Annual Report to the Alaska Board of Game on Intensive Management for Moose with Wolf, Black Bear, and Grizzly Bear Predation Control in Game Management Unit 19D East

Prepared by the Division of Wildlife Conservation
February 2026

1) Description of IM Program[1]

A) This report is an annual evaluation for a predation control program authorized by the Alaska Board of Game (board) under 5 AAC 92.123

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

Annual Report, February 2026

C) Program name: Unit 19D East wolf and bear predation control program (Fig. 1).

D) Existing program has an associated Operational Plan.

E) Game Management Unit fully or partly included in IM program area: Unit 19D East.

F) IM objective is a moose population size of 6,000–8,000 **with a harvest of** 400–600.

G) Month and year the current predation control program was originally authorized by the board: Fall 1995. **Indicate date(s) if renewed:** January 2000, March 2003, January 2006, May 2006, March 2009, February 2014, March 2020, March 2024.

H) Predation control is currently active (wolf control) and inactive (bear control) **in this IM area**.

I) If active, month and year the current predation control program began: December 2003.

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: Unit 19D East is 8,513 mi^2.

L) Size and geographic description of area for assessing ungulate abundance: Wolf Control Focus Area (WCFA) is 5,579 mi^2; Bear Control Focus Area (BCFA) is 528 mi^2.

M) Size and geographic description of area for ungulate harvest reporting: WCFA is 5,579 mi^2.

N) Size and geographic description of area for assessing predator abundance: WCFA is 5,579 mi^2; BCFA is 528 mi^2.

O) Size and geographic description of predation control area: WCFA is 5,579 mi^2; BCFA is 528 mi^2.

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

P) Criteria for evaluating progress toward IM objectives: Moose density and harvest.

Q) Criteria for success with this program: WCFA density=1.0 moose/mi^2 (~5,600 moose) moose and WCFA harvest=225 moose.

R) Department recommendation for IM program in this reporting period: Continue program (details provided in section 6).

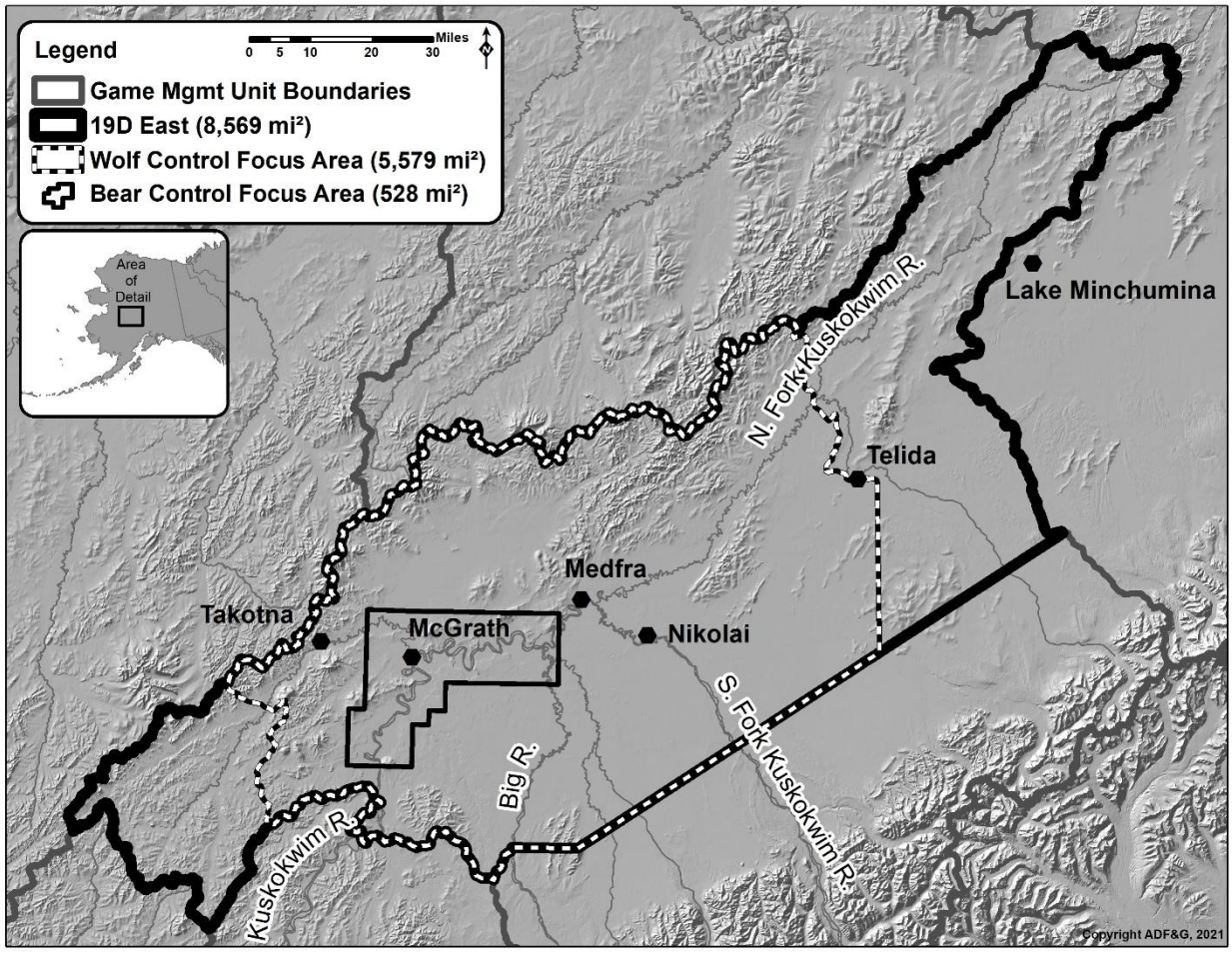

Figure 1. Unit 19D East intensive management areas.

2) Prey data

Date(s) and method of most recent abundance assessment for moose: November 2023 Geospatial Population Estimator (GSPE) in a 1,118 mi^2 area surrounding the BCFA. November 2017 GSPE in a 5,313 mi^2 portion of the WCFA.

Compared to IM area, was a similar trend and magnitude of difference in abundance observed in nearby non-treatment area(s) since program inception: Non-treatment area not established.

Date(s) of most recent age and sex composition survey: November 2023 GSPE in a 1,118 mi^2 area surrounding the BCFA.

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: Non-treatment area not established.

Table 1. Moose abundance, age and sex composition in a 1,118 mi^2 area surrounding the BCFA and the 19D East MSA, since program implementation in year 1. Regulatory year is 1 July to 30 June (e.g., Regulatory Year 2001 is 1 July 2001 to 30 June 2002).

		Moose Abundance (90% CI)[a]		Composition (number per 100 Cows)[b]		
Period	Regulatory Year	1,118 mi^2 Area	MSA[c]	Calves	Bulls	Total *n*
Year 1	2001	868(+147)	2,564(+726)	36	21	455
Year 2	2002	--		--	--	--
Year 3	2003	--		--	--	--
Year 4	2004	1,192(+228)	2,744(+661)	66	18	578
Year 5	2005	--		--	--	--
Year 6	2006	1,308(+174)		55	30	762
Year 7	2007	1,720(+306)		53	36	844
Year 8	2008	1,718(+352)	3,899(+959)	44	40	678
Year 9	2009	1,820(±323)		38	40	711
Year 10	2010	1,796(±312)		43	49	712
Year 11	2011	1,647(±296)		42	33	639
Year 12	2012	1,337(±199)		35	38	650
Year 13	2013	--		--	--	--
Year 14	2014	--		--	--	--
Year 15	2015	2,014(±398)		41	36	811
Year 16	2016	--		--	--	--
Year 17	2017	2,389(±372)	5,884(+1,020)	42	31	1,089
Year 18	2018	--		--	--	--
Year 19	2019	2,291(±443)		33	35	1,246
Year 20	2020	2,201(±414)		34	31	1,122
Year 21	2021	--		--	--	--
Year 22	2022	2,471(±429)		39	40	1,277
Year 23	2023	1,591 (±241)		24	34	684
Year 24	2024	--		--	--	--
Year 25	2025	--		--	--	--

[a] Estimate with sightability correction factor applied

[b] Composition calculated in the 1,118 mi^2 area surrounding the BCFA

[c] The 19D MSA (5,313 mi^2) includes the 1,118 mi^2 survey area and is almost fully within the 5,579 mi^2 WCFA.

Describe trend in abundance or composition: By November 2022 moose numbers had increased to the highest point since surveys began in 2001. However, after a record deep snow year in 2022/2023 moose numbers declined approximately 36%, declining to the lowest abundance reported since 2012. Due to weather, we were not able to complete a GSPE survey in 2024 or 2025.

Table 2. Reported moose harvest from the WCFA (5,579 mi^2) since Regulatory Year 2001. Regulatory year is 1 July to 30 June (e.g., Regulatory Year 2001 is 1 July 2001 to 30 June 2002).

Period	Regulatory Year	Reported		Other mortality[a]	Total
		Male	Female		
Year 1	2001	72	0	-[b]	72
Year 2	2002	95	0	-[b]	95
Year 3	2003	81	0	-[b]	81
Year 4	2004	60	0	-[b]	60
Year 5	2005	73	0	-[b]	73
Year 6	2006	64	0	3	67
Year 7	2007	89	0	1	90
Year 8	2008	104	0	1	105
Year 9	2009	98	0	2	100
Year 10	2010	108	0	2	110
Year 11	2011	129	0	1	130
Year 12	2012	102	0	1	103
Year 13	2013	115	1	2	118
Year 14	2014	139	0	3	142
Year 15	2015	159	1	2	162
Year 16	2016	143	0	2	145
Year 17	2017	136	0	2	138
Year 18	2018	123	0	2	125
Year 19	2019	120	0	1	121
Year 20	2020	114	1	3	118
Year 21	2021	100	8	2	110
Year 22	2022	91	12	1	104
Year 23	2023	77	0	0	77
Year 24	2024	101	0	0	101

[a] Mortuary harvest
[b] Records destroyed by fire

Describe trend in harvest: Harvest in the WCFA increased from 72 moose in 2001 through a peak of 162 moose in 2015. In RY16 harvest began declining and the current 5-year average harvest is 99 moose per year (RY20-RY24). This decreasing trend in harvest can be explained primarily by decreasing hunter participation and success rates. During the peak harvest years from RY14-RY18 there were an average of 255 hunters, while during the most recent 5-year period (RY20-RY24) there were an average of 210 hunters per year. Concurrent with a decline in the number of hunters, success rates also declined during these same time frames. From RY14-RY18 success was 56% while from RY20-24 success was 47%.

The winter hunt RM660 was closed by emergency order in RY23 and has been restricted to bulls only since RY24. Mortuary moose harvest remains low with only 0-3 moose taken per year.

Describe any other harvest related trend if appropriate:

3) Predator data

Wolves

Date(s) and method of most recent spring abundance assessment for wolves in the WCFA:
April 2023, pilot interviews.

Date(s) and method of most recent fall abundance assessment for wolves in the WCFA:
November 2022, pilot interviews.

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

Gardner, C. L., and N. J. Pamperin. 2014. Intensive aerial wolf survey operations manual for Interior Alaska. Alaska Department of Fish and Game, Wildlife Special Publication ADF&G/DWC/WSP-2014-01, Juneau.

Keech, M. A., M. S. Lindberg, R. D. Boertje, P. Valkenburg, B. D. Taras, T. A. Boudreau, K. B. Beckmen. 2011. Effects of Predator Treatments, Individual Traits, and Environment on Moose Survival in Alaska. The Journal of Wildlife Management 75(6):1361–1380.

Keech, M. A. 2012. Response of moose and their predators to wolf reduction and short-term bear removal in a portion of Unit 19D. Alaska Department of Fish and Game, Federal Aid in Wildlife Restoration, Final Wildlife Research Report ADF&G/DWC/WRR-2012-7, Grants W-33-4 through W-33-10, Project 1.62, Juneau, Alaska

Table 3. Wolf abundance and removal objectives in the WCFA since program implementation in year 1. Removal objectives are to reduce wolf numbers from the February 2001 pre-control estimate of 130 wolves (interpolated from a more extensive aerial survey) by 60-80% (26-52 wolves remaining in April of each year). Only removing wolves from the WCFA will ensure wolves persist in the unit.

Period	Regulatory Year	Fall abundance[a]	Harvest removal		Dept. control removal	Public control removal[b]	Total removal	Spring abundance
			Trap	Hunt				
Year 1	2001	--	19	3	0	N/A	22	--
Year 2	2002	--	28	5	0	N/A	33	--
Year 3	2003	--	9	1	0	17	27	--
Year 4	2004	47	12	2	0	14	28	19[c]
Year 5	2005	33	9	1	0	4	14	19[c]
Year 6	2006	--	13	1	0	2	16	--
Year 7	2007	--	6	2	0	29	37	--
Year 8	2008	54	4	3	0	19	26	28[c]
Year 9	2009	--	7	4	0	4	15	--
Year 10	2010	--	4	2	0	13	19	--
Year 11	2011	57	11	0	0	22	33	24[d]
Year 12	2012	33	5	0	0	8	13	20[d]
Year 13	2013	27	9	0	0	9	18	9[d]
Year 14	2014	42	13	0	0	10	23	19[d]
Year 15	2015	--	18	1	0	12	31	--
Year 16	2016	--	14	0	0	12	26	--
Year 17	2017	83	22	1	0	29	52	31[d]
Year 18	2018	83	9	1	0	63	73	10[d]
Year 19	2019	--	9	3	0	30	42	--
Year 20	2020	--	12	0	0	55	67	--
Year 21	2021	--	11	4	0	39	54	--
Year 22	2022	83	13	1	0	55	69	14[d]
Year 23	2023	--	8	0	0	31	39	--
Year 24	2024	--	17	1	0	4	22	--

[a]Calculated by adding total removal to WCFA spring abundance during each regulatory year.
[b]Public control removal began in regulatory year 2003
[c]Calculated by extrapolating the density from a 3,210 mi^2 aerial reconnaissance survey area (Keech et al. 2011) to the current WCFA (5,579mi^2)
[d]Abundance based on private pilot and department biologist observations; lack of effort in some years led to an inability to estimate abundance.

Black Bears

Date(s) and method of most recent spring abundance assessment for black bears in the BCFA: May 2016, mark-recapture estimator.

Other research or evidence of trend or abundance status in black bears:

Keech, M. A., M. S. Lindberg, R. D. Boertje, P. Valkenburg, B. D. Taras, T. A. Boudreau, K. B. Beckmen. 2011. Effects of Predator Treatments, Individual Traits, and Environment on Moose Survival in Alaska. The Journal of Wildlife Management 75(6):1361–1380

Keech, M. A. 2012. Response of moose and their predators to wolf reduction and short-term bear removal in a portion of Unit 19D. Alaska Department of Fish and Game, Federal Aid in Wildlife Restoration, Final Wildlife Research Report ADF&G/DWC/WRR-2012-7, Grants W-33-4 through W-33-10, Project 1.62, Juneau, Alaska.

Table 4. Black bear abundance and removal in the BCFA since program implementation in year 1. Public bear control ended June 30, 2014. When active, the removal objective was to reduce bear numbers as low as possible within the BCFA. The May 2004 estimated black bear population for all of Unit 19D East was approximately 1,700. A regulatory year is 1 July to 30 June (e.g, regulatory year 2001 is 1 July 2001 to 30 June 2002).

Period	Regulatory Year	Spring abundance[a] (95% CI)	Harvest removal		Dept. control removal		Public control removal		Total removal
			FA[b]	SP[c]	FA[b]	SP[c]	FA[b]	SP[c]	
Year 1	2001	--	1	0	0	0	0	0	1
Year 2	2002	96(±13)[d]	4	0	0	67[e]	0	0	71
Year 3	2003	30(±9)[d]	1	5	0	26[e]	0	0	32
Year 4	2004	--	0	1	0	0	0	0	1
Year 5	2005	--	1	5	0	0	0	0	6
Year 6	2006	70(±14)[g]	0	0	0	0	0	0	0
Year 7	2007	--	1	7	0	0	0	0	8
Year 8	2008	--	1	5	0	0	0	0	6
Year 9	2009	123(96–162)[g]	4	0	0	0	0	6	10
Year 10	2010	--	1	3	0	0	4	13	21
Year 11	2011	--	7	1	0	0	1	2	11
Year 12	2012	--	0	0	0	0	0	0	0
Year 13	2013	113(89–149)[g]	1	1	0	0	4	0	6
Year 14	2014	--	13	2	0	0	0	0	15
Year 15	2015	--	1	2	0	0	0	0	3
Year 16	2016	96[g]	0	5	0	0	0	0	5
Year 17	2017	--	5	3	0	0	0	0	8
Year 18	2018	--	2	2	0	0	0	0	4
Year 19	2019	--	5	0	0	0	0	0	5
Year 20	2020	--	3	3	0	0	0	0	6
Year 21	2021	--	3	8	0	0	0	0	11
Year 22	2022	--	6	3	0	0	0	0	9
Year 23	2023	--	2	3	0	0	0	0	5
Year 24	2024	--	3	2	0	0	0	0	5

[a]Does not include cubs of the year
[b]Fall
[c]Spring
[d]Removal estimator
[e]Non-lethal removal
[g]Mark-recapture estimator

Brown Bears

Date(s) and method of most recent spring abundance assessment for brown bears in the BCFA: May 2004, Estimated by extrapolation from BCFA.

Other research or evidence of trend or abundance status in brown bears:

Keech, M. A., M. S. Lindberg, R. D. Boertje, P. Valkenburg, B. D. Taras, T. A. Boudreau, K. B. Beckmen. 2011. Effects of Predator Treatments, Individual Traits, and Environment on Moose Survival in Alaska. The Journal of Wildlife Management 75(6):1361–1380

Keech, M. A. 2012. Response of moose and their predators to wolf reduction and short-term bear removal in a portion of Unit 19D. Alaska Department of Fish and Game, Federal Aid in Wildlife Restoration, Final Wildlife Research Report ADF&G/DWC/WRR-2012-7, Grants W-33-4 through W-33-10, Project 1.62, Juneau, Alaska.

Table 5. Brown bear abundance and removal in the BCFA since program implementation in year 1. When active the removal objective is to reduce bear numbers as low as possible within the BCFA. Public bear control ended June 30, 2014. The May 2004 estimated brown bear population for all of Unit 19D East was approximately 128. The regulatory year is 1 July to 30 June (e.g, Regulatory Year 2001 is 1 July 2001 to 30 June 2002).

Period	Regulatory Year	Spring abundance[a]	Harvest removal		Dept. control removal		Public control removal		Total removal
			FA[b]	SP[c]	FA[b]	SP[c]	FA[b]	SP[c]	
Year 1	2001	--	0	0	0	0	0	0	0
Year 2	2002	12[d]	0	0	0	6[e]	0	0	6
Year 3	2003	--	0	0	0	0	0	0	0
Year 4	2004	--	0	0	0	0	0	0	0
Year 5	2005	--	0	0	0	0	0	0	0
Year 6	2006	--	0	2	0	0	0	0	2
Year 7	2007	--	0	2	0	0	0	0	2
Year 8	2008	--	0	0	0	0	0	0	0
Year 9	2009	--	2	0	0	0	0	0	2
Year 10	2010	--	0	0	0	0	0	0	0
Year 11	2011	--	0	0	0	0	0	0	0
Year 12	2012	--	0	0	0	0	0	0	0
Year 13	2013	--	0	0	0	0	0	0	0
Year 14	2014	--	1	1	0	0	0	0	2
Year 15	2015	--	0	0	0	0	0	0	0
Year 16	2016	--	2	0	0	0	0	0	2
Year 17	2017	--	0	0	0	0	0	0	0
Year 18	2018	--	0	0	0	0	0	0	0
Year 19	2019	--	0	0	0	0	0	0	0
Year 20	2020	--	0	0	0	0	0	0	0
Year 21	2021	--	1	0	0	0	0	0	1
Year 22	2022	--	2	0	0	0	0	0	2
Year 23	2023	--	1	0	0	0	0	0	1
Year 24	2024	--	0	0	0	0	0	0	0

[a]Does not include cubs
[b]Fall
[c]Spring
[d]Estimated by using density extrapolated from other areas of Interior Alaska with comparable habitat
[e]Non-lethal removal

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: No active habitat enhancement occurring.

Table 6. Nutritional indicators for moose in a 1,118 mi^2 area surrounding the BCFA since program implementation in regulatory year 2001 (year 1). A regulatory year is 1 July to 30 June (e.g, Regulatory Year 2001 is 1 July 2001 to 30 June 2002).

Period	Regulatory year	Twinning rate for radiocollared cows >2 yrs (*n*)	Twinning rate uncollared cows (*n*)
Year 1	2001	59% (22)	
Year 2	2002	24% (25)	39% (46)
Year 3	2003	32% (31)	36% (39)
Year 4	2004	44% (45)	39% (31)
Year 5	2005	40% (60)	50% (40)
Year 6	2006	52% (56)	35% (29)
Year 7	2007	55% (51)	50% (30)
Year 8	2008	33% (43)	--
Year 9	2009	33% (40)	26% (87)
Year 10	2010	--	29% (45)
Year 11	2011	--	37% (38)
Year 12	2012	--	34% (47)
Year 13	2013	--	22% (55)
Year 14	2014	--	--
Year 15	2015	--	49% (45)
Year 16	2016	--	32% (53)
Year 17	2017	--	27% (44)
Year 18	2018	--	13% (39)
Year 19	2019	--	18% (49)
Year 20	2020	--	15% (48)
Year 21	2021	--	23% (40)
Year 22	2022	--	35% (43)
Year 23	2023	--	29% (45)
Year 24	2024	--	30% (44)

5) Costs specific to implementing Intensive Management

Table 7. Unit 19D East program cost ($1,000 = 1.0) of agency salary based on estimate of proportional time of field level staff and cost of operations for intensive management activities performed by personnel in the Department or work by other state agencies (e.g., Division of Forestry) or contractors in Unit 19D East during years 10-23. Fiscal year is also 1 July to 30 June but the year is one greater than the comparable regulatory year (e.g, Fiscal Year 2011 is 1 July 2010 to 30 June 2011).

Period	Fiscal Year	Predation control[a]		Other IM activities		Total IM cost	Research cost[d]
		Time[b]	Cost[c]	Time[b]	Cost[c]		
Year 10	2011	0.4	3.5	0.4	5.0	8.5	56.0
Year 11	2012	1.2	7.3	4.0	43.6	50.9	39.0
Year 12	2013	1.3	8.0	2.0	44.2	52.2	119.3
Year 13	2014	1.0	11.3	0.4	5.0	16.3	256
Year 14	2015	1.4	11.5	0.4	5.0	16.5	0.0
Year 15	2016	1.4	9.5	0.4	5.0	14.5	242.2
Year 16	2017	1.4	9.5	0.4	5.0	14.5	242.2
Year 17	2018	0.1	1.2	7.9	139.4	140.6	190.3
Year 18	2019	0.8	6.4	5.6	139.7	146.1	23.0
Year 19	2020	0.3	4.4	6.2	86.3	90.7	111.9
Year 20	2021	0.7	5.5	13.2	139.1	174.5	90.0
Year 21	2022	0.8	6.2	12.6	208.7	214.9	72.5
Year 22	2023	0.6	5.9	4.8	148.4	154.4	73.1
Year 23	2024	0.8	8.0	10.6	190.1	198.1	0.0
Year 24	2025	0.1	2.0	5.7	113.7	115.7	0.0

[a]State or private funds only.
[b]Person-months (22 days per month)
[c]Salary plus operations. Beginning in Fiscal Year 2019, Other IM activities includes normal survey and inventory work, which is typically more robust than standard survey and inventory work.
[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) Evaluation (February 2026) for program renewal and department recommendations for Unit 19D East.

Has progress toward defined criteria been achieved? Yes. The moose population continued to grow from program implementation through RY22. However, following an exceptionally deep snow winter (2022/2023) the moose population declined to 2012 levels. Due to poor weather, we have not been able to complete a GSPE survey since November 2023. Harvest is currently around 100 moose per year with a fall season from September 1 - 25 and a winter season the entire month of February.

Has achievement of success criteria occurred? Moose abundance and harvest are evaluated at the scale of the WCFA. However, we have not surveyed this area since 2017, and recent surveys have only been conducted in the 1,118mi^2 area surrounding the BCFA. Within the WCFA, moose densities approximately doubled from 2001 (0.5 moose/mi^2) to 2017 (1.1 moose/mi^2),

exceeding the IM density objective of 1.0 moose/mi^2. While the WCFA has not been surveyed since 2017, a 2023 GSPE survey in the 1,118 mi^2 survey area showed a decline of approximately 36%. A similar decline in the WCFA would indicate we are now below the density objective for the WCFA. The harvest objective of 225 moose has not been met to date. However, with the limited access in Unit 19D East, it is unlikely a harvest of 225 moose can be achieved.

Recommendation for IM program: Continue program.

Rationale for recommendation on overall program: With the recent decline in the moose population due to a severe winter (2022/2023) we are now likely below the IM population objective. Predator reductions (bears and wolves), in combination with a burn in the BCFA and a favorable period of mild winters (2012-2019) resulted in a marked increase in moose densities since program implementation. Although bears have since returned to pre-control abundance, by April of most years, wolves have been successfully reduced by 60-80% from 2001 pre-control numbers. The effect of wolf reductions in the absence of reduced bear abundance and in comparison, to the effects of the burn remains a topic of research and evaluation. With the resolution of our survey data, it may be difficult to apportion what percentage of the growth was due to habitat improvements, winter conditions, and predator removals. The current program was reauthorized by the board in March 2024 and expires June 30, 2030. A reassessment of program-specific moose population and harvest objectives as well as wolf removal objectives may be warranted when the region is next in-cycle at board of game (March 2027).