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

Prepared by the Division of Wildlife Conservation
February 2016

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

A) **This report is an** <u>annual</u> **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 <u>X</u> (annual report)   **August** ___ (interim annual update[2])   **Year** <u>2016</u>

C) **Program name:** <u>Unit 13 Wolf Predation Control Area</u>

D) **Existing program** <u>does not have</u> **an associated Operational Plan**<u>, it does have a detailed Intensive Management Plan in regulation (5 AAC 92.121).</u>

E) **Game Management Unit(s) fully or partly included in IM program area:**
<u>Units 13(A), 13(B), 13(C), and Unit 13(E)</u>

F) **IM objectives for** <u>moose</u>:
<u>Population objective for Unit 13 is 17,000 – 21,400 (including Unit 13(D) and harvest objective for Unit 13 is 1,050 – 2,180 (including Unit 13(D).</u>

<u>For those units within by the Unit 13 wolf predation control area, population and harvest objectives are identified in the Table 1.</u>

Table 1. Population and harvest objectives for moose in the Unit 13 wolf predation control area.

Population	Population Objective	Harvest Objective
Unit 13(A)	3,500 – 4,200	210 – 420
Unit 13(B)	5,300 – 6,300	310 – 620
Unit 13(C)	2,000 – 3,000	155 – 350
Unit 13(E)	5,000 – 6,000	300 – 600

G) **Month and year the current predation control program was originally authorized by the Board:** <u>March 2000</u> **Indicate date(s) if renewed:**
<u>March 2005 (IM area increased to include Unit 13(C)), plan renewed again October 2010 (current area open to predation control has been stable since 2006; current plan active through October 2016).</u>

H) **Predation control is** <u>temporarily suspended</u> **in this IM area.**
<u>The decision to suspend predation control for regulatory year (RY) 2015 (RY15 = 1 July</u>

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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

2015 through 30 June 2016) was in response to an undetermined spring wolf estimate in RY2013, and a RY2014 spring wolf estimate below the minimum intensive management objective. Program activities will resume when the minimum number of wolves in excess of objectives has been confirmed.

I) **If active, month and year the <u>current</u> predation control program began:** <u>March 2000.</u>
<u>The program was temporarily suspended in RY2012 and RY2015 because spring wolf population estimates were below the intensive management objective.</u>

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

K) **Size of IM program area (square miles) and geographic description:**
  *   <u>15,416 square miles (Figure 1)</u>
  *   <u>All lands within Units 13(A), 13(B), 13(C), and that portion of Unit 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.</u>
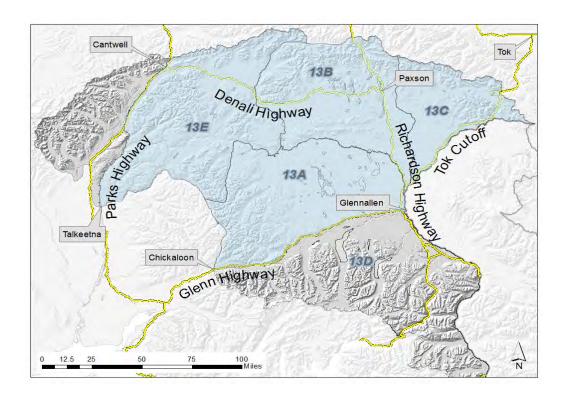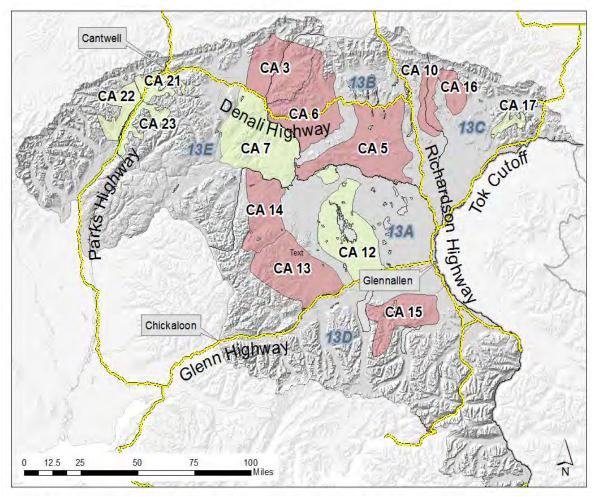

Figure 1. Intensive management area for moose in Unit 13.

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 Unit 13 encompassing a total of 3,219 square miles (Figure 2). Periodic surveys are also flown in CA 7, 12, 17, 21, 22, and 23, encompassing an additional 2,146 square miles. Periodic surveys help to

refine estimates of abundance. (CA 21, 22, and 23 are on the border of the IM area.)

Figure 2. Unit 13 moose count areas, darker pink areas are continuous count areas surveyed annually, and lighter green areas are surveyed periodically.

M) Size and geographic description of area for ungulate harvest reporting:

Unit 13 – approximately 23,367 square miles.

N) Size and geographic description of area for assessing predator abundance:

Unit 13 – approximately 23,367 square miles.

O) Size and geographic description of predation control area:

14,188 square miles were open to predation control in RY13; 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-to-cow ratios
- Bull-to-cow ratios

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

R) Department recommendation for IM program in this reporting period:
> The Department recommends continuation of the program (see Section 6).

2) Prey data

Date(s) and method of most recent <u>fall</u> abundance assessment for moose in Unit 13 (if statistical variation available, describe method here and show 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 2015. 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 _N [*Y/N*] and in the last year _Y_ [*Y/N*]? Describe comparison if necessary:
> Moose abundance in CAs receiving control treatment more than doubled through 2012, whereas abundance in the adjacent non-treatment areas (CA 15 in Unit 13D) has remained relatively unchanged.

Table 2a. **Moose abundance, age and sex composition in assessment area (L) since program implementation in <u>Year 10</u> (not exclusively limited to inception of predation control) to reauthorization review in <u>Year 15.</u> Regulatory year is 1 July to 30 June (e.g, RY2012 is 1 July 2012 to 30 June 2013).**

Period	RY	Moose Observed (Estimated Abundance)	Composition (number per 100 females)			
			Calves	Yearling Males	Males	Total *n*
Year 8	2008	4,310 (13,680)	22	11	31	4,334
Year 9	2009	4,875 (14,640)	23	9	33	4,875
Year 10	2010	5,112 (15,870)	21	10	28	5,112
Year 11	2011	5,432 (16,620)	23	10	32	5,432
Year 12	2012	5,230 (16,305)	16	7	31	5,230
Year 13	2013	5,217 (15,645)	27	5	32	5,217

Year 14	2014	-	-	-	-	-
Year 15	2015	5,496 (15,670)	25	6	31	5,496

Describe trend in abundance or composition:

Moose across the Unit 13 treatment area have generally increased since IM program inception. Observed numbers of cows peaked in 2012. Between 2012 and 2013, cow numbers increased further in Unit 13(A), but may have declined slightly in the remainder of the treatment area. Observed bull numbers increased substantially during the early years of the program peaking in 2011. Based on extrapolation of fall count area densities (corrected for sightability), moose population estimates were calculated by subunit in 2010 prior to reauthorization at: 3,490 moose in Unit 13(A), 5,280 moose in Unit 13(B), 1,700 moose in Unit 13(C), and 5,430 moose in Unit 13(E). Moose population estimates by subunit in 2015 were: 3,570 moose in Unit 13(A), 5,050 moose in Unit 13(B), 1,980 moose in Unit 13(C), and 5,070 moose in Unit 13(E).

Table 2b. Moose abundance, age and sex composition in comparison area, Unit 13(D), CA15.

			Composition (number per 100 females)			
Period	RY	Moose Observed (Estimated Abundance)	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	174 (1,950)	15	2	67	174
Year 13	2013	133 (1,510)	12	3	89	133
Year 14	2014	151 (1,710)	17	9	69	151
Year 15	2015[a]	100 (1,190)	8	7	58	100

[a]2015 survey conducted in December, and after seasonal migration from count area.

Table 3. **Moose harvest in assessment area (M). Methods for estimating unreported harvest are described in Survey and Inventory reports.**

		Reported		Estimated				
Period	RY	Male	Female	Unreported	Illegal	Total harvest	Other mortality[a]	Total
Year 8	2008	735	1	25	25	786	75	861
Year 9	2009	861	2	25	25	913	75	988
Year 10	2010	945	1	25	25	996	75	1071
Year 11	2011	950	1	25	25	1001	100	1101
Year 12	2012	712	5	25	30	772	75	847
Year 13	2013	721	2	25	30	778	75	853
Year 14	2014	929	4	25	30	988	75	1063

[a]Vehicle/Train.

Describe trend in harvest: Moose harvests increased in the treated area of Unit 13 through 2011, but declined in 2012 and 2013. Harvest has been variable, but relatively stable in Unit 13(D) which is not part of the treatment area. Harvest pressure has increased in the treatment area since 2009 due to regulatory changes providing additional harvest opportunities.

The reported harvest in Year 14 by subunit is 264, 267, 117, 74, and 209 in 13(A), 13(B), 13(C), 13(D), and 13(E) respectively. An additional 10 moose were reported in Unit 13(Z) for a total of 941 harvested moose.

3) Predator data

Date(s) Spring 2015 **and method of most recent spring abundance assessment for wolves (Table 3):**

The most recent spring abundance estimate of 84 wolves in Unit 13 (RY2014; spring of 2015) was derived from a minimum count conducted in 13D and 13E, combined with observations of wolves by ADF&G staff, hunters, trappers, and pilots minus the documented harvest.

Date(s) Fall 2012 **and method of most recent fall abundance assessment for wolves (Table 3):**

The most recent fall abundance assessment for Unit 13 of 322 wolves (RY2013; fall of 2013) was derived using the same methods above.

Table 4. Wolf abundance objectives and removal in wolf assessment area (N) of the Unit 13 Wolf Predation Control Area. The annual removal objective in Unit 13 depends on the fall wolf abundance. The goal is to reduce the number of wolves in the predation control area (O) to meet the spring wolf objective, so estimated or confirmed number remaining in the wolf assessment area (N) by spring (30 April) each RY is 135-165.

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	42	18	0	23	83 (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	266	37	21	0	0	59 (69%)	191
Year 13	2013	320	26	16	0	60	102 (89%)	-
Year 14	2014	-	35	18	0	0	53 (83%)	84

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

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): No specific objectives have been specified.

Area treated and method: No area was treated during this report period.

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

Table 5. Moose abundance, age and sex composition in habitat improvement area, Unit 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
Year 13	2013	122 (130)	26	7	71	122
Year 14	2014	-	-	-	-	-
Year 15	2015	135 (149)	18	10	97	135

Similar trend in nearby non-treatment areas?
The habitat improvement area is a small burn, and composition is based on a small count area (65 square miles). Annual variability is high. 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 2012. Bull ratios in CA 5 have stabilized since 2008 due to increased harvest opportunities (average = 41 bulls:100 cows). Bull ratios are higher in the treatment area likely due to the relative inaccessibility of the small burn area. Ratios reached a high of 107 bulls:100 cows in 2012. Calf ratios have

been similar between the 2 areas.

Describe any substantial change in habitat not caused by active program: No major habitat changes have occurred in this area in recent years.

Table 6. **Nutritional indicators for moose in assessment area (L) of the Unit 13 Wolf Predation Control Area.**

Period	RY	Twinning Rate (radiocollared parturient cows[a])	Twinning rates (random parturient cows) Prior to 1 June
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	30% in 13A northwest & 13E south (n=44); 18% in 13B (n=17)	20% in 13A northwest & 13E south (n=40)
Year 13	2013	44% in 13B (n=18) 46% in northwest GMU 13 (n=34)	19% in 13A west (n=32); 42% in 13C (n=24)
Year 14	2014	20% in 13B (n=20) 46% in northwest GMU 13 (n=35)	26% in 13A west (n=50); 30% in 13C (n=10); 25% in 13E (n=28)

[a] Only cows 3 years of age and older were monitored. The term parturient refers to a cow observed with a calf.
[b] Only 4 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 Unit 13(B) in RY2011 may be attributable to the minimal number of flights and undocumented early calf mortality. Flights were increased in RY2012-RY2014 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 7. **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 Unit 13 Wolf Predation Control Area. 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).

Period	FY	Predation Control[a] Time[b]	Predation Control[a] Cost[c]	Other IM activities Time	Other IM activities Cost	Total IM cost	Research cost[d]
Year 11	2012	0.0	0.0	2.5	25.0	25.0	25.6
Year 12	2013	0.0	0.0	1.75	14.3	14.3	0.0
Year 13	2014	0.0	0.0	1.0	8.9	8.9	6.0
Year 14	2015	0.0	0.0	1.0	8.9	8.6	22.0

[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[3] for annual evaluation (1 February) following Year 13 for Unit 13 Wolf Predation Control Area—skip in final year and go to section 7

Has progress toward defined criteria been achieved? Yes

Has achievement of success criteria occurred?
As a result of deep snow in 2011-2012, the moose population showed a slight decline across Unit 13 between 2011 and 2012. Further declines were observed in portions of the treatment area in 2013. Population objectives were met in 1 of 4 treated subunits in 2013. The population estimate for Unit 13(A) and 13(E) fell above the minimum population objective. The population estimates in Unit 13(C) is just below the minimum population objective; however, the Unit 13(B) population estimate is well below the minimum objective.

Calf-to-cow ratios in general have been below objectives in all subunits since program inception. Calf ratios were well below objectives in all count areas in 2012. In 2013, ratios improved substantially - likely a rebound effect from very low productivity in 2012. In 2015 ratio objectives were met in Unit 13(A) and Unit 13(E) while ratios remained below objectives in Units 13(B) and 13(C).

Bull-to-cow ratios were met in all 4 treated subunits through 2012. Bull-to-cow ratios declined below the minimum objective in 2013 in 13(A), although remained above the minimum objective in 13(B), 13(C), and 13(E). In 2015, bull-to-cow ratios were again met in all treated subunits. The lowest ratios were observed in accessible portions of each subunit.

Harvest data for the current hunting season (RY2015) has not yet been finalized. As of

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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.

the RY2014 hunting season, harvest objectives were being met in 1 of 4 treated subunits, with the Unit 13(A) harvest within objective range. The harvest for Unit 13(E) has increased to a level not seen since RY1997, but remains well below the objective range.

Table 8. **Unit 13 IM population and harvest objectives and estimates.**

	Unit 13(A)	Unit 13(B)	Unit 13(C)	Unit 13(E)
Harvest Objective	**210-420**	**310-620**	**155-350**	**300-600**
2014 harvest	264	267	117	209
Population Objective	**3,500-4,200**	**5,300-6,300**	**2,000-3,000**	**5,000-6,000**
2015 abundance estimate	3,570	5,050	1,980	5,070
Calf-to-cow Ratio Obj.	**25:100**	**30:100**	**30:100**	**30:100**
2015 estimate	29	25	15	31
Bull-to-cow Ratio Obj.	**25:100**	**25:100**	**25:100**	**25:100**
2015 estimate	25	37	30	25

Recommendation for IM practice(s): Continue   **Modify**   Suspend   Terminate
    Predation control: Modify
        Temporarily suspend and re-activate wolf control in each subunit 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. In the case 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 subunits.