

# **Carnivore Monitoring**



**Banff, Kootenay and Yoho National Parks**

**Summer – 2009**

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## INTRODUCTION

This report summarizes the events garnered by the *Carnivore Monitoring Project* for the period of May 15 to October 31 in 2009. It is the third report dedicated specifically to gathering data on carnivore movement, status and events that I have compiled for Parks Canada and is in addition to the winter report of 2007 – 2008, and the winter report of 2008 – 2009. This is the first opportunity I have had to monitor all carnivores in Banff (BNP), Kootenay (KNP) and Yoho (YNP) National Parks in the summer, as our past summer remote camera documentation has been largely devoted to work performed in conjunction with bear DNA hair collection studies. I suggest that should this study continue, significant quantitative analysis may be made which could provide for example: a comparison of parks over years or the trend a particular species per park over time. I remind the reader of the secondary benefit of having a researcher in the field performing camera maintenance, that can also glean data on amongst other things, temporal and spatial carnivore movement patterns (especially highway crossing locations), multi-year wolf den use and status, composition and denning success, etc.

## METHODOLOGY

Our methodology is consistent with that presented previously in other reports, with several exceptions. Obviously no tracking sessions were possible owing to the lack of snow. Wolf and cougar predations were not investigated due to the high probability of contacting bears in the area that were attracted to carrion. However, many potential kill locations were noted this summer ( $n > 15$ ) and will be available for investigation shortly. Participation from back-country lodges and huts was not solicited during this summer term as potential respondents would be highly unlikely to partake in a survey when they could not find evidence of animal tracks (no snow).

Twenty-three fixed sites and 1 roving camera were monitored with 11 cameras deployed in the Banff Field Unit and 15 in the LLYK Field Unit (Figure 1). I tallied all carnivores larger than weasels and noted all other animals, in addition to hikers, bikers, horses and motorized vehicles.

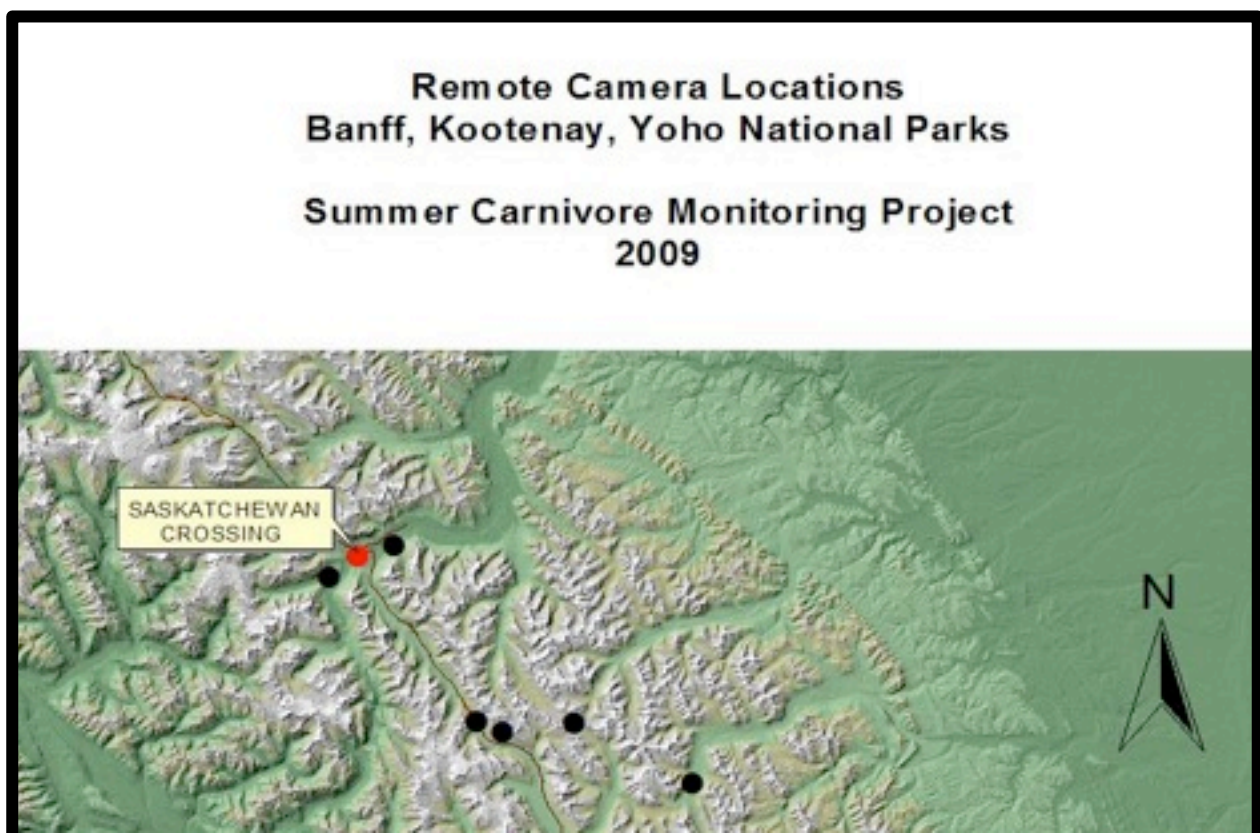


Figure 1. Locations of remote cameras used in the Summer Carnivore Monitoring Project of 2009 in Banff, Kootenay and Yoho National Parks. Black dots indicate camera placements.

## RESULTS

All cameras, most of which are over 5 years old, performed well, with minor exceptions. Despite many programming corrections, one site continues to receive many “false images” created when winds blow trees in the background of the field of view. The camera at this site (Spray Mineral Lick) was deemed too productive to eliminate or reposition to alleviate this problem.

Approximately 3510 camera nights documented 788 carnivore events. Close to one-tenth of a million images were viewed, tabulated, categorized and analyzed. Table 1 presents carnivore numbers captured by remote camera, by each fixed location, and Table 2 displays these same data by national park. Discounting “Other” carnivores in this table and adjusted to find mean success per camera, I found that BNP’s cameras documented carnivores at a mean rate of 25.5 carnivores per camera, while KNP and YNP’s cameras recorded 66.7 and 54.7 respectively (Figure 2).

Table 1. Tally of carnivores imaged per fixed remote camera station in the summer Carnivore Monitoring Project – 2009, in BNP, KNP and YNP.

Synopsis of Carnivores Photographed per Fixed Camera Station. Carnivore Monitoring Project Summer - 2009											
	wolf	coyote	fox	cougar	lynx	marten	wolverine	grizzly bear	black bear	other carnivore	TOTAL
ALAN'S	20	1				1			2	5 skunk	29
JOHNSON JUNCTION	25	1	1	6		2		2	1		38
YOHO CARRION PIT	44	21	1					20	4		90
CROOKS	48	13		2		5		7	21	1 LT Weasel, 1 skunk	98
HILLSDALE SPLIT	17	14						3	5		39
HELEN LAKE	15				1	3	3	4			26
BREWSTER/BADGER PASS	4	2	2					10			18
WHITEHORN LOOP	4	1			6	1		2	8		22
WEST KOOTENAY FIRE ROAD	38	6	1	2				5	10		62
ICERIVER	39	4	2		3			7	1		56
LONE PINE	49	13			2			6			70
RED DEER LAKES	3							2			5
OTTERHEAD	4					1		3	10		18
PIPESTONE PASS						1		5			6
SASK CROSSING Warden Lake	21							4	3		28
SPRAY MINERAL LICK	12			2		2		3	2		21
CUTHEAD SCENT POST	9					1		3			13
BOW	9		7		1			2	6		25
JOHNSON LAKE	24		1	4				4	2		35
POWERLINE WEST (FAIRHOLME)	11		4							1 skunk	16
SASK CROSSING Howse River	2					4					6
FLINTS	3	7						8			18
POWERLINE EAST (FAIRHOLME)	38		3	5				3			49
<b>TOTAL</b>	<b>439</b>	<b>83</b>	<b>22</b>	<b>21</b>	<b>13</b>	<b>21</b>	<b>3</b>	<b>103</b>	<b>75</b>	<b>8</b>	<b>788</b>

Table 2. Distribution of carnivores imaged by remote cameras per National Park, determined by the summer Carnivore Monitoring Project – 2009 in BNP, KNP and YNP.

Mean Carnivore Events per									
	wol	coyot	fo	couga	lyn	marte	wolveri	grizzl bea	blac bea
<b>Banff National</b>	24	38	18	17	10	14	3	61	27
<b>Kootenay National</b>	10	20	1	4	0	6	0	12	33
<b>Yoho National</b>	87	25	3	0	3	1	0	30	15

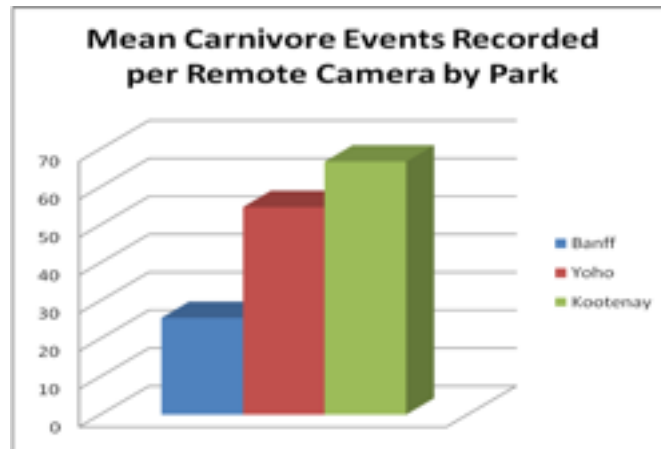


Figure 2. Graph of carnivore images per camera per National Park show that KNP cameras recorded more than twice on average, the number of carnivores, compared to BNP.

I sorted data both by success per fixed station per day and by number of camera days to capture a carnivore event per site and present these data in Table 3. Success ranged widely from 1.30 days to document a carnivore event on the east end of the Power line on the Fairholme Bench, to 29.50 on the Howse River camera station with an average of 7.35 days required throughout the study area.

Table 3. Operational Success of cameras per station as determined by the summer Carnivore Monitoring Project – 2009, in BNP, KNP and YNP.

<b>Operational Success by Fixed Site</b>			
	<b># Operational Days</b>	<b>Mean success per station per camera day</b>	<b>Mean camera days per carnivore event</b>
<b>POWERLINE EAST (FAIRHOLME)</b>	62	0.79	1.30
<b>CROOKS</b>	188	0.52	1.92
<b>YOHO CARRION PIT</b>	180	0.50	2.00
<b>LONE PINE</b>	180	0.39	2.57
<b>WEST KOOTENAY FIRE ROAD</b>	184	0.34	3.00
<b>ICE RIVER</b>	178	0.31	3.20
<b>BREWSTER/BADGER PASS</b>	63	0.29	3.50
<b>POWERLINE WEST (FAIRHOLME)</b>	68	0.22	4.50
<b>HILLSDALE SPLIT</b>	179	0.22	4.60
<b>JOHNSON JUNCTION</b>	181	0.21	4.80
<b>JOHNSON LAKE</b>	178	0.20	5.10
<b>BOW</b>	137	0.18	5.50
<b>ALAN'S</b>	184	0.16	6.30
<b>SASK CROSSING Warden Lake</b>	177	0.16	6.30
<b>WHITEHORN LOOP</b>	157	0.14	7.10
<b>HELEN LAKE</b>	176	0.15	7.70
<b>SPRAY MINERAL LICK</b>	174	0.12	8.30
<b>OTTERHEAD</b>	174	0.10	9.70
<b>FLINTS</b>	181	0.10	10.06
<b>PIPESTONE PASS</b>	72	0.08	12.00
<b>CUTHEAD SCENT POST</b>	180	0.07	13.85
<b>RED DEER LAKES</b>	81	0.06	16.20
<b>SASK CROSSING Howse River</b>	177	0.03	29.50
<b>TOTAL</b>	<b>3511</b>	<b>mean .23</b>	<b>mean 7.35</b>

Other species photographed per station are shown in Table 4. Of interest is the number of White-tailed versus Mule Deer documented (740 and 135 respectively) - a ratio of 5.5 white tails to mule deer. The greatest discrepancy in this ratio was found from the remote camera north of the Hillsdale Split in BNP, which recorded 181 White-tails and only 2 Mule deer.

Table 4. Ungulate and other species photographed per station in the summer Carnivore Monitoring Project – 2009, BNP, KNP and YNP.



Other Species Imaged by Remote Camera by Fixed Site						
	WT DEER	MULE DEER	DEER SPS	ELK	MOOSE	OTHER
ALAN'S	12		1	24		
JOHNSON JUNCTION	101	10	1	33		
YOHO CARRION PIT					1	
CROOKS	115	12		2	8	
HILLSDALE SPLIT	181	2	3	9	7	
HELEN LAKE		9	3	4		
BREWSTER/BADGER PASS	1	8		6		
WHITEHORN LOOP	1			2	1	
WEST KOOTENAY FIRE ROAD	81	4		3	1	
ICE RIVER	37	15		52	19	
LONE PINE		19		14		13 gray jays, 2 juncos, 7 squirrels
RED DEER LAKES	1	3		11		
OTTERHEAD	15	5		2	8	
PIPESTONE PASS	3	1			1	
SASK CROSSING Warden Lake	22		1	3	1	
SPRAY MINERAL LICK	14	4		12	5	91 goats and 21 sheep
CUTHEAD SCENT POST		1				4 grouse, 32 squirrels, 9 hare, 10 wood rats, 1 gray jay
BOW	1	5		1		
JOHNSON LAKE	73	2		25		
POWERLINE WEST (FAIRHOLME)	4			1		
SASK CROSSING Howse River	7	14	2	26	2	
FLINTS		8		11		
POWERLINE EAST (FAIRHOLME)	71	13		9		
<b>TOTAL</b>	<b>740</b>	<b>135</b>	<b>11</b>	<b>250</b>	<b>54</b>	

Human use by site was tallied and is presented in Table 5. I was surprised to note that cameras documented 3255 horses as compared to 2155 hikers. The pie graph in Figure 3 compares the relative amount of the four major human uses by groups, to show that 54% of all human caused wildlife disturbance potentials were from hikers. At the 7 camera sites where both horse and hikers could be found, I noted that 59% of the wildlife disturbances were caused by horse groups, versus 41% hiker groups (Figure 4). It should be noted at least at the Crooks Meadows and West Kootenay Fire Road site, that > 95% of all cyclists documented were Park's employees. This begs the question of whether Parks Canada is maintaining particular trails and roads for visitor use, or for their employee's use. It may be prudent for Parks Canada to collect user data on some trails/roads to determine who the users are, and thus evaluate the cost effectiveness of applying maintenance resources. A similar effect is obvious for the Ice River and Kicking Horse Fire Roads (KHFR) in YNP. Cameras have been remained at fixed stations there for a full year and only 45 and 137 human groups have used the facility. In one month, the KHFR received almost more use from Parks Canada snow machines needed to groom the trail, than users. I suggest again, that when fire road trail maintenance is performed, that it should be done at the minimum width needed to pass a small all-terrain vehicle – not cleared to the full width of the available road. This is to increase wildlife values by increasing hiding cover and foraging values, and also to increase visitor experience. It is our conviction that hikers and bikers do not want to navigate an outsized road such as the lower Cascade Fire Road, for their National Park experience.

Table 5. Human use by type per fixed camera station from the summer Carnivore Monitoring Project – 2009, in BNP, KNP and YNP.

Human Use Imaged by Remote Cameras per Fixed Site							
	HIKERS	HIKER GROUPS	BIKES	BIKE GROUPS	HORSES	HORSE GROUPS	OTHER
ALAN'S	7	6	5	3			
JOHNSON JUNCTION	17	14					
YOHO CARRION PIT	5	4					18 trucks, 1 car
CROOKS	82	26	49	25	4	2	2quads
HILLSDALE SPLIT	47	26	28	14			1 car, 1 motor cycle
HELEN LAKE	462	109					
BREWSTER/BADGER PASS	366	162	230	121	968	105	11 snow machines
WHITEHORN LOOP	5	5					
WEST KOOTENAY FIRE ROAD	41	24	44	30			4quads
ICE RIVER	46	30	23	13			2 trucks
LONE PINE	77	33	6	3	1374	193	4 snow machines
RED DEER LAKES	43	22			92	22	
OTTERHEAD	16	11	67	33			2 tractors
PIPESTONE PASS	8	7					
SASK CROSSING Warden Lake	711	340	10	5			
SPRAY MINERAL LICK	16	12	3	1			
CUTHEAD SCENT POST	7	5					
BOW	25	13					
JOHNSON LAKE	22	15	4	2	4	2	
POWERLINE WEST (FAIRHOLME)	3	3					34 kubotas
SASK CROSSING Howe River	40	20					
FLINTS	88	49			811	136	2 snow machines
POWERLINE EAST (FAIRHOLME)	21	15			2	1	29 kubotas
<b>TOTAL</b>	<b>2155</b>	<b>951</b>	<b>469</b>	<b>250</b>	<b>3255</b>	<b>461</b>	<b>111 machines</b>

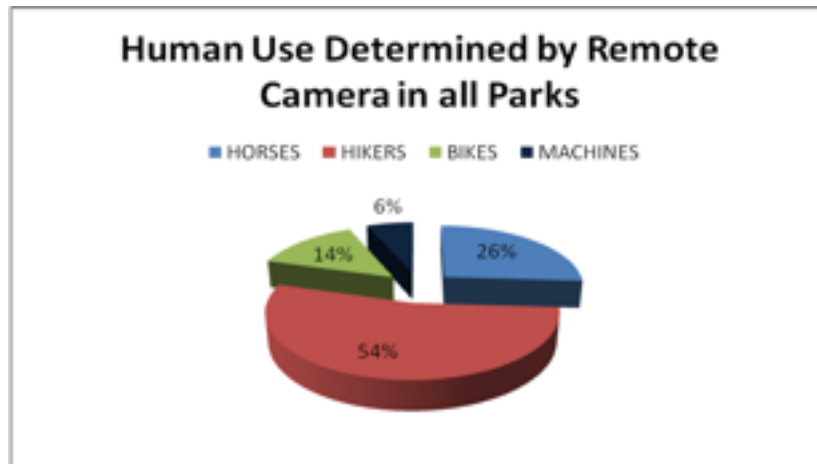


Figure 3. Pie graph of human use (numbers of groups) showing the relationship of hiker traffic versus all other types of human use at camera sites. The category “Machines” included: a garden tractor, trucks, cars, motor cycles, snowmobiles, all-terrain vehicles and kubotas.



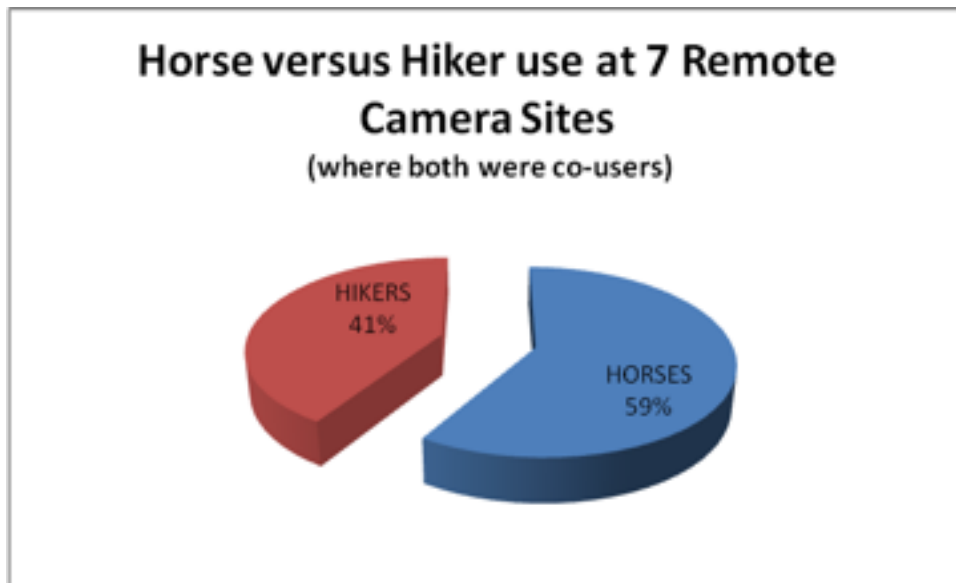


Figure 4. At the 7 camera sites where both horse and hiker use overlapped, horse groups (n = 461) outnumbered hiker groups (n = 322) by 18%.

#### 1) Lynx

I am still of the belief that robust lynx populations are found in all three parks. Extensive winter tracking through the coming months may bear this out. However, in a recent 5 day back-country trip in the Banff Field Unit where I travelled over 100 kilometres in good snow tracking conditions, I was only able to document 1 set of lynx tracks. Four of the five stations where lynx images were captured by remote camera, were in the LLYK Field Unit. The most productive camera sites for lynx appeared near Lake Louise (Figure 5), which concurs to our winter study results



Figure 5. Lynx moving through the base of the Lake Louise ski hill lease in mid-May, 2009.

#### 2) Cougar

Similar to lynx, our camera data suggest strong cougar populations in Banff, Kootenay and Yoho National Parks. Excellent sign in BNP continues to be found on the Fairholme Bench, Cascade and Spray Valleys and around the Town of Banff. Images of what likely is the tagged study cougar “Doug” appeared a number of times from around Johnson Lake (Figure 6). He was travelling with another adult sized cougar in several image sets. At least three additional cougars were photographed in the Banff Field Unit, one of which appears in Figure 7 and all cougars photographed by remote camera were in this Field Unit and KNP.



Figure 6. Consorting pair of cougars includes what is likely the tagged study animal “Doug” along with another adult.



Figure 7. This adult cougar was photographed a number of times on the Fairholme Bench in Banff National Park. White-tailed deer are abundant in this region and two probable kills from this animal (which will be investigated this November), are likely here.

In Yoho National Park, cougar sign (images, tracks) were located most often in the Beaverfoot Valley. On a four day investigation of this valley in September I crossed fresh (< 1 day old) cougar tracks at least three times/day. Hunters commented regularly and negatively about this phenomenon. Cougar sign is also almost always to be found on Mt Hunter in YNP.

Kootenay National Park was a “hot spot” of cougar activity as determined by tracks although cameras only documented their presence there in 4 of the 21 total cougar events noted. South of the Simpson Monument, abundant fresh cougar sign were found with regularity during periods of good tracking conditions. As was noted in our report from last winter, cougar activity remains high between Daer Pond and Conservation Corps Ponds and based on tracks and images, I believe at least three cats are using this area.

### 3) Wolves

Wolves were imaged 439 times this summer. As wolves tend to travel in summer in singles or small groups, pack composition was hard to document. Packs were only noted in images from the later portion of the study period. I expect that winter tracking and camera data will confirm our knowledge of pack status. A brief summary of pack and pup data is provided in Table 6.

Table 6. Colouration and composition of wolf packs found in study area and surroundings. Data is from the summer Carnivore Monitoring Project – 2009.

Wolf Pack Composition, Colour of Individuals and Pup Survival			
Carnivore Monitoring Project, Summer - 2009 (as of November 1, 2009)			
PACK	NUMBER	COLOUR COMPOSTION	PUPS
Bow Valley	1	1 Gray	unknown
Fairholme	6	1 Black, 5 Gray	3 Gray
Cascade	7	4 Black, 3 Gray	2 Black, 1 Gray
Red D.	2	1 Black, 1 Gray	1 Black, 1 Gray

### **a) Banff Wolf Packs (General)**

Wolves in BNP that ventured east of park boundaries were hit hard by legal trapping and hunting this past winter (Figure 8). Blair Fyten reports that a Ya Ha Tinda trapper collected 8 wolves this winter and hands at the ranch report very little sign this spring. I am aware of an unsubstantiated report (to this time) of a trapper at Panther Corners having harvested 9 wolves. Alberta Sustainable Resource Development produced data (after considerable prodding) that indicated 31 wolves had been harvested in the Registered Fur Management Areas bordering the East boundary of BNP, during the winter of 2008 – 2009. I am also aware of an additional 3-4 wolves also harvested that have not appeared in these records. The apparent demise this winter of both the Panther and Saskatchewan Crossing Wolf Packs, are probably attributable to this high mortality. I have no data at this time on what once was the Clearwater Wolf Pack. Although I am aware of up to 35 wolves killed this past winter east of Banff National Park, our experience suggests that this number may be considerably higher as many human-caused wolf mortalities often are unreported. Conservatively, I estimate at least 10 additional wolves harvested and unreported in this area in addition to at least a few dead from natural causes. Potentially, 50 wolves could have died this winter in these RFMA's and it is our opinion that most would have been associated with packs that used parts of BNP.

Within the Parks this season, I note 5 wolf mortalities – details of which area outlined in Table 7. I made efforts to ensure 4 of the 5 carcasses available were brought to the walk-in freezer of the Banff Abattoir. A considerable effort was made to acquire similar wolf mortality data from the Province of British Columbia, but after many attempts, no useable data was provided.

**Numbers of wolf mortalities in RFMA's east of Banff National Park in winter 2008 - 2009**



Figure 8. Known wolf harvest in Registered Fur Management Areas (RFMA) east of BNP in the winter of 2008 – 2009. Data provided by Alberta Sustainable Resource Development and from author’s personal communications with trappers. Note the high mortality east of Saskatchewan River Crossing.

**Table 7. Specifics of 5 wolf mortalities documented during the summer Carnivore**

<b><u>Wolf Mortalities - Summer</u></b>					
<b><u>Carnivore Monitoring Project - 2009</u></b>					
<b>Date</b>	<b>Age</b>	<b>Colour</b>	<b>Sex</b>	<b>Pack</b>	<b>Location</b>
20-Aug	YOY - unconfirmed	black	unknown	Yoho	Finn Creek, TCH, YNP
25-Aug	young adult- unconfirmed	black	M	unknown	Norquay Interchange, TCH, BNP
26-Aug	young adult	gray	F	Bow (likely)	Storm Mtn., Highway 93 South, BNP
04-Sep	YOY	gray	F	Kootenay	Numa/Floe TH, Highway 93 South, KNP
6-Oct	YOY	black	F	Pipestone	Divide TCH, YNP/BNP boundary

**Monitoring Project. Death by vehicle strike was the cause of all mortalities.**



## **b) Red Deer Pack**

Ken Schroeder provided evidence for the possible existence of a pack of 3-4 wolves that he followed from Red Deer Lakes to the Ya Ha Tinda Ranch in mid-October. At this time, I was aware of a different location of the Pipestone Pack that historically would have occupied that same area. The two packs were over 60 km apart at that time, which suggests the presence of two distinct packs. However, an almost contiguous wolf tracking sequence of over 80 kilometres this fall, showed the Cascade Pack of 7 moving from Flint's Park, to Wigmore, to Windy and Barrier, a side trip up Elk Horn and then heading up Snow Creek Summit (where I did not follow). It is conceivable that the wolves that Ken followed, may have been from this pack and not the Red Deer Pack. However, to add more confusion, our camera at Red Deer Lakes on September 26, produced images of three very distinctly coloured adult wolves that were identical to those in the Pipestone Pack. So three scenarios at least are possible: 1) We have a separate "Red Deer Lakes Pack", 2) The Red Deer Lakes wolves are from the Pipestone Pack, and 3) the Red Deer Lakes wolves are from the Cascade Pack.

## **c) Saskatchewan Crossing Pack**

This group of 5 animals virtually disappeared over the winter. Data from Alberta Sustainable Resource Development indicated that 19 wolves were harvested in the RFMA – a significant portion of which was occupied by this pack. After four months of little or no wolf sign from the east park boundary at Saskatchewan Crossing to the middle Howse River region, a single gray wolf began to appear on our cameras. The den site was not occupied this summer but by September 3, the gray was joined by an adult black wolf, so the potential exists for a litter next year, should the trapping season be less successful.

Further information from Alberta biologists acquired in late 2008 confirmed that one radioed wolf in the pack was killed less than a month after collaring, and a second died in April 2008. Its relocations appear in Figure 9. I feel it unfortunate that due to the poor liaison with the Alberta provincial employees, both ourselves and Parks Canada personnel, devoted huge resources in attempts to relocate a wolf that was off the air and had died many months prior.

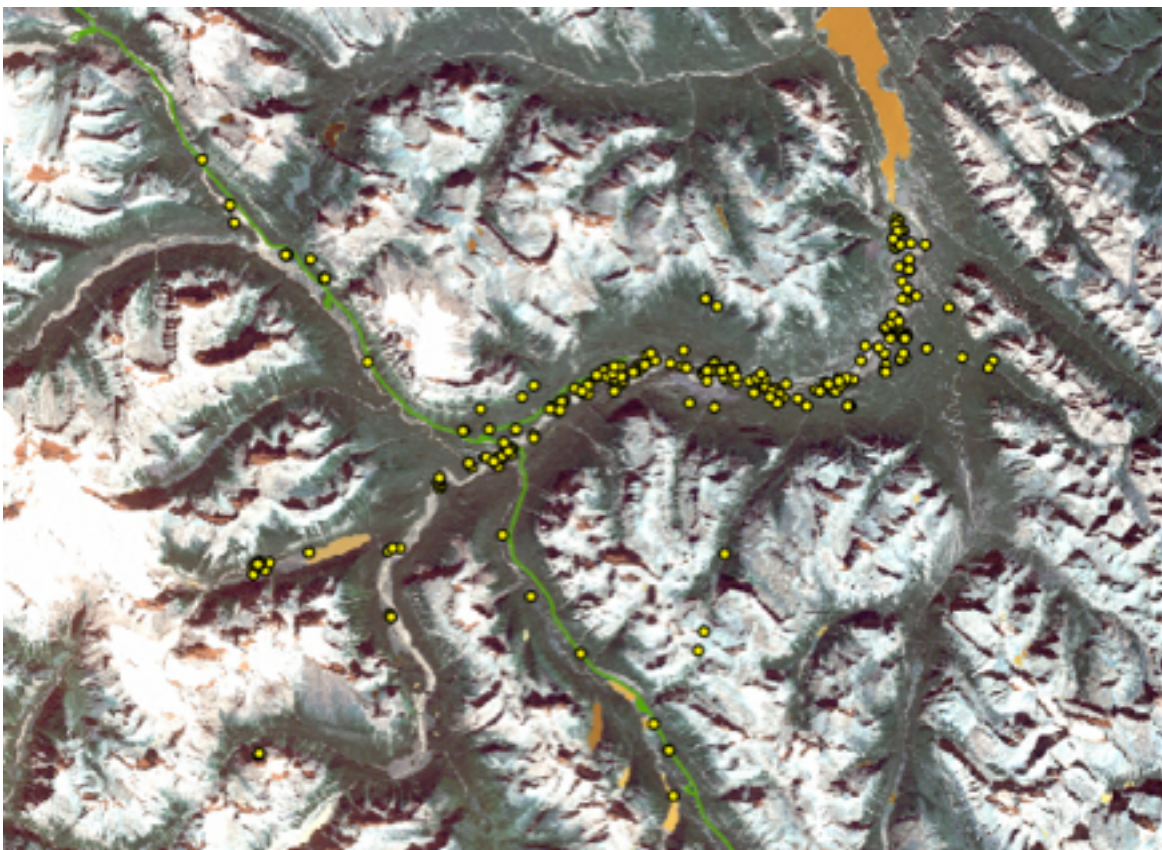


Figure 9. Relocations of the GPS collared wolf in the Saskatchewan Crossing Pack in early 2008. Most locations were along the South Saskatchewan River and south-west of Abraham Lake (large brown area). Our field work in conjunction to that of Park's confirms that the pack ranged as far south as Bow Summit, and as far north as The Weeping Wall (BNP).

#### d) Pipestone Pack

Confirmed denning of the pack of 5 occurred when a park visitor photographed 5 pups on June 26 near Protection Mountain in BNP. Subsequent observations have shown that the pack consists at the time of writing of only three adults coloured gray, dark silver and a black, along with 3 black pups. The Pipestone Pack of five that I observed last winter, have apparently lost some adults. Several observations were made this spring and early summer of a limping black adult in the group with a severely cut front left foot and it may not have contributed to the breeding success of this pack. One pup was killed on the TCH near the boundary to YNP in mid-October. This pack is ranging from Bow Summit, to Helen Lake, up the Pipestone River, to Castle Junction and into KNP north of Marble Canyon. The presence of this pack confirms that 4 to 6 wolf packs (Pipestone, Bow, Fairholme, Cascade and possibly Peter Lougheed and Palliser) inhabit the Bow Valley Watershed. Maximum annual wolf numbers for pack members during this reporting period in the Bow may be in excess of 40 (8, 7, 11, 6, 3, 7 - for the packs above respectively in early summer), but may range as low as 27 (6, 1, 6, 7, 1, 6 - minimum currently recorded to the time of writing).

An interesting cow elk kill was made by this pack near Altrude Lake on September 28. The elk was discovered by the pack in the low sedge meadows between lower Altrude and Vista Lake. Using the terrain to their maximum benefit, the pack ran the elk in the narrow confined valley until it hit a large boulder talus slope where it could proceed no further. The pack of 7 at the time, consumed 100% of the elk in 4 days. Our investigation thereafter showed the elk to be healthy (see bone marrow Figure 10).



Figure 10. Bone marrow of cow elk killed by the Pipestone Wolf Pack on September 28, 2009 at Altrude Lake, KNP. A high fatty content is evident.



### e) Bow Valley Pack

Very little is known about the current status of this pack and I suspect its demise. High winter mortality coupled with at least 2 (possibly 3) summer mortalities of the pack, leave its status in question. I remind the reader of the death of a lactating female and a YLY? on August 25 and September 4 respectively – both on the TCH near Redearth Creek and both from this pack. Early summer camera images this year show a black and a gray adult at large. Several observations of 5 pups in the Hillsdale area were made (one shown in Figure 11) by visitors this summer. Subsequent camera data suggest that only one adult (gray) may remain and the fate of the pups is unknown. During a fortuitous snow in October, I was able to travel Goat Creek, Middle Spray, Sundance Pass and the 1A Bow Valley with exceptionally good tracking conditions. I found no evidence of any wolves at that time, however it is possible that the pack may have been up Johnston or 40 Mile Creek.



Figure 11. One of 5 pups known to be born to the Bow Valley Pack this summer in BNP. (Photo courtesy of Dongwon Shin, August 26, 2009)

When the den site on Highway 1A was checked this fall, I was interested to discover that 82% (n = 72 of 87) of adult wolf scat found in the area that were deposited in 2009, consisted partially or largely of berries (*Vaccinium* sp., *Ribes* sp., *Rubus* sp., *Juniperus* sp., *Viburnum* sp., and *Rosa* sp.) (Figures 12 and 13). I have previously observed berries in scat, but never to this extent. Our hypothesis was that there may have only been one other adult supporting the breeding female and her pups. Perhaps that female was forced to partially sustain herself by local foraging. Also at the den site I found parts of a helium balloon that the pups had apparently chewed upon – perhaps brought to them by adults as a toy. Coincidentally I observed the same remnants in the KNP wolf pack den site. Helium balloons have been found 5 times in 2 years by this researcher. I know of balloons found in the park that were released by an auto dealer in Seattle, U.S.A. and suggest that they be banned from use in special events in BNP (if not the entire Mountain Parks).



Figures 12 and 13. Adult wolf scat photographed at 1A 2009 wolf den site of Bow Valley Pack in BNP. Note the preponderance of cranberry skins and blueberry seed.

Canola seeds were apparent in a wolf scat collected on the 1A near Silver City (BNP) in September this season (Figure 14). The wolf may have ingested the seed when consuming the gut contents of a deer which had fed on CPR tracks. Concurrent to this study, I viewed and tabulated over one-quarter of a million images taken in time-lapse of 5 – 6 CPR rail sections in Banff and Yoho National Parks this summer for Jesse Whittington's studies, and at no time did I observe any canids eating grain on the tracks.





Figure 14. Canola seed within a wolf scat near Silver City BNP. It is probable that this wolf consumed the seed incidental to eating the gut contents of deer. As seed from the tracks is often coated in petro-chemicals (creosote and various lubricating greases), it may be prudent to have wolf and bear mortalities tested for petro-chemical metabolites upon necropsy.

#### f) Fairholme Pack

An early May survey of three previous Fairholme wolf pack den sites this year, showed no sign of wolf activity. As the only “pack” activity that I observed on the Fairholme bench this past winter was attributed to the Cascade Wolf Pack, I had no reason to suspect that denning would occur there. (The Cascade Pack has denned near the middle Cascade for a number of years.) However, it appears that the Cascade Pack of 6 wolves (past winter count) had split and three denned in each traditional den area (Cascade and Fairholme). I was fortunate to briefly observe a single gray adult female and 8 gray pups on the power line approximately halfway down the bench in July (Figure 15). Later survey showed that they had indeed denned on the bench although the onset of denning was several weeks later than normal (mid-May). This, coupled with the large litter size, accounted for the exceptionally small size of the pups observed at that time (Figure 16). Our best available current data now shows 6 gray wolves on the Fairholme Bench.



Figure 15. Adult and 8 wolf pups (not all appear in this picture) were seen in late July, 2009 on the Fairholme Bench in BNP. This confirmed that two packs existed and that the Cascade Pack had most likely split.



Figure 16. One of 8 pups seen near Duthill, BNP in August of 2009. As the Cascade Pack denned late and the litter size was exceptional, the pup size was smaller than normal for that time period. This image was taken with a Reconyx covert remote camera situated > 1 km from the known den site.

In October, I skirted the current den site of the Fairholme Pack and discovered an additional set of dens in the area. Leaf debris and vegetative growth in the 4 den

entrances, suggest that they were used > 4 years ago. I was disturbed to also discover at this site, a photographer's tree stance within 7 m of the most heavily used den (Figures 17 and 18). That photographers utilize this technique with wolves was recently confirmed by J. Marriott when interviewed for the Canmore Leader, November 4, 2009 ("*Marriott's Delinda pic to get cover treatment*"). This structure speaks additionally to the considerable human induced stress placed on wolves in the Bow Valley. I suggest that the location of all wolf dens be kept out of all databases and be shared on a "need to know" basis only.



Figures 17 and 18. Left image shows the photographer's tree stance at an older den site of the Fairholme wolf pack in BNP. This same blind appears top centre in the image to the right and is < 7 m from the den opening seen at lower center.

#### **g) Cascade Pack**

Two black and 2 gray adult wolves remained in the Cascade Valley after the apparent pack split this spring. Cameras, personal sightings and tracks confirmed denning near the Elk Trap in the middle Cascade, but at a site new to the author. Cameras confirmed a black lactating female in the area on July 21, 2009. Last year's den near Flint's Park was unoccupied. In late July, I was able to conclude that at least 3 pups were born to the group. In August, when the pups were able to travel at least short distances with the pack, the black female moved them north of Wigmore Summit.

With great interest I tracked a single wolf from CR32 (upper Cascade) over Badger Pass to Johnston Creek this summer. This speaks to the ephemeral nature of the human construed “boundaries” of wolf territories.

An examination was made of the temporal use of the Cascade Fire Road by this wolf pack and compared to use (generalized) by commercial horse traffic. This interesting application of remote camera data in Figure 19 demonstrates that wolf activity is virtually eliminated at the Lone Pine camera station, when daily horse traffic begins. The effect to wolf pups and breeding female of this displacement is unknown, but I hypothesize negative results when wolf use of the main travel route is precluded. Wolves feeding both pups and the Alpha female would be forced to use alternative (less desirable) routes or alter the diurnal pattern of feeding.

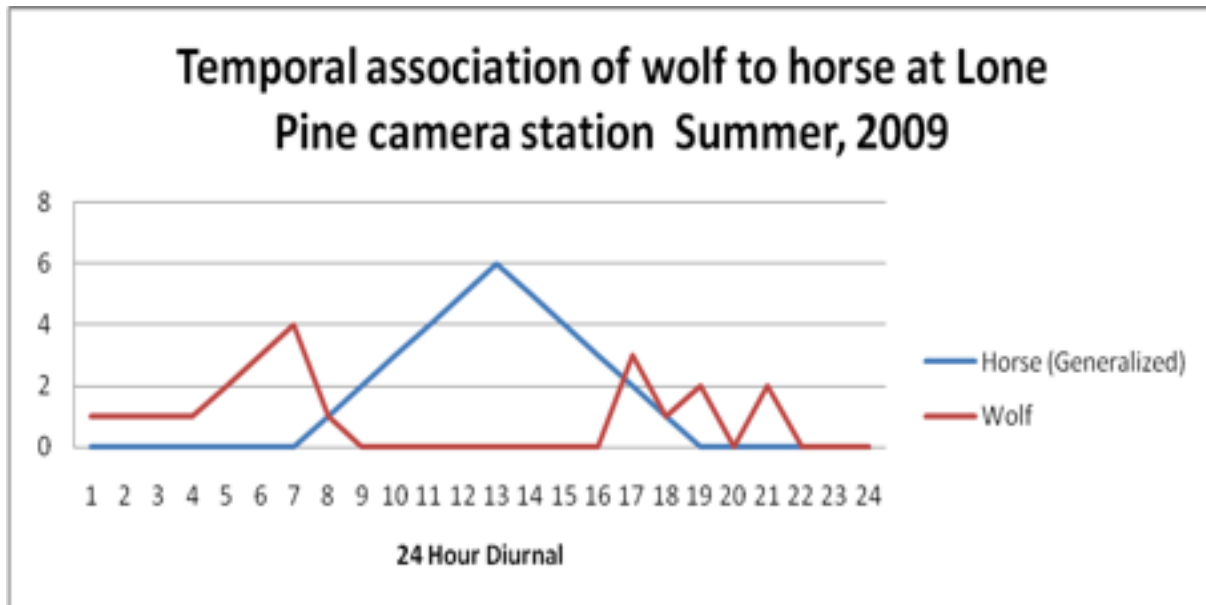


Figure 19. Graph of all wolf appearances at the Lone Pine camera station on the Cascade Fire Road (BNP) where commercial horse traffic was also present (June 1 – October 1, 2009), to a representation of diurnal horse use (patterned after remote camera data collected at site).

**h) Panther Pack**

Still no evidence exists for a separate wolf pack in the Panther/Barrier region. Resource Conservation staff and ourselves checked the traditional den site for this pack and no fresh sign was evident. I continue to believe that the Cascade Pack has adopted the region and now occupies the Panther, Dormer, Stony, Elk Lakes, Upper to Lower Cascade and 40-Mile (to an unknown extent) drainages. Back-tracking wolf sequences this fall showed that the Cascade Pack investigated the Panther River den site.

**i) Kootenay Pack**

At this time, I believe the Kootenay Pack to be comprised of at least 6 gray wolves, only two of which are YOY. I have additional gray wolves appearing on camera or from visitor reports that suggest that more wolves may be loosely affiliated with the pack. Most documentations of the pack by cameras, record 3 to 4 grays travelling together and one series shows 5. I remind the reader of the YOY mortality near Numa/

Floe trailheads this September 4<sup>th</sup>, so the pack must have produced a minimum of three pups this spring. A question remains as to the disposition of 3 adult grays that have “disappeared” as the original pack at time of denning, was comprised of 6 gray adults. It appears from sightings and camera data that the territory of this pack has not changed significantly since the time of our last report. It is expected that the preponderance of wolf activity in the north end of KNP, will soon diminish as snow depths approach 50 cm this winter.

#### **j) Yoho Pack**

I am still unsure of the number of pups surviving and the status of the Yoho Wolf Pack. Four contiguous days spent in YNP and the Beaverfoot with good snow tracking conditions, produced evidence of only 4 wolves moving together. Camera data suggested that only 3 adults remained in the pack from late winter, into the denning season of 2009 and during the denning period, only two were documented. Careful examination of the traditional den site of the pack revealed that they did not den in the middle Kicking Horse Valley of YNP. I attribute this potentially to disturbances caused by humans investigating a near-by historical site and a reference to the wolf den location in a well known hiking guide for Kootenay, Yoho, Revelstoke and Glacier National Parks. I contacted the authors and editors of the guide but no compliance to our simple request to omit the offending brief passage was made. The “Friends of Revelstoke/Glacier” were notified and were asked to remove the book from sale, but again, they were not supportive. The “Friends of Yoho” were asked to do the same, and for a brief time, the book was not available in the Field Visitor Center. When the author last checked however, the book had been returned to the shelves for public sale. I am liaising with YNP Fire and Vegetation staff to protect the den area should the proposed prescribed fire occur in the Kicking Horse Valley.

I was able to confirm successful denning in the Beaverfoot this spring with pup scat and tracks located, but could not determine the total number of adults and pups. Counting the August 20<sup>th</sup> YOY mortality at Finn Creek, we know the female produced at least 3 pups. It would not surprise us to learn that additional wolf mortality has occurred in the Beaverfoot during the hunting season. The pack appeared in close proximity to numerous hunters for the duration of our investigation there. All hunters contacted except for one (n = > 20) suggested they would readily shoot a wolf if they had the chance.

#### **k) Lone wolves**

With the absence of snow, it is almost impossible to determine the presence of lone wolves. As wolves appear to often hunt in small groups in the summer (and recently I’ve noticed the same for the winter), I will wait until good tracking conditions exist to postulate the status of lone wolves. Cameras do continue to produce images of a small adult black wolf on occasion that frequents the West Kootenay and Dolly Varden Fire Roads. In one pass by the Crooks Meadows camera this summer (KNP) this wolf was accompanied by another gray. Subsequent images show it travelling solo again. It is possible that a gray lone wolf is travelling in the Spray and Bow Valleys which could be from the Bow Valley Pack.

#### **4) Coyotes**

“Ubiquitous” adequately describes the coyote status in all 3 Mountain Parks. Confirmed 2009 denning is at: the Buffalo Paddock, Indian Grounds, Moose Meadows, CR6 campsite (BNP); and the Black Bridge (YNP). I suspect successful (unverified) denning at: Island Lake and Baker Lake, Middle Spray near Rink’s Camp (BNP); the Yoho Carrion Pit (YNP); and at Kootenay Crossing Pasture and Crook’s Meadows (KNP). No other new reportings are included here. Eighty-three coyotes were photographed in 11 of 23 fixed camera locations



## 5) Fox

I was able to confirm successful denning of fox at: Cascade trailhead, CR6 campsite (Cascade), Elk Trap (Cascade), and near Dog Lake (KNP). It is highly likely that fox also denned near the Yoho Carrion Pit, at Leanchoil Marsh (YNP), Moose Meadows (BNP), Johnson Lake (BNP), although these sites have not been specifically located. In June 2009 I reported that the den site at the CR6 campsite had been vandalized. Several large logs had been rammed into the two holes that had been traditionally used by fox for the past 4 years. They were removed but this site had been rendered unusable by this time. Happily in September of this year, I was able to locate a new fox den site that had been recently used, within 800 m of the old site (Figure 20). Nine remote camera locations documented 22 image sets of fox.



Figure 20. The new den opening of the CR6 fox of BNP. Kit scat in an adjacent meadow suggests successful denning in 2009.

## 6) Wolverine

Tracks continue to be found with regularity in Helen Lake/Creek area, Dolomite Pass, Sherbrooke Lake, lower Cataract Brook/Narao Lakes; and sporadically in Dainard and Amiskwi Basin, near Wigmore Summit to Bighorn Lake, and up the Elk Horn drainage on the Panther River. I followed one wolverine over Badger Pass from Flints Park in good summer tracking conditions but lost it after 6 kilometres. Cameras showed only 3 wolverine image sets – all at Helen Lake.

## 7) Fisher

No tracks/scat/sightings or camera images were produced by this study for Fisher during this reporting period.

## 8) Bobcat



Similarly, no sign was found for Bobcat. I am surprised that KNP cameras do not document the occasional image of Bobcat, but our cameras are largely concentrated in the central portion of that park and Bobcat are more apt to inhabit southern regions (in spite of the 2008 mortality of a Bobcat at Castle Junction, BNP).

## 9) Grizzly Bears

An unusually cold late spring and early summer negatively affected the number of sightings of grizzlies in all three parks. Steve Michel kindly did a Parks Canada database search to provide that between May 27 and November 9, 1837 bear sightings were reported for the study area in 2008, compared to 1187 in 2009. The 650 fewer sightings in 2009 represent a 35% drop in sightings year over year.

Green-up was approximately 2 weeks later than normal and severe frosts in late June and early July significantly reduced viable flowering of Buffalo Berry. Pockets of higher elevation berries could be found in late July, having escaped the frost because they were not flushed at the time of the frosts. Southern Yoho and Kootenay Parks were not affected and produced reasonable crops of these berries. As a result, bears rapidly moved high after green-up and stayed high until the fall. Surprisingly, the bears observed post berry season (personal sightings and camera images) suggest relatively good (average?) body condition (Figures 21, 22, 23, 24, 25). Hedysarum crops were heavily dug and exceptional berry crops other than Buffalo Berry were produced (especially in the burns of KNP) that may have been contributory. I tracked a late season 8 km movement of a grizzly up Snow Creek in BNP when 40 cm of snow lay on the ground and yet the bear continued to successfully dig Hedysarum on the south facing bank of a fire road. A grizzly that likely received a significant shoulder wound from another bear appears in Figure 26, yet still appears in fine early fall condition. Grizzly bears were documented by remote cameras on 103 occasions – a presence second only to wolves (439 wolves). It was interesting to note that every camera station but three that documented wolf activity, also documented grizzly bears. Grizzlies were captured by remote cameras 12, 30 and 61 times in KNP, YNP, and BNP respectively. Adjusted to a per camera basis, I found that they were photographed 4, 10 and 4 times respectively, per camera station over the summer. Yoho showed the highest incidence of grizzly appearances however this result is somewhat skewed by the high amount of bears documented at the Yoho Carrion Pit (N = 20).

Personal communication with hunters in the Beaverfoot Valley, indicate that 2 grizzlies were successfully hunted there this year. I was not able to confirm this information with British Columbia Conservation Officers. I provide no tabulation of grizzly or black bear mortality as Park's database is current and accurate.







Figures 21 - 25 show mid to late season grizzly bears in all three parks and attest to the apparently “average” body condition despite the virtually total failure of their most significant summer/fall food – *Shepherdia canadensis* (Buffalo Berry).



Figure26. An apparently healthy grizzly bear strolls near the Crooks Meadow of KNP in late September. The body condition appears “normal” although this bear shows a significant shoulder wound – possibly from a fight with another bear.

### 10) Black Bears

Black bears suffered high mortality both within and adjacent the Parks this summer. Mike Gibeau and Barb Bertch’s bear mortality summaries would best be used to examine this matter. Black bears were roughly 25% less common than grizzlies throughout the study area as judged by camera data (103 grizzly bears versus 75 black bears). They were found most often in KNP and YNP as compared to BNP (n = 33, 15 and 27 respectively). On a per camera comparison, I found a mean of 11, 5 and .6 black bears were imaged for the three parks respectively. The same discussion regarding body condition of grizzly bears, generally applies to black bears and I believe that they too, denned in fair body shape (Figure 27).



Figure 27. This black bear near Bow Summit in BNP appeared in fine form in October, 2009.

In October, 2009 Patrick Langan collected a black bear rail-killed approximately 3 km west of Field (Figure 28). Our investigation showed the bear's front paws and shoulders to be covered in grease. Gut contents confirmed that this animal was feeding on grain from the tracks. Figure 29 shows further proof of the attraction of creosote on power poles, to bears in YNP. I believe that all bear mortalities (rail killed especially) should have samples submitted for laboratory determination of metabolite levels of grease and diesel fuel.



Figure 28. The front paws of this black bear killed by CPR east of Field (YNP) were saturated in grease and the bear had a very pronounced odour of diesel fuel. The bear had been feeding on grain spilled on the tracks and had also been rolling in rail-switch grease.



Figure29. These images of two heavily oiled power line poles in YNP, show extensive damage by bear bites and scratches. That various petroleum products are attractants to bears is undisputed and lends credence to the suggestion that the metabolic effects on bears should be investigated. (Photo courtesy of Ken Schroeder, YNP)



**Other events of interest**

A pair of Peregrine Falcons were twice observed in the North Molar meadows (NG 527260, 5723500) this summer. Perhaps this pair was also observed at the headwaters of the Siffleur River on other occasions. A pair was also observed at Baker Lake (NG 670, 050) in June. Prairie Falcons nested again on Flints Peak in the upper Cascade. Additional oddities of interest are displayed in Figures 30 to 33.



Figure 30. Two White-tailed Deer on hind legs, jousting near Johnston Campground (BNP) in September, 2009.





Figure 31. The black wolf of the Yoho Wolf Pack chases off a young adult grizzly in the Yoho Carrion Pit (YNP), August, 2009. The remote camera showed a number of confrontations between two adult wolves and this bear. In every instance that I could determine, the wolves (singly or as a pair) successfully drove off the grizzly bear – albeit temporarily. Another grizzly/wolf confrontation was documented on September 1, 2009 in tracks along the banks of the Vermillion River. The bear was circled and harassed by at least 3 wolves on the river’s edge – outcome unknown.



Figure32. I believe that the impact of horse traffic on Parks Canada’s physical infra-structure coupled with a wide variety of ecological concerns, suggests that the cumulative effects of large-party commercial

horse traffic, should be re-visited. In the summer of 2009, our cameras documented a horse party of 34 guests (perhaps two parties coalesced) and two mule/horse groups numbering 30 and 41 in the Cascade Valley, BNP.





Figure 33. At the Spray Mineral Lick (BNP) our camera documented 13 species this summer including the goat group above. The site is of considerable importance to ungulates and predators alike. Most carnivore species including Fisher, have been imaged here over a two year period. This goat group was displaced by joggers illegally coming out of Sundance Pass on June 26, 2009.

### Covert Camera success

Field trials of two new PC-90 Reconyx cameras show a marked reduction of the startle effect shown by wolves when the older camera models (PM35 and PC85) flashed varying degrees of infra-red light at night (as reported by Gibeau and McTavish in *Wildlife Professional, Volume 3 No.3*). I suggest that Parks adopt a position towards elimination of all white or visible red-flash remote cameras when used for internal research. Perhaps a park-wide ban could be phased in and could include hobby and professional photographers that continue to employ these devices in all three parks. Figures 34, 35, and 36 show fox, wolves and cougar photographed with the Reconyx PC-90 which has an invisible flash at night.





Figures 34, 35, and 36. Fox, wolves and cougar photographed at night with the Reconyx PC-90 remote camera, which flashes no visible light at night. No displacement or startle effect was noted by these or by any animals photographed at night by these camera units. It is suggested that Parks Canada gradually phase out the older model Reconyx PM-35 cameras still in use, and ban the use by researchers and professional and hobby photographers, of this model and any remote camera that flashes white light at night. An article on this issue by Mike Gibeau and this author was published in *“Wildlife Professional”* this fall.

### **Numa Flats Wolf**

A series of road-side appearances of a young, somewhat emaciated gray wolf occurred this summer between Numa Flats and the Simpson Monument (Figure 37). It was observed to have been fed by humans and habituated to this activity in the close presence of visitors. Our great respect is given to Parks’ personnel for the many attempts made to dissuade this animal from this activity (Figure 38).

Diversionsary feeding of 7 deer proved to be effective as this animal was last seen in good condition and not seen again after August 1, 2009.



Figure 37. Bedraggled young wolf, road side at Numa Flats (KNP) in July 2009. (Photo courtesy of Kevin Dibb.) This animal was seen numerous times along Highway 93S begging for food until it was successfully (assumed) lured away from this activity by diversionary feeding in August, 2009.



Figure 38. Signage placed here near Numa Falls and at the Simpson Monument in KNP, appeared very effective in reducing the illegal feeding of the habituated wolf. This pro-active move was a huge expense and considerable effort made for one wolf!



Figure 39. The concept of “Animal Communication Trees – Billboards of the Forest” continues to be developed. At one tree near Johnson Lake (BNP) I have documented use (sniffing, scent marking, urination, scratching and defecation) by: wolves, coyotes, black and grizzly bears, cougar, marten, both species of deer, elk and moose. Over 40 species have been recorded now at these special sites. The wolf above has scent marked on the tree that a grizzly has just rubbed and that several bull elk have sniffed. Even domestic dogs react positively to these trees and if they are off leash, the result may be problematic to wildlife. A paper on this phenomenon is currently in preparation.



Figure 40. I was greatly concerned when a series of images (one above) appeared on a remote camera near Flint's Park in BNP this summer. It appears obvious that certain Resource Conservation personnel had likely been spending an excessive amount of time in remote secluded back-country settings, to the point where one must question both the deleterious effects of spending too much time alone and the sanity of these same staff.

### **Outreach**

Presentations of our work were made to four groups of school children this summer, in Banff and Calgary public schools. Approximately 160 junior high students in two schools were shown a road-killed wolf adult and pup along with many other specimens. Topics covered ranged from "Form and Function", to "Wildlife Corridors", to "Conservation of species issues within National Parks". With few exceptions, students and teachers were greatly appreciative.

### **ACKNOWLEDGEMENTS**

Mike Gibeau has supported and funded the Carnivore Monitoring projects for several seasons. His experience, level-headed wisdom, and far-sighted approach to carnivore conservation and monitoring, has been much appreciated and greatly admired! Jesse Whittington also has supported our work both logistically and financially. Thank-you Jesse! Eli Whittington provided the nicest company and entertainment on a number of our wilderness forays. Sharon McTavish continues to volunteer countless hours in the field and in logging the database. What a great wife! Barb Bertch and Greg Olesky competently continued once again to assist in field work in District West. Steve Michel and Hal Morrison proficiently and accurately answered our many enquires. I thank Hilary Husar, Chris Worobets, and Glenn Kubian for their assistance and generosity in sharing Park's cabin facilities and Ken Schroeder for his assistance, sheerfully supplied knowledge, skill, incite and jokes. Shelagh Wrazej was as usual, a miracle worker with her happy, competent and conscientious manner. Thanks all!