

**Annual Report to the Alaska Board of Game on  
Intensive Management for Moose and Caribou  
with Wolf Predation Control  
in the Upper Yukon/Tanana Rivers**

**Prepared by the Division of Wildlife Conservation  
February 2014**



1) **Description of IM Program<sup>1</sup>**

A) **This report is an annual evaluation for a predation control program authorized by the Alaska Board of Game (Board) under 5 AAC 92.113**

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

February X (annual report) August    (interim annual update<sup>2</sup>) Year 2013

C) **Program name: Upper Yukon/Tanana Wolf predation Control Program (UYTPCP)**

D) **Existing program does not have an associated Operational Plan**

E) **Game Management Unit(s) fully or partly included in IM program area: Units 12, 20B, 20D, 20E and 25C**

F) **IM objectives for Fortymile caribou herd (FCH): population size 50,000–100,000 and harvest 1,000–15,000 ; for moose in Unit 12 north of the Alaska Highway and all of Unit 20E: population size 8,744–11,116 and harvest 547–1,084**

G) **Month and year the current predation control program was originally authorized by the Board: November 2004. Indicate date(s) if renewed: March 2009**

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

I) **If active, month and year the current predation control program began: January 2005**

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: 18,750 mi<sup>2</sup> in that portion of Unit 12 north of the Alaska Highway; that portion of Unit 20D within the Goodpaster River drainage upstream from and including the South Fork Goodpaster River drainage, and within the Healy River, and the Billy and Sand creek drainages; that portion of Unit 20B within the Salcha River drainage upstream from and including the Goose Creek drainage, and within the Middle Fork of the Chena River drainage; all of Unit 20E; and that portion of Unit 25C within the Birch Creek drainage upstream from the Steese Highway bridge, and within the area draining into the south and west bank of the Yukon River upstream from the community of Circle (Fig. 1).**

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

<sup>2</sup> 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*]

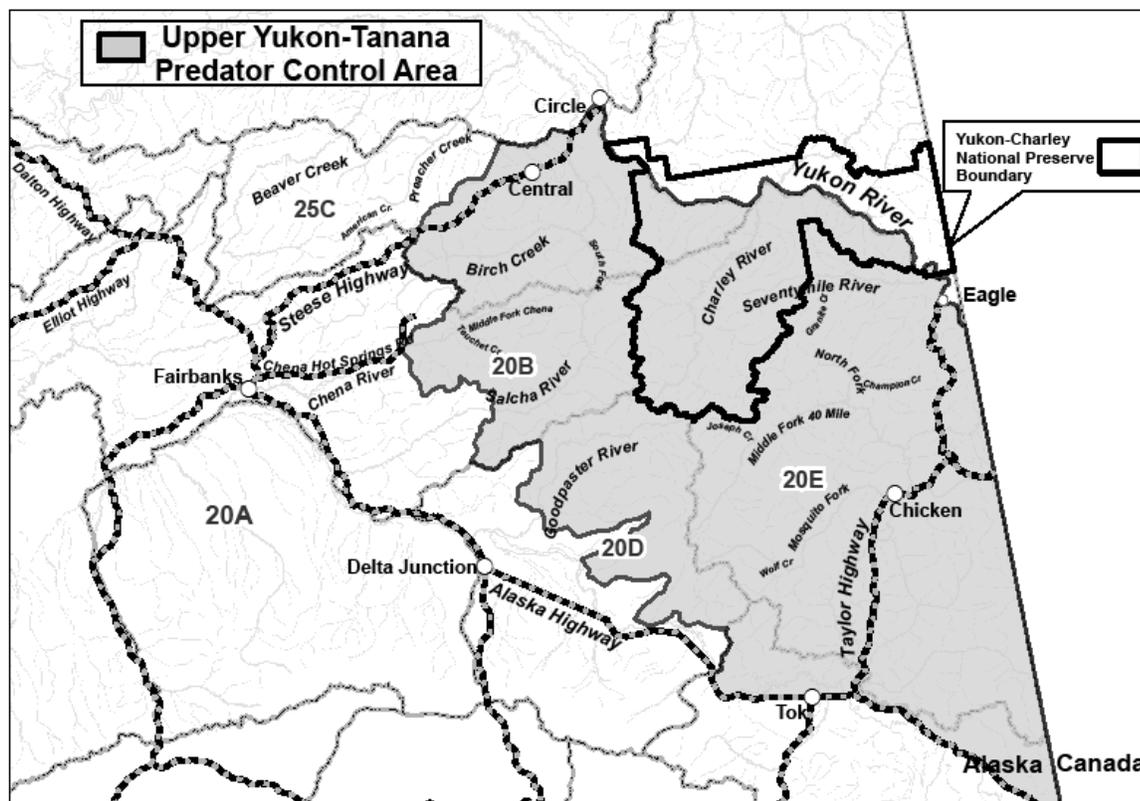


Figure 1. Upper Yukon/Tanana Predator Control Program Area (18,750 mi<sup>2</sup>)

L) Size and geographic description of area for assessing ungulate abundance: Caribou-25,217 mi<sup>2</sup> FCH hunt area (Fig. 2); Moose-4,630 mi<sup>2</sup> within the Unit 20E West and 20E Central Moose Survey Areas in southern Unit 20E.

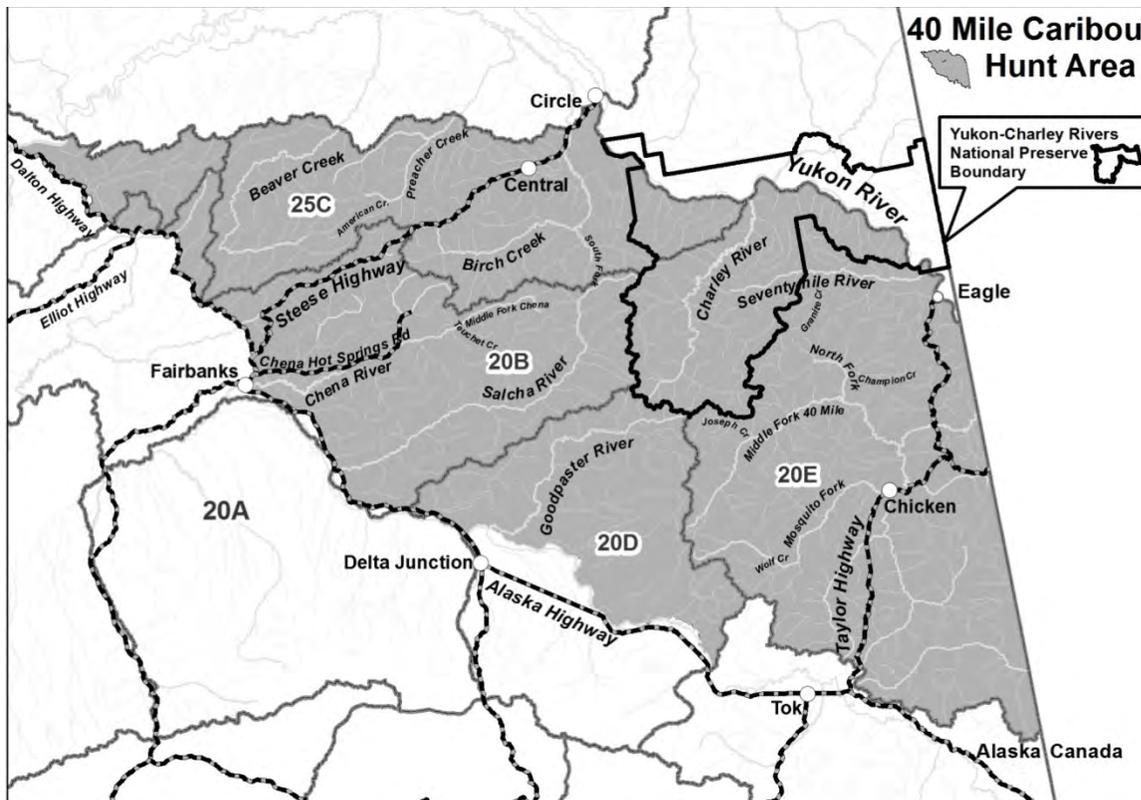


Figure 2. Fortymile Caribou Herd Hunt Area (25,217 mi<sup>2</sup>).

- M) **Size and geographic description of area for ungulate harvest reporting:** Caribou–FCH hunt area (25,217 mi<sup>2</sup>); Moose–Unit 12 north of the Alaska Highway and all of Unit 20E (9,150 mi<sup>2</sup>).
- N) **Size and geographic description of area for assessing predator abundance:** Predator Control Area (PCA)-18,750 mi<sup>2</sup>.
- O) **Size and geographic description of predation control area:** PCA-18,750 mi<sup>2</sup>.
- P) **Criteria for evaluating progress toward IM objectives:** Caribou and moose abundance and harvest.
- Q) **Criteria for success with this program:** FCH population = 50,000–100,000 and harvest = 1,000–15,000 caribou; moose population in Unit 12 north of the Alaska Highway and in all of Unit 20E population = 8,744–11,116 and harvest = 547–1,084 moose.
- R) **Department recommendation for IM program in this reporting period:** Continue program (details provided in section 6)

## 2) Prey data

**Date(s) and method of most recent fall/spring abundance assessment for:** Caribou–June 2010 photo census (Table 1); Moose – November 2012 geospatial moose population survey (Table 2).

**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 for:** Caribou – October 2013 composition survey (Table 1); Moose – November 2012 geospatial moose population survey (Table 2)

**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. Fortymile Caribou Herd (FCH) abundance, age and sex composition in FCH\_hunt area since the herd was added to the control program in year 3 to year 10. Regulatory year is 1 July through 30 June (e.g., RY13 = 1 July 2013 through 30 June 2014).**

Period	Regulatory year	Abundance	Composition (number per 100 cows)		
			Calves	Bulls	Total <i>n</i>
Year 1	2004	--	--	--	--
Year 2	2005	--	--	--	--
Year 3	2006	43,837 <sup>a</sup>	34	43	4,995
Year 4	2007	44,673 <sup>a</sup>	37	36	5,228
Year 5	2008	46,510 <sup>b</sup>	33	37	4,119
Year 6	2009	51,675 <sup>b</sup>	34	59	4,503
Year 7	2010	--	32	43	7,169
Year 8	2011	--	25	42	3,949
Year 9	2012	--	22	40	4,832
Year 10	2013	--	28	38	3,921

<sup>a</sup> Modeled population estimate.

<sup>b</sup> Minimum population estimate from photo census.

**Describe trend in abundance or composition:** 2–4% annual rate of increase during RY06–RY09, based on modeling and photo census results

**Table 2. Moose abundance, age and sex composition in Unit 20E West and 20E Central moose survey areas in southern Unit 20E since program implementation in year 1 to year 10. A regulatory year is 1 July through 30 June (e.g., RY12 = 1 July 2012 through 30 June 2013).**

Period	Regulatory year	Abundance (variation)	Composition (number per 100 cows)		
			Calves	Bulls	Total <i>n</i>
Year 1	2004	2268 (90% CI±17%)	24	55	516

Period	Regulatory year	Abundance (variation)	Composition (number per 100 cows)		
			Calves	Bulls	Total <i>n</i>
Year 2	2005	2913 (90% CI±14%)	23	52	887
Year 3	2006	3352 (90% CI±15%)	31	42	1104
Year 4	2007	3469 (90% CI±14%)	26	48	935
Year 5	2008	3147 (90% CI±11%)	28	60	865
Year 6	2009	3950 (90% CI±12%)	30	58	1046
Year 7	2010	3894 (90% CI±15%)	28	70	987
Year 8	2011	4148 (90% CI±16%)	14	67	1071
Year 9	2012	4165 (90% CI±16%)	17	53	1061
Year 10	2013	— <sup>a</sup>	— <sup>a</sup>	— <sup>a</sup>	— <sup>a</sup>

<sup>a</sup> No survey conducted.

**Describe trend in abundance or composition:** Moose increased during RY04–RY12 based upon point estimates with non-overlapping 90% confidence intervals in RY04 and RY12

**Table 3. Fortymile Caribou Herd (FCH) harvest in FCH<sub>hunt</sub> area since the herd was added to the control program in year 3 to year 10. A regulatory year is 1 July through 30 June (e.g., RY12 = 1 July 2012 through 30 June 2013). Methods for estimating unreported harvest are described in Survey and Inventory reports.**

Period	Regulatory year	Reported		Estimated			Total harvest
		Male	Female	Unreported	Illegal	Yukon	
Year 1	2004	--	--	--	--	--	--
Year 2	2005	--	--	--	--	--	--
Year 3	2006	601	247	10	10	5	873
Year 4	2007	746	262	10	10	5	1033
Year 5	2008	696	217	10	10	10	913
Year 6	2009	891	192	10	10	20	1083
Year 7	2010	636	89	10	10	5	750
Year 8	2011	918	103	10	10	5	1046
Year 9	2012	1081	190	10	10	5	1,296
Year 10	2013	1151 <sup>a</sup>	13 <sup>a</sup>	30 <sup>b</sup>	10	60	1,264

<sup>a</sup> Preliminary data.

<sup>b</sup> Includes 20 caribou reports with unknown sex.

**Describe trend in harvest:** Harvest controlled by fixed annual harvest quota. Annual quota was 850 during RY06–RY09, 795 in RY10, and 1,000 during RY11–RY13.

**Describe any other harvest related trend if appropriate:** None.

**Table 4. Moose harvest in Unit 12 north of the Alaska Highway and all of Unit 20E since program implementation in year 1 to year 10. A regulatory year is 1 July through 30 June (e.g., RY13 = 1 July 2013 through 30 June 2014). Methods for estimating unreported harvest are described in Survey and Inventory reports.**

Period	Regulatory year	Reported		Estimated		Total harvest
		Male	Female	Unreported	Illegal	
Year 1	2004	86	0	0–5	5–10	91–101
Year 2	2005	123	0	0–5	5–10	128–138
Year 3	2006	141	1	0–5	5–10	147–157
Year 4	2007	151	0	0–5	5–10	156–166
Year 5	2008	189	0	0–5	5–10	194–204
Year 6	2009	180	0	0–5	5–10	185–195
Year 7	2010	184	0	0–5	5–10	189–199
Year 8	2011	212	0	0–5	5–10	217–227
Year 9	2012	193	0	0–5	5–10	198–208
Year 10	2013	147 <sup>a</sup>	0 <sup>a</sup>	0–5	5–10	152–162 <sup>a</sup>

<sup>a</sup> Preliminary data.

**Describe trend in harvest:** Harvest increased during RY04–RY13.

### 3) Predator data

**Date(s) and method of most recent spring abundance assessment for wolves:** May 2013 modeled estimate.

**Date(s) and method of most recent fall abundance assessment for wolves:** October 2013 – ADF&G Pred–Prey model which uses the relationship between spring wolf, moose and caribou population sizes to predict a likely growth rate for the wolf population from spring to fall. Mathematical equations which define model functions were taken from published predator–prey studies.

**Other research or evidence of trend or abundance status in wolves:** None.

**Table 5. Wolf abundance and removal in Wolf Control Area (WCA) since program implementation in year 1 to year 10. Removal objective is 60–80% of pre-control fall abundance in year 1 of wolf predation control program, so estimated or confirmed number remaining by 1 May each regulatory year in the WCA must be at least 88. Regulatory year is 1 July through 30 June (e.g., RY12 = 1 July 2012 through 30 June 2013).**

Period	Regulatory year	Fall abundance (range)	Harvest removal		Dept. control removal	Public control removal	Total removal	Spring abundance (range) <sup>a</sup>
			Trap	Hunt				
Year 1	2004	380 <sup>bc</sup> (350–410)	52	23	N/A	60	135	245 (215–275)
Year 2	2005	335 <sup>c</sup> (300–370)	58	10	N/A	17	85	250 (215–285)
Year 3	2006	362 <sup>c</sup> (300–425)	73	7	N/A	23	103	259 (197–322)

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Period	Regulatory year	Fall abundance (range)	Harvest removal		Dept. control removal	Public control removal	Total removal	Spring abundance (range) <sup>a</sup>
			Trap	Hunt				
Year 4	2007	382 <sup>c</sup> (366–398)	57	14	N/A	27	98	284 (268–300)
Year 5	2008	372 <sup>d</sup>	82	11	84	49	226	146
Year 6	2009	235 <sup>c</sup>	31	4	15	10	60	175
Year 7	2010	274 <sup>c</sup> (262–285)	26	11	0	25	62	212 (200–223)
Year 8	2011	329 <sup>c</sup> (315–342)	62	17	56	8	145	184 (170–197)
Year 9	2012	386 <sup>c</sup> (368–403)	41	12	40	78	171	215 (197–232)
Year 10	2013	356 <sup>c</sup> (338–373)	0 <sup>f</sup>	10 <sup>f</sup>	0 <sup>f</sup>	0 <sup>f</sup>	10 <sup>f</sup>	N/A

<sup>a</sup> Fall estimate minus all known wolf kills.

<sup>b</sup> Pre-control population estimate.

<sup>c</sup> Fall modeled estimate.

<sup>d</sup> Revised fall modeled estimate using results from a March 2009 reconnaissance survey and RY08 removal data. The original fall modeled estimate was 393–431.

<sup>e</sup> Revised fall modeled estimate using results from a March 2010 reconnaissance survey and RY09 removal data. The original fall modeled estimate was 262–299.

<sup>f</sup> Preliminary data.

#### 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.

**Table 6. Nutritional indicators for Fortymile Caribou Herd (FCH) in FCH\_hunt area since the herd was added to the control program in year 3 to year 9. A regulatory year is 1 July through 30 June (e.g., RY12 = 1 July 2012 through 30 June 2013).**

Period	Regulatory Year	Spring Birthrates (% of cows ≥36 months that gave birth)
Year 1	2004	--
Year 2	2005	--
Year 3	2006	89
Year 4	2007	90
Year 5	2008	70
Year 6	2009	70
Year 7	2010	86
Year 8	2011	82
Year 9	2012	88

**Table 7. Nutritional indicators for moose in Unit 20E West and 20E Central moose survey areas in southern Unit 20E since program implementation in year 1 to year 9. A regulatory year is 1 July through 30 June (e.g., RY12 = 1 July 2012 through 30 June 2013).**

<b>Period</b>	<b>Regulatory Year</b>	<b>Twinning Rates (% of cows observed with calf that had twins)</b>
Year 1	2004	24
Year 2	2005	47
Year 3	2006	27
Year 4	2007	17
Year 5	2008	41
Year 6	2009	22
Year 7	2010	21
Year 8	2011	35
Year 9	2012	32

**5) Costs specific to implementing Intensive Management**

**Table 8. 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 Upper Yukon/Tanana Predator Control Area during year 7 to year 9. 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).**

<b>Period</b>	<b>FY</b>	<b>Predation control<sup>a</sup></b>		<b>Other IM activities</b>		<b>Total IM cost</b>	<b>Research cost<sup>d</sup></b>
		<b>Time<sup>b</sup></b>	<b>Cost<sup>c</sup></b>	<b>Time</b>	<b>Cost</b>		
Year 7	2011	0.4	3.5	12.7	166.4	169.9	67.1
Year 8	2012	3.9	242.5	12.0	154.0	396.5	80.3
Year 9	2013	2.3	136.1	11.8	150.0	286.1	12.0

<sup>a</sup>State or private funds only.

<sup>b</sup>Person-months (22 days per month)

<sup>c</sup>Salary plus operations

<sup>d</sup>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 2014) for program renewal following Year 9 and Department recommendations for UYTSCP.**

Has progress toward defined criteria been achieved? Yes

Has achievement of success criteria occurred? The lower end of the FCH population and harvest objectives have been met. The moose population and harvest objectives have not been met.

Recommendation for IM program: Continue predator control to benefit FCH and remove moose from the program.

Rationale for recommendation on overall program: The program was first authorized by the Board of Game in 2004 to benefit moose in southern Unit 20E. Wolf and bear control began in 2005. The wolf control portion of the program was expanded to include the FCH in 2006. The bear control portion of the program was deleted in 2009 because it was determined to be ineffective at removing bears from the control area due to ineffective control methods. Moose will not be included in the reauthorization because no focused predation control efforts specifically intended to benefit moose have been conducted or are planned. However, moose will likely continue to benefit to some degree from wolf control conducted to increase the FCH.

The estimated population of the FCH in June 2010 was 51,675 and the annual FCH harvest during regulatory years 2009–2010 to 2012–2013 was 750–1,296. Public wolf control has been conducted in the majority of the FCH range since 2006, and department wolf control, focused on the FCH calving area, was conducted during the winters of 2008–2009, 2009–2010, 2011–2012 and 2012–2013. The FCH population and harvest are within the lower end of the range of IM objectives; however, continued recovery of the FCH to a higher population and harvest within the range of the IM objectives is needed to provide for high levels of human consumptive use of the herd.

Other recommendations: Public aerial shooting permits for removal of wolves should continue to be available to interested parties as authorized in 5 AAC 92.110. Aerial removal of wolves by Department staff using helicopters should continue to be used to assist public permittees meet removal objectives in areas where they are unable to successfully remove wolves.