human development, forest maturation, unacceptable forestry practices, lack of large prescribed burns and the impacts of predation are the most important threats to moose on the Kenai Peninsula. Relatively small logging operations that held some promise of habitat enhancement for moose have been completed without scarification, resulting in little net benefit for moose. In fact, in most logged areas, opening of the forest has increased access and made moose easier to hunt. Spruce dying from bark beetle infestations may open forest canopies and provide some benefit if browse species become established, but travel for humans and moose through these areas will be difficult once older trees fall.

## *CARIBOU*

**STATUS:** Historically, caribou were found on Kenai Peninsula. Although reports indicate distribution was widespread, population estimates were not given. Because suitable habitat on the peninsula is limited, caribou probably never were numerous. Antlers originating from the early 1900s have been found during the past two decades in the Caribou Hills in Subunit 15C and on the Skilak-Tustumena Bench in 15B East.

Caribou were extirpated from the peninsula by 1912, likely due to large fires and market hunting. The USFWS first considered reintroducing caribou in 1951. However, a reintroduction was not attempted until the mid-1960s when a decision was made by ADF&G to reintroduce caribou with the objective of establishing viable herds for the purpose of hunting. The Nelchina was selected as the donor herd for the reintroduction. Fifteen caribou (3 males and 12 females) were released at an airstrip near Chickaloon River in Subunit 15A in 1965. A second release of 29 caribou (3 males and 26 females) was conducted at Watson Lake, also in 15A. These two reintroduction efforts resulted in the establishment of two herds, the Kenai Mountains herd in Unit 7, presently with 250-350 animals, and the Kenai Lowlands herd in Unit 15, presently with 100-120 animals.

Despite these successful reintroductions in 1965-66, historic range in central and southern portions of the peninsula remained unoccupied. In 1985 and 1986, ADF&G and USFWS initiated a cooperative program to reintroduce caribou within this unoccupied range on the Kenai National Wildlife Refuge. Eighty animals from the Nelchina herd were released, resulting in the establishment of two herds by 1988 (Killey River and Fox River herds). Presently, the Killey River herd in Unit 15B East and the Fox River herd in 15C number about 200-300 and 20-50 animals, respectively.

The Kenai Mountains and Killey River herds are open to hunting under a drawing permit system. Interest in hunting these herds is high, however, they are difficult to reach and annual harvest is low when compared to hunting caribou in more accessible areas across the state. A total of 275 (250 for the Kenai Mountains Herd and 25 for the Killey River Herd) drawing permits were issued in 2008.

**MANAGEMENT OBJECTIVES:**
*Kenai Mountains caribou*— to maintain the post-hunting population between 300-400 animals.
*Kenai Lowlands caribou*— to increase the herd to a minimum of 150. Hunting will be allowed once this objective is reached.
*Killey River and Fox River caribou*— to maintain viable caribou populations throughout suitable habitat and to provide for opportunities to hunt these herds when deemed sustainable.

**MANAGEMENT/RESEARCH ACTIVITIES:** In cooperation with the USFWS, we have captured caribou in all four Kenai herds with variable efforts since 1996. The primary purpose was to replace failing radio collars on adult females and capture 11-month-old females in the Killey River and Kenai Mountains herds to determine their mean weight. In addition to comparing mean weight of caribou calves among peninsula herds, we were interested in comparing Kenai calves to calves in other herds. Currently, we are focused on maintaining collars on adult females to help us locate animals when we conduct our censuses.

**ISSUES:** The primary management issue is maintaining the herds in a relative balance with available habitat while allowing hunting opportunity. Access to all of the herds, with the exception of the lowland herd, is difficult. In years when permits were unlimited, hunters with horses exceeded the harvest objective. Future management options should include provisions to improve access to increase hunter success. Average calf weights for Killey River caribou decreased from 1996 to 2002, but were up in 2004. During the winters of 2001-02 through 2003-04, evidence from three separate areas indicates an estimated 200 animals from the Killey River herd died in avalanches.

## *SHEEP*

**STATUS:** Records suggest the Kenai Mountains sheep population steadily increased from the first aerial surveys done by USFWS in 1949, reaching an estimated 2,200-2,500 in 1968, before sharply declining until 1981. Trends showed an increase in population size from the early 1980s until the mid 1990s, but the population has been declining in the past decade and is estimated at roughly 1,000 animals. Hunting is allowed under a

general season Aug.10-Sept. 20 with a bag limit of one ram with full-curl or larger horns. A drawing permit hunt for full-curl rams is held on a portion of Round Mountain in Unit 15A and 7 with three permits issued each year since 2004. Drawing permits are also issued for full-curl rams in the Crescent Lake area with six permits issued each year since 2004. The Crescent Lake area has had a small ewe hunt (10 permits) in the past, but no permits will be issued for this in the foreseeable future.

**MANAGEMENT OBJECTIVES**: Adequately monitor population trends and allow for hunting opportunities with a sustainable harvest.

**MANAGEMENT/RESEARCH ACTIVITIES:** Aerial surveys are conducted in selected count areas of the Kenai Mountains. Sheep are classified as lambs, sub legal rams (<4/4 curl), legal rams (full curl or larger) and ewe-like sheep. The ewe-like category includes primarily ewes and a small number of yearling and 2-year-old rams.

**ISSUES:** Hunter numbers and harvest have continued to decline since the early 1990s. As with mountain goats, sheep are believed to be affected by a decrease in range quality and periodic severe winters.

## *FURBEARERS*

**STATUS:** Many furbearer populations on the peninsula appear to be stable or increasing. Wolf, coyote, beaver, river otter, mink and weasel numbers are high. Wolverine and lynx numbers appear stable over the long term. Lynx, are on the upswing after a long periodic low. The distribution and density of red fox and muskrat on the peninsula are limited. Red fox were abundant prior to 1930, according to long-time residents, however, quickly disappeared as coyotes became established. Marten are moderately abundant in Unit 7, but rare in Unit 15. In the winter of 1996-97 the first-ever marten reported in 15C was taken. In 1997-98 another marten was reported taken near the same area and one in 15B-west. Because marten have never been abundant in Unit 15, it is suspected that habitat rather than human-caused mortality controls their distribution and abundance on the peninsula. In recent years marten harvest has increased in 15A, but is still considered low.

Although reliable harvest data are not available, mink are probably the most-sought-after furbearer on the peninsula. Local trappers commonly report harvest of 20-50, with a couple of trappers who specifically target mink catching more than 100 in a season. The peninsula's many lakes, streams and rivers, abundant with fish and small mammals for mink to prey upon, allows for this high number of animals. Mink also are taken by most young trappers or trappers who do not have time to manage a long trap line where higher value furbearers could be caught.

Of the six furbearers sealed, beaver, marten and otter are the most commonly reported. Beaver harvests fluctuated from 62 to 165 with mean harvest 106 during 2003-2007. Because most fur is trapped for home use or recreation, harvest levels are driven primarily by trapping conditions rather than fur prices. In years when beaver harvests are low, nuisance complaints are common. The mean harvest for marten from 2003-2007 was 107. Land otter harvests have ranged from 26 to 58 from 2003-2007with a mean of 45.

The first trapping season for lynx since 1987 opened in 1996-97 with a harvest of 52 during a four-week season. In 1997-98 two weeks were added to the season and 15A was opened, resulting in a harvest of 148 animals. The 2008-09 season marks the first open trapping season for lynx since 2001-02. Lynx numbers track the roughly decade-long cycle in hare populations, which are on the upswing.

Although many trappers talk about wolves, compared to other furbearers wolves and wolverines are the least sought after. To catch wolves or wolverine with any level of efficiency requires expensive equipment, a method of winter travel that allows one to cover a large area and a commitment of time. For these reasons, most wolves and wolverine are taken incidentally or by trappers with limited trap lines. Trappers often average less than two wolves or wolverine per season. Wolf harvest over the past five years has averaged 45 with a range of 39-63. Wolverine harvest has ranged between 16-26 with a mean of 18 annually from 2003-2007.

**MANAGEMENT/RESEARCH ACTIVITIES:** Furbearer abundance is monitored by staff observations, trapper questionnaires, and by interviews with trappers. Mandatory sealing for six furbearers provides data to monitor trends in harvest. Trends in harvest for animals not sealed are monitored by information provided through trapper questionnaires.

In April of 1998, 18 wolves were transplanted to the Kenai Peninsula from the Forty-Mile caribou management area. The Kenai was chosen for two reasons. First, the peninsula satisfied the Board of Game's requirement that wolves be relocated to areas where prey densities were greater than the Forty-Mile range. Second, was the potential benefit to the Kenai wolf population through increasing the potential for genetic diversity.

The number of offspring produced by these wolves is unknown but at least six pups were produced by one of the relocated packs in the spring of 1999.

**ISSUES:** The primary issues concerning trapping on the peninsula are the restrictions on trappers using the Kenai National Wildlife Refuge. Trappers on the refuge are required to complete an orientation class prior to receiving an annually required permit, tag each trap or snare, check leg-hold traps every four days, prohibited from using exposed bait within 30 feet of a set, prohibited from using traps with toothed jaws, prohibited from using "cubby sets" when lynx season is closed and prohibited from trapping within one mile of any road, campground or trail head. In combination, these restrictions have made trapping on the refuge too cumbersome to be enjoyable for some trappers who traditionally trapped there. In addition to the specific trapping requirements, the refuge does not open to snowmachine use until at least Dec. 1. The opening date can be delayed further if refuge staff determines there is inadequate snow cover and recent mild winters have limited the amount of time the refuge is open to snowmachine.

The infestation of lice on wolves, documented in 1982, has reduced the pelt value and some interest in trapping wolves. Pelt damage begins in early winter as the number of lice on an animal builds. Wolves taken early in the season generally have only slight

signs of hair loss, and are marketable. Wolves, especially pups, taken later in the winter generally have heavily damaged pelts and are not suitable for sale.

## *SMALL GAME*

The peninsula has all three species of ptarmigan, spruce grouse and a recently introduced population of ruffed grouse. Ptarmigan numbers appear to be stable at lower levels and limited to sub alpine and alpine habitats, except during late winter when heavy snow accumulations drive them to lower elevations. The spruce grouse population is at a moderate level, while lynx and hare numbers are increasing.

Efforts to establish a viable ruffed grouse population on the peninsula began in 1995 with the release of 63 birds in Subunit 15A, 66 additional birds released in 1996 and a final release of 103 birds in 1997. Hunter and other public reports of broods of birds suggest the transplanted birds have survived and produced offspring, however, they have not flourished since the introduction and sightings are uncommon.

**MANAGEMENT/RESEARCH ACTIVITIES**: No studies are currently being conducted on ptarmigan or spruce grouse. Their abundance is monitored through hunting reports and staff observations.

**ISSUES:** The BOG spent a considerable amount of time in 2007 authorizing a youth hunt for small game in the Skilak Loop Management Area. Local response was good and there more youth hunters than mentors to accompany them. Many participants subsequently signed up for the 4-H shooting sports program and hunter education program. Interestingly, the vast majority of the parents calling to sign up their child for the opportunity were single mothers who didn’t hunt or shoot, but said they wanted their kids to learn how.

# GAME MANAGEMENT UNIT 8

# Kodiak Archipelago

**Area Biologist: Larry Van Daele, Kodiak**
**John Crye, Wildlife Biologist**
**Doris Mensch, Program Technician**

## *DESCRIPTION*

The Kodiak Archipelago is located in the Gulf of Alaska, approximately 250 miles southwest of Anchorage. Kodiak is the largest island in the archipelago, encompassing 3,300 square miles. Other large islands include Afognak, Shuyak and Sitkalidak. Tugidak and Marmot islands are classified as State Critical Habitat Areas. Nearly half the land in Unit 8 is included in the Kodiak National Wildlife Refuge and most of the smaller islands and offshore rocks, and the waters around Afognak are part of the Alaska Maritime National Wildlife Refuge, which assures that the U.S. Fish & Wildlife Service plays an influential role in management decisions. The region has a maritime climate characterized by cloudy skies, cool temperatures, moderate to heavy precipitation, and frequent windstorms. Maximum temperatures generally range from 55-65$^{o}$F and winter temperatures below 10$^{o}$F are infrequent.

The six original mammalian inhabitants of the Archipelago (land otter, red fox, tundra vole, little brown bat, short tailed weasel, and brown bear) now share it with numerous introduced species. Deer, elk, reindeer, muskrats, and beavers were released on the islands in the 1920s. Raccoons came in the 1930s. Mountain goats, martens, red squirrels, snowshoe hares and mink were introduced in the 1950s. In the 1960s, moose and sheep were unsuccessfully introduced to Kodiak. The most recent introduction to the archipelago was Vancouver Canada geese in the 1980s.

The archipelago supports a human population of 14,000, most living in the city of Kodiak and six outlying villages. A single Fish and Game Advisory Committee represents the area. The Kodiak/Aleutians Regional Advisory Committee provides representation to the Federal Subsistence Board for Kodiak, the southern Alaska Peninsula, and the Aleutian chain. In the past several of years these state and federal committees have made tremendous strides in cooperation, including participation by individual members on both committees.

## *BROWN BEAR*

**STATUS:** Our brown bear population continues to be healthy and the harvest continues to include a good proportion of large males. In 2007/08 we harvested 184 bears (average for the previous 5 years was 177), including 72% males (5-yr average = 76%). The 2008 fall harvest of 109 bears was the largest on record, far above the 5-yr average of 64,

continuing an increasing harvest trend we have seen since 2002/03. Hide quality was generally excellent and most hunters were able to see several bears during their hunts. Bear/human conflicts and illegal kills were high this year. In spring 2007, we conducted a survey the bear population on southwest Kodiak (Sturgeon River) with staff from Kodiak NWR. The population estimate derived from that survey suggests a continuation of a stable to increasing trend in the area since a decline noted in the early 1990s.

Research and management actions: In May 2008 we initiated an investigation of bear movements and habitat use in the vicinity of Old Harbor and in the upper Karluk Lake drainage. We captured 17 brown bears (14 females and 3 males) and deployed GPS/VHF transmitters on 13 adult females. These projects are being conducted in cooperation with the Kodiak National Wildlife Refuge, the Kodiak Brown Bear Trust, and Washington State University (WSU). We are also in the second year of a project with a master's degree student from WSU investigating bear feeding strategies using stable isotope and mercury analyses of hair samples from bears harvested across the Archipelago.

We continued to work with residents of local villages to improve their landfills and reduce bear/human encounters. The landfill at Larsen Bay remains a success story with a noticeable reduction in bear problems as village residents work diligently to maintain the electric fence and burn box. Port Lions completed a major landfill renovation in 2007, including an electric fence, lighting, and bear resistant dumpsters. Old Harbor has applied for a grant for a similar renovation, but was plagued with up to 20 bears that frequented the village this summer and fall. In spite of concerted efforts by most residents, four bears were killed in defense of life or property near the village this year.

**ISSUES:** Kodiak National Wildlife Refuge is proposing to open a bear-viewing area at O'Malley River this summer. They envision a blend of an agency-run and private concessionaire-run program with restrictions comparable to the McNeil River operation. The most obvious difference between the two programs is that hunting will continue to be authorized in the O'Malley area. The *Kodiak Bear Conservation and Management Plan* addressed this issue and recommended finding ways to allow both hunting and viewing to occur. Once the program becomes established there will probably be proposals to limit or curtail hunting in the immediate area.

## *DEER*

**STATUS:** Our deer population appears to have declined during the past two years as a result of relatively harsh winters. The harvest in 2007/08 was 3,290 deer (78% bucks), down from a 5-yr average of 4,585 deer per year. We suspect the harvest in 2008/09 will be comparable or slightly below what we saw in 2007/08. Fawn production has been good, with several observations of adult does with twins; however, these younger deer have experienced high over-winter mortality during the past two winters. Hunters reported seeing fewer spikes and forked-antler yearlings last fall. Hunter success has declined in the past couple years from 84% in 2005/06 to 57% in 2007/08.

**MANAGEMENT/RESEARCH ACTIVITIES:** We cooperate with the Kodiak NWR staff to conduct annual winter mortality surveys in selected portions of the unit each spring. This year the surveys revealed somewhat higher than average mortality.

**ISSUES:** The deer population seems to have declined below our management objective. We do not plan to recommend any changes in deer regulations because we anticipate that reduced hunter effort and success will reduce harvest.

Deer with atypical antler development have been observed on Kodiak for at least the past 20 years, especially on the south end of the island. Evidence suggests the aberrations are caused by abnormal testicular development, but the cause is unknown. Potential culprits are genetics, diet, and contaminants. In spite of the increasing reports of abnormal deer, survival and productivity of deer in the affected areas do not appear to have been impacted, and we feel that no management action is practical or necessary at this time.

## *ROOSEVELT ELK*

**STATUS:** The elk population in Game Management Unit 8 has declined during the past few years and is estimated to include about 640 elk in seven herds on Afognak Island and one on Raspberry. The harvest in 2007/08 was 78 elk (72% bulls); below the 5-year average of 95. In 2008 we issued a series of three Emergency Orders, eventually curtailing all registration hunts two weeks prior to the scheduled close of the season.

**MANAGEMENT/RESEARCH ACTIVITIES:** In May 2008 we deployed 14 radio-collars on female elk on Afognak and Raspberry islands as part of the joint project with Afognak Native Corporation, Rocky Mountain Elk Foundation and Kodiak National Wildlife Refuge. This project will improve management of private and public lands by increasing our understanding of elk distribution and habitat use. It will also be instrumental in developing a forest regeneration strategy for private lands that enhances wildlife habitat while maximizing tree production. Afognak Native Corporation has taken a leadership role among private landowners in cooperating in this venture, and other local corporations have expressed interest in working with us.

**ISSUES:** We do not recommend any changes to the elk hunting regulations, and plan to reduce the harvest in 2009 by reducing drawing permits and setting lower harvest quotas. Current harvest regulations have proven effective, allowing us the flexibility to manage harvests in-season. We are still concerned about wounding loss and hunters who do not salvage all of their elk meat, and we plan to expand education efforts next season. Cooperation with landowners on Afognak continues to improve and wildlife habitat improvements are being planned.

## *MOUNTAIN GOAT*

**STATUS:** Our mountain goat population trend is stable to increasing, with an estimated total population of 2,200 goats. To estimate goat populations within hunt areas we

conduct aerial surveys of core areas yearly and island-wide surveys every few years. In recent years goat herds on the central and northern portions of Kodiak have been stable while those on the south end of the island are increasing rapidly. The island-wide harvest in 2007/08 was 143 goats (67% male), up slightly from the 5-yr average of 138. Preliminary data from 2008 indicate a harvest of 152 goats.

**MANAGEMENT/RESEARCH ACTIVITIES:** Staff from the Kodiak National Wildlife Refuge assist with goat surveys each year, and they have been instrumental in transferring survey data into a GIS format to facilitate analysis.

We did not issue any Emergency Orders closing the registration hunts in 2007 or 2008.

**ISSUES:** Goats have expanded to all available habitats on the island, and staff from the Kodiak National Wildlife Refuge has expressed concerns that goats are impacting the natural vegetation in some alpine areas. Our current harvest strategy of working closely with the Refuge, the Kodiak/Aleutians Regional Advisory Committee and the Kodiak Fish and Game Advisory Committee has successfully provided methods to reduce goat populations in some areas while providing expanded hunting opportunities. A proposal from a joint subcommittee meeting of those two advisory committees is recommending liberalization of goat hunting regulations for the two southern hunt areas, merging them into a single registration hunt. Department and Kodiak National Wildlife Refuge staff were included in the formation of this proposal and support its passage.

## *FERAL REINDEER*

**STATUS:** In 1924, 32 reindeer were introduced on the south end of Kodiak Island in an effort to diversify village economies. The project was unsuccessful, and the animals soon became feral. The current herd of approximately 250 animals remains on the southwest part of Kodiak, primarily within and adjacent to the Ayakulik River drainage.

**MANAGEMENT/RESEARCH ACTIVITIES:** The Department does not routinely survey the herd, nor do we manage it for sustained yield. There is no closed season or bag limit and same-day-airborne hunting is authorized. Hunters must obtain a caribou harvest ticket/tag prior to going hunting and all meat must be salvaged for human consumption. Data obtained from hunter report cards indicate a minimum annual harvest of 31 reindeer in 2007/08, up from the 5-yr average of 19 reindeer.

**ISSUES:** Interest in reindeer hunting has increased since authorization of same-day-airborne hunting, and some local air carriers and lodges are marketing Kodiak reindeer hunts. The consequent increase in harvest has led to a call from the public to make regulations more restrictive and begin managing the herd for sustained yield.

## *FURBEARERS*

**STATUS:** Otters, foxes and beavers, the species most often pursued by trappers, are abundant and lightly harvested in most areas. Snowshoe hare populations appear to have

peaked in 2007/08, and vole populations are coming off of a high. Fox and weasel (ermine) populations appeared to be declining during the past year.

**MANAGEMENT/RESEARCH ACTIVITIES:** Furbearer abundance is monitored by sealing data, staff observations, trapper questionnaires, hunters and local residents. In 2007/08, 122 otters and 24 beavers were harvested. Trapping records on unsealed species are incomplete.

**ISSUES:** The otter and beaver harvests were lower than the average of the previous five years (210 and 50, respectively), probably because of lower fur prices.

# GAME MANAGEMENT UNIT 9

# Alaska Peninsula

### Area Biologist: Lem Butler, King Salmon

## *DESCRIPTION*

Unit 9 stretches some 600 miles from Lake Clark Pass to False Pass, and covers approximately 33,640 square miles. Because of its size, linear nature, and geographic location, Unit 9 offers tremendous diversity along with unusual logistical challenges. There are 24 villages with a winter population totaling about 4,000 residents. The Alaska Peninsula is the meeting ground of four aboriginal cultures -- Aleut, Pacific Eskimo, Yup'ik Eskimo, and Athapaskan Indian. During summer, the influx of seasonal workers more than triples the population. As might be expected, the major economies of commercial fishing, tourism (including sport fishing, hunting, and bear viewing), and subsistence sometimes clash. With the severe downturn in the commercial fishing industry and increased costs of fuel, the economic viability of this region is under great strain.

Approximately half of Unit 9 is federal land, including three national parks and four national wildlife refuges. Due mostly to their interactions with the Commercial Fisheries Division and the Board of Fisheries, most local residents have some familiarity and confidence in the state system, but there is confusion over management authority as it applies to hunting, trapping, and subsistence activities. Habitat on the Alaska Peninsula remains intact and there is a strong commitment by local people to protect habitat and wildlife populations through scientific management.

## *BLACK BEAR*

**STATUS:** Black bears are found only in the northern portions of 9A and 9B. The population status is unknown, but probably stable.

**MANAGEMENT/RESEARCH ACTIVITIES:** Sealing of black bears is not required in Unit 9. During May 1999 and 2000, a new line-transect survey method was used in the northern portion of Unit 9B to estimate the density of both black and brown bears. Within suitable black bear habitat around Lake Clark, we estimated a density of about 120 bears per 1000 $km^2$ (about 31 black bears per 100 $mi^2$).

**ISSUES:** None.

## *BROWN BEAR*

**STATUS:** In 1989 the population estimate for areas open to hunting in Unit 9 was 5,700 brown bears. Another 2,200 were estimated in areas closed to hunting (i.e. national parks, and McNeil River). Aerial surveys in the central portion of Unit 9E and reports from local residents and guides suggest the population has increased since then. Unit 9 produces about one-quarter of the state's brown bear harvest, with guided hunters accounting for about 75% of the take. Unit 9 has accounted for approximately 40% of the top 350 brown bears listed in the Boone & Crocket record book. We estimate hunters spend at least $8 million annually to pursue brown bears in Unit 9. With only minor changes, management guidelines and the alternate year hunting seasons adopted by the Board in 1975 remain in effect. This management scenario has allowed the population and number of adult males to increase. Currently the population is considered stable with more than 6,000 brown bears occupying areas open to hunting in Unit 9. Annual harvest averaged 331 during 2001 to 2007.

**MANAGEMENT/RESEARCH ACTIVITIES:** Research was conducted at Black Lake, in central 9E from 1988 through 1996 to assess population status and make comparisons with data collected from the same area during 1970-75. Results indicate harvest rates during the early 1970s were approximately twice as high for adult males, adult females and sub-adult males as during the more recent period. The ratio of adult males to adult females in the 1970s was about half the current estimate. The mean age of adult bears is higher than in the 1970s, and older males are being taken. During the early 1970s, sub-adults made up 32-37 percent of the population, versus about 22 percent now.

**ISSUES:** With the population probably near the historic high, the number of bear-human conflicts is also very high. There does not appear to be any increase in tolerance of bears near villages or remote dwellings. Poor salmon escapements in some areas, the decline of caribou populations, and chronically poor moose calf recruitment will lead to local residents calling for drastically more liberal brown bear seasons in Unit 9. We can expect a proposal to establish annual seasons and perhaps to liberalize the bag limit for residents. Given the level of unreported/illegal "DLP" kills and the appropriateness of current harvests to adhere to management goals, it would not be prudent to expand the hunting opportunity in any portion of GMU 9 unless the Board wants to shift the Unit 9 management priority away from bears. It should also be noted that harvests would need to be increased dramatically if the change were expected to benefit ungulate populations. High bear numbers have also resulted in increased demand from both consumptive and non-consumptive users, increasing tension between user groups in some areas. We should expect to continue to receive proposals to allocate the use of this resource until these conflicts are resolved.

# *CARIBOU*

**Northern Alaska Peninsula Caribou Herd**

**STATUS:** The herd calves on the Bristol Bay coastal plain in the southern half of 9E and traditionally migrates north to winter from the Egegik drainage north to the Naknek River. From 1981-1993, the herd was relatively stable within the prescribed population range of 15,000-20,000 animals. Based on evidence the herd could not be sustained at the upper objective, we liberalized winter bag limits to bring the herd down to 15,000. During the winter of 1993-94, the combination of record harvests during the winter within the Naknek drainage and high natural mortality reduced the herd to an estimated 12,500. Since then, despite increased hunting restrictions culminating in a hunting closure in 2005, the herd has continued declining to approximately 2,000 caribou. As a result of continued population decline and chronic low calf recruitment, there are currently no plans to reopen hunting of this population.

A number of observations point to deteriorating range condition as the primary cause of the initial decline. These indicators include: scarcity of lichens on the traditional winter range; expansion of the winter range north of the Naknek River; smaller body size and lower fat reserves than in caribou from the neighboring Nushagak herd (which originated from a transplant of this herd); reduced recruitment (including no calving by 2-year-old cows and a relatively low pregnancy rate); and the apparently high incidence of lung worm in calves collected during October 1995-99. During the mid 1980s when some of these signs were first detected, there was hope the herd could use untouched winter range between the Naknek River and Lake Iliamna. However, about the same time some of the herd began moving into this area, large numbers of Mulchatna caribou also began spending part of the winter in 9C. During the early 1990s, the expansion of both herds' winter range continued, with some Northern Peninsula animals moving north of the Kvichak River and some Mulchatna animals traveling south of the Naknek River. Not only did the Mulchatna animals compete for winter forage, they also complicated harvest management. With both herds mixing in 9C, it became impossible to apportion the harvest to each herd. This wasn't a concern prior to 1993 when we wanted to encourage harvests of the Northern Alaska Peninsula herd to reduce it to about 15,000 animals. But after the 1993-94 decline, we were faced with the conflicting objectives of maximizing harvest opportunity on the Mulchatna herd while becoming more conservative for the Northern Alaska Peninsula herd.

In March 1999 the Board thoroughly reviewed the situation and implemented a Tier II permit system. When the Board did so, it triggered the need to evaluate the feasibility of intensive management options at its October 1999 meeting. After considering available options and the underlying nutritional problems that plague the herd at this time, the Board found intensive management was impractical. Intensive management options were reevaluated in 2005 and 2007 in response to public proposals, but to date no feasible options has been found. Tier II permits have not been issued since 2005 due to continued concerns for the conservation of this herd.

**MANAGEMENT/RESEARCH ACTIVITIES:** We maintain 40 radio-collars on cows to monitor seasonal movements, estimate survival rates, and facilitate annual post-calving photo-censuses. In recent years the U.S. Fish & Wildlife Service has increased its

participation and has funded many of the caribou projects. We have completed annual fall sex/age composition surveys since 1980. In 1995 we began more intensive efforts to assess body condition as an indicator of range condition by collecting and/or capturing female calves each fall through 1999 to assess body condition and monitor the prevalence of lungworms. Since 1995 we have collared only female calves to be able to document changes in body condition and monitor the age at first calving

In response to continued concern for this herd, ADF&G and USFWS initiated joint studies to identify factors contributing the continued decline. From 2005 through 2007 calf mortality studies and population health assessment were conducted. Results indicated that extremely low calf production (63%) and low calf survival after 2 weeks of age (36%) have had the largest impact on the low calf recruitment observed. Calf survival in neonates was low (43%), but not significantly different from stable populations in Interior Alaska. The cause of the poor calf survival after the neonatal stage is unknown. Calf production has improved in recent years, but calf recruitment still remains low.

Results of the health assessment indicate that NAPCH caribou were in poor condition when the health assessment was conducted in 2005. Caribou examined had heavy parasite loads and compromised immune systems. Low fat reserves and muscle loss are apparent in all animals handled during capture events. The poor nutritional status was believed to be responsible for the low pregnancy rates observed during parturition surveys in 2005 and 2006.

**ISSUES:** We will continue to monitor nutritional condition and productivity of this herd to assess its potential for recovery. As range conditions improve, the herd eventually will have the potential to grow, and we will need to evaluate whether predation rates at that time are constraining recovery.

In setting new population and harvest objectives under intensive management guidelines, we have recognized the need to try to maintain this herd at 12-15,000 animals. In 1999, the Board determined the number of caribou necessary to meet subsistence needs was 1,200-1,900. The Board may wish to revisit this finding because that level of use approaches the peak harvests at a time when the herd numbered more than 20,000 animals, a level proven to be unsustainable. Other factors contributed to this high level of use, which was atypical of past subsistence patterns. For instance, the herd was rarely accessible from the King Salmon-Naknek road system prior to 1987. When the herd expanded its winter range north of the Naknek River and became easily accessible with a bag limit of up to four caribou in one day, many non-local residents were attracted. Large harvests also occurred when the King Salmon Air Force Base was still active, a factor which greatly facilitated hunting by many non-local residents with military connections. As the herd declined during the 1990s, many Alaskans shifted their hunting efforts to the Mulchatna herd, and have been encouraged to do so by liberal bag limits and the ability to hunt same-day-airborne during the late winter. Finally, these high harvests were attained in winters when many Mulchatna caribou had moved into the Naknek River drainage. Animals from both herds intermingled within easy range of the road system, but it was impossible to apportion the harvest to the individual herds. All these circumstances reflect the ability and willingness of non-local Alaskans to adapt to changing conditions of caribou abundance and regulations.

The decline of the Northern Alaska Peninsula Caribou Herd has increased tension between user groups particularly in regard to local vs. nonlocal needs. During recent winters, several thousand Mulchatna caribou moved into the northern portion of the Naknek drainage in Unit 9C. Using radio-telemetry, we were able to monitor NAP distribution and offer a limited hunt for Mulchatna caribou to provide some caribou hunting opportunity in the area.

**Southern Alaska Peninsula Caribou Herd**

**STATUS:** The herd resides between Port Moller and Bechevin Bay in Unit 9D. This herd was previously thought to include caribou on Unimak Island. Although interchange between the island and the mainland has been documented on several occasions, recent genetic testing and the presence of separate calving areas suggest these herds are distinct enough to be recognized as independent herds. The Southern Alaska Peninsula herd peaked in 1983 at 10,300 animals and then began a prolonged decline. Studies begun in 1988 pointed to depleted range conditions as the primary cause of poor body condition, low reproductive performance and high natural mortality.

A cooperative management plan with the U.S. Fish & Wildlife Service called for a closure of all hunting if the combined population size of the Southern Alaska Peninsula herd and the Unimak Caribou Herd dropped below 2,500 animals. This level was reached in 1993, and state and federal seasons were closed by emergency actions. The herd continued to have high natural mortality (25-30 percent per year) of adult females and low recruitment (less than 20 percent calves in June), and declined to less than 2,000 animals by the mid 1990s according to USFWS winter counts. In April 1997 the USFWS counted 3,200 caribou within the same core area, which had been surveyed in past years. Although there was no explanation for how the herd could have expanded by more than 60 percent in one year, the Federal Subsistence Board implemented a hunt with an initial quota of 100 bulls. A composition count in October 1997 showed the four-year hunting closure had allowed the bull:cow ratio to recover to more than 40:100, but calf recruitment remained poor. The USFWS counted 3,100 caribou in February 1998, giving credence to the herd being larger than previously counted by both the FWS and ADF&G post-calving surveys. Yet the source of the additional caribou remains a mystery.

Between 1998 and 2001, additional survey work and a calf mortality study showed evidence of improved nutritional condition and productivity for this herd and a gradual population recovery. A state season in Subunit 9D for both residents and nonresidents was reopened in 1999. Surveys in Unimak Island also show improved productivity. In November 2002 the USFWS counted 4,100 caribou in Subunit 9D and 1,200 on Unimak Island.

Following this brief recovery, the population again entered a period of low calf recruitment. Calf: cow ratios decreased from 38 calves:100 cows in 2001 to 8, 7, 6, 1, and 0.5 calves:100 cows in 2003, 2004, 2005, 2006, and 2007 respectively. During the winter of 2005-06 the USFWS counted 1,650 caribou in Subunit 9D. All hunting was closed in 2007 by Emergency Order following surveys that estimated population size of 600 caribou and indicated that calf survival to 4 weeks of age was less than 1%.

Calf mortality studies and field observations indicated that predation on neonates was the primary cause of the poor calf recruitment observed, which in turn led to a severe decline in the bull:cow ratio (10 bulls:100 cows in 2008) that could influence the reproductive potential of this herd. High pregnancy rates and good body condition of adult female caribou indicated nutrition has not played a significant role in the recent population decline.

In 2008 the Board of Game adopted a wolf predation control plan designed to remove wolves from key packs on the caribou calving grounds to improve calf survival and facilitate the recovery of this herd. Department staff removed 28 wolves (including 14 wolf pups) from two packs that occupied the caribou calving grounds and simultaneously monitored calf survival. Results of this study showed a dramatic improvement in calf survival and recruitment to fall (39 calves:100 cows in 2008). This project appears to have halted the severe decline and promises to be instrumental in the recovery of this herd.

**MANAGEMENT/RESEARCH ACTIVITIES:** We have conducted an annual composition survey since 1986. We first deployed radio-collars on Southern Peninsula caribou in 1987. We have conducted post-calving photo counts and fall sex/age composition surveys in Subunit 9D in most years since then. The Izembek National Wildlife Refuge staff periodically conducts winter transect surveys to estimate total herd size. Studies of reproduction rates, survival, and body condition were conducted in 1989, 1999, 2007, and 2008.

**ISSUES:** A revised operational plan for the Southern Alaska Peninsula herd was adopted in 2007 that address the Subunit 9D caribou population independent of the caribou on Unimak. During the late 1970s and early 1980s, we were unable to direct enough hunting effort to this herd to prevent it from drastically exceeding the population objective and over-grazing the range. Even with a better appreciation of the carrying capacity of this range, it may be difficult to maintain the herd at the desired level.

The wolf predation reduction program in 2008 represents the first step in facilitating herd recovery, but much work remains before this herd is able to recover without human intervention. The Department has revised its operation plan to remove wolves prior to wolf denning and instituted a new policy to handle wolf pups if they are encountered.

## *MOOSE*

**STATUS:** Moose expanded onto the Alaska Peninsula during the 1950s and 60s, and may have exceeded the carrying capacity by 1970. Numbers were intentionally reduced during the early 1970s to reduce over-browsing. Over the past 20 years, the population has apparently stabilized at about half the density of the late 1960s. The bull:cow ratio is acceptable in all subunits. Calf recruitment remains low due primarily to high neonatal predation.

**MANAGEMENT/RESEARCH ACTIVITIES:** Annual fall sex and age composition surveys are rotated among count areas in 9B, 9C and 9E. However, poor snow and/or

flying conditions often limit the number of count areas surveyed each year; and no surveys were conducted in 2002, 2004, and 2008.

**ISSUES:** Household subsistence surveys suggest the unreported moose harvest from villages may be as high as 200 moose in some years with as much as 30% of the harvest being cows. Approximately 40% of this unreported harvest takes place in September, December, and January when the season is open, while the remainder is scattered through months when there is no season. If accurate, this level of unreported moose harvest is substantially higher than previously estimated. Some villages have complained about perceived competition with "sport hunters." Many local residents believe sport hunters have over-harvested moose and the population is reduced. Proposals to liberalize seasons for local residents and close seasons for nonlocals have become common at public meetings that address State and Federal moose hunting regulations. However trend surveys show high bull:cow ratios and relatively stable densities. The tension between user groups is expected to increase as caribou numbers decline throughout Unit 9 and caribou hunting opportunity becomes more restrictive.

Moose recruitment has been chronically low in most areas of Unit 9. Bear predation on calves and year-round predation by wolves is believed to be responsible. Predator (bear and wolves):prey (moose and caribou) ratios are approximately 1:2 in most of Unit 9.

Moose harvests have been remarkably stable over the past 20 years, and hunter success has remained relatively high. However, given the low productivity throughout Unit 9, where calf:cow ratios have been averaging about 18:100 in recent years, the population will not be able to sustain additional harvest.

## *FURBEARERS*

**STATUS:** Little is known about the population of furbearers in Unit 9. It appears wolves are increasing in all subunits. Lynx in 9C experienced a population peak during 1992-95, but now are at low levels. The beaver population remains high. Coyotes appear to be increasing and expanding their range slowly. Red foxes are abundant, as are most other species, except marten and muskrats. The combination of frequent periods of unfavorable trapping conditions and chronic low prices has reduced trapping effort to the point where it has little impact on most species in most areas of Unit 9.

**MANAGEMENT/RESEARCH ACTIVITIES:** Furbearer abundance is monitored by sealing data, staff observations, trapper questionnaires, hunters and local residents.

**ISSUES:** Given low fur prices, the cost of travel and unreliable travel conditions in Unit 9, most fur species are harvested below sustainable levels. This is particularly true for beavers and the Board has implemented a longer beaver trapping season and a spring season when the use of firearms is legal. Wolf abundance and the impacts on moose and caribou continue to be grave concerns among subsistence users. When snow conditions are favorable for snowmobile travel, wolf numbers have been temporarily reduced near communities by local trappers and hunters.

# GAME MANAGEMENT UNIT 10

# Aleutian Islands

### Area Biologist: Lem Butler, King Salmon

## *DESCRIPTION*

Unit 10 encompasses about 9,700 square miles of land on a string of sparsely populated volcanic islands, large and small, stretching 1,100 miles west-southwest from the tip of the Alaska Peninsula into the Pacific Ocean and Bering Sea. The wildlife on Unimak Island, the first of the Aleutians, is similar to that found on the adjacent mainland. The only big game found on the remainder of the Aleutians is the transplanted caribou herd on Adak Island. Because of the limited amount of big game in Unit 10, our management presence is minimal.

## *BROWN BEAR*

**STATUS:** The state assumed responsibility for a drawing permit hunt on Unimak Island from the U.S. Fish & Wildlife Service in 1979. The management objective is to provide a quality hunt with the opportunity to be selective. Eight fall and seven spring permits are issued. Over the past five years, the annual harvest has averaged 10 bears.

**MANAGEMENT/RESEARCH ACTIVITIES:** Harvest data comes from sealing records. Abundance estimates were derived from guides and hunters. In 2002 a new line-transect survey was used to estimate the population at 250-300.

**ISSUES:** One of the two guides authorized on Unimak has expressed interest in a permit system similar to the one used on Kodiak.

## *CARIBOU*

**Unimak Caribou herd**
**STATUS:** Caribou on Unimak Island reached a peak population size of 5,000 caribou in the 1975 and rapidly declined to 300 caribou during the 1980s. The population slowly recovered and numbered 1,200 by 2002. Since 2002 the population entered a period of poor calf recruitment and is now declining. During the past year as much as 50% of the population may have been lost. The current sex ratio of 9 bulls:100 cows suggest the population is experiencing problems associated with a skewed age structure and that the reproductive potential of this herd may be limited by the availability of bulls. The best guess at a current population estimate is approximately 300 caribou based on observations by biologists and local guides, however a population count has not been attempted to verify this estimate.

**MANAGEMENT/RESEARCH ACTIVITIES:** Weather often prohibits annual surveys on Unimak and data are scant. In 1999 we captured calves from Unimak Island to evaluate body condition and obtain blood samples for genetic comparison. A guide volunteered his time to conduct a population survey on Unimak during May 2000, and we conducted a sex/age composition survey on the island in October 2000 and 2002. In November 2002 the USFWS counted 1,200 caribou on Unimak Island. Fall caribou composition survey conducted in October indicate calf recruitment has been low for several years, averaging 6 calves:100 cows, despite relatively high pregnancy rates (85% pregnancy rate for adult females in 2008). Reported harvests average 14 caribou annually on Unimak.

**ISSUES:** Recent observations suggest that there has been a rapid decline in both population size and sex ratio over the past year. These observations are not surprising given the history of poor recruitment and fit a similar pattern to other caribou populations in Southwest Alaska that are also declining. Though the severity of these trends has not been confirmed by additional surveys, steps need to be taken for the conservation of this herd.

Until recently caribou on Unimak were managed as part of the Southern Alaska Peninsula Caribou Herd. Now that Unimak is recognized as a separate herd, attention should be given to establishing new objectives for this population, but it must be recognized that we will not have the ability to manage and regulate caribou numbers on the island with much precision.

**Adak Caribou Herd**

**STATUS:** In 1958-59, 25 caribou from the Nelchina herd were moved to Adak Island by the U.S. Fish & Wildlife Service and the Navy to provide an emergency food supply and recreational opportunity for Navy personnel stationed there. A 1993 survey estimated 550 adults and 175 calves, well above the management objective of 150 established in a 1980 cooperative management plan. Recent surveys indicate that the Adak Caribou Herd tripled in size from an estimated 850 caribou in 1998 to 2,750 in 2005 based on surveys conducted by the Alaska Maritime National Wildlife Refuge staff.

**MANAGEMENT/RESEARCH ACTIVITIES:** Annual registration hunts were conducted by the USFWS to try to maintain the herd at sustainable levels, but in many years the harvest objective was not reached. The decision to close the naval facility resulted in concern that keeping the herd in check would be impossible and the population would exceed the island's carrying capacity. The Board approved a year-round season with no bag limit, but harvests remained minimal. While harvests have increased in recent years, it is unlikely that harvests are sufficient to stem the growth of this herd.

**ISSUES:** A plan to remove caribou from the island, with some transplanted to other Aleutian islands and the rest killed for salvage by Food Bank of Alaska, was developed by state and federal agencies but was derailed by social/political concerns. The issues of overpopulation and habitat degradation remain unresolved.

The caribou herd on Adak recently developed a reputation for producing trophy bulls and hunter effort has increased. Selective harvests favoring large bulls are reputed to have significantly reduced the bull population according to unconfirmed reports. This

development would not be surprising given the small size of the population. Harvest data suggest cows are slowly becoming a larger portion of harvests. Whether this reflects a declining bull ratio or is the result of recent regulatory changes intended to increase the cow harvests is unknown.

# GAME MANAGEMENT UNITS 11 & 13

# Nelchina Basin


### Area Biologist: Bob Tobey
**Assistant Area Biologist: Rebecca Schwanke**


## *DESCRIPTION*

Game Management Unit 11 contains approximately 13,000 square miles, but much of it consists of mountains and glaciers, with only about 5,500 square miles of wildlife habitat. Unit 11 is bounded on the west by the Copper River, on the east by the Canadian Border, on the north by the Nutzotin Mountains near Slana, and on the south by the crest of the Chugach Range. The Wrangell St. Elias National Park and Preserve occupies most of Unit 11. Consequently, our activities are limited. Few people live within the unit and access is limited largely to the Nabesna and McCarthy roads. Between Park Service regulations and a large amount of land being privately owned land (Ahtna Inc.), further access is limited.

Game Management Unit 13 contains approximately 23,400 square miles of diverse wildlife habitat between the Chugach Mountains and the Alaska Range. The unit is bordered on the west by the Susitna River drainage and on the east by the Copper River. Approximately 15,600 square miles are below 4,000 feet elevation and are generally considered wildlife habitat. Since the unit is so large, it is divided into five subunits. Road access from major population centers, relatively open terrain and abundant moose and caribou populations have drawn thousands of hunters into Unit 13 every fall for decades. It is a hunting area for urban Alaskans as well as rural residents living within the unit.

**MANAGEMENT ACTIVITIES**: In addition to monitoring wildlife population and harvest trends, the Department attends meetings and comments on land use, planning, development, habitat changes and access issues.

**UNITWIDE ISSUES:** Motorized access, and ORV use in particular, has been and will continue to be one of the most important land use issues in Unit 13. The area always has been considered important for motorized hunting because of its proximity to population centers and access from the road system. This unit has a long history of motorized access for hunting and trapping. There are numerous lakes and gravel bars suitable for landing aircraft, along with higher elevation strips that have been cleared for bush plane use over the years. There are large rivers and lakes where boats are utilized. Most significant is the well developed and still expanding trail system for ORV use. Motorized access disperses hunters off the road system and allows distribution of the harvest. This is an important historic harvest pattern that has been built into the management program for the Nelchina Caribou Herd and Unit 13 moose harvests. The Department has long been a proponent of maintaining motorized access for hunting, trapping and fishing in Unit 13. In planning

efforts with agencies such as the NPS, BLM, DNR as well as private landowners, the Department has always advocated maintaining motorized access.

## *BISON*

**STATUS:** The small Chitina bison herd is located in the remote upper Chitina River valley between the Tana River and the Chitina Glacier. This herd increased to 39 bison observed, including seven calves, in 2008 after dropping to a low of 25 with only two calves in 2004. The Copper River bison herd is larger, and ranges between the Nadina and Kotsina Rivers in GMU 11 with occasional movement into GMU 13 near Kenny Lake. This herd reached a record high in 2008, with 135 bison observed during a spring survey. Calf production increased to 32 from 18 in 2007, and was the highest calf count ever observed for this herd. A series of mild winters with low snow fall in recent years have allowed for the increase in bison in these herds.

**MANAGEMENT ACTIVITIES:** Annual composition counts are flown during June using fixed wing aircraft to assess herd size and productivity. Survey conditions for both herds are difficult because bison are often in the timber, thus survey observations constitute minimum population estimates. Drawing permit hunts are held for both herds when population size and productivity allow. Up to 24 permits may be issued for the Copper River herd. Since opening the season in 1999, 68 bison have been taken (annual range = 4-11). Two permits are generally issued for the Chitina herd, unless survival declines during a severe winter with deep snow result in a population decline; no permits were issued in 2004 or 2005. One Chitina bison permit was donated to National FNAWS (Wild Sheep Foundation) to auction in 2008; the other was offered in the drawing. There have been 11 bison taken from this herd since the hunt opened in 1999.

**ISSUES:** The Copper River herd spends most of its time on private Ahtna Native Corp. land and trespassing is an important management issue for this hunt. For the past three seasons, the landowners have sold trespass permits, greatly improving the trespass issue while also increasing hunter success. The Copper River herd is currently large enough to allow a harvest of 10–15 bison annually. The Chitina herd can sustain a harvest of 1–4 bison annually and only in years with favorable winter conditions.

## *BLACK BEAR*

**STATUS**: Black bears are considered numerous in those portions of Units 11 and 13 with suitable forest habitat. In good bear habitat in southern Unit 11 near McCarthy, the National Park Service estimated 100-200 black bears/1000km$^2$; a density similar to those observed elsewhere in Southcentral Alaska. Annual black bear harvests in Unit 11 are low (averaging 14/year, 1997-2007) with no overall trend evident.

Between 1980 and 1996, the average yearly black bear harvest in Unit 13 was 82 (range = 65-102). Since 1997, interest in black bear hunting has increased, and the average yearly harvest since then has been 122 (range = 87-162). The 2007-08 harvest was 141. Since 2000-01, an average of 40 (range=24-51) bears have been taken per year over bait. Spring harvests have exceeded the fall take since 2001, and have been steadily increasing

since the early 1990s. Males dominate the harvest in both units. Current black bear harvest rates are not believed to have any effect on overall abundance in either unit.

**MANAGEMENT/RESEARCH ACTIVITIES:** With no efficient and cost-effective way to monitor unit-wide population dynamics of black bears, the only management tool we currently have is to monitor is successful hunter harvest reports.

**ISSUES:** None, as current harvest levels are considered sustainable. Most harvest is close to the road system, leaving extensive refugia in remote portions of both units.

## *BROWN BEAR*

**STATUS:** Unit 13 is considered to have good habitat and bears are numerous. The earliest population estimate of 1,500 bears in the late 1970s was based on harvest and sightings. Mark-recapture population estimates from the 1980s and 1990s produced estimates that varied from 1,280 to 1,450 bears. The latest population estimate of 1,300 was extrapolated using data from line transect surveys between 2002 and 2004 in subunits 13A, B, and E. Initial capture data from 13A west between 2006 and 2008 suggest the brown bear population may not have declined much, if any, in this area compared to a mark-recapture study in the same area in 1998.

Unit-wide harvests increased from an average of 39 annually in the 1960s, to 59 in the 1970s, to 105 in the 1980s. The first half of the 1990s had an average bear harvest of 84. In an effort to increase bear harvest under intensive management for Unit 13, the Board of Game in 1995 increased the bag limit to one bear per regulatory year, waived the resident tag fee and opened the fall season earlier. In response to the liberalized regulations, the average harvest for the second half of the 1990s increased to 132 per year, with 1999–2000 having a record harvest of 166 bears. In 2003, the Board adopted a no closed season for brown bear in Unit 13. Harvests since then have averaged 138 bears per year. There have been no real trends in the harvest since liberalization of the regulations in 1995. There is little evidence from population estimates, capture operations, harvest data analysis, changes in moose calf survival or bear sightings that an appreciable decline in the Unit 13 brown bear population has occurred.

Brown bears are common throughout Unit 11 but no formal population estimate is available. Brown bear seasons were lengthened, the bag limit changed to one per year and the resident tag fee dropped in 2003 by the Board. Harvests averaged only 10 bears/year the three years before the change; take has increased to 17/year since then. Males continue to dominate the harvest. General hunting of brown bears is prohibited in more than half of Unit 11 by federal regulations in areas designated as park land. Current harvest levels are considered sustainable in Unit 11.

**MANAGEMENT/RESEARCH ACTIVITIES:** Management activities involve administering hunts, monitoring harvest, and sealing hides and skulls. In 2008, we began collecting genetic samples from harvested bears in Units 11 and 13 for use in future years.

Since May 2006, we have captured 77 brown bears (71 were collared) in Unit 13A west (Nelchina River north to the Susitna River). This area is heavily hunted, and to date, 26 of the initial 77 have been harvested or died naturally. The goals of this project are to evaluate the effectiveness of the liberalized harvest regulations, as well as develop an understanding of the current bear population in comparison to past research from the same area. Initial data suggest a minimum density of 25 bears/1000km2 (all identifiable observed bears) in the area in 2008, which is comparable to the 1998 density estimate of 27 bears/1000km2.

**ISSUES:** Brown bears are an important predator of moose in both units, primarily because they kill a substantial percentage of newborn moose calves. They also take an unknown number of adults. Current management objectives for Unit 13 set by the Board call for reducing brown bear numbers by increasing hunter harvests through liberalized seasons, bag limits and waived resident tag fees. The objective is to decrease moose calf predation by brown bears. Even though the harvest of brown bears has increased, there are no data indicating a decline in either the number of bears unit-wide or brown bear predation rates on neonatal moose calves. The only discernable impact of hunting has been a change in the sex ratio (from capture data), with an increasingly female dominated population. Considering most sows with cubs are protected from harvest, this increased hunting pressure may actually be increasing cub production and survival (concepts we plan to address with ongoing research). At this point, harvest levels of brown bears in Unit 13 appear insufficient to effectively reduce the bear population given the protection afforded sows under current regulations, the productivity of the population, and the large areas of refugia within and surrounding Unit 13.

In Unit 11, the liberalizations have mostly acted to increase opportunity for a minimal number of bear hunters, and population level impacts are not expected.

# *CARIBOU*

### *NELCHINA CARIBOU HERD (NCH)*

**STATUS:** The NCH fall 2007 population estimate was 32,569, 11% below the 36,428 count in 2005. A census was not completed in 2008, but a herd estimate of 33,288 was obtained by modeling the previous count with current sex and age composition data along with hunter harvests. The long-term management objective for the NCH is 35–40,000 caribou. The herd dropped below this objective in 2007. Since active wolf management started on the NCH calving ground in 2001 (Little Nelchina north to the Kosina River), calf survival to fall has increased, with the fall calf:cow ratio averaging 41:100 (range = 35-48) compared to 26:100 (range = 20-38) between 1997 and 2000. The fall calf/cow ratio objective is 40:100, which has been met in six of the last eight years. The bull/cow ratio 2002-07 averaged 31:100 (range=23-36), consistently below the management objective of 40:100. The 2008 ratio was 39:100.

The NCH is open only to subsistence hunting within Unit 13, with the current amount necessary for subsistence set at 100% of allowable harvest. The state portion of the NCH harvest is by Tier II permit. The number of permits issued, the bag limit and total harvest quota are reviewed annually with quotas based on herd size and productivity. Harvest

quotas were reduced in 2007, when the herd went below the minimum 35,000 population objective. In 2007, 3,000 Tier II permits were issued and 966 caribou taken during the fall season; the winter season was closed by emergency order. The state must employ the use of emergency season closures when reported harvests indicate the combined state and federal harvests will exceed annual harvest objectives. Federal harvests on the NCH in Unit 13 are managed by registration permit by BLM for designated rural residents (including residents of the greater Delta area). The federal bag limit is two caribou. In 2007, 2,490 federal permits were issued and 385 caribou were reported harvested. In some years the BLM reported harvest has reached 600 caribou. There is also a small federal hunt near Tetlin where the FWS issues between 50-100 permits; up to 20 animals are reported taken annually.

**MANAGEMENT/RESEARCH ACTIVITIES**: A census of the herd and a composition survey are scheduled annually near the end of June. Unusually cold springs with late snowfall in 2006 and 2008 disrupted normal post calving grouping of caribou in the NCH, thus preventing scheduled photo censuses. Another composition survey is flown in October which is used to calculate the fall population estimates for cows, calves and bulls. Radio-collared cows are flown to monitor movements, mortality and productivity. Population data is modeled yearly to provide a harvest quota and the number of permits issued each year. State and federal harvests are monitored in season, and the state Tier II season is closed when harvest quotas for bulls and/or cows are met. While BLM does not have the authority to emergency close the federal season, they can and do alter the sex of the bag limit in-season if need be.

Weather conditions are monitored to predict annual variations in survival and productivity. Variation in weather may dictate the amount as well as quality of forage available on the critical calving and summer range. During years with favorable weather patterns, the NCH remains very productive and, with reduced wolf numbers throughout Unit 13, calf survival has improved. Predation by wolves increases during winter when caribou migrate out of the Unit 13 wolf predation control area.

**ISSUES:** The potential for high harvests under federal subsistence regulations is an annual management problem. In 1991-92, 681 Nelchina caribou were taken, and in 2005-06, 614 were taken under federal regulations. When herd numbers are below population objectives, the total harvest is generally limited to 1,000 bulls (or fewer), and there is a chance that up to 70% of the harvest could be from federal subsistence hunters (even though they can hunt legally on only about 1% of the land in Unit 13). Even though there is only a small amount of land open to federal subsistence hunting, harvest can be very high if caribou winter there (such as on the Denali Highway near Tangle Lakes) or when caribou migrate across the federal hunting corridors along the Richardson Highway. If more federal land opens to subsistence hunting as native/state land conveyances are finalized, the federal hunt could potentially take the entire harvest quota.

The current state management of the NCH is an experiment with the objective to stabilize a moderately sized (35-40,000) caribou herd by managing human harvest and predation. Since 1989, the NCH estimates have ranged from a high of 50,000 caribou in 1995 to a low of 30,000 in 2000 with a 20-year herd size average of about 37,000 caribou. Since 1975, 60,400 Nelchina caribou have been harvested for an average take of 2,620 a year.

### *MENTASTA CARIBOU HERD*

**STATUS:** The 2008 population estimate was approximately 320 caribou. Body condition for the Mentasta herd is excellent and pregnancy rates are high. Chronically low calf survival (documented with fall composition surveys), due to high levels of predation, has been the primary cause of the severe decline of the herd.

**MANAGEMENT/RESEARCH ACTIVITIES:** An annual census of this herd is conducted in June and several radio tracking flights are conducted annually to monitor movements and mortalities. The Mentasta herd has been closed to all hunting (including federal subsistence hunting) since the fall of 1998.

**ISSUES:** The Mentasta herd has declined from more than 3,000 animals to its present level over the last 20 years. The driving factor behind the decline was increased calf predation after NPS regulations curbed wolf harvests in the 1980s by restricting methods of take on federal land. Predator numbers remain high on the Mentasta range.

## *MOUNTAIN GOAT*

**STATUS:** Overall goat numbers are thought to be relatively stable throughout occupied habitat in Units 11 and 13 over the past decade. The percentage of kids observed has ranged from 18-28% in central subunit 13D and 14-29% in southern Unit 11 count areas. The most recent population estimate for southern Unit 11 is 400 animals in the Wrangell Mountains north of the Chitina River and 300 south of the river in the Chugach Range. There is no formal estimate for subunit 13D, though trend surveys, harvest data and anecdotal information suggest the population is stable at a rather low density. Goat harvests in Unit 11 are by registration permit for both the state and federal subsistence. Harvests over the past 10 years have averaged eight goats a year for the state hunt and three a year for federal subsistence hunters. In subunit 13D there are two drawing hunts (east and west of Klutina Lake) with a combined average take of six goats a year. A small portion of southern 13D was also open to registration hunting in 2007 and 2008. In 2007, three hunters reported hunting in this area; one goat was harvested. The 2008 data is not yet complete.

**MANAGEMENT/RESEARCH ACTIVITIES:** Aerial surveys have been limited to a few areas each year. We monitor permit hunts in Units 11 and 13 to limit the possibility of over-harvest. Harvests have been low in recent years and are felt to have little effect on the overall population status in either unit.

**ISSUES:** If hunters concentrate their efforts in the same hunting areas every year, they could have adverse effects on local populations.

## *MOOSE*

**STATUS:** The Unit 13 moose population declined by about 50% between the late 1980s and 2002 because of severe winters and increased wolf predation. The decline observed in fall moose surveys between 1996 and 2001 was in all sex and age classes. Bull/cow ratios dropped as low as 18/100. Calf/cow ratios fell to a low of 11:100 in 2000, which was the worst recorded in more that 20 years of moose counts. Moose trend count data show an increase in both numbers and ratios since active wolf management started in 2001. Moose numbers fell as low as 377 moose/1000 $km^2$ observed in fall surveys in 2001. Since then, the decline has been stopped, and the population turned around with 485 moose/1000 $km^2$ observed in 2008. The calf:cow ratio improved to 19:100 in 2008, and the bull/cow ratio is up to 35:100.

Although the moose population is responding to active wolf management, a quick recovery was not possible nor expected. Deep snow in 2004-05 was a setback for the recovery, and any more deep snow could further hamper efforts. Also, the recovery is not unit-wide as moose numbers over some large areas in 13 A, D and E remain depressed. Brown bear predation on moose calves is likely increasingly important when moose numbers are low.

Harvests under the state general hunt, Tier II, and federal subsistence hunts averaged 943 bulls (range = 824-1,027) between 1994 and 1999. Harvests dropped dramatically in 2000 and 2001, bottoming out at 463 bulls. The harvest trend has generally been increasing ever since, and the 2007 harvest was 645 bulls. Non-residents have been excluded from hunting moose in Unit 13 since 2001 because the harvest fell below the subsistence figure and the population was in a steep decline. The 2008 data is not yet final.

The moose population in Unit 11 is considered stable at a low density. Bull/cow ratios vary depending on the area (regularly hunted versus lightly hunted), and range from 40 to 100 bulls/100 cows; calf/cow ratios usually range from 10 to 20/100. The moose density is below 0.5 moose/square mile across most of Unit 11. Harvest and hunting pressure has increased since 2000, when the federal subsistence permit hunt for any bull was established (season dates Aug. 20-Sept. 20). The total harvest for the state general hunt and federal subsistence hunt in 2007 was 48 moose. The moose harvest in Unit 11 is concentrated along the Nabesna and McCarthy roads and limited access points.

**MANAGEMENT/RESEARCH ACTIVITIES:** The management staff in Glennallen conduct fall trend count surveys, winter snow surveys, spring twinning surveys and activities related to managing the fall hunts. For many years, Department staff has worked with BLM and DNR on prescribed fire to improve habitat in the Alphabet Hills (central Unit 13). In 2003 and 2004, 41,000 acres were burned. Vegetation plots and an additional moose survey area were established to monitor the burn effects. Additional surrounding area will be burned in future years, weather permitting. Also, a mechanical crushing program was carried out in 2006 and 2008 on critical winter habitat along the Copper River. Fifty acres of winter habitat were treated each year. Research staff have been conducting projects in 13A west to document calf mortality, and to evaluate habitat condition and carrying capacity. Movements, productivity and survival of moose have

been monitored by placing collars on neonatal moose calves as well as other age classes of cows.

**ISSUES:** The moose population decline was stopped in 2001 through active wolf management. Low calf recruitment has long been a major issue for moose management in Unit 13. As expected, low calf recruitment is partially responsible for a slow recovery. Calf recruitment is a factor of both productivity and calf survival. To monitor productivity we look at twinning rates. Twinning rates have averaged 25% (range= 14–35%) in 13A west (an area with the highest historical moose density in the unit) since 2003. Twinning data from 2008 was good across the unit, although surveys in 13B and northern 13E indicated a very good combined twinning rate of 53%. Productivity in Unit 13 is typical of a high elevation moose population and is considered more than adequate to allow an increase in the moose population. The other component of calf recruitment, annual calf survival, has improved since wolves were reduced, but remains lower than observed before the decline. Consistently low fall calf/cow ratios have long since been linked to brown bear predation on neonatal moose calves in Unit 13. Given current productivity and survival patterns, the moose population is expected to continue increasing at 3-5% a year.

Providing for additional moose harvest in Unit 13 is a management issue because the observed increase in moose is not unit-wide. Moose numbers have increased in 13B, C and western 13A, while moose in 13D and E show little or no increase. Because of population differences between subunits, it is not possible to liberalize moose hunting regulations unit wide at this time.

Much of Unit 11 is national park land where only local residents can hunt, and hunting by aircraft is prohibited. The remainder of the area is national preserve land or privately owned. Hunting access is largely limited to the Nabesna and McCarthy roads. Habitat improvement is not a management option under park regulations. However, most of the unit is in a “let-burn” fire suppression category should a wildfire ever get started. Predation by both brown bears and wolves is considered high in Unit 11, as evidenced by very low fall calf/cow ratios. Federal subsistence hunting regulations allow the harvest of any bull, compared to the state spike-fork/50-inch, 4-brow time regulation.

# *SHEEP*

### *WRANGELL MOUNTAINS*

**STATUS:** Sheep numbers in the southwest Wrangell Mountains (between the Dadina and the Kuskulana rivers) have declined significantly since 1984, when 904 sheep were observed. By 2006, numbers had declined by nearly 70%. The population now appears to have stabilized. Counts in 2007 and 2008 show slight improvements (384 and 383 total sheep observed respectively). Hunting does not appear to have played a part in the decline, considering ram:ewe ratios have remained relatively stable (average = 39:100). Lamb production (and early survival) in this area can be highly variable year to year, as indicated by lamb/ewe ratios ranging from 12 to 37:100 since the 1980s. Annual recruitment over the past few years appears to be up, and has perhaps been responsible for the increase in sheep numbers (average = 35 lambs:100 ewes in 2007 and 2008).

Sheep in the Upper Chitina River portion of the southern Wrangells (MacColl Ridge, Hawkins and Barnard glaciers) declined nearly 40% between 1999 and 2003, although the population now appears to be stable to increasing. Sheep numbers in the Hawkins Glacier area were up slightly in 2005, and the adjacent Barnard Glacier area showed a little improvement in a 2007 survey. These areas had poor lamb production (and/or early survival) specifically in 2000 and 2001, but recruitment has since rebounded somewhat. Similar to the southwest Wrangells, sheep declines in this area are not likely attributable to hunting given the consistency of ram:ewe ratios (average = 33:100). Predation and the possibility of winter icing conditions are likely factors.

***TALKEETNA MOUNTAINS***

In 1999, a high of 1,665 sheep were observed in the eastern Talkeetna Mountains (subunit 13A). Since then, deep snow years 1999-2000, 2001-02, and 2004-05 have contributed to lower population numbers. Complete surveys were flown most recently during the summer of 2007, when 872 sheep were observed. A partial survey was done in 2008 (Caribou Creek, Hicks Creek, and Sheep Mountain). These surveys indicate the population is stable to increasing.

As expected, hunters in this area have seen ram numbers decline dramatically over the past decade. The response has been considerably lower hunter numbers since the mid-1990s (both resident and nonresident). In the last three years, an average of 208 hunters has pursued sheep in this area compared to the peak of 441 in 1995. Residents continue to dominate the harvest in this area, taking an average of 18 rams/year over the last three years (total harvest average = 31).

Sheep numbers in this portion of the Talkeetna Mountains are expected to increase, given moderate winter snow depths in coming years. Deep snow appears to be the most important factor determining sheep numbers in this area. Lamb production/early survival in the 2007 survey were good, averaging 33 lambs:100 ewes. The sex composition also appears well balanced with 31 rams:100 ewes (32% of the rams being ≥ full curl).

***CHUGACH MOUNTAINS***

Sheep count areas in the central Chugach Mountains (subunit 13D) have been restructured to assess the population in three separate management areas: the Tonsina Controlled Use Area (TCUA), western 13D, and eastern 13D. The TCUA, a walk-in only sheep hunting area east of the Richardson Highway, remains open under general season regulations due to the difficulty of hunting there. Sheep numbers in the walk-in area are considered low but stable. The drawing areas also have low sheep numbers, although recent surveys indicate the population is stable to increasing.

Beginning in 2008, the western area has been managed as an any-ram drawing area and the eastern area has been managed as a full-curl drawing area to help reduce hunting pressure. The limited hunting pressure under the drawing hunts is expected to improve the number of large mature rams, returning the population to a more desirable structure.

**MANAGEMENT/RESEARCH ACTIVITIES:** Sheep populations in Units 11 and 13 are monitored by fixed-wing aerial surveys (June-August), analyses of harvest reports, sealing data, and anecdotal information.

**ISSUES:** Depending on the specific area, deep snow, winter chinooks/icing conditions and vulnerability to predation likely have tremendous influence on sheep population dynamics in this region. To help address the specifics of sheep population dynamics in this area, a research project is scheduled to begin in the central Chugach Mountains in the spring of 2009. Given the new management strategy in this area, research will also help address the effect of recent changes.

## *WOLVES*

**STATUS:** A large portion of Unit 13 has been subject to a wolf predation control implementation plan since 2000-01; same-day-airborne take has been allowed since 2003-04 (excluding subunit 13D and 13E west of the Alaska railroad). Under the plan, the unit-wide fall wolf population has been reduced from a high of 520-600 wolves in 2001 to a fall estimate of 254 wolves in 2007. The 2008 spring population estimate of 153 falls within the long-term population objective of 135-165, and represents the third year of meeting the population objective.

The wolf population in Unit 11 is not tracked as closely as Unit 13. Much of the area is inaccessible to trappers until late in the winter when the Copper River freezes. In 2007, the unit-wide fall wolf estimate was 85-105. Annual wolf harvests in Unit 11 are also low, and have ranged 15-35 since 2000-01.

**MANAGEMENT/RESEARCH ACTIVITIES:** Population trends are monitored by periodic aerial surveys, sealing records, and anecdotal information. No wolf research projects are currently being conducted in Unit 11 or 13.

**ISSUES:** The reduction in wolf numbers has already improved caribou and moose survival in the unit. The number of Tier II caribou permits issued increased from 2,000 between 2001 and 2003 to 5,500 in 2006. The moose decline has also been halted, and recovery is under way. The 2008 preliminary harvest of moose is the highest it has been since 1999.

## *FURBEARERS*

**STATUS:** Furbearer populations in Units 11 and 13 fluctuate annually and are monitored by trapper questionnaires, field observations, and harvest reports from sealing records. Hares declined to a cycle low in 2001 and 2002 but have been increasing ever since. The Unit 13 lynx harvest has increased from a cycle low of 42 in 2002 to 499 in 2007. Unit 11 shows a similar trend with only two lynx taken in 2002 and 192 in 2007. Lynx track surveys and percent kittens in the harvest also suggest an increase in the lynx population. Wolverine, beaver and otter harvests fluctuated, and may reflect trapping effort and conditions rather that abundance, as no population trends are evident. The harvest of unsealed species such as fox, coyote, marten, and mink are unknown, however anecdotal information suggest these populations are healthy, especially coyotes. Reports of packs of up to five coyotes hunting together are common. Responses to the trapper questionnaires concerning furbearer abundance also suggest yearly fluctuations, and no trends are evident for the furbearers that are not sealed.

**MANAGEMENT/RESEARCH ACTIVIES:** Lynx track transects established in 1988 are flown annually when snow conditions permit. Results from these surveys are combined with indices of hare abundance, total lynx harvest, percent kittens, trapping effort data, and the price of fur in the harvest tracking strategy to determine lynx seasons on an annual basis. Populations of other furbearers are monitored with trapper questionnaires, sealing records and anecdotal information.

**ISSUES:** The high cost of equipment and fuel, low fur prices, and the increase in private property in the basin have contributed to declining interest in trapping remote portions of the unit. While a few young trappers are getting involved, they are concentrated along the highway and on accessible public land. When fur prices increase we see increased effort, but it is usually along the road system and conflicts amongst trappers increase. The impact of increased recreational snowmachining is also negatively impacting trappers as recreationists follow trapping trails particularly late in the season, disturbing sets and in some cases stealing fur.

## *SMALL GAME*

**STATUS:** Spring breeding counts for ptarmigan along the eastern Denali Highway showed an increase in birds between 2002 and 2006. Unfortunately, following the 2006 counts, a very late (June 20) snowfall of 8–12 inches throughout the high country resulted in a loss of birds. Ptarmigan numbers have remained low the last two years, and in 2008 only willow ptarmigan were detected (no rock ptarmigan). Another cold late spring with snow fall after the hatch occurred again in 2008, and is thought to have resulted in high brood mortality. Hunter reports this season suggest ptarmigan numbers are the lowest in years. Observations during unrelated early winter aerial surveys also suggest ptarmigan numbers are low. Spruce and sharp-tail grouse sightings also decreased, as did birds bagged by hunters. Ruffed grouse have been increasing along the Richardson Highway and the Copper River for the first time in recent history. The last hare cycle crash was in 2001 and we are currently near or even a little past the peak of the current cycle. Related increases in raptors are also likely impacting ptarmigan and grouse.

**MANAGEMENT ACTIVITIES:** Ptarmigan breeding activity is being studied to determine if yearly abundance indices can be obtained. Snowshoe hare pellet transects are conducted by National Park Service biologists in Unit 11, and the cycle has correlated well with lynx harvests.

**ISSUES:** Recreational snowmachine use in important habitat around Cantwell, Paxson, and Eureka has increased dramatically in the last 15 years. The effect on ptarmigan breeding activity and overall abundance is unknown. Snowmachines are being used to hunt ptarmigan in areas that used to be considered refugia, and the winter harvest pressure is considered high. The reason for the increase in ruffed grouse in the habitats along the Copper River is unknown, but a welcome event.

# GAME MANAGEMENT SUBUNITS 14A, 14B, & UNIT 16

# Matanuska and Susitna Valleys

**Area Biologist: Tony Kavalok, Palmer**
**Assistant Area Biologist: Tim Peltier**

## *DESCRIPTION*

Subunits 14A, 14B, 16A and 16B encompass almost 17,000 square miles, including the lower drainages of the Matanuska and Susitna rivers, the west-side drainages of Cook Inlet north of Redoubt Creek, and Kalgin Island. It is primarily boreal forest surrounded by the mountains of the Chugach, Talkeetna, Alaska and Aleutian ranges and the coastal marshes of upper Cook Inlet. Large areas of black spruce muskeg break up the dominant stands of mixed white spruce and paper birch forest types. The Alaska Railroad and two major highways pass through portions of 14A, 14B and 16A. Subunit 16B, covering more than 10,405 square miles, is accessible only by boat or aircraft except during winter when rivers are frozen. The human population of the Matanuska-Susitna Borough is estimated at more than 80,000 and has increased almost 24% since 2000. It is the fastest growing region in the state. A portion of Subunit 16B southwest of Beluga River and Beluga Lake is in the Kenai Peninsula Borough and includes the communities of Tyonek and Beluga.

The bulk of the human population resides in subunit 14A around Wasilla, Palmer, Houston, Big Lake, Butte, Sutton, Chickaloon and Willow. These have been called ‘bedroom’ communities for some residents employed in Anchorage, but there is a growing urban infrastructure and a business community becoming more prominent in the Palmer and Wasilla areas. Outside of the developed areas, there are numerous remote cabins accessible only by boat or aircraft. The economy in 14A is based on services supporting a mix of all other industries of the state. The construction industry is one of the major employers in the area. Local resource-based industries include gas exploration and development, gold and gravel extraction, timber harvest, commercial fishing, guiding, tourism and outdoor recreation. Agriculture remains an important land use in some road-accessible areas. The Point MacKenzie agricultural project in the southern portion of the subunit has developed into a large area of early successional stage deciduous trees, attractive to wintering moose. In adjacent subunits, tourism, commercial fishing, guiding and gas, mineral and timber extraction support the economy.

The climate in this area is transitional from coastal to interior and snow depth can vary substantially within the area. The eastern two-thirds of 14A commonly has low snow accumulation. When combined with significant amounts of forest disturbance, this area serves to attract wintering moose in close association with the human population. Farther north and west snow accumulation can be much greater, seriously impacting ungulate survival.

Land ownership is primarily state, borough and private, but Unit 16 also includes parts of the Denali and Lake Clark national parks and preserves. The only management unit in the Palmer area designated by the Boards of Fish and Game for priority subsistence use is 16B. Proximity to a large segment of Alaska's human population, combined with the requirement to mesh seasons and bag limits for subsistence and non-subsistence uses, complicates wildlife management programs. Federal hunting and trapping regulations allow local residents additional harvest opportunity.

## *BLACK BEAR*

**STATUS:** Since the late 1990s in much of Units 14 and 16 black bear numbers appear to have stabilized or increased. Recent warm summers coupled with good berry crops, better than average fish runs and excellent forage production have produced favorable conditions for bears. During 2000-2007, the average annual hunter harvest was for 14A, 76 (37% females); 14B, 28 (24% females); 16A, 71 (35% females); and 16B, 180 (27% females). An average of three bears in 14A and one bear in 14B annually are reported as non-hunting mortality. In Unit 16, one or two bears annually are reported as non-hunting mortality.

**MANAGEMENT/RESEARCH ACTIVITIES:** We monitor harvest through sealing. Nuisance bear reports are addressed as they occur, although we encourage preventive methods to deal with nuisance bears. In order to reduce nuisance and DLP calls in 14A, the Board of Game extended the season to year-round in 2003. Hunters who use hounds or bait to hunt black bears are required to have a permit and are closely regulated. We conduct black bear baiting education classes that cover bear biology and management, hunter ethics and regulations. In the spring of 2007 we conducted a line transect bear density study to help quantify bear populations in 16. As a result of that work we estimate that there are approximately 1,900 black bears in 16B.

**ISSUES:** The population of moose remains low in Unit 16 and it is believed that the failure of moose to recover in the unit is due in part to black bear predation on calves in the spring. Black bear bag limits and harvest opportunities have been increased to reduce the population. Indicators of a population reduction such as a decrease in skull size, or an increase in the amount of females in the harvest, have not been demonstrated in Unit 16. Therefore it is believed that liberalizing season and bag limits alone has not had the desired effect. Beginning in the fall of 2007 we implemented a black bear control program in Unit 16B and a portion of 16A. At this point the control program has not directly resulted in a significantly higher take of black bears in the unit.

## *BROWN BEAR*

**STATUS:** Densities are stable or slightly decreasing. While the density in highly settled 14A appears lower than adjacent subunits, good brown bear numbers can be found in most areas. There had been relatively few "problem bears" until recent years when interactions with humans appear to have increased. During 2000-2007 hunters harvested an annual average of 19 brown bears (36% female) in Unit 14, and an additional three

bears annually in non-hunting mortality. During the same period in Unit 16 the annual harvest average was 102 brown bears (31% females) and two annually in non-hunting mortality.

**MANAGEMENT/RESEARCH ACTIVITIES:** We monitor harvest through sealing and address nuisance bears as they occur. We resist moving problem bears. Brown bear population estimates from line transect surveys completed in 2000, 2001, and 2003 along with estimates from other sources place the brown bear population at 100 – 170 for Unit 14, and 700–1,325 for Unit 16.

**ISSUES:** Brown bear densities seem to be near the social carrying capacity for residents of these game management units. Bear predation on moose calves, especially in Unit 16B, is possibly a significant factor in moose survival. In 2003 and 2005, brown bear hunting regulations were liberalized by the Board of Game in 16B. Bear-viewing is growing more popular and several opportunities exist for air taxis and tour operators on the west side of Cook Inlet. Liberalized hunting seasons in these areas create conflicts between user groups. In 2003, the Board of Game delayed the brown bear opening date to Sept. 15 within one mile of Wolverine Creek in order to reduce some of this. Conflicts continue between anglers and bears. As fishing opportunities are identified and exploited, bears attracted either to the good fishing or availability of human-caught fish or their parts become vulnerable to DLP mortality and illegal harvest. Some air taxi operators are exploiting both the fishing and bear-viewing opportunities, while anglers and bear-viewers are unprepared for conflicts with bears and other users.

## *CARIBOU*

**STATUS**: There are two caribou herds that use some portion of Units 14 and 16. The Rainy Pass Herd seasonally resides in western 16B and a portion of the Nelchina Herd remains in the Talkeetna Mountains in Units 14A and 14B. During 1997 we conducted an aerial survey of a major portion of the Rainy Pass caribou range and estimated the herd at 1,750-2,000. The herd has declined since that survey and has not recovered. Region III staff has primary management responsibility for the Rainy Pass herd and has limited information on its status. On average seven caribou have been taken per year for the last three years.

Although considered a sub-herd of the Nelchina, the Unit 14 caribou are believed to remain year-round and are managed separately. We conducted a basic count in June 2005 and came up with 201 animals. We believe numbers peaked in the mid-1990s, and during the late 1990s numbers appeared to decrease, probably in response to increasing wolf numbers coupled with tough winter conditions. The Board designated 14B a “non-subsistence area” so hunting caribou is by drawing permit. Prior to 1993, Tier II hunters reported up to 35 caribou taken in Unit 14B. Initially we issued 40-60 drawing permits and hunters took an average of six caribou. Beginning in 1995 we issued 100 permits and, between 1995-2001, allowed approximately 14 caribou (42% female) to be taken annually. We reduced the number of permits to 60 for the 2002 season. From 2002 to 2007 an average of 27 hunters took an average of 11 caribou annually.

**MANAGEMENT/RESEARCH ACTIVITIES:** Only recently have we tried to quantify caribou in these areas. No previous systematic surveys of either herd had been documented. Harvest monitoring by permit and harvest ticket reports continue.

**ISSUES:** There continue to be low harvests in 14B and 16B. The status of the main Nelchina herd drives management and harvest in 14B. Until unique calving, rutting and wintering ranges are verified for the resident animals, it is unlikely major changes will occur to our management strategy. The reported decline of the Rainy Pass herd prompted reduction in season length during 2000. Radio-collaring cows from both herds would allow a more accurate assessment. Time and budget limitations have made such work a low priority.

## *MOUNTAIN GOAT*

**STATUS:** In 2006 in the Chugach Mountains portion of 14A we observed 131 goats, of which 22% were kids. In 2004 we located 158 goats with 25% kids. The population may be increasing from 2002 when we reported observing 135 goats with 22% kids. Surveys completed in the summer of 2008 placed the Chugach goat population at 215 animals with 21% kids. The population continues to remain above the minimum objective of 60. During 2000-2006 hunters reported an annual average harvest of 11 goat units (nannies count as two goats, therefore the actual number of goats taken in a given year may be slightly less). Action by the BOG in 2007 changed the Chugach goat hunt from a registration to a draw hunt. Two billies and a nanny (four goat "units") were taken in the first draw hunt in fall 2008. Our last complete survey of goats in the Talkeetna Mountains portion of 14A in 1998 revealed 17 goats. We believe densities remain low in this area. The population objective is a minimum of 50 goats before hunting is recommended.

**MANAGEMENT/RESEARCH ACTIVITIES:** We attempt to survey all goat range on a three-year cycle. Surveys are often conducted with sheep surveys. Maximum allowable harvests are adjusted to the most recent survey results and apparent trends. Maximum allowable harvest is generally 6-7 percent of the most recent observed number of goats. We monitor harvest through registration permit reporting.

**ISSUES:** Given the recent survey data and the harvest under the new Chugach drawing permit hunt, we may be able to increase permit levels in the future.

## *MOOSE*

**STATUS:** We estimate approximately 13,000 moose within these units. This figure was calculated from surveys completed in 2005 and 2008. Surveys were not completed in 2006 or 2007 due to inadequate snow conditions. Population objectives include post-hunt bull:cow ratios of 20-25:100 on the mainland and 15-20:100 on Kalgin Island. Units 14B, 16A and 16B are below current overall population objectives, while 14A and Kalgin Island are at or above.

**14A:** During November 2008 this subpopulation, under good survey conditions, was estimated at 6,613 moose with 23 bulls:100 cows and 42 calves:100 cows. Winter calf

survival is generally 80 percent during mild winters and as low as 30-40 percent during deep snow winters. The current post-hunt population objective is 6,000-6,500. This subpopulation is managed with a lengthy spike-fork/50 general season and antlerless permit hunts. During 2000-2008 the annual harvest averaged 351 bulls. Additional female harvest was allowed when surpluses were identified and ranged from 30 in 2001 to 212 in 2002. Trains and highway vehicles kill 100-300 moose annually within 14A, although 375 were reported killed on the highway in 2003-04. Between 40 and 50 percent of the vehicle fatalities tend to be calves. At least eight packs of wolves and low-density black and brown bear populations affect recruitment.

**14B:** This unit was flown in 2005. The current estimate of the population is 1,412 with 30 bulls and 16 calves:100 cows. The post-hunt objective is 2,500-2,800. This subpopulation has failed to recover from the deep-snow winter of 1989-90 when the number dropped to 1,700. Eight to 10 wolf packs and black and brown bear predation are factors influencing calf survival and recruitment. During winter 1989-1990 trains and highway vehicles killed more than 400 moose within the subunit. In recent years railroad kills dropped to 20-100 in 14B. During 2000-2008 hunters reported harvesting an average of 55 bulls during the general season.

**16A:** This unit was also surveyed in 2005. The subpopulation was 1,619 with 22 bulls and 19 calves:100 cows during fall 2005. The post-hunt objective is 3,500-4,000. A series of deep snow winters 1989-94 in the northern third of the subunit depressed the population for a number of years. It recovered to objective levels during 1997, but by 1998 wolf predation increased substantially. Predation by six to seven packs of wolves, both species of bears and the prolonged deep snow winter of 1999-2000 caused a 33% decline since 1997. Although only a few moose are killed each year by vehicles within the subunit boundaries, 16A moose wintering in 14A and 14B are at risk. During 2000-2008 hunters reported harvesting an average of 125 bulls between the general season and permit hunts.

**16B (mainland):** The subunit (excluding Kalgin Island) objective set in 1993 was 6,500 moose. This moose subpopulation probably had 12,000-16,000 moose during the early 1980s. Biologists identified a declining trend in the mid-1980s that has persisted. Deep snow winters during the early 1990s caused a steeper decline in northern 16B, and predation unit-wide had escalated the overall declining trend. This subpopulation was impacted by the 1999-2000 winter, which further reduced moose numbers north of Beluga River. In the fall of 2008 we were able to conduct full surveys in the northern and middle portions of the unit, and a trend survey in the southern portion of the unit. We believe there are about 4,300 moose in GMU 16B. North of the Skwentna River we estimated 917 moose with 58 bulls and 12 calves:100 cows. Between the Skwentna and Beluga rivers we estimated 2,446 moose with 54 bulls and 21 calves:100 cows. This is the primary source of harvest during the Tier II any-bull permit hunts as reflected by the lower bull:cow ratio. South of Beluga River we estimated approximately 960 moose and our counts of a portion of the area showed 78 bulls and 18 calves:100 cows. Significant predation level by wolves in previous years has depleted the adult segment. The entire subunit of 16B is managed under the Tier II system. Hunters of mainland 16B reported harvesting 83 bulls in 2003, 85 bulls in 2004, and 61 in 2005 during the general season. This season was closed in 2001, 2002 and 2006 through 2008. During 2000-2007 an average of 88 moose were taken by Tier II permit hunters.

**Kalgin Island:** This 23-square-mile island has moose as the result of an introduction of calves during the 1950s. Due to the lack of predators, hunter harvest and winter mortality are the primary influences on numbers. In the early 1980s, this population grew to an estimated density of seven moose per square mile, which was beyond carrying capacity. High hunter effort was effective at reducing the density, however during 1998-99 this population again reached high numbers prompting a liberal, any-moose registration hunt. In 2007 we observed 118 moose with 42 of which were calves. The average harvest from 2001 to 2007 has been 37 moose.

**MANAGEMENT/RESEARCH ACTIVITIES:** Weather permitting, we conduct annual aerial moose surveys within 14A, 16B south of Beluga River and on Kalgin Island, while the remaining subpopulations are surveyed once every third year. Since 1993 harvest has been regulated through spike-fork/50 antler restrictions and limited any-bull permits to meet population composition objectives. Surplus cows have been harvested in 14A and on Kalgin Island to manipulate population size. The spike-fork/50 rule has been applied to all fall hunts, except on Kalgin Island. Kalgin hunters could take any bull, and beginning in 1999 they could take any moose. The surplus of bulls suggested by higher-than-objective bull:cow ratios was addressed by any-bull permits, either by drawing permit in 14A, 14B and 16A or by Tier II permit in 16B. Recently the any-bull permits were replaced with a longer spike-fork/50 season. Opportunity is maximized in 14A and 14B by an early season archery-only hunt and in these subunits. To meet harvest desires of subsistence hunters, long winter Tier II permit seasons for any bull are offered in 16B.

In past years, small habitat plots have been mechanically manipulated in 14A and 14B. A 1993 controlled burn returned 900 acres of 14A black spruce to early successional stages. During June 1996, approximately 38,000 acres burned in 14A during the Miller's Reach wildfire. A 6,500-acre controlled burn for 16A, scheduled since 1994, was postponed indefinitely as a result of the Miller's Reach fire. That proposed controlled burn remains a high priority when conditions, funds and public support are favorable. Recent aspen stand manipulation on the Matanuska Moose Range in 14A to benefit grouse will also improve moose browse quantity and quality. Up to 75 radio collared cow moose have been monitored for the last four years to evaluate reproduction and survival in conjunction with the wolf control program started in December 2004 in Unit 16B.

**ISSUES:** The winter of 1999-2000 developed into a prolonged, deep-snow winter north and west of Willow, adversely affecting moose subpopulations in 14B, 16A and 16B north of Beluga River. Combined with record wolf numbers, the winter produced substantial reductions in moose numbers. The 16B-mainland moose population has declined an estimated 70% since 1980 and is now 30% or more below minimum objectives. While a small surplus of bulls currently exists, poor recruitment over the past 5-7 years has limited the potential for future surplus.

Hunters in 14B and 16A report declining numbers of bulls available for harvest. This may be due to reduced populations and changes in access to moose hunting areas. Late season hunts, when snow is on the ground, is seen by many as promoting snowmachine harassment of moose. There is evidence that moose have been forced from traditional post-rut/early winter range by rapidly increasing use by snowmachines. Although there

are no late-season general hunts at this time, the Tier II moose hunts in 16B are currently conducted through the end of February.

Despite substantial declines in some area subpopulations, both Kalgin Island and portions of 14A have high moose densities that threaten moose habitat viability. With the growth in the human population in the valley, loss of habitat and migration corridors, and increased vehicle traffic killing more moose, population objectives may have to be re-evaluated in the near future. Cow moose harvest is a necessary management tool to address some of these issues despite local opposition. Chickaloon Native Village chose to close all their village lands to moose hunting during 2000-2001. Future closures may confound attempts to maintain healthy moose densities in the Matanuska River Valley.

## *SHEEP*

**STATUS:** Numbers in the Talkeetna Mountains declined an estimated 40 percent as a result of the winter of 1999-2000. Also, poor lamb survival was reported in 2000. Based on the surveys conducted in the Unit 13 portion of this range and information from pilots and hunters, we believe the population has stabilized since then. We estimate that the portion of the Talkeetna Mountain population within 14A and 14B is now 300-400 sheep. The average harvest of sheep in the 14A & 14B portion of the Talkeetnas from 2000 to 2007 was 18 rams.

The sheep population in the Chugach Mountains has fluctuated from 907 in 1998, to 866 in 2002, to 509 in 2004, to 644 in 2006, to 751 in 2007. Based upon our observations, we believe the population is stable or slightly increasing. Between 2000 and 2007 hunters harvested 186 rams.

In July 1996 we estimated 1,100-1,200 sheep in the 16B portion of the Alaska Range between Chakachamna Lake and Dall Glacier and east of the Styx, Tatina and South Fork of the Kuskokwim rivers as part of a cooperative project with the National Park Service. Limited sheep surveys for this area conducted since 1996 indicate a substantial decline. Four of the survey areas went from 723 sheep observed in 1996 to 290 in 2003. We believe this decline is due to winter weather and wolf predation.

**MANAGEMENT/RESEARCH ACTIVITIES:** We survey at least part of the Chugach Mountain portion of 14A when budgets allow. In the Talkeetna Mountains we attempt to coordinate surveys with staff in Glennallen, and conduct surveys every 4-5 years. Some surveys are in conjunction with goat or caribou surveys. Mandatory sealing of sheep began in the fall of 2004. Numerous rams were measured and sealed from 14A and 14B and hunters and guides were asked general questions about herd history, location and numbers. We continue to monitor harvest and hunter effort via harvest tickets.

In 14A and 14B, hunter crowding and perceived harvest of sub-legal rams are issues of concern. Crowding seems worst in the eastern portion of 14A in the Talkeetnas and in certain drainages of the Chugach Mountains. Competition between resident and guided nonresident hunters is a growing issue. As a response to these issues in 2007 the BOG changed the Chugach portion of 14A from a general hunt to a draw hunt with no more than 10% of the available permits going to non-residents. In addition since there was

concern about harvest being concentrated on one age class, the legal bag limit went from one full curl ram to one ram of any horn size. This would result in a more equitable distribution of the size of rams in the harvest. Studies and conversations with numerous sheep managers have indicated that an any-ram drawing permit system will result in more trophy class rams and fewer law enforcement issues.

**ISSUES:** Lack of experience and/or sheep hunter education were identified as problems in evaluating legal rams. Numerous sheep measured that were sub-legal by size were legal by age. Hunters were often surprised at age and size determinations made by staff. Creating a draw hunt for the Chugach range has been perceived by some members of the public to shift hunting pressure to adjacent areas. As a result the public appears to be split between creating more draw hunting areas and reverting the Chugach range to the previous hunt strategy.

## *WOLF*

**STATUS**: Populations have been increasing since the early 1990s. The estimated wolf population in Unit 14A and 14B is 90 to 125. We estimated the spring 2008 (pre-pupping) wolf population in Unit 16 at 75 - 101. From 2000 to 2007 trappers and hunters reported taking an average of 23 wolves in Units 14A and B (range 11-32). In 16A and 16B hunters and trappers have reported taking 70 wolves from 2004 to 2007. Control pilots have taken an additional 167 during that same time period.

**MANAGEMENT/RESEARCH ACTIVITIES**: Observations by the public and biologists have been used to estimate pack size and distribution. Harvest is monitored through sealing records. In March 1993 we systematically surveyed most of GMU 16 to estimate a minimum population and help evaluate a new technique for estimating wolf numbers. During the 1998 outbreak of the dog biting louse on wolves in 14B and 16A, we gained useful insight into the actual population size and rapid growth of wolf numbers in the area. Palmer staff and others have been attempting to do an intensive wolf population survey in 16B since 2003. In fall 2004 same-day-airborne predator control program for wolves began in 16B. We continue to collect wolf numbers and pack information from wolf control pilots working with this program.

**ISSUES**: Substantial declines in moose subpopulation in 14B and 16 indicate wolves had a significant effect. A predator control implementation plan for 16B was adopted by the Board of Game in 2003. In December of 2004, wolf control for 16B was begun similar to the program started in Unit 13 in 2003. In spring 2006 the area was expanded to include part of 16A. This expansion allowed pilots to target wolf packs that were crossing into 16B.

## *FURBEARERS*

**STATUS**: Densities and trends are difficult to assess. Although track count transects were conducted periodically in 14A, 14B and 16A between 1991 and 1997, data were inconclusive. Some suggested a substantial increase while others indicated a decline. No track count transects have been completed since then. We believe lynx are currently increasing in most of the area. Beavers are abundant and river otters and mink and muskrat are common. Red foxes appear common to abundant, fluctuating with prey (and perhaps wolf) abundance. Coyote numbers appear to be up. Marten populations may have increased slightly in the past couple of years and are thought to be at their cyclic peak. Wolverine populations are stable at low levels, and occur primarily in mountainous habitat outside of the road accessible areas.

**MANAGEMENT/RESEARCH ACTIVITIES**: Trapper questionnaires solicit observations of fur populations and trends. Lynx, land otter, wolverine, marten and beaver must be sealed while harvest of other species is obtained through questionnaires.

**ISSUES**: With increasing beaver abundance and human development, the Board eliminated the bag limit in 1995 and lengthened the season in 1999 and again in 2003. Trapper interest in beaver is primarily market-driven, and nuisance complaints are common. Moose and pet dogs that are caught in traps and/or snares continue to be an issue with area residents. Others concerned about fish population management suggest that beaver are responsible for increasing northern pike populations, which is harmful to salmon and wish to decrease beaver populations. Lynx trapping is driven by a harvest tracking strategy approved by the BOG that allows season modification by DWC. This has worked well to provide flexibility in regulation. Staff workloads, emphasis on higher-profile species and loss of transects to rapid human development often precludes completion of track transects.

## *SMALL GAME*

**STATUS:** Hares and grouse probably peaked during 1999-2000 in 14A, but grouse numbers declined substantially. Ruffed grouse spring drumming counts in 14A were very low and then have rebounded to a limited extent during the last two seasons. Spruce grouse numbers have remained low in 14A for several years now. Ptarmigan densities are reported to be low, although some hunters report good numbers in certain areas and at certain times. Hunters report moderate numbers of grouse in the fall.

**MANAGEMENT/RESEARCH ACTIVITIES:** We conduct ground surveys along six drumming count routes in 14A for ruffed grouse during April-May. We also document tracks and bird numbers when we conduct furbearer track counts, although this has not been done for several seasons. Anecdotal information regarding snowshoe hare numbers is beneficial to directing hunters to specific areas depending on game availability.

**ISSUES:** Small game hunting opportunities are highly sought by hunters on the road-accessible portion of these subunits. Hunters tend to concentrate in 14A and 14B,

probably influencing local small game densities. No major peaks in small game population cycles had been observed in over 15 years, yet hare and ptarmigan seemed to have gone through a small peak. Lynx and coyote numbers appear to be coming up and loose pets in 14A also may be affecting small game population dynamics.

# *SPECIAL AREAS*

### *State Refuges and Critical Habitat Areas*

**STATUS:** There are no controlled use areas or closed areas in 14A, 14B, 16A and 16B. We have one moose range and three critical habitat areas in these subunits. The Alaska Legislature created the Matanuska Valley Moose Range in 1984. The purpose of the moose range was to maintain, improve and enhance moose populations and habitat and other wildlife resources of the area and to perpetuate public multiple use of the area. A management plan was written for the Matanuska Valley Moose Range in 1986.

There are three State Critical Habitat Areas; Redoubt Bay CHA (created in 1989), Willow Mountain CHA (1989) and Kalgin Island CHA(1972). A management plan exists for Redoubt Bay Critical Habitat Area (1994). Willow Mountain Critical Habitat Area and Kalgin Island Critical Habitat Area have no plans.

In addition to the Critical Habitat Areas and the Moose Range, there are four State Game refuges (SGR) in this area. The Palmer Hay Flats SGR was created in 1975 and expanded in 1985 with the purpose of protecting fish and wildlife habitat (especially waterfowl). The Trading Bay SGR was created in 1976 to protect fish and wildlife habitat and to provide public use in a high quality environment. The Susitna Flats SGR was created in 1976 also to protect fish and wildlife habitat and to provide public use in a high quality environment. The Goose Bay SGR was created in 1975 as a waterfowl refuge.

**MANAGEMENT:** Refuge management staff has made efforts to contact landholders adjacent to and within the Palmer Hay Flats to solicit land conservation and protection through various means. We are working with the Ruffed Grouse Society and Division of Forestry to develop and enhance habitat for grouse (and moose) within the Matanuska Valley Moose Range. To date more than 441 acres have been cut for habitat improvement. We intend to continue this project on the Moose Range as long as suitable stands of aspen and funding allows.

**ISSUES:** Management plans are needed for Willow Mountain and Kalgin Island Critical Habitat Areas and Goose Bay SGR. The Willow Mountain CHA was established to protect moose during the critical post-rut period, but stipulations prevent any regulatory action before a plan is adopted. Snowmachine and ORV (specifically ATVs) activity has increased to the point that moose distribution is being influenced. There is a lack of information available for the Kalgin Island CHA. Development adjacent to the MVMR and increased popularity of the area for recreation has reduced the area's value as moose habitat, particularly as winter range. Modifications to the MVMR plan may be necessary to maintain the value of the area as moose habitat.

# GAME MANAGEMENT SUBUNIT 14C

# Anchorage Area

**Area Biologist: Rick Sinnott**
**Assistant Area Biologist: Jessy Coltrane**

## *DESCRIPTION*

Game Management Subunit 14C encompasses about 1,900 square miles, including all drainages between the Knik River and Turnagain Arm in upper Cook Inlet. The area is dominated by Anchorage, with approximately 40 percent of the state's population. Chugach State Park, approximately 700 square miles, is a refuge for some wildlife species (notably brown bears and wolves) and preserves a variety of outdoor recreational opportunities (including hunting) for local residents and nonresidents.

The state park, two military installations, and a state wildlife refuge surround the most urbanized portion of the unit, the Anchorage Bowl. These large blocks of natural habitat support populations of moose, bears, wolves and other wildlife. Wild animals are valuable components of the natural areas, appreciated by nearly all residents as symbols of Alaska. But when they cross the invisible line into the city these same animals can become nuisances and hazards. Wolves, bears, coyotes, and moose kill and injure pets. Bears threaten humans in suburban neighborhoods. Moose eat hundreds of thousands of dollars worth of landscaping annually, charge people, and are hit by vehicles. Flocks of Canada geese collide with airplanes and carpet athletic fields with droppings. Wildlife management in the Anchorage area is a balancing act. Any effort to maintain or increase the populations of these species outside of the Anchorage Bowl is likely to maintain or increase the number of wildlife nuisances and hazards. Efforts to decrease wildlife populations in the Anchorage Bowl may decrease hunting and wildlife-watching opportunities in the city and adjacent areas.

Anchorage residents tend to reflect attitudes of urban dwellers in other states: many are non-hunters who tend to anthropomorphize wildlife, and some support animal rights. Anchorage also has more hunters than any other community, due to its sheer size. Most Anchorage hunters want to maintain or increase, where feasible, hunting opportunities near Anchorage. But creating new hunts in or near the Anchorage Bowl can be difficult because of extensive private property, public safety concerns, the popularity of wildlife viewing, and some anti-hunting sentiment. Park visitors and local residents want to see bears and moose, and viewing opportunities could decline in areas opened to hunting.

Because of urbanization and the presence of Chugach State Park, we can't always employ the usual tools of wildlife management. For example, aerial surveys and controlled burns are impractical in urban areas.

## *BLACK BEAR*

**STATUS:** An estimated 250-300 bears inhabit the unit, and the population appears to have increased in recent decades. Hunters harvest only 20-40 black bears annually, primarily because black bear hunting is not allowed in most urban areas, the military reservations, and portions of Chugach State Park, and baiting is prohibited throughout the subunit. Defense of life or property (DLP) shootings increased substantially in the late 1990s and have remained high. In the past decade (1999-2008) about 10.7 black bears have been shot annually in DLP, with a record high of 21 bears in 2008.

**MANAGEMENT/RESEARCH ACTIVITIES:** Most management activities are either information/education or enforcement related. Food-conditioned black bears cause most of the wildlife-related problems in the Anchorage area. Area staff works extensively with other agencies, education specialists and the media to convince people to keep bears out of garbage, pet food and bird seed.

In 2002 we created the Anchorage Bear Committee (ABC), an interagency task force that includes the city, Anchorage Police Department, Chugach State Park, the two military bases, state troopers, Bureau of Land Management (BLM), U. S. Forest Service, and the largest waste management company in the state. The ABC, and the department in consultation with the ABC, have created 1) a brochure that illustrates areas in Anchorage where people often encounter bears and recommends ways to minimize problems; 2) other bear-safety brochures; 3) several school programs on bears and bear safety; 4) a website that provides information on bear safety, bear deterrents and bear-resistant containers; and 5) a set of land-use guidelines to the municipality to conserve bear habitat, reduce the number of bear problems and DLPs, and minimize risks to human safety, particularly in neighborhoods and parks.

Enforcement activities include responding to problem bears and citing people, usually for negligently attracting bears with garbage, pet food or bird seed.

**ISSUES:** Despite our best efforts, black bears are a growing problem in Anchorage residential areas and city parks. Subdivisions are expanding rapidly into bear habitat adjacent to Chugach State Park. Large lots and dense natural vegetation allow bears to use these subdivisions relatively undetected. Most residents are careless with garbage and pet food, even when they know bears have been seen in the area, or despite having experienced bear problems in previous years. Bears also eat birdseed from the thousands of bird feeders in Anchorage. Responding to public complaints, shooting, and capturing black bears takes a considerable amount of staff time. Each summer, we receive hundreds of calls about black bears in town. Most of these complaints are generated by people negligently leaving garbage, birdseed or pet food unsecured in a manner which attracts bears.

When bears are not hunted, and particularly when human foods are easily obtained, some bears are likely to adapt to the presence of humans. From 1974 to the late 1990s bear hunting was increasingly restricted in the Anchorage area. Although this is not the primary reason for increasing bear problems in urban areas, it is a contributing factor. In

addition to information, education, and enforcement, we have attempted to provide more hunting opportunity, especially for local residents, in areas where bears can be hunted safely. In the past decade, the Board has created two registration hunts for black bears in the upper Eagle River valley and established a black bear hunting season in most of the Chugach State Park Management Area. We are working with natural resources staff on Elmendorf AFB and Fort Richardson to allow bear hunting on the military reservations. There are no proposals to change black bear hunting regulations in the unit.

## *BROWN BEAR*

**STATUS:** Based on a minimum count (using DNA obtained from hair samples), available habitat, and anecdotal information, the unit has at least 65 brown bears. The population is robust and has probably increased in recent decades, although the increasing human population, particularly those using local parks, probably accounts for most of the increased sightings. While most of the bears likely den in Chugach State Park, they are attracted to salmon-spawning streams in lowland areas, primarily in the Anchorage Bowl and Eagle River valley, where most of the people live or recreate. Salmon are a critical resource for brown bears in Southcentral Alaska.

In the past decade (1999-2008) about 2.3 brown bears have been shot annually in DLP, with a record high of 4 bears in 2004, 2005, and 2007. Road kills have also been increasing. For example, a record four brown bears were killed by vehicles in 2008. Adding traffic mortality to three DLPs and two cubs captured and transferred to a zoo resulted in a record high non-hunting mortality in the unit.

**MANAGEMENT/RESEARCH ACTIVITIES:** Bear sightings in neighborhoods and parks are monitored and we advise BLM, city parks and recreation, the military reservations, and Chugach State Park when areas should be posted or closed due to bear activity. Relocating bears is no longer an option, because adjacent game management units have active predator control programs or are experiencing their own urban bear problems. In spring, when brown bears kill many moose calves in neighborhoods, we remove carcasses to keep the bears from defending food caches and encourage them to move out of populated areas. In 2005, Dr. Sean Farley began placing GPS collars on brown bears in the Anchorage area with funding from Elmendorf AFB and Fort Richardson. This collaring effort has provided valuable data on movements of brown bears in and around urban areas, and accompanying research has established a minimum count of bears and confirmed the nutritional value of salmon in local bear diets.

In the late 1990s we commissioned a survey of wildlife-related experiences, attitudes, and preferences of Anchorage residents. Much of the focus of the survey was on brown bears and moose. The responses to the survey have guided our management decisions for the last decade; however, public experiences, attitudes, and preferences may have changed. We plan to conduct a similar survey this year.

**ISSUES:** Brown bears often are seen in outlying residential areas and in heavily used parts of Chugach State Park and Bicentennial Park. Unlike black bears, brown bears rarely spend time in neighborhoods looking for human garbage and pet food. Most of the reports are of brown bear sightings or bear-killed moose in town. Because the city's

neighborhoods and parks have engulfed salmon-spawning streams and lowland moose habitats, bear-human encounters have increased as bears are attracted into the city by moose calves and spawning salmon and as more people use the parks. All of the bear maulings in the Anchorage area have occurred in the last two decades. Three people were injured by brown bears and one person by a black bear in Anchorage in 2008. This was an unusually high number, constituting half of the people mauled in the Anchorage area in the past decade. We do not believe that the increased maulings in 2008 reflects more bears in the population as much as it does more people using the parks, more habituated bears, and faster recreational activities (e.g., running, biking) which create more surprise encounters.

In the past the subunit's brown bear population estimate was lower, with some risk of over-harvest due to increasing DLPs and roadkills. With the new information on minimum bear numbers and increasing encounters in the Anchorage Bowl, we believe additional bears can be harvested by hunters without threatening the population. Before 2007 very little of the unit was open to brown bear hunting, and hunters seldom harvested brown bears. The Board established a drawing hunt for brown bears in Chugach State Park Management Area in 2007. In the first season, no bears were harvested. The number of permits will be increased, with the objective of reducing the bear population somewhat, and eliminating bold or unwary brown bears that are most likely to frequent areas used by Anchorage residents. Several department proposals also seek to increase the area open to brown bear hunting in the unit.

## *MOUNTAIN GOAT*

**STATUS:** The last aerial goat survey in Unit 14C was in 1994. We counted 619 goats and estimated a population of 750. At that time the population was increasing and expanding slowly westward into Chugach State Park. We no longer know how many goats are in the unit; however, the number of goats counted during sheep surveys has declined. Recent harvests have ranged from 20 to 30 goats, with about 80 percent billies.

**MANAGEMENT/RESEARCH ACTIVITIES:** Hunters are required to bring in horns for measuring and aging.

**ISSUES:** In recent years, most of the unit's harvestable surplus was taken in a couple of weeks by hunters with registration permits, necessitating emergency closures. Under this system, with many hunters and guides competing in the field for a limited quota, goat harvests exceeded the harvest objectives four years in a row. Last year a new strategy was employed -- a combination of early-season archery hunt, followed by drawing permit hunts, followed by a late-season registration hunt. The change spread the hunting effort, achieved the harvest objective, and resulted in greater hunter satisfaction. The Board will consider a proposal to return to the previous registration permit system.

## *MOOSE*

**STATUS:** The population doubled during the 1970s and 1980s. In the early 1990s it peaked at 2,000-2,200, probably well above carrying capacity. Since then, the population has suffered declines of greater than 25 percent during severe winters, primarily due to starvation and vehicle collisions. The population rebounds after milder winters; however, these have been outnumbered by severe winters in the past decade. The current population estimate is about 1,700, which is probably closer to the carrying capacity. In recent years, bull:cow ratios have ranged from 40-55 bulls per 100 cows and calf:cow ratios from 30-45 calves per 100 cows.

In most of the unit, hunting is by drawing permit only. In the last decade, the Board has increased hunting opportunity and harvests by establishing new hunts in the Anchorage Bowl, and any-moose drawing hunts and a late-season, any-bull registration hunt in the upper Ship Creek drainage. Recent harvests (2003-2007) have ranged from 83-116 moose (mean 105), exceeding the harvest objective.

In the last decade, more moose (about 155) were salvaged after vehicle and train collisions than were harvested by hunters in an average year. This figure is less than the actual roadkill, because some moose killed by vehicles are not found in time to be salvaged for human consumption. The winter of 1994-95 was the worst on record, with 239 documented road kills and 22 train kills, but the winters of 2001-02 and 2003-04 were nearly as bad.

**MANAGEMENT/RESEARCH ACTIVITIES:** Composition counts are conducted annually on less than one-fourth of the unit. An annual census is conducted on Fort Richardson and the Ship Creek drainage. As many as 1,000 moose winter in the Anchorage Bowl. Moose are frequently observed on school grounds or at school bus stops. Staff responds to several thousand calls annually, mostly by giving advice over the phone, but also by shooting aggressive moose.

**ISSUES:** Many moose calve in the Anchorage Bowl and Eagle River area, where most Anchorage residents live. Young calves attract black and brown bears into local parks and neighborhoods, particularly in spring before salmon are available. Some local residents have suggested reducing the moose population to reduce the number of bears in the Anchorage and Eagle River areas. Reducing the moose population will reduce hunting and viewing opportunities.

Most Anchorage residents appreciate moose for hunting or viewing. As the Anchorage area continues to develop, moose habitat is being lost or altered. Fences block moose movements and separate cows from calves. New and improved roads are not providing adequate moose passage, which is increasing the number of moose-vehicle collisions.

The Board will consider two proposals to change the current moose hunting regulations and several antlerless reauthorizations.

## *SHEEP*

**STATUS:** The population doubled from 1980 to 1989. In the 1990s, winters with deep snow or heavy icing killed an estimated 150-500 annually, but aerial counts remained high, ranging from 2,000 to 2,400 sheep. The last complete aerial count, in 2004, found 1,685 sheep, down about 31 percent from the record highs in the late 1990s. Severe snow and ice conditions in recent years continue to reduce the population. Most of the decline has occurred in the northern portion of the unit. However, the number of full-curl rams has risen to 115, only half the number seen in the late 1990s, but rebounding somewhat from a low of 85 in 2002. Normally, lambs comprise about 13-22% of the population, and the 2004 count was at the low end. All hunting is by drawing permit. Concern over the potential for severe winter die-offs prompted regulation changes to better control the population. Demand for Unit 14C sheep permits is high. In 2007, 6,500 hunters applied for 344 permits (80 ewe-only, 129 full curl or ewe, 135 any-sheep archery only). The average annual harvest from 2003-2007 was 62 sheep.

**MANAGEMENT/RESEARCH ACTIVITIES:** Aerial surveys have been conducted in most years.

Several non-profit organizations have had enormous success in auctioning a Governor's sheep hunt permit at annual national conventions. Auctions have raised as much as $200,000 for a single Unit 14C permit. Much of the money is used to fund sheep research and surveys.

**ISSUES:** Drawing permits for Dall sheep in Subunit 14C have long been a successful program; however, recent severe winters have reduced the sheep population. We have eliminated all ewe-only permits and dropped the ewe harvest option from the full-curl ram permits. Like other parts of the state, there is competition between guides and resident hunters for Dall sheep. The Board will consider several proposals that seek to establish a nonresident quota for Subunit 14C drawing permits.

## *FURBEARERS*

**STATUS:** The beaver population is stable or increasing. Aerial and ground surveys in 1995 found 39 active colonies with an estimated 195 beavers. Since then new colonies have been established. A 1995 aerial survey estimated 27 wolves (in 4-5 packs). Two aerial surveys, in 1995 and 2008, have estimated 17-18 wolverines in the unit after the trapping season. Red foxes and coyotes seem to be increasing. Snowshoe hares are abundant this winter. The lynx population is also increasing. Very little trapping occurs in Unit 14C. A few trappers compete primarily for beavers and wolverines. From 10-50 beavers are harvested annually, up to half of them under nuisance permits. A few wolves, wolverines, otters, lynx, and marten are trapped, but not every species every year.

**MANAGEMENT/RESEARCH ACTIVITIES:** Pelts are sealed and data on location, harvest date, and sex and/or pelt measurements are collected. Numerous beaver complaints are resolved without on-site visits. If deemed necessary, volunteer trappers are issued depredation permits to take nuisance beavers.

**ISSUES:** Beaver damage and control are controversial in Anchorage. Most callers reporting damage in the Anchorage Bowl are satisfied with a policy of "live and let live" if the downed trees and flooding are on public property. Many residents don't want beavers harmed and are satisfied that we only respond when private property or public utilities are threatened. Wolves, coyotes, and foxes generate complaints every year when they kill and eat pets in town. However, there is also a great deal of public interest in wolves, coyotes, foxes, lynx, and wolverines and possible viewing opportunities. Many residents, particularly dog owners, are concerned about trapping near communities and along popular hiking trails. Trapping pressure is high for wolverines in the unit, considering the small population and limited opportunity for immigration. Many park users and other residents are concerned that wolverines might be over-harvested in Unit 14C. The Board will consider a variety of proposals that would restrict wolverine trapping, or all trapping, in Chugach State Park.

# GAME MANAGEMENT UNIT 17

# Northern Bristol Bay

### Area Biologist: Jim Woolington, Dillingham

## *DESCRIPTION*

Game Management Unit 17 is bounded by the Alaska Range on the east, the Kuskokwim Mountains on the west, and Bristol Bay to the south. It encompasses about 19,000 square miles, including the Nushagak, Mulchatna and Togiak river drainages, and the Walrus Islands. The eastern two-thirds of the area is tundra divided by large river valleys. The western side is mainly mountains and large glacial lakes. Approximately 5,500 people live in the area. The local economy is dominated by commercial fishing and government employment, however, subsistence activities are very important to local residents. A considerable amount of fishing and hunting by non-local people also occurs in the area. At present there are no active resource extraction activities for non-renewable resources in the area. However, there is extensive exploration for large-scale mining as well as plans for oil and gas exploration. Major land management areas include Wood-Tikchik State Park, Walrus Islands State Game Sanctuary, Togiak National Wildlife Refuge, and Lake Clark National Park and Preserve.

## *BLACK BEAR*

**STATUS:** We do not have much information about the population or trends. Local concerns about reduced numbers in the upper Nushagak River area were addressed in 1994 when the Board reduced the season and bag limit.

**MANAGEMENT/RESEARCH ACTIVITIES:** Most observations are obtained incidental to moose and caribou surveys and from reports by local residents, hunters, and fishermen. Mandatory sealing of black bear began in 1994. Each year between 10 and 20 black bears are reported killed in GMU 17. We have no research programs ongoing or planned.

**ISSUES:** Little information about black bear population in GMU 17.

## *BROWN BEAR*

**STATUS:** The population is likely stable to increasing. Brown bears are hunted by sport hunters and to a lesser extent by subsistence hunters. The past decade has seen increased hunting and harvest compared to previous times, however, abundant food and the remoteness of this large area has likely precluded any decline, and the population appears robust. Generally increasing salmon runs in to many of the river systems of GMU 17, as well as milder winters has likely been beneficial to bears in the region. Bears are

common near villages and fish camps. Bears frequently use the landfills at local villages and some routinely travel through residential areas. Though most local residents have been tolerant, bears are killed under defense of life or property each year.

**MANAGEMENT/RESEARCH ACTIVITIES:** We have no specific research activities to determine brown bear numbers for the entire unit. Population trends are based on incidental observations during moose and caribou surveys, input from local residents, hunters and fishermen, and from monitoring harvest data. We have been working with the Alaska Department of Public Safety and Dillingham police to investigate each DLP bear and most other encounters. We have also been working with local residents to install electric fence systems designed to keep bears from fish racks, garbage dumpsters, and outdoor home freezers.

**ISSUES:** The population is sufficient for the present season and bag limit. Incidental harvest of bears taken by hunters attracted to the area for moose and caribou hunting has contributed to the harvest, but the increase in registered big game guides in GMU 17 is likely the primary factor in reported harvests twice that of a decade ago. Moose and caribou hunters report problems with bears at camps and kill sites. Future regulatory changes for bear hunting will need to be carefully scrutinized in view of hunting activities for these other species, as well as concerns about predation on moose and caribou.

## *CARIBOU*

**Mulchatna Caribou Herd**

**STATUS:** The Mulchatna herd grew from 18,600 caribou in 1981 to almost 200,000 when it peaked in 1996. Since then the herd has decreased substantially and is no longer considered one of the larger in the state. Present estimates have it likely between 30,000 and 40,000 caribou. This herd has not followed any predictable movement patterns since 1993. Formerly wintering in the Mulchatna and Nushagak drainages, large numbers presently travel through parts of the lower Kuskokwim as far as the western coast of Alaska. Each year a large portion of the herd also winters on the eastern side of the herd's range. Hunter numbers increased steadily as the herd grew in size, popularity, and distribution. As the herd declined, so did hunting activity and reported caribou harvests. In 1999, the first year of harvest report card statistics, 4,039 hunters reported killing 4,467 caribou. By the 2007-2008 regulatory year, 1,084 hunters reported hunting for Mulchatna caribou, and reported killing 767 caribou, with an unknown amount of unreported harvest. As the area used by the herd increased with increased herd size, so did utilization by hunters in different areas. As the herd size declined, the area used by the herd has not. During the past several fall and winter hunting seasons, Mulchatna caribou have been widely scattered throughout parts of GMUs 9, 17, 18 and 19.

**MANAGEMENT/RESEARCH ACTIVITIES:** We maintain radio-collars on female caribou to help document herd movements and locate them during calving surveys, photo censuses, and composition counts. Radio-tracking flights occur periodically. A photo census is scheduled every year, and composition counts are conducted each October. A project to study bull calf survival was started fall 2006.

**ISSUES:** As the herd's range expanded, management challenges increased. The unpredictable nature of this herd makes it difficult for hunters and air-taxi operators to plan trips. It also fosters numerous calls to the Dillingham office for the latest information. The large number of non-local hunters who staged out of communities in GMUs 9, 17, 18, and 19 when the herd was large gave some local economies a boost. With the decline in herd size and low bull:cow ratio, hunter numbers declined. Waste of game meat and other violations cited by troopers resulted in regulations which require meat be left on the bone prior to removal from the field. The decline in this herd resulted in regulation changes reducing the bag limit and season.

**Nushagak Caribou Herd**

**STATUS:** This herd began in 1988 when 146 caribou were captured near Becharof Lake and released on the Nushagak Peninsula south of Dillingham. DWC spearheaded the effort with cooperation from the USFWS, several villages and local residents to establish a herd for local residents to use as a source of meat. The herd grew to more than 1,300 caribou by the late 1990s, but has declined to a present population of about 600. Productivity and calf survival has remained high, and the decline is thought to be contributed to by excessive unreported illegal harvests and perhaps a skewed age ratio of old cows. Very limited movement by these caribou off the Nushagak Peninsula has been observed.

**MANAGEMENT/RESEARCH ACTIVITIES:** The herd is managed through a cooperative agreement between the Department, the USFWS, and representatives from local villages. The first hunt was allowed in 1995 by federal subsistence permit. During the past several years, no caribou have been reported legally taken during the federal hunt. Togiak National Wildlife Refuge funds most of the management and research, but we are active participants in field activities and management actions. We maintain radio-collars on several dozen female caribou and track them monthly. Censuses are conducted annually. Collaring and sex/age composition flights are conducted every year.

**ISSUES:** Cooperative management has been successful. We have an excellent relationship with the refuge staff and village representatives are partners in management and allocation decisions. Their involvement on the team not only assists us, but gives them better insight into why we make the decisions we do on other species and issues. The decline in herd size has emphasized the need for enforcement and is the subject of continuing discussion with the management team.

## *MOOSE*

**STATUS:** Moose are common near all of the villages in GMU 17, something unheard of 30 years ago. Unit-wide population estimation surveys have been completed only in recent years. Starting with essentially no moose in 17A during the early 1980s, the population in that subunit has grown to at least 1,100 (February 2008). The moose population in all of GMU 17 may be around 7,000 to 8,000. Many hunters were attracted to the area by the past liberal caribou hunting seasons. During the past several years more than 1,100 hunters per year reported hunting moose in 17B and 17C. The reported harvest increased from 127 in 1983 to a peak of 415 moose in 2003. In recent years, hunters in GMU 17B&C report killing between 350 and 400 moose year. Moose also are

taken by a healthy wolf population that has increased along with the moose and caribou. A registration moose hunt in 17A began in 1997, which was the first legal moose hunting season in that area since 1981.

**MANAGEMENT/RESEARCH ACTIVITIES:** Trend counts are an ineffective method of assessing moose populations in GMU 17 because of weather and moose movements. A large segment of the moose population does not move into post-rut or winter areas until forced by snow. During November and December, snow is usually scarce and often followed by strong, scouring winds. If we wait until January when moose are concentrated, most of the bulls have shed their antlers. Winter counts also are affected by snow depths, which are inconsistent from year to year. It seems the only way to assess population trends is by unit population estimation surveys. We have been able to do so each year in 17A. The first successful survey for the western part of 17B was conducted in March 2001, and repeated in 2006. The first successful survey for the eastern half of 17B was conducted in 2002. The first successful survey of 17C was conducted in 1999, and repeated in 2004 and 2008. Surveys for 17A and the eastern half of 17B are scheduled for this late winter. We are working with Togiak NWR staff on a moose movement and productivity study in 17A.

**ISSUES:** The moose populations in subunits 17A and 17C appear to be healthy, and much of that success can likely be attributed to winter conditions conducive to moose survival. Many reports are received of increased wolf numbers in 17B and 17C, and poor calf survival in 17B. If a series of hard winters occurs, or predation continues to increase, the population might be unable to support present hunting activity. Typically poor fall survey conditions prevent obtaining reliable sex and age composition information. We continue to work with Togiak NWR staff and local residents in a moose management strategy for 17A that has allowed continued expansion of moose and moose hunting opportunity.

## *FURBEARERS*

**STATUS:** Populations of most furbearers are likely stable or increasing. Red fox, coyotes, mink, marten, wolverines, lynx, and wolves are probably at moderate densities. Muskrats and arctic fox occur in low numbers. Beavers, formerly harvested in large numbers, are probably at record abundance. Land otters are common. Beaver Round-Up is the annual spring festival in Dillingham, a time when local trappers traditionally brought their pelts to be sealed and sold. The past several years have seen the lowest numbers of beaver sealed from GMU 17 since sealing was required in 1956. Wolves have been increasing for at least the past 15 years. Packs or tracks are commonly seen during moose and caribou surveys, with numerous reports by hunters and local air taxis. Most packs likely have defined territories and we have not seen evidence of them following caribou moving through the area. Harvests declined after the kill of 121 wolves taken in 1995 when same-day-airborne methods were legal, but have since increased to exceed former levels. The increasing harvest probably reflects an increase in the wolf population as well as increased interest by local residents. Harvest numbers are likely regulated by winter traveling conditions for hunters and trappers on snow machines, as well as fuel costs. Marten and wolverine are species for which we've seen increased harvest numbers in the past several years.

**MANAGEMENT/RESEARCH ACTIVITIES:** We collect population information by interviewing trappers, hunters, fishermen and local residents. We have eliminated aerial surveys of beaver caches because of the decline in trapping effort. No surveys for wolves or wolverine are conducted.

**ISSUES:** With current populations and pelt prices, we can safely support present seasons on furbearers. Beaver appear to be an underutilized resource, with limited trapping activity on an apparently abundant population. A substantial increase in the wolverine harvest following extension of the trapping season through March in 2003 has declined to former levels, with female wolverine a low proportion of the harvest.

## *WALRUS*

**STATUS:** The number of walrus using Round Island varies greatly both during the summer and from year to year. A summer visitor program has occurred on Round Island for more than 25 years. A fall walrus hunt on Round Island with permitted access for local villagers began in 1995. The current permit period is Sept. 10-Oct. 20, with a quota of 20 walrus struck or lost. There has been very good cooperation between hunters, USFWS, and ADF&G. Participation in the hunt by local villages has been low recently.

**MANAGEMENT/RESEARCH ACTIVITIES:** While ADF&G has management authority for the Walrus Islands State Game Sanctuary, research and management activities on Round Island have been shared with USFWS. In the past the federal government provided a biologist and half the cost of logistics for the summer field season. Beginning several years ago, the Department became solely responsible for providing staff, several volunteers when available, and logistical costs. Visitor services, trail and facility maintenance, and enforcement activities comprise the bulk of the work of the sanctuary staff. Ongoing research includes daily walrus counts and periodic sea lion counts. The hunt was initially monitored by ADF&G and USFWS staff, but that is now done by an employee of Bristol Bay Native Association in cooperation with the Eskimo Walrus Commission.

**ISSUES:** Reduced transportation options have caused problems for both visitors and staff, reducing the number of visitors and creating difficulties in supplying the staff.