Annual Report to the Alaska Board of Game on Intensive Management for Moose with Wolf and Bear Predation Control in Game Management Unit 19D (East)

Prepared by the Division of Wildlife Conservation
February 2013

1) Description of Intensive management (IM) Program[1] and Department recommendation for reporting period

A) This report is an interim review _X_ or renewal evaluation ___ for a predation control program authorized by the Alaska Board of Game (Board) under 5 AAC 92.125

B) Date this report was submitted by the Department to the Board:

1 February _X_ (annual report) 1 August __(interim annual update[2]) Year 2013

C) Program name: Unit 19D East wolf and bear predation control program (Fig. 1)

D) Existing program has _ / does not have X an associated IM plan

E) Game Management Unit fully or partly included in IM program area: Unit 19D East

F) IM objectives for Moose: population size 6000 – 8000 harvest 400 – 600

G) Month and year the current predation control program was originally authorized: Fall 1995 by the Board. Indicate date(s) if renewed: January 2000, March 2003, January 2006, May 2006, March 2009

H) Predation control is currently active _X_ or temporarily inactive ____ in this IM area

I) If active, month and year the current predation control program began December 2003 or resumed ___.

J) Indicate if a habitat management program funded by the Department or from other sources is currently active in this IM area (Y/N) N

K) Size of IM program area and geographic description: Unit 19D East - 8,513 mi^2

L) Size and geographic description of area for assessing ungulate abundance: Upper Kuskokwim Villages Moose Management Area (MMA) -1,118 mi^2

M) Size and geographic description of area for ungulate harvest reporting: MMA-1,118 mi^2

N) Size and geographic description of area for assessing predator abundance: Wolf Control Focus Area (WCFA)-4,484 mi^2 ;Bear Control Area (BCA)-528 mi^2

O) Size and geographic description of predation control area: WCFA - 4,484 mi^2; BCA - 528 mi^2;

[1] For purpose and context of this report format, see appendix.

P) Criteria for evaluating progress toward IM objectives: moose abundance and harvest

Q) Criteria for success with this program: MMA abundance=2500 moose and MMA harvest=100 moose

R) **Department recommendation for IM program in this reporting period**: continue program (details provided in section 5)

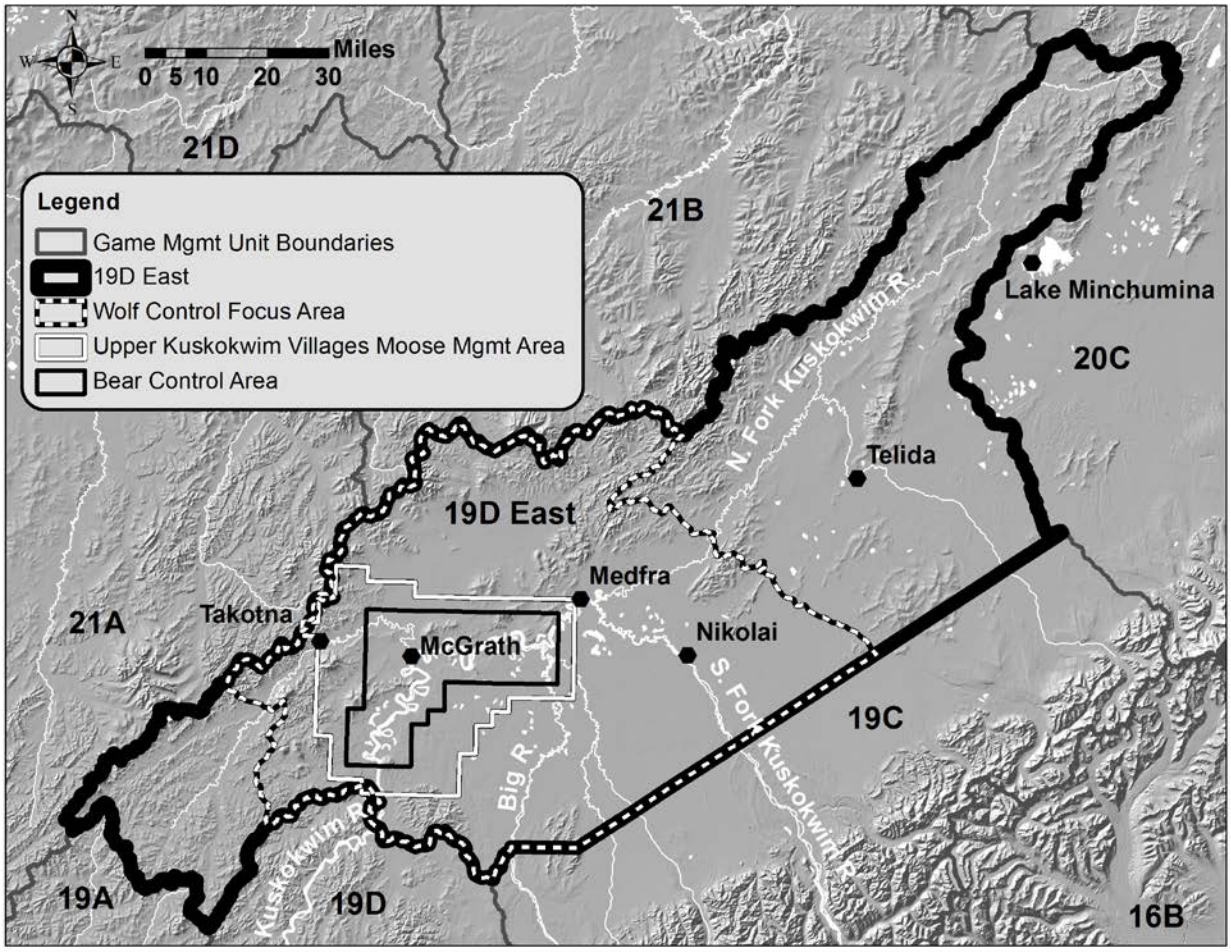

Figure 1. Unit 19D East intensive management area.

2) Prey data

Date(s) and method of most recent fall/spring abundance assessment for moose: Nov 2012-goespatial moose population estimate (GSPE) in MMA

Compared to IM area, was a similar trend and magnitude of difference in abundance observed in nearby non-treatment area(s) since program inception: Non-treatment area not established (Y/N); and in the last year: Non-treatment area not established (Y/N)?

Date(s) of most recent age and sex composition: Nov 2012-goespatial moose population estimate in MMA

Compared to IM area, was a similar composition trend and magnitude of difference in composition observed in nearby non-treatment area(s) since program inception: Non-treatment area not established (Y/N) and in the last year Non-treatment area not established (Y/N)?

Table 1. Moose abundance, age and sex composition in Upper Kuskokwim Villages Moose Management Area (MMA) since program implementation in year 1 to year 12. Regulatory year is 1 July to 30 June (e.g, RY 2011 is 1 July 2011 to 30 June 2012).

			Composition (number per 100 Cows)			
Period	RY	Abundance [a] (90% CI)	Calves (90% CI)	Yearling Bulls (90% CI)	Bulls (90% CI)	Total *n*
Year 1	2001	868(±147)	36(±10)	8(±3)	21(±6)	455
Year 2	2002	--	--	--	--	--
Year 3	2003	--	--	--	--	--
Year 4	2004	1192(±228)	66(±18)	8(±4)	18(±6)	578
Year 5	2005	--	--	--	--	--
Year 6	2006	1308(±174)	55(±10)	12(±3)	30(±8)	762
Year 7	2007	1720(±306)	53(±14)	15(±4)	36(±10)	844
Year 8	2008	1718(±352)	44(±12)	14(±5)	40(±11)	678
Year 9	2009	1820(±323)	38(±10)	11(±4)	40(±11)	711
Year 10	2010	1796(±312)	43(±11)	16(±5)	49(±13)	712
Year 11	2011	1647(±296)	42(±11)	10(±3)	33(±10)	639
Year 12[b]	2012	1337(±199)	35(±11)	7(±2)	38(±5)	650

[a] Estimate with sightability correction applied

[b] Preliminary data

Describe trend in abundance or composition: Results of a RY 2001-2009 trend analysis indicate a statistically significant increasing linear trend in abundance within the MMA (115 moose/year, SE=19.2, P=0.004). Midpoints of estimates since 2009 have been lower.

Table 2. Moose harvest in Upper Kuskokwim Villages Moose Management Area (MMA) since program implementation in year 1 to year 12. Regulatory year is 1 July to 30 June (e.g, RY 2011 is 1 July 2011 to 30 June 2012).

Period	RY	Reported		Other mortality[a]	Total
		Male	Female		
Year 1	2001	29	0	-[b]	29
Year 2	2002	23	0	-[b]	23
Year 3	2003	32	0	-[b]	32
Year 4	2004	7	0	-[b]	7
Year 5	2005	14	0	-[b]	14
Year 6	2006	12	0	3	15
Year 7	2007	25	0	1	26
Year 8	2008	61	0	1	62
Year 9	2009	56	0	2	58
Year 10	2010	50	0	2	52
Year 11	2011	100	0	1	101
Year 12[c]	2012	69	0	1	70

[a] Mortuary harvest
[b] Records destroyed by fire
[c] Preliminary data

Describe trend in harvest: General increase in harvest since 2001.

Describe any other harvest related trend if appropriate: None

3) Predator data

Wolves

Date(s) and method of most recent spring abundance assessment for wolves: March 2009 - aerial reconnaissance survey

Date(s) and method of most recent fall abundance assessment for wolves: March 2009 - calculated by subtracting total removal from following spring abundance estimate

Other research or evidence of trend or abundance status in wolves:

Keech, M. A., M. S. Lindberg, R. D. Boertje, P. Valkenburg, B. D. Taras, T. A. Boudreau, K. B. Beckmen. 2011. Effects of Predator Treatments, Individual Traits, and Environment on Moose Survival in Alaska. The Journal of Wildlife Management 75(6):1361–1380.

Keech, M. A. 2012. Response of moose and their predators to wolf reduction and short-term bear removal in a portion of Unit 19D. Alaska Department of Fish and Game, Federal Aid in

Wildlife Restoration, Final Wildlife Research Report ADF&G/DWC/WRR-2012-#, Grants W-33-4 through W-33-10, Project 1.62, Juneau, Alaska.

Table 3. Wolf abundance and removal in Wolf Control Focus Area (WCFA) since program implementation in year 1 to year 11. Removal objectives are to reduce wolf numbers as low as possible in the WCFA and to maintain a minimum of 40 wolves in all of Unit 19D East to ensure wolves persist in the unit. The WCFA was established in RY 2010. Prior to RY 2010, control was conducted in various different geographic areas. All values listed are for the current WCFA. Regulatory year is 1 July to 30 June (e.g, RY 2011 is 1 July 2011 to 30 June 2012).

Period	RY	Fall abundance[a]	Harvest removal		Dept. control removal	Public control removal[b]	Total removal	Spring abundance[c]
			Trap	Hunt				
Year 1	2001	89	19	3	0	N/A	22	67
Year 2	2002	--	28	5	0	N/A	33	--
Year 3	2003	--	9	1	0	17	27	--
Year 4	2004	--	12	2	0	12	26	--
Year 5	2005	26	9	1	0	3	13	13
Year 6	2006	29	13	1	0	2	16	13
Year 7	2007	--	6	2	0	19	27	--
Year 8	2008	--	4	3	0	19	26	--
Year 9	2009	37	7	4	0	4	15	22
Year 10	2010	--	4	2	0	13	19	--
Year 11	2011	--	11	0	0	22	33	--

[a]Calculated by subtracting total removal from following spring abundance in each RY when spring abundance surveys were conducted
[b]Public control removal began in RY 2003
[c]Calculated by extrapolating density within a 3,210 mi^2 aerial reconnaissance survey area within the WCFA to the entire WCFA

Black Bears

Date(s) and method of most recent spring abundance assessment for black bears: May 2010 - mark/recapture estimator

Date(s) and method of most recent fall abundance assessment for black bears: November 2009 - calculated by subtracting total removal from May 2010 abundance estimate.

Other research or evidence of trend or abundance status in black bears:

Keech, M. A., M. S. Lindberg, R. D. Boertje, P. Valkenburg, B. D. Taras, T. A. Boudreau, K. B. Beckmen. 2011. Effects of Predator Treatments, Individual Traits, and Environment on Moose Survival in Alaska. The Journal of Wildlife Management 75(6):1361–1380

Keech, M. A. 2012. Response of moose and their predators to wolf reduction and short-term bear removal in a portion of Unit 19D. Alaska Department of Fish and Game, Federal Aid in Wildlife Restoration, Final Wildlife Research Report ADF&G/DWC/WRR-2012-#,

Grants W-33-4 through W-33-10, Project 1.62, Juneau, Alaska.

Table 4. Black bear abundance and removal in Bear Control Area (BCA) since program implementation in year 1 to year 12. Removal objective is to reduce bear numbers as low as possible within the BCA. Regulatory year is 1 July to 30 June (e.g, RY 2010 is 1 July 2010 to 30 June 2011).

Period	RY	Spring abundance[a] (95% CI)	Harvest removal		Dept. control removal		Public control removal		Total removal	Fall abundance[a,b]
			FA[c]	SPR[d]	FA	SP	FA	SP		
Year 1	2001	--	1	0	0	0	0	0	1	--
Year 2	2002	96(±13)[e]	4	0	0	67[f]	0	0	73	--
Year 3	2003	30(±9)[e]	1	5	0	26[f]	0	0	32	23
Year 4	2004	--	0	1	0	0	0	0	1	Near 0
Year 5	2005	--	1	5	0	0	0	0	6	--
Year 6	2006	70(±14)[g]	0	0	0	0	0	0	0	--
Year 7	2007	--	1	7	0	0	0	0	8	70
Year 8	2008	--	1	5	0	0	0	0	9	--
Year 9	2009	123(96–162)[g]	4	0	0	0	0	6	10	--
Year 10	2010	--	1	3	0	0	4	13	21	113
Year 11	2011	--	7	1	0	0	1	2	11	--
Year 12	2012[h]	--	0	--	0	--	0	--	0	--

[a]Does not include cubs
[b]Calculated by subtracting total removal from spring abundance estimate in the previous RY
[c]Fall
[d]Spring
[e]Removal estimator
[f]Non-lethal removal
[g]Mark/recapture estimator
[h]Preliminary data

Grizzly Bears

Date(s) and method of most recent spring abundance assessment for grizzly bears: May 2002-Estimated by using density extrapolated from other areas of Interior Alaska with comparable habitat

Date(s) and method of most recent fall abundance assessment for grizzly bears: November 2003-Calculated by subtracting total removal from May 2002 abundance estimate.

Other research or evidence of trend or abundance status in grizzly bears:

Keech, M. A., M. S. Lindberg, R. D. Boertje, P. Valkenburg, B. D. Taras, T. A. Boudreau, K. B. Beckmen. 2011. Effects of Predator Treatments, Individual Traits, and Environment on Moose Survival in Alaska. The Journal of Wildlife Management 75(6):1361–1380.

Keech, M. A. 2012. Response of moose and their predators to wolf reduction and short-term bear removal in a portion of Unit 19D. Alaska Department of Fish and Game, Federal Aid in Wildlife Restoration, Final Wildlife Research Report ADF&G/DWC/WRR-2012-#, Grants W-33-4 through W-33-10, Project 1.62, Juneau, Alaska.

Table 5. Brown bear abundance and removal in Bear Control Area (BCA) since program implementation in year 1 to year 12. Removal objective is to reduce bear numbers as low as possible within the BCA. Regulatory year is 1 July to 30 June (e.g, RY 2011 is 1 July 2011 to 30 June 2012).

Period	RY	Spring abundance[a]	Harvest removal		Dept. control removal		Public control removal		Total removal	Fall abundance[a,b]
			FA[c]	SP[d]	FA	SP	FA	SP		
Year 1	2001	--	0	0	0	0	0	0	0	--
Year 2	2002	12[e]	0	0	0	6[f]	0	0	6	--
Year 3	2003	--	0	0	0	0	0	0	0	6
Year 4	2004	--	0	0	0	0	0	0	0	--
Year 5	2005	--	0	0	0	0	0	0	0	--
Year 6	2006	--	0	2	0	0	0	0	2	--
Year 7	2007	--	1	2	0	0	0	0	3	--
Year 8	2008	--	0	0	0	0	0	0	0	--
Year 9	2009	--	2	0	0	0	0	0	2	--
Year 10	2010	--	0	0	0	0	0	0	0	--
Year 11	2011	--	0	0	0	0	0	0	0	--
Year 12	2012[g]	--	0	--	0	--	0	--	0	--

[a]Does not include cubs
[b]Calculated by subtracting total removal from spring abundance estimate in the previous RY
[c]Fall
[d]Spring
[e]Estimated by using density extrapolated from other areas of Interior Alaska with comparable habitat
[f]Non-lethal removal
[g]Preliminary data

4) Habitat data and nutritional condition of prey species

Where active habitat enhancement is occurring or was recommended in the *Intensive Management Plan*, describe progress toward objectives: No active habitat enhancement occurring.

Table 5. Nutritional indicators for moose in Upper Kuskokwim Villages Moose Management Area (MMA) since program implementation in year 1 to year 11. Regulatory year is 1 July to 30 June (e.g, RY 2011 is 1 July 2011 to 30 June 2012).

Period	RY	Twinning Rate for Radiocollared cows >2 yrs (*n*)	Twinning Rate uncollared cows (*n*)
Year 1	2001	59% (22)	39% (46)
Year 2	2002	24% (25)	36% (39)
Year 3	2003	32% (31)	39% (31)
Year 4	2004	44% (45)	50% (40)
Year 5	2005	40% (60)	35% (29)
Year 6	2006	52% (56)	50% (30)
Year 7	2007	55% (51)	--
Year 8	2008	33% (43)	26% (87)
Year 9	2009	33% (40)	29% (45)
Year 10	2010	--	37% (38)
Year 11	2011	--	34% (47)

5) Costs specific to implementing Intensive Management

Table 5. Proportional time of field level staff and cost ($1000 = 1.0) of ADF&G personnel salary plus operations for predation control and for other intensive management activities (e.g., habitat enhancement, wildlife survey efforts beyond normal Survey and Inventory work) in Unit 19D East during years 10 and 11. Fiscal year (FY) is also 1 July to 30 June but the year is one greater than the comparable RY (e.g, FY 2010 is 1 July 2009 to 30 June 2010).

		Predation control[a]		Other IM activities		Total IM	Research
Period	FY	Time[b]	Cost[c]	Time	Cost	cost	cost[d]
Year 10	2011	0.4	3.5	0.4	5.0	8.5	56.0
Year 11	2012	1.2	7.3	4.0	43.6	50.9	39.0

[a]State or private funds only.
[b]Person-months (22 days per month)
[c]Salary plus operations
[d]Separate from implementing IM program but beneficial for understanding of ecological or human response to management treatment (scientific approach that is not unique to IM).

6) Department recommendations for annual evaluation (1 February) following Year 11 for Unit 19D East wolf and bear predation control program

Has progress toward defined criteria been achieved? Yes. Results of a 2001-2009 trend analysis indicate a statistically significant increasing linear trend in moose abundance within the MMA (115 moose/year, SE=19.2, P=0.004). However, midpoints of estimates since 2009 are lower. MMA moose harvest has increased as abundance has increased and seasons have been

liberalized. Increases with the MMA are contributing to achievement of Unit 19D East IM objectives.

Has achievement of success criteria occurred? Yes. During RY11, the harvest objective of 100 from the MMA was achieved, but only for that year.

Recommendation for Predation Control: Continue as currently being conducted.

7) Appendix: Purpose and context of Department Report

This document provides a standard format for area biologists in the Alaska Department of Fish and Game (Department) to periodically report on progress in intensive management (IM) programs with predation control to the public and the Alaska Board of Game (Board). Predation control programs are authorized in Title 5, Chapter 92, Section 125 of the Alaska Administrative Code (5 AAC 92.125). The Department Report is premised on the 10 November 2010 draft *Guidelines for intensive management of big game in Alaska*, which describes the legal background, scientific principles, and management factors of producing and maintaining elevated harvests of ungulates (caribou, deer, or moose) in selected areas of Alaska. For IM programs initiated or renewed after 1 January 2012, the intent is that details of rationale, decision criteria involving public process and other biological and management factors for specific IM programs will be found in the corresponding *Intensive Management Plan*.

IM objectives for deer and moose are determined by the Board for a game management unit (GMU), whereas those for caribou are determined by herd. The IM program area may be described by geography (drainage) or community(s) if it is focused in a smaller area than the one describing the corresponding IM objectives, or if the area is composed of multiple GMUs. A predation control area may be smaller, and contained within, the IM program area or the area used for assessing predator abundance in a game management unit. Thus, the number of wolves, black bears, or grizzly/brown bears remaining in the larger abundance assessment area on a specific date incorporates the potential for recolonization of the smaller control area by predators on surrounding lands (where hunting and trapping but not control methods are allowed), in addition to reproduction by predators remaining in the control area.

The Department Report to the Board documents evaluation of progress toward IM population or harvest objectives for ungulate or other objectives determined by public process for existing IM programs. Initially these reports will be only for areas with predation control to meet annual reporting requirements (Alaska Statutes, Title 16, Section 50, Part b), but they may be expanded to IM programs that only include ungulate habitat enhancement, diverse strategies for hunter access and ungulate harvest, and outreach programs (see *Guidelines*). Predator harvest is achieved through hunting and trapping regulations, whereas predation control typically removes predators by additional means such as by public participants (by special Department permit) or by Department personnel (non-lethal methods could also be applied). Report information will be used for Department recommendations and Board decisions on continuing, modifying, suspending, or terminating IM programs. The annual report will be issued on 1 February with an interim report on 1 August. These dates account for lag time in entering reported predator removal and ungulate harvest into an electronic database for archive and analysis. The August

interim report will have the ungulate harvest and wolf removal from the previous regulatory year, whereas the February annual report will include most of the ungulate harvest from the prior fall and bear removal from the prior regulatory and calendar years. Report information is for a single program, but it may also be presented in a table showing multiple IM programs in a region or all IM programs statewide.