PROPOSAL 1 – 5 AAC 92.126 (b) Non-Intensive Management Predator Control Plans, Unit 26(B) Musk Oxen Recovery Area.

PROPOSED BY: Alaska Department Fish and Game

WHAT WOULD THE PROPOSAL DO? This proposal would reauthorize the non-intensive management program in Unit 26B, found in 5 AAC 92.126, to remove bears associated with muskox predation during the calving and post-calving period.

WHAT ARE THE CURRENT REGULATIONS?

The current regulation expired in 2018 (5AAC92.126(5)(A).

5 AAC 92.126:

(a) Non-intensive management plans are established under this section in areas described in this section.

(b) Unit 26(B) Musk Oxen Recovery Area: Notwithstanding any other provisions in this title, and based on the following information contained in this subsection, the commissioner or the commissioner's designee may conduct selective, lethal, brown bear removal to allow recovery of the musk oxen population in Unit 26(B):

(1) the Unit 26(B) Musk Oxen Recovery Area is established and consists of all lands within Unit 26(B); this recovery program does not apply to any National Park Service or National Wildlife Refuge lands unless approved by the federal agencies;

(2) musk oxen and brown bear objectives are as follows:

(A) Unit 26(B) musk oxen are not managed intensively for high levels of human harvest, but are managed to provide hunting opportunities; the population objective is a minimum of 300 musk oxen that are one year old or older during April surveys; achieving this objective will allow re-establishment of a hunting season and also enhance and maintain viewing opportunity; the harvest objective is 3 - 9 musk oxen annually, once the population reaches 300 musk oxen and a harvestable surplus is available;

(B) the brown bear population objective for Unit 26(B) is to maintain the current estimated population of 200 - 320 bears, while annually removing up to 20 brown bears identified as threatening or killing musk oxen; limiting the number of bears that can be removed will assure that brown bears persist as part of the natural ecosystem and will assure continued brown bear hunting and viewing opportunities;

(3) findings of the Board of Game (board) concerning populations and human use are as follows:

(A) the Unit 26(B) musk oxen population and harvest objectives have not been achieved, based on the following:

(i) the musk oxen population size was estimated at 190 musk oxen in April 2011; musk oxen numbers in Unit 26(B) increased during 1990 - 1995 from 122 to 330 musk oxen; some of this increase in population was the result of immigration from Unit 26(C); during the mid-to-

late 1990s, numbers stabilized at around 265 - 300 musk oxen through 2003; subsequently, the population declined to 216 musk oxen by 2006, and during 2007 - 2011, the population in Unit 26(B) slightly declined and stabilized at its current, reduced population size;

(ii) the hunting season for musk oxen in Unit 26(B) has been closed since regulatory year 2006 - 2007; the first hunting season in Unit 26(B) was in 1990; during 1990 - 1997, all hunting was by Tier II permit; in regulatory year 1998 - 1999, the board determined that the amount necessary for subsistence was 20 musk oxen in Unit 26(A) and Unit 26(B), west of the Dalton Highway Management Corridor and established a Tier II hunt; the board also determined that the amount necessary for subsistence was four musk oxen in Unit 26(B), east of the Dalton Highway Management Corridor and established a Tier I registration hunt for residents only; a drawing permit hunt was also established for residents only; three permits were issued annually for bull musk oxen in Unit 26(B), east of the Dalton Highway, and the harvest of up to five musk oxen were authorized by the board; beginning in regulatory year 2005 - 2006, permits were not issued for the drawing and Tier I registration hunts, east of the Dalton Highway in Unit 26(B); this was in response to the sharp decline in musk oxen numbers following 2003; however, the Tier II subsistence hunt west of the Dalton Highway remained open until regulatory year 2006 - 2007, when no permits to hunt musk oxen were issued for any of the hunts;

(B) predation by brown bears was identified as a primary source of mortality on musk oxen and is an important cause of the failure to achieve the population and harvest objectives, based on the following:

(i) during 2007 - 2011, brown bear predation was identified as the primary source of mortality; 62 percent of the documented total adult musk oxen mortality (n=73) was attributed to brown bear predation, which accounted for an average of nine adult musk oxen deaths annually; during the same time period, 58 percent of documented calf mortality (n=45) was caused by brown bear predation; this resulted in an annual average of five calves known to be preyed on by brown bears; over the five years, a total of 74 calves were classified as "missing"; their fates were unknown and not included in the above calculations;

(ii) during 2007 - 2011, the habitat appeared capable of supporting a larger musk oxen population; captured musk oxen were generally in good condition, and birth rates were sufficient to provide for population growth, but growth was not realized because of poor survival; concentrations of some trace nutrients in musk oxen body tissues were believed to be suboptimal for survival; an imbalance of trace minerals, particularly low copper and selenium with elevated concentrations of zinc and iron, can negatively affect immune systems and make musk oxen more susceptible to diseases and potentially more vulnerable to predation; thus, it is possible that habitat limitations may have been obscured by high mortality due to predation; controlling predation will help answer this question;

(C) reducing predation can reasonably be expected to aid in achieving the objectives, based on the following:

(i) during 2004 - 2011, the population remained relatively stable at around 200 musk oxen; evidence indicates that the number of yearlings being recruited annually

approximately equaled the number of adult musk oxen dying annually; if survival rates of either adult musk oxen or calves increase, then the musk oxen population would be expected to increase; reducing predation on adults and calves should change survival rates of one or both; during 1987 - 1995, the annual rate of increase for the entire population was seven percent; this time period should be representative of what population growth rate Unit 26(B) musk oxen could experience if bear predation is reduced and habitat is not limiting; therefore, in a best case scenario, it would take approximately seven years for the musk oxen population to reach 300 musk oxen;

(ii) when the musk oxen population increases to 300 musk oxen one year old or older during April surveys, a hunt will be established if a harvestable surplus is available;

(D) reducing predation is likely to be effective and feasible using recognized and prudent active management techniques and based on scientific information; selectively removing brown bears to reduce predation is an experimental approach, based on the hypothesis that relatively few individual bears commonly kill musk oxen; brown bear radiotracking data collected during 1991 - 2007 indicated that several radiocollared adult males were responsible for multiple musk oxen predation events in early spring in a given year or over several years; this suggests that targeting individual bears should be effective, especially for reducing the incidence of multiple kills in spring; most of the predation was caused by male bears before the time when females emerge from dens;

(E) reducing predation is likely to be effective given land ownership patterns, based on the following:

(i) most of Unit 26(B) is state land; the land ownership pattern is 69 percent state land, 29 percent federal land, and 2 percent private land; of the 29 percent federal lands, 12 percent is Bureau of Land Management, and these lands are available for bear control; total land available for bear control is 72 - 74 percent of the unit;

(ii) only two of the 8 - 15 total musk oxen groups in Unit 26(B) occasionally occur on federal lands within the Arctic National Wildlife Refuge;

(F) reducing predation is in the best interests of subsistence users because no harvest is currently taking place; an increase in the population that results in sustainable harvest will benefit all residents;

(4) permissible methods and means are as follows:

(A) hunting of brown bears by the public in Unit 26(B) during the term of the program may occur as provided in the hunting regulations set out elsewhere in this title; however, hunting will be restricted as necessary to maintain the current estimated population of 200 - 320 bears;

(B) notwithstanding any other provisions in this title, the commissioner may allow agents of the state accompanied by department employees, or department employees, to conduct aerial, land and shoot, or ground-based lethal removal of any sex and age of brown bear using state-owned, privately-owned, or chartered equipment, including helicopters, under AS 16.05.783;

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

(A) through June 30, 2018, the commissioner may authorize removal of bears in the Unit 26(B) Musk Oxen Recovery Area;

(B) annually the department shall, to the extent practicable, provide to the board a report of program activities conducted during the preceding 12 months, including implementation activities, the status of the musk oxen and brown bear populations, and recommendations for changes, if necessary to achieve the objectives of the plan;

(C) the program will be reviewed and modified or suspended if there is no evidence of improved survival or a detectable increase in the Unit 26(B) musk oxen population after three years of bear removal.

The board has made a positive customary and traditional use determination for musk oxen in unit 26(B) and determined an amount reasonably necessary for subsistence uses (ANS) in that portion of Unit 26(B) east of the Dalton Highway Corridor of 4 muskox and ANS of 20 musk oxen for that portion of the remainder of Unit 26(A) and Unit 26(B) west of the Dalton Highway.

WHAT WOULD BE THE EFFECT IF THE PROPOSAL WERE ADOPTED? The regulation (5AAC 92.126) would be reauthorized until 30 June 2034.

BACKGROUND: In 2004, the Unit 26(B) musk oxen population declined from around 300 musk oxen to 200 musk oxen and the hunting season was closed. Following the decline, from 2007–2011, the department conducted a series of studies to help determine the cause of the decline, including studies on habitat, nutrition, mineral deficiencies, disease, and predation. Of the 73 adult muskox mortalities during the study, 62% were attributed to brown bear predation. Among those, 74% were adult females, which are the most important demographic age and sex class due to reproductive potential. Other known causes of mortality included vehicle collisions and illegal take (11%), drowning (5%), and disease (3%). The cause of nineteen percent of adult mortalities could not be determined. Among calf mortalities with known causes, 58% were attributed to bear predation. However, the proportion of calf mortalities related to bear predation was suspected to be much higher as 63% of the calves in the study went missing and were not located by the department, presumably because many were eaten, buried, removed from kill sites by brown bears, or abandoned after bear predation events.

The results of those studies also indicated that most musk oxen mortalities were caused by relatively few brown bears that specialized in killing musk oxen and that the time period during which this occurred was relatively short during the calving season. This was based on the repeated presence of a few radiocollared bears as well as observations of a few non-radiocollared bears, that appeared to be the same brown bears based on body size and hair color that were observed numerous times at musk oxen kill sites.

As a result of the population decline and subsequent research, in March 2012, the board adopted a non-intensive management predator control program for the Unit 26(B) muskox population. The program authorized selective lethal removal of brown bears by the department. The program was based on the results of the 2007–2011 Department research which demonstrated: 1) the primary cause of musk oxen mortalities was brown bear predation, 2) relatively few brown bears from the Unit 26(B) population would be removed, 3) most bears would be males, and 4) this would have

little or no effect on the overall brown bear population size because the removal from the control program, in addition to hunting mortality, would be within estimates of sustained yield. The department also recognized this was an experiment, as few management options were available to try to improve musk oxen survival given the results of the research studies.

During 2012–2013, the department intensively monitored eight groups of musk oxen, comprising over 90% of the existing 26B population. Groups included musk oxen marked with radiocollars. The department conducted over twenty monitoring flights annually with most primarily occurring during the calving period from April–June. Three bears were removed in 2012 and 3 in 2013 when the department detected predation events or predatory behavior. All removed bears were males. Similar to observations during the previous research study, predation by brown bears appeared to be the primary source of calf mortalities. Of the musk oxen groups where a predation event did not occur, summer calf survival was 98% (n=44) in 2012 and 90% (n=21) in 2013. However, in the groups of musk oxen that experienced bear predation, summer calf survival was 35% (n=17) in 2012 and 55% (n=20) in 2013.

Summer survival of muskox calves during the removal program increased from 63% annually during the research period to 77% during the control program. However, annual survival of calves did not appear to improve and recruitment was similar to pre-control efforts.

The control efforts also decreased predation on adult muskox. From 2007–2011 during the research period, brown bears annually preyed on an average of nine adult muskoxen (range 4–18); representing approximately 3%–10% of the adult muskox population in each year. During the bear removal years, adult muskox mortality from brown bear predation decreased to an average of 2 muskoxen annually (range 1–3) representing approximately 1% of the population. However, the population did not grow, in part due to a single major drowning event in 2012 that led to the loss of approximately 11% of the entire population. Due to this stochastic event and no evidence of improved recruitment of calves to the short-yearling age class, the program was suspended for re-evaluation.

Following program suspension, in 2018, the muskox population began to increase and surpassed the management objective of ≥300 muskoxen by 2020 when the board re-established a hunt. The hunt structure includes Tier II and Tier I registration hunts, as well as a limited drawing permit hunt.

During the period of population growth from 2018 to 2023, few brown bear predation events were detected when compared to the period prior to the control program and it is plausible that the impact of removing relatively few bears that specialize in killing muskoxen had a positive effect on population growth that was not immediately detectable when the program was active. Traditional survey and inventory and research survey techniques were consistent throughout the entire time period. This may be due in part to the drowning event possibly masking the department's ability to detect improvements in survival at the population level as results of

decreased bear predation and/or because this population is small and improvements to survival and population growth are difficult to detect.

Since 2023, the population has declined significantly and has dropped below the management objective. The most recent population estimate in April 2026 indicated a total of 220 muskoxen. Mortality of radiocollared muskoxen due to bear predation increased to levels similar to those observed prior to and during the bear removal period from 2007 to 2016. Given the current rate of decline there is risk that this population may decline to very low levels which will result in hunt closures.

While conducting the composition survey in April 2026, one brown bear (adult male) was found to have killed 3 muskoxen in less than 2 days. This was based on tracks in the snow during excellent tracking conditions, no other bear tracks found in the area, and repeated aerial flights during the 2 days monitoring the muskox groups when the predation took place. The department captured and collared the bear and will monitor it to identify if or when it continues to predate on muskox. If other bears are found to be near muskox groups or predating on muskoxen, the department will attempt to catch and collar those bears to better understand the overall impact that a very small number of bears may be having on the muskox population.

The most current population estimate for brown bears in Unit 26B occurred during a muti- year survey from 1999–2003 as well as demographic data collected on collared bears during this time. The results of these surveys indicated the brown bear population in Unit 26B was 243–423 adult brown bears. Currently, the department manages the brown bear population for an annual harvest rate of 8% or 27 brown bears per year, of which no more than 40% (12 brown bears) can be female. Brown bear harvest over the past 5 years has averaged a total of 17 per year, with females composing an average of 4 per year. Over that 5-year period, 5 bears (2 female, 3 male) were removed by agency personnel for human safety concerns, 2 male bears were killed in defense of life or property, and 1 male was taken illegally. Combined this results in a total average take of 19 bears (5 female, 14 male) per year.

DEPARTMENT COMMENTS: The department submitted and SUPPORTS this proposal.

The department and the board are required to consider all important, relevant, and material factors relating to the sustainability of a replenishable, public, wildlife resource prior to adoption of a regulatory proposal. Reinstating the non-intensive management predator control for musk oxen in Unit 26B will assist in maintaining a harvestable surplus to offer hunting opportunity by reducing predation from brown bears. The department has designed the proposed non-intensive management program for brown bears to be sustainable. With removal of only those bears identified as preying or exhibiting predatory behavior on muskox, annual removals under the program, in addition to hunting mortality, are expected to be near the annual estimated harvestable surplus and thus sustainable. Therefore, all open seasons for the harvest of brown bears will remain open in Unit 26(B).

The current muskox population objective in Unit 26(B) is at least 300 adult musk oxen. The current brown harvest objective, based on sustained yield, in Unit 26(B) is 27 brown bears. Current average harvest of brown bears in Unit 26(B) is 17, annually. Therefore, the department suggests the current non-intensive management plan described in regulation (5AAC 92.126) be modified to include the following predator and prey thresholds to activate or suspend brown bear removal. These include: 1) no more than 10 brown bears will be lethally removed annually and 2) brown bear removal will be suspended if the muskox population reaches 300 or more musk oxen or no population growth is detected after 6 years.

The department is committed to the conscious application of management principles intended to sustain the yield of muskoxen and brown bears. The department has considered the role of predators in the ecosystem, as well as their distribution within the range of the Unit 26B muskox population.

COST ANALYSIS: Adoption of this proposal would result in additional costs for the department if bear removal efforts were conducted.

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