Annual Report to the Alaska Board of Game on Intensive Management for Moose with Wolf Predation Control in GMU 13

**Prepared by the Division of Wildlife Conservation
February 2013**

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

A) This report is an annual evaluation for a predation control program authorized by the Alaska Board of Game (Board) under 5 AAC 92.121

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

   February _X_ (annual report)   August ___ (interim annual update[2])   Year _2013_

C) Program name: GMU 13 Wolf Predation Control Area/GMU 13/moose

D) Existing program does not have an associated Operational Plan

E) Game Management Units (GMUs) fully or partly included in IM program area:
     GMUs 13(A), 13(B), 13(C), and 13(E)

F) IM objectives for moose:
     Population objective for GMU 13 is 17,600 – 21,900 (including GMU 13(D)) and harvest objective for GMU 13 is 1,050 – 2,180 (including GMU 13(D)).

     For those GMUs covered by the GMU 13 wolf predation control area, population objectives for GMUs 13(A), 13(B), 13(C), and 13(E) are 3,500 – 4,200, 5,300 – 6,300, 2,600 – 3,500, and 5,000 – 6,000 moose respectively and harvest objectives for GMUs 13(A), 13(B), 13(C), and 13(E) are 210 – 420, 310 – 620, 155 – 350, and 300 – 600 moose respectively.

G) Month and year the current predation control program was originally authorized by the Board:
     March 2000 by the Board (minimal area covered in GMUs 13(A), 13(B), and 13(E); Same-day-airborne take first allowed January 2004); plan renewed March 2005 (IM area increased to include GMU 13(C)), plan renewed again October 2010 (current area open to predation control has been stable since 2006; current plan active through 15 December 2016).

H) Predation control is temporarily inactive in this IM area.
     The decision to suspend predation control initially for regulatory year (RY) 2012 (RY12 = 1 July 2012 through 30 June 2013) was a low spring wolf estimate from RY2011, below the minimum required. Program activities will resume once the minimum number of wolves has been confirmed.

I) If active, month and year the current predation control program began: March 2000.

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[1] For purpose and context of this report format, see *Agency Protocol for Intensive Management of Big Game in Alaska*.
[2] The interim annual update may be limited only to sections that changed substantially since prior annual report [*e.g., only Tables 3 and 6 in areas with a fall ungulate survey and only wolf control*]

J) An habitat management program funded by the Department or from other sources is currently active in this IM area: Yes
   The Alphabet Hills Prescribed Burn plan is active and will be implemented given prescription conditions.

K) Size of IM program area (square miles) and geographic description:
   - 15,413 square miles
   - All lands within GMUs 13(A), 13(B), 13(C), and that portion of GMU 13(E) east of the Alaska Railroad, except National Park Service and other federal lands where same-day-airborne take of wildlife is not allowed

L) Size and geographic description of area for assessing ungulate abundance within the IM area:
   Continuous count areas (CA) 3, 5, 6, 10, 13, 14, and 16 across GMU 13 encompassing a total of 3,219 square miles

M) Size and geographic description of area for ungulate harvest reporting:
   GMU 13 covering 23,367 square miles

N) Size and geographic description of area for assessing predator abundance:
   GMU 13 covering 23,367 square miles

O) Size and geographic description of predation control area:
   Total IM area 15,413 square miles (14,550 square miles open to predation control in regulatory year 2012; closures include populated areas and federal lands where same-day-airborne take of wildlife is not allowed)

P) Criteria for evaluating progress toward IM objectives:
   - population abundance
   - harvest
   - calf:cow ratios
   - bull:cow ratios

Q) Criteria for success with this program:
   - Achieve population and harvest objectives (listed above)
   - Maintain a minimum of 25 bulls:100 cows for GMU 13, 25 calves:100 cows for GMU 13(A)
   - Maintain a minimum of 30 calves:100 cows for GMUs 13(B), 13(C), and 13(E)

R) **Department recommendation for IM program in this reporting period**:
   The Department recommends continuation of the program with modifications (details provided in sections 6)

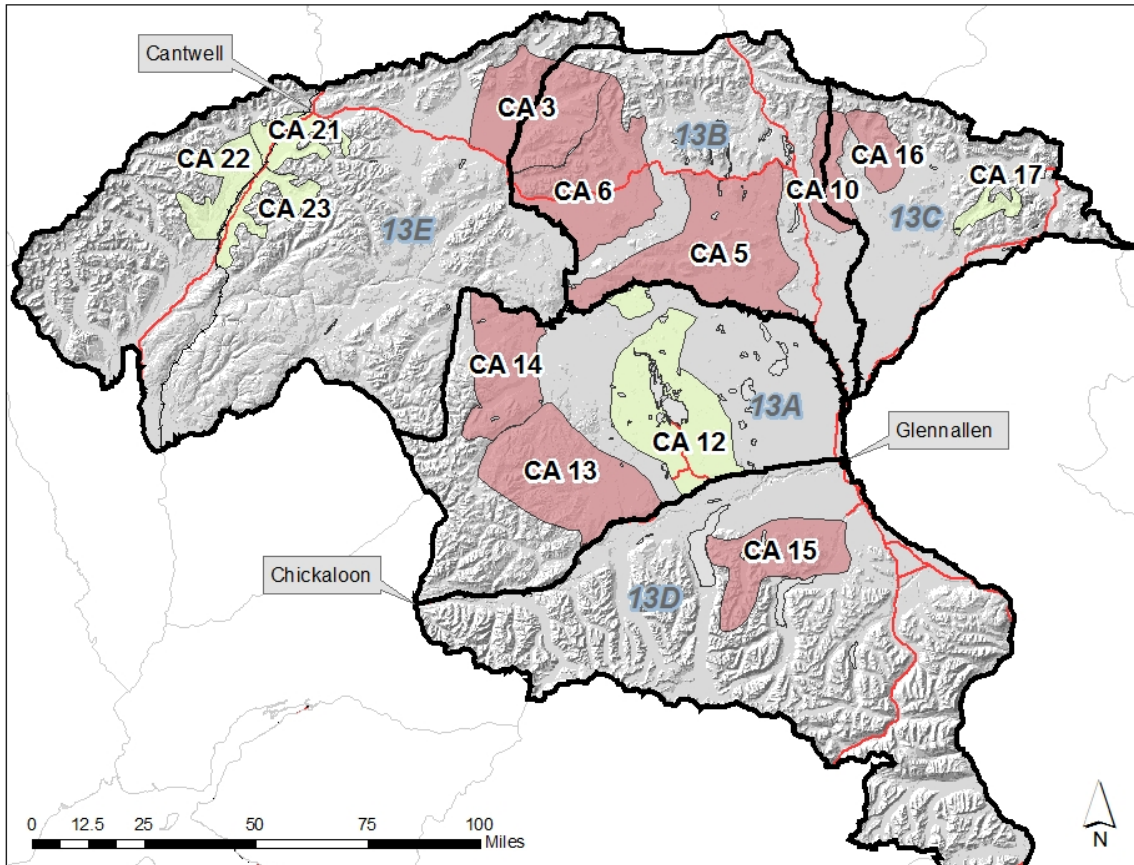For moose count areas (CA) described in this section, see map below.

Figure 1. GMU 13 moose count areas, darker pink areas are continuous count areas surveyed annually, lighter green areas are surveyed periodically.

2) Prey data

Date(s) and method of most recent <u>fall</u> abundance assessment for <u>moose</u> (result in Table 1):
> Fall trend count surveys are conducted annually November – December to determine sex and age composition of moose. The most recent surveys were conducted in November 2012. Trend count data, corrected for estimated sightability were extrapolated to estimate unit-wide population abundance.

> Compared to IM area, was a similar trend and magnitude of difference in abundance observed in nearby non-treatment area(s) since program inception (Y/N) <u>N</u> and in the last year (Y/N) <u>Y</u>?   Describe comparison if necessary:
> > Moose abundance in CAs receiving treatment has more than doubled since program inception, whereas abundance in CA 15 in GMU 13(D) which is

adjacent to the current IM area has been relatively stable. The moose abundance in CAs receiving treatment remained relatively stable between 2011 and 2012, similar to the trend observed in CA 15.

Date(s) of most recent age and sex composition survey (result in Table 1): Fall trend count surveys provide age and sex composition data; most recent surveys November 2012.

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 (Y/N) No and in the last year (Y/N) N?   Describe comparison if necessary:
Moose composition (calf and bull ratios) in CAs receiving treatment has improved substantially since program inception, whereas composition in CA 15 in GMU 13(D) has remained relatively stable. The bull ratios have declined slightly in CAs receiving treatment in recent years due to liberalized harvest regulations designed to take available harvestable surplus. Bull ratios continue to meet or exceed objectives in each treated GMU. Calf ratios in treated areas declined between 2011 and 2012, while the calf ratio in CA 15 remained consistently low.

Table 1. Moose abundance, age and sex composition in assessment area (L) since program implementation (reauthorization) in year 10 (not exclusively limited to inception of predation control) to reauthorization review in year 15 in GMU 13. Regulatory year is 1 July to 30 June (e.g, RY 2010 is 1 July 2010 to 30 June 2011).

Period	RY	Moose Observed (Estimated Abundance)	Composition (number per 100 females)			
			Calves	Yearlings Males	Males	Total n
Year 8	2008	4310 (13,680)	19	12	33	4310
Year 9	2009	4875 (14,710)	23	9	33	4875
Year 10	2010	5,112 (15,900)	21	10	28	5112
Year 11	2011	5,432 (16,960)	23	10	32	5432
Year 12	2012	5,232 (16,245)	16	7	31	5232

Describe trend in abundance or composition: Moose across the GMU 13 control area have generally increased since IM program inception. Cows continue to increase across the control area. Bulls increased substantially during the early years of the program, though have stabilized in the last few years due to increased harvest. Calf numbers have slowly increased since program inception, though 2012 calf abundance was reduced likely due to an annual weather effect. Based on extrapolation of fall count area densities, corrected for estimated sightability, moose population estimates were calculated in 2010 by GMU: 3,490 moose in GMU 13(A), 5,280 moose in GMU 13(B), 1,700 moose in GMU 13(C), and 5,430 moose in GMU 13(E). Moose population estimates in 2012 by subunit were: 3,650 moose in GMU 13(A), 5,350 moose in GMU 13(B), 1,675 moose in GMU 13(C), and 5,570 moose in GMU 13(E).

Table 1b. Moose abundance, age and sex composition in comparison area, GMU 13(D), CA15.

Period	RY	Moose observed (Estimated Abundance)	Composition (number per 100 females)			
			Calves	Yearling Males	Males	Total *n*
Year 8	2008	171 (1,940)	17	15	79	171
Year 9	2009	-	-	-	-	-
Year 10	2010	201 (2,280)	23	12	72	201
Year 11	2011	172 (1,950)	10	7	62	172
Year 12	2012	172 (1,950)	14	2	67	172

Table 2. Moose harvest in assessment area (M). Methods for estimating unreported harvest are described in Survey and Inventory reports.

Period	RY	Reported		Estimated		Total harvest	Other mortality[a]	Total
		Male	Female	Unreported	Illegal			
Year 8	2008	730	5	25	25	785	75	860
Year 9	2009	857	3	25	25	910	75	985
Year 10	2010	937	1	25	25	988	75	1063
Year 11	2011	945	1	25	25	996	100	1096
Year 12	2012[b]							

[a] Vehicle/Train
[b] Current year harvest is incomplete

Describe trend in harvest: Moose harvests have generally increased in the wolf control area of GMU 13 along with the increase in moose numbers, but have been relatively stable in GMU 13(D) which is not part of the wolf control area. Harvest pressure has increased since 2009 due to regulatory changes that provided additional harvest opportunities. Any-bull and nonresident drawing permit numbers are altered annually to maintain objective bull ratios.

The reported harvest in Year 10 (most recent reauthorization) by subunit was 289, 304, 101, 66, and 170 in 13(A), 13(B), 13(C), 13(D), and 13(E) respectively. An additional 8 moose were reported in GMU 13(Z) for a total of 938 moose.

The reported harvest in Year 11 by subunit is 293, 268, 113, 83, and 180 in 13(A), 13(B), 13(C), 13(D), and 13(E) respectively. An additional 9 moose were reported in GMU 13(Z) for a total of 946 moose.

3) Predator data

Date(s) <u>winter 2011-12</u> and method of most recent spring abundance assessment for wolves (Table 3):

> The most recent spring abundance estimate for GMU 13 of 104 (spring of 2012) was derived over the course of the 2011-2012 winter and is based on wolf and track sightings gathered from staff biologists, hunters, trappers, and pilots, adjusted for documented harvest.

Date(s) <u>fall 2011</u> and method of most recent fall abundance assessment for wolves (Table 3):

> The most recent fall abundance assessment for GMU 13 of 204 wolves (fall of 2011) was derived using the same methods.

> The wolf population in GMU 13 has been relatively stable since RY 2006. The annual take by all methods has reflected this trend, although take is more sensitive to changes in annual weather conditions than are population trends.

<u>The low 2011-2012 population estimates are partially attributed to consistent snow events over the course of the winter and a reduced number of wolf sightings by all sources. Whether the low estimates reflect the true population or a lack of information is unknown. Additional fixed-wing surveys are being conducted this winter to confirm the size of the wolf population.</u>

Table 3. Wolf abundance objectives and removal in wolf assessment area (N) of the GMU 13 Wolf Predation Control Area. The annual removal objective in GMU 13 depends on the fall abundance in relation to the spring objective of 135 – 165 wolves. No less than 135 wolves are to remain by 30 April each RY in all of GMU 13. The annual removal since Year 10 (RY2010) has averaged 48%. No lethal or non-lethal predation control methods were used by Department personnel.

Period	RY	Fall abundance (variation) in area N	Harvest removal from area N		Dept. control removal from area O	Public control removal from area O	Total removal[a] from area N (% from area O)	Spring abundance (variation) in area N
			Trap	Hunt				
Year 8	2008	273	38	26	0	55	121 (76%)	144
Year 9	2009	272	40	18	0	23	81 (67%)	180
Year 10	2010	314	46	10	0	103	159 (92%)	146
Year 11	2011	204	16	35	0	40	91 (80%)	104
Year 12	2012							

[a]Additional removal may be Defense of Life and Property, vehicle kill, unknown method of take, etc.

The predator control assessment area N is all of GMU 13. The predation control area O is smaller and does not include GMU 13D, populated areas, or federal lands where same-day-

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airborne take is closed. Of the unitwide removal, the percentage from area O is noted in parenthesis.

4) Habitat data and nutritional condition of prey species

Where active habitat enhancement is occurring or was recommended in the Operational Plan, describe progress toward objectives:

Objective(s): <u>No specific objectives were specified</u>

Area treated and method: <u>No area was treated during this report period</u>

Observation on treatment response:
<u>The only recent large scale habitat improvement project that has occurred in GMU 13 is the 41,000 acre Alphabet Hills Prescribed Burn in 2003 and 2004 on the border of GMU 13(A) and 13(B). Further burning under this plan is still being pursued, though is contingent upon meeting burn prescriptions.</u>

Table 4. Moose abundance, age and sex composition in habitat improvement area, GMU 13(A) Alphabet Hills Prescribed Burn count area (65 square miles).

Period	RY	Moose observed (Estimated Abundance)	Composition (number per 100 females)			
			Calves	Yearling bulls	Males	Total *n*
Year 8	2008	116 (128)	14	21	51	116
Year 9	2009	209 (230)	29	6	62	209
Year 10	2010	186 (205)	24	24	88	186
Year 11	2011	109 (120)	24	8	94	109
Year 12	2012	136 (150)	13	5	107	136

Similar trend in nearby non-treatment areas?
<u>The habitat improvement area is a small burn, and composition is based on a small count area. Annual variability is substantial. The nearest adjacent count area is CA 5, which is substantially larger (846 square miles) and contains more variable moose habitat. Because these areas are adjacent, moose in western CA 5 may be experiencing some benefit from the habitat improvement area. The highest density observed in the treatment area was 3.2 moose per square mile in 2009, though the highest density observed for CA 5 was 2.1 moose per square mile in 2010. Bull ratios increased in both areas since 2006. Bull ratios in CA 5 have stabilized due to increased harvest opportunities. Bull ratios continue to rise in the treatment area likely due to the relative inaccessibility of the small burn area. Except for the low observed in 2007, calf ratios were similar throughout.</u>

Describe any substantial change in habitat not caused by active program:
<u>Deep snow across the majority of GMU 13 in 2004-2005 reduced moose numbers unitwide. Deep snow was also a concern in 2011-2012, though the impact on the</u>

moose population appears to be limited to low overwinter calf survival and perhaps low calf production in 2012. Adult numbers in 2012 were similar to 2011. In general, winters have been relatively mild and conducive to population growth across GMU 13 throughout the current Intensive Management program.

Table 5. Nutritional indicators for moose in assessment area (L) of the GMU 13 Wolf Predation Control Area.

Period	RY	Twinning Rate (radiocollared parturient cows[a])	Twinning rates (random parturient cows)
Year 8	2008	25% in 13A west (n=32)	28% in 13A west (n=79); 50% in 13E (n=unk)
Year 9	2009	38% in 13A west (n=24)	13% in 13A west (n=24)
Year 10	2010	33% in 13A west (n=18)	
Year 11[b]	2011	33% in 13A west (n=12) 11% in 13B (n=9)	
Year 12	2012		

[a]Only cows 3 years of age and older were monitored. The term parturient refers to a cow observed with a calf.
[b] Only four flights were conducted in RY2011 (spring 2012), and some twins may have been missed.

No objectives on nutritional condition were listed in the *Intensive Management Plan*, and there is no *Operational Plan* for this area.

Evidence of trend:
There was an apparent increase in twinning rates during the first several years of the Intensive Management program. In recent years, it appears twinning may have stabilized. Low rates in GMU 13(B) in RY2011 may be attributable to the minimal number of flights and undocumented early calf mortality. Flights will be increased in RY2012 to improve the likelihood of documenting actual twinning rates.

Similar trend in nearby non-treatment areas? Unknown

5) Costs specific to implementing Intensive Management

Table 6. Cost ($1000 = 1.0) of agency salary based on estimate of proportional time of field level staff and cost of operations for intensive management activities (e.g., predator control or habitat enhancement beyond normal Survey and Inventory work) performed by personnel in the Department or work by other state agencies (e.g., Division of Forestry) or contractors in the GMU 13 Wolf Predation Control Area. Fiscal year (FY) is also 1 July to 30 June but the year is one <u>greater</u> than the comparable RY (e.g, FY 2010 is 1 July 2009 to 30 June 2010).

Period	FY	Predation control[a]		Other IM activities		Total IM cost	Research cost[d]
		Time[b]	Cost[c]	Time	Cost		
Year 6	2007	15.0				15.0	
Year 7	2008	15.0				15.0	
Year 8	2009	15.0		2.0	15.0	15.0	
Year 9	2010	30.0		3.0	30.0	30.0	
Year 10	2011	25.0		2.5	25.0	25.0	25.6
Year 11	2012			1.75	14.3	14.3	

[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[3] for annual evaluation (1 February) following Year <u>11</u> for GMU 13 Wolf Predation Control Area—skip in final year and go to section 7

Has progress toward defined criteria been achieved? <u>Yes</u>

Has achievement of success criteria occurred?
<u>Due to deep snow in 2011-2012, the population declined somewhat across GMU 13 between 2011 and 2012. Similar to 2011, population objectives were still being met in 3 of 4 treated GMUs in 2012. Population estimates for GMUs 13(A) and 13(B) fall just above the minimum objective. The population in 13(E) is in the middle of the population objective range. The population in GMU 13(C) remains well below the objective range.</u>

<u>Calf-to-cow ratios in general remain below objectives in all GMUs, and declined substantially between 2011 and 2012 likely due to deep snow. Calf ratios were well below objectives in all count areas in 2012. Regardless of low fall calf ratios, consistent improvement in overall moose numbers has been realized since program inception due to improved overwinter survival of all age classes. Bull-to-cow ratios are being met in all 4 treated GMUs. Bull-to-cow ratios are just above the minimum objective in easily</u>

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[3] Prior sections include primarily objective information from field surveys; Sections 6 and 7 involve professional judgment by area biologists to interpret the context of prior information for the species in the management area.

accessed portions of 13(A), 13(B), and 13(C), with higher ratios in more remote portions of each GMU. Bull-to-cow ratios have been stabilized with additional bull moose hunting opportunities since 2009.

Harvest data for the current hunting season (RY2012) has not yet been finalized. As of the RY2011 hunting season, harvest objectives were being met in 1 of 4 treated GMUs, with the GMU 13(A) harvest falling in the middle of the objective range. The harvest for GMU 13(B) declined between 2010 and 2011, and remains below the objective range. Harvests in GMU 13(C) and 13(E) continue to slowly increase, but both remain well below their respective objective ranges.

Recommendation for IM practice(s): Continue **Modify** Suspend Terminate
> Predation control   **Modify** – Temporarily suspend and re-activate wolf control in each GMU based on moose population/harvest guidelines identified through the Board of Game process, as well as nutritional guidelines developed through increased monitoring efforts beginning in 2013.

> Habitat enhancement **Continue**

> Harvest strategy   **Modify -** Antlerless moose (cow) harvests may become necessary to maintain harvest and keep the population and the bull-to-cow ratio within objectives. If the moose population exceeds management objectives and antlerless hunts are not approved through the Board of Game process, the IM program should be suspended in individual GMUs.

7) **Evaluation (1 February) for program renewal (following final Year 15 [RY 2015]) and Department recommendations for the Unit 13 Wolf Predation Control Area**

Has progress toward defined criteria been achieved (describe)? _____

Has achievement of success criteria occurred (describe)? _____

Recommendation for IM program [*choose one*]: Continue Modify Suspend Terminate

Rationale for recommendation on overall program: _____

Other recommendations (if continuation is recommended, specific actions on individual practices): _____