

Annual Report to the Alaska Board of Game on Intensive Management for Mulchatna Caribou with Wolf and Bear Predation Control in Game Management Units 9B, 17, 18, and 19A&B

**Prepared by the Division of Wildlife Conservation
February 2024**



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) Year 2024

C) Program name: Mulchatna Caribou Herd Predation Management Area

D) Existing program *has an associated Operational Plan* (Version 2.1 February 2023) it does have a detailed Intensive Management Plan in regulation (5 AAC 92.111).

E) Game Management Unit(s) fully or partly included in IM program area:
Units 9B, 17, 18 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: 2011. Indicate date(s) if renewed:

- March 2012 to include Units 19A&B
- January 2022 to include Units 17A and 18 and bear removal

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

I) If active, month and year the current predation control program:
Reauthorized January 2022 (RY21)

J) A habitat management program funded by the Department or from other sources is currently active in this IM area No

K) Size of IM program area (square miles) and geographic description:
39,683 sq. miles in Units 9B, 17, 18 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 includes Units 9B, 17, 18, and 19A&B.

M) Size and geographic description of area for ungulate harvest reporting: Historic range of MCH of approximately 50,000 sq. miles in Units 9B, 17, 18, and 19A&B.

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

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)]

assessing predator abundance includes the entire predation control area and is described in 'O' below.

- o) **Size and geographic description of predation control area:** Initially the predation control area designed in RY12 was named the Mulchatna Wolf Control Area. However, this area was expanded in RY17 to include additional calving grounds and adjacent habitat used by the Mulchatna herd since RY13. Because this newly expanded area has a different starting date for SDA hunters (December 1) than the original area (February 1), we refer to these areas with different names. The initial control area was renamed Kemuk Wolf Control Area (KWCA) while the newly added area is named Greater Mulchatna Wolf Control Area (GMWCA). It was expanded again in RY21 and the KWCA nested within the GMWCA totals 15,584 mi².

Kemuk Wolf Control Area:

That portion of Unit 17B south of a line between Tikchik Mountain (N 60.05, W 158.300) and Sleitat Mountain (N 60.05, W 157.067), then southeast to the Koktuli Hills (N 59.80, W 156.300), then southwest into 17C to a point at N 59.32, W 157.066, then west to N 59.32, W 158.300, then north returning into 17B to the beginning point at Tikchik Mountain (N 60.05, W 158.300).

Greater Mulchatna Predator Control Area:

That portion of Units 9B, 17B, 17C, 18, and 19B beginning east of the Muklung River in Unit 17C (59.28930, -158.38913) following a line south east to the mouth of the Kvichak River in unit 9B where subunits 9B, 9C, and 9E merge (58.76149, -157.21015) north easterly along the southern 9B unit boundary to a point 59.14496, -156.18456 to the south west shore of Lake Illiamna (59.32861, -155.86018) following the western shores of Lake Illiamna north (59.73373, -155.67282) to the 17B border 59.77470, -155.54983 continuing a line north east through Long Lake and the upper tributaries of the Chulitna River (60.41724, -154.74627) back into unit 17B (60.51603, -154.74673) east to a point (60.51608, -154.61928) northerly across the Chilikonratna River (60.57817, -154.53903) across the Bonanza Hills (60.77636, -154.53955) back west two miles to a point 60.77637, -154.59452; then north across the Mulchatna River in eastern 17B into Unit 19B at a point (60.94211, -154.59499) northwest to the 19B boundary north of Whitefish Lake (61.00033, -154.81963) westward across Calm Mountain to Sparevohn Radar Site extending to a point (61.07810, -156.69607) then south along the divide between the Hoholitna River and Titnuk Creek to a point (60.77424, -156.59389) then southwest across a portion of

Bear Control Focus Areas:

That portion of Units 17B, 18, and 19B surrounding pregnant adult females from the Mulchatna caribou herd within a 10-mile buffer from the western calving grounds. In May and June of 2023 this included 1,200 mi² in portions of the upper stretches of the Kisaralik, Aniak, Tikchik and King Salmon rivers drainages.

P) Criteria for evaluating progress toward IM objectives:

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- Fall calf-to-cow ratios
- Fall bull-to-cow ratio
- Recruitment of neonates (overwinter survival)
- 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.
- Overwinter survival of calves and recruitment
- 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: Continue (details provided in sections 6 or 7)

S) IM Annual Report data and information inclusion date:

February X (annual report) Year 2023

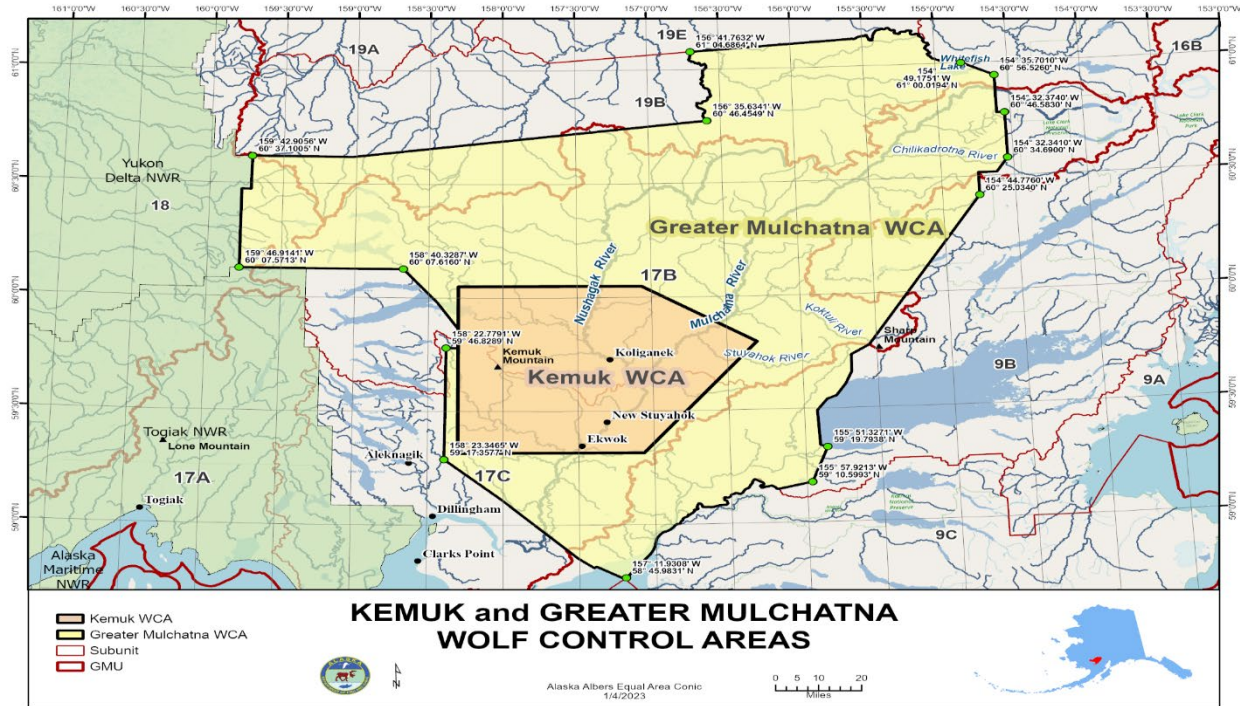


Figure 1. Location of the Kemuk and Greater Mulchatna Wolf Control Areas in Game Management Units 9B, 17B&C, 18 and 19B, RY2023.

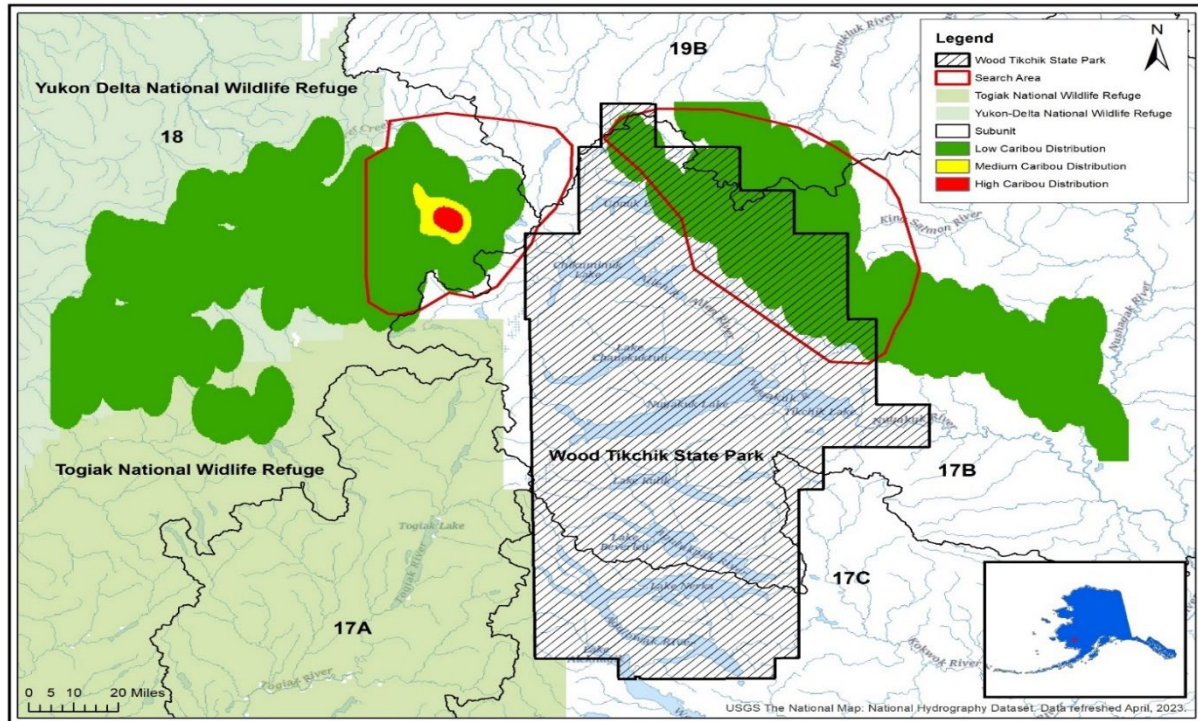


Figure 2. Location lethal predator removal carried out by the department in the Bear Control Focus Area in 2023.

1) 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 July 12, 2023 and estimated $12,507 \pm 682$ (95% C.I. 11,170–13,844)

Compared to IM area, was a similar trend and magnitude of difference in abundance observed in nearby non-treatment area(s) since program inception No and in the last year N/A? Describe comparison if necessary: The IM area comprises roughly 38% of the annual range of the Mulchatna caribou herd. The annual range of most 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. The current department led predator removal efforts are focused on the western calving areas in Units 17B, 18, and 19B. Outside of public SDA, no efforts have been put forth on the eastern herd centered around their calving area in 19B near Lime Village. The lack of department treatment in the east may provide some utility but we recognize that we have not accounted for the influence of all potential variables, so 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 12, 2023 (EMCH) and October 19, 2023 (WMCH).

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 N/A and in the last year N/A? Describe comparison if necessary: The IM area has been expanded to include winter range for EMCH in Units 9B and 17B&C. Initially the WCA aligned closely with the calving ground of the western segment of the population (RY2011–2013), but due to a shift in the calving grounds the subsequent expansion included Unit 18 and further expansion in 17B and 19B, where the western segment has calved since RY2014, and also includes the summer and winter grounds of the eastern segment of the population. However during RY2014–2016, this western segment of the population calved 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 were compounded by the fact that these two areas were too close spatially to be considered independent of one another. Additionally, the eastern calving grounds have often occurred within Unit 19 predator control program thus negating the comparison to a control.

During RY2017, the wolf control area was expanded to include much of the calving grounds of the eastern segment of the Mulchatna herd in the upper Mulchatna River. Both portions of the herd experienced relatively high calf ratios in fall of 2018, yet these ratios declined in 2019 (Table 1). At this point we are unable to accommodate a true experimental versus control comparison given that both East and West Mulchatna are undergoing predator control treatments at different times, intensity, and methods.

From 11 May–4 June 2023, the department carried out lethal predator removal in a 1,200 mi² area within portions of Units 17B, 18, and 19B (Figure 2). A noticeable increase in subsequent summer calf-to-adult ratios (45:100 $n=4,850$) and fall calf to-cows (Table 1) were documented.

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 regulatory year 2023 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

		Composition (number per 100 cows)		
Period	RY	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
Year 8	2018	39	33	2,515
Year 9	2019	31	42	1,851
Year 10	2020	46	51	1,472
Year 11	2021	-	-	-
Year 12	2022	37	44	1,756
Year 13	2023	32	37	1,067

Western Segment of the MCH

		Composition (number per 100 cows)		
Period	RY	Calves	Bulls	Total (<i>n</i>)
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
Year 8	2018	29	32	2,283
Year 9	2019	18	41	1,645
Year 10	2020	26	17	1,728
Year 11	2021	-	-	-
Year 12	2022	26	32	1,588

Year 13	2023	44	35	1,840
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All Areas Combined

Period	RY	Abundance (variation)	Composition (number per 100 cows)		
			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 ^b	30	35	4,793
Year 5	2015	30,736–38,190 ^b	29	35	5,414
Year 6	2016	21,346–33,137 ^b	22	39	5,195
Year 7	2017	-	23	32	5,160
Year 8	2018	-	34	32	4,798
Year 9	2019	11,581–15,315 ^b	25	42	3,496
Year 10	2020	10,249–16,647 ^b	36	34	5,357
Year 11	2021	11,892–13,782 ^b	-	-	-
Year 12	2022	11,410–12,814 ^b	31	38	3,344
Year 13	2023	11,825–13,189 ^b	38	36	3,648

^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).

The combined ratio of 38 calves per 100 cows is the highest since RY99 and is above the 30:100 objective for the fourth time in the past 10 years. This was primarily driven by an increase in the western segment from a 5-year average of 23:100 (2017–2022) to 44:100 (2023). The ratio in the eastern portion of the range of 32:100 is below the five-year average of 36:100. The percent calves in the herd, 21.8%, is a 3% increase from RY22, and 4.8% higher than the 10-year average of 17%.

The combined ratio of 36 bulls per 100 cows is lower than RY22 (above objective) and is consistent with the 5-year average. Bull-to-cow ratios in the east segment are 37:100 and 45:100 in the West. The percent bulls in the herd, 21%, is a slight decrease from the preceding year.

Describe trend in abundance or composition: Trends in calf-to-cow ratios are variable from year to year and remain 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 RY2010–2016 but declined in RY2017 and have been variable since. Currently (Fall 2023) the combined calf-to-cow ratio, and the bull-to-cow ratio is slightly above objectives. The RY2023 point estimate for abundance of 12,507 ± 682 continues to remain below objectives.

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 ^c	209	119	2	Unk	Unk	330	Unk	330
Year 7	2017 ^c	250	186	4	Unk	Unk	440	Unk	440
Year 8	2018 ^c	147	90	1	Unk	Unk	238	Unk	238
Year 9	2019 ^c	84	42	1	Unk	Unk	127	Unk	127
Year 10	2020 ^c	55	0	1	Unk	Unk	56	Unk	56
Year 11 ^d	2021	0	0	0	Unk	23 ^e	23	Unk	23
Year 12 ^d	2022	0	0	0	Unk	11 ^e	11	Unk	11
Year 13	2023	0	0	0	Unk	1 ^e	1	Unk	1

^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.

^d No open state or federal hunting season.

^e Minimum number of unreported caribou harvested outside of the closed season.

Describe trend in harvest: There has been no legal harvest on the MCH since RY20. Historically most harvest occurs during late winter, but this changed during the last years of the hunt due to early closures and hunt periods restricted to the fall. Most 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 RYs 2016 and 2017 enabled hunters to access caribou by snowmachine which increased hunting success. RY2018 was a poor snow year, resulting in less reported harvest than in RY2016 and 2017. In RY2019 harvest was restricted to bulls only and the season was closed in January. In RY2020, only a fall season was offered with a bag limit of 1 bull. We suspect the actual harvest is substantially higher than the reported harvest. There was no open hunting season for Mulchatna caribou in 2022. Some unreported harvest did occur and was documented by an interagency law enforcement effort.

Describe any other harvest related trend if appropriate: NA

2) Predator data

Date(s) and method of most recent spring abundance assessment through survey, modeling, and pilot interviews for wolves (if statistical variation available, describe method here and

list in Table 2): *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.*

Table 3. Wolf abundance objectives and removal in wolf assessment area (N) of Mulchatna Caribou Herd Predation Management Area. Removal objective is to annually reduce wolf numbers in the predation control area to a level that results in increased adult and calf survival and recruitment. If non-lethal predation control methods used by Department personnel, clarify with footnote in control removal tally.

Period ^a	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 ^b from area N	Spring abundance (variation) in area N
			Trap	Hunt				
Year 1	2011		14	52	-	11	102	14
Year 2	2012		17	0	-	0	35	-
Year 3	2013		0	10	-	0	26	-
Year 4	2014		0	0	-	0	6	-
Year 5	2015		19	2	-	0	27	-
Year 6	2016		26	28	-	3	67	-
Year 7	2017 ^c		30	10	-	30	86	-
Year 8	2018		12	0	-	11	29	-
Year 9	2019		3	45	-	28	82	-
Year 10	2020		20	4	-	28	104	-
Year 11	2021		5	5	-	2	19	-
Year 12	2022		19	7	5	25	37	-

^a Each respective year of data is from the ADF&G WinfoNet database: Fur Sealings, Fur Sealing Lookup.

^b Additional removal may be Defense of Life and Property (DLP), vehicle kill, etc.

^c In 2017 the Wolf Control Area was expanded to include 9,844 square miles.

Other research or evidence of trend or abundance status in wolves: 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 initial capture field work, wolf tracks were common and found throughout much of the MCH WCA. Seventeen wolves were collared, comprising 5 packs and multiple lone wolves. Mean minimum observed pack size was 6 wolves during spring and 9 wolves during fall 2017. A preliminary density calculation based on 7 months of GPS data and minimum observed seasonal pack sizes resulted in spring and fall 2017 wolf densities of 2.2 and 3.0 wolves per 1000 km², respectively, in the Mulchatna and lower Nushagak River drainages. The estimated fall density of 3.0 wolves calculates to a minimum of 76 wolves comprising the packs that inhabit the MCH WCA. This estimate should be viewed cautiously, as we did not have all the known packs within the WCA

collared, and the estimate does not include lone wolves that are known to occur in the WCA.

In RY2017, favorable snow conditions like conditions the first year of the program, and an expanded WCA boundary facilitated the highest reported wolf harvest since the first year of the wolf control program. A total of 70 wolves were reported harvested in the WCA, including 9 of 12 (75%) remaining radiocollared wolves. The density of harvested wolves alone equals 3.1 wolves per 1,000 km² and compared to the minimum estimate of pack dwelling wolves previously mentioned, indicates a significant population reduction obtained during RY2017. Observations during wolf capture operations in April 2018 were that both the occurrence and distribution of wolf tracks was down substantially from the previous spring, and most sets of tracks encountered were of singles or pairs of wolves. During that effort we only found a total of 5 additional wolves: 1 breeding pair and 3 lone females. The 2018 spring mean pack size was 2 wolves. Three packs produced a minimum of 16 pups during the summer, and 2018 fall mean pack size was 7 wolves.

Date(s) NA and method of most recent spring abundance assessment for black bear (if statistical variation available, describe method here and list in Table 4)

Date(s) NA and method of most recent fall abundance assessment for black bear (if statistical variation available, describe method here and list in in Table 4)

Other research or evidence of trend or abundance status in black bears: In October of RY2023 staff conducted two hillside surveys within and immediately adjacent to the BCFA where bears were expected to be above shrub line in preparation for denning. Two flights, with five days between flights, documented no black bears during the first flight and 8 black bears observed the second flight. This result is not unusual considering the effort above treeline and at the edge of black bear range.

Table 4. Black bear abundance objectives and removal in black bear assessment area (N) of Mulchatna Caribou Herd Predation Management Area. Removal objective is to remove enough black bears from the control area to have an effect of calf survival. If non-lethal predation control methods used by Department personnel, clarify with footnote in control removal tally.

Period	RY	Spring abundance (variation) in area N	Harvest removal from area N		Dept. control removal from area O		Public control removal from area O		Total removal ^b from area N	Fall abundance (variation) in area N
			FA	SP	FA	SP	FA	SP		
Year 11 ^a	2021	-	2	3	-	-	-	-	5	-
Year 12	2022	-	11	-	-	5	-	-	16	-

^a For example, bear harvest needed for 31 October calculation in Year 1 combines spring (SP: 1 January–30 June) of the prior RY (Year 0) with fall (FA: 1 July–31 Dec) of the current RY.

^b Additional removal may be Defense of Life and Property, vehicle kill, etc.

Date(s) NA and method of most recent spring abundance assessment for brown bears (if statistical variation available, describe method here and list in Table 4)

Date(s) NA and method of most recent fall abundance assessment for brown bears (if statistical variation available, describe method here and list in in Table 4)

Other research or evidence of trend or abundance status in brown bears: In October of RY2023 staff conducted two hillside surveys within and immediately adjacent to the BCFA where bears were expected to be above shrub line in preparation for denning. Two flights, with five days between flights, documented 19 brown bears during the first flight, and 14 brown bears and 8 black bears observed the second flight. A total of 13 independent brown bears, 9 maternal sows and 13 brown bear cubs were observed between the two flights resulting in 39% independent, 22% maternal and 39% dependent brown bears. While sample sizes are low 22% maternal sows is indicative of high reproductive success in comparison to previous and neighboring surveys. Brown bear monitoring flights each fall may provide further information on the localized bear population when removal ceases.

Table 5. Brown bear abundance objectives and removal in brown bear assessment area (N) of Mulchatna Caribou Herd Predation Management Area. Removal objective is to remove enough brown bears from the control area to have an effect of calf survival. If non-lethal predation control methods used by Department personnel, clarify with footnote in control removal tally.

Period	RY	Spring abundance (variation) in area N	Harvest removal from area N		Dept. control removal from area O		Public control removal from area O		Total removal ^b from area N	Fall abundance (variation) in area N
			FA	SP	FA	SP	FA	SP		
Year 11 ^a	2021	-	28	7	-	-	-	-	35	-
Year 12	2022	-	24	5	-	94	-	-	123	-

^a For example, bear harvest needed for 31 October calculation in Year 1 combines spring (SP: 1 January–30 June) of the prior RY (Year 0) with fall (FA: 1 July–31 Dec) of the current RY.

^b Additional removal may be Defense of Life and Property, vehicle kill, etc.

3) 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 [a table could be added, but these programs are often periodic, so most years in most IM areas would be zero acres to report]:

Objective(s): Not Applicable - there are no demonstrated methods to improve caribou habitat.

Area treated and method: N/A

Observation on treatment response: N/A

Evidence of progress toward objective(s) (choose one: Apparent Statistical)

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

Describe any substantial change in habitat not caused by active program: In RY21 wildfires burned 656 mi² in the Eastern range of MCH which likely degraded caribou habitat.

Table 5. Nutritional indicators for caribou in assessment area (L) of the Mulchatna Caribou herd Predation Management Area.

Period	RY	Pregnancy Females >3 yrs. age ^a	Female Calf Weight ^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)
Year 7	2017	80%	122 (15)
Year 8 ^d	2018	67%	-
Year 9 ^d	2019	76%	-
Year 10 ^d	2020	85%	-
Year 11	2021	88%	-
Year 12	2022	88%	122 (16)
Year 13	2023	96%	-

^a Pregnancy rate based on known-aged animals from collared sample. Pregnancy status determined in May, i.e., RY10 pregnancy data collected in May 2011, based on observed characteristics of pregnancy.

^b Calf weights are collected in March of the RY, i.e., RY 2010 female calf weight data is collected March 2011.

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

^d No calves were captured during this RY due to logistical constraints.

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 (clarify which: N/A)

Evidence of trend (choose one: Apparent Statistical)

Although there are no nutritional objectives identified in the IM Operational Plan, the pregnancy rates of females \geq 3years of age has increased from 61% in 2014 to 96% in 2023 with the last four years all above 85%.

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

4) 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 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	13.0	230.0
Year 7	2018	0.0	0.0	1.0	223.5	223.5	321.8
Year 8	2019	0.0	0.0	7.7	117.7	117.7	26.0
Year 9	2020	0.0	0.0	5.0	112.5	112.5	344.2
Year 10	2021	0.0	0.0	3.5	158.9	158.9	345.3
Year 11	2022	0.0	0.0	9.5	231.34	231.3	163.0
Year 12	2023	6.0	392.0	4.5	220.6	612.6	241.1

^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).

5) Department recommendations³ for annual evaluation (1 February) following Year 12 (RY2023) for the Mulchatna Caribou herd Predation Management Area —skip in final year and go to section 7

Has progress toward defined criteria been achieved? No. There are, however, positive indications of growth such as a large, small-bull cohort and consistently higher bull and calf-to-cow ratios in the eastern segment of the range since RY14. During this reporting period the combined bull:100 cow ratio declined, but an increase in the calf ratio in RY22. Calf-to-cow ratios remain variable but were above objective during this reporting period. A similar

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.

increase was observed in RY18 after high numbers of wolves were removed in the previous winter. The overall estimated population remains at less than half the minimum objective of 30,000 animals. Recently, a high prevalence of Brucella var suis 4 was detected in the MCH during routine screening; occurring at a higher prevalence rate in the West. It is unclear if the outbreak has previously occurred or if it is active in the herd. Additional work will be conducted to monitor the situation.

Has achievement of success criteria occurred? Yes – the bull:100 cow objective of 35:100 was met in three of the last five years during RY2019–RY2023. No fall composition survey was conducted in RY2021 due to weather and while it is variable annually, the ten-year average combined bull:100 cow ratio is 35:100. The bull:cow ratio could be meeting management objective due to the closure of a hunt. The calf:100 cow objective of 30:100 was met in RY2014, RY2018, RY2020, RY2022 and RY2023. Although the point estimates for the abundance estimates were below the lower bound of the population objective, they initially indicate growth in the herd during RY2012–2016. However, overlapping confidence intervals across these years suggest that the population could have been anywhere on the spectrum of values, and in fact could have been declining instead of growing. The harvest objective of 2,400–8,000 has not been met due to the close of the seasons for continued conservation concerns as the MCH has shown no appreciable population increase since at least 2017.

Recommendation for IM practice(s): **Continue Modify Suspend Terminate**
Suspend the public same-day airborne wolf predation control program; Continue department-led lethal removal on the western calving grounds; and Continue current closed season harvest strategy for caribou.

6) Evaluation (1 February) for program renewal (following final Year [X]) and Department recommendations for Mulchatna Caribou Herd Predation Management Area.

Has progress toward defined criteria been achieved (describe)? No

Has achievement of success criteria occurred (describe)? No

Recommendation for IM program: Continue Modify Suspend Terminate

Rationale for recommendation on overall program: The Department recommends continuation of the predation control program during RY2024. We will continue monitoring the Mulchatna Caribou herd to determine progress towards IM objectives (details provided in Section 6). It is also recommended that a late winter wolf removal effort led by the department be conducted in April prior to the caribou calving period.

Other recommendations (if continuation is recommended, specific actions on individual practices): None