



Livestock Protection Program

Status Report March 24, 2017

Prepared by: BCCA Program Delivery Inc.
Prepared for: LPP Oversight Committee

Funded in part by GOVERNMENT TRANSFER No. TAGR16003

MESSAGE FROM THE MANAGER (K Boon)

The program is operating as expected with keen interest and appreciation by producers and I am pleased with the work of the Program Coordinator and Wildlife Specialists in meeting the needs of livestock producers who are encountering losses to wild predators. The program has been even more successful than anticipated and the funding projected for this work was proven to be insufficient to meet the demands.

The co-ordinator reports good relations with CO's and the trappers and the work of the program is welcomed by producers.

As of March 24, 2017, the LPP has dealt with 495 calls, 416 files OPENED, received 399 verification reports and removed 167 wolves and 45 coyotes in closed files (additional taken in open files for total removal of 218 wolves and 73 coyotes). The Program Co-ordinator has processed documentation for compensation for cattle losses on 224 wolf, 26 coyote, 33 bear and 12 bird kills.

With the delay in the permit for the Peace (Region 7b), limited activity was carried out and we do anticipate an increase in workload in that region going forward.

The significant amount of activity that has been completed during this year-to-date has put a financial strain on BCCA Program Delivery Inc. The amount of work was unanticipated, and we have currently exceeded the budget, covering the shortfall in funding with a reduction in administration fees for this year alone. Discussion with the funder about reallocating next year funding is a priority.

ACTIVITIES

The following program activities were completed for the period of January 1 through March 24, 2017

Operations Activities:

- Served as the point of contact for program services (calls/emails)
- Coordinate/dispatch response for verification/mitigation purposes
- Contracted with Wildlife Specialists (total 46).
- Updated the status of active files and incident reports
- Distributed information about the program and best management practices
- Liaised with agency staff (COS, AGRI) on program delivery, verifications and compensation
- Replied to a request from FLNRO for program activity in the TNG territory.

Administration Activities:

- Compiled program data – summarized for distribution
- Updated the program website (www.cattlemen.bc.ca/LPP.htm)
- Provided an initial point of contact for questions / complaints about program
- Coordinated teleconference/meetings of the LPP Producer Advisory Committee
- Distributed 185 surveys to program participants and tabulated results.
- Completed all accounting and reporting functions.

WILDLIFE SPECIALISTS

BCCA Program Delivery Inc. has 46 wildlife specialists under contract to work in all regions of the province. Every Wildlife Specialist working under contract with the Livestock Protection Program has both a trapper's license and a hunter's license (or are exempt from the requirement). We are confident that they have the safety training and skills necessary to carry out mitigation tasks. The co-ordinator provides orientation training for the new Wildlife Specialists as required.

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As of March 24:

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- 165 files were recommended for mitigation
- 70 files were reporting harassment only

VERIFICATION & MITIGATION SUMMARY

Activities from January 1, 2016 through March 24, 2017:

LIVESTOCK PROTECTION PROGRAM			PROVINCIAL TOTALS	
Data summary as of		24-Mar-17	# files per Zone	
Total # calls to the Hotline		495	1 Peace	60
Information and inquiries		79	2 Central	106
Total # Files actioned by LPP		416	3 Skeena	24
Total # Files referred to COS (CLOSED)		55	4 Cariboo	126
Total # Files CLOSED		251	5 Thompson	52
Total # files active in LPP (# LESS CLOSED)		165	6 Okanagan	19
			7 Kootenay	27
Total # livestock impacted (killed/injured/harassed)			8 Coast/Island(Abbotsford west)	2
# head beef calves	273		TOTAL FILES ACTIONED	416
# head beef yearlings	21			
# head beef cows	49			
# head beef bulls	3			
# head sheep - ewes	19			
# head sheep - lambs	30			
other (goats)	2			
# head dairy cattle	2			
total # head	399			
Total # verifications completed				
	cattle	sheep		
conclusive - wolf	224	4		
conclusive - coyote	26	37		
conclusive - bear	33	1		
conclusive - cougar	0	9		
conclusive - bird	12	0		
conclusive - dogs	0	0		
negative - scavenged	16			
inconclusive	29			
total # verifications	391			
Harrassment - # files	70			
Mitigation				
Total # files requiring mitigation	165			
Total # wild animals mitigated-closed files			Total mitigation open & closed files	
# wolves - male	81		wolves:	
# wolves - female	86	167	218	
# coyotes male	25		coyotes:	
# coyotes female	20	45	73	
Total # wild animals mitigated	212			
# non-target species (released or dispatched)	25			

INCIDENTAL CATCH

All from January 1 to March 24, 2017

LIVESTOCK PROTECTION PROGRAM - REPORT OF INCIDENTAL CATCHES - TO March 17, 2017								
FILE #	DATE	REGION	SPECIES	MITIGATION	DETAILS	Released/dispatched	COS Notified	LAND TYPE
160001	January 19, 2016	Skeena	Coyote	Snare	Coyote was caught in a snare. COS notified.	dispatched	Yes	Private
160009	February 2016	Cariboo	Coyote	Snare	Coyote found dead in a snare. COS notified.	dispatched	Yes	Private
160010								
160066	June 7, 2016	Kootenay	Grizzly	Trap (wolf set)	Grizzly found in trap. RAPP line called and COS contacted. COS responded. Grizzly was tranquilized, released unharmed and fitted with a GPS collar. COS relocated the bear to the Grizzly study areas in SE BC.	released	Yes	Crown
160073	June 8, 2016	Kootenay	Grizzly	Trap (wolf set)	Grizzly was caught in wolf set approximately 10 miles from the previous incident. WS contacted local COS and reported to the RAPP line. COS responded. Bear was tranquilized and released unharmed.	released	Yes	Private
160073	June 16, 2016	Kootenay	Badger	Trap (wolf set)	Badger was caught in a trap. WS used a pole to release the badger from the trap unharmed. As per direction, COS were not contacted.	released	Not Necessary - animal was released	Private
160065	July-15-16	Omineca	Dog	Trap (coyote)	Dog caught several times harassing livestock, owners were warned that traps were set, dog was released with a slight limp	released	Yes	Private
160102	July-21-16	Thompson	Bear cub	Trap (wolf set)	contacted CO's and they came and helped Bruce release it unharmed	released	Yes	Crown
160194	July-21-16	Thompson	Bear cub	Trap (wolf set)	called local CO who helped him release it unharmed	released	Yes	Private
160216	August-02-16	Thompson	Coyote	Trap (wolf set)	Rancher found coyote had a damaged leg and he dispatched it for humane reasons	dispatched	Yes	Crown
160233	August-15-16	Thompson	Large bear	Trap (wolf set)	Owner found a large bear in wolf set, she said bear was very unhappy and RAPP line was called - CO's tranquilized bear and released cub unharmed with help from the CO - traps pulled as too much activity in the area.	released	Yes	Crown
160261	September-08-16	Kootenay	Bear cub	Trap (wolf set)	Rancher called to report cougar in the trap, called the RAPP line, CO came and released cougar.	released	Yes	Crown
160279	September-27-16	Thompson	Cougar	Trap (wolf set)	called local CO who helped him release it unharmed	released	Yes	Private
160168	July-02-16	Central	Bear yearling	Trap (wolf set)	released by WS	released	Yes	Private
160226	December 28, 2016	Cariboo	Fox	Trap (wolf set)	released by WS	released	No	
160234	Oct 11, 2016	Cariboo	Coyote	Trap (wolf set)	released by WS	released	No	
160251	October-10-16	Okanagan	Coyote	Trap (wolf set)	released by WS	released	No	
160251	October-10-16	Okanagan	Coyote	Trap (wolf set)	released by WS	released	No	
160251	October-10-16	Okanagan	Coyote	Trap (wolf set)	dispatched by ranch	dispatched	No	
160251	October-10-16	Okanagan	Coyote	Trap (wolf set)	dispatched by ranch	dispatched	No	
160284	December-28-16	Craiboo	Fox	Trap (wolf set)	dispatched by WS	dispatched	No	
160286	October-11-16	Craiboo	Raven	Trap (wolf set)	killed by trap	dispatched	No	
160286	October-11-16	Craiboo	Coyote	Trap (wolf set)	killed by trap	dispatched	No	
160354	October 16-16	Thompson	Cougar	Trap (wolf set)	contacted CO who assisted in release	release	Yes	Crown
17031	March-02-17	Okanagan	bobcat	coyote trap	killed by trap	dispatched	no	private
17027	march 14-17	Central	eagle	Trap (wolf set)	contacted co turned over eagle which had a too tight band- Washington DC & numbers	dead in trap	yes	private

OBSERVATIONS

Predator Behaviour/Activity:

- Program has taken a lot of wolves north of Williams Lake on both sides of the Fraser River.
- Still seeking solutions to wolf problems in the Poplar Lake area south of Houston.

Best Management Practices:

- Program Co-ordinator was pleased to report that overwhelmingly, producers are taking multiple steps in following best management practices to avoid wild predator problems. Only **four producers** were asked make improvements and all complied.
- Best Management Practices information is e-mailed to all program participants when they seek program assistance.

Operations:

- The current compensation for cattle is very effective when a carcass is available for verification. Unfortunately, oftentimes there is nothing left, or perhaps just a few bones. We would encourage Business Risk Management to consider the model used in Alberta where following a verification of one carcass, subsequent losses qualify for 50% compensation with no verification required.
- As steps are being taken to include sheep in the BRM compensation program, several options are being considered as we seek to have an effective compensation program with reasonable administration.
- Lack of work done in the Peace Region due to the time it took to have the permit approved – expect this to change now, hoping that it's not too late to be effective.
- There has been a good working relationship with the COS.

Challenges:

- Cross Reporting RAPP line / LPP Hotline:
Issues in this area have been resolved.
- Complete & Accurate Verification Reports:
Verification reports were lacking quality photos and complete information resulting in additional time spent reviewing these reports with the COS. Verification Refresher Tips article was featured in the July issue and improvements have been realized.
- 500-meter Mitigation Area Restriction:
The 500-meter limitation continues to be a challenge for Wildlife Specialists but the COS have provided approvals for our requests to extend the working area.
- Trapper Contact Information
We have now been provided with a list of trapper contract information that will improve our ability to contact trappers (especially when phone numbers are available).

Future:

- Advisory committee to establish benchmarks for program for use in assessing program effectiveness.
- Continued work on sheep compensation processes.
- Seek funding required to continue the program.

RECOMMENDATIONS

- Additional funding support is required to continue this program at its current level that has proven so successful. The current approved funds should provide for the program expenses until cattle come off range this fall.

CONTACTS

Kevin Boon, BCCA General Manager Ph: 250-573-3611 Cell: 250-320-3611 Email: bccattle@cattlemen.bc.ca

Mark Grafton, LPP Program Coordinator (Operations) Cell: 250-613-9828 Email: LPP@cattlemen.bc.ca

APPENDIX – A: Data Summary by Zones

LPP DATA BREAKDOWN TO ZONES	PEACE - ZONE 1	CENTRAL - ZONE 2	SKEENA - ZONE 3	CARIBOO - ZONE 4	THOMPSON ZONE 5	OKANAGAN ZONE 8	KOOTENAY ZONE 7	COAST/ISLAND ZONE 8
24-Mar-17	Count as of 24-Mar-17	Count as of 24-Mar-17	Count as of 24-Mar-17	Count as of 24-Mar-17	Count as of 24-Mar-17	Count as of 24-Mar-17	Count as of 24-Mar-17	Count as of 24-Mar-17
Total # calls to the Hotline	60	106	24	126	52	19	27	2
Total # Files actioned by LPP	15	11	0	16	4	1	8	0
Total # Files to COS(CLOSED)	39	63	9	77	37	6	20	0
Total # Files active in LPP	21	43	15	49	15	13	7	2
Total # livestock impacted (killed/injured/harassed)								
# head beef calves	40	66	16	88	34	14	15	0
# head beef yearlings	6	8	0	6	0	0	1	0
# head beef cows	5	7	6	16	5	2	8	0
# head beef bulls	0	0	0	3	0	0	0	0
# head sheep - ewes	0	8	0	4	3	1	2	1
# head sheep - lambs	6	12	1	4	4	1	1	1
# head dairy cattle								
total # head	57	101	23	121	46	18	27	2
Total # verifications completed								
conclusive - wolf	21	56	1	83	25	5	13	0
conclusive - coyote	5	7	0	2	5	7	2	1
conclusive - bear	8	6	1	12	3	0	3	0
conclusive - cougar	0	0	0	5	0	0	0	0
conclusive - bird	5	3	0	4	0	0	0	0
conclusive - dogs	0	0	0	0	0	0	0	0
negative - scavenged	3	6	0	7	0	0	0	0
inconclusive	10	0	0	5	5	1	7	0
total # verifications	59	97	23	121	43	16	26	2
Harrassment - # files	4	22	4	22	11	1	5	0
Mitigation								
Total # files requiring mitigation	16	42	11	59	14	6	15	2
Total # wild animals mitigated								
# wolves - male	2	26	9	35	6	0	3	0
# wolves - female	0	31	10	32	8	2	3	0
# coyotes male	4	10	0	3	4	4	0	0
# coyotes female	6	10	0	1	1	2	0	0
Total # wild animals mitigated	12	77	19	71	19	8	6	0
# non-target species (released or dispatched)	0	5	1	12	0	2	5	0

APPENDIX – B: REQUESTS TO COS FOR EXTENSION

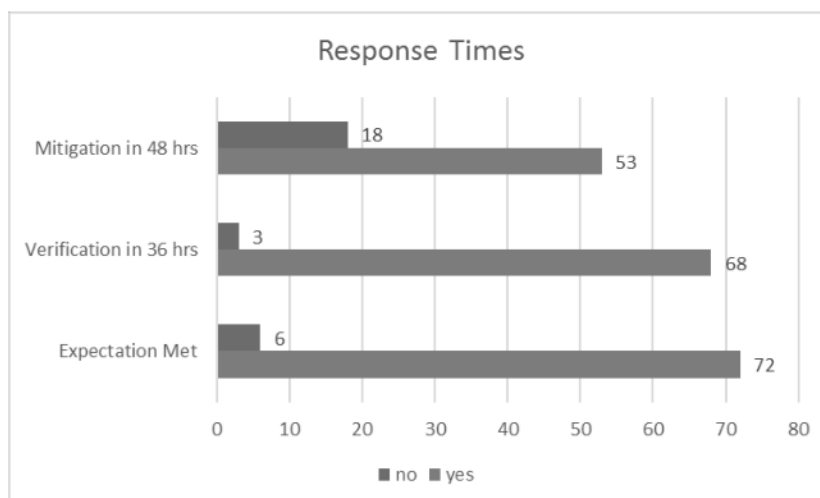
REQUESTS TO COS FOR EXTENSION				
File	Date	Request	Reason for Request	Decision by COS
160001	April 15 2016	Time beyond 60 days	WS requesting an additional 30 days to allow the removal of remaining 3 or 4 wolves in the pack. Additional time would allow for 2 more cycles of the wolves.	Approved with conditions. WS can continue to trap until May 19th using only foothold traps, no snares. WS is directed to work on private land for now. If the WS needs to go onto Crown land, additional notification to LPP Coordinator/COS is necessary and additional requirements are to be followed.
160071	June 13 2016	Distance beyond 500m	WS is requesting additional distance because he is concerned about setting traps in a populated area. Requested to set traps 2.5 km away on an area of fenced private land (with no public access).	Approved.
160090	Aug 10 2016	Increase from 500 m to 1,200 m	one wolf left, keeping his distance more needed more room	approved 2,000 meters
160265	Aug 29 2016	Increase beyond 500 m	cattle were on the move after wolves devoured a 400# calf over night - wolves were following the cattle through the next pasture	approved 2,000 meters
160255	Aug 31 2016	Increase beyond 500 m to 1,500 m	WS found a den area and wanted to set up on the trails coming out of the den area	approved 2,000 meters
160168 160172	Sept 1 s016	increase behond 500 m to 5,000 m	wolves shoed up a natural hay meadow on private ground	extension wasn't necessary as we are permitted to trap on private land as there is no closed season or bag limit for wolves in this MU.
160256	Oct 17 2016	time extenstion to 60 days	cows have been concentrated the area making it difficult for trapping they recently moved off range into private land close to where he was trapping	extension of time valid until November 15.
160338	Nov 1 2016	increase beyond 500 to 1,000 m	pulled traps due to concerns over too much recreation use around the attack site. Attack site was close to South Star Rec. area extension to get distance between the sets and the recreation users.	extension to 1,000 m granted
160222	Oct 15 2016	extension for 30 days	extension request to get the last wolf for full pack removal	extension granted to November 15, 2016
160338	Dec 28 2016	request 3 months time	extension request to get the full pack removal (5 more)	extension granted, with requirement to report February 1 on how the file is going.
17011	Feb 2 2017	extenstion distance	large distance of wolves.	

APPENDIX – C: SATISFACTION SURVEY RESULTS

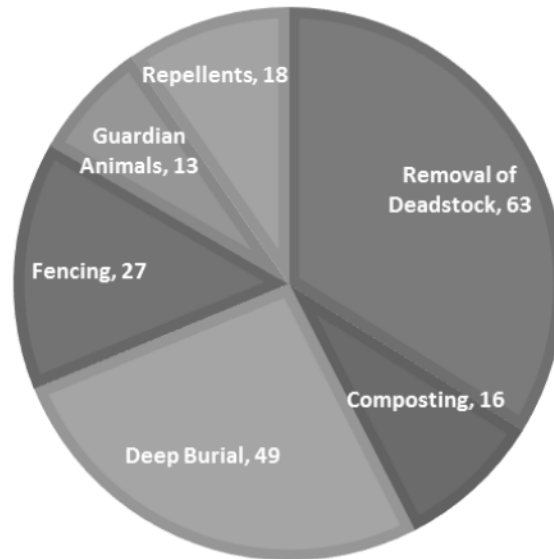
At the end of December 2016 the Livestock Protection Program mailed a survey to 176 program participants asking for assistance to “ascertain the importance of the Livestock Protection Program to producers. We received a 46% response rate to the survey with 81 producers taking the time to respond. The surveys indicated an overwhelming satisfaction with the program services, with only 13 responders marking ‘poor’ service in any of the categories.

The 36 hours for verification service was met in 96% of the replies, and mitigation service within 48 hours reported in 75% of the replies – the program is close to meeting these time frames in the vast majority of cases.

Of the 44 respondents receiving mitigation service, the wildlife specialists were successful in removing problem predators in 33 of the cases (75%).



BMP'S IN PRACTICE

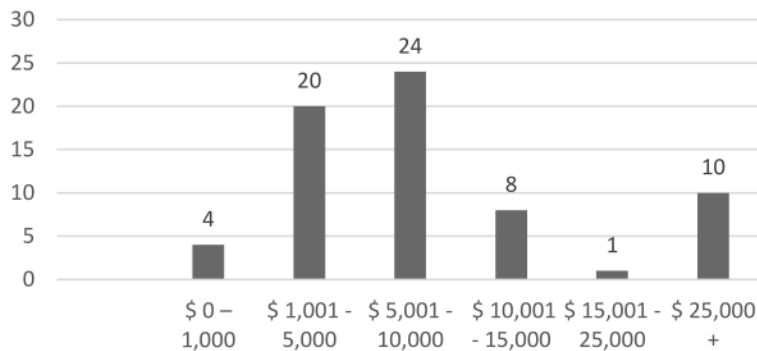


Best management practices appear to be almost standard on the vast majority of operations requesting service.

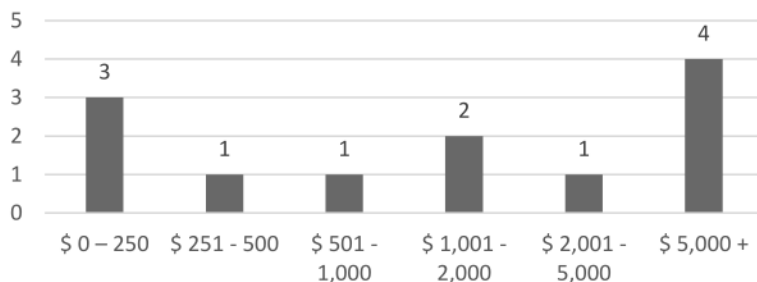
The Co-ordinator reports only four operations with poor practices, which were remedied prior to receiving assistance from the program.

Most respondents reported two or three of the best management practices in place on their operations.

Cattle Operations Estimate Losses Saved
reporting x least amt in category = total \$485,053



Sheep Operations Estimate Losses Saved
reporting x least amt in category = total \$24,755



In the replies to the question about potential losses saved by program service, cattle producers estimated savings of more than \$485,000 and the sheep producers more than \$24,000.

APPENDIX – D: COST BENEFIT

Livestock Protection Program - Report #5 - Jan 1, 2016 to March 24, 2017									
CASH COST BENEFIT ANALYSIS									
<p>The total cash contributions to this program to date is \$445,500 - survey replies from 46% of participants reported loss prevention as a result of service from this program was more than \$500,000.</p> <p>Other benefits to the program are significant, however a cash value has not been estimated in this report.</p>									
Cash Contributions				Benefits				Benefit Value	
\$ 68,000	BCCA Program Delivery Inc.			Benefits to Livestock Producers				\$500,000 +	
				- information about best management practices to prevent predator attacks					
				- removal of predators to result in protection of animals following proven predator attacks					
				- successful removal of predators results in less loss of animals, increased profit in operation					
\$ 377,500	Ministry of Agriculture			Benefits to Ministry of Agriculture					
				- verification forms completed and processed for compensation program					
				- significant potential loss in the livestock industry alleviated for improved agriculture production					
				Benefits to Ministry of Environment (COS)					
				- conservation officers relieved of wolf/coyote mitigation service					
				- problem wolf/coyote population being controlled					
				- program provides verification service on non wolf/coyote attacks (when results indicate non wolf/coyote)					
				Benefits to Ministry of Forests, Lands and Natural Resource Operations					
				- program aligns with the Management Plan for the Grey Wolf in B.C.					



Livestock Protection Program

Report #5 (March 24, 2017)

Prepared by: BCCA Program Delivery Inc.

Prepared for: LPP Oversight Committee

Funded in part by GOVERNMENT TRANSFER No. TAGR16003

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160009	February 2016	Cariboo	Coyote	Jim Hunter	Snare	Coyote found dead in a snare. COS notified.	dispatched	Yes	Private
160010									
160066	June 7, 2016	Kootenay	Grizzly	Bob Faiers	Trap (wolf set)	Grizzly found in trap. RAPP line called and COS (MWest) contacted. COS responded. Grizzly was tranquilized, released unharmed and fitted with a GPS collar. COS relocated the bear to the Grizzly study areas in SE BC.	released	Yes	Crown
160073	June 8, 2016	Kootenay	Grizzly	Bob Faiers	Trap (wolf set)	Grizzly was caught in wolf set approximately 10 miles from the previous incident. WS contacted local COS and reported to the RAPP line. COS responded. Bear was tranquilized and released unharmed.	released	Yes	Private
160073	June 16, 2016	Kootenay	Badger	Bob Faiers	Trap (wolf set)	Badger was caught in a trap. WS used a pole to release the badger from the trap unharmed. As per direction, COS were not contacted.	released	Not Necessary - animal was released	Private
160065	July-15-16	Omineca	Dog	Steve Hamilton	Trap (coyote)	Dog caught several times harassing livestock, owners were warned that traps were set, dog was released with a slight limp	released	Yes	Private
160102	July-21-16	Thompson	Bear cub	Bruce Ambler	Trap (wolf set)	Bruce contacted CP's and they came and helped Bruce release it unharmed	released	Yes	Crown
160194	July-21-16	Thompson	Bear cub	Gordie Roy	Trap (wolf set)	Gordie called local CO who helped him release it unharmed	released	Yes	Private
160216	August-02-16	Thompson	Coyote	Cuyler Huffman	Trap (wolf set)	Rancher Corey Nottingham found coyote had a damaged leg and he dispatched it for humane reasons	dispatched	Yes	Crown
160233	August-15-16	Thompson	Large bear	Bruce Ambler	Trap (wolf set)	Owner Ruth Robinson found a large bear in wolf set, she said bear was very unhappy and RAPP line was called - CO's tranquilized	released	Yes	Crown
160261	September-08-16	Kootenay	Bear cub	Bob Faiers	Trap (wolf set)	Faiers released cub unharmed with help from the CO - traps pulled as too much activity in the area.	released	Yes	Crown
160279	September-27-16	Thompson	Cougar	Ryan Fadear	Trap (wolf set)	Rancher Chuck Karr called Grafton to report cougar in the trap, Chuck called the RAPP line, CO came and released cougar.	released	Yes	Crown
160168	July-02-16	Central	Bear yearling	Gordie Roy	Trap (wolf set)	Gordie called local CO who helped him release it unharmed	released	Yes	Private
160226	December 28, 2016	Cariboo	Fox	Doug McMann	Trap (wolf set)	released by WS	released	No	
160234	Oct 1 st , 2016	Cariboo	Coyote	Bruce Ambler	Trap (wolf set)	released by WS	released	No	
160251	October-10-16	Okanagan	Coyote	Brent Smith	Trap (wolf set)	released by WS	released	No	
160251	October-10-16	Okanagan	Coyote	Brent Smith	Trap (wolf set)	released by WS	released	No	
160251	October-10-16	Okanagan	Coyote	Brent Smith	Trap (wolf set)	dispatched by ranch	dispatched	No	
160251	October-10-16	Okanagan	Coyote	Brent Smith	Trap (wolf set)	dispatched by ranch	dispatched	No	
160284	December-28-16	Craiboo	Fox	Doug McMann	Trap (wolf set)	dispatched by WS	dispatched	No	
160286	October-11-16	Craiboo	Raven	Bruce Ambler	Trap (wolf set)	killed by trap	dispatched	No	
160286	October-11-16	Craiboo	Coyote	Bruce Ambler	Trap (wolf set)	killed by trap	dispatched	No	
160354	October 16-16	Thompson	Cougar	Dustin Rainer	Trap (wolf set)	contacted CO who assisted in release	release	Yes	Crown
17031	March-02-17	Okanagan	bobcat	Brian Hancock	coyote trap	killed by trap	dispatched	no	private
17027	march 14-17	Central	eagle	Cam Hill	Trap (wolf set)	contacted co turned over eagle which had a too tight band- Washington DC & numbers	dead in trap	yes	private

FINANCIAL REPORT

Livestock Protection Program - Report #5 - Jan 1, 2016 to March 24, 2017													
	Last Fiscal Year		Report to June 30		Report to Sept 30		Report to Dec 31		PRELIM LAST QTR - EXP TO March 24		TOTAL THIS FISCAL	BUDGET	
	Prior Fiscal Year		Current Fiscal										Apr 16-Mar 17
	Jan - March 2016		April - June 30, 2016		July - Sept 30, 2016		Oct - Dec 2016		Jan- Mar 2017				
Funding Received													
Ministry of Agriculture	62,500				62,500		125,000		127,500		315,000	250,000	
BCCA Programs	12,500		50,000						5,500		55,500	50,000	
total funds		75,000		50,000		62,500		125,000		133,000	370,500	300,000	
Expenses													
Management	15,336		10,972		18,512		11,885		9,581		50,950	50,000	
Mgr Travel/Office /Print/Ph	11,974		6,250		3,809		2,523		3,718		16,300	10,000	
Verification Payments	8,700		9,650		16,305		6,850		5,715		38,520		
Mitigation payments	10,075		27,745		73,992		89,882		65,531		257,150	220,000	
Training Session(s)			22,794		325		-		-		23,119		
Direct office support													
Administration exp	3,218		5,000		5,000		-				10,000	20,000	
total expense		49,303		82,412		117,943		111,139		84,545	396,039	300,000	
balance funds		25,697		- 32,412		- 55,443		13,861		48,455	- 25,539	-	
correction to prior yrs & 1st Q since last report (+ and -269.00)													
24-Mar-17 funds \$ 157.85 (= general ledger balance)													

A complete accounting summary (general ledger) is available on request.

Total program expenses to March 24, 2017 (almost 5 quarters), the planned spending has been exceeded.

In addition to the planned contributions (\$62,500 for program to date), BCCA Program Delivery Inc has assisted in meeting the expenses to a total of \$37,500:

- contributed a further \$5,500 in cash to assist in meeting the expenses
- reduced the budgeted administration fee by \$10,000
- contributed administrative services that were not budgeted, but realized as the program moved forward, estimated value to this contribution is at least \$22,000

It is noted that the Ministry of Agriculture increased the government transfer amount by \$2,500.

At the onset of the program, it was difficult to estimate the funding requirements for the program. We estimated that the program would require in the neighborhood of \$300,000 per year to operate. When we include the period between January 1 and March 31, 2016 where we started the program early, we have almost 15 months completed. We now have a clearer understanding of what the actual costs of the program are and we have exceeded the anticipated costs by over \$96,000 per year.

There are a couple of observations that do alter it some from a straight 12 months of operating with a fully functioning program.

1. Training Sessions for WS are a one-time expense and will not be an annual expenditure;
2. 1st six months were start up thus took time to establish with producers what and how the program would operate;
3. Permits were not in place for nearly six months for Crown lands and not in the Peace district until after cattle came off Range.

Additional funding support is required to continue this program at its current level that has proven so successful. The current approved funds should provide for the program expenses until cattle come off range this fall.

OBSERVATIONS

Predator Behaviour/Activity:

- Program has taken a lot of wolves north of Williams Lake on both sides of the Fraser River.
- Still seeking solutions to wolf problems in the Poplar Lake area south of Houston.

Best Management Practices:

- Program Co-ordinator was pleased to report that overwhelmingly, producers are taking multiple steps in following best management practices to avoid wild predator problems. Only **four producers** were asked make improvements and all complied.
- Best Management Practices information is e-mailed to all program participants when they seek program assistance.

Operations:

- The current compensation for cattle is very effective when a carcass is available for verification. Unfortunately, oftentimes there is nothing left, or perhaps just a few bones. We would encourage Business Risk Management to consider the model used in Alberta where following a verification of one carcass, subsequent losses qualify for 50% compensation with no verification required.
- As steps are being taken to include sheep in the BRM compensation program, several options are being considered as we seek to have an effective compensation program with reasonable administration.
- Lack of work done in the Peace Region due to the time it took to have the permit approved – expect this to change now, hoping that it's not too late to be effective.
- There has been a good working relationship with the COS.

Challenges:

- Cross Reporting RAPP line / LPP Hotline:
Issues in this area have been resolved.
- Complete & Accurate Verification Reports:
Verification reports were lacking quality photos and complete information resulting in additional time spent reviewing these reports with the COS. Verification Refresher Tips article was featured in the July issue and improvements have been realized.
- 500-meter Mitigation Area Restriction:
The 500-meter limitation continues to be a challenge for Wildlife Specialists but the COS have provided approvals for our requests to extend the working area.
- Trapper Contact Information
We have now been provided with a list of trapper contract information that will improve our ability to contact trappers (especially when phone numbers are available).

Future:

- Advisory committee to establish benchmarks for program for use in assessing program effectiveness.
- Continued work on sheep compensation processes.
- Seek funding required to continue the program.

RECOMMENDATIONS

- Additional funding support is required to continue this program at its current level that has proven so successful. The current approved funds should provide for the program expenses until cattle come off range this fall.

CONTACTS

Kevin Boon, BCCA General Manager Ph: 250-573-3611 Cell: 250-320-3611 Email: bccattle@cattlemen.bc.ca

Mark Grafton, LPP Program Coordinator (Operations) Cell: 250-613-9828 Email: LPP@cattlemen.bc.ca

APPENDIX – A: Data Summary by Zones

LPP DATA BREAKDOWN TO ZONES	PEACE - ZONE 1	CENTRAL - ZONE 2	SKEENA - ZONE 3	CARIBOO - ZONE 4	THOMPSON ZONE 5	OKANAGAN ZONE 8	KOOTENAY ZONE 7	COAST/ISLAND ZONE 8
24-Mar-17	Count as of 24-Mar-17	Count as of 24-Mar-17	Count as of 24-Mar-17	Count as of 24-Mar-17	Count as of 24-Mar-17	Count as of 24-Mar-17	Count as of 24-Mar-17	Count as of 24-Mar-17
Total # calls to the Hotline	60	106	0	126	52	19	27	2
Total # Files actioned by LPP	15	11	0	16	4	1	8	0
Total # Files to COS(CLOSED)	39	63	9	77	37	6	20	0
Total # Files active in LPP	21	43	15	49	15	13	7	2
Total # livestock impacted (killed/injured/harassed)								
# head beef calves	40	66	16	88	34	14	15	0
# head beef yearlings	6	8	0	6	0	0	1	0
# head beef cows	5	7	6	16	5	2	8	0
# head beef bulls	0	0	0	3	0	0	0	0
# head sheep - ewes	0	8	0	4	3	1	2	1
# head sheep - lambs	6	12	1	4	4	1	1	1
# head dairy cattle								
total # head	57	101	23	121	46	18	27	2
Total # verifications completed								
conclusive - wolf	21	56	1	83	25	5	13	0
conclusive - coyote	5	7	0	2	5	7	1	0
conclusive - bear	8	6	1	12	3	0	3	0
conclusive - cougar	0	0	0	0	0	0	0	0
conclusive - bird	5	3	0	4	0	0	0	0
conclusive - dogs	0	0	0	0	0	0	0	0
negative - scavenged	3	6	0	7	0	0	0	0
inconclusive	10	0	0	5	5	1	7	0
total # verifications	59	97	23	121	43	16	26	2
Harrassment - # files	4	22	4	22	11	1	5	0
Mitigation								
Total # files requiring mitigation	16	42	11	59	14	6	15	2
Total # wild animals mitigated								
# wolves - male	2	26	9	35	6	0	3	0
# wolves - female	0	31	10	32	8	2	3	0
# coyotes male	4	10	0	3	4	4	0	0
# coyotes female	6	10	0	1	1	2	0	0
Total # wild animals mitigated	12	77	19	71	19	8	6	0
# non-target species (released or dispatched)	0	5	1	12	0	2	5	0

APPENDIX – B: REQUESTS TO COS FOR EXTENSION

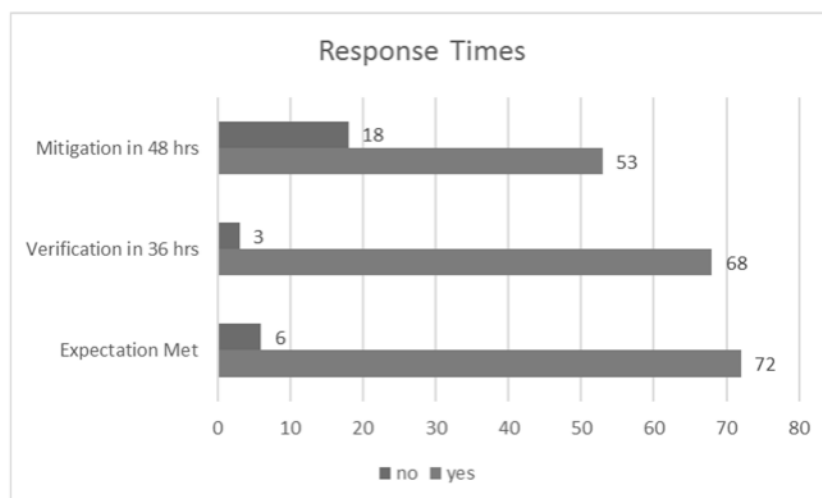
REQUESTS TO COS FOR EXTENSION					
File	Date	Wildlife Spec Request	Reason for Request	Decision by COS	
160001	April 15 2016	Richard Lokken	Time beyond 60 days	WS requesting an additional 30 days to allow the removal of remaining 3 or 4 wolves in the pack. Additional time would allow for 2 more cycles of the wolves.	Approved with conditions. WS can continue to trap until May 19th using only foothold traps, no snares. WS is directed to work on private land for now. If the WS needs to go onto Crown land, additional notification to LPP Coordinator/COS is necessary and additional requirements are to be followed.
160071	June 13 2016	Bob Faiers	Distance beyond 500m	WS is requesting additional distance because he is concerned about setting traps in a populated area. Requested to set traps 2.5 km away on an area of fenced private land (with no public access).	Approved.
160090	Aug 10 2016	Tom Sword	Increase from 500 m to 1,200 m	one wolf left, keeping his distance more needed more room	approved 2,000 meters
160265	Aug 29 2016	Ed Roberson	Increase beyond 500 m	cattle were on the move after wolves devoured a 400# calf over night - wolves were following the cattle through the next pasture	approved 2,000 meters
160255	Aug 31 2016	Ryan Fadear	Increase beyond 500 m to 1,500 m	WS found a den area and wanted to set up on the trails coming out of the den area	approved 2,000 meters
160168 160172	Sept 1 s016	Gordie Roy	increase behind 500 m to 5,000 m	wolves shoed up a natural hay meadow on private ground	extension wasn't necessary as we are permitted to trap on private land as there is no closed season or bag limit for wolves in this MU.
160256	Oct 17 2016	Kan Halvarson	time extension to 60 days	cows have been concentrated the area making it difficult for trapping they recently moved off range into private land close to where he was trapping	extension of time valid until November 15.
160338	Nov 1 2016	Bob Faiers	increase beyond 500 to 1,000 m	pulled traps due to concerns over too much recreation use around the attack site. Attack site was close to South Star Rec. area extension to get distance between the sets and the recreation users.	extension to 1,000 m granted
160222	Oct 15 2016	Ryan Fadear	extension for 30 days	extension request to get the last wolf for full pack removal	extension granted to November 15, 2016
160338	Dec 28 2016	Bob Faiers	request 3 months time	extension request to get the full pack removal (5 more)	extension granted, with requirement to report February 1 on how the file is going.
17011	Feb 2 2017	Bruce Ambler	extension distance	large distance of wolves.	

APPENDIX – C: SATISFACTION SURVEY RESULTS

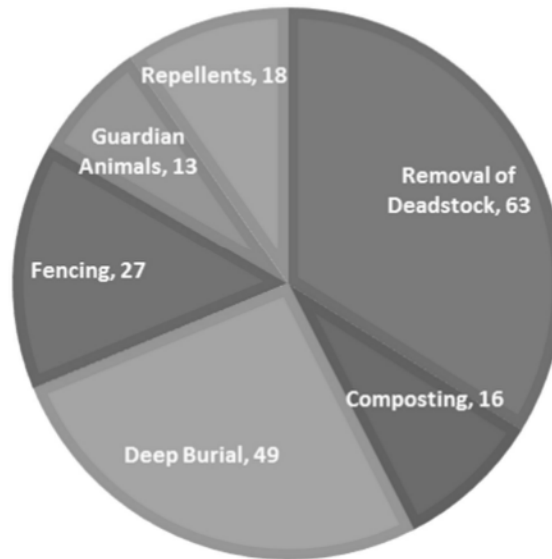
At the end of December 2016 the Livestock Protection Program mailed a survey to 176 program participants asking for assistance to “ascertain the importance of the Livestock Protection Program to producers. We received a 46% response rate to the survey with 81 producers taking the time to respond. The surveys indicated an overwhelming satisfaction with the program services, with only 13 responders marking ‘poor’ service in any of the categories.

The 36 hours for verification service was met in 96% of the replies, and mitigation service within 48 hours reported in 75% of the replies – the program is close to meeting these time frames in the vast majority of cases.

Of the 44 respondents receiving mitigation service, the wildlife specialists were successful in removing problem predators in 33 of the cases (75%).



BMP'S IN PRACTICE

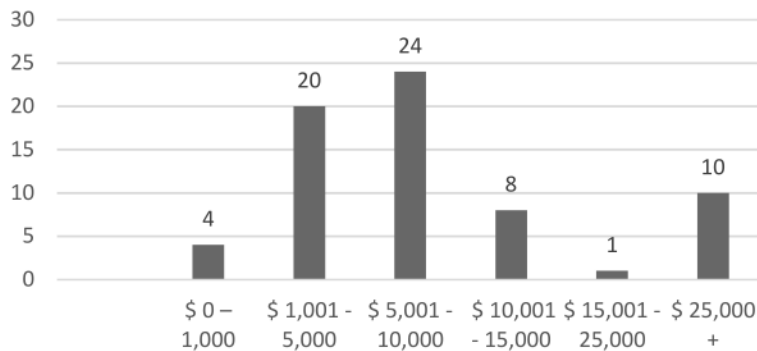


Best management practices appear to be almost standard on the vast majority of operations requesting service.

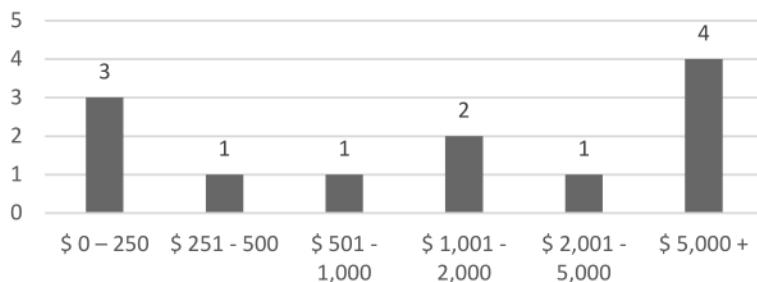
The Co-ordinator reports only four operations with poor practices, which were remedied prior to receiving assistance from the program.

Most respondents reported two or three of the best management practices in place on their operations.

Cattle Operations Estimate Losses Saved
reporting x least amt in category = total \$485,053



Sheep Operations Estimate Losses Saved
reporting x least amt in category = total \$24,755



In the replies to the question about potential losses saved by program service, cattle producers estimated savings of more than \$485,000 and the sheep producers more than \$24,000.

APPENDIX – D: COST BENEFIT

Livestock Protection Program - Report #5 - Jan 1, 2016 to March 24, 2017

CASH COST BENEFIT ANALYSIS

The total cash contributions to this program to date is \$445,500 - survey replies from 46% of participants reported loss prevention as a result of service from this program was more than \$500,000.

Other benefits to the program are significant, however a cash value has not been estimated in this report.

Cash Contributions		Benefits	Benefit Value
\$ 68,000	BCCA Program Delivery Inc.	Benefits to Livestock Producers	\$500,000 +
		- information about best management practices to prevent predator attacks	
		- removal of predators to result in protection of animals following proven predator attacks	
		- successful removal of predators results in less loss of animals, increased profit in operation	
\$ 377,500	Ministry of Agriculture	Benefits to Ministry of Agriculture	
		- verification forms completed and processed for compensation program	
		- significant potential loss in the livestock industry alleviated for improved agriculture production	
		Benefits to Ministry of Environment (COS)	
		- conservation officers relieved of wolf/coyote mitigation service	
		- problem wolf/coyote population being controlled	
		- program provides verification service on non wolf/coyote attacks (when results indicate non wolf/coyote)	
		Benefits to Ministry of Forests, Lands and Natural Resource Operations	
		- program aligns with the Management Plan for the Grey Wolf in B.C.	

From: Hallie MacDonald
To: Morgan, Jeff A FLNR:EX
Cc: Mark Grafton; Elaine Stovin; BC Cattle; Ed Salle; almadley@gmail.com; Grant Huffman; ardillsranch@xplornet.com; brian_mckersie@msn.com; fraserms16@xplornet.com; John Buchanan; Jasper, Geneve AGRI:EX
Subject: Livestock Protection Program data to 19 May 2017
Date: Friday, May 19, 2017 3:06:57 PM
Attachments: image002.png

Hello everyone – following is the update of the data of the LPP program to May 19, 2017

Happy long weekend!

Hallie

Hallie MacDonald hallie@cattlemen.bc.ca

Administrator 250-573-3611

BC Cattlemen's Association

#4-10145 Dallas Drive

Kamloops, BC V2C 6T4

LIVESTOCK PROTECTION PROGRAM			PROVINCIAL TOTALS	
Data summary as of		19-May-17	# files per Zone	
Total # calls to the Hotline/Mark		535	1 Peace	68
Information and inquiries		41	2 Central	121
Total # Files actioned by LPP		494	3 Skeena	28
Total # Files referred to COS (CLOSED)		62	4 Cariboo	157
Total # Files CLOSED		315	5 Thompson	69
Total # files active in LPP (# LESS CLOSED)		179	6 Okanagan	20
			7 Kootenay	29
Total # livestock impacted (killed/injured/harassed)			8 Coast/Island(Abbotsford west)	2
# head beef calves	325		TOTAL FILES ACTIONED	494
# head beef yearlings	22			
# head beef cows	59			
# head beef bulls	5			
# head sheep - ewes	22			
# head sheep - lambs	35			
other (goats)	2			
# head dairy cattle	2			
total # head	472			
Total # verifications completed				
	cattle	sheep		
conclusive - wolf	234	4		
conclusive - coyote	37	41		
conclusive - bear	36	1		
conclusive - cougar	0	9		
conclusive - bird	18	0		
conclusive - dogs	0	0		
negative - scavenged	23			
inconclusive	33			
total # verifications	436			
Harrassment - # files	84			
Mitigation				
Total # files requiring mitigation	180			
Total # wild animals mitigated-closed files			Total mitigation open & closed files	
# wolves - male	102		wolves:	
# wolves - female	103	205	256	
# coyotes male	34		coyotes:	
# coyotes female	28	62	104	
Total # wild animals mitigated	267			
# non-target species (released or dispatched)	30			

Population Status of Central Mountain Caribou Herds in British Columbia and Response to Recovery Management Actions, 2017



Dale Seip and Elena Jones

May, 2017

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Background

The South Peace region of British Columbia contains several caribou herds (Figure 1) that have been declining rapidly over the past few decades, and one herd (Burnt Pine) has recently been extirpated (Seip and Jones 2016). First Nations traditional knowledge and reports by early explorers indicate that historically, caribou were very abundant in the South Peace (West Moberly First Nations 2009). As recently as 20 years ago there were at least 672 caribou in the herds south of the Peace River (i.e., not including the Graham) and likely more; but by 2015 the estimated number of caribou in the South Peace had declined to 248 - 263 (Seip and Jones 2016).

The declining numbers of caribou in these herds resulted in them being nationally listed as Threatened in 2003. In April 2014, the Committee on the Status of Endangered Wildlife in Canada re-evaluated the status of the herds south of the Peace River as part of the Central Mountain caribou population and recommended they be classified as Endangered due to ongoing population declines.

http://www.cosewic.gc.ca/eng/sct1/searchdetail_e.cfm?id=1266&StartRow=1&boxStatus=All&boxTaxonomic=All&location=All&change=All&board=All&commonName=caribou&scienceName=&returnFlag=0&Page=1

The immediate (proximate) cause of declining caribou numbers in these herds is excessive predation, primarily by wolves (Seip and Jones 2016). It is generally believed, however, that the underlying cause of increased predation is industrial landscape change which has created conditions that allow wolves to be more effective at killing caribou. Over the long term, protection and restoration of habitat will be necessary to re-establish self-sustaining caribou herds in the South Peace.

Unfortunately, recovery of disturbed caribou habitat is a lengthy process that takes decades. During that time the habitat remains unsuitable for the survival of caribou, and caribou herds will continue to decline. If caribou populations are to be maintained in the South Peace, immediate and more direct measures are required to reduce the excessive level of predation until habitat conditions improve.

Since 2014, the West Moberly and Sauteau First Nations have been conducting a maternal penning project to capture and hold pregnant adult female caribou in a pen throughout the calving period in order to protect the newborn calves from predators (McNay et al. 2016). Results from the first year indicated that calves could be successfully produced and protected within the pen, but when calves were released back to the wild they experienced very high

mortality from wolf predation. It appears that maternal penning is only successful if it is accompanied with wolf control.

In an effort to halt the decline of caribou in the South Peace, the Government of British Columbia approved a wolf control program which began in 2015. The objective of the program was to reduce the number of wolves on and immediately adjacent to the ranges of five threatened caribou herds in the Central Mountain caribou population (Figure 2). The response of the caribou to reduced wolf numbers is being monitored by evaluating the survival rate of radio-collared adult caribou, conducting calf recruitment counts, and conducting periodic population counts. In addition to wolf control, the West Moberly First Nations and Saulteau First Nations have continued with the maternal penning project for the Klinse-za (Moberly/Scott) caribou herd. Additionally, the Peace Northern Caribou Program supported winter feeding of the Kennedy Siding caribou herd during the period that the caribou were using low-elevation winter range. The purpose of this report is to update the status of Central Mountain caribou herds in B.C. during 2017, and to evaluate the response of the herds to the different recovery management actions.

Wolf Reduction in Winter 2016

A total of 201 wolves were killed within or immediately adjacent to the wolf control area during January to March 2016. This included 155 wolves that were shot from a helicopter and 46 that were trapped. A total of 86 wolves were removed from the Moberly/Scott zone, 50 from the Kennedy zone, and 65 from the Quintette zone (Figure 3). The numbers for the treatment areas differ from those reported in Seip and Jones (2016) because the wolf treatment boundary between Kennedy Siding and Moberly was changed to recognize that the Scott herd is more closely linked to the Moberly herd.

Prior to wolf control, the wolf population within the removal area was estimated to be 166, (10 wolves/1000 square km.) based on previous wolf research in the area and published reports in areas with similar habitat. The underestimate was largely due to not including wolf packs that straddled the border of the removal areas. If the 29 wolves that were killed adjacent to the removal area are deducted, the remaining 172 removals would closely match the estimate of 166 wolves. Therefore, it appears that the wolf control program in winter 2016 likely removed almost all of the wolves within the wolf control zone. The crews working on the program believed that only a few wolves remained in the area by late March. A significant level of wolf recolonization of the area was expected to occur, however, as soon as wolf control stopped for the year, and wolf control would likely need to be repeated each year.

Caribou Population Status

Quintette

Adult mortality: A total of 12 radio-collared adult female caribou were monitored in the Quintette herd between March 2016 and March 2017. During that period, one of the caribou died which equates to an annual mortality rate of 8%.

The radio-collared caribou that died had left the wolf control area and moved to the Hart Ranges on the west side of the Rocky Mountains for the summer. The cause of death was uncertain, but the movement pattern of the caribou prior to death was indicative of wolf predation. The caribou typically inhabited alpine summer range but made a rapid movement to lower elevations where she was killed. We have observed this movement pattern in previous cases of documented wolf predation.

Overall the adult mortality rate for the Quintette herd was lower than average, and no collared caribou died within the wolf control area. The number of collared caribou in the Quintette herd, however, is very small so the estimate of adult mortality has a high level of uncertainty.

Calf recruitment: Sixteen radio-collared adult females in the Quintette herd were located on 03 April 2017 in order to determine the proportion of calves in the population. During that count, a total of 49 caribou were counted (Figure 4). The count included 40 adults and nine calves for a recruitment rate of 18% calves in the population. The 18% calf recruitment is higher than the average level of 14.2% observed from 2003 to 2015, but there were individual years during that period that had equal or higher calf recruitment (Seip and Jones 2016).

Assuming that 60% of the adults were female (similar to the results for the Kennedy Siding herd, see below), this would correspond to 9 calves/24 adult females, or 37 calves/100 adult females. If half of the calves are female, there would be 0.18 female calves/adult female.

Population trend: The estimate of 0.18 female calves/adult female exceeds the adult female mortality rate of 0.08 and would result in a population increase of adult females of 10%. As these sample sizes are very small and statistically weak, ongoing monitoring is necessary to determine if the herd is indeed increasing.

The minimum population count during this year's survey was 49 caribou compared to 39 in 2016 which further supports the likelihood of an increasing population.

These results suggest that the Quintette caribou herd may be showing a positive population response to the wolf control program, but ongoing monitoring is required to confirm this preliminary conclusion.

Kennedy Siding

Adult mortality: A total of seven radio-collared adult female caribou in the Kennedy Siding herd were monitored between March 2016 and March 2017 and no mortalities occurred.

Calf recruitment: Heard and Zimmerman (2017) used motion sensitive cameras placed at feeders to identify all the individual caribou in the Kennedy Siding herd based on antler and other body characteristics. They reported a total of 63 caribou, including 27 adult cows, 18 adult bulls and 18 calves. This represents 29% calves in the population and 0.67 calves/adult female. If half the calves are female, this would be 0.33 female calves/adult female.

An aerial survey was conducted on 03 April 2017 to determine the proportion of calves in the population. Conditions were unsuitable to get a direct count, but based on photographs, there were 10 calves in two groups totalling 31 caribou. For those two groups, calves comprised 32% of the population, similar to the 29% reported in the camera census.

Population trend: The high calf recruitment and low adult female mortality indicate that the herd had a positive growth rate of 33%. The total count of caribou in the camera census increased from 50 in 2016, to 63 in 2017, which is a 26% growth rate.

These results indicate that the Kennedy Siding herd had a strong population response to the wolf control program resulting in a significant increase in the population. Although the herd is also receiving supplemental feed, the feeding program in the absence of wolf control in 2015 did not result in a positive population response (Heard and Zimmerman 2016). Feeding is likely improving the nutritional status of the caribou and may be providing some benefit to the herd. Wolf control, however, appears to be the primary management action contributing to the population increase.

Klinse-za (Moberly/Scott)

The Klinse-za herd is the subject of an ongoing maternal penning project led by Wildlife Infometrics in co-operation with the West Moberly First Nations and the Saulteau First Nations. In March 2016, 14 adult female caribou were captured and put into a maternity pen. One of these caribou died in the pen a few weeks later. Eleven of the 13 remaining cows produced calves and all those calves survived in the pen until they were released into the wild with the adult cows in July.

In November 2016, eight of the 11 calves born in the maternity pen were still alive. In March 2017, at least seven and possibly eight of the calves from the pen were still alive. The

uncertainty is because one of the cows from the pen was in heavy forest cover and could not be seen. Therefore, the cows that had been in the pen had 0.54 - 0.62 calves/adult female. The survival rate of calves that were born in the pen was 64 - 73% as of March 2017.

Calf recruitment: A survey in March 2017 counted 61 caribou including 12 calves for a calf recruitment rate of 20% in the total population. Those calves included seven that had been born in the pen. The remaining five calves belonged to the 20 adult cows that had not been in the pen, which corresponds to 0.25 calves/adult female. The survival rate of calves born in the pen was about twice the survival rate of calves born in the wild.

Adult mortality: Excluding the caribou that died in the pen, three of 22 collared adult females died over the year for an adult mortality rate of 14%. The three mortalities were from two separate avalanche events which also killed one additional uncollared caribou. There were no situations of collared caribou being killed by predators.

Population trend: The population estimate of 61 caribou is an increase from the 54 last year, an increase of 13% in the population. The increase would have been greater except for the unusual deaths from the avalanches. The combination of maternal penning and wolf control has improved both adult and calf survival resulting in an increasing population.

Bearhole-Redwillow

The Bearhole-Redwillow herd is a small remnant herd of caribou that winter in low-elevation boreal forest. Ongoing monitoring of this herd is limited to maintaining a few radio-collared caribou in the herd to provide information on adult mortality, calf recruitment and minimum population size.

Only two radio-collared caribou were monitored in this herd between March 2016 and March 2017. During that period, both caribou survived. Those two animals were in the same group of nine that included six adults and three calves.

This limited data suggest good calf recruitment (33%) and low adult mortality but the very small sample size precludes making any conclusions regarding population trend. The minimum population size was only nine compared to 18 in 2016 (Seip and Jones 2016). The fact that the two remaining collared caribou were both in the same group suggests that there may not be any other groups to join, and therefore that the minimum count may represent most of the total population.

The Bearhole-Redwillow range is outside of the wolf control area but the wolf removal in the adjacent area may have drawn some wolves out of the Bearhole-Redwillow range leading to

higher adult survival and high calf recruitment. The sample sizes, however, are too small to draw any firm conclusions.

South Narraway

Data for the South Narraway herd was provided by the Alberta Ministry of Environment and Parks. A survey in March 2017 located 19 adults and four calves for a total minimum count of 23 caribou. The calves represented 17% of the population.

There were 10 radio-collared caribou located in five different groups with each group containing between one to three collared caribou. The fact that most groups contained multiple collars suggest that there are not many groups for caribou to join. The estimate of the population size based on the number of collars in each group was 23 caribou with a 95% confidence interval of 20 – 43 caribou (Table 1). That number suggests an ongoing population decline of the South Narraway herd.

Graham

The Graham herd lives in the Rocky Mountains north of the Peace River and is not part of the Central Mountain caribou population. It is being monitored as the “no wolf control” comparison for the South Peace wolf control program. Between March 2016 and March 2017, five of 26 collared adult females died for an annual mortality rate of 19%.

In March 2017, an aerial survey counted 86 caribou including 75 adults and 11 calves for a calf recruitment rate of 12.8%. Calf recruitment was inadequate to balance the adult mortality rate which suggests that the Graham herd is continuing to decline in the absence of any wolf control or other population management actions.

Summary of Management Actions

1. The Quintette herd appeared to benefit from reduced wolf numbers resulting in adult mortality and calf recruitment levels that likely contributed to a small population increase. Ongoing monitoring is required to further evaluate this result.
2. The Kennedy Siding herd appeared to experience a very significant benefit from reduced wolf numbers with no adult mortality detected, very high calf recruitment, and a population increase. Supplemental feeding likely improved the nutritional condition of

the caribou but hasn't been directly linked to the population response. The supplementary feeding is required, however, to support the camera inventory of this herd.

3. The combination of maternal penning and wolf control in the Klinse-za (Moberly/Scott) population improved the survival of adults and calves over the past few years leading to an increasing population.
4. Overall, it appears that all of the herds within the wolf control area experienced a population increase over the past year in response to the management actions. The estimated caribou population within the wolf control zone increased from 166 to 192 caribou, a 16% increase.
5. The Graham herd which is the "no wolf control" comparison continues to have high adult mortality, low calf recruitment and the population decline is likely continuing.
6. The Bearhole-Redwillow herd appeared to have high adult survival and high calf recruitment but those results are based on a very small sample size. This herd is outside the wolf control area but there may have been an indirect effect if wolves were drawn out of this area into the void created by wolf control in the adjacent area.
7. The South Narraway herd appears to be experiencing an ongoing decline in the absence of any population management actions.

Wolf Reduction in Winter 2017

A total of 93 wolves were killed within or immediately adjacent to the removal zone, 62 by shooting from the air, and 31 by trapping (Figure 5). Thirteen wolves from different packs were radio-collared to assist finding the packs for subsequent removal. The wolves killed outside of the removal zone were tracked to those locations from within the removal zone. There were 57 wolves removed from the Moberly/Scott zone, 11 from Kennedy Siding, and 25 within or on the boundary of the Quintette zone. At the end of the control program in April 2017 there were at least 30 - 40 wolves remaining in the removal zone based on radio-collared packs that were still present. It was not possible to kill every member of the packs because they were often in dense forest cover when they were located.

These numbers indicate that prior to the start of the 2017 removal program; there were at least 123 - 133 wolves present within the removal zone. This is somewhat less than the 201 wolves

present in 2016, but still indicates very substantial recovery of the wolf population within one year of control. This finding indicates that a very extensive effort will be required every year to continue to keep wolf numbers at low levels.

The Moberly zone had a fairly high level of wolf removal which may have been sufficient to allow ongoing caribou population recovery. The level of removal in the Kennedy Siding and Quintette herd ranges was much lower than what occurred in 2016 so a positive population response for those herds is less certain.

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Acknowledgements

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Mike Klaczek assisted with the Quintette calf count and provided the cover photo.

Table 1. Population estimate for South Narraway caribou using model predictions based on the observed distribution of collared caribou among groups during calf recruitment surveys. The total count (minimum population) of caribou observed during the calf recruitment surveys is also reported.

Year	Mean Group Size \pm 95% CIs	Minimum Mean Group Size Possible	Most Probable No. Groups in Herd (Model Prediction)	Population Estimate	Population Estimate Range (95% CIs)	Minimum Count ³
2006	7 \pm 2 ¹					40
2007	7 \pm 4	5	15 - 18	116	78 - 207	87
2008	6 \pm 1	4	27 - 29	179	139 - 221	102
2009	4 \pm 1	2	44 - 51	176	103 - 262	86
2010	5 \pm 1 ¹					91
2011	6 \pm 2		14 - 100 ²	106	51 - 849	97
2012	3 \pm 1	2	23 - 28	79	53 - 112	55
2013	5 \pm 3	4	10 - 12	50	43 - 95	50
2014	8 \pm 6	5	10 - 12	93	48 - 175	59
2015	7 \pm 4	7	5	33	33 - 72	40
2016	4 \pm 2	3	15	58	34 - 82	35
2017	4 \pm 2	4	5 - 6	23	20 - 43	23

¹ Due to distribution of collars (most groups had only 1 collared caribou) model predictions for the most probable number of groups was unreliable.

² Based on unusual collar distribution (1 group contained 9 collared caribou) there was no difference in probabilities for number of groups from 14 to 100. 100 was the highest number of groups tested as it was highly unlikely that the Narraway herd contained more than 100 groups.

³ Data provided by the Alberta Department of Environment and Sustainable Resource Development.

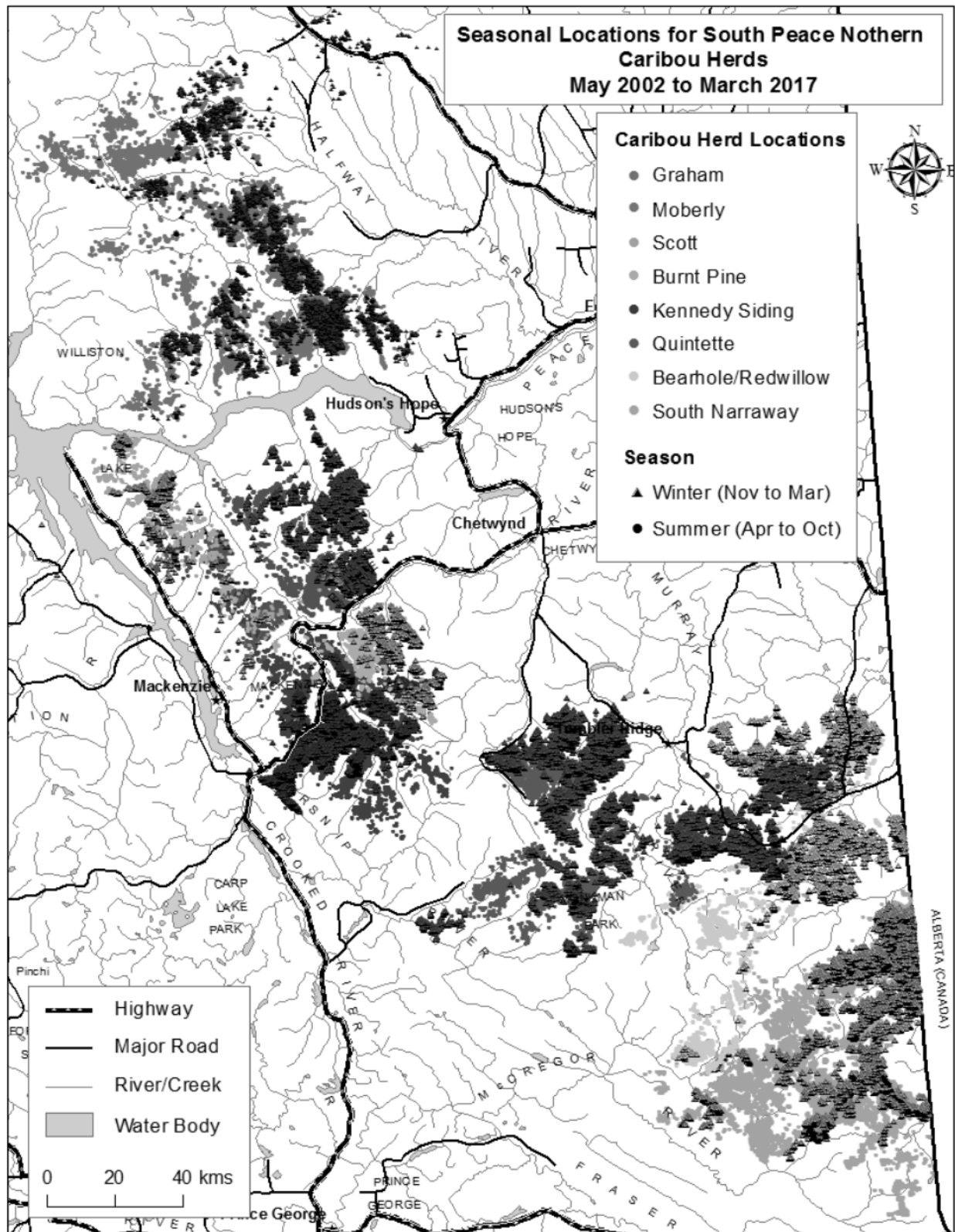


Figure 1. Radio-telemetry locations of caribou herds in the South Peace region of British Columbia, 2002 to 2017.

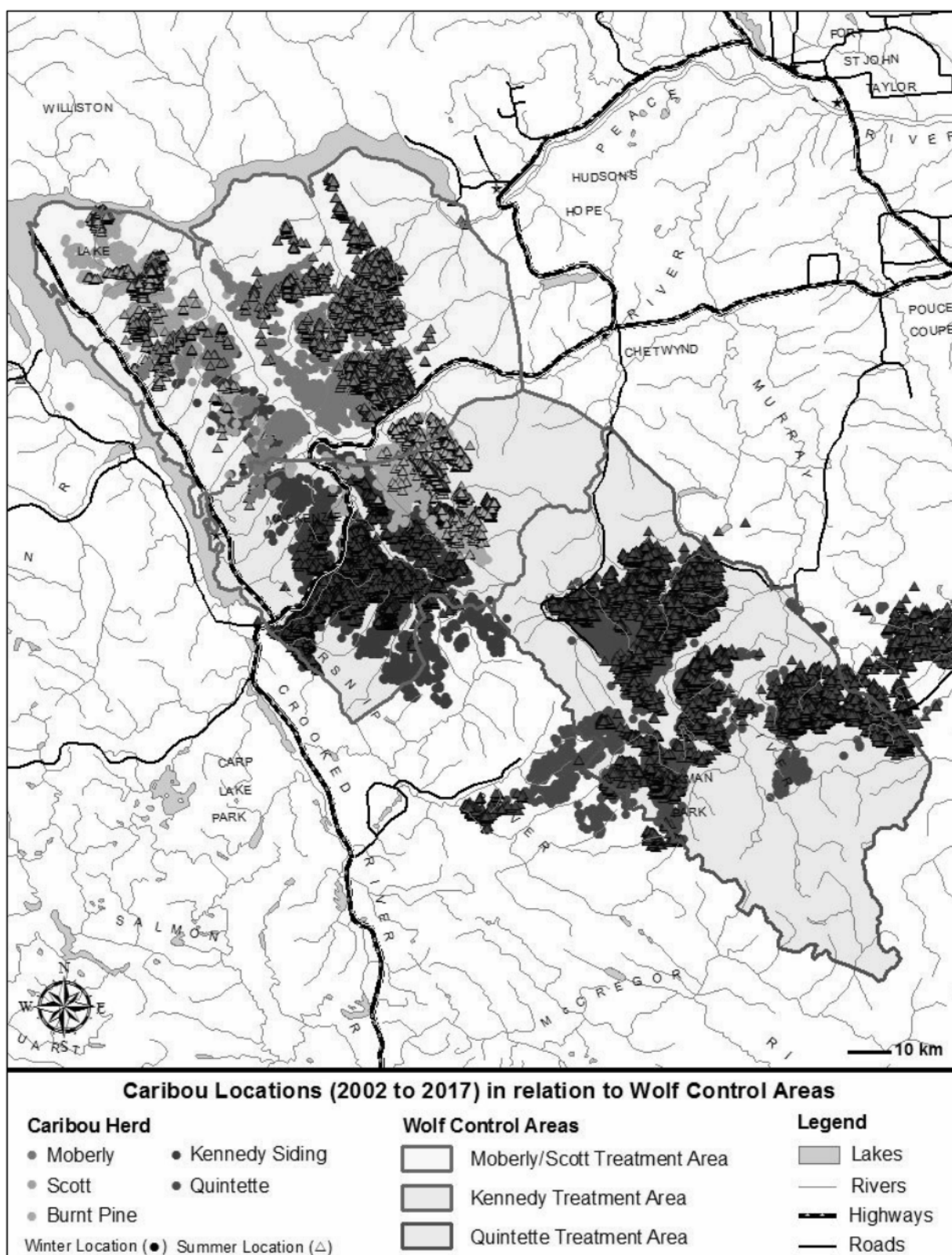


Figure 2. Radio-telemetry locations of caribou (2002 to 2017) and wolf control treatment areas in the South Peace region of British Columbia.

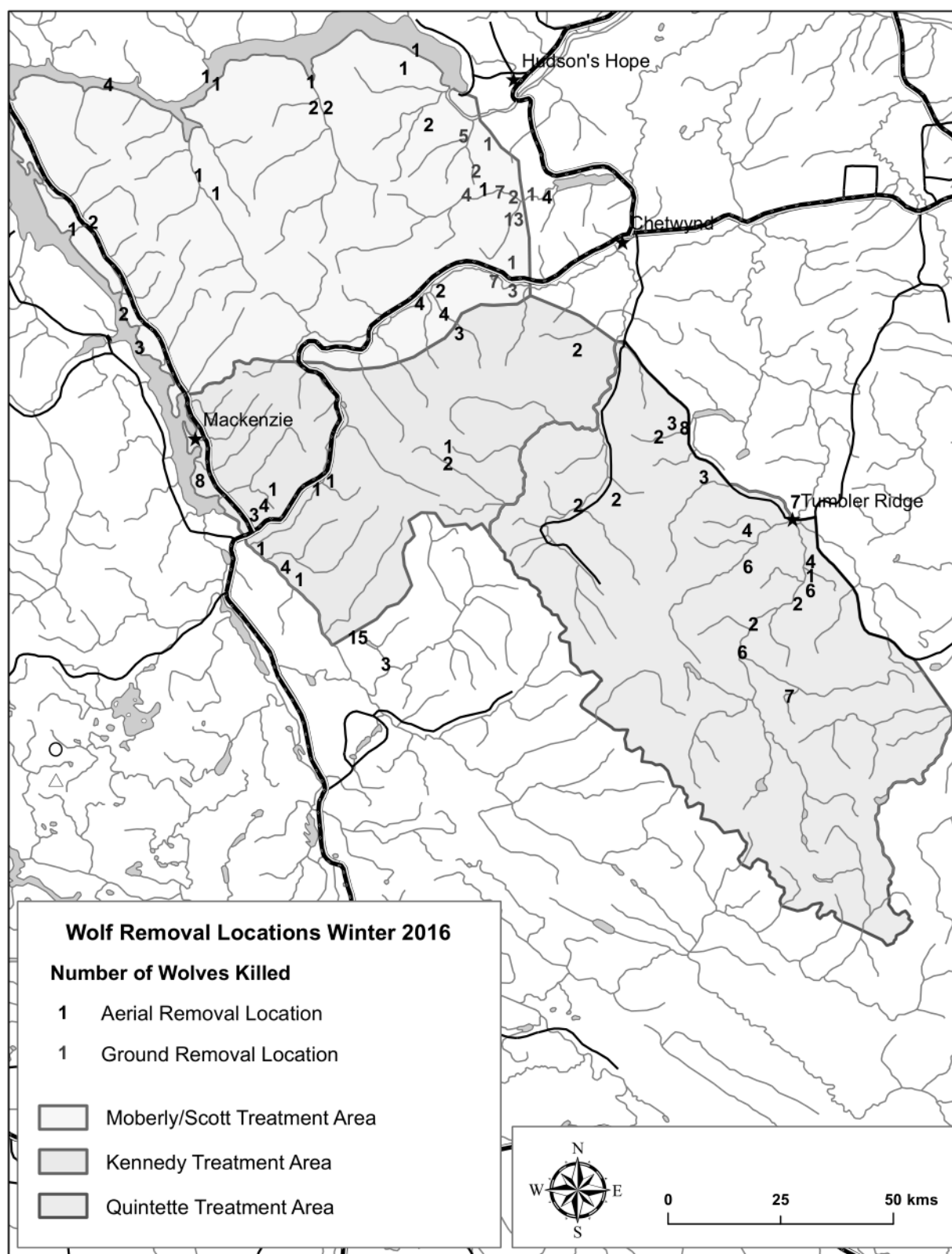


Figure 3. Wolf removal locations and treatment areas in the South Peace region of British Columbia, winter 2016.

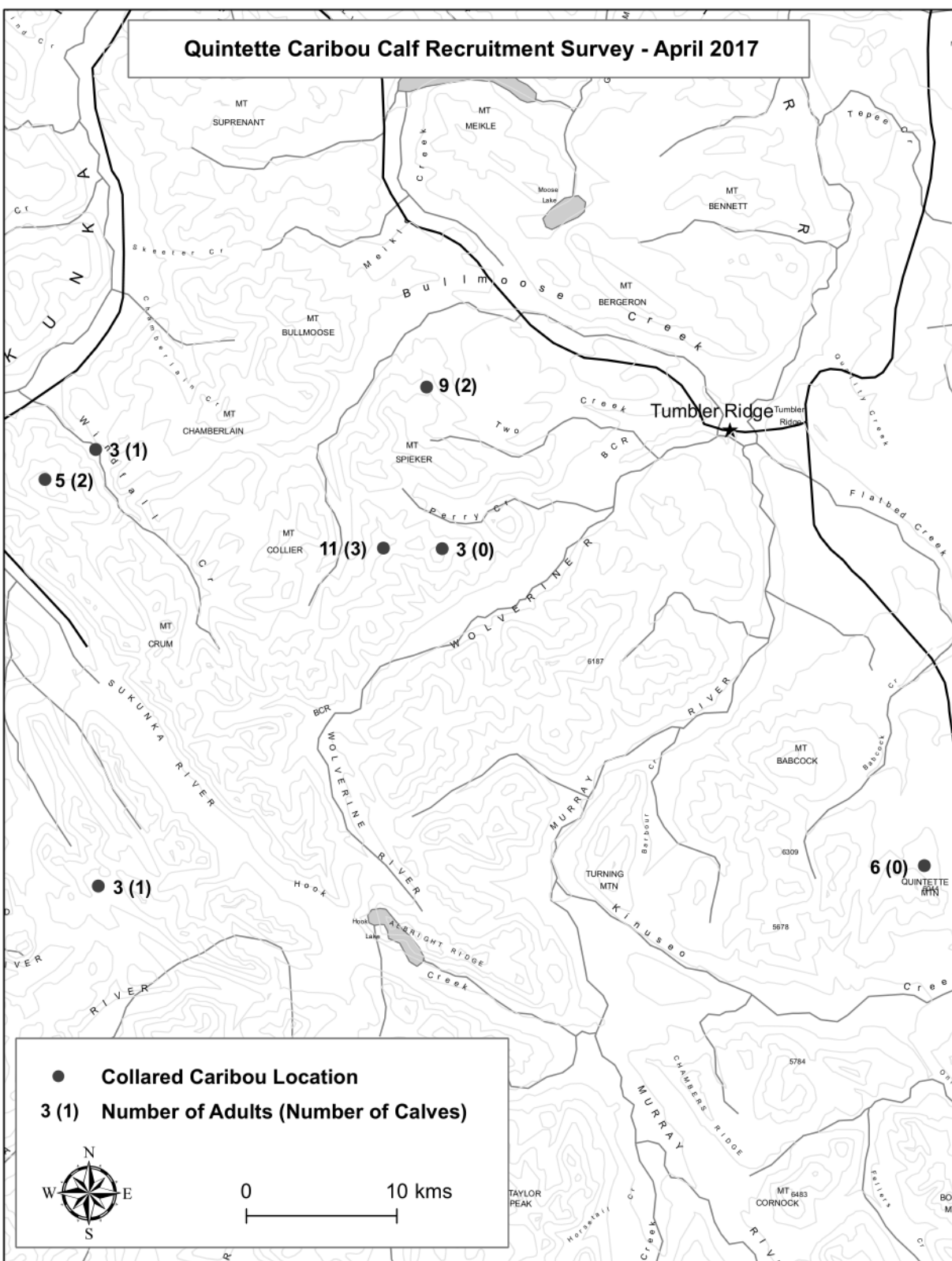


Figure 4. Number and location of caribou observed during the Quintette caribou herd calf recruitment survey, 03 April 2017.

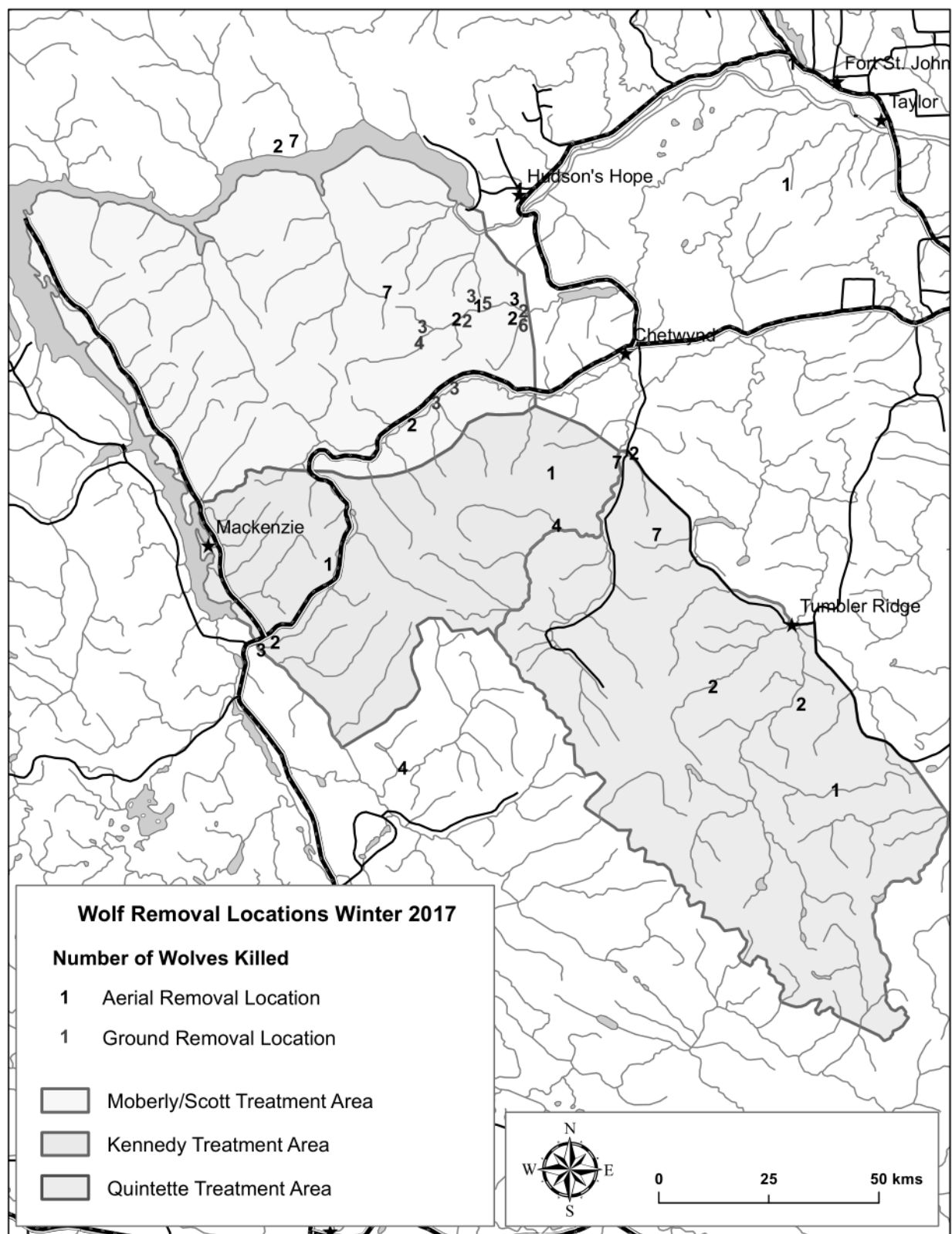


Figure 5. Wolf removal locations and treatment areas in the South Peace region of British Columbia, winter 2017.

HUNT YEAR	SPECIES	CI	PROV FLAG	WMU	REGION	RESIDENT HUNTERS	RESIDENT DAYS	RESIDENT KILLS	RESIDENT MALE RATIO	RESIDENT FEMALE RATIO	RESIDENT OTHER SEX RATIO	NON-RESIDENT HUNTERS	NON-RESIDENT DAYS	NON-RESIDENT KILLS	NON-RESIDENT MALE RATIO	NON-RESIDENT FEMALE RATIO	NON-RESIDENT OTHER SEX RATIO
2015	WOLF	no	0	100	1	8	8	0	0	0	0	0					
2015	WOLF	no	0	102	1	25	33	0	0	0	0	0					
2015	WOLF	no	0	103	1	42	109	0	0	0	0	0					
2015	WOLF	no	0	104	1	77	256	0	0	0	0	0					
2015	WOLF	no	0	105	1	84	681	0	0	0	0	0					
2015	WOLF	no	0	106	1	118	1116	0	0	0	0	0					
2015	WOLF	no	0	107	1	35	377	0	0	0	0	0					
2015	WOLF	no	0	109	1	47	254	0	0	0	0	0					
2015	WOLF	no	0	110	1	97	1426	0	0	0	0	0					
2015	WOLF	no	0	111	1	9	45	0	0	0	0	0					
2015	WOLF	no	0	112	1	16	40	8	1	0	0	5	20	2	0.5	0.5	0
2015	WOLF	no	0	113	1	8	40	0	0	0	0	0					
2015	WOLF	no	0	114	1							2					0
2015	WOLF	no	0	199	1	427	4385	8	1	0	0	7	28	2	0.5	0.5	0
2015	WOLF	no	0	205	2	8	72	0	0	0	0	0					
2015	WOLF	no	0	206	2	37	315	0	0	0	0	0					
2015	WOLF	no	0	211	2	36	126	0	0	0	0	0					
2015	WOLF	no	0	212	2	24	152	0	0	0	0	1	3	0	0	0	0
2015	WOLF	no	0	216	2	8	8	0	0	0	0	0					
2015	WOLF	no	0	299	2	97	673	0	0	0	0	1	3	0	0	0	0
2015	WOLF	no	0	300	3	25	25	0	0	0	0	0					
2015	WOLF	no	0	312	3	93	1252	0	0	0	0	0					
2015	WOLF	no	0	313	3	59	894	0	0	0	0	0					
2015	WOLF	no	0	314	3							1					0
2015	WOLF	no	0	315	3							1	9	0	0	0	0
2015	WOLF	no	0	317	3	42	294	0	0	0	0		9	0	0	0	0
2015	WOLF	no	0	318	3	51	128	0	0	0	0	0					
2015	WOLF	no	0	319	3	59	455	0	0	0	0	0					
2015	WOLF	no	0	320	3	66	685	0	0	0	0	2	10	0	0	0	0
2015	WOLF	no	0	326	3	73	593	0	0	0	0	0					
2015	WOLF	no	0	327	3	58	240	9	0	1	0	0					
2015	WOLF	no	0	328	3	58	282	0	0	0	0	0					
2015	WOLF	no	0	329	3	101	1077	0	0	0	0	0					
2015	WOLF	no	0	330	3	216	2743	0	0	0	0	0					
2015	WOLF	no	0	331	3	54	1257	0	0	0	0	1	2	1	1	0	0
2015	WOLF	no	0	332	3	72	757	16	0.5	0.5	0	52	347	1	1	0	0
2015	WOLF	no	0	333	3	55	238	0	0	0	0	0					
2015	WOLF	no	0	334	3	8	24	0	0	0	0	0					
2015	WOLF	no	0	335	3	25	150	0	0	0	0	0					
2015	WOLF	no	0	336	3	41	205	0	0	0	0	1	10	0	0	0	0
2015	WOLF	no	0	337	3	58	530	0	0	0	0	0					
2015	WOLF	no	0	338	3	48	432	0	0	0	0	0					
2015	WOLF	no	0	339	3	32	448	0	0	0	0	0					
2015	WOLF	no	0	340	3	45	1230	7	1	0	0	0					
2015	WOLF	no	0	341	3	30	140	0	0	0	0	0					
2015	WOLF	no	0	342	3	8	80	0	0	0	0	0					
2015	WOLF	no	0	399	3	1070	14159	32	0.5	0.5	0	58	387	2	1	0	0
2015	WOLF	no	0	400	4	8	120	0	0	0	0	0					
2015	WOLF	no	0	401	4	53	548	0	0	0	0	15	120	0	0	0	0
2015	WOLF	no	0	402	4	133	1365	9	1	0	0	23	166	0	0	0	0
2015	WOLF	no	0	403	4	211	1425	8	0	1	0	7	30	2	0	1	0
2015	WOLF	no	0	404	4	76	482	18	0	1	0	0					
2015	WOLF	no	0	405	4	59	514	0	0	0	0	1	6	0	0	0	0
2015	WOLF	no	0	406	4	89	720	8	1	0	0	0					
2015	WOLF	no	0	407	4	41	320	0	0	0	0	0					
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2015	WOLF	no	0	409	4	50	525	0	0	0	0	0					
2015	WOLF	no	0	414	4	8	16	0	0	0	0	0					
2015	WOLF	no	0	415	4	75	650	0	0	0	0	0					
2015	WOLF	no	0	416	4	51	740	0	0	0	0	0					
2015	WOLF	no	0	417	4	17	153	0	0	0	0	0					
2015	WOLF	no	0	418	4	16	168	0	0	0	0	0					
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2015	WOLF	no	0	421	4	79	614	0	0	0	0	4	28	0	0	0	0
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2015	WOLF	no	0	424	4	70	726	9	1	0	0	6	43	1	1	0	0
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2015	WOLF	no	0	435	4	33	380	0	0	0	0	9	66	0	0	0	0
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2015	WOLF	no	0	437	4	8	112	0	0	0	0	0					
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2015	WOLF	no	0	440	4	9	63	0	0	0	0	0					
2015	WOLF	no	0	499	4	1570	23337	69	0.5	0.38	0.13	144	1032	5	0.4	0.4	0.2

2015 WOLF	no	0	743 7B	27	243	7	0	1	0	1	1	1	1	0	0
2015 WOLF	no	0	744 7B	45	360	9	1	0	0						
2015 WOLF	no	0	745 7B	72	4392	11	1	0	0						
2015 WOLF	no	0	746 7B	30	190	33	0.33	0.67	0						
2015 WOLF	no	0	747 7B							1	1	1	0	1	0
2015 WOLF	no	0	748 7B							1	1	1	1	0	0
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2015 WOLF	no	0	750 7B	93	628	44	0.75	0.25	0	24	187	4	0.75	0.25	0
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2015 WOLF	no	0	752 7B	58	842	18	0	0	1	25	213	3	0.67	0.33	0
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2015 WOLF	no	0	755 7B	11	22	23	0.5	0.5	0						
2015 WOLF	no	0	756 7B	18	162	0	0	0	0						
2015 WOLF	no	0	757 7B	44	405	0	0	0	0						
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2015 WOLF	no	0	799 7	2781	46325	588	0.53	0.35	0.12	501	3735	43	0.7	0.3	0
2015 WOLF	no	0	800 8	8	8	0	0	0	0						
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2015 WOLF	no	0	802 8	8	88	0	0	0	0						
2015 WOLF	no	0	804 8	18	100	0	0	0	0						
2015 WOLF	no	0	805 8	68	357	0	0	0	0						
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2015 WOLF	no	0	807 8	9	9	0	0	0	0						
2015 WOLF	no	0	808 8	7	63	0	0	0	0	3	19	0	0	0	0
2015 WOLF	no	0	809 8	83	888	0	0	0	0	5	29	0	0	0	0
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2015 WOLF	no	0	811 8	76	1089	0	0	0	0	11	71	0	0	0	0
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2015 WOLF	no	0	814 8	84	353	0	0	0	0	2	8	0	0	0	0
2015 WOLF	no	0	815 8	48	360	0	0	0	0						
2015 WOLF	no	0	822 8	17	85	0	0	0	0						
2015 WOLF	no	0	823 8	67	670	0	0	0	0	2	16	0	0	0	0
2015 WOLF	no	0	824 8	25	59	8	1	0	0						
2015 WOLF	no	0	825 8	8	8	0	0	0	0						
2015 WOLF	no	0	826 8	17	187	0	0	0	0						
2015 WOLF	no	0	899 8	805	8641	16	1	0	0	26	154	0	0	0	0
2015 WOLF	no	0	999	732	748	8	1	0	0						
2015 WOLF	no	9	999	8219	116226	907	0.53	0.37	0.1	1242	9209	70	0.64	0.3	0.06
2015 WOLF	no	0 7A	7A	1244	22288	173	0.55	0.3	0.15	314	2213	24	0.63	0.38	0
2015 WOLF	no	0 7B	7B	1584	23880	415	0.53	0.38	0.09	187	1522	19	0.79	0.21	0

TRAP YEAR	REGION	WMU	ATN	SPECIES	HARVEST QUANTITY
2015		3	327 TR0327T002	WOLF	2
2015		3	330 TR0330T005	WOLF	1
2015		3	340 TR0340T001	WOLF	2
2015		4	403 TR0403T007	WOLF	3
2015		4	404 TR0404T001	WOLF	1
2015		4	405 TR0405T003	WOLF	2
2015		4	405 TR0405T004	WOLF	1
2015		4	405 TR0405T006	WOLF	5
2015		4	414 TR0414T001	WOLF	1
2015		4	420 TR0420T004	WOLF	1
2015		4	422 TR0422T007	WOLF	3
2015		4	423 TR0423T013	WOLF	3
2015		4	423 TR0423T014	WOLF	4
2015		4	423 TR0423T016	WOLF	3
2015		4	426 TR0426T001	WOLF	1
2015		4	433 TR0433T005	WOLF	1
2015		4	439 TR0439T003	WOLF	1
2015		5	502 TR0502P698	WOLF	1
2015		5	502 TR0502T023	WOLF	5
2015		5	502 TR0502T045	WOLF	2
2015		5	502 TR0502T048	WOLF	1
2015		5	512 TR0512T009	WOLF	11
2015		5	513 TR0513P055	WOLF	3
2015		5	513 TR0513T005	WOLF	2
2015		5	513 TR0513T021	WOLF	1
2015		5	513 TR0513T032	WOLF	1
2015		5	513 TR0513T035	WOLF	1
2015		6	604 TR0604P008	WOLF	3
2015		6	604 TR0604T024	WOLF	1
2015		6	604 TR0604T040	WOLF	1
2015		6	604 TR0604T045	WOLF	1
2015		6	605 TR0605T011	WOLF	6
2015		6	608 TR0608P003	WOLF	3
2015		6	608 TR0608T012	WOLF	9
2015		6	608 TR0608T013	WOLF	1
2015		6	608 TR0608T023	WOLF	3
2015		6	608 TR0608T030	WOLF	1
2015		6	619 TR0619T004	WOLF	1
2015		6	620 TR0620T001	WOLF	5
2015		6	623 TR0623T003	WOLF	1
2015		6	623 TR0623T011	WOLF	2
2015		6	626 TR0626T021	WOLF	2
2015		6	627 TR0627T003	WOLF	7
2015		8	823 TR0823T041	WOLF	2
2015 7A			702 TR0702T006	WOLF	2
2015 7A			703 TR0703T005	WOLF	1

2015 7A	703 TR0703T009	WOLF	2
2015 7A	704 TR0704T001	WOLF	2
2015 7A	706 TR0706T006	WOLF	3
2015 7A	707 TR0707T004	WOLF	1
2015 7A	707 TR0707T008	WOLF	1
2015 7A	709 TR0709T004	WOLF	1
2015 7A	710 TR0710T001	WOLF	1
2015 7A	710 TR0710T007	WOLF	4
2015 7A	711 TR0711T001	WOLF	3
2015 7A	712 TR0712P267	WOLF	1
2015 7A	712 TR0712T043	WOLF	2
2015 7A	713 TR0713T009	WOLF	5
2015 7A	715 TR0715P003	WOLF	1
2015 7A	715 TR0715T011	WOLF	1
2015 7A	716 TR0716T005	WOLF	1
2015 7A	716 TR0716T006	WOLF	2
2015 7A	718 TR0718T002	WOLF	1
2015 7A	718 TR0718T003	WOLF	1
2015 7A	724 TR0724T013	WOLF	1
2015 7A	726 TR0726T010	WOLF	1
2015 7A	728 TR0728T010	WOLF	1
2015 7A	729 TR0729T005	WOLF	9
2015 7B	721 TR0721P001	WOLF	2
2015 7B	721 TR0721T003	WOLF	4
2015 7B	721 TR0721T005	WOLF	3
2015 7B	721 TR0721T008	WOLF	5
2015 7B	721 TR0721T015	WOLF	3
2015 7B	732 TR0732T007	WOLF	1
2015 7B	732 TR0732T011	WOLF	1
2015 7B	733 TR0733P051	WOLF	5
2015 7B	733 TR0733P057	WOLF	9
2015 7B	734 TR0734P016	WOLF	4
2015 7B	735 TR0735T005	WOLF	2
2015 7B	743 TR0743T007	WOLF	1
2015 7B	744 TR0744P003	WOLF	2
2015 7B	744 TR0744T004	WOLF	3
2015 7B	745 TR0745T001	WOLF	5
2015 7B	745 TR0745T006	WOLF	4
2015 7B	749 TR0749T005	WOLF	6
2015 7B	749 TR0749T009	WOLF	26
2015 7B	751 TR0751T007	WOLF	3
2015 7B	752 TR0752T006	WOLF	2
2015 7B	755 TR0755T012	WOLF	3