

5 AAC 92.125. Intensive Management Plans

(a) Intensive management plans are established under this section in the areas described in this section.

... (e) **Unit 19(A) Predation Control Area:** the Unit 19(A) Predation Control Area is established and consists of those portions of the Kuskokwim River drainage within Unit 19(A), encompassing approximately 9,969 square miles; this predator control program does not apply within National Park Service or National Wildlife Refuge lands unless approved by the federal agencies; notwithstanding any other provision in this title, and based on the following information, the commissioner or the commissioner's designee may conduct a wolf **and a black bear and brown bear** population reduction or wolf **and black bear and brown bear** population regulation program in the Unit 19(A) Predation Control Area:

(1) the following Predation Control Focus Areas are established in Unit 19(A):

(A) a Unit 19(A) Wolf Predation Control Focus Area (WCFA) is established and consists of approximately 3,913 square miles generally within the Holitna, Hoholitna, and Stony River drainages; the purpose is to focus wolf control in an relatively small area where moose are accessible to hunters, rather than spread this effort over the entire game management unit; wolf control will be conducted only within the WCFA; the department will have the discretion to adjust its size and shape up to 40 percent (approximately 4,000 square miles) of Unit 19(A);

(B) a Unit 19(A) Black Bear and Brown Bear Predation Control Focus Area (BCFA) is established and consists of those portions of the Kuskokwim River drainage within the area starting at Sleetmute at 61° 42.00' N. lat., 157° 10.00' W. long., then east to 61° 42.00' N. lat., 157° 00.00' W. long., then north to 61° 44.00' N. lat., 157° 00.00' W. long., then east to 61° 44.00' N. lat. 156° 55.00' W. long., then north to 61° 46.00' N. lat., 156° 55.00' W. long., then east to 61° 46.00' N. lat. 156° 50.00' W. long., then north to 61° 48.00' N. lat., 156° 50.00' W. long., then east to 61° 48.00' N. lat., 156° 45.00' W. long., then north to 61° 50.00' N. lat., 156° 45.00' W. long., then east to 61° 50.00' N. lat., 156° 30.00' W. long., then south to 61° 40.00' N. lat., 156° 30.00' W. long., then west to 61° 40.00' N. lat., 156° 45.00' W. long., then south to 61° 18.00' N. lat., 156° 45.00' W. long., then west to 61° 18.00' N. lat., 157° 15.00' W. long., then north to 61° 24.00' N. lat., 157° 15.00' W. long., then east to 61° 24.00' N. lat., 157° 10.00' W. long., then north to 61° 42.00' N. lat., 157° 10.00' W. long., encompassing approximately 540 square miles; the purpose is to focus bear control in an area where moose are accessible to hunters, rather than spread this effort over the entire game management unit; bear control will be conducted only within the BCFA; the department will have the discretion to adjust its size and shape by 40 percent (approximately 325 – 750 square miles); the BCFA is generally within the WCFA;

(2) [(1)] the discussion of wildlife population and human use information is as follows:

(A) prey population information is as follows:

(i) a Central Kuskokwim Villages moose management area (MMA) is established within **the same area as the WCFA and includes the BCFA;** [UNIT 19(A) PREDATION CONTROL AREA, ENCOMPASSING APPROXIMATELY 3,913 SQUARE MILES GENERALLY WITHIN THE HOLITNA, HOHOLITNA, AND STONY RIVER DRAINAGES] the purpose of the MMA is to **designate an area where moose numbers are closely monitored and objectives for number of moose and moose harvest can be applied; the department may adjust the size and shape of the MMA;** [FOCUS INTENSIVE MANAGEMENT ACTIVITIES, INCLUDING PREDATOR CONTROL AND HABITAT MANAGEMENT, IN A RELATIVELY SMALL AREA WHERE MOOSE ARE ACCESSIBLE TO HUNTERS, RATHER THAN SPREAD THIS EFFORT OVER THE ENTIRE GAME MANAGEMENT UNIT; WOLF CONTROL WILL BE CONDUCTED ONLY WITHIN THE MMA, AND THE DEPARTMENT WILL HAVE THE DISCRETION TO ADJUST ITS SIZE AND SHAPE UP TO 40 PERCENT (APPROXIMATELY 4,000 SQUARE MILES) OF UNIT 19(A);]

(ii) the moose population size for Unit 19(A) was estimated in March 2004, based upon earlier estimates of density in portions of the unit; in March 1998, 1.25 moose per square mile (plus or minus 14 percent at an 80 percent confidence interval) was estimated in a portion of the Holitna-Hoholitna drainage; in March 2001, 0.7 moose per square mile (plus or minus 21 percent at a 90 percent confidence interval) was estimated in a portion of the Aniak River drainage; extrapolation of data from both estimates to all of Unit 19(A) resulted in an estimated total population size of 4,300 - 6,900 moose; the population size for Unit 19(A) was updated in February 2005, based upon an estimate of 0.27 moose per square mile (plus or minus 16 percent at a 90 percent confidence interval) obtained from a survey in the portion of the unit south of the Kuskokwim River; extrapolation of **these** [THIS] data to all of Unit 19(A) resulted in an estimated total population size of 3,000 - 4,000 moose (0.3 - 0.4 moose per square mile), which was corrected for sightability of moose and was lower than the 2004 estimate indicating moose numbers had declined; the population size estimate was updated in March 2006, based on an estimate of 0.39 moose per square mile (plus or minus 15 percent at a 90 percent confidence interval) obtained from a survey conducted south of the Kuskokwim River, from Kalskag to the mouth of Crooked Creek (3,440 square miles); extrapolation of these data to all of Unit 19(A) resulted in a estimated total population size of 2,700 - 4,250 moose (0.27 - 0.42 moose per square mile), which was also corrected for sightability; the population size was updated again in March 2008, based on an estimate of 0.55 moose per square mile (plus or minus 28 percent at the 90 percent confidence interval) obtained within a 3,874 square mile moose survey area located south of the Kuskokwim River, within the Holitna, Hoholitna, and Stony River drainages; extrapolation of these data to all of Unit 19(A) resulted in an estimated

total population size of 3,200 - 5,275 moose (0.32 - 0.53 moose per square mile), which was corrected for sightability; **the population size was updated in March 2011, based on an estimate of 0.43 moose per square mile (plus or minus 36 percent at the 90 percent confidence interval) obtained within a 3,874 square mile moose survey area located south of the Kuskokwim River, within the Holitna, Hoholitna, and Stony River drainages; extrapolation of these data to all of Unit 19(A) resulted in an estimated total population size of 2,791 - 5,782 moose (0.28 - 0.58 moose per square mile), which was corrected for sightability;**

(iii) in November 2001, a survey on the Holitna-Hoholitna Rivers in Unit 19(A) was conducted; a total of 196 moose were classified with an observed bull-to-cow ratio of 6:100 and an observed calf-to-cow ratio of 8:100; the low numbers observed could have been influenced by an atypical moose distribution caused by shallow snow and relatively temperate late-fall weather;

(iv) in November 2004, a survey was conducted to estimate composition in the Holitna-Hoholitna, Oskawalik, and Stony River portion of Unit 19(A) (4,828 square miles); a total of 226 moose were classified and the bull-to-cow ratio (19:100, plus or minus 76 percent at a 90 percent confidence interval) and calf-to-cow ratio (32:100, plus or minus 38 percent at a 90 percent confidence interval) estimates were higher than observed in the November 2001 trend count survey; some improvement in the ratios is indicated; however, results of the two surveys cannot be directly compared because the 2004 survey covered a much larger geographic area and was done using different methods than the 2001 survey; the estimated percent moose calves in the total population during the November 2004 composition survey was 22 percent (plus or minus 38 percent with a 90 percent confidence interval);

(v) in November 2005, composition surveys were conducted in the Holitna-Hoholitna drainage in Units 19(A) and 19(B) and in the Aniak River drainage including the Kuskokwim River from Lower Kalskag to Napaimiut in Unit 19(A); a different technique was implemented than what was used for previous composition surveys because of the concern about possible atypical moose distribution when confining the survey area to the river corridor and the concern about wide confidence intervals in the November 2004 survey; a total of 307 moose were observed and the observed bull-to-cow ratio was 8:100 with most (12 of 19) bulls classified as yearlings; the observed calf-to-cow ratio was 24:100 and the percent of calves was 18 percent; the low bull-to-cow ratios observed during the past three composition surveys indicate that hunting pressure has been high in the Holitna-Hoholitna drainage; in the western portion of Unit 19(A), the Aniak River drainage and the Kuskokwim River from Lower Kalskag to Napaimiut was also surveyed; composition data had not been collected previously in this portion of Unit 19(A); a total of 410 moose were counted with an observed bull-to-cow ratio of 20:100 and an observed calf-to-cow ratio of 23:100;

(vi) in November 2007, composition surveys were conducted in the Holitna-Hoholitna drainage in Unit 19(A) and in the Aniak River drainage downriver from the Buckstock River including the Kuskokwim River from Lower Kalskag to Aniak in Unit 19(A); in

the Holitna-Hoholitna drainage a total of 200 moose were observed, the bull-to-cow ratio was 35:100, the calf-to-cow ratio was 45:100, and the percent of calves was 25 percent; in the Aniak River drainage a total of 122 moose were observed, the bull-to-cow ratio was 28:100, the calf-to-cow ratio was 51:100, and the percent of calves was 29 percent; in November 2008, composition surveys were again conducted in the same area; in the Holitna-Hoholitna drainage a total of 117 moose were observed, the bull-to-cow ratio was 34:100, and the calf-to-cow ratio was 27:100, and the percent of calves was 18 percent; in the Aniak River drainage a total of 51 moose were observed, the observed bull-to-cow ratio was 42:100, and the observed calf-to-cow ratio was 23:100, and the percent of calves was 14 percent;

(vii) in November 2009, composition surveys were conducted in the Holitna-Hoholitna drainage; a total of 129 moose were observed, the bull-to-cow ratio was 51:100, the calf-to-cow ratio was 36:100, and the percent of calves was 19; in November 2010, composition surveys were conducted in the Holitna-Hoholitna drainage a total of 212 moose were observed, the bull-to-cow ratio was 48:100, the calf-to-cow ratio was 19:100, and the percent of calves was 11; in November 2011, composition surveys were conducted in the Holitna-Hoholitna drainage; a total of 164 moose were observed, the bull-to-cow ratio was 38:100, the calf-to-cow ratio was 31:100, and the percent of calves was 18;

(viii) [(VII)] birth rate among radiocollared cows in Unit 19(A) is high; in 2005, of nine radiocollared cows in the lower Holitna River, three had twins, four had a single calf, and two had no calf (78 percent birth rate); of eight radiocollared cows in the Aniak River drainage, two had twins and six had single calves (100 percent birth rate); overall, the 2005 birth rate among radiocollared cows in Unit 19(A) was 88 percent; combined data from twinning surveys in the Holitna during 2007, 2008, and 2010, indicate 12 of 19 cows with calves had twins (63% twinning rate);

(ix) [(VIII)] a late winter survey to estimate calf survival, conducted in April 2003 in Unit 19(A), resulted in an estimate of 7.6 percent calves in the moose population in Holitna-Hoholitna drainage (sample size 107 adults and 9 short-yearlings) and 8.9 percent in the moose population in the Aniak River drainage (sample size 61 adults and six short-yearlings); spring population surveys conducted south of the Kuskokwim River drainage and west of the Holitna-Hoholitna drainage (3,440 square miles) in 2006, resulted in 17 percent calves and 9 percent calves respectively (plus or minus 30 percent at a 90 percent confidence interval); the calf-to-cow ratios in fall and the percent of calves found in spring surveys support the conclusion that calf survival in the moose population is very low, and a decline in moose numbers is probably occurring;

(x) [(IX)] based on current estimates of recruitment, population density and bull-to-cow ratios, there is no harvestable surplus in eastern Unit 19(A) (upstream from and excluding the George River), excluding the Lime Village Management Area; in western Unit 19(A) (downstream from and including the George River), the harvestable surplus is 60 bulls, using a conservative harvest rate for bulls that is based on three percent of the total estimated population;

(xi) [(X)] the intensive management moose population objective established by the board for Units 19(A) and 19(B) is 13,500 - 16,500 moose; based on the relative sizes of the two units, the proportional population objective for Unit 19(A) alone is 7,600 - 9,300 moose; the intensive management moose harvest objective for Units 19(A) and 19(B) is 750 - 950 moose; the proportional harvest objective for Unit 19(A) alone is 400 - 550 moose; achieving the population and harvest objectives for Unit 19(A) will contribute to achieving the intensive management population and harvest objectives established for Units 19(A) and 19(B);

(xii) [(XI)] based on data available, habitat is probably not a factor limiting population growth in moose in the central Kuskokwim region; a browse survey in Unit 19(D) (in the upper Kuskokwim River) during spring 2001, found that moose were removing about 16 percent of current annual growth; these removal rates are near the midpoint of the range observed in areas of low to high moose browse use (9 - 42 percent); a browse survey in fall 2002 below Lower Kalskag on the Kuskokwim River (Unit 18) found that 78 percent of shrubs were unbrowsed and none were heavily browsed by moose; there is some indication that cows are in average or good body condition because twinning rates of 32 percent were observed in spring 2000 on the Holitna and Hoholitna Rivers, although sample sizes were small (less than 10); of 15 radiocollared cows in Unit 19(A) that had calves in 2005, five produced twins for a 33 percent twinning rate; **in 2007, 2008, and 2010 a combined twinning rate of 63% was observed;** if observations of browsing upriver and downriver from Unit 19(A), and limited observations of twinning are indicative of the situation in Unit 19(A), habitat enhancement alone is unlikely to cause a significant population increase in moose in the foreseeable future; the highest quality moose habitat in the unit is found in the lower Holitna River floodplain; high quality habitat is present in riparian areas along the Kuskokwim River and adjacent drainages; other portions of Unit 19(A) have lower quality habitat;

(xiii) [(XII)] total estimated mortality is likely high relative to the size of the moose population; information gained from studies on moose mortality in Unit 19(D)-East and other similar areas of Alaska, and observations by local residents indicate that wolves are currently a major limiting factor for moose in Unit 19(A); research from Unit 19(D)-East also indicates that black and brown bear predation is likely a factor that contributes to limiting the moose population in Unit 19(A); of 38 adult moose radiocollared in October 2003, seven had died by November 2005; moose mortality from harvest by humans is also high, relative to the population size, and regulatory proposals have been submitted to severely restrict harvest;

(xiv) [(XIII)] the number of animals that can be removed from the Unit 19(A) moose population on an annual basis without preventing growth of the population or altering the composition of the population in a biologically unacceptable manner is less than the harvest objective established for the population in 5 AAC 92.108; the moose population in Units 19(A) and 19(B) is well below the intensive management objective set by the board; the moose population in Unit 19(A) is also well below the objective calculated by the department for the unit;

(xv) [(xiv)] without an effective wolf **and black bear and brown bear** predation control program, moose in Unit 19(A) are likely to persist in a low density dynamic equilibrium state with little expectation of increase; data from moose mortality studies, and predator and prey studies, conducted throughout Alaska and similar areas in Canada suggest that reducing the number of wolves **and bears** in Unit 19(A) can reasonably be expected to increase the survival of calves as well as older moose, particularly yearlings; reducing wolf **and bear** predation on moose, in combination with reducing harvest, particularly of cows, can reasonably be expected to initiate an increase of the moose population towards the population objective;

(B) the human use information for prey population is as follows:

(i) the division of subsistence conducted household surveys on the subsistence use of big game in communities in Unit 19(A) between April 2003 and March 2004; moose was the most widely used and hunted animal in all eight communities surveyed; overall, 76 percent of all households in the central Kuskokwim area used moose, 57 percent of all households attempted to harvest moose, and 22 percent of all households successfully harvested one or more moose; of the estimated 107 moose harvested by the eight survey communities, 64, or 60 percent, were taken in Unit 19(A), 14 or 13 percent, were taken in Unit 18, and the remainder 27 percent were taken in other subunits of Unit 19 or in unreported locations; an estimated 426 individuals, or 28 percent of the area population, spent a total of 4,591 hunter days in pursuit of moose; to put this number in perspective, it is equivalent to a period of nearly 12.6 years, a clear testament to the importance of moose as a subsistence resource in the central Kuskokwim region; of the 426 individuals who went hunting, only 96, or 23 percent, were successful in harvesting a moose; the average number of days spent hunting by successful households per moose harvested (14.7) is higher than any previously reported numbers in the state where similar methods of data collection and analysis were employed; households were asked to compare their 2003 - 2004 harvest of moose with their harvest both five years and 10 years before, and the householders overwhelmingly noted harvesting fewer moose in 2003 - 2004;

(ii) between June 1982 and June 1983, the staff of the division of subsistence conducted extensive research on the resource use patterns and community characteristics of Chuathbaluk and Sleetmute; a comparison of that information with the 2004 data indicates a significant decline in household harvest rates; from an average of 0.55 - 0.2 moose harvested per household in Chuathbaluk and from 0.68 - 0.3 moose harvested per household in Sleetmute;

(iii) residents of Unit 19(A) have always had a high demand for moose for subsistence needs; since the 1990s when larger boats became available to residents in the lower Kuskokwim River and income from commercial fishing increased the ability to purchase fuel for long hunting trips, demand for moose in Unit 19(A) has increased; since 2004, there has been a moratorium on moose hunting in the Kuskokwim River drainage in Unit 18 and this has increased the demand for moose for subsistence purposes in Unit 19(A);

(iv) the amount necessary for subsistence established by the board for Unit 19 (including the Lime Village Management Area) is 430 - 730 moose; most of the human population in Unit 19 is residents of communities along the Kuskokwim River in Unit 19(A); the amount necessary for subsistence for Unit 19 is also based on subsistence need by residents of Unit 18; Unit 19(A) includes the most accessible portion of Unit 19 for the main population base in the region; subsistence hunters have depended on Unit 19(A) to provide the majority of subsistence harvest in Unit 19 as a whole; harvest in Unit 19(A) is a critical component of the amount necessary for subsistence for Unit 19 and the ability to meet subsistence needs in the region;

(v) according to harvest ticket reports, the numbers of hunters and moose harvested declined substantially between the mid-1990s and 2002; the total reported moose harvested in Unit 19(A) declined from the 1994 - 1995 season (168 moose) to the 2002 - 2003 season (67 moose); in Unit 19(A), the number of moose reported harvested by local residents and other Alaska residents declined approximately 65 percent, from 138 moose to 48 moose, between 1994 - 1995 and 2002 - 2003; after the RM 640 registration permit hunt for Alaska residents was implemented in fall 2004, harvest reporting greatly improved; in 2004, reports indicate that 107 moose were harvested in Unit 19(A); during the fall of 2005, 176 moose were reported harvested; while it may appear that moose harvest increased significantly after the registration permit hunt was established, the increase is most likely attributable to better reporting rates; during 2006, 2007, and 2008, reported moose harvest was 43, 77, and 75, respectively; **during 2009 and 2010, the reported moose harvest was 58 and 84, respectively;** these lower harvests were influenced by Tier II hunt restrictions and moose hunting closures;

(vi) the average number of nonresident hunters in Unit 19(A) between 1994 - 1995 and 2002 - 2003 was 52 hunters; the peak number of nonresident hunters was 91 in 2000 - 2001; when Unit 19(A) was closed to nonresident hunting in March 2004 several guides protested vigorously that their agreements with clients could not be met and their businesses would suffer; since that time demand for nonresident hunting opportunity has not been met;

(vii) demand for moose harvest in Unit 19(A) is likely to increase in the future; if the moose hunting moratorium in Unit 18 is successful in increasing the moose population in that area it will help relieve some of the demand on Unit 19(A); still, with more than 20,000 residents in Unit 18 there will be high demand for moose throughout the region indefinitely into the future; clearly, demand is not being met now; if the wolf **and black bear and brown bear** control program is successful it will help to meet the need for moose in the region in the future; without a wolf **and black bear and brown bear** predation control program, there is a very low probability that the moose population will increase sufficiently to meet subsistence needs or other harvest demands in the future;

(C) the predator population information is as follows:

(i) the pre-control wolf population in Unit 19(A) was estimated in fall 2004 using an extrapolation technique combined with sealing records and anecdotal observations the population in the entire 9,969 square mile area was estimated at 180 - 240 wolves in 24 - 28 packs or approximately 1.8 - 2.4 wolves per 100 square miles; a revised pre-control estimate of 125 - 150 was calculated in 2006 because wolf survey data collected during early 2006 and moose survey data collected during 2005 and 2006 indicated the initial pre-control wolf population estimate was too high;

(ii) after a complete wolf survey was conducted in Unit 19(A) in January and March 2006, a total of 107 - 115 wolves was estimated in 26 - 27 packs or approximately 1.1 - 1.2 wolves per 100 square miles; a complete wolf survey was conducted again in Unit 19(A) in February 2008, a total of 74 wolves was estimated in 17 packs or approximately 0.74 wolves per 100 square miles; **in February 2011, aerial wolf surveys, pilot interviews, and harvest and control data were used to obtain fall 2010 estimates of 30 wolves in 7 packs in Unit 19(A) upriver of Sleetmute and approximately 80 wolves in all of Unit 19(A);** in areas with limited human developments, habitat is not considered a significant factor in limiting wolf populations and it is presumed that numbers of wolves are limited mainly by prey availability; there is no evidence of disease or any other naturally occurring factors that would cause wolf mortality to be higher than normally expected;

(iii) using the **2011** [2008] moose and wolf population estimates, the moose-to-wolf ratio in Unit 19(A) is between **35-72:1** [43:1 AND 71:1];

(iv) when present, the Mulchatna caribou herd provides an alternative source of prey for wolves in Unit 19(A); because migrations of the herd into portions of 19(A) vary each year, the herd is not consistently available to wolves in the plan area;

(v) studies in Alaska and elsewhere have repeatedly concluded that large reductions are required to affect wolf population levels and to reduce predation by wolves on their prey; research indicates a reduction of about 60 - 80 percent of the pre-control wolf population may be necessary to achieve prey population objectives; once the wolf population has been reduced to the population control objective, annual reductions of less than 60 percent will likely regulate the wolf population at the control objective; the wolf population control objective during winters 2004 - 2005 and 2005 - 2006 was 40 - 53 wolves in order to achieve a reduction of between 60 and 80 percent of the pre-control estimate of 180 - 240; beginning in winter 2006 - 2007, the wolf population control objective was changed to 30 - 36 wolves based on the revised pre-control wolf population estimate of 125 - 150; the minimum wolf population control objective will achieve the desired reduction in wolf predation, and also ensure that wolves persist within the plan area;

(vi) without a wolf predation control program, the wolf population is expected to decline somewhat due to further decline in the moose population and reduced availability of prey; the moose and wolf populations in Unit 19(A) are in a low density dynamic equilibrium state where both predator and prey numbers are likely to stay at

low levels indefinitely; if wolf predation control efforts continue and the wolf population is reduced according to the wolf population and harvest objectives, the wolf population will be maintained at 30 - 36 wolves for several years, but once the moose population increases and wolf control efforts are discontinued, the wolf population will increase in response to the increased prey base;

(vii) based on extrapolation of densities from other areas, an estimated 2,475 – 2,970 black bears exist in Unit 19(A), including approximately 135 – 160 black bears within the BCFA;

(viii) based on extrapolation of densities from other areas, an estimated 200 brown bears exist in Unit 19(A), including approximately 10 – 15 brown bears within the BCFA;

(D) the human use information for the predator population is as follows:

(i) total reported harvest of wolves in Unit 19(A) by both hunters and trappers between 1998 and 2004 ranged between 21 and 49 wolves; during the winter of 2004 - 2005, a total of 72 wolves were reported taken in Unit 19(A); of those, 43 wolves were taken in the wolf predation control program and 29 wolves were taken by trappers and hunters; during the winter of 2005 - 2006, a total of 80 wolves were reported taken in Unit 19(A); of those, 47 wolves were taken in the wolf predation control program, and 33 wolves were taken by trappers and hunters; during the winter of 2006 - 2007, a year with low snow and poor travel conditions, a total of 10 wolves were reported taken in Unit 19(A); of those, seven wolves were taken in the wolf predation control program and three wolves were taken by trappers and hunters; during the winter of 2007 - 2008, a total of 24 wolves were reported taken in Unit 19(A); of those, 15 wolves were taken in the wolf predation control program and nine wolves were taken by trappers and hunters; **during the winter of 2008 - 2009, a total of 31 wolves were reported taken in Unit 19(A); of those, 20 were taken in the wolf predation control program and 11 were taken by trappers and hunters; during the winter of 2009 - 2010, a year with low snow and poor travel conditions, a total of 12 wolves were reported taken in Unit 19(A); of those, 2 wolves were taken in the wolf predation control program and 10 wolves were taken by trappers and hunters; during the winter of 2010 - 2011, a total of 14 wolves were reported taken in Unit 19(A); of those, 10 wolves were taken in the wolf predation control program and 4 wolves were taken by trappers and hunters; it is likely that a few additional wolves (estimated 5 – 10 annually) are harvested in the area, but are used locally and do not get sealed and reported;** [IT IS LIKELY THAT A FEW ADDITIONAL WOLVES (ESTIMATED 5 - 10) ARE HARVESTED IN THE AREA, BUT ARE USED LOCALLY AND DO NOT GET SEALED AND REPORTED;]

(ii) the human population in Unit 19(A) is concentrated along the Kuskokwim River corridor; there are large portions of the unit that are remote from communities in the region and access is difficult; the central Kuskokwim region weather is influenced by coastal conditions and often warm spells in the winter will melt snow and make travel

and tracking conditions poor; in addition, the low price of wolf pelts and cost of fuel make it difficult for local residents to harvest a high number of wolves throughout the unit;

(iii) in the first year of the Unit 19(A) wolf predation control program reported wolf harvest by hunters and trappers was 27 wolves, within the range of previous years' harvest; without a wolf predation control program in place wolf harvest is expected to remain relatively constant;

(iv) there is no reporting requirement for black bears harvested in Unit 19(A) and hunter harvest is believed to be low; without a black bear predation control program in place black bear harvest is expected to remain relatively constant;

(v) during 2006 – 2010, a total of 77 brown bears were reported harvested by hunters from Unit 19(A), including an average of 3 per year from the Holitna River drainage; without a brown bear predation control program in place brown bear harvest is expected to remain relatively constant;

(2) the predator and prey population levels and population objectives, and the basis for those objectives, is as follows:

(A) the **2011** [2008] estimated moose population in Unit 19(A) is **2,791 - 5,782** [3,200 - 5,275] moose; the moose population objective for Unit 19(A) is 7,600 - 9,300 moose; this objective is based on the intensive management objective for Units 19(A) and 19(B) established by the board and the proportion of the land area in the combined subunits that is within Unit 19(A); intensive management objectives were based on historical information about moose numbers, carrying capacity of the habitat, sustainable harvest levels, and human use;

(B) the revised pre-control estimated wolf population in Unit 19(A) was 125 - 150 wolves during fall 2004; studies in Alaska and elsewhere have repeatedly concluded that large, annual reductions of wolves are required to diminish wolf population levels and predation by wolves on their prey; consistent with scientific studies and department experience, the objective of this plan is to substantially reduce wolf numbers from pre-control levels in order to relieve predation pressure on moose and allow for improved recruitment to the moose population; this plan also has as a goal to maintain wolves as part of the natural ecosystem within the described geographical area; to achieve the desired reduction in wolf predation, but ensure that wolves persist within the plan area, the wolf population in Unit 19(A) will be reduced by no fewer than 30 wolves;

(C) the wolf population control objective for Unit 19(A) is 30 - 36 wolves; a minimum population of 30 wolves is within the 60 - 80 percent recommended reduction from the pre-control minimum estimated wolf population; the minimum wolf population control objective will achieve the desired reduction in wolf predation, and also ensure that wolves persist within the plan area;

(D) the pre-control estimated black bear population in Unit 19(A) was 2,475 – 2970 bears, including 135 – 160 black bears within the BCFA; the objective for the black bear predation control program is to reduce black bear numbers and black bear predation on moose to the lowest level possible within the BCFA; this plan includes a goal to maintain black bears as part of the natural ecosystem within Unit 19(A); because the BCFA is a relatively small geographic area, removing black bears from within it will have only a minor effect on the black bear population in Unit 19(A) overall, but should significantly contribute to moose calf survival in the BCFA;

(E) the pre-control estimated brown bear population in Unit 19(A) was 200 bears, including 10 – 15 brown bears within the BCFA; the objective for the brown bear predation control program is to reduce brown bear numbers and brown bear predation on moose to the lowest level possible within the BCFA; this plan includes a goal to maintain brown bears as part of the natural ecosystem within Unit 19(A); because the BCFA is a relatively small geographic area, removing brown bears from within it will have only a minor effect on the brown bear population in Unit 19(A) overall, but should significantly contribute to moose calf survival in the BCFA;

(3) the justifications for the predator control implementation plan are as follows:

(A) the estimated **2011** [2008] density of the moose population in Unit 19(A) is in the range of **0.28 – 0.58** [0.32 - 0.53] moose per square mile with a population of **2,791 - 5,782** [3,200 - 5,275] moose; based on current estimates of recruitment, density, and bull-to-cow ratios, there is no harvestable surplus in eastern Unit 19(A) upstream from and excluding the George River), excluding the Lime Village Management Area; in western Unit 19(A) (downstream from and including the George River), the harvestable surplus is 60 bulls, using a conservative harvest rate for bulls that is based on three percent of the estimated population; harvestable surplus is not sufficient to provide the amount of moose necessary for subsistence purposes or provide for nonsubsistence uses; the moose population and harvest objectives for Unit 19(A) are not being met because mortality has exceeded recruitment into the population causing a decline in moose numbers; wolf, **black bear and brown bear** predation is an important cause of moose mortality;

(B) kill rates by wolves are affected by availability of moose, snow depth, number of alternate prey, size of wolf packs, and other local factors; in Alaska and Canada where moose are the primary prey of wolves, studies documented kill rates ranging from four to seven moose per wolf per winter;

(C) black bear and brown bear predation is likely a major cause of moose calf mortality; in nearby Unit 19D-East, a 96 percent and 50 percent reduction in black bears and brown bears, respectively, resulted in increased survival rates during summer;

(D) [C] reducing wolf, black bear and brown bear numbers through a wolf, black bear and brown bear predation control program, combined with reduction in moose harvest is the approach most likely to succeed in a recovery of the moose population; wolf, black

bear and brown bear harvest through hunting and trapping efforts has not resulted in lowering the wolf, **black bear and brown bear** populations sufficiently to allow the moose population to grow; a regulation change in March 2002 to allow the use of snowmachines to take wolves has not resulted in a measurable increase in wolf harvest; public information and education programs have been implemented in the central Kuskokwim region to improve understanding of the biological effect of killing cow moose and the potential benefits to the moose population of increasing harvest of wolves and bears; education should help in the long-term but is not expected to result in a significant increase in the moose population in the short-term; Unit 19(A) was closed to nonresident hunting and a registration permit system for resident hunters was established in 2004; beginning in fall 2006, moose hunting was closed upstream from and excluding the George River drainage and excluding the Lime Village Management Area; a Tier II permit hunt was implemented downstream from and including the George River drainage; these changes were made in response to new information obtained during 2005 surveys;

(E) [D] presently known alternatives to predator control for reducing the number of predators are ineffective, impractical, or uneconomical in the Unit 19(A) situation; hunting and trapping conducted under authority of ordinary hunting and trapping seasons and bag limits is not an effective reduction technique in sparsely populated areas such as Unit 19(A); the numbers of hunters and trappers are relatively low and educational programs to stimulate interest and improve skills in taking wolves are in the early stages of development, and so far have been unsuccessful in increasing the harvest of wolves; the inherent wariness of wolves, difficult access, and relatively poor pelt prices also explain low harvest rates; application of the most common sterilization techniques, including surgery, implants, or inoculation, are not effective reduction techniques because they require immobilization of individual predators, which is extremely expensive in remote areas, relocation of wolves, **black bears and brown bears** is impractical because it is expensive and it is very difficult to find publicly acceptable places for relocated wolves, **black bears and brown bears**; habitat manipulation is ineffective because it may improve the birth rate of moose in certain circumstances, but it is poor survival, not poor birth rate that keeps moose populations low in rural areas of interior Alaska; supplemental feeding of wolves and bears as an alternative to predator control has improved moose calf survival in two experiments; however, large numbers of moose carcasses are not available for this kind of effort and transporting them to remote areas of Alaska is not practical; stocking of moose is impractical because of capturing and moving expenses; any of the alternatives to a wolf predation control program are not likely to be effective in achieving the desired level of predator harvest;

(F) [E] moose hunting seasons and bag limits have been reduced in Unit 19(A); in 2004 - 2005, the nonresident season in Unit 19(A) was closed and resident hunters in Unit 19(A) were required to have a registration permit; the resident winter moose hunting season in Unit 19(A) was eliminated to reduce overall harvest and eliminate incidental cow harvest to improve the reproductive potential of the population; beginning in fall 2006, moose hunting in the eastern part of Unit 19(A) outside the Lime Village Management Area was closed and the remainder of Unit 19(A) was limited by Tier II permit; while helpful, these

measures alone will not likely stop the decline in the moose population and they will not be enough alone to allow the moose population to increase;

(G) [F] without an effective wolf, black bear and brown bear predation control program, the wolf, black bear and brown bear harvest objectives cannot be achieved and moose in Unit 19(A) are likely to persist in a low density dynamic equilibrium state with little expectation of increase; data from moose mortality studies, and predator and prey studies, conducted throughout Alaska and similar areas in Canada suggest that reducing the number of wolves, black bears and brown bears in Unit 19(A) can reasonably be expected to increase the survival of calves as well as older moose; reducing wolf, black bear and brown bear predation on moose, in combination with reducing harvest, particularly of cows, can reasonably be expected to initiate an increase of the moose population towards the population objective; aerial wolf predation control makes it possible to increase the take of wolves over large expanses of territory in a vast and remote region like the majority of Unit 19(A); a combination of aerial black bear and brown bear control and bear trapping are effective techniques for reducing bear numbers and bear predation on moose; with a reduction in wolf **and bear**-caused mortality and restrictions in harvest, the moose population is expected to grow;

(4) the permissible methods and means used to take wolves, **black bears and brown bears** are as follows:

(A) hunting and trapping of wolves, **black bears and brown bears** by the public in Unit 19(A) during the term of the program will occur as provided in the hunting and trapping regulations set out elsewhere in this title, including use of motorized vehicles as provided in 5 AAC 92.080;

(B) notwithstanding any other provisions in this title, the commissioner may issue public aerial shooting permits or public land and shoot permits as a method of wolf removal under AS1605.783;

(C) notwithstanding any other provisions in this title, the commissioner may reduce the black bear population within the BCFA by means and direction included in the Board of Game Bear Conservation and Management Policy (2011-186-BOG), dated March 25, 2011, and incorporated by reference, including the following methods and means under AS1605.783:

(i) under a department developed predation control permit allowing take of any black bear, including sows and cubs, same-day-airborne taking of black bears if the permittee is at least 300 feet from the aircraft, sale of unmounted, tanned or untanned black bear hides if the sale tag remains attached, use of foot snares, and no bag limit;

(ii) use agents of the state, or department employees to conduct aerial, land and shoot, and/or ground based lethal black bear removal using state owned, privately owned, or chartered equipment, including helicopters;

(D) notwithstanding any other provisions in this title, the commissioner may reduce the brown bear population within the BCA by means and direction included in the Board of Game Bear Conservation and Management Policy (2011-186-BOG), dated March 25, 2011, and incorporated by reference, including the following methods and means under AS1605.783:

(i) under a department developed predation control permit allowing take of any brown bear, including sows and cubs, same-day-airborne taking of black bears if the permittee is at least 300 feet from the aircraft, sale of unmounted, tanned or untanned black bear hides if the sale tag remains attached, use of foot snares, and no bag limit;

(ii) use agents of the state, or department employees to conduct aerial, land and shoot, and/or ground based lethal brown bear removal using state owned, privately owned, or chartered equipment, including helicopters;

(5) the anticipated time frame and schedule for update and reevaluation are as follows:

(A) for up to five years beginning on July 1, 2009, the commissioner may reduce the wolf, **black bear and grizzly bear** populations in Unit 19(A);

(B) annually, the department shall to the extent practicable, provide to the board at the board's spring board meeting, a report of program activities conducted during the preceding 12 months, including implementation activities, the status of moose and wolf populations, and recommendations for changes, if necessary, to achieve the objectives of the plan;

(6) other specifications the board considers necessary are as follows:

(A) the commissioner will suspend wolf control activities:

(i) when wolf inventories or accumulated information from permittees indicate the need to avoid reducing wolf numbers below the management objective of 30 wolves specified in this subsection;

(ii) when spring conditions deteriorate to make wolf control operations infeasible; or

(iii) no later than April 30 in any regulatory year;

(B) wolf, **black bear and brown bear** control activities will be terminated

(i) when prey population management objectives are attained; or

(ii) upon expiration of the period during which the commissioner is authorized to reduce predator numbers in the predator control plan area;

(C) [D] the commissioner will annually close wolf hunting and trapping seasons as appropriate to ensure that the minimum wolf population objective is met.