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 2014

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** 2014

C) **Program name:** Unit 13 Wolf Predation Control Area

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

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

F) **IM objectives for** moose:
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)).

For those Units covered by the Unit 13 wolf predation control area, population objectives for Units 13(A), 13(B), 13(C), and 13(E) are 3,500 – 4,200, 5,300 – 6,300, 2,000 – 3,000, and 5,000 – 6,000 moose respectively and harvest objectives for Units 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 Units 13(A), 13(B), and 13(E); Same-day-airborne take first allowed January 2004); plan renewed 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 15 December 2016).

H) **Predation control is** active **in this IM area.**

I) **If active, month and year the current predation control program began:** March 2000.
The program was temporarily suspended for regulatory year (RY) 2012 (RY12 = 1 July 2012 through 30 June 2013) because spring wolf population estimate was below the intensive management objective.

J) **An habitat management program funded by the Department or from other sources is**

[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*]

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:

- 15,416 square miles
- 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

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. 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.)

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

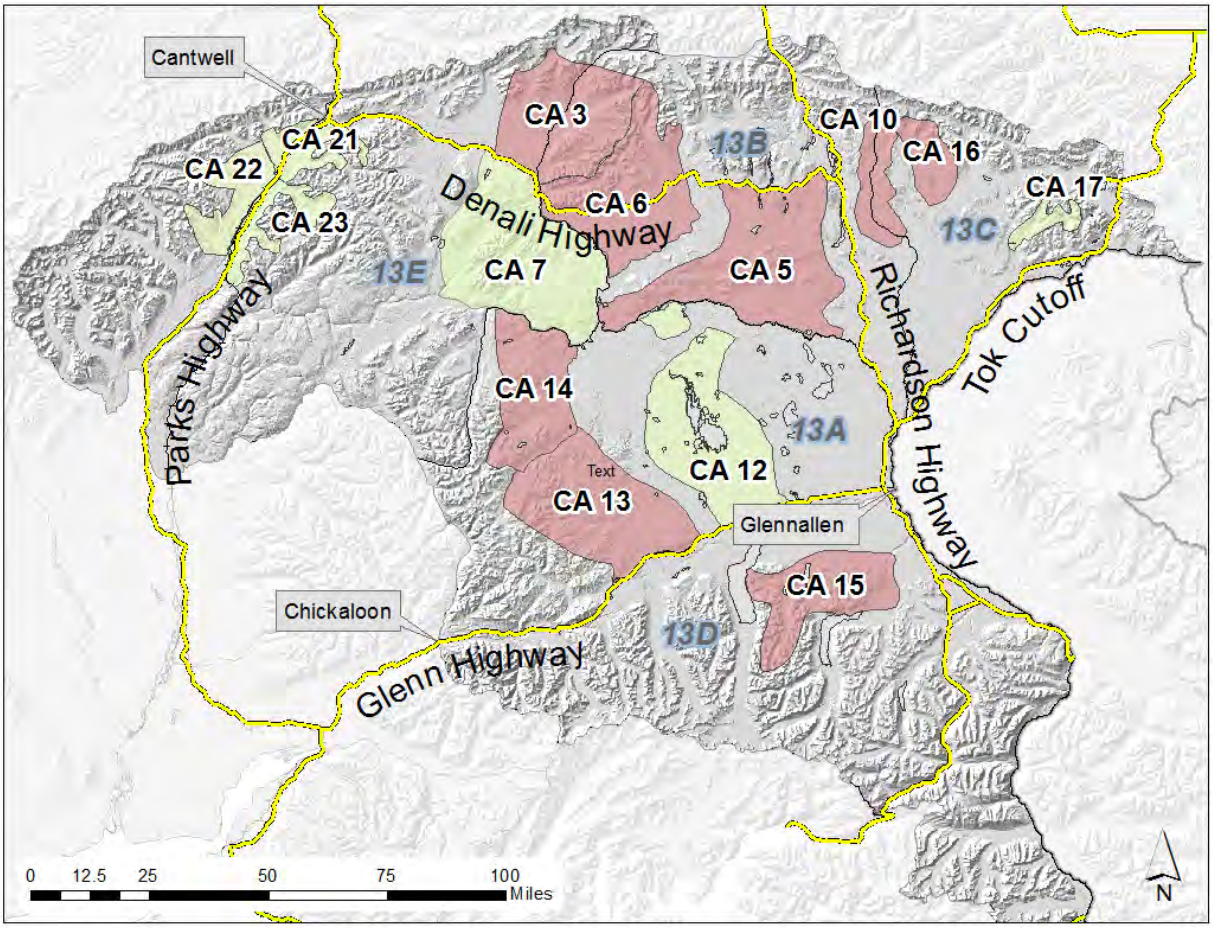

Figure 1. Unit 13 moose count areas, darker pink areas are continuous count areas surveyed annually, lighter green areas are surveyed periodically.

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

Unit 13 covering 23,367 square miles

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

Unit 13 covering 23,367 square miles

O) Size and geographic description of predation control area:

Total IM area 15,416 square miles (14,188 square miles open to predation control in RY13; closures include populated areas and federal lands where same-day-airborne take of wildlife is not allowed)

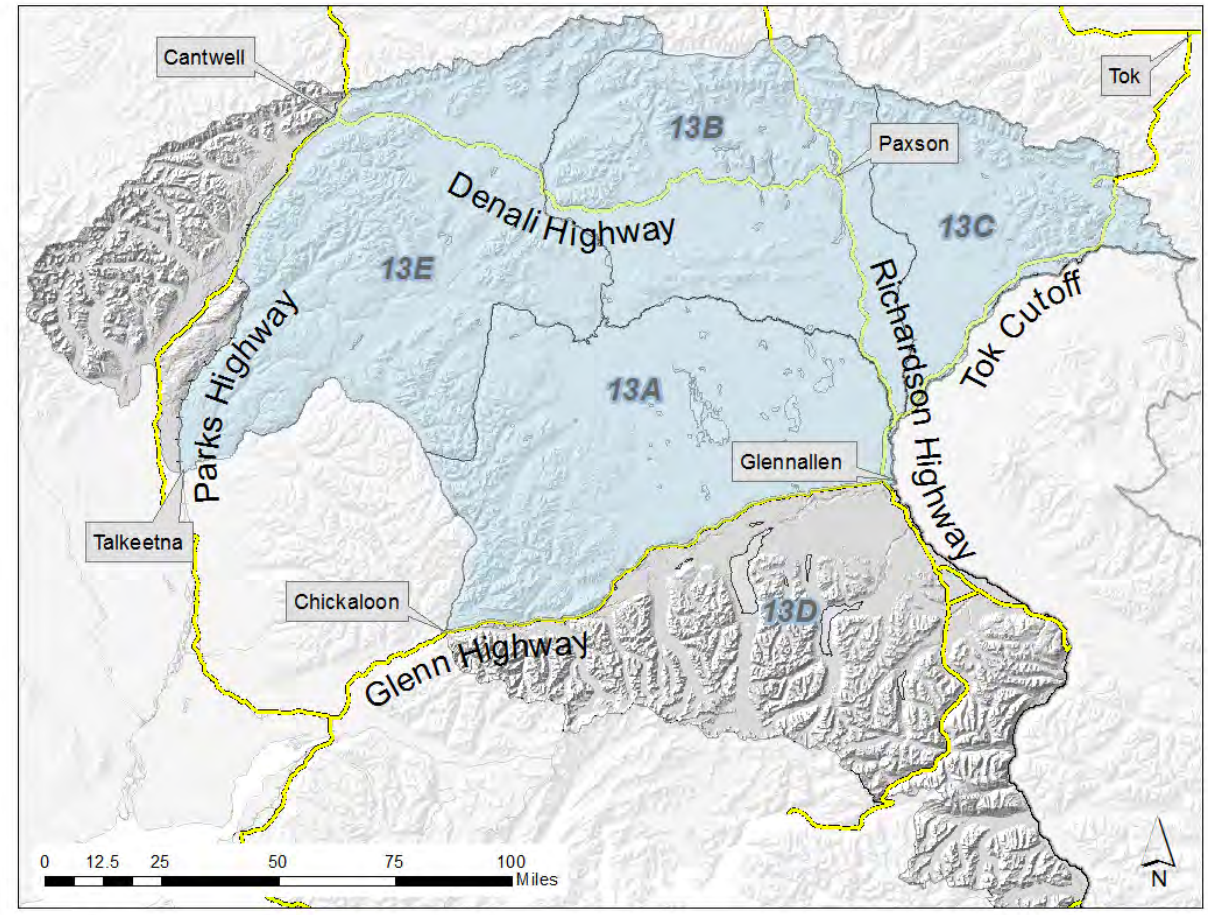

Figure 2. Unit 13 total Intensive Management Area.

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 (listed above)
- 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 (details provided in sections 6)

2) Prey data

Date(s) and method of most recent fall **abundance assessment for** moose (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 2013. 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) N **and in the last year? (Y/N)** Y **Describe comparison if necessary:**
Moose abundance in CAs receiving treatment more than doubled through 2012, whereas abundance in CA 15 in Unit 13(D) which is adjacent to the current IM area has remained relatively stable. While the total observed moose numbers in CAs receiving treatment remained stable between 2012 and 2013, due to differences in area specific counts, estimated abundance for the treatment area as a whole declined slightly. A slight decline was also observed in the one CA in Unit 13(D).

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 2013.

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) N **and in the last year?** (Y/N) N **Describe comparison if necessary:**
Moose composition (calf and bull ratios) in CAs receiving treatment improved substantially since program inception, whereas composition in CA 15 in Unit 13(D) has remained relatively stable. Bull ratios have remained relatively stable 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 subunit, except for Unit 13(A), where ratios dropped below objectives in 2013. Calf ratios across treated areas declined in 2012, though ratios rebounded in 2013. The calf ratio in CA 15 has 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 the** Unit 13 Wolf Predation Control Area. **Regulatory year is 1 July to 30 June (e.g, RY 2012 is 1 July 2012 to 30 June 2013).**

			Composition (number per 100 females)			
Period	RY	Moose Observed (Estimated Abundance)	Calves	Yearlings Males	Males	Total *n*
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

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), though numbers declined in the remainder of the treatment area. Observed bull numbers increased substantially during the early years of the program, peaking in 2011. Numbers have declined slightly in recent years. Calf numbers have slowly increased since program inception. Likely due to an annual weather effect, calf numbers were lower in 2012. Calf numbers improved in 2013, to a new peak since program inception. Based on extrapolation of fall count area densities, corrected for estimated sightability, moose population estimates were calculated in 2010 by subunit prior to reauthorization: 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 in 2013 by subunit were: 4,000 moose in Unit 13(A), 4,930 moose in Unit 13(B), 1,765 moose in Unit 13(C), and 4,950 moose in Unit 13(E).

Table 1b. **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 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

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 9	2009	859	3	25	25	912	75	987
Year 10	2010	937	1	25	25	988	75	1063
Year 11	2011	945	1	25	25	996	100	1096
Year 12	2012	705	7	25	30	767	75	842
Year 13	2013[b]	693	2	25	30	750	75	825

[a] Vehicle/Train

[b] Current year harvest is incomplete

Describe trend in harvest:

Moose harvests increased in the treated area of Unit 13 through 2011, concurrent with the increase in moose numbers. Harvest has declined since. 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. Any-bull and nonresident drawing permit numbers were altered annually to take advantage of surplus bulls.

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 Unit 13(Z) for a total of 938 moose.

The preliminary reported harvest in Year 13 by subunit is 243, 197, 48, 64, and 140 in 13(A), 13(B), 13(C), 13(D), and 13(E) respectively. An additional 3 moose were reported in Unit 13(Z) for a total of 695 moose.

3) Predator data

Date(s) winter 2012-13 **and method of most recent spring abundance assessment for wolves (Table 3):**

The most recent spring abundance estimate for Unit 13 of 191 (spring of 2013) was derived over the course of the 2012-2013 winter and was based on wolf and track sightings gathered from staff biologists, hunters, trappers, and pilots, adjusted for 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 266 wolves (fall of 2012) was derived using the same methods.

Wolf population estimates in Unit 13 were relatively stable from RY 2005-2010. Limited wolf and track sightings due to poor snow conditions in 2011 resulted in lower wolf estimates for the fall of 2011 and spring of 2012. Improved conditions and tracking efforts in 2012 resulted in increased population estimates for the fall of 2012 and spring of 2013.

Table 3. **Wolf abundance objectives and removal in wolf assessment area (N) of the** Unit 13 Wolf Predation Control Area. **The annual removal objective is to reduce the wolf population in Unit 13 to the spring objective of** 135 – 165 wolves by 30 April. **If non-lethal predation control methods used by Department personnel, clarify with footnote in control removal tally.**

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 9	2009	272	42	18	0	23	81 (67%)	180
Year 10	2010	314	46	10	0	146	159 (92%)	146
Year 11	2011	204	16	35	0	73	91 (80%)	104
Year 12	2012	266	37	21	0	40	58 (69%)	191

[a]Additional removal may be Defense of Life and Property, vehicle kill, unknown method of take, 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 were 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 is contingent upon meeting burn prescriptions.

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

			Composition (number per 100 females)			
Period	RY	Moose observed (Estimated Abundance)	Calves	Yearling bulls	Males	Total *n*
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

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 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 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 two 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 5. **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)
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 and 13E south (n=44) 18% in 13B (n=17)	20% in 13A northwest and 13E south (n=40)

[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 Unit 13(B) in RY2011 may be attributable to the minimal number of flights and undocumented early calf mortality. Flights were 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 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).

		Predation Control[a]		Other IM activities		Total IM cost	Research cost[d]
Period	FY	Time[b]	Cost[c]	Time	Cost		
Year 11	2012	25.0		2.5	25.0	25.0	25.6
Year 12	2013			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 11 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?

Due to deep snow in 2011-2012, the population declined somewhat 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) falls above the mid-point of the population objective.

[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 population estimates in Unit 13(B), Unit 13(C), and Unit 13(E) fall just under the minimum objective for each unit respectively.

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 2013 objectives were met in Unit 13(A). Ratios were just below objectives in Units 13(B), 13(C), and 13(E). Regardless of low fall calf ratios, consistent improvement in overall moose numbers was realized through 2011 due to improved overwinter survival of all age classes.

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), though remained above the minimum objective in 13(B), 13(C), and 13(E). The lowest ratios were observed in accessible portions of each subunit.

Harvest data for the current hunting season (RY2013) has not yet been finalized. As of the RY2012 hunting season, harvest objectives were being met in 1 of 4 treated subunits, with the Unit 13(A) harvest falling in the middle of the objective range. The harvest for Unit 13(B) has declined annually between 2010 and 2012, and remains well below the objective range. Harvests in Unit 13(C) and 13(E) increased through 2011, but have declined since. Both areas remain well below their respective objective ranges.

Table 7. **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**
2013 preliminary harvest	243	197	48	140
Population Objective	**3500-4200**	**5300-6300**	**2000-3000**	**5000-6000**
2013 abundance estimate	4,000	4,930	1,765	4,950
Calf-to-cow Ratio Objective	**25:100**	**30:100**	**30:100**	**30:100**
2013 estimate	31	29	28	24
Bull-to-cow Ratio Objective	**25:100**	**25:100**	**25:100**	**25:100**
2013 estimate	21	39	57	30

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.

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): _____