

GAME MANAGEMENT UNITS 12 AND 20E

TOK AREA OFFICE

Area Biologist: Jeff Gross
Assistant Area Biologist: Jeff Wells (acting)
Seasonal Wildlife Technician: Bob Gingue
Seasonal Administrative Clerk: Tess Faulise

DESCRIPTION

GAME MANAGEMENT UNIT 12

Game Management Unit 12 is located along the Yukon, Canada border in eastern Interior Alaska. It measures approximately 10,000 mi², of which 9,000 mi² is wildlife habitat.

LAND OWNERSHIP: Over 80% of the land is managed by the National Park Service (Wrangell–St. Elias National Park and Preserve), the U.S. Fish and Wildlife Service (Tetlin National Wildlife Refuge) or is privately owned by Native corporations or villages. The Tok Management Area (TMA) is the only state special management area in Unit 12 and there are no controlled use areas. Approximately 2,000 people live in 6 communities and villages within the unit.

ACCESS: The Glenn and Alaska Highways, Nabesna Road, and the Tanana, Tok, and Nabesna Rivers are primary access routes into Unit 12. There are few trails suitable for off-road vehicles. Due to the combination of limited access and land owner policies, hunting pressure is low in most of the unit.

HUMAN USE: The Dall sheep population in Unit 12 is the most intensively hunted in the state. Guided nonresident Dall sheep hunting is common, but most moose hunting is by local residents (>70% of the hunters) who take >40% of the harvest. Trapping, primarily for marten and lynx is economically important.

FISH AND GAME ADVISORY COMMITTEES: Upper Tanana–Fortymile and Tok Cutoff–Nabesna Road Advisory Committees.

SPECIAL MANAGEMENT AREAS:

TOK MANAGEMENT AREA: The TMA was created in 1974 to provide sheep hunters with the opportunity to hunt large-horned Dall sheep under uncrowded conditions. It is one of the top 3 areas in Alaska in terms of Dall sheep horn growth, and hunt objectives were designed to enhance horn growth potential. The TMA is the only sheep hunting area

in Alaska specifically established for trophy sheep management. It is very popular among sheep hunters and is one of the most sought-after sheep permits in the state.

GAME MANAGEMENT UNIT 20E

Unit 20E is located north of Unit 12 along the Yukon, Canada border. It encompasses about 11,000 mi² of diverse wildlife habitat.

LAND OWNERSHIP: Most of the land in Unit 20E is in state (about 50%) or Native corporation (30%) ownership. State special management areas include the Ladue River and Glacier Mountain Controlled Use Areas. The remaining land is under federal management either within the Yukon–Charley Rivers National Preserve (National Park Service) or the Fortymile National Wild and Scenic River System (Bureau of Land Management.) About 220 people reside in the 3 communities in Unit 20E.

ACCESS: The Taylor Highway, several extensive off-road vehicle trails, and the Yukon, Charley, and Fortymile Rivers are the primary access routes in Unit 20E. Portions of central Unit 20E can be accessed by float plane. Most of western, eastern, and northern Unit 20E is inaccessible, except from a small number of landing areas.

HUMAN USE: Caribou in the Fortymile herd are the most sought-after wildlife species in Unit 20E. Moose hunting participation and harvest increased significantly between 2001 and 2003, exceeding historic records, but has since declined to levels observed during the 1990s. Trapping, primarily for marten and lynx is economically important. Grizzly bear hunting regulations have been liberal since 1981 in an attempt to reduce grizzly bear predation on moose and caribou calves.

FISH AND GAME ADVISORY COMMITTEES: Eagle and the Upper Tanana–Fortymile Advisory Committees.

CONTROLLED USE AREAS:

Glacier Mountain Controlled Use Area (CUA). The Glacier Mountain CUA encompasses about 600 mi² and was formed in 1971 to afford greater protection for the Dall sheep population on Glacier Mountain. Methods of access are restricted during August 5–September 20. Access was originally limited to walk-in hunters only. In 1981, the restriction on use of pack animals was eliminated. This CUA continues to provide needed protection for the Dall sheep population as originally intended, and more recently, has provided opportunity for walk-in hunters to hunt Fortymile caribou for a large portion of the fall season.

Ladue River CUA. The Ladue River CUA encompasses about 1,375 mi² and was formed in 1994 to afford greater protection to the low density (<0.5 moose/mi²) moose population. Motorized access is limited to designated trails and airstrips during August 24–September 20. The area is achieving its purpose of protecting this moose in this area from overharvest.

The board reduced the size of the LRCUA to 1,115 mi² during their March 2010 meeting. The Upper Tanana–Fortymile and Eagle Fish and Game Advisory Committees continue to support retaining the LRCUA for continued protection of the low density moose population.

During 2006–2012, the moose density in the LRCUA area averaged 0.57 moose/mi². Average ratios were 54 bulls:100 cows and 17 calves:100 cows. If the LRCUA was eliminated, additional trail pioneering is likely to occur and could lead to increased harvest pressure on this low density moose population. If harvest increases, additional season and bag limit restrictions could become necessary to maintain bull:cow ratios above the management objective of 40 bulls:100 cows.

Currently, moose hunting seasons and bag limits are aligned throughout Unit 20E. If season and bag limit changes resulted from elimination of the LRCUA additional hunter confusion is likely to occur.

BLACK BEAR

STATUS: Black bears are present in all suitable habitats in Units 12 and 20E. Based on limited radiotelemetry data collected in Unit 12 and other units with comparable habitats, the estimated black bear density is 1 bear/4–7 mi² of black bear habitat. The estimated number of black bears in Units 12 and 20E combined is 2,000–2,500. The black bear population is productive and the reproductive interval is similar to other Interior Alaska black bear populations. Historically, black bear harvest has been low in both units. The primary users in Unit 12 are local residents (>70% of the harvest) and primary users in Unit 20E are Alaska residents (>50% of the harvest). Local residents take black bears primarily during the spring for meat.

MANAGEMENT/RESEARCH ACTIVITIES: Harvest data are obtained through sealing of bears killed in defense of life or property and hunter-harvested bears. The impact of hunting black bears over bait is monitored through mandatory registration of all bait stations in combination with harvest tickets and harvest reports.

ISSUES: There are no biological or social issues at this time. Units 12 and 20E black bear populations exist at densities considered natural for Interior Alaska black bear populations and harvest and habitat are not limiting.

GRIZZLY BEARS

STATUS: Grizzly bear populations are estimated to be stable at 350–425 (46.6–56.7 bears of all ages/1,000 mi²) in Unit 20E and 320–394 bears (29.9–36.9 bears of all ages/1,000 mi²) in Unit 12. These estimates are based on the Department’s DNA-based mark–recapture surveys and extrapolations from point estimate surveys the Department conducted in Unit 20E and other units with similar type habitats, radiotelemetry data, and harvest statistics. Hunting regulations have been liberal since 1981 to allow hunters to take more grizzly bears in an attempt to reduce grizzly bear predation on moose calves. Strategies used to increase grizzly bear harvest and grizzlies killed in predation control programs include: 1) a public awareness campaign; 2) increased bag limit to 1 bear per regulatory year (1 July through 30 June) in Unit 12 and 2 bears per regulatory year in Unit 20E since regulatory year 2004–2005 (RY04; e.g., RY04 = 1 Jul 2004 through 30 Jun 2005); 3) lengthened seasons; 4) waived resident tag fee in Unit 20E during RY84–RY90 and RY02–RY09 outside the Yukon–Charley Preserve and waived tag the resident fee in all of Region 3 (including Unit 12 and 20E) starting in RY10 and 5) a grizzly bear predation control program in southern Unit 20E during RY05–RY08 that included baiting as a method for bear control permittees and allowed sale of untanned hides with claws attached and skulls as an incentive for the public to participate in the predation control program. In Unit 12, harvest declined in 1989 and remained stable (avg.=18 bears annually during RY89–RY12). In Unit 20E, grizzly bear take remained low (avg.=15 bears annually) during RY81–RY12 despite liberal harvest regulations and predator control efforts, and the population has not been reduced to levels adequate to increase moose calf survival. Grizzly bear harvest by hunters combined with predation control kills in Units 12 and 20E has been below maximum sustainable levels. Grizzly bears are a significant cause of moose calf mortality in Unit 12 and are an important factor limiting the Unit 20E moose population.

MANAGEMENT ACTIVITIES: Management activities include implementing the Unit 20E grizzly bear predation control program during RY04–RY08, monitoring grizzly bears killed, and evaluating data to track changes in bear numbers. A total of 14 bears were harvested and sealed in the Alaska Department of Fish and Game (ADF&G) office in Tok under this control program during the 5 years it was active. In 2006, ADF&G research staff conducted a grizzly bear population survey in a 2,005-mi² area in southern Unit 20E. In February 2009, we analyzed grizzly bear and moose population data in Unit 20E to evaluate the effects of bear densities on moose calf survival. No statistical relationship was found at current bear densities. The grizzly bear portion of the predation control program was suspended on July 1, 2009 because it was ineffective at reducing bear numbers. In 2012 the Board of Game passed a proposal to allow baiting of grizzly bears in Units 12 and 20E.

ISSUES: The Board of Game designated the Fortymile caribou herd and the moose populations in Units 12 and 20E as important for high levels of human consumptive use under the Intensive Management Law (AS 16.05.255(e)–(g)). This designation means that the board must consider intensive management if regulatory action to significantly reduce harvest becomes necessary because the population is depleted or has reduced

productivity. Past research has shown that grizzly bear predation is the primary cause of moose calf mortality in Unit 20E and would have to be reduced before the moose population could meet its population goals. Liberal grizzly bear harvest regulations since 1981 and the recent grizzly bear predation control program in Unit 20E have been ineffective at reducing the grizzly bear population enough to allow for increased moose calf survival.

CARIBOU

FORTY MILE CARIBOU HERD

STATUS: Historically, the Fortymile herd was one of the largest herds in Alaska. For over 70 years, it ranged between the White Mountains north of Fairbanks to central Yukon, Canada. Like most other herds in Alaska, it underwent changes in abundance and distribution throughout this period but maintained its use of Yukon, Canada and habitats near the Steese Highway. The Fortymile herd underwent a major decline in size during 1963–1973 to about 6,000 caribou. Following the decline the herd used less than 25% of its traditional range, stopped migrating across the Steese Highway, and rarely traveled into Yukon. Primarily due to favorable weather conditions, the Fortymile herd increased during the late 1970s and 1980s, but much slower than adjacent herds despite similar weather patterns. Range use did not increase during this period. Between 1990 and 1995, herd growth stabilized due to adverse weather conditions and predation, primarily by wolves. The herd increased 119% between 1995 and 2003, primarily due to favorable environmental conditions, wolf trapping, and nonlethal wolf predation control. During 2000–2009, the herd increased the size of its range, using historic range west of the Steese Highway during the fall and historic range in Yukon, Canada during fall and winter. During 2004 and 2005, the herd declined slightly, likely due to increased wolf predation and adverse weather conditions during both years. In 2006, good calf survival to autumn (34 calves:100 cows in October) and mild winter conditions allowed the herd to increase. Following a June 2007 photocensus, the herd was estimated at approximately 38,400 caribou.

Good calf survival to fall (37 and 33 calves:100 cows in October 2007 and 2008) and mild conditions in winter 2007–2008 allowed the herd to continue to grow. Following a July 2009 photocensus, the herd was estimated at approximately 46,500 caribou. Composition data from 2009–2011 indicate the herd likely experienced similar calf survival to fall as observed in 2006–2008. Following the July 2010 photocensus, the herd was estimated at 51,675 caribou.

MANAGEMENT/RESEARCH ACTIVITIES: During 1996–2000, the herd was managed under the Fortymile Caribou Herd Management Plan that was developed through a public planning process. This management plan included reduced harvest, nonlethal wolf control conducted by ADF&G and public wolf trapping. During 2001–2006, harvest was guided by the Harvest Management Plan developed by a coalition of 5 Fish and Game Advisory Committees (Central, Delta Junction, Eagle, Fairbanks and Upper Tanana–Fortymile) and endorsed by the board in spring 2000. The primary goal of

this plan was to manage for herd growth and secondarily to provide for increased harvest. During 2005–2006, these advisory committees developed a revised Harvest Management Plan that the board endorsed in March 2006 to guide harvest from fall 2006 through spring 2013. The plan was again revised in 2011–2012 that the board endorsed in 2012 to guide harvest from fall 2013 through spring 2019. The 2012 revision was developed by an international coalition (Harvest Management Coalition) of stake holders consisting of members of the Anchorage, Central, Delta, Eagle, Fairbanks, Matanuska Valley, and Upper Tanana/Fortymile state fish and game advisory committees, the Federal Eastern Interior Regional Subsistence Advisory Council, Yukon Fish and Wildlife Management Board, Yukon Department of Environment, and Yukon First Nations, in cooperation with Bureau of Land Management and the Alaska Department of Fish and Game. It retained the primary goal of managing for herd growth and restoring the herd to its historic range in both Alaska and Yukon to the extent possible without compromising herd health.

In spring 2006, the Board of Game added the Fortymile Caribou Herd to the Upper Yukon–Tanana Predator Control Program. In spring of 2009, the Board of Game reauthorized this predation control program for another 5 years.

ISSUES: Since 1995, Fortymile caribou management has been successful because agencies and the public have worked together to develop and implement management and harvests plans to encourage herd growth. Herd growth, predator control and caribou harvest will all be important issues for years to come.

CHISANA CARIBOU HERD

STATUS: The Chisana herd is a small, mostly nonmigratory caribou herd. Its primary range encompasses the Nutzotin and northern Wrangell Mountains between the Nabesna River in Alaska and the Generec River in Yukon, Canada. During the 1980s, the Chisana herd grew from an estimated 1,000 to about 1,900 caribou in 1988. The herd was estimated to have declined from 1,800 in 1989 to 315 by 2002. However in fall 2003, the U.S. Geological Survey (USGS) completed a more intensive census than had been done previously, which resulted in 603 caribou observed and a population estimate of 720 caribou. In addition, the adult bull:cow ratio was estimated to be 37:100 in 2003 versus 25:100 in 2002, indicating that previous surveys may have underestimated these population parameters. The USGS census in 2005 yielded a population estimate of 656–733. In the 2007 USGS census, 719 caribou were observed, with 13 calves:100 cows and 50 bulls:100 cows. A census was not attempted in 2008 and 2009; however, 21 calves:100 cows and 35 bulls:100 cows were observed in the fall 2008 composition survey. The fall 2010 census indicated the population remained stable at an estimated 651–743 caribou based on 622 observed caribou. During 2009–2013 The herd composition has averaged 17 calves:100 cows and 46 bulls:100 cows.

Habitat and harvest do not appear to be limiting herd growth. Based on percent lichen in the diet of these caribou, winter range conditions are adequate in most of the herd's range. Pregnancy rates (>80% per year) and median calving date indicate nutritional

status is adequate. During 1950–1993, harvest was limited to bulls, and the annual harvest rate (<2.5%) did not limit the herd’s ability to increase. In 1994 harvest of Chisana caribou in Alaska was stopped. Herd management was reviewed by an international working group comprised of members from Government of Yukon, ADF&G, White River First Nation, Kluane First Nation, U. S. National Parks Service (NPS), and the U. S. Fish and Wildlife Service. The working group developed a cooperative management plan that was completed in 2012.

MANAGEMENT ACTIVITIES: Between 2003 and 2008, the USGS lead cooperative research with the NPS, ADF&G, and Yukon Department of Renewable Resources to evaluate various population parameters to determine why this herd declined by more than 60% since the late 1980s. In 2003–2006, 20–50 adult caribou cows were captured in Yukon by the Yukon Department of Renewable Resources and placed in a pen during late winter through early June to provide protection from predators during and immediately following calving. ADF&G maintained a cooperative technical role in these efforts. ADF&G, in cooperation with the NPS and Yukon Department of Environment, conducted fall composition surveys in 2008, 2009, 2011 and 2013 and completed a successful census in 2010. The management plan recommends that the herd can support a 2% bulls only harvest split between Yukon and Canada, as long as the herd maintains ≥ 15 calves:100 cows and ≥ 35 bulls:100 cows.

In 2010 the Board of Game passed a proposal to open a joint state/federal bulls only drawing hunt for Chisana caribou following the recommendations of the draft management plan. However, the entire hunt area occurs on federal lands and in spring of 2012, the Federal Subsistence Board approved a federal hunt open to federal qualified subsistence users only. In the first 2 years of this federal hunt, a total of 2 bulls were harvested in RY12 and 3 bulls in RY13. All harvest occurred in Alaska on NPS lands. No state harvest from this herd is anticipated in the near future.

ISSUES: The most critical issue to Chisana caribou herd management is to maintain the ability to monitor the herd as the number of radio collared cows declines. The herd management plan recommends the herd can support a limited bulls only harvest. This small caribou herd will need yearly monitoring if state or federal harvest continues.

FURBEARERS

STATUS: Marten and lynx are the most economically important furbearers in Units 12 and 20E. During population highs, muskrats are also economically and socially important in Unit 12. Trapping effort has increased in the last couple of years with increasing fur prices. However, trapping effort for coyote, red fox, mink, otter, beaver, ermine and wolverine (except in a portion of southern Unit 12) remains relatively low for these less valuable or less abundant furbearers. Furbearer populations are primarily monitored using trapper questionnaire reports. The snowshoe hare and lynx populations are currently at a low point in their population cycles. Beginning in early winter 2009, hares were reported to be declining or absent in many parts of Units 12 and 20E; lynx harvest has declined from 812 in RY08 to an average of 205 during RY10–RY12. Marten numbers increased

between 2002 and 2005, but declined during 2006–2008 and remain low in most of Units 12 and 20E. However, marten appear to be more plentiful in portions of the areas burned in Unit 20E during 2004 and 2005. Wolverine numbers appear to be increasing, possibly in response to large numbers of caribou wintering in Units 12 and 20E.

MANAGEMENT ACTIVITIES: Wolverine, lynx, and otter harvest are monitored through mandatory sealing and harvest reporting. A trapper questionnaire is sent to area trappers each year to assess their impression of population trends. This information, along with trapper interviews, field observations and sealing records is used to develop management direction for furbearers in Units 12 and 20E.

ISSUES: No biological concerns currently exist for furbearer populations in Units 12 and 20E.

MOOSE

UNIT 12

STATUS: The moose population in Unit 12 increased slowly from 1982 to 1989, remained relatively stable during 1989–1993, and due primarily to increased calf survival, grew slightly during 1994–1997. The most substantial increase was in northwestern Unit 12 within the area affected by the 1990 Tok wildfire (155 mi²). This area supported 0.19 moose/mi² in 1989, 0.6 moose/mi² in 1994, and 0.8–1.2 moose/mi² during 1997–2012.

Moose densities currently range from 0.03 moose/mi² in the Northway Flats to >2.0 moose/mi² along the north side of the Nutzotin Mountains. Between 1997 and 2000, calf and yearling bull recruitment declined and the population remained stable or declined slightly. Based on fall moose surveys in 2003, the Unit 12 population was estimated at 2,900–5,100 moose (0.6–0.7 moose/mi² of suitable moose habitat). From 2003 to 2006, we conducted surveys only in northwestern Unit 12 and unitwide estimates were not developed. Surveys in northwestern Unit 12 were conducted in 2004–2006 to monitor the moose population within the Tok River drainage due to concerns about declining bull:cow ratios, and to monitor moose populations north of the Alaska highway within the Upper Yukon–Tanana Predation Control Area. No surveys were conducted in 2007 due to poor snow conditions and budget constraints. The most recent Unit 12 population estimate of 4,300–5,600 moose (0.6–0.7 moose/mi² of suitable moose habitat) was developed from fall 2008 surveys.

In November 2011 a 1,602 mi² portion on Units 11 and 12 accessible from the Nabesna Road and adjacent trail system, mostly within the Wrangell St Elias Park and Preserve, was surveyed in cooperation with the National Park Service. The population in this area was estimated at 1,009–1,536 moose with a density of 0.8 moose/mi².

Past research indicated that predation was the primary factor limiting the Unit 12 moose population at low density. However, land ownership patterns preclude the use of predator

control in most of the unit. Moose numbers are expected to remain stable at low densities (0.3–1.0 moose/mi²) in most of the unit.

Hunter participation and moose harvest in Unit 12 remained stable during 2002–2010, with an average of 558 hunters (range = 474–616) harvesting an average of 129 (range = 107–159) moose annually.

Most of Unit 12 is difficult to access and harvest has little effect on the bull population. The unitwide bull:cow ratio exceeds the population objective of 40 bulls:100 cows. Most moose are harvested along the Tok, Little Tok and Tanana Rivers in western Unit 12 where access is easiest. In these areas, bull:cow ratios have declined to 20–40 bulls:100 cows. In response, regulations that limit hunters to bulls with spike, fork, or 50-inch antlers, or antlers with 4 brow tines on at least 1 side were enacted in the Little Tok River drainage in 1993 and a portion of the main stem of the Tok River drainage in 2006. Bull:cow ratios have improved in these areas and hunters support these restrictions. There is little local interest in antler restrictions as a form of harvest management in other areas of Unit 12.

MANAGEMENT ACTIVITIES: In 2005 and 2006, we conducted moose surveys in northwestern Unit 12, primarily to monitor bull:cow ratios within the Upper Tok River drainage and the population status north of the Alaska Highway, within the portion of Unit 12 included in the Upper Yukon–Tanana Predation Control Area. In cooperation with Tetlin National Wildlife Refuge, we conducted a Geospatial Population Estimation survey in 2008 to estimate population size, and sex and age composition of moose in more than 90% of the moose habitat in Unit 12. This information was extrapolated to develop a unitwide population estimate.

Signs are posted along area roads and primary trails to inform hunters about hunting regulations and boundaries. Greater enforcement effort occurs in the Little Tok River area to ensure hunters comply with antler restrictions.

Use and availability of browse is periodically monitored within important wintering areas along the Tok and Tanana Rivers. Habitat enhancement has been conducted in Unit 12 since 1982. Since 1982, over 1,800 acres of decadent willows have been intentionally disturbed to stimulate crown sprouting of new leaders. This has produced more than 2 million pounds of additional browse each year for wintering moose. In 2003, a 40,000-acre wildfire burned in the Black Hills on the Tetlin Refuge National Wildlife Refuge. In 1998, we mechanically crushed 275 acres of decadent willow and aspen within the Tok River Valley. We cooperated with Department of Natural Resources, Division of Forestry to implement a 1,000 acre timber sale in 2008 in the Tok River Valley to enhance moose habitat. Cut areas were planned based on number of marketable trees, historic winter use by moose, and potential to regenerate quality moose browse species. In addition, we are assisting in designing and implementing site-specific scarification techniques that will promote willow and aspen regeneration following logging. Cut areas will be 80–200 acres in size. Wildfire burned an additional 17,000 acres of mature spruce forest within the Tanana river valley in 2010.

In January 2005 the Upper Yukon–Tanana Predation Control Program was implemented in an effort to reduce mortality in the southern Unit 20E moose population by providing conditions to allow the Unit 20E moose population to increase to meet Intensive Management objectives. A small portion of northwestern Unit 12 was included in the wolf portion of the predation control program in 2004–2006. In May 2006, the board modified the Upper Yukon–Tanana Predation Control Program to include all of Unit 12 north of the Alaska Highway in the wolf predation control program. The grizzly bear predation control portion of the program was suspended in July 2009 because it was ineffective at reducing grizzly bear predation on moose calves. The wolf predation control program is still in place.

ISSUES: The primary management challenge for Unit 12 moose is managing this predator-limited, low density moose population that is subject to high harvest near roads and rivers, within sustainable levels.

The Board of Game has identified the moose population within Unit 12 as important for high levels of human consumptive use under the Intensive Management Law (AS 16.05.255(e)–(g)). This designation means that the board must consider intensive management if regulatory action to significantly reduce harvest becomes necessary because the population is depleted or has reduced productivity. The Unit 12 moose population (4,300–5,600 moose) is likely at the lower end of the board’s population objective of 4,000–6,000 moose. Population densities remain low near villages and roads, while remote portions of Unit 12 have good moose densities relative to available habitat.

Research we conducted in Unit 12 in the mid 1980s identified wolves as the primary predator on moose. Wolf control in most of the unit is not an option because of land ownership. Prescribed burns are the best option for intensively managing for moose in areas where predation control is not possible, but in northwestern Unit 12 the moose population can be intensively managed with a combination of predation control and habitat enhancement.

Taking moose for funerary or mortuary potlatches is difficult to quantify. Most potlatch harvest occurs near villages roads. Harvest reporting has improved in recent years, but is not always consistent. Therefore it remains difficult to determine the effects of this harvest. We are currently working with local villages to improve reporting.

UNIT 20E

STATUS: Between 1981 and 1988, the moose population in Unit 20E increased 5–9% annually, reaching a density of 0.3–0.5 moose/mi². Between 1988 and 2000, the population stabilized at an estimated 0.5–0.6 moose/mi². Between 2001 and 2004, the moose population experienced the lowest calf and yearling recruitment in 25–30 years. In 2004, the estimated density of moose in Unit 20E was 0.4–0.5 moose/mi². Our analysis of 2004–2012 fall moose survey data from the 4,630-mi² moose survey area in southern

Unit 20E indicates this moose population increased. The fall 2012 density estimate in southern Unit 20E was 0.8–1.0 moose/mi².

ADF&G research has shown that predation by wolves and grizzly bears is the primary factor maintaining the Unit 20E moose population at low density (0.2–1.0 moose/mi²) and that hunting and habitat quality are minor limiting factors. Moose density vary, ranging from approximately 1.0 moose/mi² in southcentral and southwestern Unit 20E, associated with several large 30-year-old burns (500,000 acres), to 0.2 moose/mi² in northern Unit 20E along the Yukon River. During 2005–2012, fall bull:cow ratios were above management objectives (≥ 40 bulls:100 cows).

Hunter participation and harvest increased in Unit 20E between 1993 and 2002 and reached a peak of 944 hunters who harvested 170 moose in 2002. Beginning in 2003, hunter numbers and harvest declined through 2006 when 695 hunters harvested 130 moose. Hunters and harvest increased in 2007, when 749 hunters harvested 144 moose, and in 2008 when 770 hunters harvested 179 moose. Hunter numbers varied during 2009–2012 (range 661–823), but harvest remained relatively stable averaging 169 (range 166–172).

MANAGEMENT ACTIVITIES: We monitor population trends and composition annually. Survey areas are primarily in southern Unit 20E, but occasionally the National Park Service (NPS) conducts surveys in the Yukon–Charley Rivers National Preserve in northern Unit 20E. ADF&G samples browse availability and use every 2–3 years in important wintering areas and prescribed burn sites.

Since 2001, moose hunting in most of Unit 20E has been under a registration permit that requires the hunter to select either moose or caribou. The moose hunting season in most of Unit 20E is separated into a 5-day hunt in August and a 10-day hunt in September.

During 2004 and 2005, over a million acres of moose habitat burned in Unit 20E. This burn varied widely in severity and left significant unburned inclusions. It will provide exceptional improvements in moose habitat for many years.

In 2004, the Upper Yukon–Tanana Predation Control Program was implemented in an effort to reduce moose mortality from predation in southern Unit 20E and thereby stimulate an increase toward meeting Intensive Management population objectives. In May 2006, the Board of Game expanded the control program to include all of Unit 20E, although the NPS does not allow predation control within the Yukon–Charley Rivers National Preserve. The grizzly bear portion of the control program was suspended in July 2009 because it was ineffective at reducing grizzly bear numbers and predation on moose. The wolf control portion of the program is still in place.

ISSUES: The greatest challenge in Unit 20E is to manage for an increase in moose numbers in this predator-limited population that is also subject to high harvest along roads and rivers.

Currently, much of Unit 20E is inaccessible because there are few trails or suitable aircraft landing sites. However, hunters using all-terrain and off-highway-vehicles are increasingly pioneering new trails from the Taylor Highway. We expect this proliferation of trails to new areas to increase as moose numbers increase. This increased hunter access is likely to cause the bull component of the population to decline below 40 bulls:100 cows in portions of the unit; however, we expect the unitwide bull:cow ratio to remain above the minimum management objective of 40 bulls:100 cows. The split hunting season and the requirement that hunters choose either to hunt moose or caribou appears to have stabilized harvest in most areas but this may not be sufficient as hunter numbers and off-road vehicle use increases in key areas.

The Board of Game has identified the moose population within Unit 20E as important for high levels of human consumptive use under the Intensive Management Law (AS 16.05.255(e)–(g)). This designation means that the board must consider intensive management if regulatory action to significantly reduce harvest becomes necessary because the population is depleted or has reduced productivity. The Upper Yukon–Tanana Predation Control Program in Unit 20E began in January 2005 and was reauthorized for 5 years in March of 2009.

DALL SHEEP

STATUS: There are three distinct sheep areas in Units 12 and 20E: 1) northern Wrangell, Mentasta, and Nutzotin Mountains; 2) Tok Management Area (TMA); and 3) Tanana Hills.

The sheep population in Wrangell, Mentasta, and Nutzotin Mountains traditionally exists at relatively high densities in typically rugged, glaciated habitats. This area produces rams with horns below average size, compared with other sheep populations in Alaska. The consumptive use management goal in this area is to provide the greatest opportunity to participate in sheep hunting. This population grew throughout the 1980s, declined during the early 1990s, and appeared to be stable or growing slowly during 1994–1998. Unfavorable winter weather occurred in 1999 and 2000, and lamb recruitment was low. The number of legal rams increased during 2001–2005 due to favorable weather conditions in the mid-1990s, but declined in 2006–2008. This area receives some of the highest harvest in the state; 131–152 rams per year during 2002–2006. Between 2007 and 2012, harvest has been lower with 68–126 rams harvested per year.

Sheep in the TMA exist at low to moderate densities but produce large-horned rams. This population grew during the 1980s until 1992. The population declined during 1992 and 1993 due to adverse weather. Weather conditions were mild to average from 1994 to 1998, and based on lamb and yearling survival data, the population increased slowly. Winters 1999–2000 and 2000–2001 had greater than average snow depths and lamb survival was low. During 2001–2004, mild winters and moderate snow depth allowed good lamb production and recruitment. The number of legal rams increased between 2001 and 2004 due to favorable weather conditions in the mid 1990s and good survival of rams to 7–8 years of age. During winter 2004–2005, portions of the TMA experienced

deep snow with layers of ice from early winter rains, resulting in die-offs in the eastern portions. Mild weather during winters 2005–2006 to 2007–2008 allowed good lamb recruitment. However, severe winter conditions in 2008–2009 may have caused further declines in some areas. The population increased during 2009–2010 and 2011–2012, but severe winter and spring conditions during 2012 – 2013 resulted in a decline in the sheep population.

The TMA is designated for trophy sheep management. The primary consumptive use goal is to provide the opportunity to pursue large-horned trophy rams under uncrowded hunting conditions. This goal is attained through a limited number of drawing permits. Maintaining low hunter density has increased the number of large trophy rams and created high quality hunting experiences. All harvest objectives were met in the TMA during 2004–2006. In 2007, the average horn size fell below the management objective of at least a 36 inch average, and in 2008 and 2009, the percentage of harvested rams with horns 40-inch or greater fell below the management objective of 7–10% of harvested rams with 40-inch or greater horns. Due to concerns about numbers of trophy quality rams in the TMA, the number of permits was reduced from 100 to 80 in 2010. During 2010–2012, the percent of rams with horns 40 inches or greater increased to 11%, 21%, and 16% respectively. In 2013, both the mean horn size and percentage of harvested rams with horns 40-inch or greater fell below management objectives. The TMA permit is the most sought-after sheep permit in the state, with over 5,000 applicants applying for DS102 (first half of the season) and DS103 (second half of the season) permits in 2013.

The Tanana Hills sheep population occurs at low density and is disjunct due to the physical geography of the Tanana Hills, which is atypical sheep habitat. The Tanana Hills were not glaciated during the most recent glacial advance and underwent little uplift. Overall elevations are low, and the range has a rolling rather than rugged physiography. The sheep population has remained at low densities, but maintains enough legal rams to provide adequate opportunity for hunters who access the area from a few small aircraft landing strips or by walking into the Glacier Mountain Controlled Use Area (Glacier Mountain CUA). The management objective is for uncrowded hunting conditions. Most of this area is very difficult to access, and due to sheep distribution, is very difficult to hunt. The portion of the area accessible from the Taylor Highway was designated the Glacier Mountain Controlled Use Area, and the most accessible fly-in area (Mount Harper) is managed by drawing permit. Annual harvest has ranged from 1 to 8 full-curl rams annually during the 2009–2013 seasons, and the management objective is being met.

MANAGEMENT ACTIVITIES: Status of the sheep population and quality of hunting experience in Units 12 and 20E are evaluated by analyses of harvest reports, periodic aerial and mineral lick surveys and interviews with area guides and hunters. During 2009 through 2013 we conducted aerial surveys in portions of the TMA in all five years, in portions of the Mentasta and Nutzotin Mountains in 2009 and 2011–2013, and in the Glacier Mountain CUA in 2012 and 2013. During 2004–2013, the Tok ADF&G office sealed 36–66 rams annually.

ISSUES: There are currently no biological issues with the sheep populations in Units 12 and 20E.

SMALL GAME

STATUS: The status of the small game populations in Units 12 and 20E are not rigorously monitored. Most information is collected from incidental sightings made during surveys for other animals and from discussions with hunters, trappers, hikers, and other outdoors enthusiasts. Overall, it appears that the 3 grouse species (spruce, ruffed and sharp-tailed) and ptarmigan increased during 2003–2006, but declined during 2007–2009. Grouse appeared to be on the rise again in 2013. Hares increased between 2003 and 2008, but declined during 2009–2011. Hares are likely just starting to come back up from a low in the population cycle.

MANAGEMENT ACTIVITIES: We continue to survey area hunters, trappers, hikers and other outdoors enthusiasts concerning numbers and locations of grouse, ptarmigan and hares.

ISSUES: No biological concerns currently exist for small game populations in Units 12 and 20E.

WOLVES

STATUS: The wolf population in Unit 20E numbered at least 227–238 wolves in 1996. The population remained relatively stable between fall 1997 and fall 1998, but declined slightly by fall 1999 due to a combination of nonlethal wolf control and public trapping. The wolf population increased slightly during 2000, except in western and central Unit 20E where effects of nonlethal wolf control continued. By 2004, most of the effects of the nonlethal control program had subsided as the sterilized pairs died and their territories were overtaken by unsterilized wolves. Recovery of sterilized packs, increased numbers of Fortymile caribou throughout most of Unit 20E, and increased numbers of wintering Nelchina caribou in southern Unit 20E resulted in an overall increase in the number of wolves in Unit 20E during 2001–2004. The Unit 20E wolf population was estimated to be 250–310 wolves in August 2004.

Using data inputs from information gathered during predator control activities and wolf surveys conducted in March 2010, models indicate the fall 2011 wolf population estimate in Unit 20E was 179–195 wolves. No further estimate has been developed; however, the Unit 20E population is likely below 2004 levels, primarily due to ongoing lethal wolf control and an increase in efforts by several trappers in southcentral Unit 20E during 2005–2012.

Historically, the Unit 20E wolf population has been lightly harvested. The fur market primarily affects wolf trapping intensity. Most wolf harvest in northwestern Unit 12 and southern Unit 20E is associated with the predator control program and efforts of 3–4 area trappers, while traditional trapping efforts are the primary source of human harvest in the

remainder of these units. Demand for wolf pelts has been moderate to low during the past few years, resulting in light trapper efforts for wolves. Most wolves trapped in these units were taken incidental to other furbearer species and harvest by trappers remains moderate to low.

In spring 2008 we estimated the Unit 12 fall wolf population to be 217–229 wolves. No further estimate has been developed, but with light harvest and a similar food base as in 2008, the current population is likely similar to 2008 levels except within the portion of northern Unit 12 included in the Upper Yukon–Tanana Predation Control Program.

MANAGEMENT/RESEARCH ACTIVITIES: Population trends are monitored by aerial surveys and hunter and trapper reports in both Units 12 and 20E, and by predator control permittees in the Upper Yukon–Tanana Predation Control Program. Harvest is monitored from mandatory sealing and harvest reporting in both units and by closely monitoring wolves killed in the predator control program. In addition, ADF&G personnel conducted aerial wolf control from helicopters in March 2012, resulting in 56 wolves killed within the Upper Yukon–Tanana Wolf Predation Control Area, 32 of which were killed in Unit 20E. In March 2013 ADF&G personnel killed an additional 40 wolves in the control area, of which 14 were in Unit 20E.

ISSUES: Lethal wolf control within the Upper Yukon–Tanana Predation Control Area in Unit 20E and a portion of Unit 12 continues to be monitored and evaluated by Tok ADF&G staff. A report on the status of the wolf control program will be provided to the board at this meeting.