Identifying and securing hibernation habitat for bats in the Columbia Basin in response to risk of White Nose Syndrome

Year 2 End of Season Report

by

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TABLES AND FIGURES

Overview

In Year 2 of the winter bat research in East and West Kootenay regions, bat detectors were deployed. Once again, activity was detected throughout winter at most low elevation sites. Species identification of recorded bats is still be analyzed, but captures together with some preliminary acoustic analysis suggests winter bat activity mainly consists of 4 species: big brown bats, silver-haired bats, Californian Myotis, and Townsend's big-eared. Most activity is focused in low elevation areas near open water (e.g. near Kootenay Lake, near Pend D'Oreille and Columbia Rivers), but activity was not detected in high elevation areas despite open water in some locations (e.g. Retallick). Bats were mistnetted, radiotracked, and acoustically monitored in the Creston area fall 2012 and early 2013, revealing use of rock crevices by Little brown myotis and Yuma myotis late into the fall (Dec. 2012), and use of a house roost throughout winter by Yuma Myotis. Two main bat hibernacula in mines were monitored throughout winter 2012-2013: REMAC in Pend D'Oreille and Queen Victoria in Beasley. Gating of the latter is to be done in June 2013 to protect this hibernaculum.

At the time of this report, many of the high elevation bat detectors deployed in deep mines were not yet retrieved due to persistent snow-load. Several new low elevation mines were monitored this winter, and found to be used by bats.

Genetic analyses confirmed that feeding was taking place by bats (most likely California Myotis) in mines last winter (2011-12 when plastic was laid in some mines during winter months).

On cover: *Myotis californicus.*

Acknowledgements

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Methods and Results

Acoustics

Acoustic monitoring was conducted with ultrasound bat detectors (Anabat, Titley Scientific; and SM2BAT, Wildlife Acoustics), deploying them in locations of potential bat activity including near open water, cliffs, areas of high mine density, etc. At potential hibernacula, or at known roosts, RoostLoggers (RL; Titley Scientific) were deployed for long term monitoring to determine patterns of bat activity in winter, use of the structure as a hibernaculum, and/or seasonal patterns. Roostloggers have a short (5 – 15 m) detection distance, unlike standard bat detectors which can detect some species up to 50 m away.

Detector monitoring locations are listed in Table 1 and Figure 1. Not all detectors have been retrieved at the time of this report, and most data have not been analyzed. Basic information about whether bats were detected has been included for some detectors.

Mistnetting

Bats were mistnetted in the East and West Kootenays from Sept. 2012 to April 2013 (Table 1; Figure 1). A total of 257 bats of 9 species were captured (Table 2a and b; details in Appendix I).

The most significant find was the Reeves Macdonald mine (REMAC), a complex of adits and shafts on the Pend D'Oreille River. This region was previously surveyed for bats by M. Vonhof and J. Gwillam (2000; FWCP report) and found to have 9 species of bats. This mine was not mentioned in the report by these authors and was therefore presumably not surveyed at that time. Mistnetting at this mine 3 times Fall in 2012 (Sept 15, Oct 3, Dec 1), resulted in the capture of 8 of the 9 species known from the region. To better understand population numbers of bats, some bats were banded; recaptures have been low (see Table 3), suggesting that this mine may house a large number of bats across the season, but in particular winter use may be provincially significant. Four species (big brown, Townsend's big-eared, Californian myotis, silverhaired) were confirmed to hibernate in this mine, and this is more species than any other known hibernaculum in BC to date. Based on these preliminary capture numbers and acoustic activity recorded, this mine is by far the largest and most diverse winter bat roost known in B.C.

Radiotracking

In the Creston area starting late October, bats were captured and fitted with a transmitter; radiotracking continued until mid-Dec. Radiotelemetry, tracking by truck and airplane, was conducted to locate hibernacula, and bats were followed if they left maternity roosts. Once a roost was located, where possible, the roost was investigated and the bat was monitored with a LOTEK SRX400 to record how often the bat emerged from its roost; in a few cases, temperature sensitive transmitters were used to punctuate these emergences from the roost and verify that the transmitter was still attached to the bat.

A total of 15 bats were radiotracked and several new roosts were located, although not all were pinpointed exactly; 4 rock crevice roosts were found and 2 building roosts (Table 4). One of the building roosts (in Creston area) was still occupied with bats as of Dec. 16, 2012, the last time this site was investigated. The other building roost (in Kuskonook) was no longer occupied, but this may have in part been due to the insertion of a temperature/Rh datalogger into the roost, after which all bats were seen to evacuate the roost. It is possible that disturbance in winter roosts is not tolerated by bats. No further efforts were made to place microclimate dataloggers into roosts until this is better understood.

The Canadian supplier of bat transmitters is Holohil (Ontario), and difficulties were experienced with these transmitters. I worked with the company to fix the problems that occurred, but many bats were not located likely due largely to these transmitter problems encountered.

Genetics

Myotis lucifugus is a species assessed as Endangered by COSEWIC (COSEWIC 2012). It is extremely difficult to tell from *M. yumanensis*. The only way to be able to conclusively differentiate them is genetics. In the past it has not been considered vital to be able to tell these species apart and thus the expense of genetic species identification has not been undertaken. However, we now realize that we do not know maternity or hibernacula for each species as they have not been differentiated. This fall, bats producing 35-40kHz (*M. lucifugus*) and bats producing 45-50kHz (*M. yumanensis*) echolocation calls were captured. This suggested that both of the aforementioned Myotis species were captured, and in fact this was genetically confirmed. The Kuskonook house roost was a mixed species roost: both *M. lucifugus* and *M. yumanensis* were captured there roosting under the exterior siding as of 7 Nov. 2012.

Reeves Macdonald mine (REMAC), a mine that appears to house significant numbers of bats in winter, was found to contain several Myotis species in Sept.: long-legged (*Myotis volans*) and long-eared (*M. evotis*) were identified based on morphology, and Yuma myotis (*M. yumanensis*) was genetically confirmed.

Last winter (2011-12), I conducted an experiment to lay plastic in dry mines and collect feces that dropped onto it over the course of the winter. While some of the feces appeared to be rodent in nature, much of it looked like bat feces. Acoustic monitoring suggested that bats, especially *M. californicus*, were coming into mines for brief periods at night and then leaving again. The hypothesis is that they are feeding on hibernating insects that are evident in almost all low elevation mines in the Kootenays (at least 2 species of insect and harvestmen). Genetic analysis recently confirmed that feces collected mid-winter on plastic was from bat. Exact species was not available from the extracted DNA, although another attempt at resolving species of bat is being conducted by the WGI lab. If this is successful, an attempt may be made to determine whether the contents of the feces are the same types of arthropods that are found hibernating in mines. All genetic results of project to date are in Table 5.

Table 1. Sites of capture and/or acoustics in project to date (2011-13). Year of activity: 2011-12 = Yr 1; 2012-13 = Yr 2.

ACTIVITY	REGION	SITE NAME	COMMENTS	LOCATION	ELEVATION	YEAR
acoustic, roost	East Kootenay	Dominion Mine	acoustics		973 m	Y1
acoustic	East Kootenay	Tony -- St Mary's LK	acoustic; winter lakeshore near open water area; LAI deployed	11 U 557912 5496301	968 m	Y2
acoustic	East Kootenay	LAI Back Yard in Kimberley	ZCAIM in Kimberley; urban bat monitoring in winter	11 U 573893 5502461		Y2
acoustic	East Kootenay	Columbia LK NCC	acoustics; lakeshore; Lot48	11 U 581692 5570462	820 m	Y2
acoustic	East Kootenay	Half Diamond on Premier LK	acoustics lakeshore; bat houses used in summer	11 U 596623 5533862		Y2
acoustic	East Kootenay	White Swan Near Prov Park	acoustics; along creek that's open all winter	11 U 609188 5557290	1145 m	Y2
net, acoustic, roost	East Kootenay	Copper King Mine	acoustic and netting (late summer only); fecal collection on plastic; some banding		1058 m	Y1, Y2
acoustic	East Kootenay	Sand Lake	acoustics; lakeshore; winter freezes over	11 U 622768 5477843		Y2
acoustic	East Kootenay	NCC Mt Broadwood Elko	acoustics; rivershore	11 U 641529 5463831	929 m	Y2
acoustic	East Kootenay	NCC Hosmer	acoustics; River location; fall monitoring only	11 U 651069 5503717	1098 m	Y2
acoustic	East Kootenay	Summit LK	acoustics; lakeshore,	11 U 666320 5500731	1379 m	Y2
acoustic	East Kootenay	Mt Swansea Mine	acoustics; LAI installed RL; data not retrieved yet to know if it is a roost	55 H 635908 5907217		Y2
acoustic	West Kootenay	Syringa Prov Park Det2	acoustics	11 U 432589 5468306	438 m	Y1, Y2
acoustic	West Kootenay	Syringa Prov Park Det3	acoustics on lakeshore	11 U 434665 5467280	441 m	Y1

ACTIVITY	REGION	SITE NAME	COMMENTS	LOCATION	ELEVATION	YEAR
net, acoustic	West Kootenay	Syringa Prov Park Det1	acoustics and netting	11 U 435485 5466673	442 m	Y1
acoustic	West Kootenay	Nancy Green Prov Park Lakeshore	acoustics	11 U 431597 5456617		Y2
roost	West Kootenay	Siverhaired Rock Crack Roost	radiotracked; hibernaculum		593 m	Y1
roost	West Kootenay	Silverhaired Rock Crack roost	Radiotracking; Hibernaculum		691 m	Y1
acoustic, roost	West Kootenay	Casino Adit	acoustics		617 m	Y1
acoustic	West Kootenay	Allen Marlow's Old Growth	acoustics; lots of mines in area; heavy snowload; lake freezes over in winter	11 U 453440 5615429	774 m	Y1
acoustic	West Kootenay	Fort Shepherd	acoustics	11 U 454912 5431348	423 m	Y1
acoustic	West Kootenay	Fort Shepherd 2	acoustics	11 U 455008 5431200		Y2
acoustic, roost	West Kootenay	KrestovaCaves	acoustics; activity in winter suggests some winter roosting here		692 m	Y1
acoustic	West Kootenay	Iron Creek Quad Trail	lots of long-eared Myotis forage and roost near here in summer	11 U 455686 5460345	600 m	Y1
acoustic	West Kootenay	Valhalla Prov Park Lakeshore	acoustics	11 U 465682 5513282	527 m	Y1
roost	West Kootenay	Silverhaired Tree Roost2 PPine	Radiotracking; hibernaculum		976 m	Y1
roost	West Kootenay	Silverhaired Male Tree Hibernaculum	winter tree roost; radiotelemetry		782 m	Y1
net, acoustic, roost	West Kootenay	Queen Victoria Mine	acoustics, netting, banding, radiotracking		878 m	Y1, Y2
roost	West Kootenay	Silverhaired Tree Hibernaculum	Live Doug Fir; winter tree roost; radiotracking		799 m	Y1

ACTIVITY	REGION	SITE NAME	COMMENTS	LOCATION	ELEVATION	YEAR
roost	West Kootenay	Silverhaired P Pine Tree Roost	Radiotracking; Hibernaculum		811 m	Y1
acoustic	West Kootenay	Railway Bridge between Salmo and Castlegar	acoustics	11 U 469338 5448528	667 m	Y1
acoustic	West Kootenay	Marsden Face	acoustics	11 U 473181 5483242	517 m	Y1
net, acoustic, roost	West Kootenay	Reeves Macdonald Mine	acoustics		851 m	Y1, Y2
net, acoustic, roost	West Kootenay	Nelway Gated Mine	acoustics and netting		676 m	Y1
acoustic	West Kootenay	Gerrard Bridge	acoustics; open calm water all winter	11 U 480424 5595423	715 m	Y1, Y2
acoustic	West Kootenay	Retallick Mine Ponds	acoustics; open water all winter, and mines in area, yet no bat activity recorded during winter	11 U 485165 5542740	1051 m	Y1, Y2
acoustic	West Kootenay	Old Tom Moore Mine	acoustics; RL; Deep and High Elevation; deployed with Don Hunt; data not retrieved yet to know if it is a roost	11 U 485444 5539082	2035 m	Y2
acoustic	West Kootenay	Rambler Caribou Mine	acoustics; RL; Deep and High Elevation; deployed with Don Hunt; data not retrieved yet to know if it is a roost	11 U 485870 5539768	1802 m	Y2
acoustic	West Kootenay	Kokanee Glacier Mine Pseudo MollyGibson	acoustics; RL placed at entrance; actual mine name unknown; data not retrieved yet to know if it is a roost	11 U 489074 5508703	1790 m	Y2
acoustic	West Kootenay	Whitewater Mine	acoustics late summer only	11 U 489647 5544693	1545 m	Y2

ACTIVITY	REGION	SITE NAME	COMMENTS	LOCATION	ELEVATION	YEAR
acoustic	West Kootenay	Great Britain Mine	acoustics; Gillian and Don Hunt RL deployed; data not retrieved yet to know if it is a roost	11 U 490999 5566137	2190 m	Y2
acoustic	West Kootenay	Bullock Mine	acoustics; Gillian and Don Hunt RL deployed	11 U 491327 5582935	825 m	Y2
acoustic	West Kootenay	Kokanee Ck Prov Park	acoustics; no winter roosting habitat in area; no bats detected in winter	11 U 491393 5494568	568 m	Y2
acoustic	West Kootenay	Lucky Jack Mine	acoustic; Don Hunt and Gillian Sanders RL deployment; data not retrieved yet to know if it is a roost	11 U 491547 5584425	700 m	Y2
acoustic	West Kootenay	Stagleap Prov Park Lakeshore	acoustics; approx. location; detector up snag due to high snowload; no bat actitivity in mid-winter	11 U 497057 5434316		Y1, Y2
acoustic, roost?	West Kootenay	Marblehead Mine Quarry	acoustics; activity and mating songs recorded suggesting winter use but no bats seen day-roosting here			Y1
net, acoustic, roost	West Kootenay	Lardeau N Mine	acoustics and netting; radiotracking; bat feces collected on plastic mid-winter; bats seen hibernating		551 m	Y1
net, roost	West Kootenay	South Lardeau mine	netting and acoustics; approximated, it is across from highway gate			Y1
acoustic	West Kootenay	Meadow Creek Hunting Location	acoustics	11 U 502954 5558463	535 m	Y1
acoustic	West Kootenay	Lardeau Channel	acoustics	11 U 502998 5557802	536 m	Y1

ACTIVITY	REGION	SITE NAME	COMMENTS	LOCATION	ELEVATION	YEAR
acoustic	West Kootenay	Moonshine Mine	acoustics; Don Hunt and Gillian RL deployment; data not retrieved yet to know if it is a roost	11 U 503216 5553603	685 m	Y2
acoustic	West Kootenay	Lardeau R Bridge	winter detector before postdoc started	11 U 503450 5560424		Y1
acoustic	West Kootenay	Cody Low Gate	data not retrieved yet to know if it is a roost; gate is not bat-friendly but bent bars may allow some bats to enter?	11 U 503531 5508333	1392 m	Y2
acoustic	West Kootenay	Gillians Meadow	acoustic; Gillian deployed ZCAIM late summer through first of winter; summer netting	11 U 504425 5559405		Y2
acoustic	West Kootenay	Albion Mine	acoustics	11 U 506196 5507893	794 m	Y1
acoustic	West Kootenay	Cuba Mine	acoustics; Schroeder Mine; data not retrieved yet to know if it is a roost;Don Hunt and Gillian Sanders RL deployment	11 U 506359 5542457	600 m	Y1
acoustic	West Kootenay	Woodbury Upper Mine	acoustics	11 U 506522 5514122	537 m	Y1
net, acoustic, roost	West Kootenay	Woodbury1	netted and acoustics; feces of bats mid-winter		519 m	Y1
net	West Kootenay	Woodbury2	netted	11 U 506917 5514111	543 m	Y1
acoustic	West Kootenay	202B Ave Kaslo	acoustics	11 U 507192 5528522	572 m	Y2
acoustic	West Kootenay	Crawford Bay bridge	acoustic and observation; major night roost during summer	11 U 513425 5502108	544 m	Y1
acoustic	West Kootenay	NCC Next Creek Lakeshore	acoustics at mouth of cliffy creek	11 U 517371 5461072	532 m	Y2
acoustic	West Kootenay	Cummings Mine	acoustics; data not retrieved yet to know if it is a roost; RL	11 U 519757 5474069	0 m	Y2
net, roost	West Kootenay	Twin Bays Mine	acoustics		569 m	Y2

ACTIVITY	REGION	SITE NAME	COMMENTS	LOCATION	ELEVATION	YEAR
roost	West Kootenay	MYLU Rock Roost Late Fall	rock crevice roost of MYLU; estimated; late fall			Y2
roost	West Kootenay	MYYU Rock Roost Ditch Cliff	radiotracking; Dec. roost		492 m	Y2
roost	West Kootenay	MYYU Rock Crevice Roost	radiotracking; Nov roost		535 m	Y2
net, acoustic, roost	West Kootenay	Kuskonook House Roost Winter	Netted and acoustics. House with bats roosting roosting under siding facing lake. Hibernaculum for at the late fall.		543 m	Y2
acoustic	West Kootenay	Channel by Pedro	acoustics	11 U 524623 5458999	539 m	Y2
acoustic	West Kootenay	Lardeau Forest Meadow Kuskonook	acoustics	11 U 524919 5459056	535 m	Y2
roost	West Kootenay	MYYU Rock Crack Roost Fall	radiotracking in fall		526 m	Y2
net, acoustic, roost	West Kootenay	Pedro Naturals Cave	acoustic and netting		544 m	Y1, Y2
acoustic	West Kootenay	Skid Road Near Boulder CK	acoustics late fall only	11 U 525336 5458723	573 m	Y1
acoustic	West Kootenay	NCC Midgely	acoustics	11 U 526225 5444940	526 m	Y2
acoustic	West Kootenay	CVWMA End of Road	acoustic; in winter Marc Andre	11 U 526300 5447994	536 m	Y1
acoustic	West Kootenay	CVWMA Cabin	acoustics for a few days winter	11 U 526495 5441889	618 m	Y2
net	West Kootenay	CVWMA Interpretive Centre Building Roost	netting and acoustics; radiotracking; winter night roost only?	11 U 527036 5440773	541 m	Y2
roost	West Kootenay	MYTH PPine Tree Roost late summer	P Pine snag; radiotracking; late summer		1068 m	Y1

ACTIVITY	REGION	SITE NAME	COMMENTS	LOCATION	ELEVATION	YEAR
net, acoustic	West Kootenay	Bat Condo	acoustics; summer maternity roost; used late into fall and first thing in spring	11 U 527104 5448637	532 m	Y1, Y2
acoustic	West Kootenay	CVWMA Hwy Bridge Night Roost	acoustic; major night roost in summer	11 U 527338 5441614	525 m	Y1, Y2
roost	West Kootenay	MYYU Rock Crack Hibernaculum	radiotracking; hibernaculum; rock crack; late November		544 m	Y2
acoustic	West Kootenay	NCC FrogBear Property	acoustics; shore of channel at CVWMA	11 U 529751 5450122	528 m	Y2
net, acoustic, roost	West Kootenay	Reclamation Road House Hibernaculum	acoustics and mistnetting; radiotracking		529 m	Y2
net, acoustic, roost	West Kootenay	Transformer Mine	acoustics and netting		589 m	Y1
roost	West Kootenay	Grandma's Adit Mine	internal observation; bats hibernating		609 m	Y2
net, acoustic, roost	West Kootenay	Tzakis Summer House Roost Creston	acoustics; monitored in late winter; hand captures in fall for tracking by T. Hill		586 m	Y1, Y2
acoustic	West Kootenay	Mt Thompson Mine	acoustic and internal observation of hibernating bats	11 U 541526 5439385	937 m	Y1
acoustic	West Kootenay	Lussier Hot Spring	acoustics; detector removed by parks staff; No data	11 U 601708 5554604	1100 m	Y2

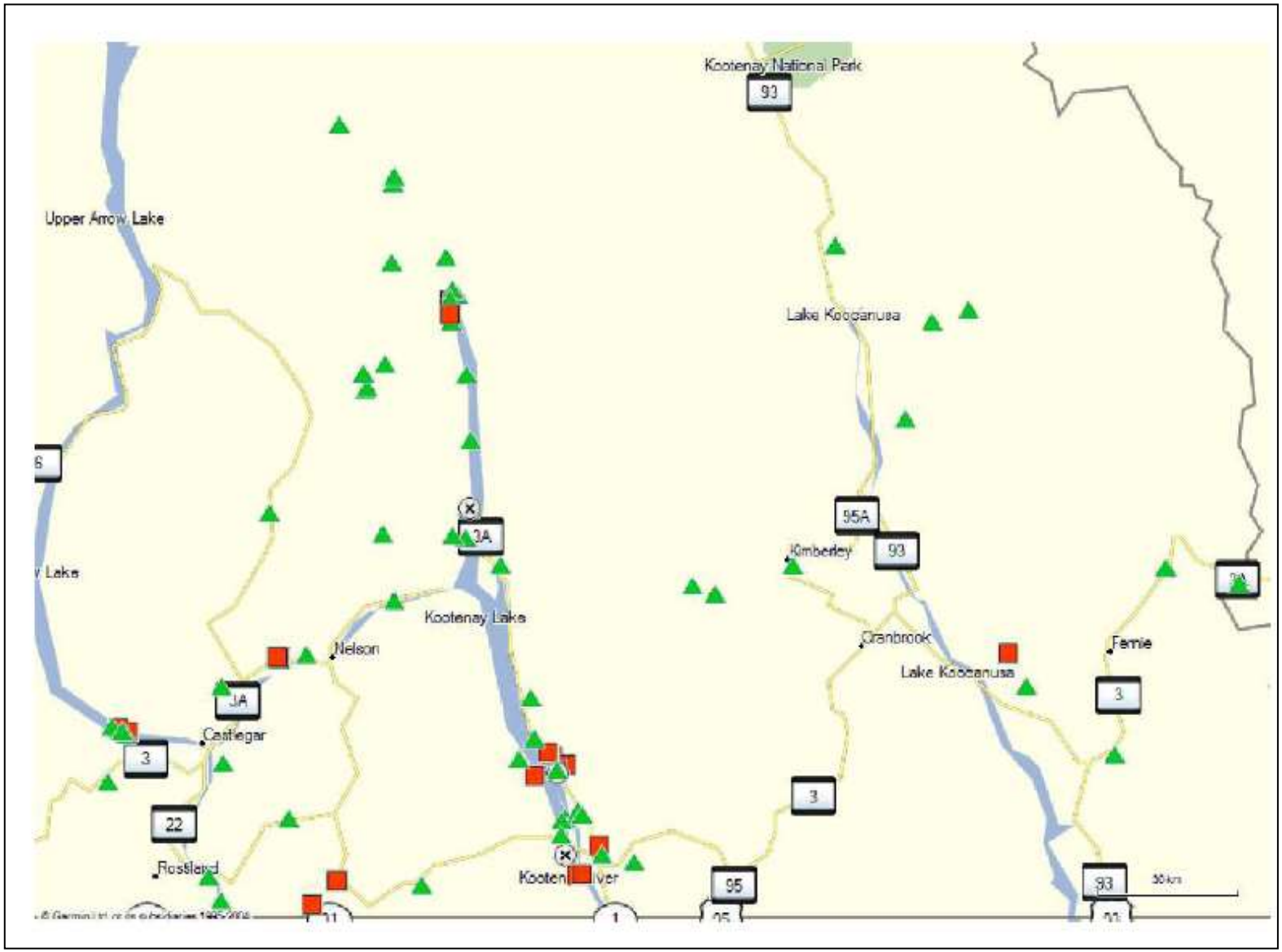

Figure 1. Sampling sites for project to date (2011-13). Squares are sites acoustic monitoring and were mistnetted; triangles are sites acoustically monitored; circles with X are sites that were just mistnetted.

Table 2a. Capture summary Sept 2012-April 2013. See Appendix I for details of captures. See Table 1 and Figure 1 for site locations, Table 2b for species codes. A = adult; VJ = volant juvenile (born in summer 2012).

Site Name	Species	Females	Males
House at Kuskonook	MYLU	2 A	
	MYYU	1 A; 2 VJ	1 A; 4 VJ
CopperKing Mine	COTO	2 VJ	3 A
	MYCA	1 VJ	4 A; 3 VJ
Cummings Mine	COTO		1 A
CVWMA Condo	MYYU	1 A	1 A
CVWMA Hwy Bridge	MYTH	1 A	
	MYYU	11 A; 4 VJ	3 A
CVWMA Interpretive Centre	MYYU	1 A; 3 VJ	3 VJ
Pedro	MYYU		2 A
Queen Victoria Mine	COTO	3 A	2 A
	LANO	3 A; 4 VJ	8 A; 4 VJ
	MYCA	3 A; 5 VJ	5 A; 2 VJ
	MYLU		1 A
	MYLUYU		2 A
Reclamation House	MYYU	2 VJ	1 VJ
REMAC	COTO	14 A; 4 VJ	23 A; 1 VJ
	EPFU	2 A	1 A
	LANO	7 VJ	10 A; 3 VJ
	MYCA	19 A; 16 VJ	30 A; 9 VJ
	MYEV	1 A; 1 VJ	2 VJ
	MYLUYU*		1 A
	MYVO	1 A	1 A; 1 VJ
	MYYU		1 A
Twin Bays Mine	MYLU**		1 A
	MYYU		8 A

*Could not be differentiated in hand

**Needs genetically confirmed yet

Table 2b. Species codes.

Species Code	Scientific name	Common Name
COTO	*Corynorhinus townsendii*	Townsends Big Eared
EPFU	*Eptesicus fuscus*	Big brown
LANO	*Lasionycteris noctivagans*	Silverhaired
MYCA	*Myotis californicus*	California myotis
MYEV	*M. evotis*	Long eared myotis
MYLU	*M. lucifugus*	Little brown myotis
MYLUYU	*M. yumanensis or lucifugus*	Yuma or little brown myotis; species almost impossible to tell apart in hand
MYTH	*M. thysanodes*	Fringed myotis
MYVO	*M. volans*	Long legged myotis
MYYU	*M. yumanensis*	Yuma myotis

Table 3. Captures and recaptures at Reeves Macdonald (REMAC) mine (hibernaculum). One year, 4 capture sessions.

CAPTURES AT REMAC MINE	New Marked	Recaptured	Total Captures
Fall 2012 session 1	48	n/a	60
Fall 2012 session 2	22	2	29
Winter 2013 session 3	52	1	58
Spring 2013 session 4	1	0	2
	123	3	149

Table 4. Late fall or winter bat roosts located/confirmed during project to date.

REGION	SITE NAME	LOCATION	ELEVATION	SPECIES*
East Kootenay	Copper King Mine	11 U 618789 5484668	1058 m	MYCA, COTO
East Kootenay	Dominion Mine	11 U 553194 5497953	973 m	MYCA, COTO
West Kootenay	Casino Adit	11 U 452501 5436322	617 m	MYCA
West Kootenay	Grandma's Adit Mine	11 U 534142 5442696	609 m	COTO
West Kootenay	Krestova Caves	11 U 455490 5476512	692 m	MYCA
West Kootenay	Kuskonook House Roost	11 U 524371 5461288	543 m	MYYU (some may have overwintered but could not be confirmed)
West Kootenay	Lardeau N Mine	11 U 502870 5558059	551 m	MYCA, COTO
West Kootenay	MYLU Rock Roost Late Fall	11 U 520565 5457472		MYLU
West Kootenay	MYYU Rock Crack	11 U 529469 5436511	544 m	MYYU
West Kootenay	MYYU Rock Crack Roost Fall	11 U 525254 5458754	526 m	MYYU

REGION	SITE NAME	LOCATION	ELEVATION	SPECIES*
West Kootenay	MYYU Rock Crevice Roost	11 U 523969 5461744	535 m	MYYU
West Kootenay	MYYU Rock Roost Ditch Cliff	11 U 523411 5462368	492 m	MYYU
West Kootenay	Nelway Gated Mine	11 U 479263 5435179	676 m	MYCA, COTO, LANO? (LANO detected but not confirmed to roost in mine)
West Kootenay	Queen Victoria Mine	11 U 467441 5482417	878 m	MYCA, COTO, LANO
West Kootenay	Reclamation Road House	11 U 530586 5436671	529 m	MYYU
West Kootenay	Reeves Macdonald (REMAC) Mine	11 U 474090 5430173	851 m	MYYU, COTO, LANO, EPFU
West Kootenay	Silverhaired Male Tree	11 U 467411 5482219	782 m	LANO
West Kootenay	Silverhaired P Pine Tree Roost	11 U 467600 5482338	811 m	LANO
West Kootenay	Silverhaired Rock Crack roost	11 U 435962 5467163	691 m	LANO
West Kootenay	Silverhaired Tree	11 U 467550 5482324	799 m	LANO
West Kootenay	Silverhaired Tree Roost2 PPine	11 U 467149 5482601	976 m	LANO
West Kootenay	Siverhaired Rock Crack Roost	11 U 433949 5467895	593 m	LANO
West Kootenay	South Lardeau mine	11 U 502926 5555117		COTO
West Kootenay	Transformer Mine	11 U 530604 5449326	589 m	COTO
West Kootenay	Twin Bays Mine	11 U 520563 s5465466	569 m	MYCA, COTO
West Kootenay	Tzakis House Creston	11 U 534804 5440827	586 m	COTO? Detector may not have functioned.
West Kootenay	Woodbury1	11 U 506894 5513992	519 m	MYCA

*species confirmed to use roost at some point between Nov – March (unless otherwise stated)

Table 5. Outcome of genetic testing by WGI (Wildlife Genetics International, Nelson, BC).

General Location	Site	Genetic result from WGI	Sample ID#	Date of Sample	Type of Sample	Details of Lab Analysis
Creston Valley	CVWMA Condo	*M. yumanensis*	110923-18	23-Sep-11	tissue	confirmation of main species using condo as maternity roost
Creston Valley	CVWMA Condo	*M. yumanensis*	120417-09	17-Apr-12	tissue	confirmation of main species using condo as maternity roost
Creston Valley	Interpretive Centre CVWMA	*M. yumanensis*	121022-02	22-Oct-12	tissue	confirmation of main species likely using this as maternity roost
Creston Valley	Interpretive Centre CVWMA	*M. yumanensis*	121022-03	22-Oct-12	tissue	confirmation of main species likely using this as maternity roost
Creston Valley	Kuskonook	*M. lucifugus*	121107-05	07-Nov-12	tissue	
Creston Valley	Kuskonook	*M. lucifugus*	121107-07	07-Nov-12	tissue	
Creston Valley	Kuskonook	*M. yumanensis*	121121-01	07-Nov-12	tissue	
Creston Valley	Reclamation House	*M. yumanensis*	121110-02	10-Nov-11	tissue	confirmation of main species using this as maternity roost and overwintering
Creston Valley	Twin Bays	*M. yumanensis*	121102-09	02-Nov-12	tissue	
Lardeau	N. Lardeau mine	*failed- lab will retry*	CLL-03	18-Jan-12	feces	need to verify this is BAT feces
Lardeau	N. Lardeau mine	*failed- lab will retry*	CLL-09	28-Jan-12	feces	need to verify this is BAT feces
Lardeau	N. Lardeau mine	*failed- lab will retry*	CLL-01	28 Dec. 2011	feces	need to verify this is BAT feces
Lardeau	S. Lardeau mine	*failed- lab will retry*	CLL-04	10 Feb. 2012	feces	need to verify this is BAT feces
Lardeau	S. Lardeau mine	*failed- lab will retry*	CLL-05	28 Dec. 2011	feces	need to verify this is BAT feces
Pend D'Oreille	REMAC	*M. yumanensis*	120915-11	15-Sep-12	tissue	
Pend D'Oreille	REMAC	*M. yumanensis*	120915-17	15-Sep-12	tissue	
Trout Lake	Allan Marlow's Old Growth	*M. septentrionalis*	090710-17	09-Jul-09	tissue	summer capture; southern range extension for this species in B.C.
Woodbury	Woodbury mine	*Bat, but species not yet determined*	CLL-07	29-Jan-12	feces	verified this is BAT feces; lab will try to refine to species
Woodbury	Woodbury mine	*M. yumanensis*	CLL-08	25-Mar-12	feces	

General Location	Site	Genetic result from WGI	Sample ID#	Date of Sample	Type of Sample	Details of Lab Analysis
Woodbury	Woodbury mine	*failed- lab will retry*	CLL-06	19 Feb. 2012	feces	need to verify this is BAT feces
Woodbury	Woodbury mine	*failed- lab will retry*	CLL-02	31 Dec. 2011	feces	need to verify this is BAT feces
Woodbury	Woodbury mine Drill hole	*M. yumanensis*	CLL-10	15-Apr-12	feces	

Discussion

Year 2 of this winter bat research yielded two substantial discoveries about bats in the Columbia Basin: 1. It was determined that *M. lucifugus* and *M. yumanensis* stay very late into the fall in the Creston area, with the former species still being captured in November, and the latter species detected at a house roost throughout the winter; 2. Reeves Macdonald mine was discovered to house a substantial species diversity in the fall/winter period, and based on 4 mark recapture sessions, a very large number of bats. Use of this mine dissipates greatly in spring, and its use in summer is unknown. Detectors in many of the high elevation mines are still in the field at the time of this report; many acoustic datasets have yet to be analyzed and will be included in an upcoming publication of winter bat ecology in western Canada.

Outreach and Conservation

I am working with the Ministry of Mines and Ministry of Environment to ensure that folks working in and around mines take precautions to not bring spores of *Geomyces destructans* into the province; this is the fungus that causes the deadly White Nose Syndrome in bats.

I am also working with BC Timber Sales to consider the winter use of trees by bats hibernating in Queen Victoria mine. This mine is an important mine in the province for winter bat research, and also touted the highest number of bats and species diversity of any bat hibernaculum in the province until this past fall with the discovery of Reeves Macdonald Mine. BCTS has agreed to hold off on putting the cut block out for bid. This cutblock contains Queen Victoria mine, and many of the roost trees found in last year's winter research. The road that would lead into the block is directly above the mine and could cause structural damage. BCTS is scheduled to resume consideration of this cutblock in 2 years. FWCP, Nature Conservancy Canada, and Sustainable Forestry Initiative, are all working to gate Queen Victoria mine in June 2013 , being completed by Never a Dull Moment (Kamloops, Steve Blackmore) in conjunction with Canadian Caving Conservancy (contact: Phil Whitfield, President). BC Timber Sales has agreed to support the gating by including their logo on the sign that will be posted at the mine's entrance, and they also provided support for the application for further SFI funding to monitor this mine. A separate FWCP report will be written about this gating project.

REMAC mine in the Pend D'Oreille is privately owned. The owners of this mine have been contacted and they are in support of bat research taking place at the mine (Leigh Anne Isaac, VAST, pers. comm.; David Hall, Reeves Macdonald Corporation, Cochrane, AB, pers. comm.). The mine has a huge footprint and most if it is inaccessible to human access; its size makes it impossible to gate, and its inaccessibility makes it unnecessary to gate as human disturbance and spore contamination seem unlikely. It is not known whether this privately owned mine will remain inactive, and it should thus be monitored, or perhaps considered for conservation purchase in the future.

Two public presentations give to the public -- general information about bats, risks to bats, and how they can become involved in bat conservation. These took place on March 6 and 7, 2013 in Cranbrook and Invermere, respectively.

Future Winter Work

Acoustic data will be thoroughly analyzed later in 2013 to elucidate patterns of high winter bat activity in relation to habitat features such as open water, mines, rock crevices, etc. and in relation to elevation and ecotype zone. This analysis should shed light on where further work should continue in the Kootenay regions to prepare for White Nose Syndrome arrival. Based on preliminary analysis and capture data, substantially more work needs to be done at the REMAC mine in the Pend D'Oreille to determine year-round use of this mine by bats, what species it houses year-round, and how many hibernating bats are using it in winter.

Queen Victoria mine hibernaculum needs to be monitored post-gating, and in particular, more information needs to be gathered about the use of trees as hibernacula in that area. Radiotracking of a few bats in 2011-12 revealed substantial use of trees mid-winter, with bats alternating regularly between the mine and trees/snags within about 400-500 m of the mine. It would be important to determine if this pattern holds true in other winters and whether roost selection criteria for tree hibernacula can be obtained such that predictive modeling may pinpoint other mines that are likely to be important hibernacula based not just on mine characteristics, but on surrounding stand structure as well. REMAC also has hibernating silver-haired bats; some radio-tracking at this mine would allow for a comparison with Queen Victoria mine to provide a larger sample size as to whether this species depends on trees mid-winter, in addition to mines/crevices. Protection of REMAC, given the likelihood of it containing extremely large numbers of hibernating bats, also seems pertinent; although human access and disturbance is low, should this mine reopen or be closed due to its tremendous human safety hazard, many bats in the Kootenays would potentially be affected.

Most importantly, few hibernacula have been discovered for Myotis species other than Californian myotis. One building roost in Creston has now been determined to house overwintering Yuma myotis, but other than this, roosts of most Myotis species during winter are completely unknown. As WNS is predicted to hit Myotis hardest, it is important over the course of the next few years, to focus more heavily on locating hibernacula for these species in the Kootenays. Year 2 work suggested that because late fall activity levels are high for *M. lucifugus* and *M. yumanensis* in the Creston area, that the hibernacula for these species are likely in this area, perhaps high in elevation, or some of the drainages. Additional radiotracking effort should occur in this area to locate hibernacula for these 2 species, with special emphasis on *M. lucifugus*, as this species was not detected mid-winter as was *M. yumanensis*. Additionally, *M. yumanensis* that were captured at the winter building roost were juveniles, so it is unclear whether adults overwinter elsewhere in the area.

References

Committee on the Status of Endangered Wildlife in Canada (COSEWIC). 2012. Emergency assessment concludes that three bat species are endangered in Canada. Available online at: http://www.cosewic.gc.ca/rpts/EA2012_bats/Bat_Emergency_Assessment_Press_Release_FINAL-EN.pdf

US Fish and Wildlife Service. 2013. White Nose Syndrome. Available: http://whitenosesyndrome.org/

APPENDIX 1

Details of 2012-2013 (Sept – April) bat captures in East and West Kootenay regions. Species codes are listed Table 2b. Repro status refers to: females being PL (Post-lactating) or NR (non-reproductive); males being S (scrotal), SS (very scrotal), and/or having stored sperm (percentage of epididymydes that contain stored sperm). Adults (A) are determined by ossified joints of fingers and confirmed through toothwear; toothclass of juveniles is sharp (1-2) whereas adults have worn teeth ranging from 2 – 7, with 7+ indicating a bat that has virtually no canine teeth left due to age and excessive wear. Bands are applied for recapture purposes (males are generally banded on the left with odd numbers; females are usually on the right forearm with even numbers). If a radiotransmitter was applied, the bat was tracked and a roost may have been located.

Region	Site Name	Date	Species	Sex	Repro Status	Age	FA Length (mm)	TC	Mass (g)	Band	Recapture Info	Transmitter Applied?	Bat ID#
East Kootenay	CopperKing Mine	07-Sep-12	MYCA	M	75%	A	32.55	3	4.3	WCS199			120907-01
			COTO	M	SS + 100%	A	44.2	6	9.9				120907-02
			COTO	M	SS + 100%	A	43.7	L7+;R6	10.3				120907-03
			MYCA	F	NR	VJ	33.8	1	4.4	WCS102			120907-04
			MYCA	M	NR	VJ	33	1	4.4	WCS197			120907-05
			MYCA	M	NR	VJ	32.7	1	4.5	WCS195			120907-06
			MYCA	M	S + 75%	A	33.4	3	4.7	WCS161			120907-07
			MYCA	M	S + 80%	A	34.4	L7;R5	4.8	WCS193			120907-08
			COTO	F	NR	VJ	44.7	L1;R4	10.3				120907-09
			COTO	M	NR	A	44.3	2	9.1				120907-10

Region	Site Name	Date	Species	Sex	Repro Status	Age	FA Length (mm)	TC	Mass (g)	Band	Recapture Info	Transmitter Applied?	Bat ID#
			COTO	F	NR	VJ	45.2	1	9.9				120907-11
			MYCA	M	NR	VJ	33.7	1	4.5	WCS189			120907-12
			MYCA	M	90%	A	32.9		4.7	WCS187			120907-13
West Kootenay	House at Kuskonook	07-Nov-12	MYYU	M	85%	A	35.9		7.1	WCS121	banded initially at Pedro this season		121107-01
			MYYU	M	NR	VJ		2	6.4	WCS143			121107-02
			MYYU	F	NR	VJ		2	6.6	WCS014		yes	121107-03
			MYYU	F	85%	VJ		2	4.8				121107-04
			MYLU	F	PL	A		3	6.7	WCS016		yes	121107-05
			MYYU	M	NR	VJ			5.7	WCS145			121107-06
			MYLU	F	PL	A		3	8.3	WCS150		yes	121107-07
West Kootenay	House at Kuskonook	21-Nov-12	MYYU	F	NR	A	35.9	2	6	WCS018		yes	121121-01
			MYYU	M	NR	VJ	34.2	2	5.8	WCS147			121121-02
			MYYU	M	NR	VJ	34.2		6.2	WCS145	banded at this house roost previous in this fall		121121-03

Region	Site Name	Date	Species	Sex	Repro Status	Age	FA Length (mm)	TC	Mass (g)	Band	Recapture Info	Transmitter Applied?	Bat ID#
West Kootenay	Cummings Mine	22-Sep-12	COTO	M	100%	A	42.1		10.5				120922-01b
West Kootenay	CVWMA Condo	21-Oct-12	MYYU	F	NR	A	34.7	3	6	WCS144		yes	121021-01
			MYYU	M	50%	A	33.7	7	6.4	WCS115		yes	121021-02
West Kootenay	CVWMA Hwy Bridge	22-Sep-12	MYYU	M	10%	A	35.1	3	6.4	Grey01			120922-01
			MYYU	F	NR	A	34.9	2	6.5	Grey04			120922-02
			MYYU	F	NR	A	35.3	2	6.8	Grey06			120922-03
			MYYU	F	NR	A	34.2	2	6.3	Grey08			120922-04
			MYTH	F	NR	A	43.7	4	8.9	WCS282			120922-05
			MYYU	F	NR	A	36.1	2	6.3	Grey10			120922-06
			MYYU	F	NR	A	33.5	2	5.8	Grey12			120922-07
			MYYU	F	NR	A	35.2	2	6.4	Grey14			120922-08
			MYYU	F	NR	A	34.7	4	5.9	Grey16			120922-09
			MYYU	F	NR	A	35.1	2	6.9	Grey18			120922-10
			MYYU	F	NR	A	34.98	2	5.3	Grey20			120922-11
			MYYU	F	NR	VJ	34.6	1	5.7	Grey22			120922-12

Region	Site Name	Date	Species	Sex	Repro Status	Age	FA Length (mm)	TC	Mass (g)	Band	Recapture Info	Transmitter Applied?	Bat ID#
			MYYU	F	NR	A	34.8	3	7	Grey24			120922-13
			MYYU	F	NR	A	34.3	2	6.2	Grey26			120922-14
			MYYU	F	NR	VJ	35.9	2	5.9	Grey28			120922-15
			MYYU	F	NR	VJ	34.3	2	5.9	Grey30			120922-16
			MYYU	F	NR	VJ	36.1	1	6.1	Grey32			120922-17
West Kootenay	CVWMA Hwy Bridge	21-Apr-13	MYYU	M	15%	A	34.8	L4; R7		WCS057			130420-03
			MYYU	M	10%	A	33.6	L3; R6	5.6	WCS059			130420-04
West Kootenay	CVWMA Interpretive Centre	22-Oct-12	MYYU	M	NR	VJ	34.5		6.2	WCS117		yes	121022-01
			MYYU	F	NR	A	34.7	2	6.7	not banded		yes	121022-02
			MYYU	F	NR	VJ	35.4	2	6.1	not banded		yes	121022-03
			MYYU	M	NR	VJ	33.7	2	5.8	WCS119			121022-04
			MYYU	F	NR	VJ	35.1	3	6.5	not banded		yes	121022-05
West Kootenay	CVWMA Interpretive Centre	30-Oct-12	MYYU	M	NR	VJ	34.2	3	5.9	WCS283 OR 285			121030-01
			MYYU	F	NR	VJ	34.4	2	4.6	WCS294			121030-02

Region	Site Name	Date	Species	Sex	Repro Status	Age	FA Length (mm)	TC	Mass (g)	Band	Recapture Info	Transmitter Applied?	Bat ID#
West Kootenay	Pedro	23-Oct-12	MYYU	M	60%	A	35.5	4	6.4	WCS121		yes	121023-01
West Kootenay	Pedro	01-Nov-12	MYYU	M	30%	A	34	2	6.7	WCS167		yes	121101-01
West Kootenay	Queen Victoria Mine	16-Sep-12	MYLU	M	85%	A	34.93	5	7.7	WCS271			120916-01
			COTO	F	NR	A	41.97	2	9.9				120916-02
			COTO	F	P-NR	A	42.3	4	11.2				120916-03
			COTO	M	S - 67%	A	44.8	2	8.6				120916-04
			MYCA	M		VJ	31.8		4.2	WCS111			120916-05
			MYLUYU	M	85%	A	34.99	2	6.6	WCS273			120916-06
			MYCA	F		VJ	34.9		4.5	WCS110			120916-07
			COTO	F	NR	A	43.2	2	11.2				120916-08
			LANO	M	80%	A	41.9	L5;R3	12.2	WCS265	originally banded Queen Vic Feb. of previous year		120916-09
			LANO	F	PL	A	39.7	3	15.9	WCS252			120916-10
			MYCA	F		VJ	33.97		4.4	WCS138			120916-11

Region	Site Name	Date	Species	Sex	Repro Status	Age	FA Length (mm)	TC	Mass (g)	Band	Recapture Info	Transmitter Applied?	Bat ID#
			LANO	M	20%	A	42.1	l7;r3	13.1	WCS275			120916-12
			MYCA	M		VJ	33		3.8	WCS113			120916-13
			LANO	M	75%	A	40.7	5	11.3	WCS277			120916-14
			MYLUYU	M	90%	A	34.4	3	6				120916-15
			COTO	M	S - 95%	A	41.7	2	8.4				120916-16
			MYCA	F		VJ	33.3		4.2	WCS140			120916-17
			MYCA	F		VJ	34.1		4.3	WCS142			120916-18
			LANO	M	50%	A	41.5	3	11.6	WCS279			120916-19
			LANO	M	60%	A	43.1	5	12.5	WCSxxx			120916-20
West Kootenay	Queen Victoria Mine	09-Jan-13	MYCA	F	NR	VJ	33		4.5	WCS044			130109-01
			MYCA	M	30%	A	32.9	4	4.7	WCS047			130109-02
			MYCA	M	40%	A	32.1	5	5.1	WCS049			130109-03
			LANO	M	NR	VJ	42.5		10	UC0591			130109-04
			LANO	M	NR	VJ	42.5		10.9	UC0583			130109-05
			MYCA	F	PL	A	32.4	L7; R6	5.1	WCS046			130109-06

Region	Site Name	Date	Species	Sex	Repro Status	Age	FA Length (mm)	TC	Mass (g)	Band	Recapture Info	Transmitter Applied?	Bat ID#
			MYCA	M	10%	A	32.2	6	4.6	WCS207	recap from 2012 previous winter		130109-07
			LANO	F	can't tell	A	40.9	6	14.3	WCS260			130109-08
			MYCA	M	30%	A	31.9	3	4.6	WCS051			130109-09
			LANO	F	NR	VJ	43.3	2	11.9	WCS262			130109-10
			LANO	F	NR	VJ	43.65	3	12.5	WCS268			130109-11
			LANO	M	10%	A	42	5	11.1	WCS270			130109-12
			MYCA	F	PL	A	33.95	6	5.8	WCS204	recap from 2012 previous winter		130109-13
			LANO	M	5%	A	41.7	3	10	UC0581			130109-14
			MYCA	F	NR	A	33.3	3	4.6	WCS048			130109-15
			LANO	M	NR	VJ	41.1	2	10.2	UC0579			130109-16
			LANO	F	NR	VJ	41.1		10.2	WCS272			130109-17
			MYCA	M	10%	A	34.5	6	5.1	WCS053			130109-18
West Kootenay	Queen Victoria Mine	20-Jan-13	LANO	M	15%	A	42.8		9.4	UC0527	originally banded Nov. 2011		130120-01

Region	Site Name	Date	Species	Sex	Repro Status	Age	FA Length (mm)	TC	Mass (g)	Band	Recapture Info	Transmitter Applied?	Bat ID#
			LANO	F	NR	A	41.6	4	11.5	UC0598			130120-02
			LANO	M	NR	VJ	43.1		9.4	UC0591	banded earlier this winter		130120-03
			LANO	F	NR	VJ	39.2		10.3	UC0596			130120-04
West Kootenay	Reclamation House	10-Nov-12	MYYU	F	NR	VJ			5.2	WCS294	banded iniatially at CVWMA Interp Centre this fall		121110-01
			MYYU	F	NR	VJ	34.9	2	7.2	WCS148		yes	121110-02
West Kootenay	Reclamation House	24-Nov-12	MYYU	M	NR	VJ	34.4	L2;R3	6.5	WCS001		yes	121124-01
West Kootenay	REMAC	15-Sep-12	COTO	M	NR	VJ	43.5		7.7				120915-01
			COTO	F	PL	A	44.98	3	10.5				120915-02
			COTO	F	NR	VJ	44.1		9				120915-03
			MYCA	M	NR	VJ	33		4.2	WCS191			120915-04
			COTO	M	100%	A	43.4		9.8				120915-05
			COTO	F	PL	A	46.1	3	11.3				120915-06
			COTO	F	NR	A	43.9	2	8.6				120915-07

Region	Site Name	Date	Species	Sex	Repro Status	Age	FA Length (mm)	TC	Mass (g)	Band	Recapture Info	Transmitter Applied?	Bat ID#
			COTO	F	NR	A	44.6	3	9.1				120915-08
			COTO	F	NR	VJ	44.7		8				120915-09
			COTO	F	EPL*	A	44	7	9.5				120915-10
			MYLUYU	M	100%	A	35.2	6	4.9	WCS101			120915-11
			MYEV	M	NR	VJ	36.9		4.8				120915-12
			MYCA	M	NR	VJ	32.9		4.1	WCS163			120915-13
			MYCA	M	NR	VJ	33.8		4.5	WCS185			120915-14
			LANO	?						WCS104			120915-15
			MYCA	F	NR	VJ	33.2		4.1	WCS165			120915-16
			MYYU	M	s+50%	A	34.5	6	5.6				120915-17
			MYVO	F	NR	A	39.3	3	7.4				120915-18
			COTO	M	100%	A	43.4		10.3				120915-19
			COTO	M	SS + 100%	A	41.7		8.8				120915-20
			MYVO	M	P-NR	A	36.7	L6;R7	6.5				120915-21
			MYEV	F	PL	A	36.7	7	6.9				120915-22

Region	Site Name	Date	Species	Sex	Repro Status	Age	FA Length (mm)	TC	Mass (g)	Band	Recapture Info	Transmitter Applied?	Bat ID#
			MYEV	M	NR	VJ	36.9		4.3				120915-23
			MYCA	F	NR	VJ	33.9		4.3	WCS106			120915-24
			MYCA	F	NR	VJ	32.5		4	WCS108			120915-25
			MYCA	F	NR	VJ	32.7		3.8	WCS112			120915-26
			MYCA	F	NR	VJ	33.6		4.3	WCS114			120915-27
			MYCA	F	NR	VJ	34.5		4.4	WCS116			120915-28
			COTO	M	SS + 100%	A	42.9	3	10.2				120915-29
			COTO	M	SS + 100%	A	44.6	2	10.4				120915-30
			MYCA	F	NR	VJ	33		4	WCS118			120915-31
			MYCA	M	NR	VJ	32.8		4	WCS103			120915-32
			MYCA	F	PL	A	31.75	3	4.8	WCS120			120915-33
			MYCA	F	NR	VJ	33.1		4	WCS122			120915-34
			MYCA	F	NR	VJ	33.8		4	WCS124			120915-35
			MYCA	M	NR	VJ	33.2		3.8	WCS105			120915-36
			MYCA	F	NR	VJ	32.5		3.3	WCS126			120915-37

Region	Site Name	Date	Species	Sex	Repro Status	Age	FA Length (mm)	TC	Mass (g)	Band	Recapture Info	Transmitter Applied?	Bat ID#
			COTO	M	SS + 100%	A	43.6	4	9.6				120915-38
			COTO	M	SS + 100%	A	43.1	6	11.8				120915-39
			COTO	M	SS + 100%	A	?	5	?				120915-40
			COTO	M	S + 100%	A	42.8	7	10.1				120915-41
			MYCA	M	NR	VJ	32.2		6.3	WCS107			120915-42
			MYEV	F	NR	VJ	38.5		4.6				120915-43
			MYCA	F	NR	VJ	33.26		3.8	WCS128			120915-44
			MYCA	F	NR	VJ	32.9		4.4	WCS130			120915-45
			COTO	F	NR	A	44.7	2	9.8				120915-46
			MYCA	F	NR	A	33.4	3	4.8	WCS132			120915-47
			MYVO	M	NR	VJ	38		5.8				120915-48
			MYCA	F	PL	A	33.7	3		WCS134			120915-49
			MYCA	F	NR	VJ	33.1		3.7	WCS136			120915-50
			MYCA	M	NR	VJ	33.2		3.8	WCS107			120915-51
			COTO	M	SS + 100%	A	42.3		9.7				120915-52

Region	Site Name	Date	Species	Sex	Repro Status	Age	FA Length (mm)	TC	Mass (g)	Band	Recapture Info	Transmitter Applied?	Bat ID#
			LANO	M	75%	A	40.3	3	12.7	WCS267			120915-53
			COTO	M	SS + 100%	A	44.9	2	10.2				120915-54
			COTO	F	NR	A	45.9	4	12				120915-55
			COTO	F	EPL*	A	42.75	5	11.2				120915-56
			COTO	F	PL	A	45.45	3	11.7				120915-57
			COTO	F	NR	VJ	43.19		10.7				120915-58
			COTO	F	PL	PL	45.3		11.1				120915-59
			COTO	M	SS + 100%	A	42.3		10.4				120915-60
West Kootenay	REMAC	03-Nov-12	COTO	M	95%	A	43.3	4	10				121103-01
			COTO	M	60%	A	42.7	5	10.2				121103-02
			MYCA	F	PL	A	34.3	5	5.8	WCS002			121103-03
			COTO	M	80%	A	43.3	3	9.8				121103-04
			COTO	M	90%	A	43.2	6	11.3		from last banding here (via DNA biospy)		121103-05
			COTO	M	90%	A	43.5	3	10.2				121103-06

Region	Site Name	Date	Species	Sex	Repro Status	Age	FA Length (mm)	TC	Mass (g)	Band	Recapture Info	Transmitter Applied?	Bat ID#
			COTO	M	100%	A	42.7	6	10.3				121103-07
			MYCA	M	75%	A	33	7+	5.7	WCS127			121103-08
			MYCA	M	NR	VJ	33.1		5	WCS129			121103-09
			MYCA	F	PL	A	35.7	L6;R7	6.5	WCS146			121103-10
			COTO	M	95%	A	45.1	5	9.4				121103-11
			COTO	M	100%	A	42.2	4	10.4				121103-12
			MYCA	M	85%	A	33	4	5.9	WCS131			121103-13
			MYCA	M	15%	A	33	2	5.5	WCS133			121103-14
			EPFU	F	PL	A	46	6	19.1	WCS284	banded in Idaho/WA; I added new band		121103-15
			LANO	M	5%	A	42.2	3	13.9	WCS283 OR 285			121103-16
			MYCA	F	PL	A	33.8	6	5.5	WCS004			121103-17
			COTO	M	95%	A	43.6	5	10.9				121103-18
			LANO	M	5%	VJ	39.9	2	13.2	WCS295			121103-19
			MYCA	F	PL	A	32.9	4	5.2	WCS006			121103-20

Region	Site Name	Date	Species	Sex	Repro Status	Age	FA Length (mm)	TC	Mass (g)	Band	Recapture Info	Transmitter Applied?	Bat ID#
			MYCA	M	50%	A	32.4	2	5.3	WCS135			121103-21
			MYCA	F	PL	A	33.9	5	5.5	WCS008			121103-22
			MYCA	F	NR	VJ	32.8		4.8	WCS010			121103-23
			COTO	M	75%	A	42.46	5	11				121103-24
			MYCA	M	55%	A	32.4	4	5.5	WCS137			121103-25
			EPFU	F	PL	A	47.4	4	18.1	WCS254			121103-26
			MYCA	M	40%	A	33.3	L7;R6	5.9	WCS149			121103-27
			MYCA	F	PL	A	34.3	4	5.6	WCS012			121103-28
			MYCA	M	60%	A	32.2	5	5.5	WCS141			121103-29
West Kootenay	REMAC	01-Dec-12	MYCA	M	30%	A	32.7	7	5.2	WCS003			121201-01
			MYCA	M	20%	A	34.2	4	5.8	WCS005			121201-02
			MYCA	M	30%	A	32.2	7	4.9	WCS007			121201-03
			LANO	F	NR	VJ	43.1	2	13.5	WCS292			121201-04
			MYCA	M	40%	A	33.2	7	5.4	WCS009			121201-05
			MYCA	F	PL	A	33.6	6	5.5	WCS050			121201-06

Region	Site Name	Date	Species	Sex	Repro Status	Age	FA Length (mm)	TC	Mass (g)	Band	Recapture Info	Transmitter Applied?	Bat ID#
			MYCA	F	NR	VJ	34.2	2	5	WCS122			121201-07
			COTO	M	75%	A	41.9	2	9.6				121201-08
			MYCA	M	40%	A	32.96	2	5.5	WCS011			121201-09
			MYCA	M	25%	A	34.5	7+	4.9	WCS013			121201-10
			MYCA	M	10%	A	34.5	3	6.4	WCS015			121201-11
			LANO	F	NR	VJ	40.95		13	WCS258			121201-12
			MYCA	M	60%	A	32.7	6	4.8	WCS017			121201-13
			MYCA	F	PL	A	32.9	5	5.3	WCS024			121201-14
			COTO	F	NR	VJ	45.2	2	10.4				121201-15
			MYCA	M	50%	A	32.5	6	5.3	WCS019			121201-16
			LANO	M	10%	A	42	4	11.3	WCS293			121201-17
			LANO	F	NR	VJ	41.96	2	13.6	WCS256			121201-18
			MYCA	M	75%	A	32.7	3	4.9	WCS021			121201-19
			COTO	F	PL	A	45.6	2	12.3				121201-20
			LANO	M	15%	A	40.76	2	11.7	WCS287			121201-21

Region	Site Name	Date	Species	Sex	Repro Status	Age	FA Length (mm)	TC	Mass (g)	Band	Recapture Info	Transmitter Applied?	Bat ID#
			LANO	M	20%	A	42	4	11.5	WCS289			121201-22
			MYCA	M	70%	A	33.6		5.9	WCS023			121201-23
			MYCA	F	PL	A	33.7	6	5.9	WCS026			121201-24
			MYCA	M	75%	A	33.95	6	5.7	WCS025			121201-25
			MYCA	M	60%	A	33.66	7	6.2	WCS027			121201-26
			LANO	M	10%	A	41	2	11.8	WCS291			121201-27
			LANO	M	20%	A	43.39	6	12.5	UC0599			121201-28
			EPFU	M	60%	A	47	6	16.59	UC0597			121201-29
			LANO	M	10%	A	42.3	3	12.1	UC0593			121201-30
			LANO	M	10%	A	40.8	4	10.3	UC0595			121201-31
			LANO	M	NR	VJ	41.76		13.9	UC0589			121201-32
			LANO	F	NR	VJ	42.8	3	15.2	WCS290			121201-33
			LANO	F	NR	VJ	40.96	2	12.8	WCS288			121201-34
			LANO	F	Nr	VJ	43.2	2	14.4	WCS260			121201-35
			MYCA	M	65%	A	32.61	7	5.3	WCS029			121201-36

Region	Site Name	Date	Species	Sex	Repro Status	Age	FA Length (mm)	TC	Mass (g)	Band	Recapture Info	Transmitter Applied?	Bat ID#
			MYCA	F	PL	A	33	6	5.6	WCS028			121201-37
			MYCA	M	70%	A	33.31	7	5.2	WCS031			121201-38
			MYCA	M	30%	A	32.7	3	5.2	WCS033			121201-39
			MYCA	M	90%	A	34.09	5	5.4	WCS035			121201-40
			MYCA	F	PL	A	31.35	5	5.4	WCS030			121201-41
			COTO	F	PL	A	41.66	2	11.5				121201-42
			MYCA	F	NR	A	32.7	3	5.1	WCS032			121201-43
			MYCA	M	70%	A	32.9	5	5.5	WCS037			121201-44
			MYCA	F	PL	A	34.8	6	5.4	WCS034			121201-45
			MYCA	F	PL	A	33.05	6	5.3	WCS036			121201-46
			MYCA	M	60%	A	33.2	5	5.6	WCS039			121201-47
			MYCA	F	PL	A	33.9	7	6.1	WCS038			121201-48
			MYCA	M	40%	A	32.44	3	5.2	WCS040			121201-49
			MYCA	F	NR	VJ	33.33	2	4.4				121201-50
			MYCA	F	didn't check	A	33.23	4	5.3	WCS042			121201-51

Region	Site Name	Date	Species	Sex	Repro Status	Age	FA Length (mm)	TC	Mass (g)	Band	Recapture Info	Transmitter Applied?	Bat ID#
			COTO	F	PL	A	46.27	5	11.8		DNA hole in wing		121201-52
			LANO	M	NR	A	40.24	2	13.2	UC0587			121201-53
			MYCA	M	40%	A	32.2	7+	5.7	WCS041			121201-54
			LANO	M	NR	VJ	40.46	L3;R5	10.8	UC0585			121201-55
			MYCA	M	15%	A	32.61	4	4.9	WCS043			121201-56
			MYCA	M	15%	A	33.73	6	5.3	WCS045			121201-57
			LANO	F	NR	VJ	42.8	2	12.5	UC0600			121201-58
West Kootenay	REMAC	20-Apr-13	MYCA	M	NR	VJ	32.9	2	3.9	WCS055			130420-01
			COTO	F	PL	A	44.2		8.7				130420-02
West Kootenay	Twin Bays Mine	02-Nov-12	MYYU	M	70%	A	34.55	6	6.4	WCS169			121102-01
			MYYU	M	10%	A	34.6	L7;R6	6.5	WCS171			121102-02
			MYYU	M	10%	A	34.3	6	6.3	WCS173			121102-03
			MYYU	M	15%	A	33.7	7	7.1	WCS175		yes	121102-04
			MYYU	M	20%	A	33.1	7	5.7	WCS177			121102-05
			MYYU	M	15%	A	34.7	6	6.3	WCS179			121102-06

Region	Site Name	Date	Species	Sex	Repro Status	Age	FA Length (mm)	TC	Mass (g)	Band	Recapture Info	Transmitter Applied?	Bat ID#
			MYYU	M	10%	A	34.6	5	6.8	WCS181		yes	121102-07
			MYLU*	M	30%	A	35.5	6	6.7	WCS183		yes	121102-08
			MYYU	M	20%	A	35.1	7	7.4	WCS125		yes	121102-09

*needs genetically confirmed yet