

Common Name	Scientific Name	CAP DATE	WHID	EAR TAG	AGE CLASS	SEX	BCS	Family	TICKS
Mule Deer	<i>Odocoileus hemionus</i>	6-Mar-2017	16-9027	Yellow 0-1138	Adult	F	Poor		Few
Mule Deer	<i>Odocoileus hemionus</i>	6-Mar-2017	16-9018	Yellow 0-1158	Adult	F	Poor	Dam of 16-8233	Few
Mule Deer	<i>Odocoileus hemionus</i>	6-Mar-2017	16-8233	Yellow 0-992	Fawn	F	Fair	Fawn of 16-9018	Moderate
Mule Deer	<i>Odocoileus hemionus</i>	6-Mar-2017	15-7030	Green-Yellow 010	Adult	F	Fair		Few
Mule Deer	<i>Odocoileus hemionus</i>	6-Mar-2017	16-9031	Yellow 0-1118	Adult	F	Poor		None obvious
Mule Deer	<i>Odocoileus hemionus</i>	6-Mar-2017	15-7028	Green-Yellow 012	Young adult	F	Fair		Few
Mule Deer	<i>Odocoileus hemionus</i>	6-Mar-2017	15-7029	Green-Yellow 011	Young adult	F	Poor		None obvious
Mule Deer	<i>Odocoileus hemionus</i>	7-Mar-2017	17-9552	Yellow 0-1336	Young adult	F	Fair	all deer capture 201	None obvious
Mule Deer	<i>Odocoileus hemionus</i>	7-Mar-2017	17-9549	Yellow 0-1320	Young adult	F	Fair	all deer capture 201	None obvious
Mule Deer	<i>Odocoileus hemionus</i>	7-Mar-2017	17-9550	Yellow 0-1338	Adult	F	Good	all deer capture 201	Few
Mule Deer	<i>Odocoileus hemionus</i>	7-Mar-2017	17-9551	Yellow 0-1317	Fawn	M	Fair	Fawn of 17-0317; a	Moderate
Mule Deer	<i>Odocoileus hemionus</i>	7-Mar-2017	17-9555	Yellow 0-1323	Young adult	F	Fair	Dam of 17-9551; all	Few
Mule Deer	<i>Odocoileus hemionus</i>	8-Mar-2017	17-9553	Yellow 0-1326	Aged	F	Fair	all deer capture 201	Moderate
Mule Deer	<i>Odocoileus hemionus</i>	8-Mar-2017	17-9562	Yellow 0-1334	Young adult	F	Poor	all deer capture 201	Moderate
Mule Deer	<i>Odocoileus hemionus</i>	8-Mar-2017	17-9561	Yellow 0-1313	Young adult	F	Fair	all deer capture 201	Few
Mule Deer	<i>Odocoileus hemionus</i>	8-Mar-2017	17-9568	Yellow 0-1318	Young adult	F	Fair	all deer capture 201	Few
Mule Deer	<i>Odocoileus hemionus</i>	8-Mar-2017	17-9554	Yellow 0-1309	Fawn	M	Fair	all deer capture 201	Moderate
Mule Deer	<i>Odocoileus hemionus</i>	8-Mar-2017	17-9560	Yellow 0-1330	Fawn	M	Fair	all deer capture 201	Few
Mule Deer	<i>Odocoileus hemionus</i>	8-Mar-2017	17-9567	Yellow 0-1316	Fawn	M	Fair	all deer capture 201	Few
Mule Deer	<i>Odocoileus hemionus</i>	9-Mar-2017	17-9558	Yellow 01333	Young adult	F	Poor		Few
Mule Deer	<i>Odocoileus hemionus</i>	9-Mar-2017	17-9573	Yellow 0-1344	Aged	F	Poor		Heavy
Mule Deer	<i>Odocoileus hemionus</i>	9-Mar-2017	17-9557	Yellow 0-1322	Aged	F	Fair		Moderate
Mule Deer	<i>Odocoileus hemionus</i>	9-Mar-2017	17-9556	Yellow 0-1332	Young adult	F	Fair		Few
Mule Deer	<i>Odocoileus hemionus</i>	9-Mar-2017	17-9565	Yellow 0-1308	Fawn	M	Poor	Sibling of 17-9564;	Heavy
Mule Deer	<i>Odocoileus hemionus</i>	9-Mar-2017	17-9564	Yellow 0-1305	Fawn	F	Poor	Sibling of 17-9565;	Moderate

CAPTURE METHOD	DRUG COMBO	COLLAR TYPE	COLLAR ID	FREQUENCY	STUDY AREA	SITE	Zone
Dart gun	BAM	Vectronics GlobalStar Survey	20655	149.735	Kimberley	s.15,s.22	
Dart gun	BAM	Vectronics GlobalStar Survey	20666	150.170	Kimberley		
Dart gun	BAM	none			Kimberley		
Dart gun	BAM	Vectronics GlobalStar Survey	20660	149.860	Kimberley		
Dart gun	BAM	Vectronics GlobalStar Survey	20661	150.018	Kimberley		
Dart gun	BAM	Vectronics GlobalStar Survey	20663	150.060	Kimberley		
Dart gun	BAM	Vectronics GlobalStar Survey	20664	150.080	Kimberley		
Dart gun	BAM	Vectronics GlobalStar Survey	20839	150.649	Cranbrook		
Dart gun	BAM	Vectronics GlobalStar Survey	20835	150.448	Cranbrook		
Dart gun	BAM	Vectronics GlobalStar Survey	20834	150.376	Cranbrook		
Dart gun	BAM	none			Cranbrook		
Dart gun	BAM	Vectronics GlobalStar Survey	20840	150.728	Cranbrook		
Dart gun	BAM	Vectronics GlobalStar Survey	20667	150.200	Cranbrook		
Dart gun	BAM	Vectronics GlobalStar Survey	20658	149.840	Cranbrook		
Dart gun	BAM	Lotek Life Cycle	36096	150.940	Cranbrook		
Dart gun	BAM	Lotek Life Cycle	36092	150.700	Cranbrook		
Dart gun	BAM	none			Cranbrook		
Dart gun	BAM	none			Cranbrook		
Dart gun	BAM	none			Cranbrook		
Dart gun	BAM	Lotek Life Cycle	36107	151.220	Kimberley		
Dart gun	BAM	Lotek Life Cycle	35831	148.379	Kimberley		
Dart gun	BAM	Lotek Life Cycle	36093	150.780	Kimberley		
Dart gun	BAM	Lotek Life Cycle	35829	148.156	Kimberley		
Dart gun	BAM	none			Kimberley		
Dart gun	BAM	none			Kimberley		

EASTING	NORTHING	Datum	TRANSLOC	RELEASE SITE	EASTING	NORTHING	Datum	Comments
573944	5502946	NAD83	Yes	km 28.5 Kootenay River FSR	596664	5576977	NAD83	2 ticks; deer would not leave trailer at release, would not stand; took he
573992	5502710	NAD83	Yes	km 28.5 Kootenay River FSR	596664	5576977	NAD83	1 tick
573992	5502710	NAD83	Yes	km 28.5 Kootenay River FSR	596664	5576977	NAD83	10 ticks
573623	5503037	NAD83	Yes	km 28.5 Kootenay River FSR	596664	5576977	NAD83	2 ticks were collected
573642	5503111	NAD83	Yes	km 28.5 Kootenay River FSR	596664	5576977	NAD83	
573642	5503111	NAD83	Yes	km 28.5 Kootenay River FSR	596664	5576977	NAD83	3 ticks were collected
573642	5503111	NAD83	Yes	km 28.5 Kootenay River FSR	596664	5576977	NAD83	
589816	5484568	NAD83	Yes	km 28.5 Kootenay River FSR	596664	5576977	NAD83	
589816	5484568	NAD83	Yes	km 28.5 Kootenay River FSR	596664	5576977	NAD83	
589816	5484568	NAD83	Yes	km 28.5 Kootenay River FSR	596664	5576977	NAD83	1 tick
589822	5484464	NAD83	Yes	km 28.5 Kootenay River FSR	596664	5576977	NAD83	
589826	5484407	NAD83	Yes	km 28.5 Kootenay River FSR	596664	5576977	NAD83	1 tick
589877	5485171	NAD83	Yes	km 28.5 Kootenay River FSR	596664	5576977	NAD83	
589744	5484961	NAD83	Yes	km 28.5 Kootenay River FSR	596664	5576977	NAD83	1 tick was collected
589778	5484985	NAD83	Yes	km 28.5 Kootenay River FSR	596664	5576977	NAD83	
589805	5485027	NAD83	Yes	km 28.5 Kootenay River FSR	596664	5576977	NAD83	
589805	5485027	NAD83	Yes	km 28.5 Kootenay River FSR	596664	5576977	NAD83	
589744	5484961	NAD83	Yes	km 28.5 Kootenay River FSR	596664	5576977	NAD83	
589744	5484961	NAD83	Yes	km 28.5 Kootenay River FSR	596664	5576977	NAD83	
575567	5498526	NAD83	Yes	km 28.5 Kootenay River FSR	596664	5576977	NAD83	2 ticks
575450	5499227	NAD83	Yes	km 28.5 Kootenay River FSR	596664	5576977	NAD83	6 ticks were collected
575735	5498421	NAD83	Yes	km 28.5 Kootenay River FSR	596664	5576977	NAD83	
575264	5498844	NAD83	Yes	km 28.5 Kootenay River FSR	596664	5576977	NAD83	2 ticks were collected
575627	5498672	NAD83	Yes	km 28.5 Kootenay River FSR	596664	5576977	NAD83	8 ticks were collected
575627	5498672	NAD83	Yes	km 28.5 Kootenay River FSR	596664	5576977	NAD83	

er back to contractor's home in trailer, attended by vet and immediately stood up in trailer. Overnighted in trailer, again very reluctant to leave trailer on Mar 7, but eventually stood and ran off.

Probable extreme submissive behaviour or stressed. Post-release movements in first week are normal.

Common Name	WHID	Capture Location	Capture Date	Sex	Age Class	Eartag	Release location
Mule Deer	16-9027	s.15,s.22	6-Mar-2017	F	Adult	Yellow 0-1138	km 28.5 Kootenay River FSR
Mule Deer	16-9018		6-Mar-2017	F	Adult	Yellow 0-1158	km 28.5 Kootenay River FSR
Mule Deer	16-8233		6-Mar-2017	F	Fawn	Yellow 0-992	km 28.5 Kootenay River FSR
Mule Deer	15-7030		6-Mar-2017	F	Adult	Green-Yellow 010	km 28.5 Kootenay River FSR
Mule Deer	16-9031		6-Mar-2017	F	Adult	Yellow 0-1118	km 28.5 Kootenay River FSR
Mule Deer	15-7028		6-Mar-2017	F	Young adult	Green-Yellow 012	km 28.5 Kootenay River FSR
Mule Deer	15-7029		6-Mar-2017	F	Young adult	Green-Yellow 011	km 28.5 Kootenay River FSR
Mule Deer	17-9552		7-Mar-2017	F	Young adult	Yellow 0-1336	km 28.5 Kootenay River FSR
Mule Deer	17-9549		7-Mar-2017	F	Young adult	Yellow 0-1320	km 28.5 Kootenay River FSR
Mule Deer	17-9550		7-Mar-2017	F	Adult	Yellow 0-1338	km 28.5 Kootenay River FSR
Mule Deer	17-9551		7-Mar-2017	M	Fawn	Yellow 0-1317	km 28.5 Kootenay River FSR
Mule Deer	17-9555		7-Mar-2017	F	Young adult	Yellow 0-1323	km 28.5 Kootenay River FSR
Mule Deer	17-9553		8-Mar-2017	F	Aged	Yellow 0-1326	km 28.5 Kootenay River FSR
Mule Deer	17-9562		8-Mar-2017	F	Young adult	Yellow 0-1334	km 28.5 Kootenay River FSR
Mule Deer	17-9561		8-Mar-2017	F	Young adult	Yellow 0-1313	km 28.5 Kootenay River FSR
Mule Deer	17-9568		8-Mar-2017	F	Young adult	Yellow 0-1318	km 28.5 Kootenay River FSR
Mule Deer	17-9554		8-Mar-2017	M	Fawn	Yellow 0-1309	km 28.5 Kootenay River FSR
Mule Deer	17-9560		8-Mar-2017	M	Fawn	Yellow 0-1330	km 28.5 Kootenay River FSR
Mule Deer	17-9567		8-Mar-2017	M	Fawn	Yellow 0-1316	km 28.5 Kootenay River FSR
Mule Deer	17-9558		9-Mar-2017	F	Young adult	Yellow 01333	km 28.5 Kootenay River FSR
Mule Deer	17-9573		9-Mar-2017	F	Aged	Yellow 0-1344	km 28.5 Kootenay River FSR
Mule Deer	17-9557		9-Mar-2017	F	Aged	Yellow 0-1322	km 28.5 Kootenay River FSR
Mule Deer	17-9556		9-Mar-2017	F	Young adult	Yellow 0-1332	km 28.5 Kootenay River FSR
Mule Deer	17-9565		9-Mar-2017	M	Fawn	Yellow 0-1308	km 28.5 Kootenay River FSR
Mule Deer	17-9564		9-Mar-2017	F	Fawn	Yellow 0-1305	km 28.5 Kootenay River FSR

Urban Deer

2017 Annual Report



Submitted by: Chris Prosser, CAO

Date: March 16, 2017

Introduction

Starting in 2014-15, the District of Invermere initiated an operational program to manage aggressive deer in targeted neighborhoods. Council directed staff to create an operational management program under an approved three (3) year permit granted from the Ministry of Forests, Lands and Natural Resources.

The program was internalized and operated with District employees who volunteered to conduct the program and attended all training. The Program was initiated in early December 2015 and ran until the middle of March 2016. All meat was delivered to a local meat cutter for processing under the requirements from the Interior Health Authority. All meat was provided to the local food bank for use in their operations within the valley community.

Invermere deer cull summary 201

Species	Total	Adult Females	Adult Males	Juvenile Females	Juvenile Males
Mule deer	17	5	8	3	1

- No white-tailed deer captured

It is estimated that 850 lbs of meat were processed and donated to local food banks. Meat processing was paid was shared with the District and the food bank. The District paid for the cost to gut and skin the deer for processing purposes. The cost for gutting and skinning the animals totaled \$2,125. All costs associated with processing the meat were covered by the Food Bank and was not disclosed to the District. All trapping was conducted internally with unionized staff volunteers. In addition to the costs for gutting and skinning the deer, labour costs for trapping amounted to \$10,087.68.

The District received no interest from the local First Nations for the deer meat.

Traps were located in zones which have aggressive deer / human safety related issues.

Instead of using contractors we were able to use District staff to work on project.

Urban deer were counted on November 19, 2016 in town. The town is separated into 7 survey units and all units are counted at the same time so as to reduce double counting. A total of 99 mule deer and 3 white-tailed deer were counted. This was the lowest count since the start of the program in 2012. We will be conducting urban deer counts annually.

Results and Observations

The targeted approach adopted by the District appears to have succeeded in removing the most aggressive deer within those neighborhoods. In 2015, complaints regarding aggressive deer were at their lowest since complaint tracking began in 2012. The milder winter impacted the results and in the reduced number of deer removed from the community.

Conclusion

The program is planned to continue beginning in December 2017 and with the submission of a permit renewal for three years. The program will be operated in the same manner and the District will continue to utilize our own resources to manage the deer population. This program will run in conjunction with any translocation or other permitted deer management tool.

Appendix “A” – 2016 Deer Count

Mr. Chris Prosser

November 20, 2016

Chief Administrative Officer
District of Invermere

	2015 deer count	2016 deer count	change
Area 1	8	23	+15
Area 2	25	8	-17
Area 3	23	21	-2
Area 4	2	23	+21
Area 5	12	22	+10
Area 6	23	9	-14
Area 7	9	8	-1
Totals	102	114	+12

s.15,s.22

carried out the

2016 urban deer count on the morning of the 19 of November.

There was an increase of 12 deer or 10% when comparing 2016 with 2015. It should be noted that the temperature -1 degrees and weather - broken cloud no precipitation compared to -10 degrees in 2015 can be a significant factor as the deer were more likely bedded down in 2015 and this year were up and about feeding.

The numbers now being significantly lower than in previous years when the count was about 200 shows that the removal of deer from the district by both relocation and cull is having an effect in overall numbers.

The total number of whitetail deer which were all in the Castle Rock area was 8 compared to 2 last year.

s.15,s.22

is looking

forward to the final report on the relocation project last winter. If

the relocation was successful then we would look into the possibility of making it an annual event carried out by ^{s.15} volunteers. We understand the Regional Biologist who oversaw the relocation may be in favour in trying a baited deer approach without the use of tranquillizers where animals are fed in livestock trailers and subsequently moved to new sites outside the community.

Regards,
s.15,s.22

Appendix “B” – Record of Wildlife Hunted, Trapped or Killed

**APPENDIX D
RECORD OF WILDLIFE HUNTED, TRAPPED OR KILLED**

PERMIT CB14-140587

- The permit holder **MUST** maintain an accurate up-to-date record.
- The permit holder **MUST** submit the original copy of this report to the FrontCounter BC within 21 days of the permit's expiry or annually as indicated in "Appendix A – Terms of Permit – Reporting Requirements" of this permit.
- The permit holder must produce a copy of this record on the demand of an officer

ID Number (Unique Identifier)	Species	Date wildlife was taken	Location * where wildlife was taken (Nearest street intersection)	Sex	Age (Adult or fawn)	Health Status	Fate of wildlife (destroyed or released)	Use of carcass (ie First Nations, Food Bank, other or landfill)
CWD-3200	MULE DEER	DEC 13/16	s.15, s.22	<input checked="" type="checkbox"/> Male <input type="checkbox"/> Female	<input checked="" type="checkbox"/> Adult <input type="checkbox"/> Fawn	<input type="checkbox"/> Good <input type="checkbox"/> Poor	cull	Food Bank
CWD-3201	mule DEER	DEC 14/16		<input checked="" type="checkbox"/> Male <input type="checkbox"/> Female	<input checked="" type="checkbox"/> Adult <input type="checkbox"/> Fawn	<input checked="" type="checkbox"/> Good <input type="checkbox"/> Poor	cull	Food Bank
CWD-3202	mule DEER	DEC 14/16		<input type="checkbox"/> Male <input checked="" type="checkbox"/> Female	<input checked="" type="checkbox"/> Adult <input type="checkbox"/> Fawn	<input checked="" type="checkbox"/> Good <input type="checkbox"/> Poor	cull	Food Bank
CWD-3165	mule DEER	DEC 15/16		<input type="checkbox"/> Male <input checked="" type="checkbox"/> Female	<input checked="" type="checkbox"/> Adult <input type="checkbox"/> Fawn	<input checked="" type="checkbox"/> Good <input type="checkbox"/> Poor	cull	Food Bank
CWD-3164	mule DEER	DEC 15/16		<input checked="" type="checkbox"/> Male <input type="checkbox"/> Female	<input checked="" type="checkbox"/> Adult <input type="checkbox"/> Fawn	<input checked="" type="checkbox"/> Good <input type="checkbox"/> Poor	cull	Food Bank
CWD-3163	mule DEER	DEC 17/16		<input checked="" type="checkbox"/> Male <input type="checkbox"/> Female	<input checked="" type="checkbox"/> Adult <input type="checkbox"/> Fawn	<input checked="" type="checkbox"/> Good <input type="checkbox"/> Poor	cull	Food Bank
CWD-3162	mule DEER	JAN 7/17		<input type="checkbox"/> Male <input checked="" type="checkbox"/> Female	<input checked="" type="checkbox"/> Adult <input type="checkbox"/> Fawn	<input checked="" type="checkbox"/> Good <input type="checkbox"/> Poor	cull	Food Bank
CWD-3185	mule DEER	JAN 9/17		<input type="checkbox"/> Male <input checked="" type="checkbox"/> Female	<input checked="" type="checkbox"/> Adult <input type="checkbox"/> Fawn	<input checked="" type="checkbox"/> Good <input type="checkbox"/> Poor	cull	Food Bank
CWD-3186	mule DEER	JAN 9/17		<input type="checkbox"/> Male <input checked="" type="checkbox"/> Female	<input checked="" type="checkbox"/> Adult <input type="checkbox"/> Fawn	<input checked="" type="checkbox"/> Good <input type="checkbox"/> Poor	cull	Food Bank
CWD-3183	mule DEER	JAN 10/17		<input type="checkbox"/> Male <input checked="" type="checkbox"/> Female	<input checked="" type="checkbox"/> Adult <input type="checkbox"/> Fawn	<input checked="" type="checkbox"/> Good <input type="checkbox"/> Poor	cull	Food bank


Signature of Permit Holder

MAY 15, 2017
Date

Ministry of Forests, Lands and Natural Resource Operations
FrontCounter BC
1902 Theatre Road
Cranbrook BC V1C 7G1

**APPENDIX D
RECORD OF WILDLIFE HUNTED, TRAPPED OR KILLED**

PERMIT CB14-140587

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- > The permit holder must produce a copy of this record on the demand of an officer

ID Number (Unique Identifier)	Species	Date wildlife was taken	Location * where wildlife was taken (Nearest street intersection)	Sex	Age (Adult or fawn)	Health Status	Fate of wildlife (destroyed or released)	Use of carcass (to First Nations, Food Bank, other or landfill)
CWP 3184	mule deer	Jan 16/17	s.15,s.22	<input checked="" type="checkbox"/> Male <input type="checkbox"/> Female	<input type="checkbox"/> Adult <input checked="" type="checkbox"/> Fawn	<input checked="" type="checkbox"/> Good <input type="checkbox"/> Poor	cull	Food bank
CWP 3203	mule deer	Jan 18/17		<input type="checkbox"/> Male <input checked="" type="checkbox"/> Female	<input type="checkbox"/> Adult <input checked="" type="checkbox"/> Fawn	<input checked="" type="checkbox"/> Good <input type="checkbox"/> Poor	cull	Food Bank.
CWP 3160	mule deer	Jan 19/17		<input type="checkbox"/> Male <input checked="" type="checkbox"/> Female	<input type="checkbox"/> Adult <input checked="" type="checkbox"/> Fawn	<input checked="" type="checkbox"/> Good <input type="checkbox"/> Poor	cull	Food Bank
CWP-3161	mule deer	Jan 19/17		<input type="checkbox"/> Male <input checked="" type="checkbox"/> Female	<input checked="" type="checkbox"/> Adult <input type="checkbox"/> Fawn	<input checked="" type="checkbox"/> Good <input type="checkbox"/> Poor	cull	Food Bank.
CWP-3204	mule deer	Jan 27/17		<input checked="" type="checkbox"/> Male <input type="checkbox"/> Female	<input checked="" type="checkbox"/> Adult <input type="checkbox"/> Fawn	<input checked="" type="checkbox"/> Good <input type="checkbox"/> Poor	cull	Food Bank
CWP-3205	mule deer	Jan 27/17		<input checked="" type="checkbox"/> Male <input type="checkbox"/> Female	<input checked="" type="checkbox"/> Adult <input type="checkbox"/> Fawn	<input checked="" type="checkbox"/> Good <input type="checkbox"/> Poor	cull	Food Bank
CWP-3210	mule deer	Jan 31/17		<input checked="" type="checkbox"/> Male <input type="checkbox"/> Female	<input checked="" type="checkbox"/> Adult <input type="checkbox"/> Fawn	<input checked="" type="checkbox"/> Good <input type="checkbox"/> Poor	cull	Food Bank.
				<input type="checkbox"/> Male <input type="checkbox"/> Female	<input type="checkbox"/> Adult <input type="checkbox"/> Fawn	<input type="checkbox"/> Good <input type="checkbox"/> Poor		
				<input type="checkbox"/> Male <input type="checkbox"/> Female	<input type="checkbox"/> Adult <input type="checkbox"/> Fawn	<input type="checkbox"/> Good <input type="checkbox"/> Poor		
				<input type="checkbox"/> Male <input type="checkbox"/> Female	<input type="checkbox"/> Adult <input type="checkbox"/> Fawn	<input type="checkbox"/> Good <input type="checkbox"/> Poor		


Signature of Permit Holder

March 15, 2017
Date

Ministry of Forests, Lands and Natural Resource Operations
FrontCounter BC
1902 Theatre Road
Cranbrook BC V1C 7G1

INVOICE

The Corporation of the City of Cranbrook
24/03/17



MINISTRY OF FORESTS, LAND & NATURAL RESO
1259 DALHOUSIE DRIVE
KAMLOOPS, BC V2C 5Z5

Account No: s.17

Invoice No: 034408

Tax Info: GST#: R119431864

DATE	DESCRIPTION	AMOUNT
24/03/17	AGREEMENT #SCA17FHQ208-01 EAST KOOTENAY URBAN DEER TRANSLOCATION	19,899.84
	*** Total this Invoice ***	19,899.84
	***** Amount Due and Payable *****	19,899.84

THE CITY OF CRANBROOK

Phone: 250-426-4211 Toll Free: 800-728-2726 Facsimile: 250-426-4026
Address: 40-10th Ave South Cranbrook, BC V1C 2M8

WWW.CRANBROOK.CA 

RECEIPT PORTION (Keep this portion for your records)

Invoice Date 24/03/17

MINISTRY OF FORESTS, LAND & NATURAL RESO
1259 DALHOUSIE DRIVE
KAMLOOPS, BC V2C 5Z5

Account No: s.17

Invoice No: 034408

Total Invoice: 19,899.84

REMITTANCE PORTION (Please detach and return this portion with your payment.)

March 23, 2017

**The Corporation of the City of Cranbrook
40 -10th Avenue S. Cranbrook, BC V1C 2M8**

**East Kootenay Urban Mule Deer Translocation Trial Extension
Agreement# SCA17FHQ208-01**

Maximum approved Grant: \$19,900

Total Project Costs: \$25,289.84

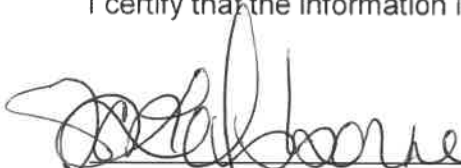
Total Billable to BC Cost Share Program: \$19,899.84

Summary of all revenue and in-kind contributions for this project:

Source	Services	Expenses	Total
BC Cost Share Program	\$11,475.00	\$8,424.84	\$19,899.84
in-kind contributions	\$5,390.00		\$5,390.00
TOTAL PROJECT:			\$25,289.84

A detailed summary of services and expenses follows.

I certify that the information included in this financial statement is correct and complete:


Charlotte Osborne, CGA, CMA
Director, Finance & Computer Services

Prepared by: S. King and I. Adams

BC Cost Share Program Summary:

Payee	Invoice #	BC-CSP	GST*	total
Adams	LEC2017-04	\$8,902.16	\$393.75	\$9,295.91
Wilson		\$1,600.00		\$1,600.00
FLNRO	1	\$124.92		\$124.92
FLNRO	2	\$1,615.00		\$1,615.00
Lewis	100383	\$2,214.03	\$110.70	\$2,324.73
Vectronic	9084-20170314	\$3,378.44		\$3,378.44
Mathieu	20217-01	\$2,000.00		\$2,000.00
Teske	1	\$65.29		\$65.29
total		\$19,899.84	\$504.45	\$20,404.29

*GST not charged to BC Cost Share Program

1. Services: (hours)

Task Description	Biologist	Technician	FLNRO	FLNRO	FLNRO	Veterinarian	Volunteers	Total Hours	total Cost
	I. Adams	D. Lewis	I. Teske	P. Stent	S. Clow	Mathieu			
bill to:	BC-CSP	BC-CSP	in kind	in kind	in kind	BC-CSP	in kind		
Planning									
Planning / Admin	s.22								\$ 2,060
Permit / Animal Care									\$ 150
Release Site scouting									\$ 660
Safety									\$ 150
Field									
Field mobilization									\$ 810
Site baiting									\$ 30
Capture / Translocation									\$ 10,380
Post-Release									
Monitoring and communications									\$ 225
Collar retrieval									\$ 1,200
Reporting									
Data Analysis									\$ -
Draft reporting									\$ 1,200
Final reporting									\$ -
Subtotal Hours									
Rate									
Subtotal Services	\$ 7,875.00	\$ 1,600.00	\$ 1,400.00	\$ 1,820.00	\$ 600.00	\$ 3,300.00	\$ 270.00		\$ 16,865
BC Cost Share Program	\$ 7,875	\$ 1,600	\$ 0.00	\$ 0.00	\$ 0.00	\$ 2,000.00	\$ 0.00		\$ 11,475
total in-kind:	\$ -	\$ -	\$ 1,400.00	\$ 1,820.00	\$ 600.00	\$ 1,300.00	\$ 270.00		\$ 5,390

2. Expenses

Category	Item	total	Billed by:	Charge to:
permit	permit	\$130.00	Adams	BC-CSP
collars	data fee	\$3,378.44	Vectronic	BC-CSP
capture supplies	BAM	\$1,440.00	FLNRO	BC-CSP
capture supplies	kits / ear tags	\$175.00	FLNRO	BC-CSP
capture supplies	darts	\$124.92	FLNRO	BC-CSP
trailer	trailer	\$1,600.00	Wilson	BC-CSP
misc	Van tires	\$44.80	Adams	BC-CSP
trailer	trailer supplies	\$11.84	Adams	BC-CSP
trailer	straw	\$10.79	Adams	BC-CSP
misc	batteries	\$56.81	Adams	BC-CSP
mileage-translocation	mileage	\$457.92	Adams	BC-CSP
mileage-translocation	mileage	\$30.00	Teske	BC-CSP
mileage-translocation	mileage	\$196.10	Lewis	BC-CSP
sub-contractor travel	per diem	\$169.25	Lewis	BC-CSP
sub-contractor travel	accomm.	\$248.68	Lewis	BC-CSP
capture supplies	blanket	\$315.00	Adams	BC-CSP
capture supplies	shipping	\$35.29	Teske	BC-CSP
Subtotal Expenses		\$8,424.84		

3. Cost Provider Summary

	Services	Expenses	Total
BC Cost Share Program	\$11,475.00	\$8,424.84	\$19,899.84
in-kind	\$5,390.00		\$5,390.00
TOTAL PROJECT:			\$25,289.84

East Kootenay Urban Deer Translocation Trial Interim Report

UKEEP Project #: UW-F16-108
BC Urban Deer Cost Share Program



Prepared For:

BC Urban Deer Cost Share Program
Upper Kootenay Ecosystem Enhancement Program
(Fish & Wildlife Compensation Program, Columbia Basin, and Columbia Basin Trust)
BC Ministry of Forests, Lands and Natural Resource Operations
District of Elkford
City of Kimberley
City of Cranbrook
District of Invermere
Animal Alliance of Canada

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March, 2007

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BACKGROUND

Mule deer populations in urban centres have dramatically increased in population size in the past decade. Many communities in the East Kootenay region now face difficulties in terms of public safety and nuisance deer. Over the same time period non-urban mule deer populations have declined throughout the East Kootenay region (BC FLNRO 2014; Mowat and Kuzyk 2009). Factors driving this decline are unknown but likely involve forage quality and quantity limitations, changes to predator-prey dynamics and climatic variability (P. Stent pers. comm.).

To date, most communities have addressed over-abundance of mule deer within their boundaries by attempting to institute lethal culls. This has resulted in significant negative public reaction from numerous groups and individuals objecting to killing urban mule deer, especially when non-urban mule deer populations are low. BC government has previously resisted translocations because survivorship of translocated mule deer has been very low in past trials in the United States. Deer are highly sensitive to the stresses associated with capture and handling which commonly leads to a fatal condition known as capture myopathy. Care can be taken by experienced personnel but there is no way to remove this risk to their welfare. Capture related mortality rates in excess of 29% are commonly reported in older literature (Beringer et al. 2002, Haulton et al. 2001). Translocated deer face the compounding challenge of becoming familiar with a new home range, which increases the likelihood of starvation, predation and accidental deaths. This can especially be true for habituated urban deer that may only be familiar with urban environments. In an analysis of the problem, the Michigan Department of Natural Resources (2000) presented post release mortality rates from a variety of studies that ranged from 25% to 85%.

Recent mule deer translocation results from Utah and New Mexico have shown capture and translocation related mortality (i.e., deaths attributed to injuries and stress during capture and moving) has been reduced from previous translocation attempts. Their projects have had virtually no capture and translocation-related myopathies and reasonable levels of post-release survivorship. Initial estimates from Utah were approximately 70% survivorship within the first few months of translocation, (S. McFarlane pers. comm.). Results from New Mexico range from 26 to 77% survival rates depending on year and release location, averaging around 50%; these rates were deemed to be successful (Ashling 2015). Translocation now seems to be a viable management option for urban deer.

Supplementing natural mule deer populations with urban deer from nearby communities may help increase non-urban East Kootenay mule deer populations. The objective of this project is to test translocation as a viable management option for urban mule deer in the East Kootenay.

Goal of the Translocation Trial:

To test translocation of urban mule deer as a management tool to reduce urban deer levels within communities in the East Kootenay.

Objectives:

- 1. To determine the mortality rate and causes of mortality during each stage of the translocation process (capture, handling, transport and post-release).*
- 2. To document movement of radio-collared translocated urban mule deer.*
- 3. To compare translocated urban deer survival and movements to non-urban populations of mule deer.*

Following initial translocation in February and March, 2016, an extension of the project was sought to redeploy collars retrieved from dead deer and renew data transmission subscription for all collars still functioning. Also, resulting from numerous complaints over translocated deer from several locations, an

alternative release site was sought for testing. Thus the trial was extended for an additional spring of translocation and GPS collar deployment.

Objectives for the 2017 translocation extension were:

- a) Renew annual data and messaging subscription to the GPS radio collars fitted on several deer
- b) Moving additional mule deer from Kimberley and Cranbrook to:
 - i. Maintain sample size of collared deer through late winter and spring when mortality in deer is typically highest
 - ii. Test the upper Kootenay River valley (near confluence of Kootenay and Palliser Rivers as a release point for translocated mule deer in the East Kootenay.

This report provides an interim summary of results to date of both 2016 and 2017 translocations. Given 2017 translocations occurred less than 2 weeks prior to this report preparation, very few results are provided here beyond capture and translocation details.

***** NOTE *** This is an interim report with no statistical tests or formal review by other project partners. As such, it must not be distributed to anyone other than immediate project partners listed on the front cover.**

METHODS

2016 Captures

Deer were captured by one of two methods: free-range darting or clover trapping. Captures took place in the four participating municipalities between February 16 and March 10, 2016. Darter deer were identified as a suitable translocation candidate (either adult female or 2015-born fawn with adult female) in a suitable darting location (municipal land or private land with permission from landowner) in a location that was safe for both deer and general public. Deer were darted, administering a dosage of one of two immobilization drug combinations: Butorphanol, Azaperone and Medetomidine (BAM-2) or Alfaxalone, Azaperone and Medetomidine (MAA) (Table 1). Darter deer were followed until recumbent and unconscious, then immediately restrained with hobbles and blindfold.

Clover trapping occurred only in Kimberley and Cranbrook in 2016. Sites were established up to one week prior to being set. They were baited with apple and oatmeal mash. Traps were set between 10pm and midnight, then checked starting at 5am the next morning. Deer that were suitable for translocation were restrained (trap collapsed with 2 workers restraining deer) and immediately administered a dosage of BAM-2 or MAA immobilization drugs. Similar to darting, once deer was recumbent and unconscious, they were immediately restrained with hobbles and blindfolds and removed from the trap.

2017 Captures

In 2017, captures were conducted between March 6 and 9, 2017 in Kimberley and Cranbrook. The objective was to redeploy collars retrieved from mortalities in the year following translocation in 2016. All deer were immobilized by free range darting, using the same procedures outlined above for 2016. No clover trapping was conducted in 2017. Only BAM drug combination was used in 2017 to immobilize deer.

Deer handling

All immobilized deer were assigned a BC provincial Wildlife Health Identification number (WHID #) and had following data collected and were tagged with a numbered ear tag.

- Ear biopsy

- Hair
- Fecal sample
- Blood sample

Deer were assigned a coarse, subjective body condition (excellent, good, fair, poor, emaciated) based on amount of lumbar fat. Degree of tick infestation around anal region was estimated (heavy, moderate, few, none obvious) while collecting fecal sample. Deer were weighed in Invermere and Cranbrook for use in anaesthetic research program (see Mathieu et al. 2017). Weight of deer was otherwise inconsequential to the project and was considered an added time constraint to moving the deer to transport trailer, so animals were not weighed in Kimberley or Elkford in 2016. None were weighed in 2017.

Adult and Young Adult females selected to be radio collared were fitted with the collar while immobilized. In 2016, 28 GPS transmitter collars (GlobalStar Survey collars, Vectronic Aerospace Inc, Berlin, Germany) were deployed on 29 appropriate size/age females up to a maximum of 7 collared deer per municipality¹. In 2017 we redeployed 12 of these Vectronic collars plus an additional 6 GPS transmitter collars available from BC Ministry of Forests, Lands & Natural Resource Operations Kootenay Region staff (Lotek Wireless, Newmarket, ON).

The Vectronic collars attempt to record and transmit the collar's location every 13 hours; the Lotek collars do so once a day. Both feature a mortality sensor that transmits an alert if the collar is motionless for 8 hours. Once on "mortality mode", the collar transmits its location every 30 minutes for 6 hours, then reverts to its initial 13 hour programmed schedule. Vectronic collars also had a VHF signal programmed to transmit for 8 hours each day. When on "mortality mode", the VHF beacon transmits constantly at double the pulse rate until the collar is retrieved and switched back to "normal mode". Collars also may revert to "normal mode" if movement is detected at least once every 4 minutes for a 24 minute interval. This is designed to allow for a predator or scavengers to move the transmitter without it reverting to "normal mode" but does account for the (very rare) possibility of a deer being alive but motionless for an 8 hour period.

Once "processed", deer were carried with the aid of a carrying blanket (Animal Handling Systems, Kananaskis, Alberta) to a minivan and placed inside on a sheet of plywood covered with a tarp. One worker held the deer's head in a normal position at all times while immobilized to ensure an open airway and reduce likelihood of aspiration. Deer were transported from the capture site to the transport trailer in the minivan.

Transport trailers were 2 or 3 horse stock trailers with all internal fittings removed and any sharp edges padded with hot water pipe insulation tubes held in place with duck tape and/or plastic cable ties. Trailers were lined with 20 to 25 cm of clean straw. Trailers were darkened as much as possible using cardboard or plywood to cover vents and windows. A flap-covered hole was available to visual checks of deer inside the trailer. A canvas tarp curtain was installed near the back of the trailer, with enough room between the curtain and the door to lay incoming immobilized deer. The curtain blocked view of outside to deer already in the trailer while adding additional deer to the trailer. Immobilized deer were placed on this "porch", had hobbles and blindfold removed and administered with a reversal stimulant of Atipamezole and Naltrexone (Table 1). Not all deer received the Naltrexone reversal.

¹ Eight deer were collared in Elkford as one collared deer from Kimberley was predated and the collar retrieved in time to redeploy the collar. Thus, in 2016, we fitted 29 deer with 28 available collars.

Ensuring complete coverage of external light sources within the trailer was essential. Efforts to completely cover windows and vents is critical and achieving maximum possible coverage with the hanging tarpaulin to both sides and the roof is equally important.

Table 1: Drug combinations and dosages used to immobilize and reverse mule deer.

Combination	Immobilization		Reversal	
	Drugs	Dosage	Drugs	Dosage
BAM-2	Butorphanol Tartrate (27.3 mg/mL)	Fawns: 0.5 cc Adults: 1.0 cc	Atipamezole (25 mg/mL)	Fawns: 1.0 cc Adults: 2.0 cc
	Azaperone Tartrate (9.1 mg/mL)		Naltrexone (50 mg/mL)	Fawns: 0.25 cc Adults: 0.5 cc
	Medetomidine HCl (10.9 mg/mL)			
MAA	Medetomidine HCl (10.9 mg/mL)	Fawns: 0.5 cc Adults: 1.0 cc	Atipamezole (25 mg/mL)	Fawns: 1.0 cc Adults: 2.0 cc
	Azaperone Tartrate (9.1 mg/mL)		Naltrexone (50 mg/mL)	Fawns: 0.25 cc Adults: 0.5 cc
	Alfaxalone HCl (10.9 mg/mL)			

Field Crews

Field crew varied with each municipality and included VAST staff, hired subcontractors, BC FLNRO staff and University of Calgary researchers.

Capture crews were larger in 2016 than 2017. In 2016, crew size averaged 8 to 9 people. In 2017, we operated with a crew of 5. This lower number worked well and significantly reduced.

- Crew Lead Biologist
- Veterinarian
- Experienced, approved darter
- 2 additional handlers

Transportation and Release

Deer were transported to release sites daily. We attempted to allow at least 2 hours of daylight following release. Release was a 'hard release' where trailer door was opened and deer allowed to leave. This was the last point of contact with the translocated deer. Post-release survival and movement of deer are only available for deer fitted with radio collars.

Movement

For the purposes of this interim report, movement has been calculated as a summed distance between consecutive 13 hour GPS locations. Only 2016 translocation data are considered here. Deer translocated in 2017 have had only 1 week post-release – a current indication of their location and mapping of their movements in their first week post-release is provided.

GPS locations greater than 13 hours apart were excluded from analyses because they are potentially gross underestimates of distance travelled. Even 13 hours is not necessarily a close reflection of the distance moved by a deer within that time frame. However it is the shortest interval available for the program assigned to the GPS collars and is a consistent time interval.

Minimum distance between consecutive 13 hour fix intervals was calculated using a 3-dimensional Pythagorean formula: $(\text{distance})^2 = x^2 + y^2 + z^2$ where x = the difference between easting Universal Transverse Mercator (UTM) values, y = the difference between northing UTM values and z = the difference between elevation values, all data transmitted by the collars.

Mortality Assessment

When a mortality alert was received, an attempt to retrieve the collar and assess cause of mortality was initiated as soon as possible. Crews combine the generalized GPS location of the collar with utilizing the VHF beacon to locate the collar. At the location of the mortality, condition of the animal is recorded along with signs of trauma, consumption by predator, location of the deer remains. When safe to do so, an *in situ* necropsy is performed by skinning the deer to reveal any puncture wounds or other signs of trauma in addition to any obvious signs of injury. Samples of major organs are retrieved including: heart, lung, liver, kidney and spleen. The lower jaw and a length of femur are also retrieved for aging (tooth) and body fat (femur marrow) analysis. All samples are frozen as soon as possible and cross-referenced with the animal's WHID # (see above). Survivorship of the translocated "population" is estimated using standard Kaplan-Meier methods for GPS collared individuals.

RESULTS & DISCUSSION

A total of 88 deer were captured over the entire translocation project. Eight-five of these deer were translocated. In 2016, 63 deer were captured, of which 60 were transported and released. One deer died (aspirated) while being transported from capture site to transport trailer, 2 other deer escaped the trailer while additional deer were being loaded. Most deer ($n = 82$, 93.2%) were captured by free-range darting. Clover trapping (6 captures) was inefficient. In 2017, 25 deer were captured in Kimberley and Cranbrook, all by free-range darting (clover trapping was not conducted).

The majority of deer captured were adults or young adults ($n = 32$ and 31 , respectively; 28 young adults were translocated). Five aged deer were captured and translocated as well as 20 fawns. Three young adult bucks were translocated, all in 2016: 2 from Kimberley in 2016 (1 darted, 1 captured in a clover trap) and 1 from Elkford. An adult buck was also mistakenly darted in Elkford (shed antlers made distinguishing between sexes more difficult). He was not translocated, but reversed where he became recumbent in Elkford. All other males translocated were fawns.

All collars were deployed by March 10, 2016. For radio collars deployed in 2016, a total of 12,231 locations were recorded through March 10, 2017 across all 29 collar deployments. This represents an overall 88.7% success rate in attempted fixed locations (based on an attempt every 13 hours). This is considered very good to excellent for GPS radio collars. Individual collars with at least 200 locations ranged from 69.5% success rate to 95.8% success. Three deer were killed within one month of translocation, all attributed to cougar predation. These deer were excluded from further analysis of movement due to insufficient sample size.

Table 2: Summary of daily capture and translocation of urban mule deer from 4 municipalities in 2016. Clover trapping was only conducted in Kimberley and Cranbrook.

Date	Kimberley		Invermere	Cranbrook		Elkford	Notes
	Dart	Trap		Dart	Trap		
2016							
16-Feb 2016	4	1					1 mortality
17-Feb 2016	7	1					
18-Feb 2016	6	2					
22-Feb 2016			5				
23-Feb 2016			6				
24-Feb 2016			3				1 escape
29-Feb 2016				2	2		
1-Mar 2016				2	0		1 escape
2-Mar 2016				5	*		* Traps not set
8-Mar 2016						4	
9-Mar 2016						6	
10-Mar 2016						5	
Total 2016 Captures	17	4	14	9	2	15	60 translocated
2017							
6-Mar 2017	7						
7-Mar 2017				5			
8-Mar 2017				7			
9-Mar 2017	6						
Total 2017 Captures	13			12			25 translocated

Table 3: Summary of sex and age class of mule deer captured in 2016 and 2017 for translocation trial.

Age Class	Kimberley		Invermere		Cranbrook		Elkford		Total
	F	M	F	M	F	M	F	M	
2016									
Aged	1		1						2
Adult	7		6		6		8		27
Young adult	4*	2	7**		4**		3	1	21
Fawn	4	3			2	1	1	2	13
<i>2016 total</i>	<i>16</i>	<i>5</i>	<i>14</i>	<i>0</i>	<i>12</i>	<i>1</i>	<i>12</i>	<i>3</i>	<i>63</i>
2017									
Aged	2				1				3
Adult	4				1				5
Young adult	4				6				10
Fawn	2	1				4			7
<i>2017 total</i>	<i>12</i>	<i>1</i>			<i>8</i>	<i>4</i>			<i>25</i>
Total Captured	28	6	14	0	20	5	12	3	88
Total Translocated	27	6	13	0	19	5	12	3	85

* 1 individual died during handling.

** 1 individual escaped trailer prior to translocation

Darting Capture Locations

Deer were targeted opportunistically for free-range darting. Deer were only darted if they were on municipal land (including sidewalks and streets) or on private land where we had permission of the land owner. Other factors taken into account prior to darting include: public safety (proximity of public citizens, especially children walking to school); proximity of major streets where darted deer might be at risk of injury during latency period between darting and recumbency. Within municipalities, our preference was to target deer closer to “city centres” as opposed peripheral or rural / woodland interface areas where deer individuals may be more likely to move between urban areas and surrounding natural habitats. This target was not always achieved, given time and crew availability constraints, deer were occasionally targeted in peripheral areas.

Following are maps of each municipality showing where deer were either darted or trapped (Figure 1 through Figure 5). Multiple individuals were captured at some locations, so the number of “dots” does not necessarily correspond to Table 2.

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Release

A total of 85 deer were released in 2016 (n = 60) and 2017 (n = 25). Details of location and originating municipalities are provided in Table 4. Location of release sites in relation to surrounding areas and mapped mule deer winter range are in Figure 6.

No injuries were observed when translocated deer were released. Deer appeared neither stressed nor agitated upon release. Frequently, they were bedded down in the straw when trailer door was opened, occasionally individuals had to be encouraged to leave the trailer. In most instances, they slowly walked away from the trailer, pausing to browse. Only once (February 23, 2016, deer from Invermere) did the released mule deer stot away from the trailer and in this instance they only moved 10 to 20 m off the road before stopping.

Table 4: Number of mule deer from each participating municipality translocated to 5 different release sites in 2016 and 2017.

Release Site	Originating Municipality	Dates	Total Deer	# Collars
Newgate transfer station	Kimberley	Feb 16-18, 2016	20	7
Lavington Flats	Invermere	February 22-24, 2016	13	7
Dorr Road	Cranbrook	Feb 29 to Mar 2, 2016	12	7
Ram Broadwood	Elkford	Mar 8-9, 2016	10	6
Newgate transfer station	Elkford	Mar 10, 2016	5	2
Gibraltar	Kimberley	Mar 6, 9, 2017	13	10
Gibraltar	Cranbrook	Mar 7-8, 2017	12	8
Total			85	47

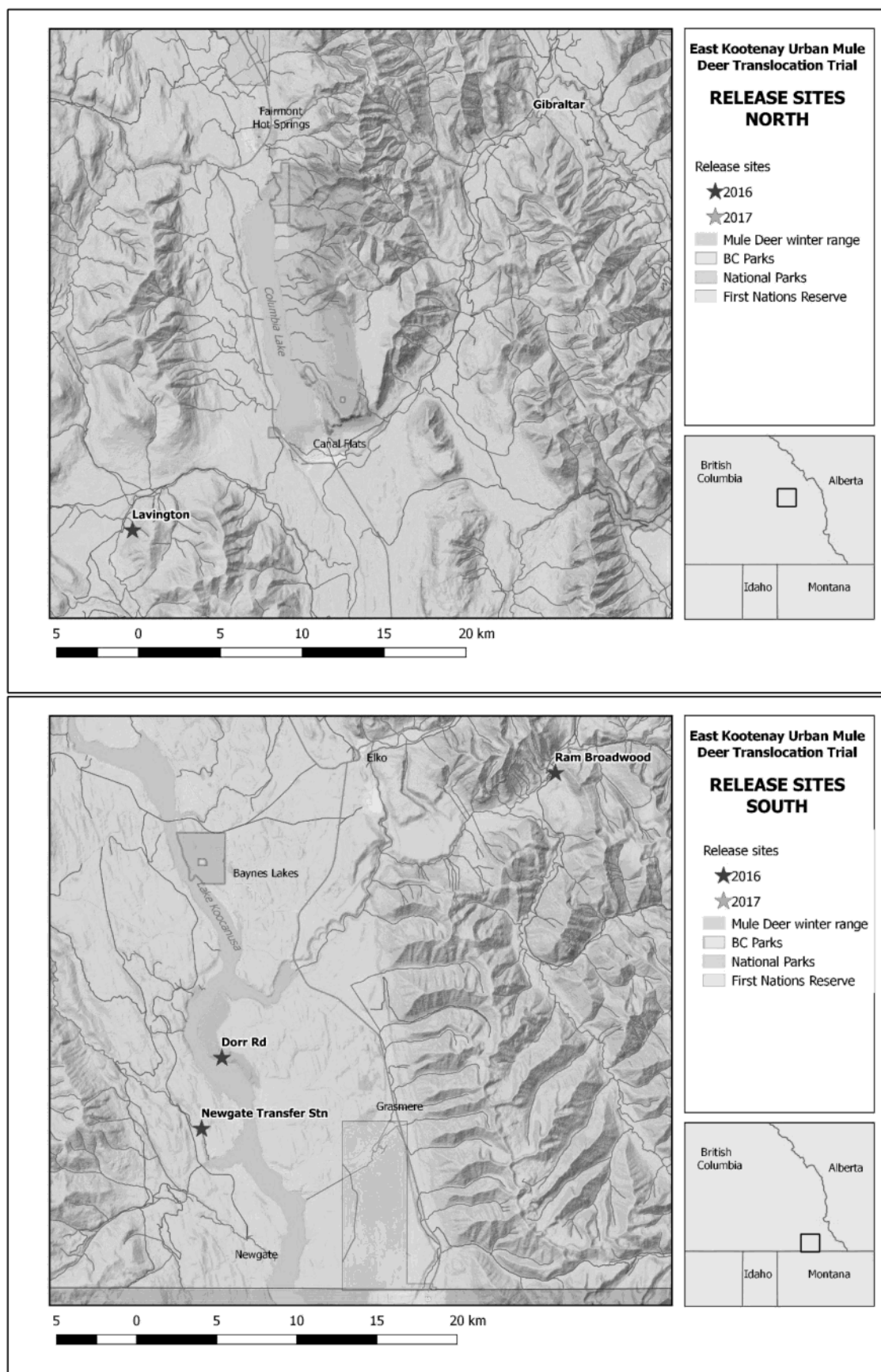


Figure 6: Release sites for translocated mule in 2016 (red stars) and 2017 (blue star)

Movement

Movement among individual collared deer was highly variable (Figure 7). Broad trends saw increased movement in May, which represents typical mule deer migration patterns. Movement declined abruptly in mid-June when fawns are born.

Movements during the first two weeks post-release (approximately 26 fixes) reflects in the individual variation among translocated deer (Figure 8). Though differences between these time intervals were very small for some individuals, others showed great disparity between these time frames.

The abrupt drop in movement rate during early June is also reflected in the moving average distance of the previous 7 GPS locations (Figure 9). This figure also shows a more diffused autumn migration back to winter range by those individuals who migrated to higher elevations in the summer. The standard deviation bars in Figure 9 reflect that the increased average movements were driven by a subset of all collared deer. This is also reflected in Figure 7 that shows some individuals never moved very far between GPS locations.

The final report will include 95% kernel home range estimates. Minimum Convex Polygon (MCP) estimates were calculated in September, 2016 with location data up until that time. However MCP method grossly overestimates true home range. For example, deer 20664 moved south in May and June from the Newgate area until she found Libby, MT, in July. Her total MCP home range was the largest of all deer through late September, 2016 (1194 km²). However she really had 2 core home ranges: immediately following release in the Gold Bay area north of Newgate (Feb 16 to May 5, 6.5 km²) and after she “found” Libby (July 15 to October 27, 29 km²). Even that Libby MCP home range is a large over-estimate. Of the 174 GPS fixes recorded by her collar after July 15 in Libby, 164 (94.2%) were within a core home range area within Libby town centre of just 1 km² (Figure 11). She was killed in a vehicle accident on the bridge over Kootenay River on October 27, 2016.

This trend in some individuals migrating to higher elevations while others do not is supported by the variation in elevation range difference among collared deer (Table 5).

The difference between maximum and minimum recorded elevation ranged from 171m to 1885m (Table 5). Strong differences were observed among originating municipalities for elevation range. Deer from Invermere displayed, by far, the greatest range in elevation differences, while Kimberley was the lowest (Table 6). This may be a factor of where deer were released as much as any pre-disposed behavioural traits within each municipality's mule deer population. The Lavington release site was much closer to alpine terrain than Kimberley's release site at Newgate transfer station. The Lavington site is also removed from permanent residences by almost 20 km. Canal Flats is the closest community, although there are single cabins and residences in the Lavington / Findlay flats area. However the Lavington area does not have nearly the amount of attractants for habituated mule deer as the Kootenai area close to the Newgate Transfer Station and Dorr Road release sites.

The hypothesis that likelihood of translocated mule deer migrating upslope in summer being influenced by release site is supported by Elkford deer who were also released to Newgate transfer station. Their elevation range was significantly lower than the other Elkford deer who were released to the more mountainous Ram-Broadwood release site (Table 5).

However, note that the mule deer with collar 20659 from Invermere, who had the second highest range in elevation, **first** returned to Invermere in mid-May, 2016. She left Invermere on her own accord 3 days after arriving back and her highest elevations were recorded during the summer in the vicinity of

Panorama ski hill west of Invermere. Her release site, therefore, presumably did not influence her high elevation behaviour during the summer. Whether she again migrates to the backcountry this spring will be very interesting to observe.

Influence of release site on seasonal migration and annual range of elevation will be tested this spring following the just-completed 2017 translocations. Deer translocated from Cranbrook and Kimberley (the two municipalities with the lowest range in elevation difference in 2016 - Table 6) were translocated to more mountainous terrain along the Kootenay River FSR, east of Canal Flats (Figure 6). If they show seasonal movements consistent with Invermere deer and (most, but not all) Elkford deer translocated to Ram-Broadwood, this will suggest that geography surrounding release sites plays a strong role in mule deer post-release movement. If they show seasonal movements more consistent with Cranbrook and Kimberley deer in 2016, this will suggest that movement patterns are more a result of the originating population than release site.

Many deer moved south into Montana. There were 22 deer fitted with GPS collars that were released to sites south of Highway 3: Newgate Transfer Station, Dorr Rd. and Ram-Broadwood. Three of these deer died in less than one month. Of the 19 remaining deer, 9 (47.4%) have been in Montana at least once.

Deer translocated in 2017 to Gibraltar release point have so far shown relatively low movements (see Figure A 5 in the Appendix A).

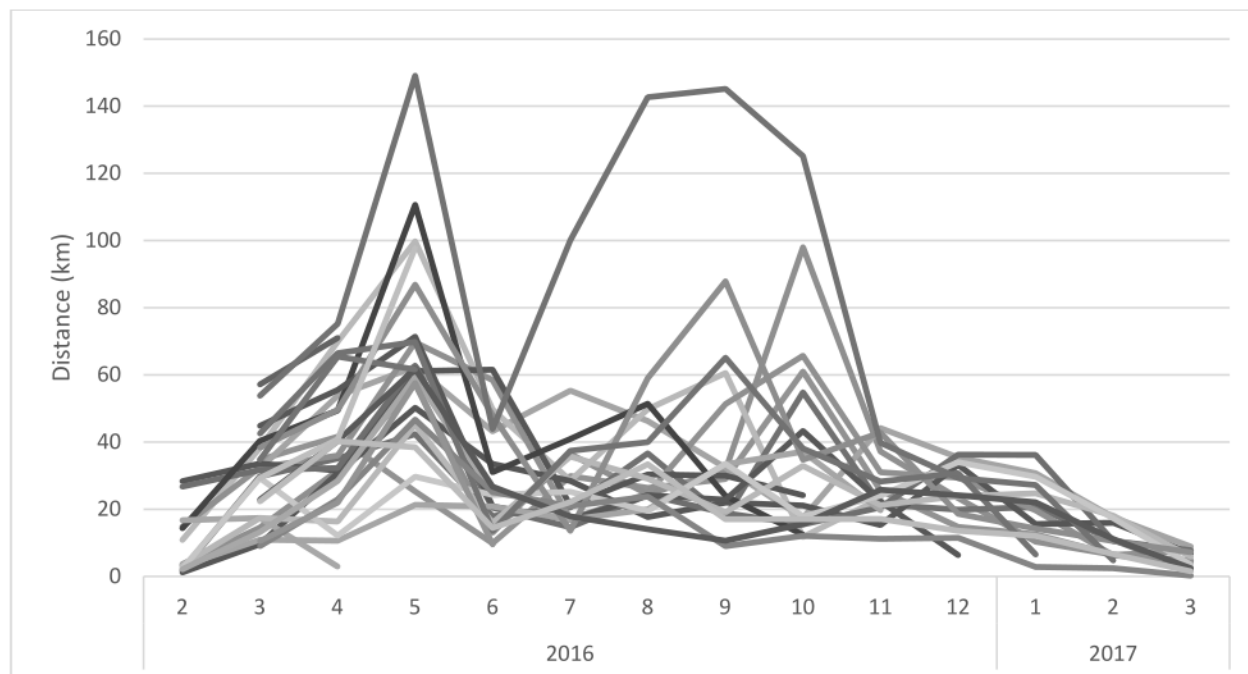


Figure 7: Total monthly distance moved (sum of distances over consecutive 13 hour fixes) for 26 individual mule deer translocated in 2016 that survived at least 1 month.

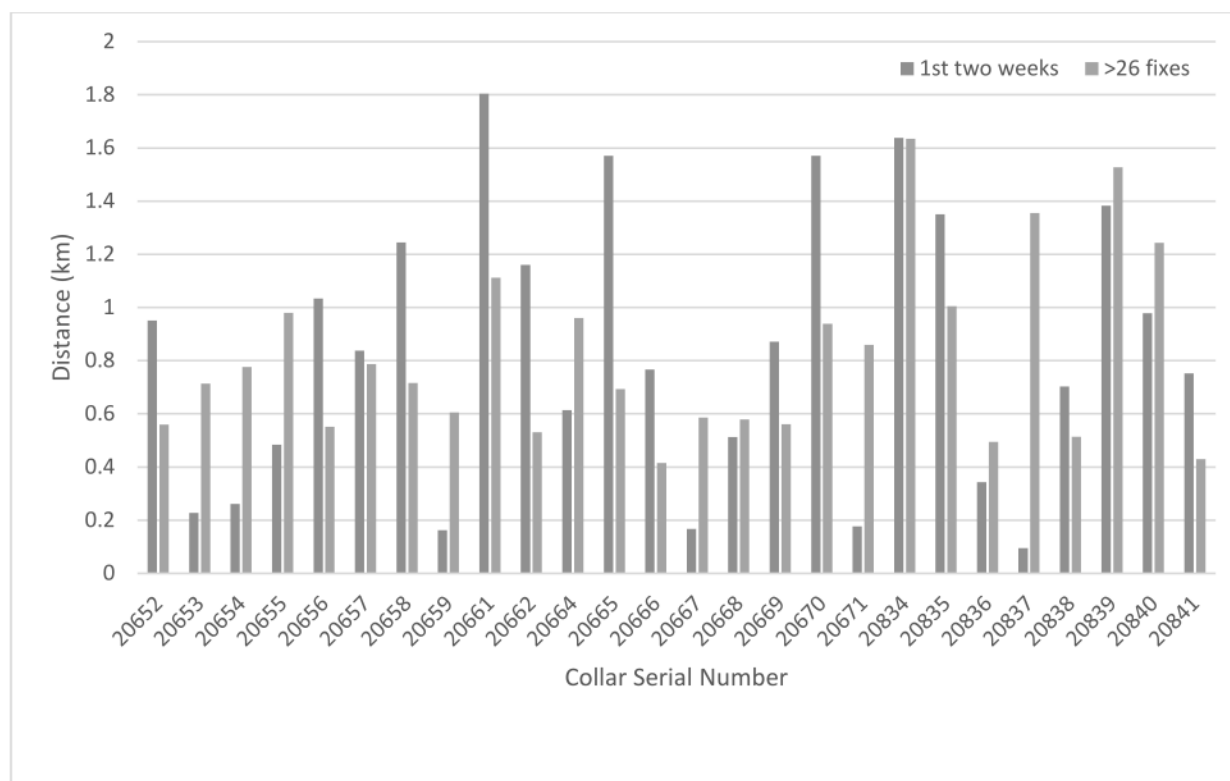


Figure 8: Mean distance between consecutive 13-hour interval GPS locations for 26 translocated mule deer during their first 26 GPS locations (approximately 2 weeks) and all subsequent locations.

Table 5: Maximum and minimum recorded elevation (metres) of translocated mule deer fitted GPS collars between release (Feb 16 to Mar 10, 2016) through March 10, 2017. Order is increasing elevation range value.

Collar	Max Elevation	Min Elevation	Elevation Range	Origin Municipality	Release Site ¹
20654	896	725	171	Cranbrook	Dorr Rd
20840	948	737	210	Elkford	Newgate T.S.
20657	953	721	232	Kimberley	Newgate T.S.
20666	959	714	245	Kimberley	Newgate T.S.
20658	1024	696	328	Kimberley	Newgate T.S.
20662	1014	685	330	Kimberley	Newgate T.S.
20838	940	578	361	Elkford	Newgate T.S.
20661	1370	740	629	Cranbrook	Dorr Rd
20652	1469	726	743	Cranbrook	Dorr Rd
20834	1481	732	750	Cranbrook	Dorr Rd
20670	1494	703	791	Cranbrook	Dorr Rd
20664	1440	617	823	Kimberley	Newgate T.S.
20655	1656	719	936	Kimberley	Newgate T.S.
20837	1943	956	988	Elkford	Ram
20836	2033	963	1070	Elkford	Ram
20665	1911	784	1127	Elkford	Ram
20839	1890	747	1143	Elkford	Ram
20671	2461	1147	1314	Invermere	Lavington
20841	2095	777	1318	Elkford	Ram
20656	2427	1102	1325	Invermere	Lavington
20835	2143	812	1331	Elkford	Ram
20653	2191	839	1352	Invermere	Lavington
20667	2507	1027	1481	Invermere	Lavington
20668	2452	795	1657	Invermere	Lavington
20659	2477	782	1695	Invermere	Lavington
20669	2720	835	1885	Invermere	Lavington

¹ Newgate T.S. = Newgate Transfer Station.

Table 6: Range of elevation difference pooled by originating municipality for translocated mule deer fitted GPS collars between release (Feb 16 to Mar 10, 2016) through March 10, 2017.

Municipality	Mean Elevation Range
Invermere	1530
Elkford	944
Cranbrook	725
Kimberley	482

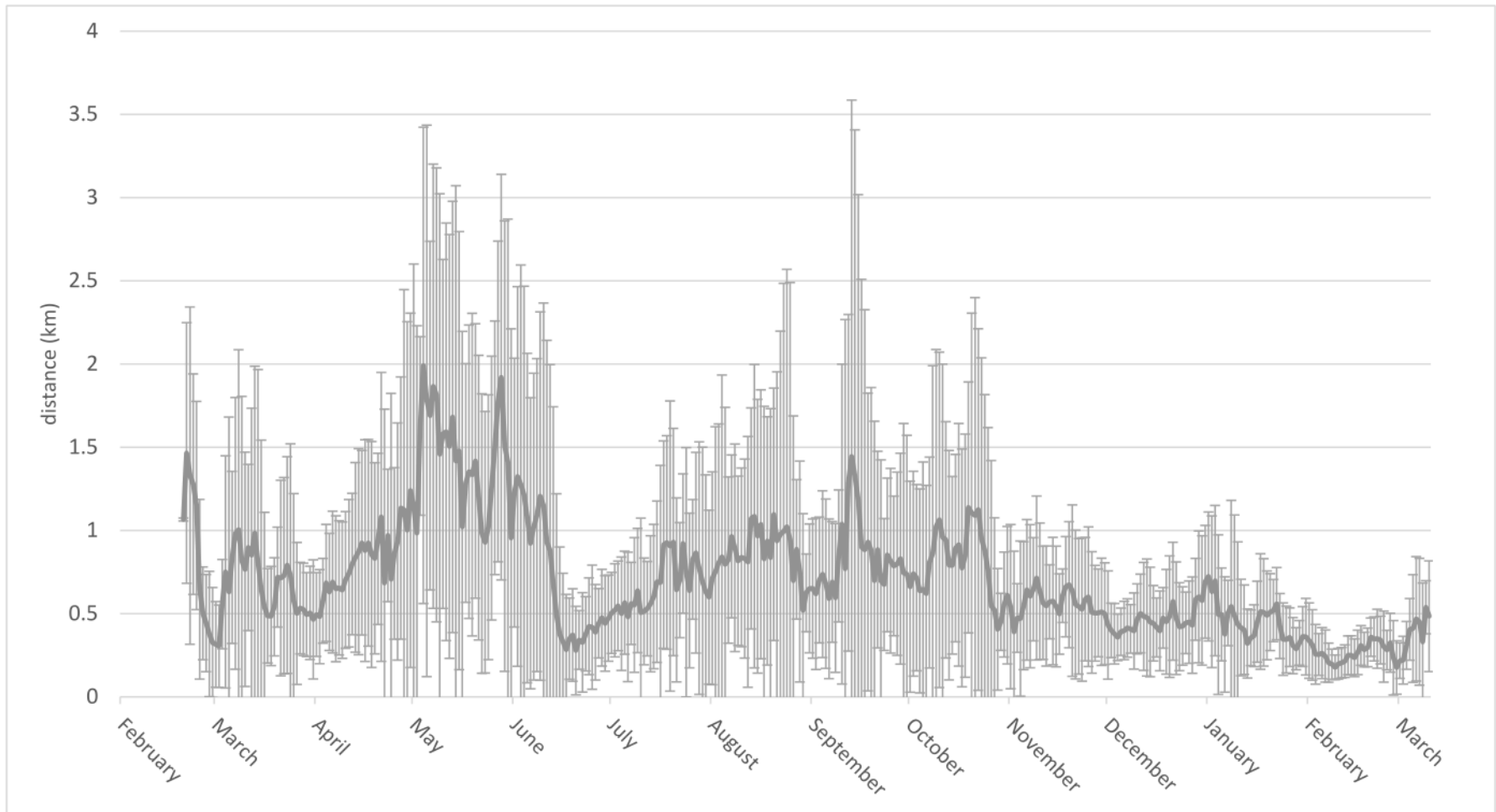


Figure 9: Moving average of distance moved (km) between 2 consecutive 13 hour locations over previous seven 13-hour intervals for all transmitting collars on translocated mule deer, \pm standard deviation from February 20, 2016 to March 10, 2017. Number of collars contributing to each mean varies with each day.

Table 7: Fate and number of days survived through March 19, 2017 and mortality cause (if applicable) of radio-collared mule deer translocated in 2016 and 2017.

Collar	Municipality	Capture Date	Age Class	BCS	Fate	# days survived	Mortality Date	Mortality Cause	Cause Certainty
20652	Cranbrook	2-Mar-16	Young adult	Fair	alive	382			
20653	Invermere	22-Feb-16	Young adult	Good	alive	391			
20654	Cranbrook	29-Feb-16	Adult	Fair	alive	384			
20655	Kimberley	17-Feb-16	Young adult	Fair	dead	278	21-Nov-16	shot	confirmed
20656	Invermere	22-Feb-16	Young adult	Good	alive	391			
20657	Kimberley	18-Feb-16	Adult	Fair	alive	395			
20658	Kimberley	16-Feb-16	Adult	Fair	dead	255	28-Oct-16	Natural / starvation	confirmed
20659	Invermere	23-Feb-16	Adult	Good	alive	390			
20660	Cranbrook	29-Feb-16	Young adult	Fair	dead	7	07-Mar-16	unknown	unknown
20661	Cranbrook	29-Feb-16	Adult	Poor	dead	59	28-Apr-16	cougar	confirmed
20662	Kimberley	16-Feb-16	Young adult	Good	alive	397			
20663	Cranbrook	29-Feb-16	Adult	Good	dead	29	29-Mar-16	wolf	probable
20664	Kimberley	17-Feb-16	Adult	Excellent	dead	253	27-Oct-16	road kill	confirmed
20665	Kimberley	16-Feb-16	Aged	Emaciated	dead	6	22-Feb-16	cougar	confirmed
20665	Elkford	9-Mar-16	Adult	Good	alive	375			
20666	Kimberley	17-Feb-16	Adult	Fair	dead	49	06-Apr-16	cougar	confirmed
20667	Invermere	22-Feb-16	Young adult	Excellent	dead	275	23-Nov-16	Natural / starvation	probable
20668	Invermere	22-Feb-16	Young adult	Excellent	alive	391			
20669	Invermere	22-Feb-16	Adult	Excellent	alive	391			
20670	Cranbrook	1-Mar-16	Adult	Good	alive	383			
20671	Invermere	23-Feb-16	Young adult	Good	dead	108	10-Jun-16	wolf	probable
20834	Cranbrook	2-Mar-16	Adult	Fair	dead	350	15-Feb-17	cougar	probable
20835	Elkford	8-Mar-16	Adult	Fair	dead	303	05-Jan-17	Natural / starvation	very certain
20836	Elkford	8-Mar-16	Adult	Fair	alive	376			
20837	Elkford	9-Mar-16	Adult	Fair	unknown	85	02-Jun-16		

Collar	Municipality	Capture Date	Age Class	BCS	Fate	# days survived	Mortality Date	Mortality Cause	Cause Certainty
20838	Elkford	10-Mar-16	Young adult	Fair	alive	374			
20839	Elkford	8-Mar-16	Adult	Fair	dead	439	21-May-17	bear	probable
20840	Elkford	10-Mar-16	Adult	Fair	dead	446	30-May-17	shot	confirmed
20841	Elkford	9-Mar-16	Adult	Fair	alive	375			
20655	Kimberley	6-Mar-17	Adult	Poor	alive	13			
20658	Cranbrook	8-Mar-17	Young adult	Poor	alive	11			
20660	Kimberley	6-Mar-17	Adult	Fair	alive	13			
20661	Kimberley	6-Mar-17	Adult	Poor	alive	13			
20663	Kimberley	6-Mar-17	Young adult	Fair	alive	13			
20664	Kimberley	6-Mar-17	Young adult	Poor	alive	13			
20666	Kimberley	6-Mar-17	Adult	Poor	alive	13			
20667	Cranbrook	8-Mar-17	Aged	Fair	alive	11			
20834	Cranbrook	7-Mar-17	Adult	Good	alive	12			
20835	Cranbrook	7-Mar-17	Young adult	Fair	alive	12			
20839	Cranbrook	7-Mar-17	Young adult	Fair	alive	12			
20840	Cranbrook	7-Mar-17	Young adult	Fair	alive	12			
35829	Kimberley	9-Mar-17	Young adult	Fair	alive	10			
35831	Kimberley	9-Mar-17	Aged	Poor	alive	10			
36092	Cranbrook	8-Mar-17	Young adult	Fair	alive	11			
36093	Kimberley	9-Mar-17	Aged	Fair	alive	10			
36096	Cranbrook	8-Mar-17	Young adult	Fair	alive	11			
36107	Kimberley	9-Mar-17	Young adult	Poor	alive	10			

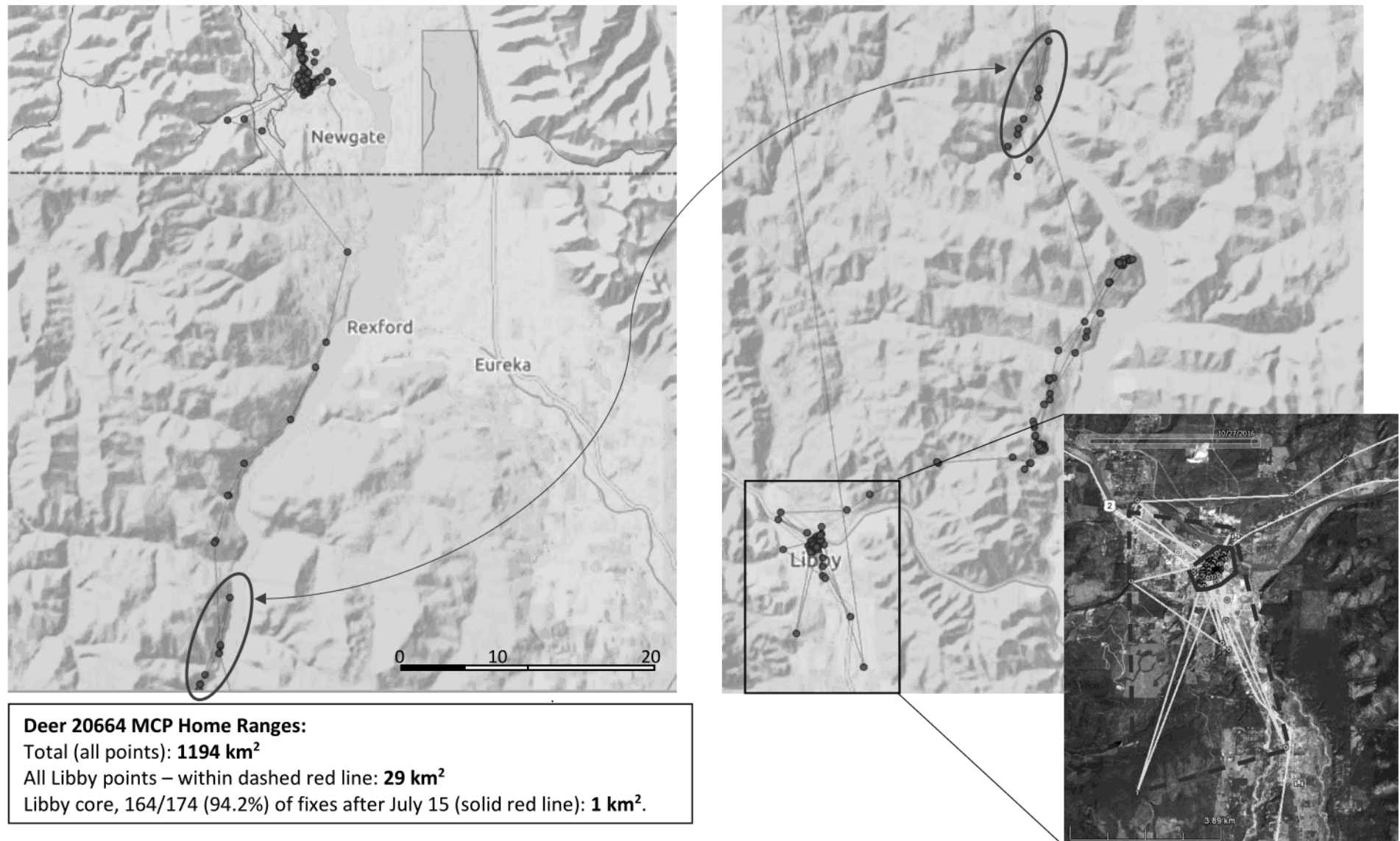


Figure 10: Location data for translocated deer 20664 from February 17 to October 27, 2016. Inset shows her locations in Libby, MT, from July 15 until her death (road mortality) October 27, 2016. Red ovals indicate the same location data on separated maps. Red star is Newgate Transfer Station release point.

Mortality

Kaplan-Meier survivor estimate for collared translocated mule deer between February 15, 2016 and February 13, 2017 is 47%. For collared mule deer in the same area over the same time period, Kaplan-Meier survivor estimates are approximately 80% (P. Stent, FLNRO, pers. comm.). More details analysis will be conducted for the final report.

As of March 10, 2017, 15 of the 29 collared mule deer translocated in 2016 have died. Eight of those 15 deaths resulted from predation, primarily cougars (Table 7). More detailed statistical survival estimates will be calculated for the final report. These will be compared with similar estimates for non-urban mule deer over the same time period in the same study areas. None of the deer translocated in 2017 have died, but have only been translocated for less than 2 weeks.

Body condition of captured urban deer was generally lower in 2017 than 2016 (Table 8). In both years, “fair” was the most common score given to individuals, between 50 and 60%. However, proportion of deer scoring “good” and “poor” were inversed between 2016 and 2017. Over one third of deer captured in 2017 were in poor condition. This may be a reflection of the severe winter conditions in the East Kootenay in 2017, particularly in the southern Rocky Mountain Trench region at lower elevations. Spring snow levels in 2016 were at record low levels, whereas snow levels in 2017 were above average, with record snow-on-ground measurements at Cranbrook airport in mid-February, 2017. However, the influence of body condition on survival of translocated mule deer is unclear. Survival of deer translocated in 2016 does not appear to be related to body condition score at time of capture (Table 9).

As of March 19, 2017, no deer translocated in 2017 have died. Conversely, 2 deer died within a week of translocation in 2016. Slopes around the Gibraltar release point with a southerly aspect were free of snow and snow depths overall near the release site were significantly lower than in Kimberley and Cranbrook where deer were captured in March, 2017.

Table 8: Summary of body condition score by age class for all deer translocated in 2016 and 2017. Total number of deer handled in each age class is provided.

	Excellent	Good	Fair	Poor	Emaciated	n deer
2016						
Aged		1.7%			1.7%	2
Adult	3.3%	13.3%	25.0%	1.7%		26
Young adult	5.0%	11.7%	15.0%			19
Fawn		5.0%	13.3%	3.3%		13
Total	8.3%	31.7%	53.3%	5.0%	1.7%	60
2017						
Aged			8.0%	4.0%		3
Adult		4.0%	4.0%	12.0%		5
Young adult			28.0%	12.0%		10
Fawn			20.0%	8.0%		7
Total		4.0%	60.0%	36.0%		25

Table 9: Fates of translocated mule deer corresponding to body condition score (BCS) at time of capture in Feb/Mar, 2016.

BCS at Capture	Alive	Dead
Poor		1
Fair	7	8
Good	5	3
Excellent	2	2

Table 10: Details of all known mortalities of translocated mule deer, including non-collared deer.

Collar	Date	Cause	Certainty	Notes
20665	22-Feb-16	cougar	confirmed	Partially buried by cougar
20660	15-Mar-16	cougar	probable	Difficult to recover, notes and location suggestive of cougar
20663	1-Apr-16	cougar	probable	Dragged into culvert under road
20666	7-Apr-16	cougar	confirmed	Cougar sign in area
20661	28-Apr-16	cougar	confirmed	Very recent, partially buried
20839	21-May-16	bear	probable	Abundant bear sign in area, very little of deer consumed
20840	30-May-16	shot	confirmed	Shot by MT wardens following complaints of aggressive behaviour
20671	10-Jun-16	wolf	probable	In Purcell Conservancy, located after 1 week, little left of carcass, collar damaged
20664	27-Oct-16	roadkill	confirmed	Hit on bridge over Kootenay River in Libby, MT
20658	28-Oct-16	natural causes	Possible	Emaciated, very old, tip of tongue mostly severed.
2015-born buck (no collar)	10-Nov-16	Hunting	Confirmed	Hunter report using phone number on ear tag after legal hunt kill in Montana.
20655	21-Nov-16	euthanized	confirmed	Shot by Conservation Officer in Baynes Lake. Could not get up.
2015-born buck (no collar)	Late Nov-16	Hunting	Confirmed	Hunter report using phone number on ear tag after legal hunt kill in Montana.
20667	24-Nov-16	Starvation / natural causes	Possible	Older deer, very thin, rumen full of needles
20835	5-Jan-17	Starvation / natural causes	Possible	Moved little in final 4 days, fawn seen nearby.
20665	3-Feb-17	euthanized	confirmed	Highly habituated deer in Yaak, MT. Hand-injected with BAM then euthanized
20834	15-Feb-17	cougar	probable	Predated in deep snow near Koocanusa
Young adult buck (no collar)	21-Feb-17	Road kill	Probable	Found dead in Fernie by Conservation Officer

Conflicts

Several deer have moved to either other communities or rural areas such as ranches or campgrounds. Five of the 26 collared deer surviving at least 1 month have generated official complaints from landowners; 2 deer have been destroyed in Montana for aggressive behaviour. However, several other deer have passed through rural areas and communities either without staying or residing there without generating complaints. Only 6 of the 26 deer have not knowing encountered a rural property or community. Two of these deer died within 2 months of release so may not have had time to encounter human developments. Another 5 deer have encountered a rural property or community but moved on and not stayed for any appreciable length of time². Formal complaints have been received on 5 of the 26 (19.2%) collared individuals used for analysis. No complaints have been received for non-collared translocated deer that could be identified by their ear tag.

The avoidance of conflict by translocated deer is a key component to success in the translocation trial. Although zero encounters and complaints cannot be expected, the Newgate Transfer Station and Dorr Road release sites south of Highway 3 (and, to a lesser extent, Ram/Mt. Broadwood) appear to be too close to attractants for any translocated deer that are even partially habituated to human presence.

The only deer released to Lavington that have encountered communities are the two that returned to Invermere (via very different routes and timeframes). Results of deer translocated to the Gibraltar release point in March 2017 will help determine whether these two more remote release sites are suitable for future translocations.

Table 11: Summary of whether collared deer translocated in 2016 have been known to encounter rural areas (ranches, campgrounds, etc.), communities (including urban centres, e.g. Baynes Lake, Eureka, MT, etc.). “Passed Through” indicates that the deer has moved through a community at one point with less than 3 days staying in the community. The deer may have subsequently returned to that community or is residing elsewhere.

COLLAR ID	Location	Release Site	Rural	Community	Passed through?	Complaint?
20652	Phillips Ck	Dorr Rd	yes	no	yes	
20653	Larsen Lake	Lavington	no	no	yes	
20654	Baynes Lake	Dorr Rd	no	yes	no	yes
20655	Dead (Baynes Lake)	Newgate	yes	yes	no	yes
20656	Engstom’s Pond	Lavington	no	no	no	
20657	West Kootenai*	Newgate	yes	no	no	
20658	Dead (West Kootenai*)	Newgate	yes	no	no	
20659	Invermere	Lavington	no	yes	yes	
20661	Dead (Gold Ck)	Dorr Rd	no	no	no	
20662	West Kootenai*	Newgate	yes	no	no	yes
20664	Dead (Libby, MT)	Newgate	no	yes	yes	
20665	Dead (Yahk, MT)	Ram	no	yes	yes	
20666	Dead (Gold Bay)	Newgate	no	no	no	
20667	Dead (Lavington)	Lavington	no	no	no	

² Note that these assessments are made by examining location data with satellite imagery (Google Earth). Any of these deer may well have encountered a property or community or stayed for a longer period of time. But we are unaware of such situations.

COLLAR ID	Location	Release Site	Rural	Community	Passed through?	Complaint?
20668	Invermere	Lavington	no	yes	no	
20669	Premier Ridge	Lavington	no	no	yes	
20670	Rexford Bridge, MT	Dorr Rd	no	no	yes	
20671	Dead (Purcell Conservancy)	Lavington	no	no	no	
20834	Dead (Koocanusa)	Dorr Rd	no	no	yes	
20835	Dead (North Galtons)	Ram	yes	no	yes	
20836	Mt Broadwood	Ram	no	no	no	
20837	Unknown	Ram	no	no	yes	
20838	West Kootenai*	Newgate	yes	no	no	
20839	Dead (Canuck Ck)	Ram	no	yes	yes	yes
20840	Dead (Eureka, MT)	Ram	yes	yes	no	yes
20841	Near Galloway	Ram	yes	yes	yes	

*West Kootenai is area of Montanan on west side of Lake Koocanusa immediately south of Canada / USA border, south of Newgate.

Table 12: Summary of potential post-release conflicts with mule deer in various land use designations. “Yes” indicates that at some point a mule deer has generated a complaint or been in proximity to rural property or been in a community. “Passed Through” indicates a deer encountered a community but left within 3 days. “Stayed” indicates they encountered a community and have never left.

Action / Designation		Dorr Rd	Lavington	Newgate T.S.	Ram Broadwood
Complaint	no	4	7	5	5
	yes	1		3	1
Rural	no	4	7	2	4
	yes	1		6	2
Community	no	4	5	5	3
	yes	1	2	3	3
Passed Through	no	1	4	4	1
	yes	3	3	1	2
	yes*	1			1
	stayed			3	2

* Indicates deer stayed in community for several days / weeks but eventually moved on.

MANAGEMENT IMPLICATIONS

There is a strong interest and hope for translocation as an operational tool for managing high urban deer populations. Whether translocation is a viable option is not yet clear. Questions not yet answered in this interim report are:

1. How does observed movement of translocated urban mule deer compare with sympatric non-urban mule deer populations?
2. How does survival of translocated urban mule deer compare with sympatric non-urban mule deer populations?

The final report for this project will compare data with results available from the concurrent non-urban mule deer project currently underway in the East Kootenay (led by Patrick Stent, FLNRO, Cranbrook).

Another issue that needs to be resolved is whether suitable release sites exist to which mule deer can be translocated with minimal risk of deer becoming a problem in other communities.

This is an essential question to the trial. Five of 26 (19.2%) collared deer that survived longer than one month generated complaints from the general public to the BC Conservation Officer RAPP line. When considering only deer released at the three sites south of Highway 3, that proportion rises to 5 of 19 (26.3%). This suggests that deer should not be released to winter range south of Highway 3. Further, 9 of those 19 (almost 50%) of those collared deer released south of Hwy 3 have been in Montana at some point. State wildlife officials in Montana have had to euthanize 2 mule deer at their expense and field calls regarding the translocated deer as a result of this project.

For translocation to become an operational tool for managing urban deer populations, some level of subsequent response by the Conservation Officer Service may be required. Occasionally individuals may find another community and revert to aggressive behaviour. What level of response becomes burdensome for the Conservation Officer Service may be a necessary decision for that branch.

Key findings of capture and transportation process:

1. Clover trapping is not an efficient method to capture deer for translocation. Low snow levels and an early spring meant food was not limited to mule deer in February, 2016, so there was little incentive for mule deer to enter traps. Further, there is no control over which deer would be trapped, or even which species. Several whitetail deer were captured in clover traps and released. Also sex of the deer capture cannot be controlled. Mixing bucks and does in a trailer is not advised (bucks are much more excitable and prone to possible injury to themselves or other deer in the trailer).
2. Free-range darting worked relatively well. Having more access to dart deer on private property would greatly increase efficiency. An option is for municipalities to offer landowners an option to approve darting on their property (e.g. opt-in box to check off on property tax form). A map could easily be generated showing which properties permit darting, which do not approve and which properties have not responded. In many instances, an opportunity to dart deer was lost while knocking on a door, having no one home to approve darting, or disturbing deer while attempting to access a front door.
3. Crew size of 5 was more efficient than larger numbers. An experienced darter and veterinarian greatly facilitated captures in 2017. In part from the experience gained in 2016, the process was smoother and less stressful. More people require further personnel management and detract from task of darting and moving deer.
4. A minivan worked well as a shuttle vehicle from point of capture to the transport trailer. Its wide tailgate opening and low rear entry facilitated moving deer into the vehicle. Having the person attending the deer able to talk with the driver was occasionally useful, however a canopy-covered pickup truck would also work. Using a shuttle avoided moving the stock trailer with deer inside allowing the deer to be quiet and restful. A van is also much more maneuverable in urban areas including narrow streets, alleys, driveways, etc.

5. Single mule deer in the trailer are much more likely to become agitated. We found the process worked best when two deer (typically a doe and her fawn) could be darted at the same time for at least the first captures each day. Starting with two deer in the trailer helped keep them calm and inactive once reversed in the trailer.
6. Six to 8 deer appears to be the maximum number an efficient crew can capture in one day. It's also the maximum number of deer than can likely be safely added to a typical 2 to 3 horse stock trailer. If translocation is approved for operational procedure, additional crews are likely required to raise the number of deer captured to have an impact on municipal populations.
7. Trailers must be darkened to the maximum extent possible and an effective tarpaulin hung at the back (while leaving a short distance on which to lay immobilized deer being added to the trailer). All sharp fittings in the trailer must be padded to prevent injury as well as loops or hooks in which a deer might catch a hoof or leg. There's very little control over the activity of the deer once they are reversed in the trailer, so all precautions must be taken in advance.
8. Trailers should be parked in a quiet, private and secure area while captures are proceeding. Ensuring they are in the shade if sun is shining is also important as stock trailers can quickly heat up, even in cool late winter weather. Keeping conversation and activity to a bare minimum close to the trailer is key to helping deer stay calm and relaxed in the trailer.
9. We had no injuries in the trailer during captures and transportation. However, at least one person attending the release should be a licensed and experienced hunter with a firearm present to euthanize any injured deer if necessary.

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APPENDIX A: LOCATION DATA

All location data , release sites and mortality location for urban mule deer translocated in 2016. Maps are divided into deer from the four participating municipalities

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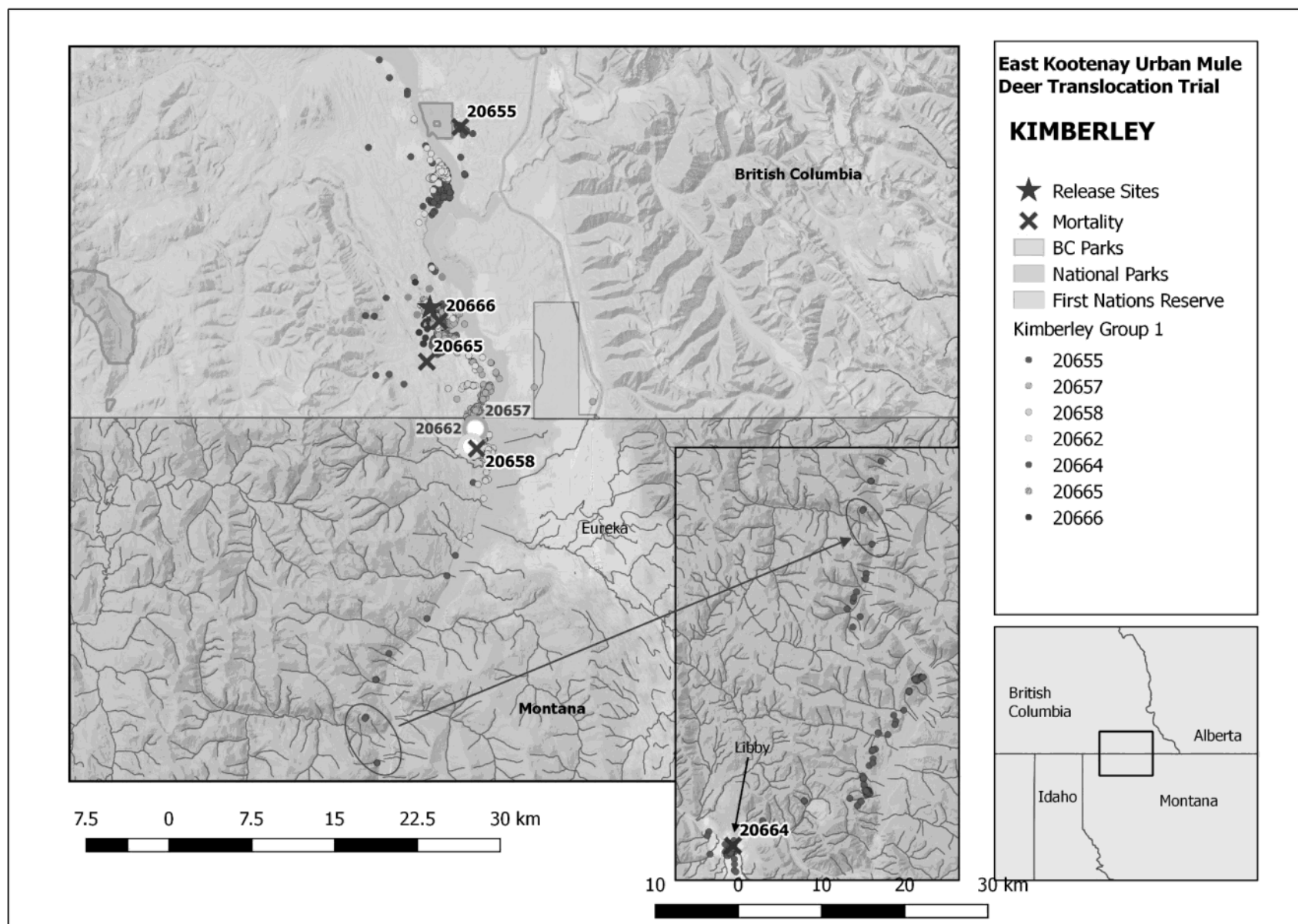


Figure A 1: All GPS collar locations of mule deer translocated from Kimberley. White-centred symbol shows position of surviving deer as of mid-March, 2017.

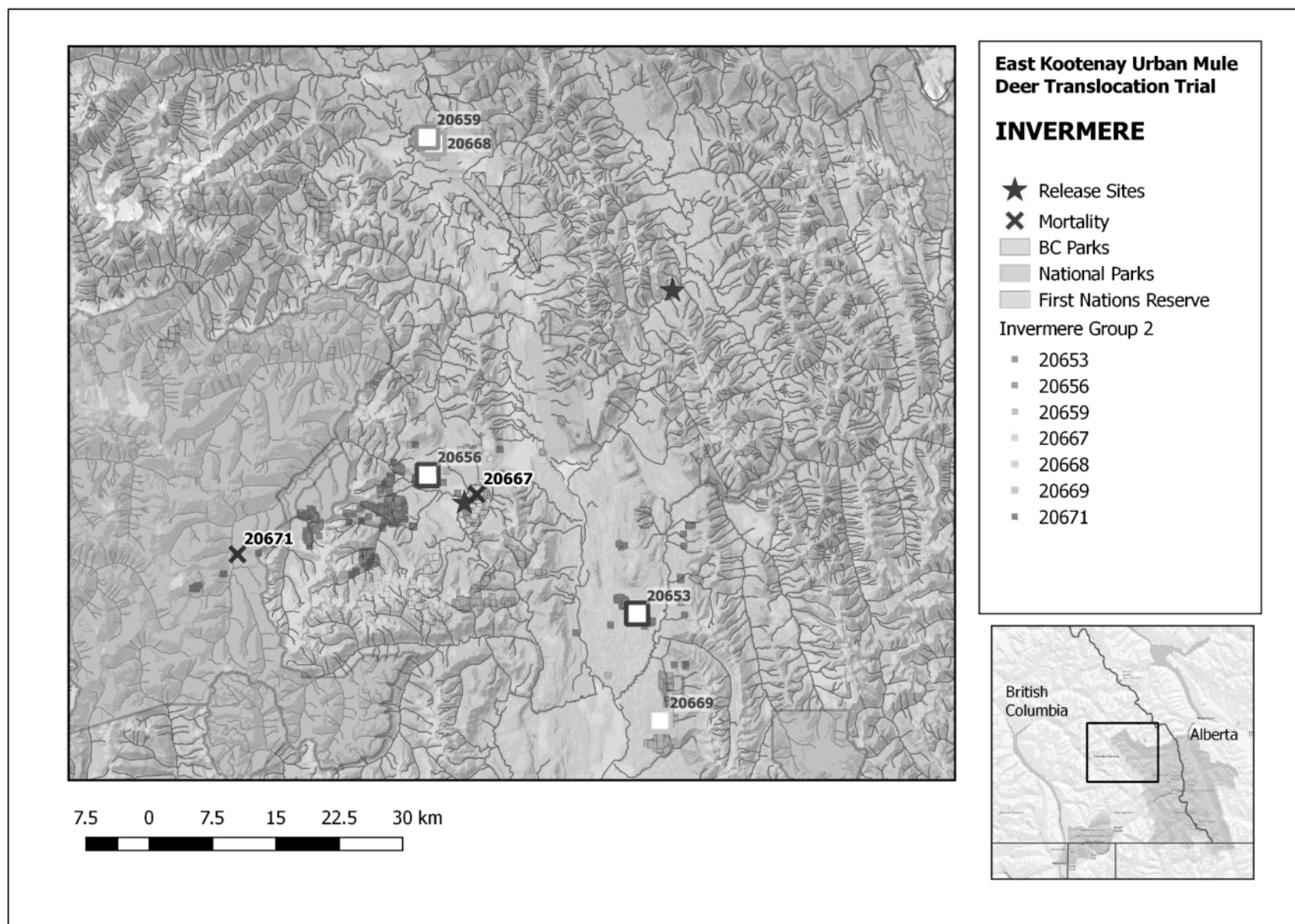


Figure A 2: All GPS collar locations of mule deer translocated from Invermere. White-centred symbol shows position of surviving deer as of mid-March, 2017.

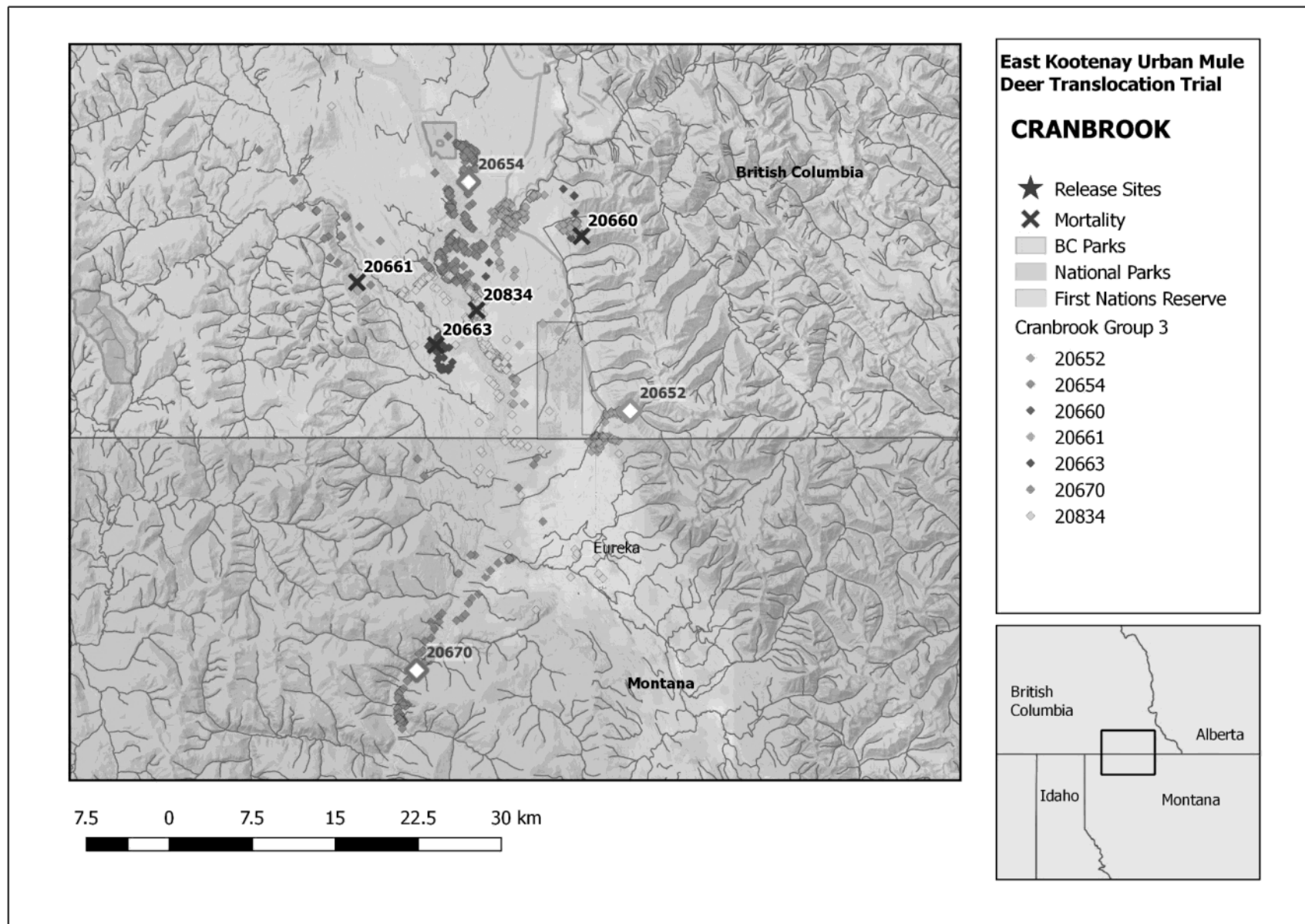


Figure A 3: All GPS collar locations of mule deer translocated from Cranbrook. White-centred symbol shows position of surviving deer as of mid-March, 2017.

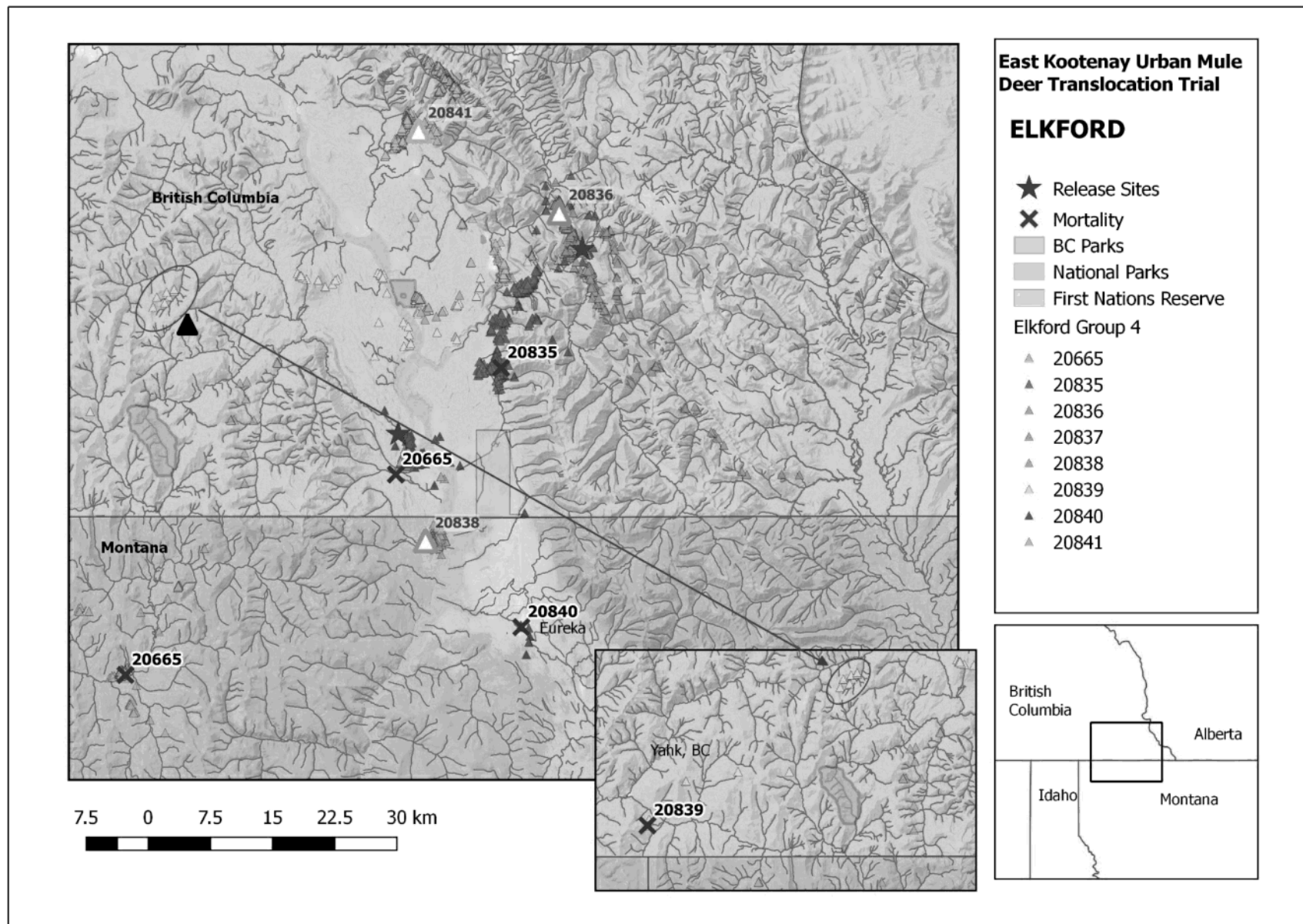


Figure A 4: All GPS collar locations of mule deer translocated from Elkford. White-centred symbol shows position of surviving deer as of mid-March, 2017.

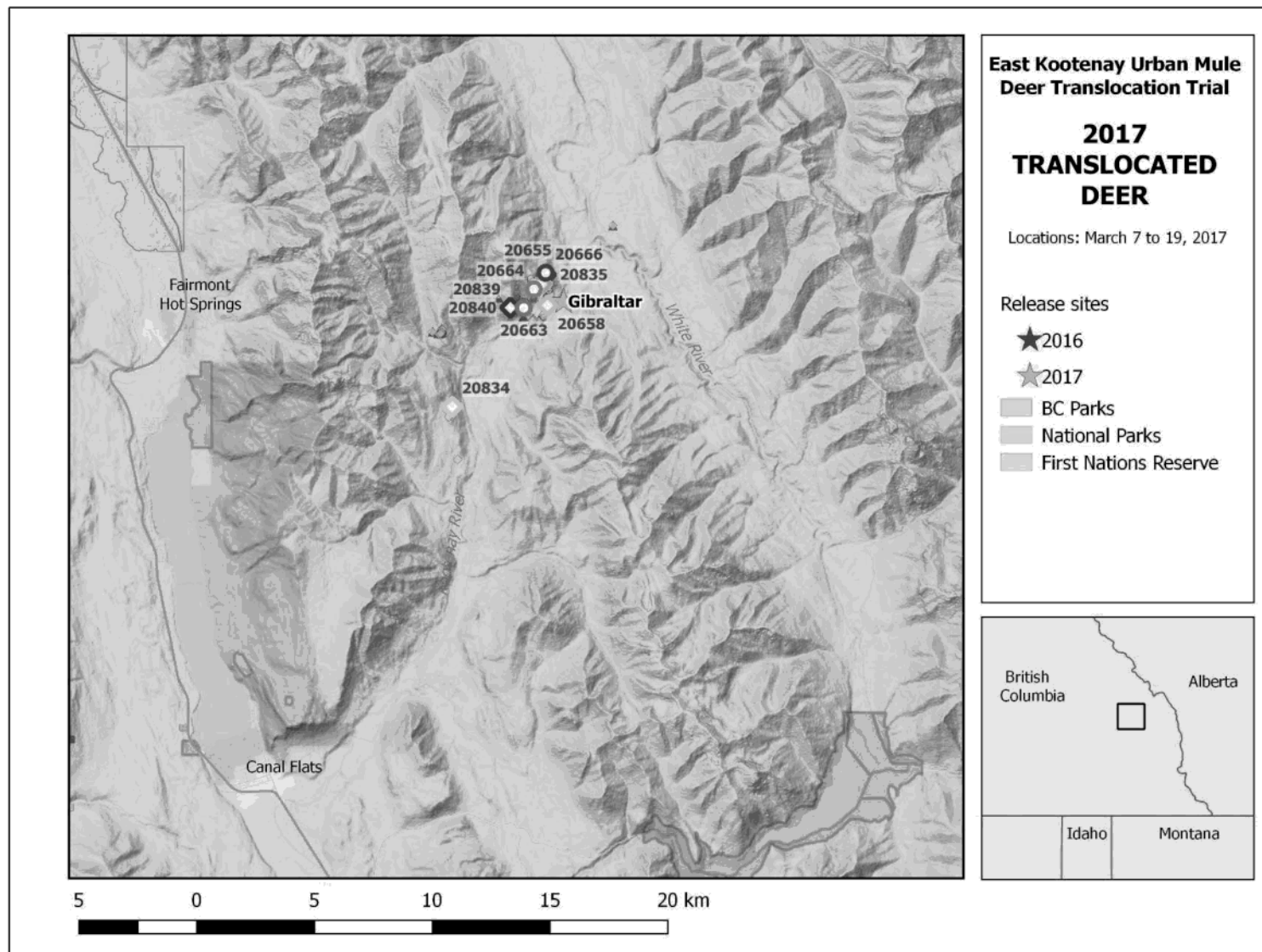


Figure A 5: GPS collar locations of mule deer translocated from Cranbrook and Kimberley in March, 2017. White-centred symbol shows position of deer as of March 19, 2017. Map shows only data from 12 Vectronic GlobalStar collars. Data from 6 Lotek collars are not shown.

APPENDIX B: CAPTURE DATA

Record of Capture for East Kootenay Urban Mule Deer Translocation Project. March, 2017. All animals captured were translocated. Full on captures and releases, including spatial data are provided in an accompanying Microsoft Excel spreadsheet file.

Common Name	WHID	Capture Location	Capture Date	Sex	Age Class	Eartag	Release location
Mule Deer	16-9027	s.15,s.22	6-Mar-2017	F	Adult	Yellow 0-1138	km 28.5 Kootenay River FSR
Mule Deer	16-9018		6-Mar-2017	F	Adult	Yellow 0-1158	km 28.5 Kootenay River FSR
Mule Deer	16-8233		6-Mar-2017	F	Fawn	Yellow 0-992	km 28.5 Kootenay River FSR
Mule Deer	15-7030		6-Mar-2017	F	Adult	Green-Yellow 010	km 28.5 Kootenay River FSR
Mule Deer	16-9031		6-Mar-2017	F	Adult	Yellow 0-1118	km 28.5 Kootenay River FSR
Mule Deer	15-7028		6-Mar-2017	F	Young adult	Green-Yellow 012	km 28.5 Kootenay River FSR
Mule Deer	15-7029		6-Mar-2017	F	Young adult	Green-Yellow 011	km 28.5 Kootenay River FSR
Mule Deer	17-9552		7-Mar-2017	F	Young adult	Yellow 0-1336	km 28.5 Kootenay River FSR
Mule Deer	17-9549		7-Mar-2017	F	Young adult	Yellow 0-1320	km 28.5 Kootenay River FSR
Mule Deer	17-9550		7-Mar-2017	F	Adult	Yellow 0-1338	km 28.5 Kootenay River FSR
Mule Deer	17-9551		7-Mar-2017	M	Fawn	Yellow 0-1317	km 28.5 Kootenay River FSR
Mule Deer	17-9555		7-Mar-2017	F	Young adult	Yellow 0-1323	km 28.5 Kootenay River FSR
Mule Deer	17-9553		8-Mar-2017	F	Aged	Yellow 0-1326	km 28.5 Kootenay River FSR
Mule Deer	17-9562		8-Mar-2017	F	Young adult	Yellow 0-1334	km 28.5 Kootenay River FSR
Mule Deer	17-9561		8-Mar-2017	F	Young adult	Yellow 0-1313	km 28.5 Kootenay River FSR

Common Name	WHID	Capture Location	Capture Date	Sex	Age Class	Eartag	Release location
Mule Deer	17-9568	s.15,s.22	8-Mar-2017	F	Young adult	Yellow 0-1318	km 28.5 Kootenay River FSR
Mule Deer	17-9554		8-Mar-2017	M	Fawn	Yellow 0-1309	km 28.5 Kootenay River FSR
Mule Deer	17-9560		8-Mar-2017	M	Fawn	Yellow 0-1330	km 28.5 Kootenay River FSR
Mule Deer	17-9567		8-Mar-2017	M	Fawn	Yellow 0-1316	km 28.5 Kootenay River FSR
Mule Deer	17-9558		9-Mar-2017	F	Young adult	Yellow 01333	km 28.5 Kootenay River FSR
Mule Deer	17-9573		9-Mar-2017	F	Aged	Yellow 0-1344	km 28.5 Kootenay River FSR
Mule Deer	17-9557		9-Mar-2017	F	Aged	Yellow 0-1322	km 28.5 Kootenay River FSR
Mule Deer	17-9556		9-Mar-2017	F	Young adult	Yellow 0-1332	km 28.5 Kootenay River FSR
Mule Deer	17-9565		9-Mar-2017	M	Fawn	Yellow 0-1308	km 28.5 Kootenay River FSR
Mule Deer	17-9564		9-Mar-2017	F	Fawn	Yellow 0-1305	km 28.5 Kootenay River FSR



THE CORPORATION OF THE DISTRICT OF OAK BAY
MUNICIPAL HALL – 2167 OAK BAY AVENUE – VICTORIA, B.C. V8R 1G2
PHONE 250-598-3311 FAX 250-598-9108 WEBSITE: www.oakbay.ca

March 28, 2017

Jeff Morgan
Manager, Fish & Wildlife Policy
Fish & Wildlife Branch, Resource Stewardship Division
Forests, Lands & Natural Resource Operations
1259 Dalhousie Drive
Kamloops, BC V2C 5Z5

Dear Mr. Morgan,

**Re: District of Oak Bay Urban Deer Management Program
Agreement #: SCA17FHQ208-05**

I am pleased to advise that the District of Oak Bay has completed terms of Agreement #:SCA17FHQ208-05 and we are now respectfully requesting payment of the \$20,000 Provincial grant toward the project. The project deliverable as defined in the agreement is:

The Recipient is to spend the funds to purchase 20 GPS radio collars that will be affixed to deer that are captured in Oak Bay. This is a key component of the research project that is being supported.

As outlined in the funding agreement the District of Oak Bay has now purchased the radio collars and cameras. UVIC participation in the project is led by Dr. Jason Fisher, Wildlife Ecologist. Please see the attached invoices from Lotek Wireless and Island Outfitters as proof of purchases and a copy of the project's overall budget.

The District of Oak Bay and the Urban Wildlife Stewardship Society very much appreciate the Province's contribution to this important project.

Please let me know if you require anything additional in order for us to complete the requirements of the grant. Thank you again for your assistance.

Yours truly,

Warren Jones
Director of Corporate Services

c- S. Huxter, UWSS



PROGRAM BUDGET

<u>ACTIVITY</u>	<u>ITEM</u>	<u>SPECIFICS</u>	<u>BUDGET</u>	<u>ACTUAL</u>
Population Research	Cameras	40 @ \$350	\$15,000	\$6,944
Deer Collaring	Loteck GPS Collars	20 @ \$1,000	\$20,000	\$21,819
	Clover Traps	3 (FLNRO)	in kind	
Preparation, Planning & Incidentals	Coordination & Communications	UVIC & Suppliers	\$5,000	\$11,300
		TOTAL	\$40,000	\$40,063



115 PONY DRIVE
NEWMARKET, ONTARIO
Canada
L3Y 7B5
TEL: (905) 836-6680
FAX: (905) 836-6455
WEB: www.lotek.com
EMAIL: biotelemetry@lotek.com

472A LOGY BAY RD
ST. JOHN'S, NEWFOUNDLAND
Canada
A1A 5C6
TEL: (709) 726-3809
FAX: (709) 726-5324
WEB: www.lotek.com
EMAIL: biotelemetry@lotek.com

INVOICE
Date 03/16/17 Number S158631 Page 1

B District of Oak Bay
I 2167 Oak Bay Avenue
L Victoria, BC V8R 1G2
L Canada
Warren Jones
T
O

S Urban Wildlife Stewardship Soc
H 2017 Cadboro Bay Road
I Victoria, BC V8R 5G4
P Canada
Barb McKerrell
T
O

ORDER NO. SO36290 ORDER DATE 03/17/17 CUSTOMER NO. s.17 PURCHASE ORDER NO. proforma

SHIPMENT METHOD Next day service SHIPMENT TERMS FOB NM FC SHIP DATE 03/16/17 TERMS PREPAID

QTY. ORDERED	QTY. TO SHIP	QTY. BACK ORDERED	ITEM NO.	DESCRIPTION	UNIT PRICE	EXTENDED PRICE
20		20	LIFECYCLE PRO 330	Lifecycle Pro 330 Collar	783.00	15660.00
				First-time buyer discount applied		
20		20	DP ACT FEE	Data Plan Activation Fee	54.00	1080.00
20		20	GS PLAN 3	Globalstar Data Plan 3	146.00	2920.00
				Fix every 13hrs for 12 months		
1		1	FREIGHT	Freight Charges	250.00	250.00
1	1		PROFORMA	Proforma Invoice	21 819.20	21 819.20

Payment Information:

Please remit to Newmarket Address
Cheque or Draft Payable to Lotek Wireless Inc., remittance address above

International Wire to Lotek Wireless Inc.
Bank of Montreal
2851 John St., Unit#300
Markham, ON L3R 5R7
Branch and Account: 29491071733
S.W.I.F.T. BOFMCA22

Canadian

Ship To EIN#

G.S.T. No 880269358

The Purchaser agrees that the use of all equipment supplied by Lotek is at the purchaser's sole risk
It is the users sole responsibility to deploy Lotek equipment in a manner that is in compliance with animal
care standards set by the users national, state and/or local governments

PLEASE NOTE: NO RETURNS WILL BE ACCEPTED WITHOUT AN AUTHORIZED LOTER RMA (RETURN
MATERIAL AUTHORIZATION) NUMBER

Subtotal: 19910.00

Sales Tax: 1909.20

Total 21 819.20



Delivering innovative technology for a sustainable future.

STANDARD TERMS, CONDITIONS AND SERVICES

Pricing:

- 1) Unit Prices are in CDN\$, FOB Plant and excludes any applicable taxes or shipping. Please include any tax exempt numbers where applicable at time of order. Freight will be Prepaid and ADDED to invoice.
- 2) Prices are **quantity and model** dependent
- 3) Quoted pricing is valid for 60 days

Payment Terms : Net 30 days with P.O. Proforma invoice available upon request. If no purchase order provided 100% PREPAYMENT NEEDED

Payment Method:

- 1) Cheque
- 2) Wire transfer
- 3) Credit card payments are only accepted for deposits or orders up to a maximum of CDN\$5,000

Shipment: Purolator courier.

Services: On site training and application support is available and will be quoted upon request.

The Purchaser agrees that the use of all equipment supplied by Lotek is at the purchaser's sole risk. It is the user's sole responsibility to deploy Lotek equipment in a manner that is in compliance with animal care standards set by the user's national, state and/or local governments.

Warranty: LifeCycle collars have an out of the box warranty, good until collars are deployed or up to 30 days after shipment. (Warranty also covers batteries.)

For questions or comments regarding this quotation, please contact Mario Henriques at 905-836-2910, mhenriques@lotek.com.



SPORT FISHING & HUNTING CENTRE

INVOICE

Invoice No.: OakBay2017

March 28, 2017

District of Oak Bay
2167 Oak Bay Ave.
Victoria, BC V8R 1G2

Attn: Mr. Warren Jones

WJones@oakbay.ca

Qty	Description	Price/Item	Amount
40	BUSHNELL TROPHY 12MP HD ESSENTIAL E2 CAMERA	\$ 155.00	\$ 6,200.00
		Subtotal	\$ 6,200.00
		5% GST	\$ 310.00
		7% PST	\$ 434.00
		Total	\$ 6,944.00

GST#R13732237

Thank you, we appreciate your business.

Telephone (250) 475-4969

Fax (250) 475-6942

3319 Douglas Street, Victoria, BC V8Z 3L2

Visit our WebSite at www.islandoutfitters.ca Email: info@fishingvictoria.com

INVOICE

District of Invermere

Box 339 - 914 - 8th Avenue

INVERMERE, BC - V0A 1K0

Phone: (250) 342-9281

Fax: (250) 342-2934



Customer Number : s.17

Invoice Number : 2017030212

Invoice Date : 16-Mar-2017

Customer P.O. No.

Due Date : 16-Apr-2017

**MINISTRY OF FORESTS LANDS AND NATURAL RESOURCE
OPERATIONS**

1259 DALHOUSIE DRIVE

KAMLOOPS BC V2C 5Z5

Product	Description	Quantity	Unit Price	Amount
525	MISCELLANEOUS AGREEMENT # SCA17FAHQ208-03 URBAN DEER MANAGEMENT	17.0000	200.0000	\$3,400.00

GST/HST Registration Number : 107021271RT0001

Total Gross \$3,400.00

GST/HST \$0.00

Total Invoice \$3,400.00

Please return this portion with your payment

Customer Number : s.17

Customer Name : MINISTRY OF FORESTS LANDS AND NATURAL RESOURCE
OPERATIONS

1259 DALHOUSIE DRIVE

KAMLOOPS BC V2C 5Z5

Invoice Number : 2017030212

Invoice Date : 16-Mar-2017

Invoice Amount : \$3,400.00

Amount Paid :

District of Invermere

Box 339 - 914 - 8th Avenue

INVERMERE, BC - V0A 1K0