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
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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 (annual report)   **Year** <u>2019</u>

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

D) **Existing program** <u>has</u> **an associated Operational Plan** <u>and 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 13A, 13B, 13C, and 13E.</u>

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

   <u>For those units within 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 13A	3,500–4,200	210–420
Unit 13B	5,300–6,300	310–620
Unit 13C	2,000–3,000	155–350
Unit 13E	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 13C.</u>
   - <u>October 2010 - Plan renewed through 2016.</u>
   - <u>February 2016 - Plan renewed through 2027</u>

H) **Predation control is** <u>active</u> **in this IM area.**
   <u>The suspension of predation control for regulatory year (RY) 2017 (RY17 = 1 July 2017</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*.

through 30 June 2018) was in response to an undetermined spring wolf estimate in RY2013, a RY2014 spring wolf estimate below the minimum intensive management objective, a RY2015 spring wolf estimate below the minimum intensive management objective, and an undetermined spring wolf estimate in RY2016. The activation of predation control for RY 2018 was in response to a spring RY17 wolf estimate above the maximum intensive management objective.

I) **If active, month and year the <u>current</u> predation control program began:** March 2000. The program was suspended in RY2012 and RY2015–2017 because spring wolf population estimates were below the intensive management objective. The predator control plan was reauthorized for 10 years in February 2016. The program was activated again in RY18.

J) **A 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 being updated and will be implemented when finalized and prescription conditions are met.

K) **Size of IM program area (square miles) and geographic description:**
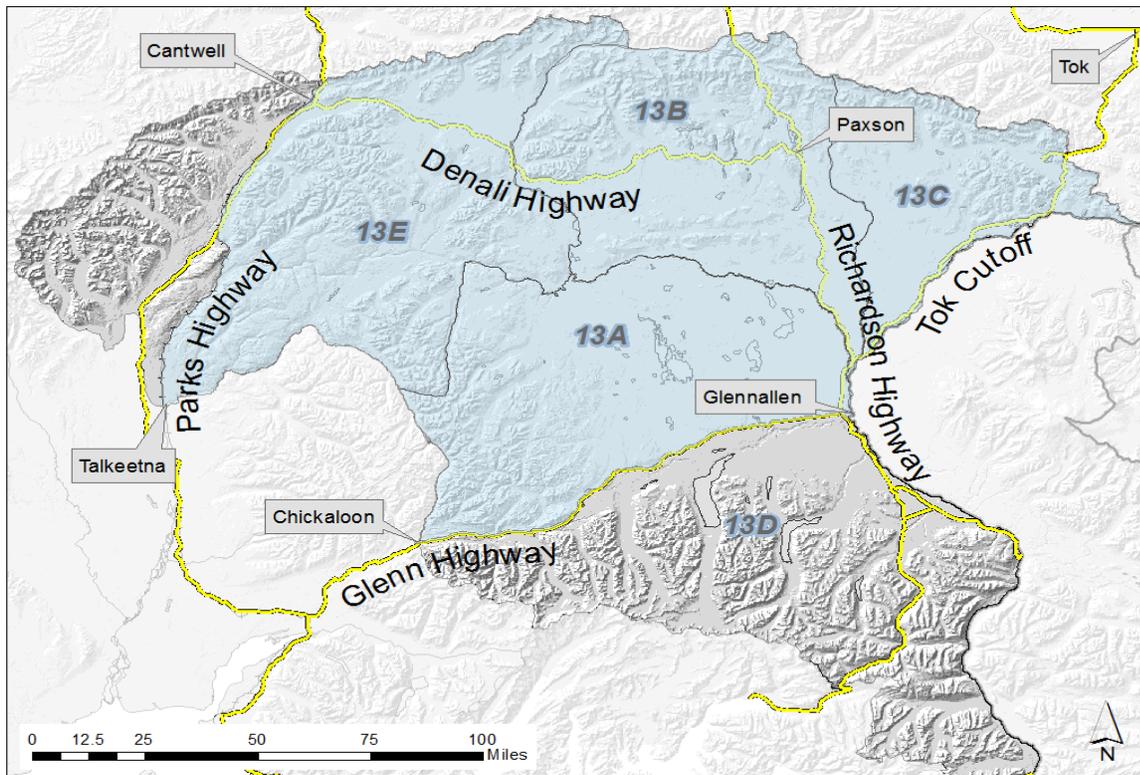   - 15,416 miles^2 (Figure 1).

Figure 1. Area under intensive management for moose in Unit 13.

L) Size and geographic description of area for assessing ungulate abundance within the IM area:

  Unit 13 – approximately 23,367 miles^2.

  Seven continuous moose count areas (CA) 3, 5, 6, 10, 13, 14, and 16 across Unit 13 encompass a total of 3,219 miles^2 (Figure 2). Periodic surveys are also flown in CA 7, 12, 17, 21, 22, and 23, encompassing an additional 2,146 miles^2. Periodic surveys help to refine estimates of abundance. (CA 21, 22, and 23 are on the border of the IM area.)
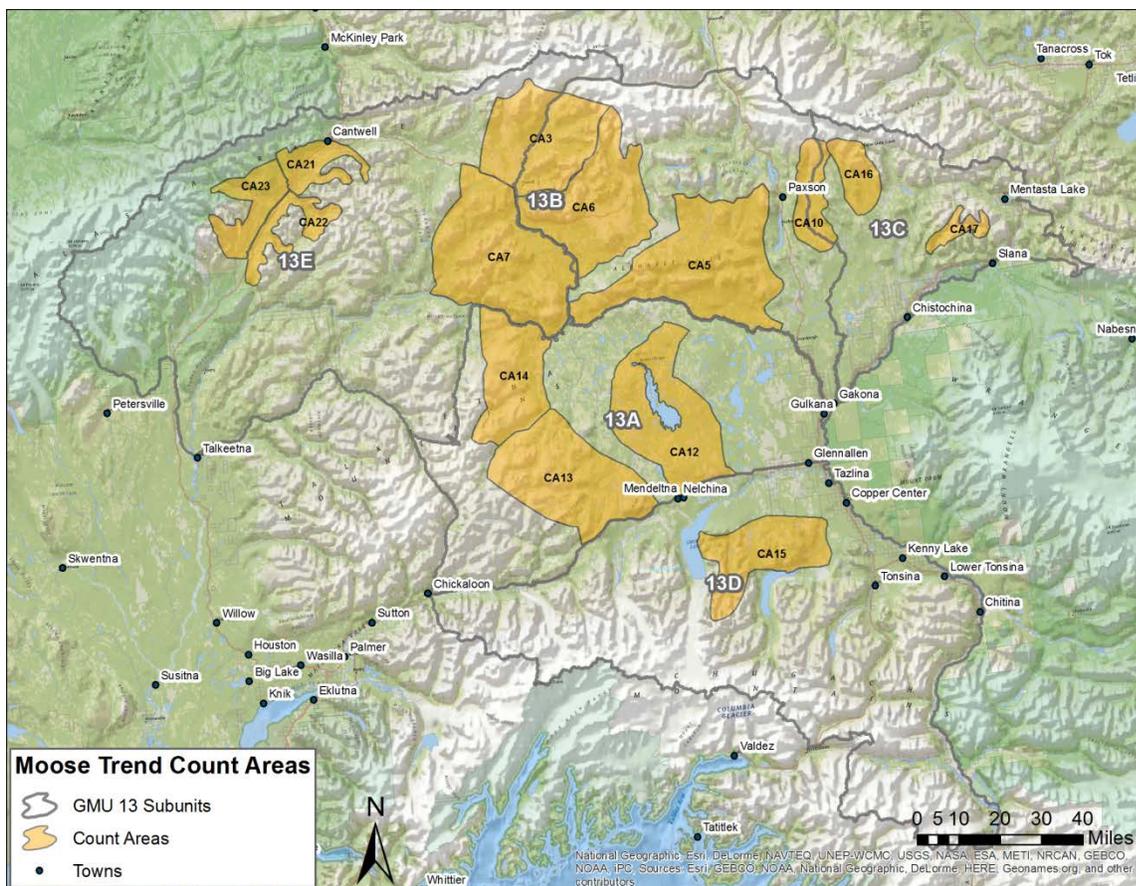

Figure 2. Location of moose trend count areas (CA) in Unit 13.

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

  Unit 13 – approximately 23,367 miles^2.

N) Size and geographic description of area for ungulate harvest reporting:
Unit 13 – approximately 23,367 miles^2.

O) Size and geographic description of predation control area:
14,188 miles^2 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
- Moose 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 13B, 13C, and 13E, and a minimum of 25 calves:100 cows for Unit 13A.

R) Department recommendation for IM program in this reporting period:
The Department recommends continued suspension of the program. *See* Section 6 of this report.

2) Prey data

Date(s) and method of most recent fall **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 2018 (FY18). Trend count data 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** N **[*Y/N*]? Describe comparison if necessary:**
Moose abundance in CAs receiving control treatment has increased or stabilized whereas abundance in the adjacent non-treatment areas (CA 15 in Unit 13D) has suggested a slight decline over the past few years.

Table 2a. **Moose abundance, age and sex composition in assessment area (L) since program implementation in** Year 10 **(not exclusively limited to inception of predation control) to** Year 17. **Regulatory year is 1 July to 30 June (e.g., RY2012 is 1 July 2012 to 30 June 2013).**

Period	RY	Estimated Abundance	Composition (number per 100 cows) Calves	Yearling Males	Males	Total observed (*n*)
Year 8	2008	17,040	19	12	35	4,481
Year 9	2009	18,812	24	10	33	5,355
Year 10	2010	19,720	22	10	31	5,847
Year 11	2011	20,429	23	10	32	5,614
Year 12	2012	20,575	16	7	32	6,468
Year 13	2013	20,634	27	6	34	6,837
Year 14	2014	20,492	16	11	35	2,213
Year 15	2015	21,087	25	6	32	5,557
Year 16	2016	20,566	19	8	32	3,840
Year 17	2017	18,381	27	6	28	4,183

[an] Abundance estimates were reevaluated in 2015 to take advantage of modern mapping technology and provide a more accurate extrapolation based on annual survey data.

Describe trend in abundance or composition:
Moose across the Unit 13 treatment area generally increased after IM program inception, although current data indicates that moose abundance may have peaked in 2015. Composition ratios have remained stable. Based on extrapolation of fall count area densities, moose population estimates were calculated by subunit for 2010 at: 4,081 moose in Unit 13A, 5,460 moose in Unit 13B, 3,000 moose in Unit 13C, and 5,041 moose in Unit 13E. Moose population estimates by subunit in 2017 were: 3,445 moose in Unit 13A, 4,872 moose in Unit 13B, 2,390 moose in Unit 13C, and 6,324 moose in Unit 13E.

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

Period	RY	Estimated Abundance	Composition (number per 100 cows) Calves	Yearling Males	Males	Total Observed (*n*)
Year 8	2008	1,818	17	15	79	171
Year 9	2009	-	-	-	-	-
Year 10	2010	2,137	23	12	72	201
Year 11	2011	1,829	10	7	62	172
Year 12	2012	1,829	14	2	67	172

Year 13	2013	1,414	12	3	89	133
Year 14	2014	1,605	17	9	69	151
Year 15	2015[a]	1,063	8	7	58	100
Year 16	2016	1,403	21	18	89	132
Year 17	2017	-	-	-	-	-

[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 | | | | |
| | | Male | Female | Unreported | Illegal | Total harvest | Other mortality | Total |
Period	RY							
Year 8	2008	730	1	25	25	781	75	856
Year 9	2009	861	1	25	25	912	75	987
Year 10	2010	937	1	25	25	988	75	1,063
Year 11	2011	950	1	25	25	1,001	100	1,101
Year 12	2012	705	5	25	30	765	75	840
Year 13	2013	714	2	25	30	771	75	846
Year 14	2014	924	4	25	30	983	75	1,058
Year 15	2015	1,042	8	25	30	1,105	75	1,180
Year 16	2016	1,070	7	25	30	1,132	75	1,207
Year 17	2017	984	8	25	30	1,047	75	1,122
Year 18	2018	761	5	25	30	821	75	896

[a] Vehicle/train mortality.

Describe trend in harvest: Moose harvests increased in the treated area of Unit 13 through 2011, declined in 2012 and 2013, and returned to a higher level in 2014–2016. Preliminary harvest reports for 2017 indicate that total harvest dropped slightly from levels observed in 2016. Harvest has been variable, but relatively stable in Unit 13(D) which is not part of the treatment area. Hunting pressure has increased in the treatment area since 2009, due to regulatory changes providing additional harvest opportunities, with the lower threshold of the harvest objective range being reached between RY15–RY17. Harvest declined below the objective range during RY18.

3) Predator data

Date(s) Spring 2015 **and method of most recent spring abundance assessment for wolves:**
The most recent spring abundance estimate of 250 wolves in Unit 13 (RY2017; spring of 2018) was derived from a minimum count conducted in 13A, 13C, 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:**
The most recent fall abundance assessment for Unit 13 of approximately 400 wolves (RY2018; fall of 2018) 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 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 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
Year 15	2015	-	40	16	0	0	56 (89%)	-
Year 16	2016	-	76	16	0	0	92 (89%)	-
Year 17	2017	-	52	37	0	0	89 (89%)	250

[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 objectives have been specified.

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

Observation on treatment response:
The only large-scale habitat improvement project that has occurred recently in Unit 13 is the 41,000 acre^2 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 prescription conditions 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	Composition (number per 100 cows)		
			Calves	Yearling bulls	Males
Year 8	2008	116	14	21	51
Year 9	2009	209	29	6	62
Year 10	2010	186	24	24	88
Year 11	2011	109	24	8	94
Year 12	2012	136	13	5	107
Year 13	2013	122	26	7	71
Year 14	2014	-	-	-	-
Year 15	2015	135	18	10	97
Year 16	2016	-	-	-	-
Year 17	2017	241	17	13	101
Year 18	2018	166	9	4	62

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 miles^2). Annual variability is high. The nearest adjacent count area is CA 5, which is substantially larger (846 miles^2) 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-to-cow ratios in CA 5 have stabilized since 2008 due to increased harvest opportunities (average = 40 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-to-cow ratios have been similar between the two areas. Typical surveys of the burn area and CA5 were not conducted in 2016, due to lack of weather/snow conditions.

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).

Period	RY	Twinning Rate (radiocollared parturient cows)	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 Unit 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 Unit 13 (n=35)	26% in 13A west (n=50); 30% in 13C (n=10); 25% in 13E (n=28)
Year 15	2015	29% in 13B (n=21)	22% in 13A (n=9) 28% in 13B (n=32)
Year 16	2016	59% in 13B (n=29)	29% in 13A (n=7) 41% in 13B (n=34)
Year 17	2017	50% in 13B (n=30)	4% in 13A (n=48)

[a] Only cows three years of age and older were monitored.
[b] Only four flights were conducted in RY2011 (spring 2012), and some twins may have been missed.

No objectives on nutritional condition were identified in the *Intensive Management Plan*

> **Evidence of trend:** There was an apparent increase in twinning rates during the first several years of the intensive management program, possibly a result of an increased likelihood of surveys detecting more obvious cows with twins before predation events. In recent years, observations of twins remain relatively high. Low rates in Unit 13B in RY2011 may be attributable to the minimal number of flights and undocumented early calf mortality. Flights were increased in RY2012–RY2017 to improve the likelihood of documenting twins. The low twinning rate detected among random parturient cows in 2017 is likely due to the late timing of the flight (June 4).

> **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]	Cost[c]	Other IM activities Time	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	8.9	22.0
Year 15	2016	0.0	0.0	1.0	8.9	8.9	40.0
Year 16	2017	0.0	0.0	0.5	4.4	4.4	22.4
Year 17	2018	0.0	0.0	0.5	4.4	4.4	75.0

[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[2] for annual evaluation (1 February) following Year 17 for Unit 13 Wolf Predation Control Area.**

Has progress toward defined criteria been achieved? Yes

Has achievement of success criteria occurred?

Population objectives were met in all treated subunits by 2010. The population estimate for Unit 13B dropped below population objective in 2013 and has remained below objective. All other subunits have remained at or above objective.

Calf-to-cow ratios in general have been below objectives in all subunits since program inception. In 2015 ratio objectives were met in Unit 13A and 13E while ratios remained below objectives in Units 13B and 13C. In 2016 calf ratios dropped below objectives in all subunits but increased and met objectives in Unit 13B in 2017.

Bull-to-cow ratios were met in all four treated subunits through 2012. Bull-to-cow ratios declined below the minimum objective in 2013 in 13A, although they remained above the minimum objective in 13B, 13C, and 13E. In 2015, bull-to-cow ratios were again met in all treated subunits. The lowest ratios were observed in accessible portions of each subunit. In 2016, bull-to-cow ratios dropped below objective in 13A and remained above objective in all other subunits. In 2017, bull-to-cow ratios were above objective in all subunits except 13E.

Since RY2014, harvest objectives are being met in one of four treated subunits, with the Unit 13A harvest within objective range. The harvest for Unit 13E has increased to a level not seen since RY1997 but does remain below the objective range. Harvest

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[2] 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.

objects were met in Unit 13B for the first time in RY2016.

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**
2016 harvest	311	327	114	229
Population Objective	**3,500–4,200**	**5,300–6,300**	**2,000–3,000**	**5,000–6,000**
2017 abundance estimate	3,445	4,872	2,390	6,324
Calf-to-cow Ratio Obj.	**25:100**	**30:100**	**30:100**	**30:100**
2017 estimate	24	31	15	14
Bull-to-cow Ratio Obj.	**25:100**	**25:100**	**25:100**	**25:100**
2017 estimate	27	29	34	24

Recommendation for IM practice(s):

Predation control: <u>Activate</u>
Activate wolf control in each subunit based on moose and wolf population/harvest guidelines identified through the Board of Game process.

Habitat enhancement: <u>Continue</u>

Harvest strategy: <u>Modify</u>
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.