

**Annual Report to the Alaska Board of Game on
Intensive Management for Caribou
with Wolf Predation Control
in Game Management Units 9B, 17B&C, and 19A&B,
the Mulchatna Caribou Herd**

**Prepared by the Division of Wildlife Conservation
February 2018**



1) Description of IM Program¹ 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 92.111²

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

February X (annual report) August ___ (interim annual update³) Year 2018

C) Program name: Mulchatna Caribou Herd Predation Management Area

D) Existing program does not have an associated Operational Plan, it does have a detailed Intensive Management Plan in regulation (5 AAC 92.111).

E) Game Management Units (Units) fully or partly included in IM program area:
Units 9B, 17B&C, and 19A&B

F) IM objectives for caribou: population size 30,000–80,000 harvest 2,400–8,000.

G) Month and year the current predation control program was originally authorized by the Board:

The plan was initially authorized in March 2011 for Units 9B and 17B&C and was modified in March 2012 to include Units 19A&B.

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

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

- March 1, 2012 in Regulatory Year (RY) 2011 (RY 2011 = July 1, 2011 through June 30, 2012).
- Reauthorized in March 2017 for six years

J) 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 (square miles) and geographic description:

39,683 sq. miles in Units 9B, 17B&C, and 19A&B.

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

Approximately 50,000 sq. miles and includes the range of the Mulchatna Caribou Herd, and extends beyond Units 9B, 17B&C, and 19A&B into Unit 18.

¹ For purpose and context of this report format, see *Intensive Management Protocol, section on Tools for Program Implementation and Assessment*

² [Regulatory numbers for existing IM programs formerly under 5AAC92.125 were divided into groups and given new numbers in October 2012 (see IM Plan template--Version 3, January 2013)]

³ 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]

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

Approximately 50,000 sq. miles and includes the range of the Mulchatna Caribou Herd and extends beyond Units 9B, 17B&C, and 19A&B into Unit 18.

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

The wolf assessment area in Units 17 and 9B is a 7,612 sq. mile area defined by corners (N60 34.0 W158 25.0, N60 34.0 W155 55.0, N59 18.0 W158 25.0, and N59 18.0 W155 55.0). Wolf numbers are also monitored in the eastern portion of Unit 19B by Region IV staff and in Unit 19A by Region III staff.

O) Size and geographic description of predation control area:

The predation control area measured approximately 2,870 sq. miles during RY 2011. It encompasses an area from Tikchik Mountain (N 60 03.00, W 158 18.00) east to Sleitat Mountain (N 60 03.00, W 157 04.00), southeast to the Koptuli Hills (N 59 48.00, W 156 18.00) southwest to Lower Klutuk Creek (N 59 19.00, W 157 04.00), west to the Muklung Hills (N 59 19.00, W 158 18.00) and then north returning to Tikchik Mountain (see Figure 1). This area encompassed the core southern calving area of the MCH when established, but in recent years caribou have begun moving outside this area to calve. In fall 2017, the predation control area was expanded to approximately 9,760 mi² to encompass part of the northern calving area as well as critical portions of the caribou summer range where predation on calves takes place throughout the summer months. The description of this revised area and results associated with this revision will be presented in the next annual report.

P) Criteria for evaluating progress toward IM objectives:

- Fall calf-to-cow ratios
- Fall bull-to-cow ratio
- Caribou abundance

Q) Criteria for success with this program:

- Fall bull-to-cow ratio can be maintained at a minimum of 35 bulls:100 cows.
- Fall calf-to-cow ratio can be sustained above 30 calves:100 cows.
- The population can grow at a sustained rate of 5% annually.
- Caribou harvest objectives are met.

R) Department recommendation for IM program in this reporting period:

The Department recommends continuation of the predation control program during RY2017. We will continue monitoring the herd to determine progress towards IM objectives (details provided in Section 6).

S) IM Annual Report data and information inclusion date:

December X (annual report) June ___ (interim annual update³) Year 2017

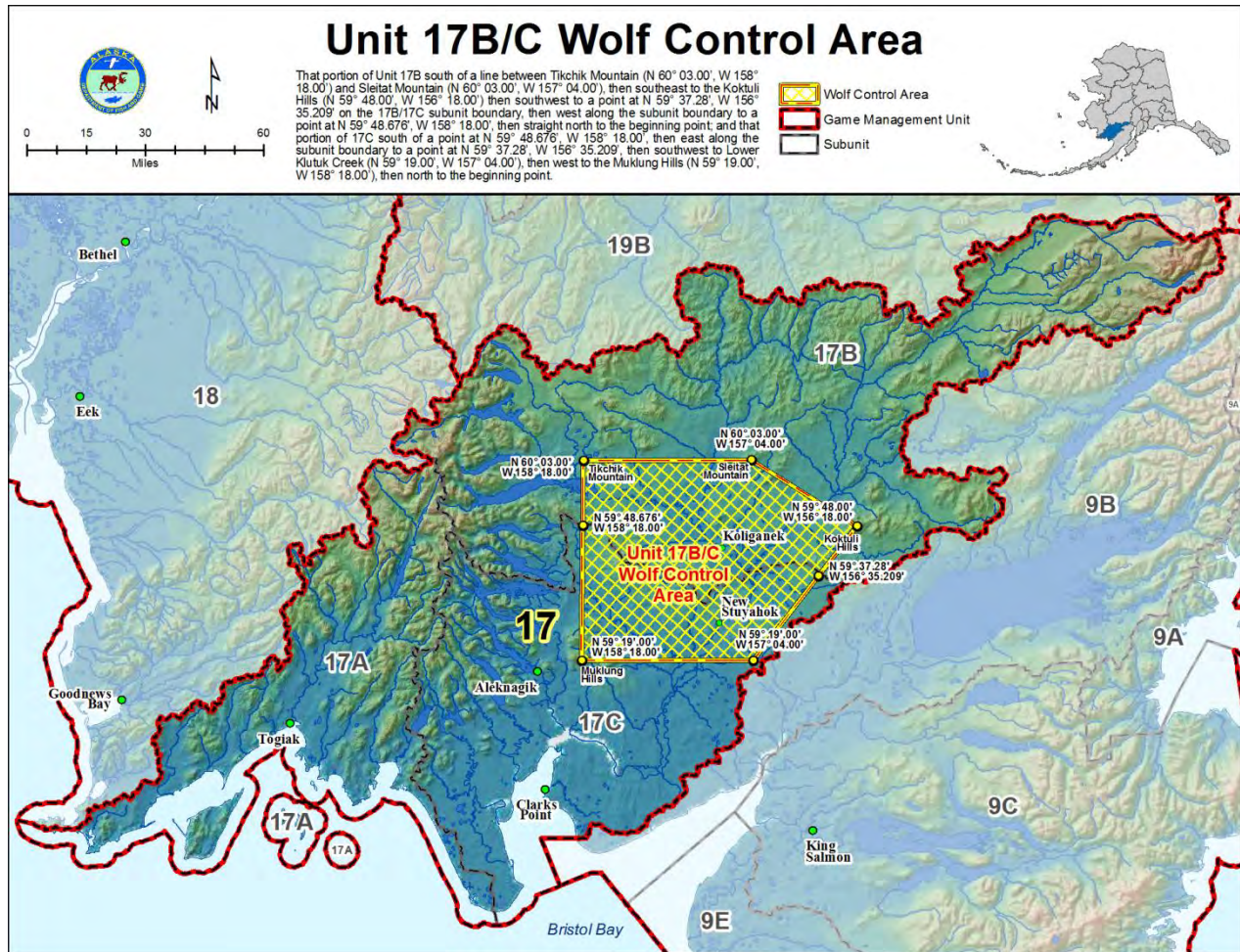


Figure 1. Location of the Mulchatna Caribou Herd Predation Control Area in Game Management Unit 17.

2) Prey data

Date(s) and method of most recent summer abundance assessment for caribou (if statistical variation available, describe method here and show result in Table 1): The last successful photocensus of post-calving aggregation was conducted on June 28–29, 2016.

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/A and in the last year (Y/N) N/A? Describe comparison if necessary:

The IM area comprises a small portion of the annual range of the Mulchatna caribou herd. The annual range of the majority of caribou in the herd includes use of areas both within and outside of the IM area, but the spatial and temporal characteristics of movements within the IM area are variable. Therefore, it is difficult to quantify trends in abundance relative to treatment and non-treatment

areas.

Date(s) of most recent age and sex composition survey (if statistical variation available, describe method here and show result in Table 1): October 14–15, 2017

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/A and in the last year (Y/N) N/A? Describe comparison if necessary:

The IM area comprises a small portion of the annual range of the Mulchatna caribou herd and was initially aligned closely with the calving ground of the western segment of the population (RY2011–2013), and the summer and winter grounds of the eastern segment of the population. In recent years however (RY2014–2016), this western segment of the population has been calving outside the wolf control area, but close enough that they still may have benefitted from any removal of wolves. Teasing out treatment and non-treatment effects is compounded by the fact that these two areas are too close spatially to really be considered independent of one another. The composition data in Table 1 suggests the caribou in the western segment of the population were more successful in rearing calves during RY2011–2013 when they were calving within the wolf removal area than they have been during RY2015–2017 given the extremely low percentage of calves in the samples during the last two fall surveys (Table 1).

The combined calf-to-cow ratio of 23 calves:100 cows in RY2017 was slightly higher than RY2016, but still far below our objective of 30:100. The combined bull:100 cows ratio of 32 bulls:100 cows in RY2017 was significantly lower than the 39:100 from the previous year. This was the first year of decline observed in this metric in the past seven years.

Table 1. Caribou abundance, age and sex composition in assessment area (L) since program implementation in year 1 (not exclusively limited to inception of predation control) to reauthorization review in year 2017 in Mulchatna Caribou Herd Predation Management Area. Regulatory year is 1 July to 30 June (e.g, RY 2010 is 1 July 2010 to 30 June 2011).

Eastern Segment of the MCH (No Predator Control)

Period	RY	Composition (number per 100 cows)		
		Calves	Bulls	Total (<i>n</i>)
Year 0	2010	17	13	2,581
Year 1	2011	14	18	2,649
Year 2	2012	22	17	2,217
Year 3	2013	14	27	1,479
Year 4	2014	33	31	2,226
Year 5	2015	31	32	2,827
Year 6	2016	27	38	2,525
Year 7	2017	28	33	2,587

Western Segment of the MCH (Active Predator Control)

		Composition (number per 100 cows)		
Period	RY	Calves	Bulls	Total (n)
Year 0	2010	23	23	2,011
Year 1	2011	28	34	1,995
Year 2	2012	38	29	2,636
Year 3	2013	23	27	1,743
Year 4	2014	27	38	2,567
Year 5	2015	27	38	2,587
Year 6	2016	18	40	2,670
Year 7	2017	18	31	2,573

All Areas Combined

		Composition (number per 100 cows)			
Period	RY	Abundance (variation)	Calves	Bulls	Total (n)
Year 0	2010	-	20	17	4,592
Year 1	2011	-	19	22	5,282 ^a
Year 2	2012	19,000-27,000 ^b	30	23	4,853
Year 3	2013	15,000-22,000 ^b	19	27	3,222
Year 4	2014	21,000-32,000	30	35	4,793
Year 5	2015	30,736-38,190	29	35	5,414
Year 6	2016	21,346-33,137	22	39	5,195
Year 7	2017	-	23	32	5,160

^a Includes caribou not assigned to the Eastern or Western Segment of the MCH.

^b Estimate of abundance based on the Rivest methodology (Rivest et al. 1998).

Describe trend in abundance or composition:

Trends in calf-to-cow ratios are variable from year to year and are still below those observed in the late 1980s–early 1990s when the herd was in a significant growth phase. Bull-to-cow ratios were on a positive trend and improved each year during 2010–2016 but declined in RY2017. Both of these metrics are below objectives at this time. The 2016 point estimate for abundance of 27,242 +/- 5,896 is lower than 2015 (30,736 +/- 3,727), but higher than 2014 (26,275 +/- 5,500). The overlap in confidence intervals between these estimates does not allow for a good understanding of the current population trend.

Table 2. Caribou 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	Unk Sex	Unreported	Illegal			
Year 0	2010 ^b	250	220	4	Unk	Unk	470	Unk	474
Year 1	2011 ^b	242	243	9	Unk	Unk	494	Unk	494

Year 2	2012 ^b	184	173	4	Unk	Unk	361	Unk	361
Year 3	2013 ^c	70	35	1	Unk	Unk	106	Unk	106
Year 4	2014 ^c	125	52	5	Unk	Unk	182	Unk	182
Year 5	2015 ^c	159	74	2	Unk	Unk	235	Unk	235
Year 6	2016	209	119	2	Unk	Unk	330	Unk	330

^a Clarify (vehicle mortality, Defense of Life and Property, Mortuary, etc.).

^b Data from WinfoNet, Harvest Information, Data Download (harvest report cards).

^c Data from WinfoNet, Permitting, Hunt Statistics, General Hunt, RY, RC503.

Describe trend in harvest:

Although the reported harvest is still below objectives, the harvest has increased from the low in RY2013. Since RY2011, the majority of harvest has been during late winter. The majority of hunters are local residents (i.e. people who live within the herd's range, primarily residents of Unit 18). Marginal snow conditions RY2013–RY2015 prevented hunters from accessing caribou with snowmachines resulting in low harvest. Improved snow conditions in RY2016 enabled hunters to access caribou by snowmachine which increased hunting success.

Describe any other harvest related trend if appropriate:

NA

3) Predator data

Date(s) and method of most recent spring abundance assessment for wolves (if statistical variation available, describe method here and list in Table 3):

See below.

Date(s) and method of most recent fall abundance assessment for wolves (if statistical variation available, describe method here and list in Table 3):

See below.

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

Increased sightings of wolves by local residents and department personnel continued through RY2016. Wolves are also frequently observed during caribou research and management studies within the SDA area, indicating wolf abundance currently continues to be fairly high.

In March 2017, the department initiated a study including deployment of GPS collars on wolf packs in the IM area. The objectives of the study are to map wolf pack territories, determine seasonal pack sizes, and evaluate change in wolf density relative to the wolf removal program. During the capture field work, wolf tracks were found throughout the MCH Predation Management area. Seventeen wolves were collared, comprising 5 packs and multiple lone wolves. A preliminary density calculation based on 7 months of GPS data and minimum observed seasonal pack sizes resulted in spring and fall wolf densities of 2.2 and 3.0 wolves per 1000 km², respectively, in the Mulchatna and lower Nushagak River drainages.

Table 3. Wolf abundance objectives and removal in wolf assessment area (N) of Mulchatna Caribou Herd Predation Management Area. Removal objective is to annually remove 100 % of the wolves in the wolf predation control area (O), so estimated or confirmed number remaining in the control area (O) by the May calving season each regulatory year is 0.

Subunits 9B and 17B&C (Subunits 19A&B are outside of areas N and O)

Period ^a	RY	Non-SDA Harvest removal from area N		Dept. control removal from area O	SDA Public control removal from area O	Total removal ^b from area N	Minimum Spring abundance (variation) in area N
		Trap	Hunt				
Year 1	2011	14	52	0	11	77	14
Year 2	2012	17	0	0	0	17	-
Year 3	2013	0	10	0	0	10	-
Year 4	2014	0	0	0	0	0	-
Year 5	2015	19	2	0	0	21	-
Year 6	2016	26	28	0	3	57	-

^a Each respective year of data is from the ADF&G Winfonet database.

^b 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):

Not Applicable: There are no demonstrated methods to improve caribou habitat and no reason to believe that habitat is limiting the caribou population.

Area treated and method: Not Applicable

Observation on treatment response: Not Applicable

Evidence of progress toward objective(s) (choose one: Apparent Statistical): Not Applicable

Similar trend in nearby non-treatment areas? Not Applicable

Describe any substantial change in habitat not caused by active program: Not Applicable

Table 4. Nutritional indicators for caribou in assessment area (L) of the Mulchatna Caribou herd Predation Management Area.

Period	RY	Pregnancy Females >2 yrs age ^a	Female Calf Weights ^b at 10.5 months in lbs. (n)
Year 0	2010	79%	124 (20)
Year 1	2011	76%	119 (13)
Year 2	2012	79%	127 (14)
Year 3	2013	90%	128 (14)
Year 4 ^c	2014	61%	133 (13)
Year 5	2015	83%	119 (23)
Year 6	2016	73%	120 (18)

^a Pregnancy rate is based on known-aged animals from a collared sample of adult female caribou. Pregnancy status is determined in May, i.e., RY 2010 pregnancy data is collected in May 2011, based on observed characteristics of pregnancy, i.e. antler retention, udder development, and/or presence of a calf at heel.

^b Female calf weight data is collected in April of the RY, i.e., RY 2010 female calf weight data is collected in April 2011.

^c Survey delayed due to weather which affected sample size and timing of survey.

Where objectives on nutritional condition were listed in the Operational Plan, describe trend in condition indices since inception of (a) habitat enhancement or (b) enhanced harvest: N/A

Evidence of trend: N/A

Similar trend in nearby non-treatment areas? N/A

5) Costs specific to implementing Intensive Management

Table 5. 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 Mulchatna Caribou Herd Predation Management 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		Other IM activities		Total IM cost	Research cost ^d
		Time ^b	Cost ^c	Time ^b	Cost ^c		
Year 1	2012	0.0	0.0	1.0	36.0	36.0	415.0
Year 2	2013	0.0	0.0	0.5	6.0	6.0	421.2
Year 3	2014	0.0	0.0	0.5	6.0	6.0	215.0
Year 4	2015	0.0	0.0	0.5	6.0	6.0	0.0
Year 5	2016	0.0	0.0	0.5	6.0	6.0	0.0
Year 6	2017	0.0	0.0	1.0	13.0	6.0	230.0

^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 recommendations² for annual evaluation (1 February) following Year 6 (RY2016) for the Mulchatna Caribou herd Predation Management Area

Has progress toward defined criteria been achieved?

Yes; The fall bull-to-cow ratio increased each year of the program until fall 2017 when it declined. It was at or above objectives during RY2014–2016, for the first time since RY2000. The calf-to-cow ratios are very erratic, are still not increasing at the desired rate and have remained below management objectives. The abundance estimate shows an increase during RY2012–2016 of 19% when comparing the point estimates, although the RY2016 estimate showed a decline from the previous year. However, the confidence intervals are overlapping on these estimates, so care must be taken in interpreting the results.

Has achievement of success criteria occurred?

We have mixed results in meeting the objectives of the success criteria. The bull:100 cow objective of 35:100 was met during RY2014–RY2016, but not during RY2017, while the calf:100 cow objective of 30:100 was met in RY2014 (30:100), narrowly missed in RY2015 (29:100), and well below in RY2016–2017 (22 and 23:100 respectively). The point estimates for the abundance estimates indicate growth in the herd during RY2012–2016 but are still below the lower bound of the population objective. The harvest objective of 2,400–8,000 has not been met, with reported harvest less than 10% of the lower objective. This is partially due to lack of opportunity stemming from lack of snow providing access and may also be the result of failure of hunters to report harvest.

Recommendation for IM program (choose one): Continue Modify Suspend Terminate

In fall of 2017, the WCA was expanded to the maximum 10,000 sq. mi. authorized in regulation.

Continue Same-Day Airborne Wolf Control Program in expanded control area (O)

7) Evaluation (1 February) for program renewal (following final Year 6 [RY 2016]) and Department recommendations for the Mulchatna Caribou herd Predation Management Area

Has progress toward defined criteria been achieved (describe)? See Section 6.

Has achievement of success criteria occurred (describe)? See Section 6.

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.

Recommendation for IM program: Continue Modify Suspend Terminate

Rationale for recommendation on overall program: Although this program has not been very successful to date, it is believed that with one or two years of good snow conditions for aircraft hunters to locate and harvest wolves, that this program could be successful in helping us meet IM objectives.

Other recommendations (if continuation is recommended, specific actions on individual practices): The wolf removal area should be adaptively expanded to envelop current and shifting calving grounds within the 10,000 sq. miles allowable in regulation. The increase in area will increase the number of susceptible wolf packs and provide for targeted efforts in calving areas; therefore, greatly increasing the chances for a successful program.