SPI Project ID	Project Name	Survey Name	Vantage	Ecological Season	Survey Intensity	Survey Field Method	Survey Intent	Stratification	Survey Objectives *	Survey Study Area Name *	Details that Informed Lumping and Splitting of Data Into Surveys	Comments
723	1974-ongoing - Caribou - Population Assessment - Central Selkirks - Kootenay Region	1974 - 1977 - Caribou - Composition - Nakusp	Ground		RA		Composition		1. Assess population size in one drainage; 2. Assess calf percentage	Poplar Creek	Reduced area surveyed	Four years of observations in one drainage, no method recorded, likely ground survey
723	1974-ongoing - Caribou - Population Assessment - Central Selkirks - Kootenay Region	1994 - Caribou - Aerial Late Winter Census - Central Selkirks	Aerial	Late Winter	AA		Census		1. Assess population size; 2. Assess individual movement between areas; 3. Assess calf percentage	Central Selkirks	Reduced area surveyed	1994 Surveyed with Kinbasket Herd, some observational data, polygon size was smaller than polygons used from 1996 onwards
723	1974-ongoing - Caribou - Population Assessment - Central Selkirks - Kootenay Region	1995 - Caribou - Aerial Late Winter Census - Central Selkirks	Aerial	Late Winter	AA		Census		1. Assess population size; 2. Assess individual movement between areas; 3. Assess calf percentage	Central Selkirks	created larger blocks, put out more collars	1995 Total count survey of Duncan block and partial Nakusp, added 14 new collars to Central Selkirks block in Feb of 1995.
723	1974-ongoing - Caribou - Population Assessment - Central Selkirks - Kootenay Region	1996 - 2002 - Caribou - Aerial Late Winter Census Mark-Recapture - Central Selkirks	Aerial	Late Winter	AA	Mark-Recapture	Census		1. Assess population size; 2.Assess calf percentage; 3. Assess population trend.	Central Selkirks	Mark-recapture census	1996 - 2002 were completed as total counts with Mark-recapture sightibility corrections and population estimates.
723	1974-ongoing - Caribou - Population Assessment - Central Selkirks - Kootenay Region	2004 - 2008 - Caribou - Aerial Late Winter Census - Central Selkirks	Aerial	Late Winter	AA		Census		1. Assess population size; 2.Assess calf percentage; 3. Assess population trend.	Central Selkirks	polygon border issues; same biologists	
723	1974-ongoing - Caribou - Population Assessment - Central Selkirks - Kootenay Region	2010 - 2017 - Caribou - Aerial Late Winter Census - Central Selkirks	Aerial	Late Winter	AA		Census		1. Assess population size; 2.Assess calf percentage; 3. Assess population trend.	Central Selkirks	change in polygon border to north, new biologist	
723	1974-ongoing - Caribou - Population Assessment - Central Selkirks - Kootenay Region	2018 - 2019 - Caribou - Aerial Late Winter Census - Central Selkirks	Aerial	Late Winter	AA	Mark-Recapture	Census		1. Assess population size; 2.Assess calf percentage; 3. Assess population trend.	Central Selkirks	realigned polygone borders for all historic census data	Due to shifting boundaries, historic census data was reanalyzing for updated survey area boundary in 2019 . See report for details.
723	1974-ongoing - Caribou - Population Assessment - Central Selkirks - Kootenay Region	2008 - Caribou - Fall Winter Reconnaissance - TFL#23	Ground, Aerial	Fall, Winter	PN		Reconnaissance		1. Defining the planning unit; 2. Inventory collation and mapping; 3. Reconnaissance-level field assessment	TFL#23	In 2007 P&T filed for bankruptcy protection and we were informed to stop work. This direction combined with weather constraints meant only Steps 1, 2 and part of 3 of planned field work was able to be completed. The remainder of the summer field sampling funding was transferred to the winter monitoring program.	Project within TFL#23 - parts of Nakusp and Duncan blocks

SPI Project ID	723	723	723	723	723	723	723	723
Project Name	1974-ongoing - Caribou - Population Assessment - Central Selkirks - Kootenay Region	1974-ongoing - Caribou - Population Assessment - Central Selkirks - Kootenay Region	1974-ongoing - Caribou - Population Assessment - Central Selkirks - Kootenay Region	1974-ongoing - Caribou - Population Assessment - Central Selkirks - Kootenay Region	1974-ongoing - Caribou - Population Assessment - Central Selkirks - Kootenay Region	1974-ongoing - Caribou - Population Assessment - Central Selkirks - Kootenay Region	1974-ongoing - Caribou - Population Assessment - Central Selkirks - Kootenay Region	1974-ongoing - Caribou - Population Assessment - Central Selkirks - Kootenay Region
Survey Name	1974 - 1977 - Caribou - Composition - Nakusp	1994 - Caribou - Aerial Late Winter Census - Central Selkirks	1995 - Caribou - Aerial Late Winter Census - Central Selkirks	1996 - 2002 - Caribou - Aerial Late Winter Census Mark-Recapture - Central Selkirks	2004 - 2008 - Caribou - Aerial Late Winter Census - Central Selkirks	2010 - 2017 - Caribou - Aerial Late Winter Census - Central Selkirks	2018 - 2019 - Caribou - Aerial Late Winter Census - Central Selkirks	2008 - Caribou - Fall Winter Reconnaissance - TFL#23
Vantage	Ground	Aerial	Aerial	Aerial	Aerial	Aerial	Aerial	Ground, Aerial
Ecological Season		Late Winter	Late Winter	Late Winter	Late Winter	Late Winter	Late Winter	Fall, Winter
Survey Intensity	RA	AA	AA	AA	AA	AA	AA	PN
Survey Field Method				Mark-Recapture			Mark-Recapture	
Survey Intent	Composition	Census	Census	Census	Census	Census	Census	Reconnaissance
Stratification								
Survey Objectives *	1. Assess population size in one drainage; 2. Assess calf percentage	1. Assess population size; 2. Assess individual movement between areas; 3. Assess calf percentage	1. Assess population size; 2. Assess individual movement between areas; 3. Assess calf percentage	1. Assess population size; 2.Assess calf percentage; 3. Assess population trend.	1. Assess population size; 2.Assess calf percentage; 3. Assess population trend.	1. Assess population size; 2.Assess calf percentage; 3. Assess population trend.	1. Assess population size; 2.Assess calf percentage; 3. Assess population trend.	1. Defining the planning unit; 2. Inventory collation and mapping; 3. Reconnaissance-level field assessment
Survey Study Area Name *	Poplar Creek	Central Selkirks	Central Selkirks	Central Selkirks	Central Selkirks	Central Selkirks	Central Selkirks	TFL#23
Details that Informed Lumping and Splitting of Data Into Surveys	Reduced area surveyed	Reduced area surveyed	created larger blocks, put out more collars	Mark-recapture census	polygon border issues; same biologists	change in polygon border to north, new biologist	realigned polygone borders for all historic census data	In 2007 P&T filed for bankruptcy protection and we were informed to stop work. This direction combined with weather constraints meant only Steps 1, 2 and part of 3 of planned field work was able to be completed. The remainder of the summer field sampling funding was transferred to the winter monitoring program.
Comments	Four years of observations in one drainage, no method recorded, likely ground survey	1994 Surveyed with Kinbasket Herd, some observational data, polygon size was smaller than polygons used from 1996 onwards	1995 Total count survey of Duncan block and partial Nakusp, added 14 new collars to Central Selkirks block in Feb of 1995.	1996 - 2002 were completed as total counts with Mark-recapture sightibility corrections and population estimates.			Due to shifting boundaries, historic census data was reanalyzing for updated survey area boundary in 2019 . See report for details.	Project within TFL#23 - parts of Nakusp and Duncan blocks

Survey Name *	Study Area Name	Population Unit	Block Label	Year	Month	Day	Total Survey Time	Total Survey Time Unit	Summary General Comments	Parameter	Parameter Method	Parameter Value (Pre-polygon redistribution)	Total Marks Available	Marked Animals Observed	Survey completeness	Survey Intensity	Survey Field Method	Survey Purpose	Issues for Survey comparisons	Summary Detail Comments	Data Source	Data Source link
1974 - 1977 - Caribou - Composition - Nakusp	Central Selkirks	Central Selkirks	Nakusp	1974	10	1			one time sighting of unknown date of family unit residing in Poplar Creek drainage	Ad - Unclas Sex	Observed - Total Count	13			Partial	RA		Composition			wsi_723_1974-1977PoplarCreek.pdf	http://a100.gov.bc.ca/pub/siwe/details.do;jsessionid=D58BD94B0964CBD8E4AB0798E613F6C6?projectId=723&surveyId=33858&pagerOffset=1
1974 - 1977 - Caribou - Composition - Nakusp	Central Selkirks	Central Selkirks	Nakusp	1974	10	1			one time sighting of unknown date of family unit residing in Poplar Creek drainage	Ad M	Observed - Total Count	1			Partial	RA		Composition			wsi_723_1974-1977PoplarCreek.pdf	http://a100.gov.bc.ca/pub/siwe/details.do;jsessionid=D58BD94B0964CBD8E4AB0798E613F6C6?projectId=723&surveyId=33858&pagerOffset=1
1974 - 1977 - Caribou - Composition - Nakusp	Central Selkirks	Central Selkirks	Nakusp	1974	10	1			one time sighting of unknown date of family unit residing in Poplar Creek drainage	All Individuals	Observed - Total Count	17			Partial	RA		Composition			wsi_723_1974-1977PoplarCreek.pdf	http://a100.gov.bc.ca/pub/siwe/details.do;jsessionid=D58BD94B0964CBD8E4AB0798E613F6C6?projectId=723&surveyId=33858&pagerOffset=1
1974 - 1977 - Caribou - Composition - Nakusp	Central Selkirks	Central Selkirks	Nakusp	1974	10	1			one time sighting of unknown date of family unit residing in Poplar Creek drainage	Juv	Observed - Total Count	3			Partial	RA		Composition			wsi_723_1974-1977PoplarCreek.pdf	http://a100.gov.bc.ca/pub/siwe/details.do;jsessionid=D58BD94B0964CBD8E4AB0798E613F6C6?projectId=723&surveyId=33858&pagerOffset=1
1974 - 1977 - Caribou - Composition - Nakusp	Central Selkirks	Central Selkirks	Nakusp	1975	10	1			one time sighting of unknown date of family unit residing in Poplar Creek drainage	Ad - Unclas Sex	Observed - Total Count	10			Partial	RA		Composition			wsi_723_1974-1977PoplarCreek.pdf	http://a100.gov.bc.ca/pub/siwe/details.do;jsessionid=D58BD94B0964CBD8E4AB0798E613F6C6?projectId=723&surveyId=33858&pagerOffset=1
1974 - 1977 - Caribou - Composition - Nakusp	Central Selkirks	Central Selkirks	Nakusp	1975	10	1			one time sighting of unknown date of family unit residing in Poplar Creek drainage	Ad M	Observed - Total Count	1			Partial	RA		Composition			wsi_723_1974-1977PoplarCreek.pdf	http://a100.gov.bc.ca/pub/siwe/details.do;jsessionid=D58BD94B0964CBD8E4AB0798E613F6C6?projectId=723&surveyId=33858&pagerOffset=1
1974 - 1977 - Caribou - Composition - Nakusp	Central Selkirks	Central Selkirks	Nakusp	1975	10	1			one time sighting of unknown date of family unit residing in Poplar Creek drainage	All Individuals	Observed - Total Count	14			Partial	RA		Composition			wsi_723_1974-1977PoplarCreek.pdf	http://a100.gov.bc.ca/pub/siwe/details.do;jsessionid=D58BD94B0964CBD8E4AB0798E613F6C6?projectId=723&surveyId=33858&pagerOffset=1
1974 - 1977 - Caribou - Composition - Nakusp	Central Selkirks	Central Selkirks	Nakusp	1975	10	1			one time sighting of unknown date of family unit residing in Poplar Creek drainage	Juv	Observed - Total Count	3			Partial	RA		Composition			wsi_723_1974-1977PoplarCreek.pdf	http://a100.gov.bc.ca/pub/siwe/details.do;jsessionid=D58BD94B0964CBD8E4AB0798E613F6C6?projectId=723&surveyId=33858&pagerOffset=1
1974 - 1977 - Caribou - Composition - Nakusp	Central Selkirks	Central Selkirks	Nakusp	1976	10	1			one time sighting of unknown date of family unit residing in Poplar Creek drainage	Ad - Unclas Sex	Observed - Total Count	6			Partial	RA		Composition			wsi_723_1974-1977PoplarCreek.pdf	http://a100.gov.bc.ca/pub/siwe/details.do;jsessionid=D58BD94B0964CBD8E4AB0798E613F6C6?projectId=723&surveyId=33858&pagerOffset=1
1974 - 1977 - Caribou - Composition - Nakusp	Central Selkirks	Central Selkirks	Nakusp	1976	10	1			one time sighting of unknown date of family unit residing in Poplar Creek drainage	Ad M	Observed - Total Count	1			Partial	RA		Composition			wsi_723_1974-1977PoplarCreek.pdf	http://a100.gov.bc.ca/pub/siwe/details.do;jsessionid=D58BD94B0964CBD8E4AB0798E613F6C6?projectId=723&surveyId=33858&pagerOffset=1

Survey Name *	Study Area Name	Population Unit	Block Label	Year	Month	Day	Total Survey Time	Total Survey Time Unit	Summary General Comments	Parameter	Parameter Method	Parameter Value (Pre-polygon redistribution)	Total Marks Available	Marked Animals Observed	Survey completeness	Survey Intensity	Survey Field Method	Survey Purpose	Issues for Survey comparisons	Summary Detail Comments	Data Source	Data Source link
1974 - 1977 - Caribou - Composition - Nakusp	Central Selkirks	Central Selkirks	Nakusp	1976	10	1			one time sighting of unknown date of family unit residing in Poplar Creek drainage	All Individuals	Observed - Total Count	11			Partial	RA		Composition			wsi_723_1974-1977PoplarCreek.pdf	http://a100.gov.bc.ca/pub/siwe/details.do;jsessionid=D58BD94B0964CBD8E4AB0798E613F6C6?projectId=723&surveyId=33858&pagerOffset=1
1974 - 1977 - Caribou - Composition - Nakusp	Central Selkirks	Central Selkirks	Nakusp	1976	10	1			one time sighting of unknown date of family unit residing in Poplar Creek drainage	Juv	Observed - Total Count	4			Partial	RA		Composition			wsi_723_1974-1977PoplarCreek.pdf	http://a100.gov.bc.ca/pub/siwe/details.do;jsessionid=D58BD94B0964CBD8E4AB0798E613F6C6?projectId=723&surveyId=33858&pagerOffset=1
1974 - 1977 - Caribou - Composition - Nakusp	Central Selkirks	Central Selkirks	Nakusp	1977	10	1			one time sighting of unknown date of family unit residing in Poplar Creek drainage	Ad - Unclas Sex	Observed - Total Count	10			Partial	RA		Composition			wsi_723_1974-1977PoplarCreek.pdf	http://a100.gov.bc.ca/pub/siwe/details.do;jsessionid=D58BD94B0964CBD8E4AB0798E613F6C6?projectId=723&surveyId=33858&pagerOffset=1
1974 - 1977 - Caribou - Composition - Nakusp	Central Selkirks	Central Selkirks	Nakusp	1977	10	1			one time sighting of unknown date of family unit residing in Poplar Creek drainage	All Individuals	Observed - Total Count	10			Partial	RA		Composition			wsi_723_1974-1977PoplarCreek.pdf	http://a100.gov.bc.ca/pub/siwe/details.do;jsessionid=D58BD94B0964CBD8E4AB0798E613F6C6?projectId=723&surveyId=33858&pagerOffset=1
1994 - Caribou - Aerial Late Winter Census - Central Selkirks	Central Selkirks	Central Selkirks	Central Selkirks	1994	3	15	1	D	Complete survey of Duncan; partial survey of Nakusp (only Silvercup Ridge/Healy Creek); block sizes were much smaller that 2010-onwards survey blocks.	Ad - Unclas Sex	Observed - Total Count	126			Partial	AA		Census			Mountain Caribou Censuses in the the North Columbia Mountains. Ecocat Report ID: 51523	\\level\s40006\ESD\El\Wildlife\WSI\Caribou_Program\4_Data_Capture\4_Kootenay\CentralSelkirks\SPI_Submissions\In_Progress\PopulationAssessment\Data
1994 - Caribou - Aerial Late Winter Census - Central Selkirks	Central Selkirks	Central Selkirks	Central Selkirks	1994	3	15	1	D	Complete survey of Duncan; partial survey of Nakusp (only Silvercup Ridge/Healy Creek); block sizes were much smaller that 2010-onwards survey blocks.	All Individuals	Observed - Total Count	148			Partial	AA		Census			Mountain Caribou Censuses in the the North Columbia Mountains. Ecocat Report ID: 51523	\\level\s40006\ESD\El\Wildlife\WSI\Caribou_Program\4_Data_Capture\4_Kootenay\CentralSelkirks\SPI_Submissions\In_Progress\PopulationAssessment\Data
1994 - Caribou - Aerial Late Winter Census - Central Selkirks	Central Selkirks	Central Selkirks	Central Selkirks	1994	3	15	1	D	Complete survey of Duncan; partial survey of Nakusp (only Silvercup Ridge/Healy Creek); block sizes were much smaller that 2010-onwards survey blocks.	Juv	Observed - Total Count	16			Partial	AA		Census			Mountain Caribou Censuses in the the North Columbia Mountains. Ecocat Report ID: 51523	\\level\s40006\ESD\El\Wildlife\WSI\Caribou_Program\4_Data_Capture\4_Kootenay\CentralSelkirks\SPI_Submissions\In_Progress\PopulationAssessment\Data
1994 - Caribou - Aerial Late Winter Census - Central Selkirks	Central Selkirks	Central Selkirks	Central Selkirks	1994	3	15	1	D	Complete survey of Duncan; partial survey of Nakusp (only Silvercup Ridge/Healy Creek); block sizes were much smaller that 2010-onwards survey blocks.	Percent Juv	Observed - Total Count	10.8			Partial	AA		Census			Mountain Caribou Censuses in the the North Columbia Mountains. Ecocat Report ID: 51523	\\level\s40006\ESD\El\Wildlife\WSI\Caribou_Program\4_Data_Capture\4_Kootenay\CentralSelkirks\SPI_Submissions\In_Progress\PopulationAssessment\Data
1994 - Caribou - Aerial Late Winter Census - Central Selkirks	Central Selkirks	Central Selkirks	Duncan	1994	3	15	1	D	Complete survey of Duncan; partial survey of Nakusp (only Silvercup Ridge/Healy Creek); block sizes were much smaller that 2010-onwards survey blocks.	Ad - Unclas Sex	Observed - Total Count	0			Partial	AA		Census				

Survey Name *	Study Area Name	Population Unit	Block Label	Year	Month	Day	Total Survey Time	Total Survey Time Unit	Summary General Comments	Parameter	Parameter Method	Parameter Value (Pre-polygon redistribution)	Total Marks Available	Marked Animals Observed	Survey completeness	Survey Intensity	Survey Field Method	Survey Purpose	Issues for Survey comparisons	Summary Detail Comments	Data Source	Data Source link
1994 - Caribou - Aerial Late Winter Census - Central Selkirks	Central Selkirks	Central Selkirks	Duncan	1994	3	15	1	D	Complete survey of Duncan; partial survey of Nakusp (only Silvercup Ridge/Healy Creek); block sizes were much smaller that 2010-onwards survey blocks.	All Individuals	Observed - Total Count	0			Partial	AA		Census				
1994 - Caribou - Aerial Late Winter Census - Central Selkirks	Central Selkirks	Central Selkirks	Duncan	1994	3	15	1	D	Complete survey of Duncan; partial survey of Nakusp (only Silvercup Ridge/Healy Creek); block sizes were much smaller that 2010-onwards survey blocks.	Juv	Observed - Total Count	0			Partial	AA		Census				
1994 - Caribou - Aerial Late Winter Census - Central Selkirks	Central Selkirks	Central Selkirks	Nakusp	1994	3	15	1	D	Complete survey of Duncan; partial survey of Nakusp (only Silvercup Ridge/Healy Creek); block sizes were much smaller that 2010-onwards survey blocks.	Ad - Unclas Sex	Observed - Total Count	126			Partial	AA		Census				
1994 - Caribou - Aerial Late Winter Census - Central Selkirks	Central Selkirks	Central Selkirks	Nakusp	1994	3	15	1	D	Complete survey of Duncan; partial survey of Nakusp (only Silvercup Ridge/Healy Creek); block sizes were much smaller that 2010-onwards survey blocks.	All Individuals	Observed - Total Count	148			Partial	AA		Census				
1994 - Caribou - Aerial Late Winter Census - Central Selkirks	Central Selkirks	Central Selkirks	Nakusp	1994	3	15	1	D	Complete survey of Duncan; partial survey of Nakusp (only Silvercup Ridge/Healy Creek); block sizes were much smaller that 2010-onwards survey blocks.	Juv	Observed - Total Count	16			Partial	AA		Census				
1994 - Caribou - Aerial Late Winter Census - Central Selkirks	Central Selkirks	Central Selkirks	Nakusp	1994	3	15	1	D	Complete survey of Duncan; partial survey of Nakusp (only Silvercup Ridge/Healy Creek); block sizes were much smaller that 2010-onwards survey blocks.	Percent Juv	Observed - Total Count	12.1			Partial	AA		Census				
1995 - Caribou - Aerial Survey - Kinbasket Lake Duncan River	Central Selkirks	Central Selkirks	Central Selkirks	1995	2	28	1	D	Complete survey of Duncan; partial survey of Nakusp (only Silvercup Ridge/Healy Creek)	Ad - Unclas Sex	Observed - Total Count	57			Partial	AA		Census			Caribou censuses in the Kinbasket Lake and Duncan River	//sfp.idir.bcgov/s140/S40143/ES/WILDLIFE%202016-2020/Wildlife%20species/Caribou/Census/1995/Central%20Selkirks/Kinbasket%20Lake%20and%20Duncan%20Census%201995.pdf
1995 - Caribou - Aerial Survey - Kinbasket Lake Duncan River	Central Selkirks	Central Selkirks	Central Selkirks	1995	2	28	1	D	Complete survey of Duncan; partial survey of Nakusp (only Silvercup Ridge/Healy Creek)	All Individuals	Minimum Number Known Alive	81			Partial	AA		Census	14 tracks were added to total count by bio (Dr. Bruce McClleland)		Caribou censuses in the Kinbasket Lake and Duncan River	//sfp.idir.bcgov/s140/S40143/ES/WILDLIFE%202016-2020/Wildlife%20species/Caribou/Census/1995/Central%20Selkirks/Kinbasket%20Lake%20and%20Duncan%20Census%201995.pdf

Survey Name *	Study Area Name	Population Unit	Block Label	Year	Month	Day	Total Survey Time	Total Survey Time Unit	Summary General Comments	Parameter	Parameter Method	Parameter Value (Pre-polygon redistribution)	Total Marks Available	Marked Animals Observed	Survey completeness	Survey Intensity	Survey Field Method	Survey Purpose	Issues for Survey comparisons	Summary Detail Comments	Data Source	Data Source link
1995 - Caribou - Aerial Survey - Kinbasket Lake Duncan River	Central Selkirks	Central Selkirks	Central Selkirks	1995	2	28	1	D	Complete survey of Duncan; partial survey of Nakusp (only Silvercup Ridge/Healy Creek)	All Individuals	Observed - Total Count	67			Partial	AA		Census			Caribou censuses in the Kinbasket Lake and Duncan River	//sfp.idir.bcgov/s140/S40143/ES/WILDLIFE%202016-2020/Wildlife%20species/Caribou/Census/1995/Central%20Selkirks/Kinbasket%20Lake%20and%20Duncan%20Census%201995.pdf
1995 - Caribou - Aerial Survey - Kinbasket Lake Duncan River	Central Selkirks	Central Selkirks	Central Selkirks	1995	2	28	1	D	Complete survey of Duncan; partial survey of Nakusp (only Silvercup Ridge/Healy Creek)	Juv	Observed - Total Count	10			Partial	AA		Census			Caribou censuses in the Kinbasket Lake and Duncan River	//sfp.idir.bcgov/s140/S40143/ES/WILDLIFE%202016-2020/Wildlife%20species/Caribou/Census/1995/Central%20Selkirks/Kinbasket%20Lake%20and%20Duncan%20Census%201995.pdf
1995 - Caribou - Aerial Survey - Kinbasket Lake Duncan River	Central Selkirks	Central Selkirks	Central Selkirks	1995	2	28	1	D	Complete survey of Duncan; partial survey of Nakusp (only Silvercup Ridge/Healy Creek)	Percent Juv	Observed - Total Count	14.9			Partial	AA		Census			Caribou censuses in the Kinbasket Lake and Duncan River	//sfp.idir.bcgov/s140/S40143/ES/WILDLIFE%202016-2020/Wildlife%20species/Caribou/Census/1995/Central%20Selkirks/Kinbasket%20Lake%20and%20Duncan%20Census%201995.pdf
1995 - Caribou - Aerial Survey - Kinbasket Lake Duncan River	Central Selkirks	Central Selkirks	Duncan	1995	2	28	1	D	Complete survey of Duncan; partial survey of Nakusp (only Silvercup Ridge/Healy Creek)	Ad - Unclas Sex	Observed - Total Count	20			Full	AA		Census				
1995 - Caribou - Aerial Survey - Kinbasket Lake Duncan River	Central Selkirks	Central Selkirks	Duncan	1995	2	28	1	D	Complete survey of Duncan; partial survey of Nakusp (only Silvercup Ridge/Healy Creek)	All Individuals	Minimum Number Known Alive	36			Full	AA		Census	12 tracks were added to total count by bio (Dr. Bruce McClleland)			
1995 - Caribou - Aerial Survey - Kinbasket Lake Duncan River	Central Selkirks	Central Selkirks	Duncan	1995	2	28	1	D	Complete survey of Duncan; partial survey of Nakusp (only Silvercup Ridge/Healy Creek)	All Individuals	Observed - Total Count	24			Full	AA		Census				
1995 - Caribou - Aerial Survey - Kinbasket Lake Duncan River	Central Selkirks	Central Selkirks	Duncan	1995	2	28	1	D	Complete survey of Duncan; partial survey of Nakusp (only Silvercup Ridge/Healy Creek)	Juv	Observed - Total Count	4			Full	AA		Census				
1995 - Caribou - Aerial Survey - Kinbasket Lake Duncan River	Central Selkirks	Central Selkirks	Duncan	1995	2	28	1	D	Complete survey of Duncan; partial survey of Nakusp (only Silvercup Ridge/Healy Creek)	Percent Juv	Observed - Total Count	16.7			Full	AA		Census				
1995 - Caribou - Aerial Survey - Kinbasket Lake Duncan River	Central Selkirks	Central Selkirks	Nakusp	1995	2	28	1	D	Complete survey of Duncan; partial survey of Nakusp (only Silvercup Ridge/Healy Creek)	Ad - Unclas Sex	Observed - Total Count	37			Partial	AA		Census				
1995 - Caribou - Aerial Survey - Kinbasket Lake Duncan River	Central Selkirks	Central Selkirks	Nakusp	1995	2	28	1	D	Complete survey of Duncan; partial survey of Nakusp (only Silvercup Ridge/Healy Creek)	All Individuals	Minimum Number Known Alive	45			Partial	AA		Census	2 tracks were added to total count by bio (Dr. Bruce McClleland)			
1995 - Caribou - Aerial Survey - Kinbasket Lake Duncan River	Central Selkirks	Central Selkirks	Nakusp	1995	2	28	1	D	Complete survey of Duncan; partial survey of Nakusp (only Silvercup Ridge/Healy Creek)	All Individuals	Observed - Total Count	43			Partial	AA		Census				
1995 - Caribou - Aerial Survey - Kinbasket Lake Duncan River	Central Selkirks	Central Selkirks	Nakusp	1995	2	28	1	D	Complete survey of Duncan; partial survey of Nakusp (only Silvercup Ridge/Healy Creek)	Juv	Observed - Total Count	6			Partial	AA		Census				
1995 - Caribou - Aerial Survey - Kinbasket Lake Duncan River	Central Selkirks	Central Selkirks	Nakusp	1995	2	28	1	D	Complete survey of Duncan; partial survey of Nakusp (only Silvercup Ridge/Healy Creek)	Percent Juv	Observed - Total Count	14.0			Partial	AA		Census				

Survey Name *	Study Area Name	Population Unit	Block Label	Year	Month	Day	Total Survey Time	Total Survey Time Unit	Summary General Comments	Parameter	Parameter Method	Parameter Value (Pre-polygon redistribution)	Total Marks Available	Marked Animals Observed	Survey completeness	Survey Intensity	Survey Field Method	Survey Purpose	Issues for Survey comparisons	Summary Detail Comments	Data Source	Data Source link
1996 - 2002 - Caribou - Aerial Late Winter Census Mark-recapture - Central Selkirks	Central Selkirks	Central Selkirks	Central Selkirks	1996	3	23	2	D	Complete survey of block areas. Redistributed caribou block observations in 2019 to reflect 2010-onwards block boundary location.	Ad F	Observed - Total Count	165			Full	AA	Mark-Recapture	Census			Population Census and Telemetry Monitoring for the Central Selkirk Caribou inventory Project 2002	http://a100.gov.bc.ca/pub/siwe/details.do?projectId=723&surveyId=6463&pagerOffset=0
1996 - 2002 - Caribou - Aerial Late Winter Census Mark-recapture - Central Selkirks	Central Selkirks	Central Selkirks	Central Selkirks	1996	3	23	2	D	Complete survey of block areas. Redistributed caribou block observations in 2019 to reflect 2010-onwards block boundary location.	Ad M	Observed - Total Count	20			Full	AA	Mark-Recapture	Census			Population Census and Telemetry Monitoring for the Central Selkirk Caribou inventory Project 2002	http://a100.gov.bc.ca/pub/siwe/details.do?projectId=723&surveyId=6463&pagerOffset=0
1996 - 2002 - Caribou - Aerial Late Winter Census Mark-recapture - Central Selkirks	Central Selkirks	Central Selkirks	Central Selkirks	1996	3	23	2	D	Complete survey of block areas. Redistributed caribou block observations in 2019 to reflect 2010-onwards block boundary location.	All Individuals	Minimum Number Known Alive	214			Full	AA	Mark-Recapture	Census	6 caribou tracks observed, but animals not located		Population Census and Telemetry Monitoring for the Central Selkirk Caribou inventory Project 2002	http://a100.gov.bc.ca/pub/siwe/details.do?projectId=723&surveyId=6463&pagerOffset=0
1996 - 2002 - Caribou - Aerial Late Winter Census Mark-recapture - Central Selkirks	Central Selkirks	Central Selkirks	Central Selkirks	1996	3	23	1	D	Complete survey of block areas. Redistributed caribou block observations in 2019 to reflect 2010-onwards block boundary location.	All Individuals	Model - Joint Hypergeometric Estimator	224.1	13	12	Full	AA	Mark-Recapture	Census		Collars observed 12; available collars 13.	Population Census and Telemetry Monitoring for the Central Selkirk Caribou inventory Project 2003	http://a100.gov.bc.ca/pub/siwe/details.do?projectId=723&surveyId=6463&pagerOffset=0
1996 - 2002 - Caribou - Aerial Late Winter Census Mark-recapture - Central Selkirks	Central Selkirks	Central Selkirks	Central Selkirks	1996	3	23	2	D	Complete survey of block areas. Redistributed caribou block observations in 2019 to reflect 2010-onwards block boundary location.	All Individuals	Observed - Total Count	208			Full	AA	Mark-Recapture	Census			Population Census and Telemetry Monitoring for the Central Selkirk Caribou inventory Project 2002	http://a100.gov.bc.ca/pub/siwe/details.do?projectId=723&surveyId=6463&pagerOffset=0
1996 - 2002 - Caribou - Aerial Late Winter Census Mark-recapture - Central Selkirks	Central Selkirks	Central Selkirks	Central Selkirks	1996	3	23	2	D	Complete survey of block areas. Redistributed caribou block observations in 2019 to reflect 2010-onwards block boundary location.	Juv	Observed - Total Count	23			Full	AA	Mark-Recapture	Census			Population Census and Telemetry Monitoring for the Central Selkirk Caribou inventory Project 2002	http://a100.gov.bc.ca/pub/siwe/details.do?projectId=723&surveyId=6463&pagerOffset=0
1996 - 2002 - Caribou - Aerial Late Winter Census Mark-recapture - Central Selkirks	Central Selkirks	Central Selkirks	Central Selkirks	1996	3	23	2	D	Complete survey of block areas. Redistributed caribou block observations in 2019 to reflect 2010-onwards block boundary location.	Percent Juv	Observed - Total Count	11.1			Full	AA	Mark-Recapture	Census			Population Census and Telemetry Monitoring for the Central Selkirk Caribou inventory Project 2002	http://a100.gov.bc.ca/pub/siwe/details.do?projectId=723&surveyId=6463&pagerOffset=0
1996 - 2002 - Caribou - Aerial Late Winter Census Mark-recapture - Central Selkirks	Central Selkirks	Central Selkirks	Duncan	1996	3	24	1	D	Complete survey of block areas. Redistributed caribou block observations in 2019 to reflect 2010-onwards block boundary location.	Ad F	Observed - Total Count	30			Full	AA	Mark-Recapture	Census				
1996 - 2002 - Caribou - Aerial Late Winter Census Mark-recapture - Central Selkirks	Central Selkirks	Central Selkirks	Duncan	1996	3	24	1	D	Complete survey of block areas. Redistributed caribou block observations in 2019 to reflect 2010-onwards block boundary location.	All Individuals	Minimum Number Known Alive	42			Full	AA	Mark-Recapture	Census	6 caribou tracks observed, but animals not located			
1996 - 2002 - Caribou - Aerial Late Winter Census Mark-recapture - Central Selkirks	Central Selkirks	Central Selkirks	Duncan	1996	3	24	1	D	Complete survey of block areas. Redistributed caribou block observations in 2019 to reflect 2010-onwards block boundary location.	All Individuals	Observed - Total Count	36			Full	AA	Mark-Recapture	Census				
1996 - 2002 - Caribou - Aerial Late Winter Census Mark-recapture - Central Selkirks	Central Selkirks	Central Selkirks	Duncan	1996	3	24	1	D	Complete survey of block areas. Redistributed caribou block observations in 2019 to reflect 2010-onwards block boundary location.	Juv	Observed - Total Count	6			Full	AA	Mark-Recapture	Census				

Survey Name *	Study Area Name	Population Unit	Block Label	Year	Month	Day	Total Survey Time	Total Survey Time Unit	Summary General Comments	Parameter	Parameter Method	Parameter Value (Pre-polygon redistribution)	Total Marks Available	Marked Animals Observed	Survey completeness	Survey Intensity	Survey Field Method	Survey Purpose	Issues for Survey comparisons	Summary Detail Comments	Data Source	Data Source link
1996 - 2002 - Caribou - Aerial Late Winter Census Mark-recapture - Central Selkirks	Central Selkirks	Central Selkirks	Duncan	1996	3	24	1	D	Complete survey of block areas. Redistributed caribou block observations in 2019 to reflect 2010-onwards block boundary location.	Percent Juv	Observed - Total Count	16.7			Full	AA	Mark-Recapture	Census				
1996 - 2002 - Caribou - Aerial Late Winter Census Mark-recapture - Central Selkirks	Central Selkirks	Central Selkirks	Nakusp	1996	3	23	1	D	Complete survey of block areas. Redistributed caribou block observations in 2019 to reflect 2010-onwards block boundary location.	Ad F	Observed - Total Count	135			Full	AA	Mark-Recapture	Census				
1996 - 2002 - Caribou - Aerial Late Winter Census Mark-recapture - Central Selkirks	Central Selkirks	Central Selkirks	Nakusp	1996	3	23	1	D	Complete survey of block areas. Redistributed caribou block observations in 2019 to reflect 2010-onwards block boundary location.	Ad M	Observed - Total Count	20			Full	AA	Mark-Recapture	Census				
1996 - 2002 - Caribou - Aerial Late Winter Census Mark-recapture - Central Selkirks	Central Selkirks	Central Selkirks	Nakusp	1996	3	23	1	D	Complete survey of block areas. Redistributed caribou block observations in 2019 to reflect 2010-onwards block boundary location.	All Individuals	Observed - Total Count	172			Full	AA	Mark-Recapture	Census				
1996 - 2002 - Caribou - Aerial Late Winter Census Mark-recapture - Central Selkirks	Central Selkirks	Central Selkirks	Nakusp	1996	3	23	1	D	Complete survey of block areas. Redistributed caribou block observations in 2019 to reflect 2010-onwards block boundary location.	Juv	Observed - Total Count	17			Full	AA	Mark-Recapture	Census				
1996 - 2002 - Caribou - Aerial Late Winter Census Mark-recapture - Central Selkirks	Central Selkirks	Central Selkirks	Nakusp	1996	3	23	1	D	Complete survey of block areas. Redistributed caribou block observations in 2019 to reflect 2010-onwards block boundary location.	Percent Juv	Observed - Total Count	9.9			Full	AA	Mark-Recapture	Census				
1996 - 2002 - Caribou - Aerial Late Winter Census Mark-recapture - Central Selkirks	Central Selkirks	Central Selkirks	Central Selkirks	1997	4	4	2	D	Complete survey of block areas, though some sections not flown due to time and fuel constraints. Redistributed caribou block observations in 2019 to reflect 2010-onwards block boundary location.	Ad - Unclas Sex	Observed - Total Count	205			Full	AA	Mark-Recapture	Census			Hamilton & Wilson 2008 Population Census of Mountain Caribou in the Central Selkirk Mountains	\\level\s40006\ESD\El\Wildlife\WSI\Caribou_Program\4_Data_Capture\4_Kootenay\CentralSelkirks\SPI_Submissions\In_Progress\PopulationAssessment\Data\1996_2008_Wilson_rawdata_census_Central_Selkirk.xls
1996 - 2002 - Caribou - Aerial Late Winter Census Mark-recapture - Central Selkirks	Central Selkirks	Central Selkirks	Central Selkirks	1997	4	4	2	D	Complete survey of block areas, though some sections not flown due to time and fuel constraints. Redistributed caribou block observations in 2019 to reflect 2010-onwards block boundary location.	All Individuals	Minimum Number Known Alive	231			Full	AA	Mark-Recapture	Census	9 caribou tracks added to Nakusp observed countby bio (Dennis hamilton)	9 caribou tracks added to Nakusp observed count; caribou not located	Hamilton&Wilson 2002 Central Selkirk Caribou Population Census	\\level\s40006\ESD\El\Wildlife\WSI\Caribou_Program\4_Data_Capture\4_Kootenay\CentralSelkirks\SPI_Submissions\In_Progress\PopulationAssessment\Data\1996_2008_Wilson_rawdata_census_Central_Selkirk.xls
1996 - 2002 - Caribou - Aerial Late Winter Census Mark-recapture - Central Selkirks	Central Selkirks	Central Selkirks	Central Selkirks	1997	4	4	2	D	Complete survey of block areas, though some sections not flown due to time and fuel constraints. Redistributed caribou block observations in 2019 to reflect 2010-onwards block boundary location.	All Individuals	Model - Joint Hypergeometric Estimator	253.6	23	22	Full	AA	Mark-Recapture	Census		Collars observed 22; available collars 23.	Hamilton & Wilson 2008 Population Census of Mountain Caribou in the Central Selkirk Mountains	http://a100.gov.bc.ca/pub/siwe/details.do?projectId=723&surveyId=12791&pagerOffset=0

Survey Name *	Study Area Name	Population Unit	Block Label	Year	Month	Day	Total Survey Time	Total Survey Time Unit	Summary General Comments	Parameter	Parameter Method	Parameter Value (Pre-polygon redistribution)	Total Marks Available	Marked Animals Observed	Survey completeness	Survey Intensity	Survey Field Method	Survey Purpose	Issues for Survey comparisons	Summary Detail Comments	Data Source	Data Source link
1996 - 2002 - Caribou - Aerial Late Winter Census Mark-recapture - Central Selkirks	Central Selkirks	Central Selkirks	Central Selkirks	1997	4	4	2	D	Complete survey of block areas, though some sections not flown due to time and fuel constraints. Redistributed caribou block observations in 2019 to reflect 2010-onwards block boundary location.	All Individuals	Observed - Total Count	222			Full	AA	Mark-Recapture	Census			Hamilton & Wilson 2008 Population Census of Mountain Caribou in the Central Selkirk Mountains	\\level\s40006\ESD\El\Wildlife\WSI\Caribou_Program\4.Data_Capture\4_Kootenay\CentralSelkirks\SPI_Submissions\In_Progress\PopulationAssessment\Data\1996_2008_Wilson_rawdata_census_Central_Selkirk.xls
1996 - 2002 - Caribou - Aerial Late Winter Census Mark-recapture - Central Selkirks	Central Selkirks	Central Selkirks	Central Selkirks	1997	4	4	2	D	Complete survey of block areas, though some sections not flown due to time and fuel constraints. Redistributed caribou block observations in 2019 to reflect 2010-onwards block boundary location.	Juv	Observed - Total Count	17			Full	AA	Mark-Recapture	Census			Hamilton & Wilson 2008 Population Census of Mountain Caribou in the Central Selkirk Mountains	\\level\s40006\ESD\El\Wildlife\WSI\Caribou_Program\4.Data_Capture\4_Kootenay\CentralSelkirks\SPI_Submissions\In_Progress\PopulationAssessment\Data\1996_2008_Wilson_rawdata_census_Central_Selkirk.xls
1996 - 2002 - Caribou - Aerial Late Winter Census Mark-recapture - Central Selkirks	Central Selkirks	Central Selkirks	Central Selkirks	1997	4	4	2	D	Complete survey of block areas, though some sections not flown due to time and fuel constraints. Redistributed caribou block observations in 2019 to reflect 2010-onwards block boundary location.	Percent Juv	Observed - Total Count	7.7			Full	AA	Mark-Recapture	Census			Hamilton & Wilson 2008 Population Census of Mountain Caribou in the Central Selkirk Mountains	\\level\s40006\ESD\El\Wildlife\WSI\Caribou_Program\4.Data_Capture\4_Kootenay\CentralSelkirks\SPI_Submissions\In_Progress\PopulationAssessment\Data\1996_2008_Wilson_rawdata_census_Central_Selkirk.xls
1996 - 2002 - Caribou - Aerial Late Winter Census Mark-recapture - Central Selkirks	Central Selkirks	Central Selkirks	Duncan	1997	4	5	1	D	Complete survey of block areas, though some sections not flown due to time and fuel constraints. Redistributed caribou block observations in 2019 to reflect 2010-onwards block boundary location.	Ad - Unclas Sex	Observed - Total Count	20			Full	AA	Mark-Recapture	Census				
1996 - 2002 - Caribou - Aerial Late Winter Census Mark-recapture - Central Selkirks	Central Selkirks	Central Selkirks	Duncan	1997	4	5	1	D	Complete survey of block areas, though some sections not flown due to time and fuel constraints. Redistributed caribou block observations in 2019 to reflect 2010-onwards block boundary location.	All Individuals	Observed - Total Count	24			Full	AA	Mark-Recapture	Census				
1996 - 2002 - Caribou - Aerial Late Winter Census Mark-recapture - Central Selkirks	Central Selkirks	Central Selkirks	Duncan	1997	4	5	1	D	Complete survey of block areas, though some sections not flown due to time and fuel constraints. Redistributed caribou block observations in 2019 to reflect 2010-onwards block boundary location.	Juv	Observed - Total Count	2			Full	AA	Mark-Recapture	Census				
1996 - 2002 - Caribou - Aerial Late Winter Census Mark-recapture - Central Selkirks	Central Selkirks	Central Selkirks	Duncan	1997	4	5	1	D	Complete survey of block areas, though some sections not flown due to time and fuel constraints. Redistributed caribou block observations in 2019 to reflect 2010-onwards block boundary location.	Percent Juv	Observed - Total Count	16.7			Full	AA	Mark-Recapture	Census				

Survey Name *	Study Area Name	Population Unit	Block Label	Year	Month	Day	Total Survey Time	Total Survey Time Unit	Summary General Comments	Parameter	Parameter Method	Parameter Value (Pre-polygon redistribution)	Total Marks Available	Marked Animals Observed	Survey completeness	Survey Intensity	Survey Field Method	Survey Purpose	Issues for Survey comparisons	Summary Detail Comments	Data Source	Data Source link
1996 - 2002 - Caribou - Aerial Late Winter Census Mark-recapture - Central Selkirks	Central Selkirks	Central Selkirks	Nakusp	1997	4	4	2	D	Complete survey of block areas, though some sections not flown due to time and fuel constraints. Redistributed caribou block observations in 2019 to reflect 2010-onwards block boundary location.	Ad - Unclas Sex	Observed - Total Count	185			Full	AA	Mark-Recapture	Census				
1996 - 2002 - Caribou - Aerial Late Winter Census Mark-recapture - Central Selkirks	Central Selkirks	Central Selkirks	Nakusp	1997	4	4	2	D	Complete survey of block areas, though some sections not flown due to time and fuel constraints. Redistributed caribou block observations in 2019 to reflect 2010-onwards block boundary location.	All Individuals	Minimum Number Known Alive	207			Full	AA	Mark-Recapture	Census	9 caribou tracks added to Nakusp observed countby bio (Dennis hamilton)	9 caribou tracks added to Nakusp observed count; caribou not located		
1996 - 2002 - Caribou - Aerial Late Winter Census Mark-recapture - Central Selkirks	Central Selkirks	Central Selkirks	Nakusp	1997	4	4	2	D	Complete survey of block areas, though some sections not flown due to time and fuel constraints. Redistributed caribou block observations in 2019 to reflect 2010-onwards block boundary location.	All Individuals	Observed - Total Count	198			Full	AA	Mark-Recapture	Census				
1996 - 2002 - Caribou - Aerial Late Winter Census Mark-recapture - Central Selkirks	Central Selkirks	Central Selkirks	Nakusp	1997	4	4	2	D	Complete survey of block areas, though some sections not flown due to time and fuel constraints. Redistributed caribou block observations in 2019 to reflect 2010-onwards block boundary location.	Juv	Observed - Total Count	13			Full	AA	Mark-Recapture	Census				
1996 - 2002 - Caribou - Aerial Late Winter Census Mark-recapture - Central Selkirks	Central Selkirks	Central Selkirks	Nakusp	1997	4	4	2	D	Complete survey of block areas, though some sections not flown due to time and fuel constraints. Redistributed caribou block observations in 2019 to reflect 2010-onwards block boundary location.	Percent Juv	Observed - Total Count	6.6			Full	AA	Mark-Recapture	Census				
1996 - 2002 - Caribou - Aerial Late Winter Census Mark-recapture - Central Selkirks	Central Selkirks	Central Selkirks	Central Selkirks	1998												No Survey						
1996 - 2002 - Caribou - Aerial Late Winter Census Mark-recapture - Central Selkirks	Central Selkirks	Central Selkirks	Central Selkirks	1999	4	5	2	D	No date of survey given, estimated as April 5. Complete survey of Block; Redistributed caribou block observations in 2019 to reflect 2010-onwards block boundary location.	Ad - Unclas Sex	Observed - Total Count	164			Full	AA	Mark-Recapture	Census			Hamilton & Wilson 2008 Population Census of Mountain Caribou in the Central Selkirk Mountains	\\level\s40006\ESD\Efl\Wildlife\WSI\Caribou_Program\4.Data_Capture\4_Kootenay\CentralSelkirks\SPI_Submissions\In_Progress\PopulationAssessment\Data\1996_2008_Wilson_rawdata_census_Central_Selkirk.xls
1996 - 2002 - Caribou - Aerial Late Winter Census Mark-recapture - Central Selkirks	Central Selkirks	Central Selkirks	Central Selkirks	1999	4	5	2	D	No date of survey given, estimated as April 5. Complete survey of Block; Redistributed caribou block observations in 2019 to reflect 2010-onwards block boundary location.	All Individuals	Minimum Number Known Alive	180			Full	AA	Mark-Recapture	Census	3 out of 17 caribou tracks added to Nakusp observed count though caribou not located by bio	3 out of 17 caribou tracks added to Nakusp observed count though caribou not located	Hamilton & Wilson 2008 Population Census of Mountain Caribou in the Central Selkirk Mountains	\\level\s40006\ESD\Efl\Wildlife\WSI\Caribou_Program\4.Data_Capture\4_Kootenay\CentralSelkirks\SPI_Submissions\In_Progress\PopulationAssessment\Data\1996_2008_Wilson_rawdata_census_Central_Selkirk.xls

Survey Name *	Study Area Name	Population Unit	Block Label	Year	Month	Day	Total Survey Time	Total Survey Time Unit	Summary General Comments	Parameter	Parameter Method	Parameter Value (Pre-polygon redistribution)	Total Marks Available	Marked Animals Observed	Survey completeness	Survey Intensity	Survey Field Method	Survey Purpose	Issues for Survey comparisons	Summary Detail Comments	Data Source	Data Source link
1996 - 2002 - Caribou - Aerial Late Winter Census Mark-recapture - Central Selkirks	Central Selkirks	Central Selkirks	Central Selkirks	1999	4	5	1	D	No date of survey given, estimated as April 5. Complete survey of Block; Redistributed caribou block observations in 2019 to reflect 2010-onwards block boundary location.	All Individuals	Model - Joint Hypergeometric Estimator	212.6	17	14	Full	AA	Mark-Recapture	Census		Collars observed 14; available collars 17.	Hamilton & Wilson 2008 Population Census of Mountain Caribou in the Central Selkirk Mountains	\\level\s40006\ESD\EI\Wildlife\WSI\Caribou_Program\4.Data_Capture\4_Kootenay\CentralSelkirks\SPI_Submissions\In_Progress\PopulationAssessment\Data
1996 - 2002 - Caribou - Aerial Late Winter Census Mark-recapture - Central Selkirks	Central Selkirks	Central Selkirks	Central Selkirks	1999	4	5	2	D	No date of survey given, estimated as April 5. Complete survey of Block; Redistributed caribou block observations in 2019 to reflect 2010-onwards block boundary location.	All Individuals	Observed - Total Count	177			Full	AA	Mark-Recapture	Census			Hamilton & Wilson 2008 Population Census of Mountain Caribou in the Central Selkirk Mountains	\\level\s40006\ESD\EI\Wildlife\WSI\Caribou_Program\4.Data_Capture\4_Kootenay\CentralSelkirks\SPI_Submissions\In_Progress\PopulationAssessment\Data\1996_2008_Wilson_rawdata_census_Central_Selkirk.xls
1996 - 2002 - Caribou - Aerial Late Winter Census Mark-recapture - Central Selkirks	Central Selkirks	Central Selkirks	Central Selkirks	1999	4	5	2	D	No date of survey given, estimated as April 5. Complete survey of Block; Redistributed caribou block observations in 2019 to reflect 2010-onwards block boundary location.	Juv	Observed - Total Count	13			Full	AA	Mark-Recapture	Census			Hamilton & Wilson 2008 Population Census of Mountain Caribou in the Central Selkirk Mountains	\\level\s40006\ESD\EI\Wildlife\WSI\Caribou_Program\4.Data_Capture\4_Kootenay\CentralSelkirks\SPI_Submissions\In_Progress\PopulationAssessment\Data\1996_2008_Wilson_rawdata_census_Central_Selkirk.xls
1996 - 2002 - Caribou - Aerial Late Winter Census Mark-recapture - Central Selkirks	Central Selkirks	Central Selkirks	Central Selkirks	1999	4	5	2	D	No date of survey given, estimated as April 5. Complete survey of Block; Redistributed caribou block observations in 2019 to reflect 2010-onwards block boundary location.	Percent Juv	Observed - Total Count	7.3			Full	AA	Mark-Recapture	Census			Hamilton & Wilson 2008 Population Census of Mountain Caribou in the Central Selkirk Mountains	\\level\s40006\ESD\EI\Wildlife\WSI\Caribou_Program\4.Data_Capture\4_Kootenay\CentralSelkirks\SPI_Submissions\In_Progress\PopulationAssessment\Data\1996_2008_Wilson_rawdata_census_Central_Selkirk.xls
1996 - 2002 - Caribou - Aerial Late Winter Census Mark-recapture - Central Selkirks	Central Selkirks	Central Selkirks	Duncan	1999	4	5	1	D	No date of survey given, estimated as April 5. Complete survey of Block; Redistributed caribou block observations in 2019 to reflect 2010-onwards block boundary location.	Ad - Unclas Sex	Observed - Total Count	24			Full	AA	Mark-Recapture	Census				
1996 - 2002 - Caribou - Aerial Late Winter Census Mark-recapture - Central Selkirks	Central Selkirks	Central Selkirks	Duncan	1999	4	5	1	D	No date of survey given, estimated as April 5. Complete survey of Block; Redistributed caribou block observations in 2019 to reflect 2010-onwards block boundary location.	All Individuals	Observed - Total Count	26			Full	AA	Mark-Recapture	Census				
1996 - 2002 - Caribou - Aerial Late Winter Census Mark-recapture - Central Selkirks	Central Selkirks	Central Selkirks	Duncan	1999	4	5	1	D	No date of survey given, estimated as April 5. Complete survey of Block; Redistributed caribou block observations in 2019 to reflect 2010-onwards block boundary location.	Juv	Observed - Total Count	2			Full	AA	Mark-Recapture	Census				
1996 - 2002 - Caribou - Aerial Late Winter Census Mark-recapture - Central Selkirks	Central Selkirks	Central Selkirks	Duncan	1999	4	5	1	D	No date of survey given, estimated as April 5. Complete survey of Block; Redistributed caribou block observations in 2019 to reflect 2010-onwards block boundary location.	Percent Juv	Observed - Total Count	7.7			Full	AA	Mark-Recapture	Census				

Survey Name *	Study Area Name	Population Unit	Block Label	Year	Month	Day	Total Survey Time	Total Survey Time Unit	Summary General Comments	Parameter	Parameter Method	Parameter Value (Pre-polygon redistribution)	Total Marks Available	Marked Animals Observed	Survey completeness	Survey Intensity	Survey Field Method	Survey Purpose	Issues for Survey comparisons	Summary Detail Comments	Data Source	Data Source link
1996 - 2002 - Caribou - Aerial Late Winter Census Mark-recapture - Central Selkirks	Central Selkirks	Central Selkirks	Nakusp	1999	4	5	1	D	No date of survey given, estimated as April 5. Complete survey of Block; Redistributed caribou block observations in 2019 to reflect 2010-onwards block boundary location.	Ad - Unclas Sex	Observed - Total Count	140			Full	AA	Mark-Recapture	Census				
1996 - 2002 - Caribou - Aerial Late Winter Census Mark-recapture - Central Selkirks	Central Selkirks	Central Selkirks	Nakusp	1999	4	5	1	D	No date of survey given, estimated as April 5. Complete survey of Block; Redistributed caribou block observations in 2019 to reflect 2010-onwards block boundary location.	All Individuals	Minimum Number Known Alive	154			Full	AA	Mark-Recapture	Census	3 out of 17 caribou tracks added to Nakusp observed count though caribou not located by bio	3 out of 17 caribou tracks added to Nakusp observed count though caribou not located		
1996 - 2002 - Caribou - Aerial Late Winter Census Mark-recapture - Central Selkirks	Central Selkirks	Central Selkirks	Nakusp	1999	4	5	1	D	No date of survey given, estimated as April 5. Complete survey of Block; Redistributed caribou block observations in 2019 to reflect 2010-onwards block boundary location.	All Individuals	Observed - Total Count	151			Full	AA	Mark-Recapture	Census				
1996 - 2002 - Caribou - Aerial Late Winter Census Mark-recapture - Central Selkirks	Central Selkirks	Central Selkirks	Nakusp	1999	4	5	1	D	No date of survey given, estimated as April 5. Complete survey of Block; Redistributed caribou block observations in 2019 to reflect 2010-onwards block boundary location.	Juv	Observed - Total Count	11			Full	AA	Mark-Recapture	Census				
1996 - 2002 - Caribou - Aerial Late Winter Census Mark-recapture - Central Selkirks	Central Selkirks	Central Selkirks	Nakusp	1999	4	5	1	D	No date of survey given, estimated as April 5. Complete survey of Block; Redistributed caribou block observations in 2019 to reflect 2010-onwards block boundary location.	Percent Juv	Observed - Total Count	7.3			Full	AA	Mark-Recapture	Census				
			Central Selkirks	2000												No Survey						
			Central Selkirks	2001												No Survey						
1996 - 2002 - Caribou - Aerial Late Winter Census Mark-recapture - Central Selkirks	Central Selkirks	Central Selkirks	Central Selkirks	2002	3	23	1	D	Complete survey of Blocks; Redistributed caribou block observations in 2019 to reflect 2010-onwards block boundary location.	Ad - Unclas Sex	Observed - Total Count	77			Full	AA	Mark-Recapture	Census			Hamilton & Wilson 2008 Population Census of Mountain Caribou in the Central Selkirk Mountains	\\level\s40006\ESD\El\Wildlife\WSI\Caribou_Program\4.Data_Capture\4_Kootenay\CentralSelkirks\SPI_Submissions\In_Progress\PopulationAssessment\Data\1996_2008_Wilson_rawdata_census_Central_Selkirk.xls
1996 - 2002 - Caribou - Aerial Late Winter Census Mark-recapture - Central Selkirks	Central Selkirks	Central Selkirks	Central Selkirks	2002	3	23	1	D	Complete survey of Blocks; Redistributed caribou block observations in 2019 to reflect 2010-onwards block boundary location.	All Individuals	Minimum Number Known Alive	97			Full	AA	Mark-Recapture	Census	4 caribou tracks added to Nakusp observed count; caribou not located	4 caribou tracks added to Nakusp observed count; caribou not located	Hamilton & Wilson 2008 Population Census of Mountain Caribou in the Central Selkirk Mountains	\\level\s40006\ESD\El\Wildlife\WSI\Caribou_Program\4.Data_Capture\4_Kootenay\CentralSelkirks\SPI_Submissions\In_Progress\PopulationAssessment\Data\1996_2008_Wilson_rawdata_census_Central_Selkirk.xls

Survey Name *	Study Area Name	Population Unit	Block Label	Year	Month	Day	Total Survey Time	Total Survey Time Unit	Summary General Comments	Parameter	Parameter Method	Parameter Value (Pre-polygon redistribution)	Total Marks Available	Marked Animals Observed	Survey completeness	Survey Intensity	Survey Field Method	Survey Purpose	Issues for Survey comparisons	Summary Detail Comments	Data Source	Data Source link
1996 - 2002 - Caribou - Aerial Late Winter Census Mark-recapture - Central Selkirks	Central Selkirks	Central Selkirks	Central Selkirks	2002	3	23	1	D	Complete survey of Blocks; Redistributed caribou block observations in 2019 to reflect 2010-onwards block boundary location.	All Individuals	Model - Joint Hypergeometric Estimator	133	9	6	Full	AA	Mark-Recapture	Census		Collars observed 6; available collars 9	Hamilton & Wilson 2008 Population Census of Mountain Caribou in the Central Selkirk Mountains	\\level\s40006\ESD\El\Wildlife\WSI\Caribou_Program\4.Data_Capture\4_Kootenay\CentralSelkirks\SPI_Submissions\In_Progress\PopulationAssessment\Data\1996_2008_Wilson_rawdata_census_Central_Selkirk.xls
1996 - 2002 - Caribou - Aerial Late Winter Census Mark-recapture - Central Selkirks	Central Selkirks	Central Selkirks	Central Selkirks	2002	3	23	1	D	Complete survey of Blocks; Redistributed caribou block observations in 2019 to reflect 2010-onwards block boundary location.	All Individuals	Observed - Total Count	93			Full	AA	Mark-Recapture	Census			Hamilton & Wilson 2008 Population Census of Mountain Caribou in the Central Selkirk Mountains	\\level\s40006\ESD\El\Wildlife\WSI\Caribou_Program\4.Data_Capture\4_Kootenay\CentralSelkirks\SPI_Submissions\In_Progress\PopulationAssessment\Data\1996_2008_Wilson_rawdata_census_Central_Selkirk.xls
1996 - 2002 - Caribou - Aerial Late Winter Census Mark-recapture - Central Selkirks	Central Selkirks	Central Selkirks	Central Selkirks	2002	3	23	1	D	Complete survey of Blocks; Redistributed caribou block observations in 2019 to reflect 2010-onwards block boundary location.	Juv	Observed - Total Count	16			Full	AA	Mark-Recapture	Census			Hamilton & Wilson 2008 Population Census of Mountain Caribou in the Central Selkirk Mountains	\\level\s40006\ESD\El\Wildlife\WSI\Caribou_Program\4.Data_Capture\4_Kootenay\CentralSelkirks\SPI_Submissions\In_Progress\PopulationAssessment\Data\1996_2008_Wilson_rawdata_census_Central_Selkirk.xls
1996 - 2002 - Caribou - Aerial Late Winter Census Mark-recapture - Central Selkirks	Central Selkirks	Central Selkirks	Central Selkirks	2002	3	23	1	D	Complete survey of Blocks; Redistributed caribou block observations in 2019 to reflect 2010-onwards block boundary location.	Percent Juv	Observed - Total Count	17.4			Full	AA	Mark-Recapture	Census			Hamilton & Wilson 2008 Population Census of Mountain Caribou in the Central Selkirk Mountains	\\level\s40006\ESD\El\Wildlife\WSI\Caribou_Program\4.Data_Capture\4_Kootenay\CentralSelkirks\SPI_Submissions\In_Progress\PopulationAssessment\Data\1996_2008_Wilson_rawdata_census_Central_Selkirk.xls
1996 - 2002 - Caribou - Aerial Late Winter Census Mark-recapture - Central Selkirks	Central Selkirks	Central Selkirks	Duncan	2002	3	23	1	D	Complete survey of Blocks; Redistributed caribou block observations in 2019 to reflect 2010-onwards block boundary location.	Ad - Unclas Sex	Observed - Total Count	13			Full	AA	Mark-Recapture	Census				
1996 - 2002 - Caribou - Aerial Late Winter Census Mark-recapture - Central Selkirks	Central Selkirks	Central Selkirks	Duncan	2002	3	23	1	D	Complete survey of Blocks; Redistributed caribou block observations in 2019 to reflect 2010-onwards block boundary location.	All Individuals	Observed - Total Count	17			Full	AA	Mark-Recapture	Census				
1996 - 2002 - Caribou - Aerial Late Winter Census Mark-recapture - Central Selkirks	Central Selkirks	Central Selkirks	Duncan	2002	3	23	1	D	Complete survey of Blocks; Redistributed caribou block observations in 2019 to reflect 2010-onwards block boundary location.	Juv	Observed - Total Count	4			Full	AA	Mark-Recapture	Census				
1996 - 2002 - Caribou - Aerial Late Winter Census Mark-recapture - Central Selkirks	Central Selkirks	Central Selkirks	Duncan	2002	3	23	1	D	Complete survey of Blocks; Redistributed caribou block observations in 2019 to reflect 2010-onwards block boundary location.	Percent Juv	Observed - Total Count	23.5			Full	AA	Mark-Recapture	Census				
1996 - 2002 - Caribou - Aerial Late Winter Census Mark-recapture - Central Selkirks	Central Selkirks	Central Selkirks	Nakusp	2002	3	24	1	D	Complete survey of Blocks; Redistributed caribou block observations in 2019 to reflect 2010-onwards block boundary location.	Ad - Unclas Sex	Observed - Total Count	64			Full	AA	Mark-Recapture	Census				

Survey Name *	Study Area Name	Population Unit	Block Label	Year	Month	Day	Total Survey Time	Total Survey Time Unit	Summary General Comments	Parameter	Parameter Method	Parameter Value (Pre-polygon redistribution)	Total Marks Available	Marked Animals Observed	Survey completeness	Survey Intensity	Survey Field Method	Survey Purpose	Issues for Survey comparisons	Summary Detail Comments	Data Source	Data Source link
1996 - 2002 - Caribou - Aerial Late Winter Census Mark-recapture - Central Selkirks	Central Selkirks	Central Selkirks	Nakusp	2002	3	24	1	D	Complete survey of Blocks; Redistributed caribou block observations in 2019 to reflect 2010-onwards block boundary location.	All Individuals	Minimum Number Known Alive	80			Full	AA	Mark-Recapture	Census	4 caribou tracks added to Nakusp observed count; caribou not located	4 caribou tracks added to Nakusp observed count; caribou not located		
1996 - 2002 - Caribou - Aerial Late Winter Census Mark-recapture - Central Selkirks	Central Selkirks	Central Selkirks	Nakusp	2002	3	24	1	D	Complete survey of Blocks; Redistributed caribou block observations in 2019 to reflect 2010-onwards block boundary location.	All Individuals	Observed - Total Count	76			Full	AA	Mark-Recapture	Census				
1996 - 2002 - Caribou - Aerial Late Winter Census Mark-recapture - Central Selkirks	Central Selkirks	Central Selkirks	Nakusp	2002	3	24	1	D	Complete survey of Blocks; Redistributed caribou block observations in 2019 to reflect 2010-onwards block boundary location.	Juv	Observed - Total Count	12			Full	AA	Mark-Recapture	Census				
1996 - 2002 - Caribou - Aerial Late Winter Census Mark-recapture - Central Selkirks	Central Selkirks	Central Selkirks	Nakusp	2002	3	24	1	D	Complete survey of Blocks; Redistributed caribou block observations in 2019 to reflect 2010-onwards block boundary location.	Percent Juv	Observed - Total Count	15.8			Full	AA	Mark-Recapture	Census				
			Central Selkirks	2003												No Survey						
2004 - 2008 - Caribou - Aerial Late Winter Census - Central Selkirks	Central Selkirks	Central Selkirks	Central Selkirks	2004	3	25	2	D	No date provided; estimated on March 25; Complete survey of Blocks; Redistributed caribou block observations in 2019 to reflect 2010-onwards block boundary location.	Ad - Unclas Sex	Observed - Total Count	57			Full	AA		Census			Hamilton & Wilson 2008 Population Census of Mountain Caribou in the Central Selkirk Mountains	\\level\s40006\ESD\El\Wildlife\WSI\Caribou_Program\4.Data_Capture\4_Kootenay\CentralSelkirks\SPI_Submissions\In_Progress\PopulationAssessment\Data\1996_2008_Wilson_rawdata_census_Central_Selkirk.xls
2004 - 2008 - Caribou - Aerial Late Winter Census - Central Selkirks	Central Selkirks	Central Selkirks	Central Selkirks	2004	3	25	2	D	No date provided; estimated to be March 25; Complete survey of Blocks; Redistributed caribou block observations in 2019 to reflect 2010-onwards block boundary location.	All Individuals	Observed - Total Count	70			Full	AA		Census	16 tracks observed with no caribou located (6-Duncan and 10 in Nakusp) NOT added to total count		Hamilton & Wilson 2008 Population Census of Mountain Caribou in the Central Selkirk Mountains	\\level\s40006\ESD\El\Wildlife\WSI\Caribou_Program\4.Data_Capture\4_Kootenay\CentralSelkirks\SPI_Submissions\In_Progress\PopulationAssessment\Data\1996_2008_Wilson_rawdata_census_Central_Selkirk.xls
2004 - 2008 - Caribou - Aerial Late Winter Census - Central Selkirks	Central Selkirks	Central Selkirks	Central Selkirks	2004	3	25	2	D	No date provided; estimated on March 25; Complete survey of Blocks; Redistributed caribou block observations in 2019 to reflect 2010-onwards block boundary location.	Juv	Observed - Total Count	13			Full	AA		Census			Hamilton & Wilson 2008 Population Census of Mountain Caribou in the Central Selkirk Mountains	\\level\s40006\ESD\El\Wildlife\WSI\Caribou_Program\4.Data_Capture\4_Kootenay\CentralSelkirks\SPI_Submissions\In_Progress\PopulationAssessment\Data\1996_2008_Wilson_rawdata_census_Central_Selkirk.xls
2004 - 2008 - Caribou - Aerial Late Winter Census - Central Selkirks	Central Selkirks	Central Selkirks	Central Selkirks	2004	3	25	2	D	No date provided; estimated on March 25; Complete survey of Blocks; Redistributed caribou block observations in 2019 to reflect 2010-onwards block boundary location.	Percent Juv	Observed - Total Count	18.6			Full	AA		Census			Hamilton & Wilson 2008 Population Census of Mountain Caribou in the Central Selkirk Mountains	\\level\s40006\ESD\El\Wildlife\WSI\Caribou_Program\4.Data_Capture\4_Kootenay\CentralSelkirks\SPI_Submissions\In_Progress\PopulationAssessment\Data\1996_2008_Wilson_rawdata_census_Central_Selkirk.xls

Survey Name *	Study Area Name	Population Unit	Block Label	Year	Month	Day	Total Survey Time	Total Survey Time Unit	Summary General Comments	Parameter	Parameter Method	Parameter Value (Pre-polygon redistribution)	Total Marks Available	Marked Animals Observed	Survey completeness	Survey Intensity	Survey Field Method	Survey Purpose	Issues for Survey comparisons	Summary Detail Comments	Data Source	Data Source link
2004 - 2008 - Caribou - Aerial Late Winter Census - Central Selkirks	Central Selkirks	Central Selkirks	Duncan	2004	3	25	1	D	No date provided; estimated on March 25; Complete survey of Blocks; Redistributed caribou block observations in 2019 to reflect 2010-onwards block boundary location.	Ad - Unclas Sex	Observed - Total Count	0			Full	AA		Census				
2004 - 2008 - Caribou - Aerial Late Winter Census - Central Selkirks	Central Selkirks	Central Selkirks	Duncan	2004	3	25	1	D	No date provided; estimated on March 25; Complete survey of Blocks; Redistributed caribou block observations in 2019 to reflect 2010-onwards block boundary location.	All Individuals	Observed - Total Count	0			Full	AA		Census	6 tracks observed with no caribou located NOT added to total count			
2004 - 2008 - Caribou - Aerial Late Winter Census - Central Selkirks	Central Selkirks	Central Selkirks	Duncan	2004	3	25	1	D	No date provided; estimated on March 25; Complete survey of Blocks; Redistributed caribou block observations in 2019 to reflect 2010-onwards block boundary location.	Juv	Observed - Total Count	0			Full	AA		Census				
2004 - 2008 - Caribou - Aerial Late Winter Census - Central Selkirks	Central Selkirks	Central Selkirks	Duncan	2004	3	25	1	D	No date provided; estimated on March 25; Complete survey of Blocks; Redistributed caribou block observations in 2019 to reflect 2010-onwards block boundary location.	Percent Juv	Observed - Total Count	0			Full	AA		Census				
2004 - 2008 - Caribou - Aerial Late Winter Census - Central Selkirks	Central Selkirks	Central Selkirks	Nakusp	2004	3	25	2	D	No date provided; estimated on March 25; Complete survey of Blocks; Redistributed caribou block observations in 2019 to reflect 2010-onwards block boundary location.	Ad - Unclas Sex	Observed - Total Count	57			Full	AA		Census				
2004 - 2008 - Caribou - Aerial Late Winter Census - Central Selkirks	Central Selkirks	Central Selkirks	Nakusp	2004	3	25	2	D	No date provided; estimated on March 25; Complete survey of Blocks; Redistributed caribou block observations in 2019 to reflect 2010-onwards block boundary location.	All Individuals	Observed - Total Count	70			Full	AA		Census	10 tracks observed with no caribou located NOT added to total count			
2004 - 2008 - Caribou - Aerial Late Winter Census - Central Selkirks	Central Selkirks	Central Selkirks	Nakusp	2004	3	25	2	D	No date provided; estimated on March 25; Complete survey of Blocks; Redistributed caribou block observations in 2019 to reflect 2010-onwards block boundary location.	Juv	Observed - Total Count	13			Full	AA		Census				
2004 - 2008 - Caribou - Aerial Late Winter Census - Central Selkirks	Central Selkirks	Central Selkirks	Nakusp	2004	3	25	2	D	No date provided; estimated on March 25; Complete survey of Blocks; Redistributed caribou block observations in 2019 to reflect 2010-onwards block boundary location.	Percent Juv	Observed - Total Count	18.6			Full	AA		Census				
2004 - 2008 - Caribou - Aerial Late Winter Census - Central Selkirks	Central Selkirks	Central Selkirks	Central Selkirks	2005	4	9	2	D	No date provided; estimated on first day of heli survey, April 10; Complete survey of Blocks; Redistributed caribou block observations in 2019 to reflect 2010-onwards block boundary location.	Ad - Unclas Sex	Observed - Total Count	59			Full	AA		Census			Hamilton & Wilson 2008 Population Census of Mountain Caribou in the Central Selkirk Mountains	\\level\s40006\ESD\EI\Wildlife\WSI\Caribou_Program\4_Data_Capture\4_Kootenay\CentralSelkirks\SPI_Submissions\In_Progress\PopulationAssessment\Data\1996_2008_Wilson_rawdata_census_Central_Selkirk.xls

Survey Name *	Study Area Name	Population Unit	Block Label	Year	Month	Day	Total Survey Time	Total Survey Time Unit	Summary General Comments	Parameter	Parameter Method	Parameter Value (Pre-polygon redistribution)	Total Marks Available	Marked Animals Observed	Survey completeness	Survey Intensity	Survey Field Method	Survey Purpose	Issues for Survey comparisons	Summary Detail Comments	Data Source	Data Source link
2004 - 2008 - Caribou - Aerial Late Winter Census - Central Selkirks	Central Selkirks	Central Selkirks	Central Selkirks	2005	4	9	2	D	No date provided; estimated on first day of heli survey, April 10; Complete survey of Blocks; Redistributed caribou block observations in 2019 to reflect 2010-onwards block boundary location.	All Individuals	Observed - Total Count	75			Full	AA		Census	21 tracks observed but not added to total count by bio		Hamilton & Wilson 2008 Population Census of Mountain Caribou in the Central Selkirk Mountains	\\level\s40006\ESD\El\Wildlife\WSI\Caribou_Program\4.Data_Capture\4_Kootenay\CentralSelkirks\SPI_Submissions\In_Progress\PopulationAssessment\Data\1996_2008_Wilson_rawdata_census_Central_Selkirk.xls
2004 - 2008 - Caribou - Aerial Late Winter Census - Central Selkirks	Central Selkirks	Central Selkirks	Central Selkirks	2005	4	9	2	D	No date provided; estimated on first day of heli survey, April 10; Complete survey of Blocks; Redistributed caribou block observations in 2019 to reflect 2010-onwards block boundary location.	Juv	Observed - Total Count	16			Full	AA		Census			Hamilton & Wilson 2008 Population Census of Mountain Caribou in the Central Selkirk Mountains	\\level\s40006\ESD\El\Wildlife\WSI\Caribou_Program\4.Data_Capture\4_Kootenay\CentralSelkirks\SPI_Submissions\In_Progress\PopulationAssessment\Data\1996_2008_Wilson_rawdata_census_Central_Selkirk.xls
2004 - 2008 - Caribou - Aerial Late Winter Census - Central Selkirks	Central Selkirks	Central Selkirks	Central Selkirks	2005	4	10	2	D	No date provided; estimated on first day of heli survey, April 10; Complete survey of Blocks; Redistributed caribou block observations in 2019 to reflect 2010-onwards block boundary location.	Percent Juv	Observed - Total Count	21.3			Full	AA		Census			Hamilton & Wilson 2008 Population Census of Mountain Caribou in the Central Selkirk Mountains	\\level\s40006\ESD\El\Wildlife\WSI\Caribou_Program\4.Data_Capture\4_Kootenay\CentralSelkirks\SPI_Submissions\In_Progress\PopulationAssessment\Data\1996_2008_Wilson_rawdata_census_Central_Selkirk.xls
2004 - 2008 - Caribou - Aerial Late Winter Census - Central Selkirks	Central Selkirks	Central Selkirks	Duncan	2005	4	9	2	D	No date provided; estimated on first day of heli survey, April 10; Complete survey of Blocks; Redistributed caribou block observations in 2019 to reflect 2010-onwards block boundary location.	Ad - Unclas Sex	Observed - Total Count	0			Full	AA		Census				
2004 - 2008 - Caribou - Aerial Late Winter Census - Central Selkirks	Central Selkirks	Central Selkirks	Duncan	2005	4	9	2	D	No date provided; estimated on first day of heli survey, April 10; Complete survey of Blocks; Redistributed caribou block observations in 2019 to reflect 2010-onwards block boundary location.	All Individuals	Observed - Total Count	0			Full	AA		Census				
2004 - 2008 - Caribou - Aerial Late Winter Census - Central Selkirks	Central Selkirks	Central Selkirks	Duncan	2005	4	9	2	D	No date provided; estimated on first day of heli survey, April 10; Complete survey of Blocks; Redistributed caribou block observations in 2019 to reflect 2010-onwards block boundary location.	Juv	Observed - Total Count	0			Full	AA		Census				
2004 - 2008 - Caribou - Aerial Late Winter Census - Central Selkirks	Central Selkirks	Central Selkirks	Duncan	2005	4	10	2	D	No date provided; estimated on first day of heli survey, April 10; Complete survey of Blocks; Redistributed caribou block observations in 2019 to reflect 2010-onwards block boundary location.	Percent Juv	Observed - Total Count	0			Full	AA		Census				

Survey Name *	Study Area Name	Population Unit	Block Label	Year	Month	Day	Total Survey Time	Total Survey Time Unit	Summary General Comments	Parameter	Parameter Method	Parameter Value (Pre-polygon redistribution)	Total Marks Available	Marked Animals Observed	Survey completeness	Survey Intensity	Survey Field Method	Survey Purpose	Issues for Survey comparisons	Summary Detail Comments	Data Source	Data Source link
2004 - 2008 - Caribou - Aerial Late Winter Census - Central Selkirks	Central Selkirks	Central Selkirks	Nakusp	2005	4	9	2	D	No date provided; estimated on first day of heli survey, April 10; Complete survey of Blocks; Redistributed caribou block observations in 2019 to reflect 2010-onwards block boundary location.	Ad - Unclas Sex	Observed - Total Count	59			Full	AA		Census				
2004 - 2008 - Caribou - Aerial Late Winter Census - Central Selkirks	Central Selkirks	Central Selkirks	Nakusp	2005	4	9	2	D	No date provided; estimated on first day of heli survey, April 10; Complete survey of Blocks; Redistributed caribou block observations in 2019 to reflect 2010-onwards block boundary location.	All Individuals	Observed - Total Count	75			Full	AA		Census	21 tracks observed but not added to total count by bio			
2004 - 2008 - Caribou - Aerial Late Winter Census - Central Selkirks	Central Selkirks	Central Selkirks	Nakusp	2005	4	9	2	D	No date provided; estimated on first day of heli survey, April 10; Complete survey of Blocks; Redistributed caribou block observations in 2019 to reflect 2010-onwards block boundary location.	Juv	Observed - Total Count	16			Full	AA		Census				
2004 - 2008 - Caribou - Aerial Late Winter Census - Central Selkirks	Central Selkirks	Central Selkirks	Nakusp	2005	4	10	2	D	No date provided; estimated on first day of heli survey, April 10; Complete survey of Blocks; Redistributed caribou block observations in 2019 to reflect 2010-onwards block boundary location.	Percent Juv	Observed - Total Count	21.3			Full	AA		Census				
2004 - 2008 - Caribou - Aerial Late Winter Census - Central Selkirks	Central Selkirks	Central Selkirks	Central Selkirks	2006	4	18	2	D	Complete survey of Blocks; Redistributed caribou block observations in 2019 to reflect 2010-onwards block boundary location.	Ad - Unclas Sex	Observed - Total Count	54			Full	AA		Census			Hamilton & Wilson 2008 Population Census of Mountain Caribou in the Central Selkirk Mountains	\\level\s40006\ESD\El\Wildlife\WSI\Caribou_Program\4.Data_Capture\4_Kootenay\CentralSelkirks\SPI_Submissions\In_Progress\PopulationAssessment\Data\1996_2008_Wilson_rawdata_census_Central_Selkirk.xls
2004 - 2008 - Caribou - Aerial Late Winter Census - Central Selkirks	Central Selkirks	Central Selkirks	Central Selkirks	2006	4	18	2	D	Complete survey of Blocks; Redistributed caribou block observations in 2019 to reflect 2010-onwards block boundary location.	All Individuals	Observed - Total Count	74			Full	AA		Census	13 tracks observed by caribou not located; bio did not add to total count		Hamilton & Wilson 2008 Population Census of Mountain Caribou in the Central Selkirk Mountains	\\level\s40006\ESD\El\Wildlife\WSI\Caribou_Program\4.Data_Capture\4_Kootenay\CentralSelkirks\SPI_Submissions\In_Progress\PopulationAssessment\Data\1996_2008_Wilson_rawdata_census_Central_Selkirk.xls
2004 - 2008 - Caribou - Aerial Late Winter Census - Central Selkirks	Central Selkirks	Central Selkirks	Central Selkirks	2006	4	18	2	D	Complete survey of Blocks; Redistributed caribou block observations in 2019 to reflect 2010-onwards block boundary location.	Juv	Observed - Total Count	20			Full	AA		Census			Hamilton & Wilson 2008 Population Census of Mountain Caribou in the Central Selkirk Mountains	\\level\s40006\ESD\El\Wildlife\WSI\Caribou_Program\4.Data_Capture\4_Kootenay\CentralSelkirks\SPI_Submissions\In_Progress\PopulationAssessment\Data\1996_2008_Wilson_rawdata_census_Central_Selkirk.xls

Survey Name *	Study Area Name	Population Unit	Block Label	Year	Month	Day	Total Survey Time	Total Survey Time Unit	Summary General Comments	Parameter	Parameter Method	Parameter Value (Pre-polygon redistribution)	Total Marks Available	Marked Animals Observed	Survey completeness	Survey Intensity	Survey Field Method	Survey Purpose	Issues for Survey comparisons	Summary Detail Comments	Data Source	Data Source link
2004 - 2008 - Caribou - Aerial Late Winter Census - Central Selkirks	Central Selkirks	Central Selkirks	Central Selkirks	2006	4	18	2	D	Complete survey of Blocks; Redistributed caribou block observations in 2019 to reflect 2010-onwards block boundary location.	Percent Juv	Observed - Total Count	27			Full	AA		Census			Hamilton & Wilson 2008 Population Census of Mountain Caribou in the Central Selkirk Mountains	\\level\s40006\ESD\El\Wildlife\WSI\Caribou_Program\4.Data_Capture\4_Kootenay\CentralSelkirks\SPI_Submissions\In_Progress\PopulationAssessment\Data\1996_2008_Wilson_rawdata_census_Central_Selkirk.xls
2004 - 2008 - Caribou - Aerial Late Winter Census - Central Selkirks	Central Selkirks	Central Selkirks	Duncan	2006	4	18	2	D	Complete survey of Blocks; Redistributed caribou block observations in 2019 to reflect 2010-onwards block boundary location.	Ad - Unclas Sex	Observed - Total Count	0			Full	AA		Census				
2004 - 2008 - Caribou - Aerial Late Winter Census - Central Selkirks	Central Selkirks	Central Selkirks	Duncan	2006	4	18	2	D	Complete survey of Blocks; Redistributed caribou block observations in 2019 to reflect 2010-onwards block boundary location.	All Individuals	Observed - Total Count	0			Full	AA		Census				
2004 - 2008 - Caribou - Aerial Late Winter Census - Central Selkirks	Central Selkirks	Central Selkirks	Duncan	2006	4	18	2	D	Complete survey of Blocks; Redistributed caribou block observations in 2019 to reflect 2010-onwards block boundary location.	Juv	Observed - Total Count	0			Full	AA		Census				
2004 - 2008 - Caribou - Aerial Late Winter Census - Central Selkirks	Central Selkirks	Central Selkirks	Duncan	2006	4	18	2	D	Complete survey of Blocks; Redistributed caribou block observations in 2019 to reflect 2010-onwards block boundary location.	Percent Juv	Observed - Total Count	0			Full	AA		Census				
2004 - 2008 - Caribou - Aerial Late Winter Census - Central Selkirks	Central Selkirks	Central Selkirks	Nakusp	2006	4	18	2	D	Complete survey of Blocks; Redistributed caribou block observations in 2019 to reflect 2010-onwards block boundary location.	Ad - Unclas Sex	Observed - Total Count	54			Full	AA		Census				
2004 - 2008 - Caribou - Aerial Late Winter Census - Central Selkirks	Central Selkirks	Central Selkirks	Nakusp	2006	4	18	2	D	Complete survey of Blocks; Redistributed caribou block observations in 2019 to reflect 2010-onwards block boundary location.	All Individuals	Observed - Total Count	74			Full	AA		Census	13 tracks observed by caribou not located; bio did not add to total count			
2004 - 2008 - Caribou - Aerial Late Winter Census - Central Selkirks	Central Selkirks	Central Selkirks	Nakusp	2006	4	18	2	D	Complete survey of Blocks; Redistributed caribou block observations in 2019 to reflect 2010-onwards block boundary location.	Juv	Observed - Total Count	20			Full	AA		Census				
2004 - 2008 - Caribou - Aerial Late Winter Census - Central Selkirks	Central Selkirks	Central Selkirks	Nakusp	2006	4	18	2	D	Complete survey of Blocks; Redistributed caribou block observations in 2019 to reflect 2010-onwards block boundary location.	Percent Juv	Observed - Total Count	27			Full	AA		Census				
2004 - 2008 - Caribou - Aerial Late Winter Census - Central Selkirks	Central Selkirks	Central Selkirks	Central Selkirks	2007	4	11	2	D	Complete survey of Blocks; Redistributed caribou block observations in 2019 to reflect 2010-onwards block boundary location.	Ad - Unclas Sex	Observed - Total Count	58			Full	AA		Census			Hamilton & Wilson 2008 Population Census of Mountain Caribou in the Central Selkirk Mountains	\\level\s40006\ESD\El\Wildlife\WSI\Caribou_Program\4.Data_Capture\4_Kootenay\CentralSelkirks\SPI_Submissions\In_Progress\PopulationAssessment\Data\1996_2008_Wilson_rawdata_census_Central_Selkirk.xls

Survey Name *	Study Area Name	Population Unit	Block Label	Year	Month	Day	Total Survey Time	Total Survey Time Unit	Summary General Comments	Parameter	Parameter Method	Parameter Value (Pre-polygon redistribution)	Total Marks Available	Marked Animals Observed	Survey completeness	Survey Intensity	Survey Field Method	Survey Purpose	Issues for Survey comparisons	Summary Detail Comments	Data Source	Data Source link
2004 - 2008 - Caribou - Aerial Late Winter Census - Central Selkirks	Central Selkirks	Central Selkirks	Central Selkirks	2007	4	11	2	D	Complete survey of Blocks; Redistributed caribou block observations in 2019 to reflect 2010-onwards block boundary location.	All Individuals	Minimum Number Known Alive	93			Full	AA		Census	18 recent tracks recorded but caribou not located added to total count by bio		Hamilton & Wilson 2008 Population Census of Mountain Caribou in the Central Selkirk Mountains	\\level\s40006\ESD\El\Wildlife\WSI\Caribou_Program\4.Data_Capture\4_Kootenay\CentralSelkirks\SPI_Submissions\In_Progress\PopulationAssessment\Data\1996_2008_Wilson_rawdata_census_Central_Selkirk.xls
2004 - 2008 - Caribou - Aerial Late Winter Census - Central Selkirks	Central Selkirks	Central Selkirks	Central Selkirks	2007	4	11	2	D	Complete survey of Blocks; Redistributed caribou block observations in 2019 to reflect 2010-onwards block boundary location.	All Individuals	Observed - Total Count	76			Full	AA		Census			Hamilton & Wilson 2008 Population Census of Mountain Caribou in the Central Selkirk Mountains	\\level\s40006\ESD\El\Wildlife\WSI\Caribou_Program\4.Data_Capture\4_Kootenay\CentralSelkirks\SPI_Submissions\In_Progress\PopulationAssessment\Data\1996_2008_Wilson_rawdata_census_Central_Selkirk.xls
2004 - 2008 - Caribou - Aerial Late Winter Census - Central Selkirks	Central Selkirks	Central Selkirks	Central Selkirks	2007	4	11	2	D	Complete survey of Blocks; Redistributed caribou block observations in 2019 to reflect 2010-onwards block boundary location.	Juv	Observed - Total Count	10			Full	AA		Census			Hamilton & Wilson 2008 Population Census of Mountain Caribou in the Central Selkirk Mountains	\\level\s40006\ESD\El\Wildlife\WSI\Caribou_Program\4.Data_Capture\4_Kootenay\CentralSelkirks\SPI_Submissions\In_Progress\PopulationAssessment\Data\1996_2008_Wilson_rawdata_census_Central_Selkirk.xls
2004 - 2008 - Caribou - Aerial Late Winter Census - Central Selkirks	Central Selkirks	Central Selkirks	Central Selkirks	2007	4	11	2	D	Complete survey of Blocks; Redistributed caribou block observations in 2019 to reflect 2010-onwards block boundary location.	Percent Juv	Observed - Total Count	14.7			Full	AA		Census			Hamilton & Wilson 2008 Population Census of Mountain Caribou in the Central Selkirk Mountains	\\level\s40006\ESD\El\Wildlife\WSI\Caribou_Program\4.Data_Capture\4_Kootenay\CentralSelkirks\SPI_Submissions\In_Progress\PopulationAssessment\Data\1996_2008_Wilson_rawdata_census_Central_Selkirk.xls
2004 - 2008 - Caribou - Aerial Late Winter Census - Central Selkirks	Central Selkirks	Central Selkirks	Duncan	2007	4	12	1	D	Complete survey of Blocks; Redistributed caribou block observations in 2019 to reflect 2010-onwards block boundary location.	Ad - Unclas Sex	Observed - Total Count	8			Full	AA		Census				
2004 - 2008 - Caribou - Aerial Late Winter Census - Central Selkirks	Central Selkirks	Central Selkirks	Duncan	2007	4	12	1	D	Complete survey of Blocks; Redistributed caribou block observations in 2019 to reflect 2010-onwards block boundary location.	All Individuals	Minimum Number Known Alive	7			Full	AA		Census	5 recent tracks recorded but caribou not located added to total count by bio			
2004 - 2008 - Caribou - Aerial Late Winter Census - Central Selkirks	Central Selkirks	Central Selkirks	Duncan	2007	4	12	1	D	Complete survey of Blocks; Redistributed caribou block observations in 2019 to reflect 2010-onwards block boundary location.	All Individuals	Observed - Total Count	2			Full	AA		Census				
2004 - 2008 - Caribou - Aerial Late Winter Census - Central Selkirks	Central Selkirks	Central Selkirks	Duncan	2007	4	12	1	D	Complete survey of Blocks; Redistributed caribou block observations in 2019 to reflect 2010-onwards block boundary location.	Juv	Observed - Total Count	1			Full	AA		Census				
2004 - 2008 - Caribou - Aerial Late Winter Census - Central Selkirks	Central Selkirks	Central Selkirks	Duncan	2007	4	12	1	D	Complete survey of Blocks; Redistributed caribou block observations in 2019 to reflect 2010-onwards block boundary location.	Percent Juv	Observed - Total Count	11.1			Full	AA		Census				

Survey Name *	Study Area Name	Population Unit	Block Label	Year	Month	Day	Total Survey Time	Total Survey Time Unit	Summary General Comments	Parameter	Parameter Method	Parameter Value (Pre-polygon redistribution)	Total Marks Available	Marked Animals Observed	Survey completeness	Survey Intensity	Survey Field Method	Survey Purpose	Issues for Survey comparisons	Summary Detail Comments	Data Source	Data Source link
2004 - 2008 - Caribou - Aerial Late Winter Census - Central Selkirks	Central Selkirks	Central Selkirks	Nakusp	2007	4	11	2	D	Complete survey of Blocks; Redistributed caribou block observations in 2019 to reflect 2010-onwards block boundary location.	Ad - Unclas Sex	Observed - Total Count	50			Full	AA		Census				
2004 - 2008 - Caribou - Aerial Late Winter Census - Central Selkirks	Central Selkirks	Central Selkirks	Nakusp	2007	4	11	2	D	Complete survey of Blocks; Redistributed caribou block observations in 2019 to reflect 2010-onwards block boundary location.	All Individuals	Minimum Number Known Alive	74			Full	AA		Census	13 recent tracks recorded but caribou not located added to total count by bio			
2004 - 2008 - Caribou - Aerial Late Winter Census - Central Selkirks	Central Selkirks	Central Selkirks	Nakusp	2007	4	11	2	D	Complete survey of Blocks; Redistributed caribou block observations in 2019 to reflect 2010-onwards block boundary location.	All Individuals	Observed - Total Count	59			Full	AA		Census				
2004 - 2008 - Caribou - Aerial Late Winter Census - Central Selkirks	Central Selkirks	Central Selkirks	Nakusp	2007	4	11	2	D	Complete survey of Blocks; Redistributed caribou block observations in 2019 to reflect 2010-onwards block boundary location.	Juv	Observed - Total Count	9			Full	AA		Census				
2004 - 2008 - Caribou - Aerial Late Winter Census - Central Selkirks	Central Selkirks	Central Selkirks	Nakusp	2007	4	11	2	D	Complete survey of Blocks; Redistributed caribou block observations in 2019 to reflect 2010-onwards block boundary location.	Percent Juv	Observed - Total Count	15.3			Full	AA		Census				
2008 - Caribou - Fall Winter Reconnaissance - TFL#23	Central Selkirks	Central Selkirks	TFL#23	2007	10	10	1	D	Ground Reconn	All Individuals	Observed - Sample-based Count	7			Partial	PN		Reconnaissance			Seaton &Hamilton TFL 23 Caribou Assessment & Monitoring Report: Pool Creek, Coffee Creek and St. Leon South East	http://a100.gov.bc.ca/pub/siwe/details.do?projectId=4353&pagerOffset=20
2004 - 2008 - Caribou - Aerial Late Winter Census - Central Selkirks	Central Selkirks	Central Selkirks	Central Selkirks	2008	3	5	2	D	Complete survey of Blocks; Redistributed caribou block observations in 2019 to reflect 2010-onwards block boundary location.	Ad - Unclas Sex	Observed - Total Count	83			Full	AA		Census			Hamilton & Wilson 2008 Population Census of Mountain Caribou in the Central Selkirk Mountains	http://a100.gov.bc.ca/pub/siwe/details.do?projectId=723&surveyId=12791&pagerOffset=0
2004 - 2008 - Caribou - Aerial Late Winter Census - Central Selkirks	Central Selkirks	Central Selkirks	Central Selkirks	2008	3	5	2	D	Complete survey of Blocks; Redistributed caribou block observations in 2019 to reflect 2010-onwards block boundary location.	All Individuals	Minimum Number Known Alive	102			Full	AA		Census	6 tracks observed but no caribou located	6 tracks observed but no caribou located	Hamilton & Wilson 2008 Population Census of Mountain Caribou in the Central Selkirk Mountains	http://a100.gov.bc.ca/pub/siwe/details.do?projectId=723&surveyId=12791&pagerOffset=0
2004 - 2008 - Caribou - Aerial Late Winter Census - Central Selkirks	Central Selkirks	Central Selkirks	Central Selkirks	2008	3	5	2	D	Complete survey of Blocks; Redistributed caribou block observations in 2019 to reflect 2010-onwards block boundary location.	All Individuals	Observed - Total Count	96			Full	AA		Census			Hamilton & Wilson 2008 Population Census of Mountain Caribou in the Central Selkirk Mountains	http://a100.gov.bc.ca/pub/siwe/details.do?projectId=723&surveyId=12791&pagerOffset=0
2004 - 2008 - Caribou - Aerial Late Winter Census - Central Selkirks	Central Selkirks	Central Selkirks	Central Selkirks	2008	3	5	2	D	Complete survey of Blocks; Redistributed caribou block observations in 2019 to reflect 2010-onwards block boundary location.	Juv	Observed - Total Count	13			Full	AA		Census			Hamilton & Wilson 2008 Population Census of Mountain Caribou in the Central Selkirk Mountains	http://a100.gov.bc.ca/pub/siwe/details.do?projectId=723&surveyId=12791&pagerOffset=0
2004 - 2008 - Caribou - Aerial Late Winter Census - Central Selkirks	Central Selkirks	Central Selkirks	Central Selkirks	2008	3	5	2	D	Complete survey of Blocks; Redistributed caribou block observations in 2019 to reflect 2010-onwards block boundary location.	Percent Juv	Observed - Total Count	13.5			Full	AA		Census			Hamilton & Wilson 2008 Population Census of Mountain Caribou in the Central Selkirk Mountains	http://a100.gov.bc.ca/pub/siwe/details.do?projectId=723&surveyId=12791&pagerOffset=0

Survey Name *	Study Area Name	Population Unit	Block Label	Year	Month	Day	Total Survey Time	Total Survey Time Unit	Summary General Comments	Parameter	Parameter Method	Parameter Value (Pre-polygon redistribution)	Total Marks Available	Marked Animals Observed	Survey completeness	Survey Intensity	Survey Field Method	Survey Purpose	Issues for Survey comparisons	Summary Detail Comments	Data Source	Data Source link
2004 - 2008 - Caribou - Aerial Late Winter Census - Central Selkirks	Central Selkirks	Central Selkirks	Duncan	2008	3	6	1	D	Complete survey of Blocks; Redistributed caribou block observations in 2019 to reflect 2010-onwards block boundary location.	Ad - Unclas Sex	Observed - Total Count	11			Full	AA		Census				
2004 - 2008 - Caribou - Aerial Late Winter Census - Central Selkirks	Central Selkirks	Central Selkirks	Duncan	2008	3	6	1	D	Complete survey of Blocks; Redistributed caribou block observations in 2019 to reflect 2010-onwards block boundary location.	All Individuals	Minimum Number Known Alive	15			Full	AA		Census	4 tracks observed in duncan with no caribou located	4 tracks observed in duncan with no caribou located		
2004 - 2008 - Caribou - Aerial Late Winter Census - Central Selkirks	Central Selkirks	Central Selkirks	Duncan	2008	3	6	1	D	Complete survey of Blocks; Redistributed caribou block observations in 2019 to reflect 2010-onwards block boundary location.	All Individuals	Observed - Total Count	11			Full	AA		Census				
2004 - 2008 - Caribou - Aerial Late Winter Census - Central Selkirks	Central Selkirks	Central Selkirks	Duncan	2008	3	6	1	D	Complete survey of Blocks; Redistributed caribou block observations in 2019 to reflect 2010-onwards block boundary location.	Juv	Observed - Total Count	0			Full	AA		Census				
2004 - 2008 - Caribou - Aerial Late Winter Census - Central Selkirks	Central Selkirks	Central Selkirks	Duncan	2008	3	6	1	D	Complete survey of Blocks; Redistributed caribou block observations in 2019 to reflect 2010-onwards block boundary location.	Percent Juv	Observed - Total Count	0			Full	AA		Census				
2004 - 2008 - Caribou - Aerial Late Winter Census - Central Selkirks	Central Selkirks	Central Selkirks	Nakusp	2008	3	5	1	D	Complete survey of Blocks; Redistributed caribou block observations in 2019 to reflect 2010-onwards block boundary location.	Ad - Unclas Sex	Observed - Total Count	72			Full	AA		Census				
2004 - 2008 - Caribou - Aerial Late Winter Census - Central Selkirks	Central Selkirks	Central Selkirks	Nakusp	2008	3	5	1	D	Complete survey of Blocks; Redistributed caribou block observations in 2019 to reflect 2010-onwards block boundary location.	All Individuals	Minimum Number Known Alive	87			Full	AA		Census	2 tracks observed in Nakusp with no caribou located	2 tracks observed in Nakusp with no caribou located		
2004 - 2008 - Caribou - Aerial Late Winter Census - Central Selkirks	Central Selkirks	Central Selkirks	Nakusp	2008	3	5	1	D	Complete survey of Blocks; Redistributed caribou block observations in 2019 to reflect 2010-onwards block boundary location.	All Individuals	Observed - Total Count	85			Full	AA		Census				
2004 - 2008 - Caribou - Aerial Late Winter Census - Central Selkirks	Central Selkirks	Central Selkirks	Nakusp	2008	3	5	1	D	Complete survey of Blocks; Redistributed caribou block observations in 2019 to reflect 2010-onwards block boundary location.	Juv	Observed - Total Count	13			Full	AA		Census				
2004 - 2008 - Caribou - Aerial Late Winter Census - Central Selkirks	Central Selkirks	Central Selkirks	Nakusp	2008	3	5	1	D	Complete survey of Blocks; Redistributed caribou block observations in 2019 to reflect 2010-onwards block boundary location.	Percent Juv	Observed - Total Count	15.3			Full	AA		Census				
2008 - Caribou - Fall Winter Reconnaissance - TFL#23	Central Selkirks	Central Selkirks	TFL#23	2008	1	25	1	D	Aerial Reconn	All Individuals	Observed - Sample-based Count	26			Partial	PN		Reconnaissance			Seaton &Hamilton TFL 23 Caribou Assessment & Monitoring Report: Pool Creek, Coffee Creek and St. Leon South East	http://a100.gov.bc.ca/pub/siwe/details.do?projectId=4353&pagerOffset=20

Survey Name *	Study Area Name	Population Unit	Block Label	Year	Month	Day	Total Survey Time	Total Survey Time Unit	Summary General Comments	Parameter	Parameter Method	Parameter Value (Pre-polygon redistribution)	Total Marks Available	Marked Animals Observed	Survey completeness	Survey Intensity	Survey Field Method	Survey Purpose	Issues for Survey comparisons	Summary Detail Comments	Data Source	Data Source link
2008 - Caribou - Fall Winter Reconnaissance - TFL#23	Central Selkirks	Central Selkirks	TFL#23	2008	2	19	1	D	Aerial Reconn	All Individuals	Observed - Sample-based Count	17			Partial	PN		Reconnaissance			Seaton &Hamilton TFL 23 Caribou Assessment & Monitoring Report: Pool Creek, Coffee Creek and St. Leon South East	http://a100.gov.bc.ca/pub/siwe/details.do?projectId=4353&pagerOffset=20
2008 - Caribou - Fall Winter Reconnaissance - TFL#23	Central Selkirks	Central Selkirks	TFL#23	2008	1	6	1	D	Ground Reconn	All Individuals	Observed - Sample-based Count	1			Partial	PN		Reconnaissance			Seaton &Hamilton TFL 23 Caribou Assessment & Monitoring Report: Pool Creek, Coffee Creek and St. Leon South East	http://a100.gov.bc.ca/pub/siwe/details.do?projectId=4353&pagerOffset=20
			Central Selkirks	2009												no survey						
2010 - 2017 - Caribou - Aerial Late Winter Census - Central Selkirks	Central Selkirks	Central Selkirks	Central Selkirks	2010	3	5	4	D	Complete survey of Blocks; Northern Naksup block completed 10 days after southern area.	Ad - Unclas Sex	Observed - Total Count	72			Full	AA		Census			DeGroot 2010 Mountain Caribou Census - Central Selkirk	http://a100.gov.bc.ca/pub/siwe/details.do?projectId=723&surveyId=17989&pagerOffset=0
2010 - 2017 - Caribou - Aerial Late Winter Census - Central Selkirks	Central Selkirks	Central Selkirks	Central Selkirks	2010	3	5	4	D	Complete survey of Blocks; Northern Naksup block completed 10 days after southern area.	All Individuals	Minimum Number Known Alive	95			Full	AA		Census	8 tracks observed in naksup block with no caribou located	8 tracks observed in naksup block with no caribou located	DeGroot 2010 Mountain Caribou Census - Central Selkirk	http://a100.gov.bc.ca/pub/siwe/details.do?projectId=723&surveyId=17989&pagerOffset=0
2010 - 2017 - Caribou - Aerial Late Winter Census - Central Selkirks	Central Selkirks	Central Selkirks	Central Selkirks	2010	3	5	4	D	Complete survey of Blocks; Northern Naksup block completed 10 days after southern area.	All Individuals	Observed - Total Count	87			Full	AA		Census			DeGroot 2010 Mountain Caribou Census - Central Selkirk	http://a100.gov.bc.ca/pub/siwe/details.do?projectId=723&surveyId=17989&pagerOffset=0
2010 - 2017 - Caribou - Aerial Late Winter Census - Central Selkirks	Central Selkirks	Central Selkirks	Central Selkirks	2010	3	5	4	D	Complete survey of Blocks; Northern Naksup block completed 10 days after southern area.	Juv	Observed - Total Count	12			Full	AA		Census			DeGroot 2010 Mountain Caribou Census - Central Selkirk	http://a100.gov.bc.ca/pub/siwe/details.do?projectId=723&surveyId=17989&pagerOffset=0
2010 - 2017 - Caribou - Aerial Late Winter Census - Central Selkirks	Central Selkirks	Central Selkirks	Central Selkirks	2010	3	5	4	D	Complete survey of Blocks; Northern Naksup block completed 10 days after southern area.	Percent Juv	Observed - Total Count	13			Full	AA		Census			DeGroot 2010 Mountain Caribou Census - Central Selkirk	http://a100.gov.bc.ca/pub/siwe/details.do?projectId=723&surveyId=17989&pagerOffset=0
2010 - 2017 - Caribou - Aerial Late Winter Census - Central Selkirks	Central Selkirks	Central Selkirks	Duncan	2010	3	18	2	D	Complete survey of Blocks; Northern Naksup block completed 10 days after southern area.	Ad - Unclas Sex	Observed - Total Count	7			Full	AA		Census			DeGroot 2010 Mountain Caribou Census - Central Selkirk	http://a100.gov.bc.ca/pub/siwe/details.do?projectId=723&surveyId=17989&pagerOffset=0
2010 - 2017 - Caribou - Aerial Late Winter Census - Central Selkirks	Central Selkirks	Central Selkirks	Duncan	2010	3	18	2	D	Complete survey of Blocks; Northern Naksup block completed 10 days after southern area.	All Individuals	Observed - Total Count	7			Full	AA		Census			DeGroot 2010 Mountain Caribou Census - Central Selkirk	http://a100.gov.bc.ca/pub/siwe/details.do?projectId=723&surveyId=17989&pagerOffset=0
2010 - 2017 - Caribou - Aerial Late Winter Census - Central Selkirks	Central Selkirks	Central Selkirks	Duncan	2010	3	18	2	D	Complete survey of Blocks; Northern Naksup block completed 10 days after southern area.	Juv	Observed - Total Count	0			Full	AA		Census			DeGroot 2010 Mountain Caribou Census - Central Selkirk	http://a100.gov.bc.ca/pub/siwe/details.do?projectId=723&surveyId=17989&pagerOffset=0
2010 - 2017 - Caribou - Aerial Late Winter Census - Central Selkirks	Central Selkirks	Central Selkirks	Duncan	2010	3	18	2	D	Complete survey of Blocks; Northern Naksup block completed 10 days after southern area.	Percent Juv	Observed - Total Count	0			Full	AA		Census			DeGroot 2010 Mountain Caribou Census - Central Selkirk	http://a100.gov.bc.ca/pub/siwe/details.do?projectId=723&surveyId=17989&pagerOffset=0
2010 - 2017 - Caribou - Aerial Late Winter Census - Central Selkirks	Central Selkirks	Central Selkirks	Nakusp	2010	3	5	3	D	Complete survey of Blocks; Northern Naksup block completed 10 days after southern area.	Ad - Unclas Sex	Observed - Total Count	65			Full	AA		Census			DeGroot 2010 Mountain Caribou Census - Central Selkirk	http://a100.gov.bc.ca/pub/siwe/details.do?projectId=723&surveyId=17989&pagerOffset=0
2010 - 2017 - Caribou - Aerial Late Winter Census - Central Selkirks	Central Selkirks	Central Selkirks	Nakusp	2010	3	5	4	D	Complete survey of Blocks; Northern Naksup block completed 10 days after southern area.	All Individuals	Minimum Number Known Alive	88			Full	AA		Census	8 tracks observed in naksup block with no caribou located	8 tracks observed in naksup block with no caribou located	DeGroot 2010 Mountain Caribou Census - Central Selkirk	http://a100.gov.bc.ca/pub/siwe/details.do?projectId=723&surveyId=17989&pagerOffset=0

Survey Name *	Study Area Name	Population Unit	Block Label	Year	Month	Day	Total Survey Time	Total Survey Time Unit	Summary General Comments	Parameter	Parameter Method	Parameter Value (Pre-polygon redistribution)	Total Marks Available	Marked Animals Observed	Survey completeness	Survey Intensity	Survey Field Method	Survey Purpose	Issues for Survey comparisons	Summary Detail Comments	Data Source	Data Source link
2010 - 2017 - Caribou - Aerial Late Winter Census - Central Selkirks	Central Selkirks	Central Selkirks	Nakusp	2010	3	5	3	D	Complete survey of Blocks; Northern Naksup block completed 10 days after southern area.	All Individuals	Observed - Total Count	80			Full	AA		Census			DeGroot 2010 Mountain Caribou Census - Central Selkirk	http://a100.gov.bc.ca/pub/siwe/details.do?projectId=723&surveyId=17989&pagerOffset=0
2010 - 2017 - Caribou - Aerial Late Winter Census - Central Selkirks	Central Selkirks	Central Selkirks	Nakusp	2010	3	5	3	D	Complete survey of Blocks; Northern Naksup block completed 10 days after southern area.	Juv	Observed - Total Count	12			Full	AA		Census			DeGroot 2010 Mountain Caribou Census - Central Selkirk	http://a100.gov.bc.ca/pub/siwe/details.do?projectId=723&surveyId=17989&pagerOffset=0
2010 - 2017 - Caribou - Aerial Late Winter Census - Central Selkirks	Central Selkirks	Central Selkirks	Nakusp	2010	3	5	3	D	Complete survey of Blocks; Northern Naksup block completed 10 days after southern area.	Percent Juv	Observed - Total Count	15.6			Full	AA		Census			DeGroot 2010 Mountain Caribou Census - Central Selkirk	http://a100.gov.bc.ca/pub/siwe/details.do?projectId=723&surveyId=17989&pagerOffset=0
			Central Selkirks	2011												no survey						
2010 - 2017 - Caribou - Aerial Late Winter Census - Central Selkirks	Central Selkirks	Central Selkirks	Central Selkirks	2012	3	24	2	D	Complete survey of blocks. Snow pack was above normal throughout the study area; weather conditions poor.	Ad - Unclas Sex	Observed - Total Count	78			Full	AA		Census			DeGroot and Furk 2012. Mountain Caribou Census Central Selkirk Mountains	http://a100.gov.bc.ca/pub/siwe/details.do?projectId=723&surveyId=24109&pagerOffset=0
2010 - 2017 - Caribou - Aerial Late Winter Census - Central Selkirks	Central Selkirks	Central Selkirks	Central Selkirks	2012	3	24	1	D	Complete survey of blocks. Snow pack was above normal throughout the study area; weather conditions poor.	All Individuals	Minimum Number Known Alive	89			Full	AA		Census	2 tracks observed in Nakusp block with no caribou located	2 tracks observed in Nakusp block with no caribou located	DeGroot and Furk 2012. Mountain Caribou Census Central Selkirk Mountains	http://a100.gov.bc.ca/pub/siwe/details.do?projectId=723&surveyId=24109&pagerOffset=0
2010 - 2017 - Caribou - Aerial Late Winter Census - Central Selkirks	Central Selkirks	Central Selkirks	Central Selkirks	2012	3	24	2	D	Complete survey of blocks. Snow pack was above normal throughout the study area; weather conditions poor.	All Individuals	Observed - Total Count	87			Full	AA		Census			DeGroot and Furk 2012. Mountain Caribou Census Central Selkirk Mountains	http://a100.gov.bc.ca/pub/siwe/details.do?projectId=723&surveyId=24109&pagerOffset=0
2010 - 2017 - Caribou - Aerial Late Winter Census - Central Selkirks	Central Selkirks	Central Selkirks	Central Selkirks	2012	3	24	2	D	Complete survey of blocks. Snow pack was above normal throughout the study area; weather conditions poor.	Juv	Observed - Total Count	9			Full	AA		Census			DeGroot and Furk 2012. Mountain Caribou Census Central Selkirk Mountains	http://a100.gov.bc.ca/pub/siwe/details.do?projectId=723&surveyId=24109&pagerOffset=0
2010 - 2017 - Caribou - Aerial Late Winter Census - Central Selkirks	Central Selkirks	Central Selkirks	Central Selkirks	2012	3	24	2	D	Complete survey of blocks. Snow pack was above normal throughout the study area; weather conditions poor.	Percent Juv	Observed - Total Count	10.3			Full	AA		Census			DeGroot and Furk 2012. Mountain Caribou Census Central Selkirk Mountains	http://a100.gov.bc.ca/pub/siwe/details.do?projectId=723&surveyId=24109&pagerOffset=0
2010 - 2017 - Caribou - Aerial Late Winter Census - Central Selkirks	Central Selkirks	Central Selkirks	Duncan	2012	3	24	1	D	Complete survey of blocks. Snow pack was above normal throughout the study area; weather conditions poor.	Ad - Unclas Sex	Observed - Total Count	2			Full	AA		Census			DeGroot and Furk 2012. Mountain Caribou Census Central Selkirk Mountains	http://a100.gov.bc.ca/pub/siwe/details.do?projectId=723&surveyId=24109&pagerOffset=0
2010 - 2017 - Caribou - Aerial Late Winter Census - Central Selkirks	Central Selkirks	Central Selkirks	Duncan	2012	3	24	1	D	Complete survey of blocks. Snow pack was above normal throughout the study area; weather conditions poor.	All Individuals	Observed - Total Count	2			Full	AA		Census			DeGroot and Furk 2012. Mountain Caribou Census Central Selkirk Mountains	http://a100.gov.bc.ca/pub/siwe/details.do?projectId=723&surveyId=24109&pagerOffset=0
2010 - 2017 - Caribou - Aerial Late Winter Census - Central Selkirks	Central Selkirks	Central Selkirks	Duncan	2012	3	24	1	D	Complete survey of blocks. Snow pack was above normal throughout the study area; weather conditions poor.	Juv	Observed - Total Count	0			Full	AA		Census			DeGroot and Furk 2012. Mountain Caribou Census Central Selkirk Mountains	http://a100.gov.bc.ca/pub/siwe/details.do?projectId=723&surveyId=24109&pagerOffset=0
2010 - 2017 - Caribou - Aerial Late Winter Census - Central Selkirks	Central Selkirks	Central Selkirks	Duncan	2012	3	24	1	D	Complete survey of blocks. Snow pack was above normal throughout the study area; weather conditions poor.	Percent Juv	Observed - Total Count	0			Full	AA		Census			DeGroot and Furk 2012. Mountain Caribou Census Central Selkirk Mountains	http://a100.gov.bc.ca/pub/siwe/details.do?projectId=723&surveyId=24109&pagerOffset=0
2010 - 2017 - Caribou - Aerial Late Winter Census - Central Selkirks	Central Selkirks	Central Selkirks	Nakusp	2012	3	23	1	D	Complete survey of blocks. Snow pack was above normal throughout the study area; weather conditions poor.	Ad - Unclas Sex	Observed - Total Count	76			Full	AA		Census			DeGroot and Furk 2012. Mountain Caribou Census Central Selkirk Mountains	http://a100.gov.bc.ca/pub/siwe/details.do?projectId=723&surveyId=24109&pagerOffset=0

Survey Name *	Study Area Name	Population Unit	Block Label	Year	Month	Day	Total Survey Time	Total Survey Time Unit	Summary General Comments	Parameter	Parameter Method	Parameter Value (Pre-polygon redistribution)	Total Marks Available	Marked Animals Observed	Survey completeness	Survey Intensity	Survey Field Method	Survey Purpose	Issues for Survey comparisons	Summary Detail Comments	Data Source	Data Source link
2010 - 2017 - Caribou - Aerial Late Winter Census - Central Selkirks	Central Selkirks	Central Selkirks	Nakusp	2012	3	23	1	D	Complete survey of blocks. Snow pack was above normal throughout the study area; weather conditions poor.	All Individuals	Minimum Number Known Alive	87			Full	AA		Census	2 tracks observed in Nakusp block with no caribou located	2 tracks observed in Nakusp block with no caribou located	DeGroot and Furk 2012. Mountain Caribou Census Central Selkirk Mountains	http://a100.gov.bc.ca/pub/siwe/details.do?projectId=723&surveyId=24109&pagerOffset=0
2010 - 2017 - Caribou - Aerial Late Winter Census - Central Selkirks	Central Selkirks	Central Selkirks	Nakusp	2012	3	23	1	D	Complete survey of blocks. Snow pack was above normal throughout the study area; weather conditions poor.	All Individuals	Observed - Total Count	85			Full	AA		Census			DeGroot and Furk 2012. Mountain Caribou Census Central Selkirk Mountains	http://a100.gov.bc.ca/pub/siwe/details.do?projectId=723&surveyId=24109&pagerOffset=0
2010 - 2017 - Caribou - Aerial Late Winter Census - Central Selkirks	Central Selkirks	Central Selkirks	Nakusp	2012	3	23	1	D	Complete survey of blocks. Snow pack was above normal throughout the study area; weather conditions poor.	Juv	Observed - Total Count	9			Full	AA		Census			DeGroot and Furk 2012. Mountain Caribou Census Central Selkirk Mountains	http://a100.gov.bc.ca/pub/siwe/details.do?projectId=723&surveyId=24109&pagerOffset=0
2010 - 2017 - Caribou - Aerial Late Winter Census - Central Selkirks	Central Selkirks	Central Selkirks	Nakusp	2012	3	23	1	D	Complete survey of blocks. Snow pack was above normal throughout the study area; weather conditions poor.	Percent Juv	Observed - Total Count	10.6			Full	AA		Census			DeGroot and Furk 2012. Mountain Caribou Census Central Selkirk Mountains	http://a100.gov.bc.ca/pub/siwe/details.do?projectId=723&surveyId=24109&pagerOffset=0
			Central Selkirks	2013												no survey						
2010 - 2017 - Caribou - Aerial Late Winter Census - Central Selkirks	Central Selkirks	Central Selkirks	Central Selkirks	2014	3	11	3	D	Complete survey of blocks	Ad - Unclas Sex	Observed - Total Count	42			Full	AA		Census			DeGroot 2014. Mountain Caribou Census - Central Selkirk Mountains	http://a100.gov.bc.ca/pub/siwe/details.do?projectId=723&surveyId=37577&pagerOffset=0
2010 - 2017 - Caribou - Aerial Late Winter Census - Central Selkirks	Central Selkirks	Central Selkirks	Central Selkirks	2014	3	11	3	D	Complete survey of blocks	All Individuals	Minimum Number Known Alive	53			Full	AA		Census	3 tracks in Nakusp block with no caribou located	3 tracks in Nakusp block with no caribou located	DeGroot 2014. Mountain Caribou Census - Central Selkirk Mountains	http://a100.gov.bc.ca/pub/siwe/details.do?projectId=723&surveyId=37577&pagerOffset=0
2010 - 2017 - Caribou - Aerial Late Winter Census - Central Selkirks	Central Selkirks	Central Selkirks	Central Selkirks	2014	3	11	3	D	Complete survey of blocks	All Individuals	Observed - Total Count	50			Full	AA		Census			DeGroot 2014. Mountain Caribou Census - Central Selkirk Mountains	http://a100.gov.bc.ca/pub/siwe/details.do?projectId=723&surveyId=37577&pagerOffset=0
2010 - 2017 - Caribou - Aerial Late Winter Census - Central Selkirks	Central Selkirks	Central Selkirks	Central Selkirks	2014	3	11	3	D	Complete survey of blocks	Juv	Observed - Total Count	8			Full	AA		Census			DeGroot 2014. Mountain Caribou Census - Central Selkirk Mountains	http://a100.gov.bc.ca/pub/siwe/details.do?projectId=723&surveyId=37577&pagerOffset=0
2010 - 2017 - Caribou - Aerial Late Winter Census - Central Selkirks	Central Selkirks	Central Selkirks	Central Selkirks	2014	3	11	3	D	Complete survey of blocks	Percent Juv	Observed - Total Count	16			Full	AA		Census			DeGroot 2014. Mountain Caribou Census - Central Selkirk Mountains	http://a100.gov.bc.ca/pub/siwe/details.do?projectId=723&surveyId=37577&pagerOffset=0
2010 - 2017 - Caribou - Aerial Late Winter Census - Central Selkirks	Central Selkirks	Central Selkirks	Duncan	2014	3	12	1	D	Complete survey of blocks	Ad - Unclas Sex	Observed - Total Count	0			Full	AA		Census			DeGroot 2014. Mountain Caribou Census - Central Selkirk Mountains	http://a100.gov.bc.ca/pub/siwe/details.do?projectId=723&surveyId=37577&pagerOffset=0
2010 - 2017 - Caribou - Aerial Late Winter Census - Central Selkirks	Central Selkirks	Central Selkirks	Duncan	2014	3	12	1	D	Complete survey of blocks	All Individuals	Observed - Total Count	0			Full	AA		Census			DeGroot 2014. Mountain Caribou Census - Central Selkirk Mountains	http://a100.gov.bc.ca/pub/siwe/details.do?projectId=723&surveyId=37577&pagerOffset=0
2010 - 2017 - Caribou - Aerial Late Winter Census - Central Selkirks	Central Selkirks	Central Selkirks	Duncan	2014	3	12	1	D	Complete survey of blocks	Juv	Observed - Total Count	0			Full	AA		Census			DeGroot 2014. Mountain Caribou Census - Central Selkirk Mountains	http://a100.gov.bc.ca/pub/siwe/details.do?projectId=723&surveyId=37577&pagerOffset=0
2010 - 2017 - Caribou - Aerial Late Winter Census - Central Selkirks	Central Selkirks	Central Selkirks	Duncan	2014	3	12	1	D	Complete survey of blocks	Percent Juv	Observed - Total Count	0			Full	AA		Census			DeGroot 2014. Mountain Caribou Census - Central Selkirk Mountains	http://a100.gov.bc.ca/pub/siwe/details.do?projectId=723&surveyId=37577&pagerOffset=0
2010 - 2017 - Caribou - Aerial Late Winter Census - Central Selkirks	Central Selkirks	Central Selkirks	Nakusp	2014	3	11	2	D	Complete survey of blocks	Ad - Unclas Sex	Observed - Total Count	42			Full	AA		Census			DeGroot 2014. Mountain Caribou Census - Central Selkirk Mountains	http://a100.gov.bc.ca/pub/siwe/details.do?projectId=723&surveyId=37577&pagerOffset=0

Survey Name *	Study Area Name	Population Unit	Block Label	Year	Month	Day	Total Survey Time	Total Survey Time Unit	Summary General Comments	Parameter	Parameter Method	Parameter Value (Pre-polygon redistribution)	Total Marks Available	Marked Animals Observed	Survey completeness	Survey Intensity	Survey Field Method	Survey Purpose	Issues for Survey comparisons	Summary Detail Comments	Data Source	Data Source link
2010 - 2017 - Caribou - Aerial Late Winter Census - Central Selkirks	Central Selkirks	Central Selkirks	Nakusp	2014	3	11	2	D	Complete survey of blocks	All Individuals	Minimum Number Known Alive	50			Full	AA		Census	3 tracks in Nakusp block with no caribou located	3 tracks in Nakusp block with no caribou located	DeGroot 2014. Mountain Caribou Census - Central Selkirk Mountains	http://a100.gov.bc.ca/pub/siwe/details.do?projectId=723&surveyId=37577&pagerOffset=0
2010 - 2017 - Caribou - Aerial Late Winter Census - Central Selkirks	Central Selkirks	Central Selkirks	Nakusp	2014	3	11	2	D	Complete survey of blocks	All Individuals	Observed - Total Count	50			Full	AA		Census			DeGroot 2014. Mountain Caribou Census - Central Selkirk Mountains	http://a100.gov.bc.ca/pub/siwe/details.do?projectId=723&surveyId=37577&pagerOffset=0
2010 - 2017 - Caribou - Aerial Late Winter Census - Central Selkirks	Central Selkirks	Central Selkirks	Nakusp	2014	3	11	2	D	Complete survey of blocks	Juv	Observed - Total Count	8			Full	AA		Census			DeGroot 2014. Mountain Caribou Census - Central Selkirk Mountains	http://a100.gov.bc.ca/pub/siwe/details.do?projectId=723&surveyId=37577&pagerOffset=0
2010 - 2017 - Caribou - Aerial Late Winter Census - Central Selkirks	Central Selkirks	Central Selkirks	Nakusp	2014	3	11	2	D	Complete survey of blocks	Percent Juv	Observed - Total Count	16			Full	AA		Census			DeGroot 2014. Mountain Caribou Census - Central Selkirk Mountains	http://a100.gov.bc.ca/pub/siwe/details.do?projectId=723&surveyId=37577&pagerOffset=0
2010 - 2017 - Caribou - Aerial Late Winter Census - Central Selkirks	Central Selkirks	Central Selkirks	Central Selkirks	2015	3	17	3	D	Complete survey of blocks. Weather issues extended observations over 2 weeks, Mar 17, 27, Apr2	Ad - Unclas Sex	Observed - Total Count	39			Full	AA		Census			DeGroot 2015. Mountain Caribou Census - Central Selkirk Mountains	http://a100.gov.bc.ca/pub/siwe/details.do?projectId=723&surveyId=37577&pagerOffset=0
2010 - 2017 - Caribou - Aerial Late Winter Census - Central Selkirks	Central Selkirks	Central Selkirks	Central Selkirks	2015	3	17	3	D	Complete survey of blocks. Weather issues extended observations over 2 weeks, Mar 17, 27, Apr2	All Individuals	Observed - Total Count	44			Full	AA		Census	tracks were seen but new snow had not fell for a few weeks before survey so these tracks were not used in estimate		DeGroot 2015. Mountain Caribou Census - Central Selkirk Mountains	http://a100.gov.bc.ca/pub/siwe/details.do?projectId=723&surveyId=37577&pagerOffset=0
2010 - 2017 - Caribou - Aerial Late Winter Census - Central Selkirks	Central Selkirks	Central Selkirks	Central Selkirks	2015	3	17	3	D	Complete survey of blocks. Weather issues extended observations over 2 weeks, Mar 17, 27, Apr2	Juv	Observed - Total Count	5			Full	AA		Census			DeGroot 2015. Mountain Caribou Census - Central Selkirk Mountains	http://a100.gov.bc.ca/pub/siwe/details.do?projectId=723&surveyId=37577&pagerOffset=0
2010 - 2017 - Caribou - Aerial Late Winter Census - Central Selkirks	Central Selkirks	Central Selkirks	Central Selkirks	2015	3	17	3	D	Complete survey of blocks. Weather issues extended observations over 2 weeks, Mar 17, 27, Apr2	Percent Juv	Observed - Total Count	11.6			Full	AA		Census			DeGroot 2015. Mountain Caribou Census - Central Selkirk Mountains	http://a100.gov.bc.ca/pub/siwe/details.do?projectId=723&surveyId=37577&pagerOffset=0
2010 - 2017 - Caribou - Aerial Late Winter Census - Central Selkirks	Central Selkirks	Central Selkirks	Duncan	2015	3	17	1	D	Complete survey of blocks. Weather issues extended observations over 2 weeks, Mar 17, 27, Apr2	Ad - Unclas Sex	Observed - Total Count	1			Full	AA		Census			DeGroot 2015. Mountain Caribou Census - Central Selkirk Mountains	http://a100.gov.bc.ca/pub/siwe/details.do?projectId=723&surveyId=37577&pagerOffset=0
2010 - 2017 - Caribou - Aerial Late Winter Census - Central Selkirks	Central Selkirks	Central Selkirks	Duncan	2015	3	17	1	D	Complete survey of blocks. Weather issues extended observations over 2 weeks, Mar 17, 27, Apr2	All Individuals	Observed - Total Count	1			Full	AA		Census	tracks were seen but new snow had not fell for a few weeks before survey so these tracks were not used in estimate		DeGroot 2015. Mountain Caribou Census - Central Selkirk Mountains	http://a100.gov.bc.ca/pub/siwe/details.do?projectId=723&surveyId=37577&pagerOffset=0
2010 - 2017 - Caribou - Aerial Late Winter Census - Central Selkirks	Central Selkirks	Central Selkirks	Duncan	2015	3	17	1	D	Complete survey of blocks. Weather issues extended observations over 2 weeks, Mar 17, 27, Apr2	Juv	Observed - Total Count	0			Full	AA		Census			DeGroot 2015. Mountain Caribou Census - Central Selkirk Mountains	http://a100.gov.bc.ca/pub/siwe/details.do?projectId=723&surveyId=37577&pagerOffset=0
2010 - 2017 - Caribou - Aerial Late Winter Census - Central Selkirks	Central Selkirks	Central Selkirks	Duncan	2015	3	17	1	D	Complete survey of blocks. Weather issues extended observations over 2 weeks, Mar 17, 27, Apr2	Percent Juv	Observed - Total Count	0			Full	AA		Census			DeGroot 2015. Mountain Caribou Census - Central Selkirk Mountains	http://a100.gov.bc.ca/pub/siwe/details.do?projectId=723&surveyId=37577&pagerOffset=0
2010 - 2017 - Caribou - Aerial Late Winter Census - Central Selkirks	Central Selkirks	Central Selkirks	Nakusp	2015	3	17	2	D	Complete survey of blocks. Weather issues extended observations over 2 weeks, Mar 17, 27, Apr2	Ad - Unclas Sex	Observed - Total Count	38			Full	AA		Census			DeGroot 2015. Mountain Caribou Census - Central Selkirk Mountains	http://a100.gov.bc.ca/pub/siwe/details.do?projectId=723&surveyId=37577&pagerOffset=0

Survey Name *	Study Area Name	Population Unit	Block Label	Year	Month	Day	Total Survey Time	Total Survey Time Unit	Summary General Comments	Parameter	Parameter Method	Parameter Value (Pre-polygon redistribution)	Total Marks Available	Marked Animals Observed	Survey completeness	Survey Intensity	Survey Field Method	Survey Purpose	Issues for Survey comparisons	Summary Detail Comments	Data Source	Data Source link
2010 - 2017 - Caribou - Aerial Late Winter Census - Central Selkirks	Central Selkirks	Central Selkirks	Nakusp	2015	3	17	2	D	Complete survey of blocks. Weather issues extended observations over 2 weeks, Mar 17, 27, Apr2	All Individuals	Observed - Total Count	43			Full	AA		Census	tracks were seen but new snow had not fell for a few weeks before survey so these tracks were not used in estimate		DeGroot 2015. Mountain Caribou Census - Central Selkirk Mountains	http://a100.gov.bc.ca/pub/siwe/details.do?projectId=723&surveyId=37577&pagerOffset=0
2010 - 2017 - Caribou - Aerial Late Winter Census - Central Selkirks	Central Selkirks	Central Selkirks	Nakusp	2015	3	17	2	D	Complete survey of blocks. Weather issues extended observations over 2 weeks, Mar 17, 27, Apr2	Juv	Observed - Total Count	5			Full	AA		Census			DeGroot 2015. Mountain Caribou Census - Central Selkirk Mountains	http://a100.gov.bc.ca/pub/siwe/details.do?projectId=723&surveyId=37577&pagerOffset=0
2010 - 2017 - Caribou - Aerial Late Winter Census - Central Selkirks	Central Selkirks	Central Selkirks	Nakusp	2015	3	17	2	D	Complete survey of blocks. Weather issues extended observations over 2 weeks, Mar 17, 27, Apr2	Percent Juv	Observed - Total Count	11.4			Full	AA		Census			DeGroot 2015. Mountain Caribou Census - Central Selkirk Mountains	http://a100.gov.bc.ca/pub/siwe/details.do?projectId=723&surveyId=37577&pagerOffset=0
2010 - 2017 - Caribou - Aerial Late Winter Census - Central Selkirks	Central Selkirks	Central Selkirks	Central Selkirks	2016	3	17	3	D	Complete survey of blocks	Ad - Unclas Sex	Observed - Total Count	32			Full	AA		Census			DeGroot 2016. Mountain Caribou Census - Central Selkirk Mountains	http://a100.gov.bc.ca/pub/siwe/details.do?projectId=723&surveyId=37579&pagerOffset=0
2010 - 2017 - Caribou - Aerial Late Winter Census - Central Selkirks	Central Selkirks	Central Selkirks	Central Selkirks	2016	3	17	3	D	Complete survey of blocks	All Individuals	Observed - Total Count	35			Full	AA		Census	no additional tracks observed		DeGroot 2016. Mountain Caribou Census - Central Selkirk Mountains	http://a100.gov.bc.ca/pub/siwe/details.do?projectId=723&surveyId=37579&pagerOffset=0
2010 - 2017 - Caribou - Aerial Late Winter Census - Central Selkirks	Central Selkirks	Central Selkirks	Central Selkirks	2016	3	17	3	D	Complete survey of blocks	Juv	Observed - Total Count	2			Full	AA		Census			DeGroot 2016. Mountain Caribou Census - Central Selkirk Mountains	http://a100.gov.bc.ca/pub/siwe/details.do?projectId=723&surveyId=37579&pagerOffset=0
2010 - 2017 - Caribou - Aerial Late Winter Census - Central Selkirks	Central Selkirks	Central Selkirks	Central Selkirks	2016	3	17	3	D	Complete survey of blocks	Percent Juv	Observed - Total Count	5.7			Full	AA		Census			DeGroot 2016. Mountain Caribou Census - Central Selkirk Mountains	http://a100.gov.bc.ca/pub/siwe/details.do?projectId=723&surveyId=37579&pagerOffset=0
2010 - 2017 - Caribou - Aerial Late Winter Census - Central Selkirks	Central Selkirks	Central Selkirks	Duncan	2016	3	17	1	D	Complete survey of blocks	Ad - Unclas Sex	Observed - Total Count	0			Full	AA		Census			DeGroot 2016. Mountain Caribou Census - Central Selkirk Mountains	http://a100.gov.bc.ca/pub/siwe/details.do?projectId=723&surveyId=37579&pagerOffset=0
2010 - 2017 - Caribou - Aerial Late Winter Census - Central Selkirks	Central Selkirks	Central Selkirks	Duncan	2016	3	17	1	D	Complete survey of blocks	All Individuals	Observed - Total Count	0			Full	AA		Census	no additional tracks observed		DeGroot 2016. Mountain Caribou Census - Central Selkirk Mountains	http://a100.gov.bc.ca/pub/siwe/details.do?projectId=723&surveyId=37579&pagerOffset=0
2010 - 2017 - Caribou - Aerial Late Winter Census - Central Selkirks	Central Selkirks	Central Selkirks	Duncan	2016	3	17	1	D	Complete survey of blocks	Juv	Observed - Total Count	0			Full	AA		Census			DeGroot 2016. Mountain Caribou Census - Central Selkirk Mountains	http://a100.gov.bc.ca/pub/siwe/details.do?projectId=723&surveyId=37579&pagerOffset=0
2010 - 2017 - Caribou - Aerial Late Winter Census - Central Selkirks	Central Selkirks	Central Selkirks	Duncan	2016	3	17	1	D	Complete survey of blocks	Percent Juv	Observed - Total Count	0			Full	AA		Census			DeGroot 2016. Mountain Caribou Census - Central Selkirk Mountains	http://a100.gov.bc.ca/pub/siwe/details.do?projectId=723&surveyId=37579&pagerOffset=0
2010 - 2017 - Caribou - Aerial Late Winter Census - Central Selkirks	Central Selkirks	Central Selkirks	Nakusp	2016	3	17	2	D	Complete survey of blocks	Ad - Unclas Sex	Observed - Total Count	32			Full	AA		Census			DeGroot 2016. Mountain Caribou Census - Central Selkirk Mountains	http://a100.gov.bc.ca/pub/siwe/details.do?projectId=723&surveyId=37579&pagerOffset=0
2010 - 2017 - Caribou - Aerial Late Winter Census - Central Selkirks	Central Selkirks	Central Selkirks	Nakusp	2016	3	17	2	D	Complete survey of blocks	All Individuals	Observed - Total Count	35			Full	AA		Census	no additional tracks observed		DeGroot 2016. Mountain Caribou Census - Central Selkirk Mountains	http://a100.gov.bc.ca/pub/siwe/details.do?projectId=723&surveyId=37579&pagerOffset=0
2010 - 2017 - Caribou - Aerial Late Winter Census - Central Selkirks	Central Selkirks	Central Selkirks	Nakusp	2016	3	17	2	D	Complete survey of blocks	Juv	Observed - Total Count	2			Full	AA		Census			DeGroot 2016. Mountain Caribou Census - Central Selkirk Mountains	http://a100.gov.bc.ca/pub/siwe/details.do?projectId=723&surveyId=37579&pagerOffset=0

Survey Name *	Study Area Name	Population Unit	Block Label	Year	Month	Day	Total Survey Time	Total Survey Time Unit	Summary General Comments	Parameter	Parameter Method	Parameter Value (Pre-polygon redistribution)	Total Marks Available	Marked Animals Observed	Survey completeness	Survey Intensity	Survey Field Method	Survey Purpose	Issues for Survey comparisons	Summary Detail Comments	Data Source	Data Source link
2010 - 2017 - Caribou - Aerial Late Winter Census - Central Selkirks	Central Selkirks	Central Selkirks	Nakusp	2016	3	17	2	D	Complete survey of blocks	Percent Juv	Observed - Total Count	5.7			Full	AA		Census			DeGroot 2016. Mountain Caribou Census - Central Selkirk Mountains	http://a100.gov.bc.ca/pub/siwe/details.do?projectId=723&surveyId=37579&pagerOffset=0
2018 - 2019 - Aerial Late Winter Census - Central Selkirks	Central Selkirks	Central Selkirks	Central Selkirks	2017	2	23	3	D	Complete survey of blocks	Ad F	Observed - Total Count	9			Full	AA		Census			DeGroot 2017. Mountain Caribou Census - Central Selkirk Mountains	http://a100.gov.bc.ca/pub/siwe/details.do?projectId=723&surveyId=33859&pagerOffset=0
2018 - 2019 - Aerial Late Winter Census - Central Selkirks	Central Selkirks	Central Selkirks	Central Selkirks	2017	2	23	3	D	Complete survey of blocks	Ad M	Observed - Total Count	18			Full	AA		Census			DeGroot 2017. Mountain Caribou Census - Central Selkirk Mountains	http://a100.gov.bc.ca/pub/siwe/details.do?projectId=723&surveyId=33859&pagerOffset=0
2018 - 2019 - Aerial Late Winter Census - Central Selkirks	Central Selkirks	Central Selkirks	Central Selkirks	2017	2	23	3	D	Complete survey of blocks	All Individuals	Observed - Total Count	29	9		Full	AA		Census		9 collared animals released in March 2017	DeGroot 2017. Mountain Caribou Census - Central Selkirk Mountains	http://a100.gov.bc.ca/pub/siwe/details.do?projectId=723&surveyId=33859&pagerOffset=0
2018 - 2019 - Aerial Late Winter Census - Central Selkirks	Central Selkirks	Central Selkirks	Central Selkirks	2017	2	23	3	D	Complete survey of blocks	Juv	Observed - Total Count	2			Full	AA		Census			DeGroot 2017. Mountain Caribou Census - Central Selkirk Mountains	http://a100.gov.bc.ca/pub/siwe/details.do?projectId=723&surveyId=33859&pagerOffset=0
2018 - 2019 - Aerial Late Winter Census - Central Selkirks	Central Selkirks	Central Selkirks	Central Selkirks	2017	2	23	3	D	Complete survey of blocks	Percent Juv	Observed - Total Count	6.9			Full	AA		Census			DeGroot 2017. Mountain Caribou Census - Central Selkirk Mountains	http://a100.gov.bc.ca/pub/siwe/details.do?projectId=723&surveyId=33859&pagerOffset=0
2018 - 2019 - Aerial Late Winter Census - Central Selkirks	Central Selkirks	Central Selkirks	Duncan	2017	2	23	1	D	Complete survey of blocks	Ad F	Observed - Total Count	0			Full	AA		Census			DeGroot 2017. Mountain Caribou Census - Central Selkirk Mountains	http://a100.gov.bc.ca/pub/siwe/details.do?projectId=723&surveyId=33859&pagerOffset=0
2018 - 2019 - Aerial Late Winter Census - Central Selkirks	Central Selkirks	Central Selkirks	Duncan	2017	2	23	1	D	Complete survey of blocks	Ad M	Observed - Total Count	0			Full	AA		Census			DeGroot 2017. Mountain Caribou Census - Central Selkirk Mountains	http://a100.gov.bc.ca/pub/siwe/details.do?projectId=723&surveyId=33859&pagerOffset=0
2018 - 2019 - Aerial Late Winter Census - Central Selkirks	Central Selkirks	Central Selkirks	Duncan	2017	2	23	1	D	Complete survey of blocks	All Individuals	Observed - Total Count	0			Full	AA		Census			DeGroot 2017. Mountain Caribou Census - Central Selkirk Mountains	http://a100.gov.bc.ca/pub/siwe/details.do?projectId=723&surveyId=33859&pagerOffset=0
2018 - 2019 - Aerial Late Winter Census - Central Selkirks	Central Selkirks	Central Selkirks	Duncan	2017	2	23	1	D	Complete survey of blocks	Juv	Observed - Total Count	0			Full	AA		Census			DeGroot 2017. Mountain Caribou Census - Central Selkirk Mountains	http://a100.gov.bc.ca/pub/siwe/details.do?projectId=723&surveyId=33859&pagerOffset=0
2018 - 2019 - Aerial Late Winter Census - Central Selkirks	Central Selkirks	Central Selkirks	Duncan	2017	2	23	1	D	Complete survey of blocks	Percent Juv	Observed - Total Count	0			Full	AA		Census			DeGroot 2017. Mountain Caribou Census - Central Selkirk Mountains	http://a100.gov.bc.ca/pub/siwe/details.do?projectId=723&surveyId=33859&pagerOffset=0
2018 - 2019 - Aerial Late Winter Census - Central Selkirks	Central Selkirks	Central Selkirks	Nakusp	2017	2	23	2	D	Complete survey of blocks	Ad F	Observed - Total Count	9			Full	AA		Census			DeGroot 2017. Mountain Caribou Census - Central Selkirk Mountains	http://a100.gov.bc.ca/pub/siwe/details.do?projectId=723&surveyId=33859&pagerOffset=0
2018 - 2019 - Aerial Late Winter Census - Central Selkirks	Central Selkirks	Central Selkirks	Nakusp	2017	2	23	2	D	Complete survey of blocks	Ad M	Observed - Total Count	18			Full	AA		Census			DeGroot 2017. Mountain Caribou Census - Central Selkirk Mountains	http://a100.gov.bc.ca/pub/siwe/details.do?projectId=723&surveyId=33859&pagerOffset=0
2018 - 2019 - Aerial Late Winter Census - Central Selkirks	Central Selkirks	Central Selkirks	Nakusp	2017	2	23	2	D	Complete survey of blocks	All Individuals	Observed - Total Count	29			Full	AA		Census		9 collared animals released in March 2017	DeGroot 2017. Mountain Caribou Census - Central Selkirk Mountains	http://a100.gov.bc.ca/pub/siwe/details.do?projectId=723&surveyId=33859&pagerOffset=0
2018 - 2019 - Aerial Late Winter Census - Central Selkirks	Central Selkirks	Central Selkirks	Nakusp	2017	2	23	2	D	Complete survey of blocks	Juv	Observed - Total Count	2			Full	AA		Census			DeGroot 2017. Mountain Caribou Census - Central Selkirk Mountains	http://a100.gov.bc.ca/pub/siwe/details.do?projectId=723&surveyId=33859&pagerOffset=0

Survey Name *	Study Area Name	Population Unit	Block Label	Year	Month	Day	Total Survey Time	Total Survey Time Unit	Summary General Comments	Parameter	Parameter Method	Parameter Value (Pre-polygon redistribution)	Total Marks Available	Marked Animals Observed	Survey completeness	Survey Intensity	Survey Field Method	Survey Purpose	Issues for Survey comparisons	Summary Detail Comments	Data Source	Data Source link
2018 - 2019 - Aerial Late Winter Census - Central Selkirks	Central Selkirks	Central Selkirks	Nakusp	2017	2	23	2	D	Complete survey of blocks	Percent Juv	Observed - Total Count	6.9			Full	AA		Census			DeGroot 2017. Mountain Caribou Census - Central Selkirk Mountains	http://a100.gov.bc.ca/pub/siwe/details.do?projectId=723&surveyId=33859&pagerOffset=0
2018 - 2019 - Aerial Late Winter Census - Central Selkirks	Central Selkirks	Central Selkirks	Central Selkirks	2018	3	10	3	D	Complete survey of blocks, collars used to assist in locating animals.	Ad - Unclas Sex	Observed - Total Count	27			Full	AA	Mark-Recapture	Census			Reid and DeGroot 2018	\\Sfp.idir.bcgov\s140\S40143\ES\WILDLIFE 2016-2020\Wildlife species\Caribou\Census\2018\Central Selkirk
2018 - 2019 - Aerial Late Winter Census - Central Selkirks	Central Selkirks	Central Selkirks	Central Selkirks	2018	3	10	3	D	Complete survey of blocks, collars used to assist in locating animals.	All Individuals	Observed - Total Count	31	8	8	Full	AA	Mark-Recapture	Census	no tracks observed	Collars observed 8; available collars 8	Reid and DeGroot 2018	\\Sfp.idir.bcgov\s140\S40143\ES\WILDLIFE 2016-2020\Wildlife species\Caribou\Census\2018\Central Selkirk
2018 - 2019 - Aerial Late Winter Census - Central Selkirks	Central Selkirks	Central Selkirks	Central Selkirks	2018	3	10	3	D	Complete survey of blocks, collars used to assist in locating animals.	Juv	Observed - Total Count	4			Full	AA	Mark-Recapture	Census			Reid and DeGroot 2018	\\Sfp.idir.bcgov\s140\S40143\ES\WILDLIFE 2016-2020\Wildlife species\Caribou\Census\2018\Central Selkirk
2018 - 2019 - Aerial Late Winter Census - Central Selkirks	Central Selkirks	Central Selkirks	Central Selkirks	2018	3	10	3	D	Complete survey of blocks, collars used to assist in locating animals.	Percent Juv	Observed - Total Count	12.9			Full	AA	Mark-Recapture	Census			Reid and DeGroot 2018	\\Sfp.idir.bcgov\s140\S40143\ES\WILDLIFE 2016-2020\Wildlife species\Caribou\Census\2018\Central Selkirk
2018 - 2019 - Aerial Late Winter Census - Central Selkirks	Central Selkirks	Central Selkirks	Duncan	2018	3	10	1	D	Complete survey of blocks, collars used to assist in locating animals.	Ad - Unclas Sex	Observed - Total Count	0			Full	AA	Mark-Recapture	Census			Reid and DeGroot 2018	\\Sfp.idir.bcgov\s140\S40143\ES\WILDLIFE 2016-2020\Wildlife species\Caribou\Census\2018\Central Selkirk
2018 - 2019 - Aerial Late Winter Census - Central Selkirks	Central Selkirks	Central Selkirks	Duncan	2018	3	10	1	D	Complete survey of blocks, collars used to assist in locating animals.	All Individuals	Observed - Total Count	0			Full	AA	Mark-Recapture	Census	no tracks observed		Reid and DeGroot 2018	\\Sfp.idir.bcgov\s140\S40143\ES\WILDLIFE 2016-2020\Wildlife species\Caribou\Census\2018\Central Selkirk
2018 - 2019 - Aerial Late Winter Census - Central Selkirks	Central Selkirks	Central Selkirks	Duncan	2018	3	10	1	D	Complete survey of blocks, collars used to assist in locating animals.	Juv	Observed - Total Count	0			Full	AA	Mark-Recapture	Census			Reid and DeGroot 2018	\\Sfp.idir.bcgov\s140\S40143\ES\WILDLIFE 2016-2020\Wildlife species\Caribou\Census\2018\Central Selkirk
2018 - 2019 - Aerial Late Winter Census - Central Selkirks	Central Selkirks	Central Selkirks	Duncan	2018	3	10	1	D	Complete survey of blocks, collars used to assist in locating animals.	Percent Juv	Observed - Total Count	0			Full	AA	Mark-Recapture	Census			Reid and DeGroot 2018	\\Sfp.idir.bcgov\s140\S40143\ES\WILDLIFE 2016-2020\Wildlife species\Caribou\Census\2018\Central Selkirk
2018 - 2019 - Aerial Late Winter Census - Central Selkirks	Central Selkirks	Central Selkirks	Nakusp	2018	3	10	2	D	Complete survey of blocks, collars used to assist in locating animals.	Ad - Unclas Sex	Observed - Total Count	27			Full	AA	Mark-Recapture	Census			Reid and DeGroot 2018	\\Sfp.idir.bcgov\s140\S40143\ES\WILDLIFE 2016-2020\Wildlife species\Caribou\Census\2018\Central Selkirk
2018 - 2019 - Aerial Late Winter Census - Central Selkirks	Central Selkirks	Central Selkirks	Nakusp	2018	3	10	2	D	Complete survey of blocks, collars used to assist in locating animals.	All Individuals	Observed - Total Count	31			Full	AA	Mark-Recapture	Census	no tracks observed	Collars observed 8; available collars 8	Reid and DeGroot 2018	\\Sfp.idir.bcgov\s140\S40143\ES\WILDLIFE 2016-2020\Wildlife species\Caribou\Census\2018\Central Selkirk

Survey Name *	Study Area Name	Population Unit	Block Label	Year	Month	Day	Total Survey Time	Total Survey Time Unit	Summary General Comments	Parameter	Parameter Method	Parameter Value (Pre-polygon redistribution)	Total Marks Available	Marked Animals Observed	Survey completeness	Survey Intensity	Survey Field Method	Survey Purpose	Issues for Survey comparisons	Summary Detail Comments	Data Source	Data Source link
2018 - 2019 - Aerial Late Winter Census - Central Selkirks	Central Selkirks	Central Selkirks	Nakusp	2018	3	10	2	D	Complete survey of blocks, collars used to assist in locating animals.	Juv	Observed - Total Count	4			Full	AA	Mark-Recapture	Census			Reid and DeGroot 2018	\\Sfp.idir.bcgov\s140\S40143\ES\WILDLIFE 2016-2020\Wildlife species\Caribou\Census\2018\Central Selkirk
2018 - 2019 - Aerial Late Winter Census - Central Selkirks	Central Selkirks	Central Selkirks	Nakusp	2018	3	10	2	D	Complete survey of blocks, collars used to assist in locating animals.	Percent Juv	Observed - Total Count	12.9			Full	AA	Mark-Recapture	Census			Reid and DeGroot 2018	\\Sfp.idir.bcgov\s140\S40143\ES\WILDLIFE 2016-2020\Wildlife species\Caribou\Census\2018\Central Selkirk
2018 - 2019 - Aerial Late Winter Census - Central Selkirks	Central Selkirks	Central Selkirks	Central Selkirks	2019	3	16	3	D	Complete survey of blocks, collars used to assist in locating animals.	Ad - Unclas Sex	Observed - Total Count	23			Full	AA	Mark-Recapture	Census			unpub. regional data files	\\Sfp.idir.bcgov\s140\S40143\ES\WILDLIFE 2016-2020\Wildlife species\Caribou\Census\2019\Central Selkirk\Data
2018 - 2019 - Aerial Late Winter Census - Central Selkirks	Central Selkirks	Central Selkirks	Central Selkirks	2019	3	16	3	D	Complete survey of blocks, collars used to assist in locating animals.	All Individuals	Minimum Number Known Alive	25	6	5	Full	AA	Mark-Recapture	Census	bio added 1 track to total count		unpub. regional data files	\\Sfp.idir.bcgov\s140\S40143\ES\WILDLIFE 2016-2020\Wildlife species\Caribou\Census\2019\Central Selkirk\Data
2018 - 2019 - Aerial Late Winter Census - Central Selkirks	Central Selkirks	Central Selkirks	Central Selkirks	2019	3	16	3	D	Complete survey of blocks, collars used to assist in locating animals.	All Individuals	Observed - Total Count	24			Full	AA	Mark-Recapture	Census		Collars observed 8; available collars 8	unpub. regional data files	\\Sfp.idir.bcgov\s140\S40143\ES\WILDLIFE 2016-2020\Wildlife species\Caribou\Census\2019\Central Selkirk\Data
2018 - 2019 - Aerial Late Winter Census - Central Selkirks	Central Selkirks	Central Selkirks	Central Selkirks	2019	3	16	3	D	Complete survey of blocks, collars used to assist in locating animals.	Juv	Observed - Total Count	1			Full	AA	Mark-Recapture	Census			unpub. regional data files	\\Sfp.idir.bcgov\s140\S40143\ES\WILDLIFE 2016-2020\Wildlife species\Caribou\Census\2019\Central Selkirk\Data
2018 - 2019 - Aerial Late Winter Census - Central Selkirks	Central Selkirks	Central Selkirks	Central Selkirks	2019	3	16	3	D	Complete survey of blocks, collars used to assist in locating animals.	Percent Juv	Observed - Total Count	4.2			Full	AA	Mark-Recapture	Census			unpub. regional data files	\\Sfp.idir.bcgov\s140\S40143\ES\WILDLIFE 2016-2020\Wildlife species\Caribou\Census\2019\Central Selkirk\Data
2018 - 2019 - Aerial Late Winter Census - Central Selkirks	Central Selkirks	Central Selkirks	Duncan	2019	3	16	1	D	Complete survey of blocks, collars used to assist in locating animals.	Ad - Unclas Sex	Observed - Total Count	0			Full	AA	Mark-Recapture	Census			unpub. regional data files	\\Sfp.idir.bcgov\s140\S40143\ES\WILDLIFE 2016-2020\Wildlife species\Caribou\Census\2019\Central Selkirk\Data
2018 - 2019 - Aerial Late Winter Census - Central Selkirks	Central Selkirks	Central Selkirks	Duncan	2019	3	16	1	D	Complete survey of blocks, collars used to assist in locating animals.	All Individuals	Observed - Total Count	0			Full	AA	Mark-Recapture	Census			unpub. regional data files	\\Sfp.idir.bcgov\s140\S40143\ES\WILDLIFE 2016-2020\Wildlife species\Caribou\Census\2019\Central Selkirk\Data
2018 - 2019 - Aerial Late Winter Census - Central Selkirks	Central Selkirks	Central Selkirks	Duncan	2019	3	16	1	D	Complete survey of blocks, collars used to assist in locating animals.	Juv	Observed - Total Count	0			Full	AA	Mark-Recapture	Census			unpub. regional data files	\\Sfp.idir.bcgov\s140\S40143\ES\WILDLIFE 2016-2020\Wildlife species\Caribou\Census\2019\Central Selkirk\Data
2018 - 2019 - Aerial Late Winter Census - Central Selkirks	Central Selkirks	Central Selkirks	Duncan	2019	3	16	1	D	Complete survey of blocks, collars used to assist in locating animals.	Percent Juv	Observed - Total Count	0			Full	AA	Mark-Recapture	Census			unpub. regional data files	\\Sfp.idir.bcgov\s140\S40143\ES\WILDLIFE 2016-2020\Wildlife species\Caribou\Census\2019\Central Selkirk\Data

Survey Name *	Study Area Name	Population Unit	Block Label	Year	Month	Day	Total Survey Time	Total Survey Time Unit	Summary General Comments	Parameter	Parameter Method	Parameter Value (Pre-polygon redistribution)	Total Marks Available	Marked Animals Observed	Survey completeness	Survey Intensity	Survey Field Method	Survey Purpose	Issues for Survey comparisons	Summary Detail Comments	Data Source	Data Source link
2018 - 2019 - Aerial Late Winter Census - Central Selkirks	Central Selkirks	Central Selkirks	Nakusp	2019	3	16	2	D	Complete survey of blocks, collars used to assist in locating animals.	Ad - Unclas Sex	Observed - Total Count	23			Full	AA	Mark-Recapture	Census			unpub. regional data files	\\Sfp.idir.bcgov\s140\S40143\ES\WILDLIFE 2016-2020\Wildlife species\Caribou\Census\2019\Central Selkirk\Data
2018 - 2019 - Aerial Late Winter Census - Central Selkirks	Central Selkirks	Central Selkirks	Nakusp	2019	3	16	2	D	Complete survey of blocks, collars used to assist in locating animals.	All Individuals	Minimum Number Known Alive	25			Full	AA	Mark-Recapture	Census	bio added 1 track to total count		unpub. regional data files	\\Sfp.idir.bcgov\s140\S40143\ES\WILDLIFE 2016-2020\Wildlife species\Caribou\Census\2019\Central Selkirk\Data
2018 - 2019 - Aerial Late Winter Census - Central Selkirks	Central Selkirks	Central Selkirks	Nakusp	2019	3	16	2	D	Complete survey of blocks, collars used to assist in locating animals.	All Individuals	Observed - Total Count	24			Full	AA	Mark-Recapture	Census		Collars observed 8; available collars 8	unpub. regional data files	\\Sfp.idir.bcgov\s140\S40143\ES\WILDLIFE 2016-2020\Wildlife species\Caribou\Census\2019\Central Selkirk\Data
2018 - 2019 - Aerial Late Winter Census - Central Selkirks	Central Selkirks	Central Selkirks	Nakusp	2019	3	16	2	D	Complete survey of blocks, collars used to assist in locating animals.	Juv	Observed - Total Count	1			Full	AA	Mark-Recapture	Census			unpub. regional data files	\\Sfp.idir.bcgov\s140\S40143\ES\WILDLIFE 2016-2020\Wildlife species\Caribou\Census\2019\Central Selkirk\Data
2018 - 2019 - Aerial Late Winter Census - Central Selkirks	Central Selkirks	Central Selkirks	Nakusp	2019	3	16	2	D	Complete survey of blocks, collars used to assist in locating animals.	Percent Juv	Observed - Total Count	4.2			Full	AA	Mark-Recapture	Census			unpub. regional data files	\\Sfp.idir.bcgov\s140\S40143\ES\WILDLIFE 2016-2020\Wildlife species\Caribou\Census\2019\Central Selkirk\Data

Column Name	Column Description	Code for in Column	Code Meaning	Code Description	Column For		
SPI Project ID	A unique numeric SPI-generated identifier permanently assigned to a project. Project IDs are assigned after projects are submitted here: www.gov.bc.ca/submit-wildlife-data.						
Project Name	The name of the species inventory project. INSTRUCTIONS: Format is Start Year-End Year - Species (or species group) - General Survey Type - Project Boundary (location) - FLNRO Region. E.g. 1976-ongoing - Roosevelt Elk - Inventory - Vancouver Island - West Coast Region.				Project		
Survey Name	The name of the survey. INSTRUCTIONS: Generally the Survey Name should be meaningful in terms of the target taxa, geographic area and calendar year for which the survey is being conducted. Format is Survey Year - Species - Specific Survey Type - Study Area (location). E.g. 2016 - Mule Deer - Composition - Vancouver Island. If the entire scope of the project consists of only this survey, then the Survey Name may be the same as the Project Name.				Survey		
Survey Intensity	The level of species-presence information to be derived from the survey.	PN	Presence/Not detected (possible)	Survey designed to determine a species' occurrence in an area. Presence/not detected is the simplest measurement of a population.	Survey		
Survey Intensity	The level of species-presence information to be derived from the survey.	RA	Relative Abundance	Survey designed to provide indices of population sizes which usually cannot be converted to an estimate of absolute abundance. However, providing survey bias is constant, the results can provide comparable estimates of abundance between localities and species, or within species over time. These indices are usually based on some measure of effort such as a unit of time or distance travelled.	Survey	Late Winter (Mar…may see very late Feb or early April)	Late Winter (Mar…may see very late Feb or early April)
Survey Intensity	The level of species-presence information to be derived from the survey.	AA	Absolute Abundance	Survey designed to determine total numbers or density of a species. Estimates of absolute abundance are often obtained in similar ways to relative abundance; however, the estimates are applied to a specified area.	Survey	Rut (Sept/Oct/early Nov)	
Survey Intent	A code indicating the intended outcome of the survey, or the measurement obtained. E.g., 'Trans' means 'Translocation'. E.g., 'Recr' means 'Recruitment'.				Project	Post-Calving (June)	
Field Method Code	A code indicating the field method employed to select, count, measure, capture, mark, or observe sample elements from a population for the purpose of collecting data required to achieve survey objectives, e.g., 'SpCo' means 'Spotlight Count'.				Project	Fall	
Ecological Season Code	A code indicating the ecological season during which a survey is conducted. Season is defined from an ecological perspective taking into account species' yearly patterns, geography, and weather patterns. E.g. 'Breeding', e.g., 'Late Winter'.			Late Winter (Mar…may see very late Feb or early April)	Project	Summer	
Study Area Photos	A list of photos (or other Standard Digital Files*) that are associated with a Study Area. INSTRUCTIONS: To easily add photo names to a cell, right-click on a cell and select 'WSI: Add File Names to Cell'. Photo names must not have spaces. To include comments about your photos, add a column named 'Study Area Photo Comments' or 'SA Photo Comments', and enter your comments. *Standard Digital Files are recognized by most operating systems To easily add photo names to a cell, right-click on a cell and select 'WSI: Add File Names to Cell'. Photo names must not have spaces. To include comments about your photos, add a column named 'Block Photo Comments' and enter your comments. *Standard Digital Files are recognized by most operating systems and includes images, videos, and documents in formats such as PNG, JPG, JPEG, GIF, BMP, PDF, MP4, AVI, and TXT.				Study Area	Early Winter/Mid-Winter/Late Winter (this is very caribou specific and may not likely work well for all ungulates if season cut-off dates differ)	
SA Photo Comments	Informative comments and/or notes about the photos, or other Standard Digital Files.				Study Area	Winter	
Parent Block Label	The label of the 'parent' Block; i.e., the label of the Block within which a Block is nested; i.e., the label of the Block that is one hierarchical level higher. If Blocks are not nested, this will be empty. INSTRUCTIONS: Spatial polygons and lines must be submited for all Blocks and Transects respectively. If your design involves nesting, enter the label of the parent Block. For example, if Block C is nested within Block B and Block B is nested within Block A, the parent Blocks are Block B and Block A, respectively. If Blocks are not nested, this will be empty.				Block	Spring	

Column Name	Column Description	Code for in Column	Code Meaning	Code Description	Column For		
UTM Zone Block	The UTM zone of the centroid of a Block, or the UTM zone of the location of a Sample Station, Trap, or Detector.□ INSTRUCTIONS: Do not enter UTM coordinates if Long-Lat coordinates are provided.				Block		
Easting Block	The UTM easting of the centroid of a Block, or the UTM easting of the location of a Sample Station, Trap, or Detector.□ INSTRUCTIONS: UTM coordinates must be recorded using NAD 83 datum.□ Do not enter UTM coordinates if Long-Lat coordinates are provided.				Block		
Northing Block	The UTM northing of the centroid of a Block, or the UTM northing of the location of a Sample Station, Trap, or Detector.□ INSTRUCTIONS: UTM coordinates must be recorded using NAD 83 datum.□ Do not enter UTM coordinates if Long-Lat coordinates are provided.				Block		
Longitude Block (DD)	The longitude of the centroid of a Block, or the longitude of the location of a Sample Station, Trap, or Detector, in decimal degrees.□ INSTRUCTIONS: Do not enter Long-Lat coordinates if UTM coordinates are provided.				Block		
Latitude Block (DD)	The latitude of the centroid of a Block, or the latitude of the location of a Sample Station, Trap, or Detector, in decimal degrees.□ INSTRUCTIONS: Do not enter Long-Lat coordinates if UTM coordinates are provided.				Block		
Block Area (sq m)	The area enclosed by a Block in square meters.				Block		
Block Comments	Informative comment(s) about a Block.				Block		
Block Photos	A list of photos (or other Standard Digital Files*) that are associated with a Block.□ INSTRUCTIONS: To easily add photo names to a cell, right-click on a cell and select 'WSI: Add File Names to Cell'. Photo names must not have spaces.□ To include comments about your photos, add a column named 'Block Photo Comments' and enter your comments.□ *Standard Digital Files are recognized by most operating systems and includes images, videos, and documents in formats such as PNG, JPG, JPEG, GIF, BMP, PDF, MP4, AVI, and TXT.				Block		
Block Photo Comments	Informative comments and/or notes about the photos, or other Standard Digital Files* associated with a Block.				Block		
Insert Predefined Block Column	You may insert additional predefined columns and codes relevant to Blocks.□ INSTRUCTIONS: Double-click on the column header again now (while Data-entry Assistant is open) to insert predefined columns and codes relevant to Blocks.						
Stratum Label	The unique label of a stratum.□ INSTRUCTIONS: E.g. 'high', 'medium', 'low' or 'S1', 'S2', 'S3', etc.				Survey Stratum		
Stratum Description	A description of the criteria that defines a stratum. E.g. low means 5-35 elk, medium means 35-85 elk, high means >85 elk; S1 means young forest and shrubby areas, S2 means forests >40 years old.□ INSTRUCTIONS: This description needs to be provided only once for each stratum.				Survey Stratum		
Year	The year for which this summary is valid, e.g., 1996.				Survey Summary General		
Month	The month (1 through 12) for which this summary is valid, e.g., 4.□ INSTRUCTIONS: Month need not be specified because some surveys span multiple months and therefore specifying a month can be misleading.	1	January		Survey Summary General		
Month	The month (1 through 12) for which this summary is valid, e.g., 4.□ INSTRUCTIONS: Month need not be specified because some surveys span multiple months and therefore specifying a month can be misleading.	2	February		Survey Summary General		
Month	The month (1 through 12) for which this summary is valid, e.g., 4.□ INSTRUCTIONS: Month need not be specified because some surveys span multiple months and therefore specifying a month can be misleading.	3	March		Survey Summary General		
Month	The month (1 through 12) for which this summary is valid, e.g., 4.□ INSTRUCTIONS: Month need not be specified because some surveys span multiple months and therefore specifying a month can be misleading.	4	April		Survey Summary General		
Month	The month (1 through 12) for which this summary is valid, e.g., 4.□ INSTRUCTIONS: Month need not be specified because some surveys span multiple months and therefore specifying a month can be misleading.	5	May		Survey Summary General		

Column Name	Column Description	Code for in Column	Code Meaning	Code Description	Column For		
Month	The month (1 through 12) for which this summary is valid, e.g., 4.□ INSTRUCTIONS: Month need not be specified because some surveys span multiple months and therefore specifying a month can be misleading.	6	June		Survey Summary General		
Month	The month (1 through 12) for which this summary is valid, e.g., 4.□ INSTRUCTIONS: Month need not be specified because some surveys span multiple months and therefore specifying a month can be misleading.	7	July		Survey Summary General		
Month	The month (1 through 12) for which this summary is valid, e.g., 4.□ INSTRUCTIONS: Month need not be specified because some surveys span multiple months and therefore specifying a month can be misleading.	8	August		Survey Summary General		
Month	The month (1 through 12) for which this summary is valid, e.g., 4.□ INSTRUCTIONS: Month need not be specified because some surveys span multiple months and therefore specifying a month can be misleading.	9	September		Survey Summary General		
Month	The month (1 through 12) for which this summary is valid, e.g., 4.□ INSTRUCTIONS: Month need not be specified because some surveys span multiple months and therefore specifying a month can be misleading.	10	October		Survey Summary General		
Month	The month (1 through 12) for which this summary is valid, e.g., 4.□ INSTRUCTIONS: Month need not be specified because some surveys span multiple months and therefore specifying a month can be misleading.	11	November		Survey Summary General		
Month	The month (1 through 12) for which this summary is valid, e.g., 4.□ INSTRUCTIONS: Month need not be specified because some surveys span multiple months and therefore specifying a month can be misleading.	12	December		Survey Summary General		
Day	The day (1 through 31) for which this summary is valid, e.g., 30.□ INSTRUCTIONS: Day need not be specified because some surveys span multiple days and therefore specifying a day can be misleading.				Survey Summary General		
Total Survey Time	Total amount of time (e.g. number of minutes, hours, or days) a study area or Block was surveyed, e.g., 35.				Survey Summary General		
Total Survey Time Unit	The unit for the amount of time that a study area or Block was surveyed, e.g., Minutes.	M	Minutes		Survey Summary General		
Total Survey Time Unit	The unit for the amount of time that a study area or Block was surveyed, e.g., Minutes.	H	Hours		Survey Summary General		
Total Survey Time Unit	The unit for the amount of time that a study area or Block was surveyed, e.g., Minutes.	D	Days		Survey Summary General		
Total Survey Time Unit	The unit for the amount of time that a study area or Block was surveyed, e.g., Minutes.	N	Nights		Survey Summary General		
Total Kilometres Surveyed	The total distance, in kilometres, traversed along a transect or flight path while surveying a study area or Block, e.g. 22.				Survey Summary General		
Total Area Surveyed (sq m)	The total area, in square metres, surveyed within a study area or Block. The surveyed area can be an entire study area or block, or portion of either.				Survey Summary General		
Sample Size	The number of samples, from within a study area or Block, that were used to generate observation summaries, e.g., 36.				Survey Summary General		
Summary General Comments	Informative notes about the general information (e.g., year, timing, distance, area) of this survey summary.				Survey Summary General		
Parameter	Parameter is the metric quantified in the Parameter Value column. This could, for example, be the total number of animals observed in your study area or block, or a population ratio such as the number of Juveniles per 100 Adult Females (i.e., calf:cow ratio), e.g., Ad M.	Individuals	Individuals	The number of individuals of all life stages and sexes.	Survey Summary Detail		
Parameter	Parameter is the metric quantified in the Parameter Value column. This could, for example, be the total number of animals observed in your study area or block, or a population ratio such as the number of Juveniles per 100 Adult Females (i.e., calf:cow ratio), e.g., Ad M.	Ad M	Adult Males	The number of adult males.	Survey Summary Detail		
Parameter	Parameter is the metric quantified in the Parameter Value column. This could, for example, be the total number of animals observed in your study area or block, or a population ratio such as the number of Juveniles per 100 Adult Females (i.e., calf:cow ratio), e.g., Ad M.	Ad F	Adult Females	The number of adult females.	Survey Summary Detail		
Parameter	Parameter is the metric quantified in the Parameter Value column. This could, for example, be the total number of animals observed in your study area or block, or a population ratio such as the number of Juveniles per 100 Adult Females (i.e., calf:cow ratio), e.g., Ad M.	Ad - Unclas Sex	Adults - Unclassified Sex	The number of adults of unclassified sex.	Survey Summary Detail		
Parameter	Parameter is the metric quantified in the Parameter Value column. This could, for example, be the total number of animals observed in your study area or block, or a population ratio such as the number of Juveniles per 100 Adult Females (i.e., calf:cow ratio), e.g., Ad M.	Yrlng M	Yearling Males	The number of yearling males.	Survey Summary Detail		

Column Name	Column Description	Code for in Column	Code Meaning	Code Description	Column For		
Parameter	Parameter is the metric quantified in the Parameter Value column. This could, for example, be the total number of animals observed in your study area or block, or a population ratio such as the number of Juveniles per 100 Adult Females (i.e., calf:cow ratio), e.g., Ad M.	Yrlng F	Yearling Females	The number of yearling females.	Survey Summary Detail		
Parameter	Parameter is the metric quantified in the Parameter Value column. This could, for example, be the total number of animals observed in your study area or block, or a population ratio such as the number of Juveniles per 100 Adult Females (i.e., calf:cow ratio), e.g., Ad M.	Yrlng - Unclas Sex	Yearlings - Unclassified Sex	The number of yearlings of unclassified sex.	Survey Summary Detail		
Parameter	Parameter is the metric quantified in the Parameter Value column. This could, for example, be the total number of animals observed in your study area or block, or a population ratio such as the number of Juveniles per 100 Adult Females (i.e., calf:cow ratio), e.g., Ad M.	Juv	Juveniles	The number of juveniles of unclassified sex.	Survey Summary Detail		
Parameter	Parameter is the metric quantified in the Parameter Value column. This could, for example, be the total number of animals observed in your study area or block, or a population ratio such as the number of Juveniles per 100 Adult Females (i.e., calf:cow ratio), e.g., Ad M.	M - Unclas Life Stage	Males - Unclassified Life Stage	The number of males of unclassified life stage.	Survey Summary Detail		
Parameter	Parameter is the metric quantified in the Parameter Value column. This could, for example, be the total number of animals observed in your study area or block, or a population ratio such as the number of Juveniles per 100 Adult Females (i.e., calf:cow ratio), e.g., Ad M.	F - Unclas Life Stage	Females - Unclassified Life Stage	The number of females of unclassified life stage.	Survey Summary Detail		
Parameter	Parameter is the metric quantified in the Parameter Value column. This could, for example, be the total number of animals observed in your study area or block, or a population ratio such as the number of Juveniles per 100 Adult Females (i.e., calf:cow ratio), e.g., Ad M.	Unclas Life Stage and Sex	Unclassified Life Stage and Sex	The number of individuals of unclassified life stage and unclassified sex.	Survey Summary Detail		
Parameter	Parameter is the metric quantified in the Parameter Value column. This could, for example, be the total number of animals observed in your study area or block, or a population ratio such as the number of Juveniles per 100 Adult Females (i.e., calf:cow ratio), e.g., Ad M.	M - Class I	Males - Class I	The number of class I male ungulates.	Survey Summary Detail		
Parameter	Parameter is the metric quantified in the Parameter Value column. This could, for example, be the total number of animals observed in your study area or block, or a population ratio such as the number of Juveniles per 100 Adult Females (i.e., calf:cow ratio), e.g., Ad M.	M - Class II	Males - Class II	The number of class II male ungulates.	Survey Summary Detail		
Parameter	Parameter is the metric quantified in the Parameter Value column. This could, for example, be the total number of animals observed in your study area or block, or a population ratio such as the number of Juveniles per 100 Adult Females (i.e., calf:cow ratio), e.g., Ad M.	M - Class III	Males - Class III	The number of class III male ungulates.	Survey Summary Detail		
Parameter	Parameter is the metric quantified in the Parameter Value column. This could, for example, be the total number of animals observed in your study area or block, or a population ratio such as the number of Juveniles per 100 Adult Females (i.e., calf:cow ratio), e.g., Ad M.	M - Class IV	Males - Class IV	The number of class IV male ungulates.	Survey Summary Detail		
Parameter	Parameter is the metric quantified in the Parameter Value column. This could, for example, be the total number of animals observed in your study area or block, or a population ratio such as the number of Juveniles per 100 Adult Females (i.e., calf:cow ratio), e.g., Ad M.	Ad M - Class III or IV	Adult Males - Class III or IV	The number of adult males with large 5 point antler, 6 or more point antler, heavy antlers, massive.	Survey Summary Detail		
Parameter	Parameter is the metric quantified in the Parameter Value column. This could, for example, be the total number of animals observed in your study area or block, or a population ratio such as the number of Juveniles per 100 Adult Females (i.e., calf:cow ratio), e.g., Ad M.	Raghorn - Class I or II	Raghorn - Class I or II	The number of elk (Rocky Mountain or Roosevelt) with either small or large antlers with 3 or 4 points, and/or small spindly 5 point antlers.	Survey Summary Detail		
Parameter	Parameter is the metric quantified in the Parameter Value column. This could, for example, be the total number of animals observed in your study area or block, or a population ratio such as the number of Juveniles per 100 Adult Females (i.e., calf:cow ratio), e.g., Ad M.	Ad M - 3 Pts or Fewer	Adult Males - 3 Points or Fewer	The number of adult males with 3 points or less.	Survey Summary Detail		
Parameter	Parameter is the metric quantified in the Parameter Value column. This could, for example, be the total number of animals observed in your study area or block, or a population ratio such as the number of Juveniles per 100 Adult Females (i.e., calf:cow ratio), e.g., Ad M.	Ad M - 3 or 4 Pts	Adult Males - 3 or 4 Points	The number of adult males with at least 3 or 4 points on one antler.	Survey Summary Detail		
Parameter	Parameter is the metric quantified in the Parameter Value column. This could, for example, be the total number of animals observed in your study area or block, or a population ratio such as the number of Juveniles per 100 Adult Females (i.e., calf:cow ratio), e.g., Ad M.	Ad M - 4 Pts or More	Adult Males - 4 Points or More	The number of adult males with 4 points or more.	Survey Summary Detail		
Parameter	Parameter is the metric quantified in the Parameter Value column. This could, for example, be the total number of animals observed in your study area or block, or a population ratio such as the number of Juveniles per 100 Adult Females (i.e., calf:cow ratio), e.g., Ad M.	Ad M - 5 Pts	Adult Males - 5 Points	The number of adult males with at least 5 points on one antler.	Survey Summary Detail		
Parameter	Parameter is the metric quantified in the Parameter Value column. This could, for example, be the total number of animals observed in your study area or block, or a population ratio such as the number of Juveniles per 100 Adult Females (i.e., calf:cow ratio), e.g., Ad M.	Ad M - 6 Pts or More	Adult Males - 6 Points or More	The number of adult males having at least 6 points or more on one antler.	Survey Summary Detail		

Column Name	Column Description	Code for in Column	Code Meaning	Code Description	Column For		
Parameter	Parameter is the metric quantified in the Parameter Value column. This could, for example, be the total number of animals observed in your study area or block, or a population ratio such as the number of Juveniles per 100 Adult Females (i.e., calf:cow ratio), e.g., Ad M.	Ad M - 10 Pts or Tripalm	Adult Males - 10 Points or Tripalm	The number of 10 point or tripalm bull moose.	Survey Summary Detail		
Parameter	Parameter is the metric quantified in the Parameter Value column. This could, for example, be the total number of animals observed in your study area or block, or a population ratio such as the number of Juveniles per 100 Adult Females (i.e., calf:cow ratio), e.g., Ad M.	Juv : 100 Ad	Juveniles : 100 Adults	E.g., 25. The number of juveniles to 100 adults. The example means there are 25 calves to 100 adults.	Survey Summary Detail		
Parameter	Parameter is the metric quantified in the Parameter Value column. This could, for example, be the total number of animals observed in your study area or block, or a population ratio such as the number of Juveniles per 100 Adult Females (i.e., calf:cow ratio), e.g., Ad M.	Juv : 100 Ad F	Juveniles : 100 Adult Females	E.g., 33. The number of juveniles to 100 adult females. The example means there are 33 calves to 100 cows.	Survey Summary Detail		
Parameter	Parameter is the metric quantified in the Parameter Value column. This could, for example, be the total number of animals observed in your study area or block, or a population ratio such as the number of Juveniles per 100 Adult Females (i.e., calf:cow ratio), e.g., Ad M.	Juv : 100 Ad Collared F	Juveniles : 100 Collared Adult Females	E.g., 33. The number of juveniles to 100 radio-collared adult females. The example means there are 33 calves to 100 collared cows.	Survey Summary Detail		
Parameter	Parameter is the metric quantified in the Parameter Value column. This could, for example, be the total number of animals observed in your study area or block, or a population ratio such as the number of Juveniles per 100 Adult Females (i.e., calf:cow ratio), e.g., Ad M.	Percent Juv	Percent Juveniles	E.g., 25. The percentage of the population that is comprised of juvenile animals. The example means 25% of the population is juvenile.	Survey Summary Detail		
Parameter	Parameter is the metric quantified in the Parameter Value column. This could, for example, be the total number of animals observed in your study area or block, or a population ratio such as the number of Juveniles per 100 Adult Females (i.e., calf:cow ratio), e.g., Ad M.	Yrlng : 100 Ad	Yearlings : 100 Adults	E.g., 20. The number of yearlings to 100 adults. The example means there are 20 yearlings to 100 adults.	Survey Summary Detail		
Parameter	Parameter is the metric quantified in the Parameter Value column. This could, for example, be the total number of animals observed in your study area or block, or a population ratio such as the number of Juveniles per 100 Adult Females (i.e., calf:cow ratio), e.g., Ad M.	Yrlng M : 100 Ad F	Yearling Males : 100 Adult Females	E.g., 15. The number of yearling males per 100 adult females. The example means there are 15 yearling males to 100 adult females.	Survey Summary Detail		
Parameter	Parameter is the metric quantified in the Parameter Value column. This could, for example, be the total number of animals observed in your study area or block, or a population ratio such as the number of Juveniles per 100 Adult Females (i.e., calf:cow ratio), e.g., Ad M.	Ad M : 100 Ad F	Adult Males : 100 Adult Females	E.g., 10. The number of adult males to 100 adult females. The example means there are 10 bulls to 100 cows.	Survey Summary Detail		
Parameter	Parameter is the metric quantified in the Parameter Value column. This could, for example, be the total number of animals observed in your study area or block, or a population ratio such as the number of Juveniles per 100 Adult Females (i.e., calf:cow ratio), e.g., Ad M.	M : 100 F	Males : 100 Females	E.g., 15. The number of males of all life stages to 100 females of all life stages. The example means there are 15 males to 100 females.	Survey Summary Detail		
Parameter	Parameter is the metric quantified in the Parameter Value column. This could, for example, be the total number of animals observed in your study area or block, or a population ratio such as the number of Juveniles per 100 Adult Females (i.e., calf:cow ratio), e.g., Ad M.	Individuals/km2	Individuals/km2	The number of individuals per square kilometer.	Survey Summary Detail		
Parameter	Parameter is the metric quantified in the Parameter Value column. This could, for example, be the total number of animals observed in your study area or block, or a population ratio such as the number of Juveniles per 100 Adult Females (i.e., calf:cow ratio), e.g., Ad M.	Individuals/m2	Individuals/m2	The number of individuals per square metre.	Survey Summary Detail		
Parameter	Parameter is the metric quantified in the Parameter Value column. This could, for example, be the total number of animals observed in your study area or block, or a population ratio such as the number of Juveniles per 100 Adult Females (i.e., calf:cow ratio), e.g., Ad M.	Detections	Detections	The number of detections.	Survey Summary Detail		
Parameter	Parameter is the metric quantified in the Parameter Value column. This could, for example, be the total number of animals observed in your study area or block, or a population ratio such as the number of Juveniles per 100 Adult Females (i.e., calf:cow ratio), e.g., Ad M.	Detections/km	Detections/km	A relative abundance index. The number of detections per km (e.g., tracks or pellet groups per kilometer)	Survey Summary Detail		
Parameter	Parameter is the metric quantified in the Parameter Value column. This could, for example, be the total number of animals observed in your study area or block, or a population ratio such as the number of Juveniles per 100 Adult Females (i.e., calf:cow ratio), e.g., Ad M.	Detections/100 m	Detections/100 m	A relative abundance index. The number of detections per 100 m (e.g., tracks or pellet groups per 100 m)	Survey Summary Detail		
Parameter	Parameter is the metric quantified in the Parameter Value column. This could, for example, be the total number of animals observed in your study area or block, or a population ratio such as the number of Juveniles per 100 Adult Females (i.e., calf:cow ratio), e.g., Ad M.	Detections/hour	Detections/hour	A relative abundance index. The number of detections per hour.	Survey Summary Detail		
Parameter	Parameter is the metric quantified in the Parameter Value column. This could, for example, be the total number of animals observed in your study area or block, or a population ratio such as the number of Juveniles per 100 Adult Females (i.e., calf:cow ratio), e.g., Ad M.	Detections/day	Detections/day	A relative abundance index. The number of detections per day.	Survey Summary Detail		
Parameter	Parameter is the metric quantified in the Parameter Value column. This could, for example, be the total number of animals observed in your study area or block, or a population ratio such as the number of Juveniles per 100 Adult Females (i.e., calf:cow ratio), e.g., Ad M.	Detections/100 days	Detections/100 days	A relative abundance index. The number of detections per 100 days.	Survey Summary Detail		

Column Name	Column Description	Code for in Column	Code Meaning	Code Description	Column For		
Parameter Method	The method used to derive the Parameter Value.	Observed - Sample-based Count	Observed - Sample-based Count	The parameter value is the number of observations during a sample-based survey. Sample-based surveys are required wherever it is impractical to survey the entire study area. In sampling surveys, a portion of the study area is counted within defined sample units (e.g., quadrats or blocks). The results are then used to estimate animal abundance throughout the study area. A sample-based survey count should typically be accompanied by a modeled or corrected estimated count. (RISC 20XX)	Survey Summary Detail		
Parameter Method	The method used to derive the Parameter Value.	Observed - Total Count	Observed - Total Count	The parameter value is the number of observations during a total count survey. Total counts are intended to enumerate all individuals (or their sign) in a study area using complete coverage of the study area. For example, alpine areas are usually small, and thus 100% flight coverage is practical for surveying mountain sheep and goats, and sometimes caribou. (RISC 20XX)	Survey Summary Detail		
Parameter Method	The method used to derive the Parameter Value.	Model or Correction	Model or Correction	The parameter value is based on the sampled value (i.e. based on the observations or detections) but is adjusted via a model (e.g., Moosepop, Aerial Survey) and/or statistical calculation and/or sightability correction factor and/or detectability correction factor. The adjusted value represents an estimate of the true parameter value for the study area or design component of interest.	Survey Summary Detail		
Parameter Method	The method used to derive the Parameter Value.	Model - Joint Hypergeometric Estimator	Model - Joint Hypergeometric Estimator	The parameter value is based on the sampled value (i.e. based on the observations or detections) but is adjusted via Joint Hypergeometric Estimator (NoREMARK). The adjusted value represents an estimate of the true parameter value for the study area or design component of interest.	Survey Summary Detail		
Parameter Method	The method used to derive the Parameter Value.	Model - Lincoln-Peterson	Model - Lincoln-Peterson	The parameter value is based on the sampled value (i.e. based on the observations or detections) but is adjusted via Lincoln-Peterson formula. The adjusted value represents an estimate of the true parameter value for the study area or design component of interest.	Survey Summary Detail		
Parameter Method	The method used to derive the Parameter Value.	Model - Recruitment-Mortality	Model - Recruitment-Mortality	DRAFT DEFINITION: The parameter value is based on the sampled value (i.e. based on the observations or detections) but is adjusted using the recruitment-mortality equation. The adjusted value represents an estimate of the true parameter value for the study area or design component of interest.	Survey Summary Detail		
Parameter Method	The method used to derive the Parameter Value.	Minimum Number Known Alive	Minimum Number Known Alive	The value is based on the sampled value but is adjusted using additional information other than a model or SCF. The adjusted value represents the minimum number of individuals known to be alive in the area of interest. MNKA may apply to: (1) observed count is adjusted based on pre- or post-survey information. (2) a survey is targeting a sub-sample of individuals in an area for age-sex composition. (3) a survey uses telemetry to locate additional collared individuals outside of the defined study area.	Survey Summary Detail		
Parameter Method	The method used to derive the Parameter Value.	Expert Opinion	Expert Opinion	The parameter value is an expert's opinion, which is based on knowledge of survey conditions, surveyor experience, scientific opinion, and other survey data.	Survey Summary Detail		
Parameter Method	The method used to derive the Parameter Value.	DC	Described in Comments	The parameter method is described in comments. Note: Describing the data in comments rather than using a predefined code may reduce the clarity and accessibility of data.	Survey Summary Detail		
Parameter Value	The numerical value of the Parameter. It can be the number of individuals, population ratio, relative abundance index, or density, e.g., 96.				Survey Summary Detail		
Parameter Denominator Value	The numeric value used as the divisor (denominator) when the parameter is given as a quotient (e.g., Individuals/km2, Detections/km, Detections/100 days). For example, the area value used to calculate a density (e.g., animals/area) would be the PARAMETER_DENOMINATOR_VALUE.				Survey Summary Detail		

Column Name	Column Description	Code for in Column	Code Meaning	Code Description	Column For		
Best Parameter Value?	An indication whether the Parameter Value represents the best possible or most representative estimate of the Parameter. The best Parameter Value can or will be used in trend analyses or for other specific management purposes (e.g., harvest allocation, species recovery). INSTRUCTIONS: Parameter Values may be derived via multiple Parameter Methods (e.g., Observed - Sample-based Count, MNKA); however, only one Parameter Value for a specific Parameter (e.g., Individuals) may be identified as the Best Parameter Value. I.e. Only one Parameter Value should be formally adopted as 'the best' for a given species-parameter-area-time combination. E.g. There should only be one 'best' for Caribou Adult Males in Nakusp Herd in 2007.	Y	Yes		Survey Summary Detail		
Best Parameter Value?	An indication whether the Parameter Value represents the best possible or most representative estimate of the Parameter. The best Parameter Value can or will be used in trend analyses or for other specific management purposes (e.g., harvest allocation, species recovery). INSTRUCTIONS: Parameter Values may be derived via multiple Parameter Methods (e.g., Observed - Sample-based Count, MNKA); however, only one Parameter Value for a specific Parameter (e.g., Individuals) may be identified as the Best Parameter Value. I.e. Only one Parameter Value should be formally adopted as 'the best' for a given species-parameter-area-time combination. E.g. There should only be one 'best' for Caribou Adult Males in Nakusp Herd in 2007.	N	No		Survey Summary Detail		
Best Parameter Value?	An indication whether the Parameter Value represents the best possible or most representative estimate of the Parameter. The best Parameter Value can or will be used in trend analyses or for other specific management purposes (e.g., harvest allocation, species recovery). INSTRUCTIONS: Parameter Values may be derived via multiple Parameter Methods (e.g., Observed - Sample-based Count, MNKA); however, only one Parameter Value for a specific Parameter (e.g., Individuals) may be identified as the Best Parameter Value. I.e. Only one Parameter Value should be formally adopted as 'the best' for a given species-parameter-area-time combination. E.g. There should only be one 'best' for Caribou Adult Males in Nakusp Herd in 2007.	UN	Unknown		Survey Summary Detail		
Best Parameter Value?	An indication whether the Parameter Value represents the best possible or most representative estimate of the Parameter. The best Parameter Value can or will be used in trend analyses or for other specific management purposes (e.g., harvest allocation, species recovery). INSTRUCTIONS: Parameter Values may be derived via multiple Parameter Methods (e.g., Observed - Sample-based Count, MNKA); however, only one Parameter Value for a specific Parameter (e.g., Individuals) may be identified as the Best Parameter Value. I.e. Only one Parameter Value should be formally adopted as 'the best' for a given species-parameter-area-time combination. E.g. There should only be one 'best' for Caribou Adult Males in Nakusp Herd in 2007.	NE	Not Evaluated		Survey Summary Detail		
Lower Confidence Limit	The lower confidence limit of the confidence interval of the parameter, e.g., 94. (A confidence interval is the range of plausible values for a parameter.) INSTRUCTIONS: The limit must be a number and is only applicable if the Parameter Value was estimated from statistics and is a mean.				Survey Summary Detail		
Upper Confidence Limit	The upper confidence limit of the confidence interval of the parameter, e.g., 98. (A confidence interval is the range of plausible values for a parameter.) INSTRUCTIONS: The limit must be a number and is only applicable if the Parameter Value was estimated from statistics and is a mean.				Survey Summary Detail		
Confidence Level (%)	The confidence, expressed as a percent, used to calculate the confidence interval, e.g., 95. INSTRUCTIONS: The confidence level indicates the probability that the confidence interval will contain the true Parameter Value. A typical level used is 95% (so that a 95% confidence interval would cover the true parameter in 95% of all possible random samples).				Survey Summary Detail		
Standard Error	The standard error of the Parameter Value, e.g., 6. INSTRUCTIONS: Only applicable if the Parameter Value was derived from statistics and is a mean.				Survey Summary Detail		
Coefficient of Variation (%)	The Coefficient of Variation (CV). It is expressed as a percent. It is a standardized measure of dispersion of a frequency/probability distribution around the mean. It is defined as the ratio of the standard deviation to the mean, e.g., 8.42.				Survey Summary Detail		

Column Name	Column Description	Code for in Column	Code Meaning	Code Description	Column For		
Sightability Correction Factor	E.g. 0.80. Sightability Correction Factor (SCF) is a quantitative coefficient which is estimated or derived and applied to a sample-based count in order to adjust for visibility or sightability bias of the observers. The SCF must be provided here as a probability. The probability of seeing or catching an animal must be less than 1. To translate a sample-based count into an estimate of total count, the observed count must be divided by the probabilty of seeing or catching an animal (sightability). For example, if we count 40 birds during a survey and we know that we only see 80% of the total number of birds actually present, then population estimate = 40 * 1/0.80 = 50 birds. The Sightability Correction Factor in this example is 0.80. (Source: Univerisity of Idaho, https://www.webpages.uidaho.edu/wlf448/aerial.htm) INSTRUCTIONS: This should be provided as a number, e.g., 0.80.				Survey Summary Detail		
Summary Detail Comments	Informative notes about the paramter, its value, and other detailed information.				Survey Summary Detail		
Date	The date of a visit to a Block, or the date of the start of a deployment (e.g., of a trap or detector) at a Block. INSTRUCTIONS: The date may not span days. For clarity, on your field forms do not use a 2-digit month format nor a 2-digit year format. A reliable format is dd-mmm-yyyy (e.g. '7 Jun 2008' or '7-Jun-2008'). When entering the date into Excel ensure that Excel interprets it as correct date information.				Block Visit		
Time	The time, in 24 hour format, at the start of a visit to a Block, or the time at the start of deployment (e.g. of a trap or detector) at a Block. INSTRUCTIONS: Use colons (e.g. 13:25). For quality assurance reasons you should use a colon because then Excel will automatically recognize it as time information and you will immediately notice obviously incorrect entries such as 26:44. The format that Excel displays does not matter as long as Excel recognizes it as legitimate time information.				Block Visit		
End Date	The date at the end of visit to, or deployment at, a Block.				Block Visit		
End Time	The time at the end of a visit to, or deployment at, a Block. INSTRUCTIONS: Use colons (e.g. 13:25). For quality assurance reasons you should use a colon because then Excel will automatically recognize it as time information and you will immediately notice obviously incorrect entries such as 26:44. The format that Excel displays does not matter as long as Excel recognizes it as legitimate time information.				Block Visit		
Total Visit or Deployment Time	The amount of time spanned during a visit to, or deployment at, a Block. If Blocks are nested (e.g. multiple cameras at one Sample Station) then this may be the totalled time spans of the multiple cameras.				Block Visit		
Unit of Total Visit or Deployment Time	The unit for the amount of time spanned during a visit to, or deployment at, a Block.	M	Minutes		Block Visit		
Unit of Total Visit or Deployment Time	The unit for the amount of time spanned during a visit to, or deployment at, a Block.	H	Hours		Block Visit		
Unit of Total Visit or Deployment Time	The unit for the amount of time spanned during a visit to, or deployment at, a Block.	D	Days		Block Visit		
Unit of Total Visit or Deployment Time	The unit for the amount of time spanned during a visit to, or deployment at, a Block.	N	Nights		Block Visit		
Trap Event	The setting of the trap or detector at the end of the visit to the trap or detector.	CLOSE	Closed	Trap deactivated, or detector deactivated.	Block Visit		
Trap Event	The setting of the trap or detector at the end of the visit to the trap or detector.	SET	Set	Trap activated and ready for capture, or detector activated and ready for detecting.	Block Visit		
Trap Event	The setting of the trap or detector at the end of the visit to the trap or detector.	SETUP	Setup	Trap locked open and possibly prebaited	Block Visit		
Number of Traps Sprung	The number of traps, or other capture/detection mechnisms, that were inoperable or sprung without a capture/detection.				Block Visit		
Number of Visits or Samples	The number of samples or detections (e.g. photos via remote camera) obtained at a Block over the course of a visit to, or deployment at, the Block.				Block Visit		
Nights Deployed	The number of nights that trapping (or other detection techniques) took place over the course of deployment at a Block. INSTRUCTIONS: Typically this is the number of nights since the last visit to the Block.				Block Visit		
Distance Covered (km)	The distance (km) traversed along a transect, during a visit to a Block.				Block Visit		
Quiet Period (s)	The set minimum time span permitted, in seconds, between the end of a recording event (e.g. photograph or video) and the triggering of a subsequent recording event.				Block Visit		
Trigger Sensitivity	The setting of the trigger sensitivity of a trap or detector. This is freeform and the names of the settings depend on the make and model of the trap or detector. E.g., medium.				Block Visit		
Trigger Timing (s)	The set time span, in seconds, between automated regularly-timed recording events.				Block Visit		

Column Name	Column Description	Code for in Column	Code Meaning	Code Description	Column For		
Photos per Trigger	The set number of photos that a camera should record when triggered.				Block Visit		
Video Length per Trigger (s)	The set minimum length of video time, in seconds, that a camera should record when triggered.				Block Visit		
Bait Lure Type	The type of bait or lure used to attract species to a trap or detector over the course of a visit to, or deployment at, a Block. Values are freeform, e.g., 'jam', 'peanuts'.				Block Visit		
Block Visit Comments	Comments about a visit to, or deployment at, a Block.				Block Visit		
Block Visit Photos	A list of photos (or other Standard Digital Files*) that are associated with a vist to, or deployment of, a Block.□ INSTRUCTIONS: To easily add photo names to a cell, right-click on a cell and select 'WSI: Add File Names to Cell'. Photo names must not have spaces.□ To include comments about your photos, add a column named 'Block Visit Photo Comments', and enter your comments.□ *Standard Digital Files are recognized by most operating systems To easily add photo names to a cell, right-click on a cell and select 'WSI: Add File Names to Cell'. Photo names must not have spaces.□ To include comments about your photos, add a column named 'Block Photo Comments' and enter your comments.□ *Standard Digital Files are recognized by most operating systems and includes images, videos, and documents in formats such as PNG, JPG, JPEG, GIF, BMP, PDF, MP4, AVI, and TXT.				Block Visit		
Block Visit Photo Comments	Informative comments and/or notes about the photos, or other Standard Digital Files.				Block Visit		
Insert Predefined Block Visit Column	You may insert additional predefined columns that are relevant to Block Visits.□ INSTRUCTIONS: Double-click on the column header again now (while Data-entry Assistant is open) to insert predefined columns and codes relevant to Block Visits.						
Sampling Condition Timing	The moment for which sampling conditions are recorded.□ INSTRUCTIONS: This moment is typically defined as either at the START of a Block visit, or at the END of a Block visit.	START	Start	Sampling conditions were recorded at the START of the Design Component Visit	Sampling Condition		
Sampling Condition Timing	The moment for which sampling conditions are recorded.□ INSTRUCTIONS: This moment is typically defined as either at the START of a Block visit, or at the END of a Block visit.	END	End	Sampling conditions were recorded at the END of the Design Component Visit	Sampling Condition		
SC DateTime	The date and time for which sampling conditions are recorded.□ INSTRUCTIONS: If this is the same as the Block Visit date and time, this may be omitted.□ For clarity, do not use a 2-digit month format nor a 2-digit year format. A reliable format is dd-mmm-yyyy (e.g. '7 Jun 2008' or '7-Jun-2008'). When entering the date into Excel ensure that Excel interprets it as correct date information.□ Similarly, for clarity use a 24 hour time format with colons (e.g. 13:45) and ensure that Excel interprets it correctly.				Sampling Condition		
Air Temp (C)	The air temperature in degrees Celsius.				Sampling Condition		
Prec 48 hr Air Temp (C)	The air temperature during the previous 48 hours, in degrees Celsius.				Sampling Condition		
Wind Speed	The strength of the wind using the Beaufort Scale, e.g. 1.	0	Calm	Less than 2 km/h	Sampling Condition		
Wind Speed	The strength of the wind using the Beaufort Scale, e.g. 1.	1	Light Air	2 - 5 km/h	Sampling Condition		
Wind Speed	The strength of the wind using the Beaufort Scale, e.g. 1.	2	Light Breeze	Leaves rustle (6 - 12 km/h)	Sampling Condition		
Wind Speed	The strength of the wind using the Beaufort Scale, e.g. 1.	3	Gentle Breeze	Leaves and twigs constantly move (13 - 19 km/h)	Sampling Condition		
Wind Speed	The strength of the wind using the Beaufort Scale, e.g. 1.	4	Moderate Breeze	Small branches move, dust rises (20 - 29 km/h)	Sampling Condition		
Wind Speed	The strength of the wind using the Beaufort Scale, e.g. 1.	5	Fresh Breeze	Small trees sway (30 - 39 km/h)	Sampling Condition		
Wind Speed	The strength of the wind using the Beaufort Scale, e.g. 1.	6	Strong Breeze	Large branches moving, wind whistling (40 - 50 km/h)	Sampling Condition		
Wind Direction	The direction of the wind recorded as a cardinal direction.	N	North		Sampling Condition		
Wind Direction	The direction of the wind recorded as a cardinal direction.	NNE	North North East		Sampling Condition		
Wind Direction	The direction of the wind recorded as a cardinal direction.	NE	North East		Sampling Condition		
Wind Direction	The direction of the wind recorded as a cardinal direction.	ENE	East North East		Sampling Condition		
Wind Direction	The direction of the wind recorded as a cardinal direction.	E	East		Sampling Condition		
Wind Direction	The direction of the wind recorded as a cardinal direction.	ESE	East South East		Sampling Condition		
Wind Direction	The direction of the wind recorded as a cardinal direction.	SE	South East		Sampling Condition		
Wind Direction	The direction of the wind recorded as a cardinal direction.	SSE	South South East		Sampling Condition		
Wind Direction	The direction of the wind recorded as a cardinal direction.	S	South		Sampling Condition		
Wind Direction	The direction of the wind recorded as a cardinal direction.	SSW	South South West		Sampling Condition		
Wind Direction	The direction of the wind recorded as a cardinal direction.	SW	South West		Sampling Condition		
Wind Direction	The direction of the wind recorded as a cardinal direction.	WSW	West South West		Sampling Condition		
Wind Direction	The direction of the wind recorded as a cardinal direction.	W	West		Sampling Condition		
Wind Direction	The direction of the wind recorded as a cardinal direction.	WNW	West North West		Sampling Condition		
Wind Direction	The direction of the wind recorded as a cardinal direction.	NW	North West		Sampling Condition		
Wind Direction	The direction of the wind recorded as a cardinal direction.	NNW	North North West		Sampling Condition		
Prec 48 hr Wind Speed	The wind speed during the previous 48 hours.	0	Calm	Less than 2 km/h	Sampling Condition		
Prec 48 hr Wind Speed	The wind speed during the previous 48 hours.	1	Light Air	2 - 5 km/h	Sampling Condition		
Prec 48 hr Wind Speed	The wind speed during the previous 48 hours.	2	Light Breeze	Leaves rustle (6 - 12 km/h)	Sampling Condition		
Prec 48 hr Wind Speed	The wind speed during the previous 48 hours.	3	Gentle Breeze	Leaves and twigs constantly move (13 - 19 km/h)	Sampling Condition		

Column Name	Column Description	Code for in Column	Code Meaning	Code Description	Column For		
Prec 48 hr Wind Speed	The wind speed during the previous 48 hours.	4	Moderate Breeze	Small branches move, dust rises (20 - 29 km/h)	Sampling Condition		
Prec 48 hr Wind Speed	The wind speed during the previous 48 hours.	5	Fresh Breeze	Small trees sway (30 - 39 km/h)	Sampling Condition		
Prec 48 hr Wind Speed	The wind speed during the previous 48 hours.	6	Strong Breeze	Large branches moving, wind whistling (40 - 50 km/h)	Sampling Condition		
Current Precipitation	The type of precipitation currently occurring.	N	No Precipitation		Sampling Condition		
Current Precipitation	The type of precipitation currently occurring.	F	Foggy	Reduced visibility, like a cloud.	Sampling Condition		
Current Precipitation	The type of precipitation currently occurring.	M	Misty Drizzle	No distinct rain drops but can dampen clothing.	Sampling Condition		
Current Precipitation	The type of precipitation currently occurring.	D	Drizzle	Fine rain drops (< 0.5 mm diameter), visible on ground.	Sampling Condition		
Current Precipitation	The type of precipitation currently occurring.	LR	Light Rain	Puddles not forming quickly, < 2.5 mm rain per hour.	Sampling Condition		
Current Precipitation	The type of precipitation currently occurring.	HR	Hard Rain	Puddles form quickly, > 2.5 mm rain per hour.	Sampling Condition		
Current Precipitation	The type of precipitation currently occurring.	S	Snow		Sampling Condition		
Rainfall over 24 hours (mm)	The amount of rainfall that fell within the last 24 hours (mm).				Sampling Condition		
Rainfall over 48 hours (mm)	The amount of rain that fell within the last 48 hours (mm).				Sampling Condition		
Prec 48 hr Precip	The type of precipitation that occurred during the preceding 48 hours.	N	No Precipitation		Sampling Condition		
Prec 48 hr Precip	The type of precipitation that occurred during the preceding 48 hours.	F	Foggy	Reduced visibility, like a cloud.	Sampling Condition		
Prec 48 hr Precip	The type of precipitation that occurred during the preceding 48 hours.	M	Misty Drizzle	No distinct rain drops but can dampen clothing.	Sampling Condition		
Prec 48 hr Precip	The type of precipitation that occurred during the preceding 48 hours.	D	Drizzle	Fine rain drops (< 0.5 mm diameter), visible on ground.	Sampling Condition		
Prec 48 hr Precip	The type of precipitation that occurred during the preceding 48 hours.	LR	Light Rain	Puddles not forming quickly, < 2.5 mm rain per hour.	Sampling Condition		
Prec 48 hr Precip	The type of precipitation that occurred during the preceding 48 hours.	HR	Hard Rain	Puddles form quickly, > 2.5 mm rain per hour.	Sampling Condition		
Prec 48 hr Precip	The type of precipitation that occurred during the preceding 48 hours.	S	Snow		Sampling Condition		
Cloud Type	The cloud-type class.	ST	Stratus	Low, continuous-cover clouds	Sampling Condition		
Cloud Type	The cloud-type class.	NS	Nimbostratus	Low, heavy rain clouds	Sampling Condition		
Cloud Type	The cloud-type class.	SC	Stratocumulus	Low fluffy clouds	Sampling Condition		
Cloud Type	The cloud-type class.	CU	Cumulus	Big, tall fluffy clouds	Sampling Condition		
Cloud Type	The cloud-type class.	AC	Altocumulus	Mid altitude fluffy clouds	Sampling Condition		
Cloud Type	The cloud-type class.	AS	Altostratus	Mid altitute continuous clouds	Sampling Condition		
Cloud Type	The cloud-type class.	CC	Cirrocumulus	High altitute bands of puffy clouds	Sampling Condition		
Cloud Type	The cloud-type class.	CI	Cirrus	Very high altitude wispy clouds	Sampling Condition		
Cloud Cover	The cloud-cover class. INSTRUCTIONS: Enter a code	1	Clear	Clear sky; no clouds	Sampling Condition		
Cloud Cover	The cloud-cover class. INSTRUCTIONS: Enter a code	2	Scattered (<50%)	Scattered clouds covering less than 50% of sky	Sampling Condition		
Cloud Cover	The cloud-cover class. INSTRUCTIONS: Enter a code	3	Scattered (>50%)	Scattered clouds covering more than 50% of sky	Sampling Condition		
Cloud Cover	The cloud-cover class. INSTRUCTIONS: Enter a code	4	Unbroken clouds	Unbroken cloud cover	Sampling Condition		
Cloud Ceiling	The height of cloud cover relative to trees and ridges. INSTRUCTIONS: Enter a code	v h	Very High		Sampling Condition		
Cloud Ceiling	The height of cloud cover relative to trees and ridges. INSTRUCTIONS: Enter a code	h	High		Sampling Condition		
Cloud Ceiling	The height of cloud cover relative to trees and ridges. INSTRUCTIONS: Enter a code	a rt	Above Ridge Tops		Sampling Condition		
Cloud Ceiling	The height of cloud cover relative to trees and ridges. INSTRUCTIONS: Enter a code	a tt	Above Tree Tops		Sampling Condition		
Cloud Ceiling	The height of cloud cover relative to trees and ridges. INSTRUCTIONS: Enter a code	b rt	Below Ridge Tops		Sampling Condition		
Cloud Ceiling	The height of cloud cover relative to trees and ridges. INSTRUCTIONS: Enter a code	b tt	Below Tree Tops		Sampling Condition		
Prec 48 hr Cloud Cover	The cloud-cover class during the preceding 48 hours. INSTRUCTIONS: Enter a code	1	Clear	Clear sky; no clouds	Sampling Condition		
Prec 48 hr Cloud Cover	The cloud-cover class during the preceding 48 hours. INSTRUCTIONS: Enter a code	2	Scattered (<50%)	Scattered clouds covering less than 50% of sky	Sampling Condition		
Prec 48 hr Cloud Cover	The cloud-cover class during the preceding 48 hours. INSTRUCTIONS: Enter a code	3	Scattered (>50%)	Scattered clouds covering more than 50% of sky	Sampling Condition		
Prec 48 hr Cloud Cover	The cloud-cover class during the preceding 48 hours. INSTRUCTIONS: Enter a code	4	Unbroken clouds	Unbroken cloud cover	Sampling Condition		
Snow Depth	The snow depth class. INSTRUCTIONS: Enter a code	1	0 cm		Sampling Condition		
Snow Depth	The snow depth class. INSTRUCTIONS: Enter a code	2	1-5 cm		Sampling Condition		
Snow Depth	The snow depth class. INSTRUCTIONS: Enter a code	3	6-25 cm		Sampling Condition		
Snow Depth	The snow depth class. INSTRUCTIONS: Enter a code	4	26-50 cm		Sampling Condition		
Snow Depth	The snow depth class. INSTRUCTIONS: Enter a code	5	51-75 cm		Sampling Condition		

Column Name	Column Description	Code for in Column	Code Meaning	Code Description	Column For		
Snow Depth	The snow depth class. INSTRUCTIONS: Enter a code	6	76-100 cm		Sampling Condition		
Snow Depth	The snow depth class. INSTRUCTIONS: Enter a code	7	101-150 cm		Sampling Condition		
Snow Depth	The snow depth class. INSTRUCTIONS: Enter a code	8	>150 cm		Sampling Condition		
Snow Cover	The snow cover class. INSTRUCTIONS: Enter a code	1	0%	0 % of ground covered	Sampling Condition		
Snow Cover	The snow cover class. INSTRUCTIONS: Enter a code	2	1-5 %	1-5 % of ground covered	Sampling Condition		
Snow Cover	The snow cover class. INSTRUCTIONS: Enter a code	3	6-25 %	6-25 % of ground covered	Sampling Condition		
Snow Cover	The snow cover class. INSTRUCTIONS: Enter a code	4	26-50 %	26-50 % of ground covered	Sampling Condition		
Snow Cover	The snow cover class. INSTRUCTIONS: Enter a code	5	51-75 %	51-75 % of ground covered	Sampling Condition		
Snow Cover	The snow cover class. INSTRUCTIONS: Enter a code	6	76-100 %	76-100 % of ground covered	Sampling Condition		
Time since 5 cm snow	The number of days since 5 cm of snow fell. INSTRUCTIONS: Enter a code	1	< 1/2 day	Less than half a day since it snowed last	Sampling Condition		
Time since 5 cm snow	The number of days since 5 cm of snow fell. INSTRUCTIONS: Enter a code	2	< 3 days	Less than 3 days since it snowed last	Sampling Condition		
Time since 5 cm snow	The number of days since 5 cm of snow fell. INSTRUCTIONS: Enter a code	3	< 14 days	Less than 14 days since it snowed last	Sampling Condition		
Time since 5 cm snow	The number of days since 5 cm of snow fell. INSTRUCTIONS: Enter a code	4	> 14 days	More than 14 days, or exactly 14 days, since it snowed last	Sampling Condition		
Time since 5 cm snow	The number of days since 5 cm of snow fell. INSTRUCTIONS: Enter a code	5	NR	Not recorded because information is of no value	Sampling Condition		
Water Temperature (C)	The current water temperature in degrees Celsius.				Sampling Condition		
Sea Wind Condition	The wind speed class over the sea. INSTRUCTIONS: Enter a code	0	Calm	Calm 0-1 knots, sea like a mirror	Sampling Condition		
Sea Wind Condition	The wind speed class over the sea. INSTRUCTIONS: Enter a code	1	Light Air	Light Air 1-3 knots, 1/4 ft waves, ripples with appearance of scales, no foam crests.	Sampling Condition		
Sea Wind Condition	The wind speed class over the sea. INSTRUCTIONS: Enter a code	2	Light Breeze	Light Breeze, 4-6 knots, 1/3 ft. waves, small wavelets, crests of glassy appearance not breaking.	Sampling Condition		
Sea Wind Condition	The wind speed class over the sea. INSTRUCTIONS: Enter a code	3	Gentle Breeze	Gentle Breeze, 7-10 knots, 2 ft. waves, large wavelets, crests begin to break, scattered whitecaps.	Sampling Condition		
Sea Wind Condition	The wind speed class over the sea. INSTRUCTIONS: Enter a code	4	Moderate Breeze	Moderate Breeze, 11-16 knots, 4 ft waves, small waves, becoming longer, numerous whitecaps.	Sampling Condition		
Sea Wind Condition	The wind speed class over the sea. INSTRUCTIONS: Enter a code	5	Fresh Breeze	Fresh Breeze, 17-21 knots, 16 ft waves, moderate waves, taking longer form, many whitecaps, some spray.	Sampling Condition		
Sea Wind Condition	The wind speed class over the sea. INSTRUCTIONS: Enter a code	6	Strong Breeze	Strong Breeze, 22-27 knots, 10 ft. waves, longer waves forming, whitecaps everywhere, more spray.	Sampling Condition		
Sea Wind Condition	The wind speed class over the sea. INSTRUCTIONS: Enter a code	7	Near Gale	Near Gale, 28-32 knots. 14 ft. waves.	Sampling Condition		
Sea Wind Condition	The wind speed class over the sea. INSTRUCTIONS: Enter a code	8	Gale	Gale, 34-40 knots, 18 ft. waves.	Sampling Condition		
Sea Wind Condition	The wind speed class over the sea. INSTRUCTIONS: Enter a code	9	Strong Gale	Strong Gale, 41-47 knots, 23 ft waves.	Sampling Condition		
Sea Wind Condition	The wind speed class over the sea. INSTRUCTIONS: Enter a code	10	Storm	Storm 48-55 knots, 29 ft waves	Sampling Condition		
Sea Wind Condition	The wind speed class over the sea. INSTRUCTIONS: Enter a code	11	Violent Storm	Violent Storm 53-63 knots, 37 ft waves	Sampling Condition		
Sea Wind Condition	The wind speed class over the sea. INSTRUCTIONS: Enter a code	12	Hurricane	Hurricane, 64-71 knots, 45 ft waves.	Sampling Condition		
Sea Surface Temperature (C)	The sea water surface temperature in degrees Celsius.				Sampling Condition		
Sea Surface Salinity (ppt)	The sea water surface salinity in parts per thousand (ppt).				Sampling Condition		
Swell Height (m)	The current swell height in meters (m).				Sampling Condition		
Wavelet Height (cm)	The current wavelet height in centimeters (cm).				Sampling Condition		
Tide Direction	The tide direction class. INSTRUCTIONS: Enter a code	H	High		Sampling Condition		
Tide Direction	The tide direction class. INSTRUCTIONS: Enter a code	IE	Intermediate Ebb		Sampling Condition		
Tide Direction	The tide direction class. INSTRUCTIONS: Enter a code	IF	Intermediate Flood		Sampling Condition		
Tide Direction	The tide direction class. INSTRUCTIONS: Enter a code	L	Low		Sampling Condition		
Ground Temperature (C)	The ground surface temperature in degrees Celsius.				Sampling Condition		
Ground Moisture	The ground moisture class. INSTRUCTIONS: Enter a code	D	Dry	no apparent moisture on ground/vegetation. Surface litter is dry and will not stain fingers when rubbed	Sampling Condition		
Ground Moisture	The ground moisture class. INSTRUCTIONS: Enter a code	M	Moist	moisture is not apparent on ground/vegetation, but soil is moist. Surface litter will stain fingers when rubbed, but no water is apparent when soil/litter is squeezed	Sampling Condition		

Column Name	Column Description	Code for in Column	Code Meaning	Code Description	Column For		
Ground Moisture	The ground moisture class. INSTRUCTIONS: Enter a code	W	Wet	moisture is apparent on ground/vegetation; water is observed if soil/litter is squeezed	Sampling Condition		
Leaf Moisture	The leaf moisture class. INSTRUCTIONS: Enter a code	Dry	No moisture detected		Sampling Condition		
Leaf Moisture	The leaf moisture class. INSTRUCTIONS: Enter a code	Droplets	Moisture detected		Sampling Condition		
Official Sunrise	The official sunrise time.				Sampling Condition		
Lunar Phase	The lunar phase class. INSTRUCTIONS: Enter a code	NM	New Moon	The moon is dark. Also called 'dark moon'.	Sampling Condition		
Lunar Phase	The lunar phase class. INSTRUCTIONS: Enter a code	WxC	Waxing Crescent		Sampling Condition		
Lunar Phase	The lunar phase class. INSTRUCTIONS: Enter a code	FQ	First Quarter	Also called 'half moon', and is waxing.	Sampling Condition		
Lunar Phase	The lunar phase class. INSTRUCTIONS: Enter a code	WxG	Waxing Gibbous		Sampling Condition		
Lunar Phase	The lunar phase class. INSTRUCTIONS: Enter a code	FM	Full Moon	The entire illuminated portion of the moon is visible.	Sampling Condition		
Lunar Phase	The lunar phase class. INSTRUCTIONS: Enter a code	WnG	Waning Gibbous		Sampling Condition		
Lunar Phase	The lunar phase class. INSTRUCTIONS: Enter a code	TQ	Third Quarter	Also called 'half moon', and is waning.	Sampling Condition		
Lunar Phase	The lunar phase class. INSTRUCTIONS: Enter a code	WnC	Waning Crescent		Sampling Condition		
Turbidity (cm)	The turbidity of the water as represented by centimeters of visibility measured with a secchi disk (cm) or other instrument.				Sampling Condition		
Temperature Variance	The water temperature variance in +/- degrees Celsius.				Sampling Condition		
Sampling Condition Comments	Comments about the sampling conditions				Sampling Condition		
Insert Predefined Sampling Condition Column	You may insert additional predefined columns and codes relevant to Sampling Conditions. INSTRUCTIONS: Double-click on the column header again now (while Data-entry Assistant is open) to insert predefined columns and codes relevant to Sampling Conditions.						
Observation #	A number that uniquely identifies a survey observation (e.g. a rare plant observation) on a field form or in an Excel data file. INSTRUCTIONS: This number is mandatory if voucher specimens are collected because it links voucher data to a survey observation. In general this number is used to link individual survey observations to related data on other field forms, or to related data in other Excel worksheets within an Excel data file.				Survey Observation		
Surveyor	The full name (First Last) of one surveyor who provided the data point. INSTRUCTIONS: Enter only one surveyor. If there are multiple surveyors for a data point, enter only the primary surveyor.						
Count	The number of individuals of all life stages. Alternatively, a count of 1 (one) may mean that details about numbers are recorded in other columns such as Sign Count or Adult Males. See project report for details.				Survey Observation		
Survey Observation Photos	A list of photos (or other Standard Digital Files*) that are associated with a Survey Observation. INSTRUCTIONS: To easily add photo names to a cell, right-click on a cell and select 'WSI: Add File Names to Cell'. Photo names must not have spaces. To include comments about your photos, add a column named 'Survey Observation Photo Comments' or 'SO Photo Comments', and enter your comments. *Standard Digital Files are recognized by most operating systems To easily add photo names to a cell, right-click on a cell and select 'WSI: Add File Names to Cell'. Photo names must not have spaces. To include comments about your photos, add a column named 'Block Photo Comments' and enter your comments. *Standard Digital Files are recognized by most operating systems and includes images, videos, and documents in formats such as PNG, JPG, JPEG, GIF, BMP, PDF, MP4, AVI, and TXT.				Survey Observation		
SO Photo Comments	Informative comments and/or notes about the photos, or other Standard Digital Files.				Survey Observation		
Animal ID	A unique identifier permanently assigned to an animal, independent of possible changes in mark method used. INSTRUCTIONS: This data is mandatory if there is telemetry or GPS data for the animal. AVOID using IDs that: - do not contain letters - start with zero For example, avoid '003' or '2-5', because data systems (e.g. Excel) often automatically reformat such data.				Survey Observation		

Column Name	Column Description	Code for in Column	Code Meaning	Code Description	Column For		
UTM Zone	The UTM zone in which the observation occurs. INSTRUCTIONS: Use these UTM columns for UTMs of individual observations only. Do not enter UTMs of Blocks, Sample Stations, or Transects here. If you do not have UTMs of the individual observations, make sure that you use the appropriate 'Block Information', 'Sample Station Information', or 'Transect Information' worksheet to enter UTMs of Blocks, Sample Stations, or Transects. Do not enter UTM coordinates if Long-Lat coordinates are provided.				Survey Observation		
Easting	The UTM east coordinate in metres. INSTRUCTIONS: The value in this field must be a 6-digit number. Use these UTM columns for UTMs of individual observations only. Do not enter UTMS of Blocks, Sample Stations, or Transects here. If you do not have UTMs of the individual observations, make sure that you use the appropriate 'Block Information', 'Sample Station Information', or 'Transect Information' worksheet to enter UTMs of Blocks, Sample Stations, or Transects. Do not enter UTMs if Long-Lats are provided.				Survey Observation		
Northing	The UTM north coordinate in metres. INSTRUCTIONS: The value in this field must be a 7-digit number. Use these UTM columns for UTMs of individual observations only. Do not enter UTMS of Blocks, Sample Stations, or Transects here. If you do not have UTMs of the individual observations, make sure that you use the appropriate 'Block Information', 'Sample Station Information', or 'Transect Information' worksheet to enter UTMs of Blocks, Sample Stations, or Transects. Do not enter UTMs if Long-Lats are provided.				Survey Observation		
Longitude (DD)	The longitude of the observation, in decimal degrees. INSTRUCTIONS: Do not enter Long-Lat coordinates if UTM coordinates are provided.				Survey Observation		
Latitude (DD)	The latitude of the observation, in decimal degrees. INSTRUCTIONS: Do not enter Long-Lat coordinates if UTM coordinates are provided.				Survey Observation		
Spatial Accuracy (m)	The measured or guesstimated spatial accuracy of the point in meters.				Survey Observation		
Comments	Informative comments about the observation.				Survey Observation		
Insert Predefined Survey Observation Column	You may insert additional predefined columns and codes relevant to Survey Observations. INSTRUCTIONS: Double-click on the column header again now (while Data-entry Assistant is open) to insert predefined columns and codes relevant to Survey Observations.						
Insert Predefined Mark Column	You may insert additional predefined columns and codes relevant to Marks. INSTRUCTIONS: Double-click on the column header again now (while Data-entry Assistant is open) to insert predefined columns and codes relevant to Marks.						
Group Label	A unique identification label assigned to track a group of animals detected more than once during the course of a Block Visit, e.g. G25. INSTRUCTIONS: Labels should contain letters, start with a character other than zero, and contain no hyphens. For example, 'AM330' or 'D30' will work well with Excel. Avoid Labels that do not contain letters, begin with zero, or contain hyphens. For example, avoid '003' or '2-5', because Excel may automatically reformat such data.				Survey Observation		
Adult Males	The number of adult males.				Survey Observation		
Adult Females	The number of adult females.				Survey Observation		
Adults - Unclassified Sex	The number of adults of unclassified sex.				Survey Observation		
Juveniles - Unclassified Sex	The number of juveniles of unclassified sex. Juveniles are defined as 'fledged birds before their first winter, mammals older than neonates but still requiring parental care, and reptiles and amphibians of adult form that are significantly smaller than adult size.' For survey observations prior to December 2015, and for incidental observations prior to May 2013, the definition of juveniles included larvae (e.g. tadpoles).				Survey Observation		
Yearling Males	The number of yearling males. A yearling is an individual that is one year, or almost one year old; individual has lived through one winter season.				Survey Observation		
Yearling Females	The number of yearling females. A yearling is an individual that is one year, or almost one year old; individual has lived through one winter season.				Survey Observation		
Yearlings - Unclassified Sex	The number of yearlings of unclassified sex. A yearling is an individual that is one year, or almost one year old; individual has lived through one winter season.				Survey Observation		

Column Name	Column Description	Code for in Column	Code Meaning	Code Description	Column For		
Males - Unclassified Life Stage	The number of males of unclassified life stage.				Survey Observation		
Females - Unclassified Life Stage	The number of females of unclassified life stage.				Survey Observation		
Unclassified Life Stage and Sex	The number of individuals of unclassified life stage and unclassified sex. I.e. neither life stage nor sex is determined.				Survey Observation		
Males - Class I	The number of Class I male ungulates.□ □ BLACK-TAILED DEER: small 2 point or 2-3 points per antler□ CARIBOU: Small antlers which are 2-3x the ear length (YEARLING)□ ELK (ROCKY MOUNTAIN and ROOSEVELT): Small antlers with 3 or 4 points (RAGHORN)□ MOOSE: antler palmated, extends beyond tip of ear, browtine a SPIKE or FORK□ MOUNTAIN SHEEP: horns larger than females or yearling rams, often difficult to separate from yearling rams, 2 year old ram (Peace-Liard)□ MULE DEER and WHITE-TAILED DEER: large 2 point or small 3 point antlers□ INSTRUCTIONS: More detail on classifications for ungulates can be found in section 3.2.2 of the RISC manual:□ https://www2.gov.bc.ca/assets/gov/environment/natural-resource-stewardship/standards-guidelines/risc/unga_ml20_final.pdf				Survey Observation		
Males - Class II	The number of Class II male ungulates.□ □ BLACK-TAILED DEER: medium 2 or 3 point or small 3 point, light antlers□ CARIBOU: antlers larger than females; antlers are lighter and smaller than Class III bulls; antlers without shovels.□ MOOSE: antlers palmated, but smaller than Class III; browtine usually a spike or fork, like Class I□ MOUNTAIN SHEEP: horns over 1/2 curl, but less than 3/4 curl, body size smaller than Class III ram; 3 year old ram (Peace-Liard)□ MULE DEER and WHITE-TAILED DEER: medium size antlers with 3 points/antler□ ROCKY MOUNTAIN ELK: large 4 point antler, small 5 point antler, spindly (RAGHORN).□ ROOSEVELT ELK: large 4 point or 5 point antler□ INSTRUCTIONS: More detail on classifications for ungulates can be found in section 3.2.2 of the RISC manual:□ https://www2.gov.bc.ca/assets/gov/environment/natural-resource-stewardship/standards-guidelines/risc/unga_ml20_final.pdf				Survey Observation		
Males - Class III	The number of class III ungulates.□ □ BLACK-TAILED DEER: large 3 or 4 points/antler, or 5 points, heavy antlers.□ CARIBOU: large, heavy-beamed antlered males; antlers with many points and a palmated brow tine; may have shovel with few points, but heavy beams.□ MOOSE: antler palmate, extends beyond tip of ear; brow tine palmate with usually 2 or more points; innermost points of brow palm close over face.□ MOUTAIN SHEEP: horns over 3/4 curl but less than full curl; 4 year to full curl ram (Peace-Liard).□ MULE DEER and WHITE-TAILED DEER: medium size with 3 or 4 points/antler; moderate to large bodied.□ ROCKY MOUNTAIN ELK: large 5 point antler, small 6 point antler, heavy antlers.□ ROOSEVELT ELK: very large bull, >6 point antler□ INSTRUCTIONS: More detail on classifications for ungulates can be found in section 3.2.2 of the RISC manual:□ https://www2.gov.bc.ca/assets/gov/environment/natural-resource-stewardship/standards-guidelines/risc/unga_ml20_final.pdf				Survey Observation		

Column Name	Column Description	Code for in Column	Code Meaning	Code Description	Column For		
Males - Class IV	The number of class IV male ungulates. ROCKY MOUNTAIN ELK - Large antlers with 6 or 7 points/antler, massive. MOUNTAIN SHEEP - Full curl horns (to bridge of nose) or greater. MULE DEER and WHITE-TAILED DEER - Large antlers with 4 or 5 points/antler. *There are no Class IV BLACK-TAILED DEER, CARIBOU, ROOSEVELT ELK, or MOOSE. INSTRUCTIONS: More detail on classifications for ungulates can be found in section 3.2.2 of the RISC manual: https://www2.gov.bc.ca/assets/gov/environment/natural-resource-stewardship/standards-guidelines/risc/unga_ml20_final.pdf				Survey Observation		
Raghorn - Class I or II	The number of ELK (Rocky Mountain or Roosevelt) with either small or large antlers with 3 or 4 points, and/or small spindly 5 point antlers. INSTRUCTIONS: Do not double count by counting the same individuals in other columns that have overlapping definitions.				Survey Observation		
Adult Males - Class III or IV	The number of adult males with large 5 point antler, 6 or more point antler, heavy antlers, massive. INSTRUCTIONS: Do not double count by counting the same individuals in other columns that have overlapping definitions.				Survey Observation		
Adult Males - 3 Points or Fewer	The number of adult males with 3 points or fewer on one antler. INSTRUCTIONS: Do not double count by counting the same individuals in other columns that have overlapping definitions.				Survey Observation		
Adult Males - 3 or 4 Points	The number of adult males with at least 3 or 4 points on one antler. INSTRUCTIONS: Do not double count by counting the same individuals in other columns that have overlapping definitions.				Survey Observation		
Adult Males - 4 Points or More	The number of adult males with at least 4 points or more on one antler. INSTRUCTIONS: Do not double count by counting the same individuals in other columns that have overlapping definitions.				Survey Observation		
Adult Males - 5 Points or More	The number of adult males with at least 5 points or more on one antler. INSTRUCTIONS: Do not double count by counting the same individuals in other columns that have overlapping definitions.				Survey Observation		
Adult Males - 6 Points or More	The number of adult males having at least 6 points or more on one antler. INSTRUCTIONS: Do not double count by counting the same individuals in other columns that have overlapping definitions.				Survey Observation		
Adult Males - 10 Points or Tripalm	The number of bull MOOSE having at least one antler with a minimum of ten points (tines), including the tines on the brow palm. Tripalm means bull moose having at least one antler with a brow palm bearing three or more points (tines). The brow palm is separated from the main palm by the deepest antler bay. The deepest bay is the bay whose vertex (deepest location) is the shortest distance from the antler base, when measured along the surface of the antler.				Survey Observation		
Activity	A code indicating the activity of the animal when it was first detected or the activity that caused the sign, e.g. GR. INSTRUCTIONS: If observing a group then record the exact, sub sampled, or guesstimated mode activity of all the individuals in the group.	AL	Alert	Activity with the purpose of detecting predators. E.g. guard or sentry duty.	Survey Observation		
Activity	A code indicating the activity of the animal when it was first detected or the activity that caused the sign, e.g. GR. INSTRUCTIONS: If observing a group then record the exact, sub sampled, or guesstimated mode activity of all the individuals in the group.	AN	Antler (not an activity)	A solid, annually deciduous horn of a cervid	Survey Observation		
Activity	A code indicating the activity of the animal when it was first detected or the activity that caused the sign, e.g. GR. INSTRUCTIONS: If observing a group then record the exact, sub sampled, or guesstimated mode activity of all the individuals in the group.	AP	Avoiding Pests	Avoiding pests. E.g. seeing caribou standing on snow fields during summer when insects are abundant.	Survey Observation		
Activity	A code indicating the activity of the animal when it was first detected or the activity that caused the sign, e.g. GR. INSTRUCTIONS: If observing a group then record the exact, sub sampled, or guesstimated mode activity of all the individuals in the group.	BA	Basking	Behaviour for the purpose of gathering warmth. E.g. Seeing a marmot or snake lying on warm rocks.	Survey Observation		
Activity	A code indicating the activity of the animal when it was first detected or the activity that caused the sign, e.g. GR. INSTRUCTIONS: If observing a group then record the exact, sub sampled, or guesstimated mode activity of all the individuals in the group.	BE	Bedding	Bedding, sleeping, or resting above ground; includes bedding for the purpose of cud chewing but does not include loafing.	Survey Observation		
Activity	A code indicating the activity of the animal when it was first detected or the activity that caused the sign, e.g. GR. INSTRUCTIONS: If observing a group then record the exact, sub sampled, or guesstimated mode activity of all the individuals in the group.	BP	Body parts (not an activity)	Incidental portions of an animal's body which are left behind, but do not indicate the animal is dead; e.g., feathers, hair, and shed skins; shed antlers are recorded as AN	Survey Observation		

Column Name	Column Description	Code for in Column	Code Meaning	Code Description	Column For		
Activity	A code indicating the activity of the animal when it was first detected or the activity that caused the sign, e.g. GR.□ INSTRUCTIONS: If observing a group then record the exact, sub sampled, or guesstimated mode activity of all the individuals in the group.	BU	Building	Building a nest, bed, burrow, den, lodge, or other dwelling.	Survey Observation		
Activity	A code indicating the activity of the animal when it was first detected or the activity that caused the sign, e.g. GR.□ INSTRUCTIONS: If observing a group then record the exact, sub sampled, or guesstimated mode activity of all the individuals in the group.	CA	Casting	Discharging bodily waste from the mouth. E.g. Seeing an owl or snake casting pellets.	Survey Observation		
Activity	A code indicating the activity of the animal when it was first detected or the activity that caused the sign, e.g. GR.□ INSTRUCTIONS: If observing a group then record the exact, sub sampled, or guesstimated mode activity of all the individuals in the group.	CO	Courting	Behaviour for the purpose of enticing a conspecific of the opposite sex into copulation; includes copulation, courtship feeding, and defense of mates.	Survey Observation		
Activity	A code indicating the activity of the animal when it was first detected or the activity that caused the sign, e.g. GR.□ INSTRUCTIONS: If observing a group then record the exact, sub sampled, or guesstimated mode activity of all the individuals in the group.	CR	Carcass (not an activity)	A carcass, or portions of a carcass, that indicates the animal is dead	Survey Observation		
Activity	A code indicating the activity of the animal when it was first detected or the activity that caused the sign, e.g. GR.□ INSTRUCTIONS: If observing a group then record the exact, sub sampled, or guesstimated mode activity of all the individuals in the group.	DE	Denning	Sleeping or hiding in a cavity, cave, or burrow; does not include hibernating.	Survey Observation		
Activity	A code indicating the activity of the animal when it was first detected or the activity that caused the sign, e.g. GR.□ INSTRUCTIONS: If observing a group then record the exact, sub sampled, or guesstimated mode activity of all the individuals in the group.	DC	Described in Comments	The activity is described in the comments field. Note: Describing the data in comments rather than using a predefined code may reduce the clarity and accessibility of data.	Survey Observation		
Activity	A code indicating the activity of the animal when it was first detected or the activity that caused the sign, e.g. GR.□ INSTRUCTIONS: If observing a group then record the exact, sub sampled, or guesstimated mode activity of all the individuals in the group.	DI	Disturbed	Behaviour for the purpose of avoiding the observer; use only if the activity before disturbance is not known.	Survey Observation		
Activity	A code indicating the activity of the animal when it was first detected or the activity that caused the sign, e.g. GR.□ INSTRUCTIONS: If observing a group then record the exact, sub sampled, or guesstimated mode activity of all the individuals in the group.	DR	Drinking		Survey Observation		
Activity	A code indicating the activity of the animal when it was first detected or the activity that caused the sign, e.g. GR.□ INSTRUCTIONS: If observing a group then record the exact, sub sampled, or guesstimated mode activity of all the individuals in the group.	EX	Excreting	Discharging waste through the anus.	Survey Observation		
Activity	A code indicating the activity of the animal when it was first detected or the activity that caused the sign, e.g. GR.□ INSTRUCTIONS: If observing a group then record the exact, sub sampled, or guesstimated mode activity of all the individuals in the group.	FD	Feeding	Consuming food items. Does not include hunting, except when animals hunt and eat simultaneously, such as grazers, browsers, and flying insectivores.	Survey Observation		
Activity	A code indicating the activity of the animal when it was first detected or the activity that caused the sign, e.g. GR.□ INSTRUCTIONS: If observing a group then record the exact, sub sampled, or guesstimated mode activity of all the individuals in the group.	FL	Fleeing	Hurried movement to avoid a conspecifics or other animal; does not include fleeing to avoid the observer.	Survey Observation		
Activity	A code indicating the activity of the animal when it was first detected or the activity that caused the sign, e.g. GR.□ INSTRUCTIONS: If observing a group then record the exact, sub sampled, or guesstimated mode activity of all the individuals in the group.	FS	Feeding, salmonid	Feeding on salmonds during a salmonid run	Survey Observation		
Activity	A code indicating the activity of the animal when it was first detected or the activity that caused the sign, e.g. GR.□ INSTRUCTIONS: If observing a group then record the exact, sub sampled, or guesstimated mode activity of all the individuals in the group.	GR	Grooming	Behaviour for the purpose of arranging and protecting the fur, feathers, skin, etc. Includes scratching and rubbing of antler velvet.	Survey Observation		
Activity	A code indicating the activity of the animal when it was first detected or the activity that caused the sign, e.g. GR.□ INSTRUCTIONS: If observing a group then record the exact, sub sampled, or guesstimated mode activity of all the individuals in the group.	HI	Hibernating	Hibernating	Survey Observation		
Activity	A code indicating the activity of the animal when it was first detected or the activity that caused the sign, e.g. GR.□ INSTRUCTIONS: If observing a group then record the exact, sub sampled, or guesstimated mode activity of all the individuals in the group.	HU	Hunting	Searching for, pursuing, and killing prey. For animals which hunt and eat simultaneously, such as grazers, browsers, and flying insectivores, the activity is recorded as eating	Survey Observation		
Activity	A code indicating the activity of the animal when it was first detected or the activity that caused the sign, e.g. GR.□ INSTRUCTIONS: If observing a group then record the exact, sub sampled, or guesstimated mode activity of all the individuals in the group.	IM	Ingesting Minerals	Ingesting minerals by eating or licking a substance for the purpose of ingesting minerals.	Survey Observation		
Activity	A code indicating the activity of the animal when it was first detected or the activity that caused the sign, e.g. GR.□ INSTRUCTIONS: If observing a group then record the exact, sub sampled, or guesstimated mode activity of all the individuals in the group.	IN	Incubating	Incubating, protecting, or laying eggs.	Survey Observation		

Column Name	Column Description	Code for in Column	Code Meaning	Code Description	Column For		
Activity	A code indicating the activity of the animal when it was first detected or the activity that caused the sign, e.g. GR. INSTRUCTIONS: If observing a group then record the exact, sub sampled, or guesstimated mode activity of all the individuals in the group.	LI	Living	Activity that could not be classified due to ignorance or the activity being too diverse.	Survey Observation		
Activity	A code indicating the activity of the animal when it was first detected or the activity that caused the sign, e.g. GR. INSTRUCTIONS: If observing a group then record the exact, sub sampled, or guesstimated mode activity of all the individuals in the group.	MD	Migrating Daily	Traveling that is a regular daily activity; includes traveling to or away from a communal habitat. E.g. seeing a bat on its daily flight to or from a roosting site.	Survey Observation		
Activity	A code indicating the activity of the animal when it was first detected or the activity that caused the sign, e.g. GR. INSTRUCTIONS: If observing a group then record the exact, sub sampled, or guesstimated mode activity of all the individuals in the group.	MS	Migrating Seasonally	Traveling that is a regular annual activity. E.g. seeing an elk or a Sandhill Crane on its migration route, or seeing a snake traveling away from a communal habitat such as a hibernaculum.	Survey Observation		
Activity	A code indicating the activity of the animal when it was first detected or the activity that caused the sign, e.g. GR. INSTRUCTIONS: If observing a group then record the exact, sub sampled, or guesstimated mode activity of all the individuals in the group.	RB	Reproducing, birthing	Giving birth to live young; preparing a birthing site, such as a den	Survey Observation		
Activity	A code indicating the activity of the animal when it was first detected or the activity that caused the sign, e.g. GR. INSTRUCTIONS: If observing a group then record the exact, sub sampled, or guesstimated mode activity of all the individuals in the group.	RE	Reproducing, eggs	Laying eggs (amphibians, reptiles and birds), building a nest, and feeding non-mobile young	Survey Observation		
Activity	A code indicating the activity of the animal when it was first detected or the activity that caused the sign, e.g. GR. INSTRUCTIONS: If observing a group then record the exact, sub sampled, or guesstimated mode activity of all the individuals in the group.	RR	Rearing	Adults feeding neonates and juveniles.	Survey Observation		
Activity	A code indicating the activity of the animal when it was first detected or the activity that caused the sign, e.g. GR. INSTRUCTIONS: If observing a group then record the exact, sub sampled, or guesstimated mode activity of all the individuals in the group.	SA	Standing	Standing; used when the specific purpose of standing is not known. If the purpose of standing is know then use a more specific activity such as alert or feeding.	Survey Observation		
Activity	A code indicating the activity of the animal when it was first detected or the activity that caused the sign, e.g. GR. INSTRUCTIONS: If observing a group then record the exact, sub sampled, or guesstimated mode activity of all the individuals in the group.	TH	Thermal Habitat	Animals using habitat for the purpose of protecting themselves from heat, cold, or precipitation	Survey Observation		
Activity	A code indicating the activity of the animal when it was first detected or the activity that caused the sign, e.g. GR. INSTRUCTIONS: If observing a group then record the exact, sub sampled, or guesstimated mode activity of all the individuals in the group.	SH	Security Habitat	Using habitat for protection or hiding from predators.	Survey Observation		
Activity	A code indicating the activity of the animal when it was first detected or the activity that caused the sign, e.g. GR. INSTRUCTIONS: If observing a group then record the exact, sub sampled, or guesstimated mode activity of all the individuals in the group.	ST	Security and Thermal	Using habitat for its security and thermal values	Survey Observation		
Activity	A code indicating the activity of the animal when it was first detected or the activity that caused the sign, e.g. GR. INSTRUCTIONS: If observing a group then record the exact, sub sampled, or guesstimated mode activity of all the individuals in the group.	TE	Territoriality	Behaviour for the purpose of marking or defending a territory; may include singing, drumming, winnowing, howling	Survey Observation		
Activity	A code indicating the activity of the animal when it was first detected or the activity that caused the sign, e.g. GR. INSTRUCTIONS: If observing a group then record the exact, sub sampled, or guesstimated mode activity of all the individuals in the group.	NT	Not Travelling	Not travelling. NT is typically used in telemetry surveys when it is only important to distinguish whether or not the animal was travelling.	Survey Observation		
Activity	A code indicating the activity of the animal when it was first detected or the activity that caused the sign, e.g. GR. INSTRUCTIONS: If observing a group then record the exact, sub sampled, or guesstimated mode activity of all the individuals in the group.	TU	Traveling, Unclassified	Travelling, but the method and purpose of traveling could not be or is not classified. TU is often used when individual tracks are observed, or in telemetry surveys when it is only important to distinguish whether or not the animal was travelling.	Survey Observation		
Activity	A code indicating the activity of the animal when it was first detected or the activity that caused the sign, e.g. GR. INSTRUCTIONS: If observing a group then record the exact, sub sampled, or guesstimated mode activity of all the individuals in the group.	TW	Traveling, Walking	Traveling by walking. TW is used when the purpose of walking is not known. If the purpose of the walking is known then use a more specific description such as migrating; does not include traveling on a path	Survey Observation		
Activity	A code indicating the activity of the animal when it was first detected or the activity that caused the sign, e.g. GR. INSTRUCTIONS: If observing a group then record the exact, sub sampled, or guesstimated mode activity of all the individuals in the group.	TR	Traveling, Running	Traveling by running. TR is used when the specific purpose of running is not known. If the purpose of the running is known then use a more specific activity such as disturbed or fleeing.	Survey Observation		
Activity	A code indicating the activity of the animal when it was first detected or the activity that caused the sign, e.g. GR. INSTRUCTIONS: If observing a group then record the exact, sub sampled, or guesstimated mode activity of all the individuals in the group.	TP	Traveling on a Path	Walking on a trail that is embedded in the ground due to animals walking the same route for many years.	Survey Observation		
Activity	A code indicating the activity of the animal when it was first detected or the activity that caused the sign, e.g. GR. INSTRUCTIONS: If observing a group then record the exact, sub sampled, or guesstimated mode activity of all the individuals in the group.	TS	Traveling, Swimming	Traveling by swimming. TS is used when the specific purpose of swimming is not known. If the purpose of the swimming is known then use a more specific activity such as fleeing.	Survey Observation		

Column Name	Column Description	Code for in Column	Code Meaning	Code Description	Column For		
Activity	A code indicating the activity of the animal when it was first detected or the activity that caused the sign, e.g. GR. INSTRUCTIONS: If observing a group then record the exact, sub sampled, or guesstimated mode activity of all the individuals in the group.	TF	Traveling, Flying	Traveling by flying. TF is used when the purpose of flying is not known. If the purpose of the flying is known then use a more specific description such as hunting.	Survey Observation		
Activity	A code indicating the activity of the animal when it was first detected or the activity that caused the sign, e.g. GR. INSTRUCTIONS: If observing a group then record the exact, sub sampled, or guesstimated mode activity of all the individuals in the group.	TO	Traveling, Other	Traveling by a method other than flying, swimming, walking, or running; if purpose of traveling is known, use a more specific activity such as fleeing or migrating.	Survey Observation		
Activity	A code indicating the activity of the animal when it was first detected or the activity that caused the sign, e.g. GR. INSTRUCTIONS: If observing a group then record the exact, sub sampled, or guesstimated mode activity of all the individuals in the group.	UR	Urinating	Urinating	Survey Observation		
Sign Type	A code indicating the animal sign detected, e.g., HA.	AN	Antler	A solid, annually deciduous horn of a cervid.	Survey Observation		
Sign Type	A code indicating the animal sign detected, e.g., HA.	BE	Bed	Sign of bedding, sleeping, or resting above ground.	Survey Observation		
Sign Type	A code indicating the animal sign detected, e.g., HA.	BP	Body parts	Incidental portions of an animal's body which are left behind, but do not indicate the animal is dead	Survey Observation		
Sign Type	A code indicating the animal sign detected, e.g., HA.	BU	Burrow	A hole in the ground made by an animal	Survey Observation		
Sign Type	A code indicating the animal sign detected, e.g., HA.	CR	Carcass	A carcass or portions of a carcass that indicate the animal is dead.	Survey Observation		
Sign Type	A code indicating the animal sign detected, e.g., HA.	DC	Described in Comments	Sign is described in comments. Note: Describing the data in comments rather than using a predefined code may reduce the clarity and accessibility of data.	Survey Observation		
Sign Type	A code indicating the animal sign detected, e.g., HA.	DE	Den	Sign of sleeping or hiding in a cavity, cave, or burrow.	Survey Observation		
Sign Type	A code indicating the animal sign detected, e.g., HA.	ES	Egg shell		Survey Observation		
Sign Type	A code indicating the animal sign detected, e.g., HA.	EX	Excrement		Survey Observation		
Sign Type	A code indicating the animal sign detected, e.g., HA.	FD	Feeding	Sign of consuming food items	Survey Observation		
Sign Type	A code indicating the animal sign detected, e.g., HA.	FE	Feather		Survey Observation		
Sign Type	A code indicating the animal sign detected, e.g., HA.	HA	Hair		Survey Observation		
Sign Type	A code indicating the animal sign detected, e.g., HA.	LO	Lodge		Survey Observation		
Sign Type	A code indicating the animal sign detected, e.g., HA.	NE	Nest		Survey Observation		
Sign Type	A code indicating the animal sign detected, e.g., HA.	PG	Pellet group	A group of pellets of excrement	Survey Observation		
Sign Type	A code indicating the animal sign detected, e.g., HA.	SC	Scratchings		Survey Observation		
Sign Type	A code indicating the animal sign detected, e.g., HA.	RP	Regurgitated Pellet	An animal's pellet of waste discharged from the mouth	Survey Observation		
Sign Type	A code indicating the animal sign detected, e.g., HA.	SS	Shed Skin	A skin shed as a natural occurrence in an animals life cycle	Survey Observation		
Sign Type	A code indicating the animal sign detected, e.g., HA.	TA	Trail		Survey Observation		
Sign Type	A code indicating the animal sign detected, e.g., HA.	TR	Tracks		Survey Observation		
Sign Type	A code indicating the animal sign detected, e.g., HA.	WW	Whitewash	Excrement from a bird, usually from a predatory bird.	Survey Observation		
Sign or Sample Age	A code indicating the age of the sign or the age of the sample, e.g. W.	H	Hour	Sign or sample is less than 1 hour old	Survey Observation		
Sign or Sample Age	A code indicating the age of the sign or the age of the sample, e.g. W.	D	Day	Sign or sample is less than 1 day old and probably greater than 1 hour old	Survey Observation		
Sign or Sample Age	A code indicating the age of the sign or the age of the sample, e.g. W.	W	Week	Sign or sample is less than 1 week old and probably greater than 1 day old	Survey Observation		
Sign or Sample Age	A code indicating the age of the sign or the age of the sample, e.g. W.	M	Month	Sign or sample is less than 1 month old and probably greater than 1 week old	Survey Observation		
Sign or Sample Age	A code indicating the age of the sign or the age of the sample, e.g. W.	Y	Year	Sign or sample is less than 1 year old and probably greater than 1 month old	Survey Observation		
Sign or Sample Age	A code indicating the age of the sign or the age of the sample, e.g. W.	O	Old (> 1 year)	Sign or sample is greater than 1 year old	Survey Observation		
Sign or Sample Age	A code indicating the age of the sign or the age of the sample, e.g. W.	UC	Unclassified	Age of sign or sample is unclassified	Survey Observation		
Sign or Sample Age	A code indicating the age of the sign or the age of the sample, e.g. W.	DC	Described in Comments	Age of sign or sample is described in comments. Note: Describing the data in comments rather than using a predefined code may reduce the clarity and accessibility of data.	Survey Observation		
Sign Count	The number of sign. See project report for details.				Survey Observation		
Snow Cover (Percent)	The percent of the ground surface that is covered by snow. Measured within a 10 m radius of the individual or group detected.				Survey Observation		
Vegetation Cover (Percent)	The percent of ground that is covered by average canopy cover that restricts species visibility. Measured within a 10 m radius of the individual or group detected. Any vegetation that blocks the observers' view is considered part of the canopy.				Survey Observation		
MacroHab Feature	The type of macrohabitat feature the individual or group was found in association with, e.g., LA.	BN	Burn	A previously burned area	Survey Observation		
MacroHab Feature	The type of macrohabitat feature the individual or group was found in association with, e.g., LA.	CAV	Cave	A large underground chamber, typically of natural origin, in a hillside or cliff	Survey Observation		
MacroHab Feature	The type of macrohabitat feature the individual or group was found in association with, e.g., LA.	DCL	Dissected cliff	Steep, rocky ground where animal may traverse up or down the slope	Survey Observation		
MacroHab Feature	The type of macrohabitat feature the individual or group was found in association with, e.g., LA.	FOS	Flats or open slope	A landscape unit that is flat with gentle slopes less than 2 degrees	Survey Observation		
MacroHab Feature	The type of macrohabitat feature the individual or group was found in association with, e.g., LA.	FCN	Forest, conifer	A stand of coniferous-dominant forest	Survey Observation		
MacroHab Feature	The type of macrohabitat feature the individual or group was found in association with, e.g., LA.	FDC	Forest, deciduous	A stand of deciduous-dominant forest	Survey Observation		

Column Name	Column Description	Code for in Column	Code Meaning	Code Description	Column For		
MacroHab Feature	The type of macrohabitat feature the individual or group was found in association with, e.g., LA.	FMX	Forest, mixed	A forest stand consisting of both coniferous and deciduous trees in the canopy	Survey Observation		
MacroHab Feature	The type of macrohabitat feature the individual or group was found in association with, e.g., LA.	RPN	Riparian	The interface between land and a river or stream	Survey Observation		
MacroHab Feature	The type of macrohabitat feature the individual or group was found in association with, e.g., LA.	SA	Subalpine	Subalpine ecosystem occupies elevations immediately below tree-line, transitional to alpine	Survey Observation		
MacroHab Feature	The type of macrohabitat feature the individual or group was found in association with, e.g., LA.	TE	Terrace	Each of a series of flat areas made on a slope	Survey Observation		
MacroHab Feature	The type of macrohabitat feature the individual or group was found in association with, e.g., LA.	AP	Alpine	An ecosystem at high elevation and above the tree line	Survey Observation		
MacroHab Feature	The type of macrohabitat feature the individual or group was found in association with, e.g., LA.	ET	Electrical transmission line	Electrical transmission line right-of-way	Survey Observation		
MacroHab Feature	The type of macrohabitat feature the individual or group was found in association with, e.g., LA.	PI	Pipeline right-of-way		Survey Observation		
MacroHab Feature	The type of macrohabitat feature the individual or group was found in association with, e.g., LA.	RP	Road surface	Area cleared and compacted for vehicle transport	Survey Observation		
MacroHab Feature	The type of macrohabitat feature the individual or group was found in association with, e.g., LA.	RN	Railway surface	Roadbed with fixed rails for possibly single or multiple rail lines	Survey Observation		
MacroHab Feature	The type of macrohabitat feature the individual or group was found in association with, e.g., LA.	TC	Transportation or Transmission Corridor	ET Electrical transmission line right-of-way PI Pipeline right-of-way RP Road surface Area cleared and compacted for vehicle transport RN Railway surface	Survey Observation		
MacroHab Feature	The type of macrohabitat feature the individual or group was found in association with, e.g., LA.	EY	Estuary		Survey Observation		
MacroHab Feature	The type of macrohabitat feature the individual or group was found in association with, e.g., LA.	LA	Lake	Naturally occurring, static body of water > 2 m deep (> 50 ha)	Survey Observation		
MacroHab Feature	The type of macrohabitat feature the individual or group was found in association with, e.g., LA.	OW	Shallow open water	Wetland of permanent shallow open water (< 2 m deep); lacking extensive emergent plant cover	Survey Observation		
MacroHab Feature	The type of macrohabitat feature the individual or group was found in association with, e.g., LA.	PD	Pond	A small body of water > 2 m deep (< 50 ha)	Survey Observation		
MacroHab Feature	The type of macrohabitat feature the individual or group was found in association with, e.g., LA.	WC	Wetland complex	Many small (less than 0.5 hectare) ponds in close proximity to each other, or ponds connected in high water but separated with water levels drop.	Survey Observation		
MacroHab Feature	The type of macrohabitat feature the individual or group was found in association with, e.g., LA.	RI	River	Watercourse formed when water flows between continuous, definable banks	Survey Observation		
MacroHab Feature	The type of macrohabitat feature the individual or group was found in association with, e.g., LA.	CF	Cultivated field	Flat or gently rolling, non-forested, open area subject to human agricultural practices	Survey Observation		
MacroHab Feature	The type of macrohabitat feature the individual or group was found in association with, e.g., LA.	CO	Cultivated orchard	Agricultural area of fruit trees planted in rows.	Survey Observation		
MacroHab Feature	The type of macrohabitat feature the individual or group was found in association with, e.g., LA.	CV	Cultivated vineyard	Agricultural area of grapes planted in rows	Survey Observation		
MacroHab Feature	The type of macrohabitat feature the individual or group was found in association with, e.g., LA.	PA	Pasture		Survey Observation		
MacroHab Feature	The type of macrohabitat feature the individual or group was found in association with, e.g., LA.	CG	Cultivated or Agricultural	CF Cultivated field Flat or gently rolling, non-forested, open area subject to human agricultural practices CO Cultivated orchard Agricultural area of fruit trees planted in rows CV Cultivated vineyard Agricultural area of grapes planted in rows PA Pasture	Survey Observation		
MacroHab Feature	The type of macrohabitat feature the individual or group was found in association with, e.g., LA.	CU	Clearcut, unvegetated		Survey Observation		
MacroHab Feature	The type of macrohabitat feature the individual or group was found in association with, e.g., LA.	CH	Clearcut, herbaceous		Survey Observation		
MacroHab Feature	The type of macrohabitat feature the individual or group was found in association with, e.g., LA.	CS	Clearcut, shrubby		Survey Observation		
MacroHab Feature	The type of macrohabitat feature the individual or group was found in association with, e.g., LA.	FC	Forest, commercially thinned		Survey Observation		
MacroHab Feature	The type of macrohabitat feature the individual or group was found in association with, e.g., LA.	FY	Forest, young		Survey Observation		
MacroHab Feature	The type of macrohabitat feature the individual or group was found in association with, e.g., LA.	FM	Forest, mature		Survey Observation		
MacroHab Feature	The type of macrohabitat feature the individual or group was found in association with, e.g., LA.	FO	Forest, old		Survey Observation		
MacroHab Feature	The type of macrohabitat feature the individual or group was found in association with, e.g., LA.	FR	Forest Related	CH Clearcut, herbaceous CS Clearcut, shrubby CU Clearcut, unvegetated FC Forest, commercially thinned FM Forest, mature FO Forest, old FY Forest, young	Survey Observation		
MacroHab Feature	The type of macrohabitat feature the individual or group was found in association with, e.g., LA.	CL	Cliff	Steep, vertical or overhanging rock face.	Survey Observation		
MacroHab Feature	The type of macrohabitat feature the individual or group was found in association with, e.g., LA.	RO	Rock outcrop	Gentle to steep, bedrock escarpment or outcropping, with little soil development and sparse vegetation	Survey Observation		
MacroHab Feature	The type of macrohabitat feature the individual or group was found in association with, e.g., LA.	TA	Talus	Large angular rock fragments at the foot of steep rock slopes as a result of successive rock falls	Survey Observation		

Column Name	Column Description	Code for in Column	Code Meaning	Code Description	Column For		
MacroHab Feature	The type of macrohabitat feature the individual or group was found in association with, e.g., LA.	GC	Golf course	Grass-covered fairways and open areas for the playing of golf	Survey Observation		
MacroHab Feature	The type of macrohabitat feature the individual or group was found in association with, e.g., LA.	UR	Urban or Residential	BU Building, . GC Golf course Grass-covered fairways and open areas for the playing of golf GA Garden	Survey Observation		
MacroHab Feature	The type of macrohabitat feature the individual or group was found in association with, e.g., LA.	BS	Bush or Scrub land	Antelope bush or savannah type environments	Survey Observation		
MacroHab Feature	The type of macrohabitat feature the individual or group was found in association with, e.g., LA.	GR	Grassland		Survey Observation		
MacroHab Feature	The type of macrohabitat feature the individual or group was found in association with, e.g., LA.	VH	Avalanche track, herbaceous		Survey Observation		
MacroHab Feature	The type of macrohabitat feature the individual or group was found in association with, e.g., LA.	VS	Avalanche track, shrubby		Survey Observation		
MacroHab Feature	The type of macrohabitat feature the individual or group was found in association with, e.g., LA.	GB	Gravel bar	Elongated landform generated by waves and currents; a mix of cobbles, pebbles, stones, and/or sand	Survey Observation		
MacroHab Feature	The type of macrohabitat feature the individual or group was found in association with, e.g., LA.	DC	Described in Comments	The data is described in the comments field. Note: Describing the data in comments rather than using a predefined code may reduce the clarity and accessibility of data.	Survey Observation		
Study Area Name	The name of the Study Area in which the survey is conducted.□ INSTRUCTIONS: Spatial polygons should be submited for all study areas.□ The Study Area Name should indicate the geographic area for which the survey is being conducted. E.g. name of mountain, river valley, watershed, wildlife management unit.				Study Area		
Block Label	A unique identifier for each Block in a Project.□ INSTRUCTIONS: Spatial polygons and lines must be submited for all Blocks and Transects respectively.□ Labels must be 50 characters (including spaces), or shorter.□ Caution must be used when entering labels into Excel. Excel can misinterpret labels with dashes in them as dates. For example, 2-58 would reformat as February 1st, 1958. This may or may not be visible in Excel, but becomes evident during the process of loading data into SPI (the WSI database). To avoid this problem, also use letters in the Block label.□ If your design involves nesting, also use column Parent Block Label. For example, if Block C is nested within Block B and Block B is nested within Block A, the Parent Blocks are Block B and Block A, respectively.				Block		
Plot Label	A label that uniquely identifies a plot (i.e. a site description) at a site.□ INSTRUCTIONS: Caution must be used when entering labels into Excel. Excel can misinterpret labels with dashes in them as dates. For example, 2-58 would reformat as February 1st, 1958. This may or may not be visible in Excel, but becomes evident during the process of importing data into SPI (the WSI database). To avoid this problem, also use letters in the Plot Label.				Site Description		
Site Description Type	The type of site description being done.	G	Ground	This site description is a 'ground inspection'	Site Description		
Site Description Type	The type of site description being done.	V	Visual	This site description is a 'visual inspection'	Site Description		
Site Description Date	The date when the site description was made.				Site Description		
Observer First Name	The observer's first name.				Site Description		
Observer Last Name	The observer's last name.				Site Description		
Info About Observer	Information about the observer(s) recording the information.				Site Description		
Observer Email Address	The email address of the observer				Site Description		
Location	A text description of the location.□ INSTRUCTIONS: This description should include a gazetted name if possible.				Site Description		
Site Access Instructions	Instructions for accessing the site.				Site Description		
Mapsheet	The map sheet or marine chart that the observed site is on.				Site Description		
UTM Zone	The UTM zone in which the observation occurs.□ INSTRUCTIONS: Do not enter UTM coordinates if Long-Lat coordinates are provided.				Site Description		
Easting	The UTM east coordinate in metres for the observation recorded.□ INSTRUCTIONS: The value in this field must be a number, and it must be 6 digits long.□ UTM coordinates must be recorded using NAD 83 datum.□ Do not enter UTM coordinates if Long-Lat coordinates are provided.				Site Description		

Column Name	Column Description	Code for in Column	Code Meaning	Code Description	Column For		
Northing	The UTM north coordinate in metres for the observation recorded. INSTRUCTIONS: The value in this field must be a number, and it must be 7 digits long. UTM coordinates must be recorded using NAD 83 datum. Do not enter UTM coordinates if Long-Lat coordinates are provided.				Site Description		
Longitude (DD)	The longitude of the observation recorded, in decimal degrees. INSTRUCTIONS: Do not enter Long-Lat coordinates if UTM coordinates are provided.				Site Description		
Latitude (DD)	The latitude of the observation recorded, in decimal degrees. INSTRUCTIONS: Do not enter Long-Lat coordinates if UTM coordinates are provided.				Site Description		
Spatial Accuracy (m)	The measured or guesstimated spatial accuracy of the point in meters. INSTRUCTIONS: The value must be less than or equal to 5 digits long.				Site Description		
Habitat Description	A general description of the habitat.				Site Description		
Site Description Photos	A list of photos (or other Standard Digital Files*) that are associated with a Site. A distinct site is defined based on each unique combination of Observer Name, UTMs, and Site Description Date, if Site Description Date is included. INSTRUCTIONS: To easily add photo names to a cell, right-click on a cell and select 'WSI: Add File Names to Cell'. Photo names must not have spaces. To include comments about your photos, add a column named 'Site Description Photo Comments' or 'SD Photo Comments', and enter your comments. *Standard Digital Files are recognized by most operating systems To easily add photo names to a cell, right-click on a cell and select 'WSI: Add File Names to Cell'. Photo names must not have spaces. *Standard Digital Files are recognized by most operating systems and includes images, videos, and documents in formats such as PNG, JPG, JPEG, GIF, BMP, PDF, MP4, AVI, and TXT.				Site Description		
SD Photo Comments	Informative comments and/or notes about the photos, or other Standard Digital Files.				Site Description		
Site Condition	A description of the quality of biotic and abiotic factors within a site. INSTRUCTIONS: For example, the extent of invasive species and the health of individuals and/or populations may be considered; damage from herbivory, trampling, or disease may be considered.				Site Description		
Landscape Context	A description of the disturbances and/or threats, as related to the viability of individuals and/or populations of plants and fungi, at the landscape level. This information is used in BC CBlock Element Occurrence ranking. Refer to the following link for examples of threat types: http://cmp-openstandards.org/using-os/tools/threats-taxonomy/.				Site Description		
Ownership Type	The type of ownership of the land on which this site occurs. INSTRUCTIONS: Enter a code	C	Corporation	The observation occurred on land owned by a corporation.	Site Description		
Ownership Type	The type of ownership of the land on which this site occurs. INSTRUCTIONS: Enter a code	E	Estate	The observation occurred on an estate.	Site Description		
Ownership Type	The type of ownership of the land on which this site occurs. INSTRUCTIONS: Enter a code	F	Federal Government	The observation occurred on Federal government owned lands.	Site Description		
Ownership Type	The type of ownership of the land on which this site occurs. INSTRUCTIONS: Enter a code	F-CNP	Parks Canada	The observation occurred in a national park or ecological reserve.	Site Description		
Ownership Type	The type of ownership of the land on which this site occurs. INSTRUCTIONS: Enter a code	FN	First Nations Reserve	The observation occurred on First Nations Reserve lands.	Site Description		
Ownership Type	The type of ownership of the land on which this site occurs. INSTRUCTIONS: Enter a code	I	Private individual	The observation occurred on land owned by a private indivdual.	Site Description		
Ownership Type	The type of ownership of the land on which this site occurs. INSTRUCTIONS: Enter a code	L	Local Government	The observation occurred on local government owned lands.	Site Description		
Ownership Type	The type of ownership of the land on which this site occurs. INSTRUCTIONS: Enter a code	M	Municipal	The observation occurred on municipal lands.	Site Description		
Ownership Type	The type of ownership of the land on which this site occurs. INSTRUCTIONS: Enter a code	OTH	Other	The observation occurred on land owned by another type of group or individual.	Site Description		
Ownership Type	The type of ownership of the land on which this site occurs. INSTRUCTIONS: Enter a code	P	Private Organization	The observation occurred on land owned by a private organization.	Site Description		
Ownership Type	The type of ownership of the land on which this site occurs. INSTRUCTIONS: Enter a code	S	State/Provincial Gov.	The observation occurred on Provincial government owned lands.	Site Description		
Ownership Type	The type of ownership of the land on which this site occurs. INSTRUCTIONS: Enter a code	T	Trust	The observation occurred on lands governed by a trust.	Site Description		
Ownership Type	The type of ownership of the land on which this site occurs. INSTRUCTIONS: Enter a code	UNK	Unknown	The observer did not know who the landowner is.	Site Description		
Ownership Type	The type of ownership of the land on which this site occurs. INSTRUCTIONS: Enter a code	X	Partnership(legal entity)	The observation occurred on land owned by a legal partnership.	Site Description		
BGC Unit	The biogeoclimatic unit, including zone, subzone and variant.				Site Description		
Site Series Code 1	A two- or three-digit site series code and a coding for site series phases or seral designation, where recognized.				Site Description		

Column Name	Column Description	Code for in Column	Code Meaning	Code Description	Column For		
Site Series Code 2	A second site series used where site is uniform but transitional				Site Description		
Soil Moisture Regime	The moisture class of the soil.	0	Very xeric	Water supply removed very rapidly in relation to supply. Soil is moist for a negligiblbe time after precipiation.	Site Description		
Soil Moisture Regime	The moisture class of the soil.	1	Xeric	Water removed very rapidly in relation to supply; soilis moidt for brief periods following precipitation.	Site Description		
Soil Moisture Regime	The moisture class of the soil.	2	Subxeric	Water removed rapidly in relation to supply; soil is moist for short periods following precipitation	Site Description		
Soil Moisture Regime	The moisture class of the soil.	3	Submesic	Water removed readily in relation to supply; water available for moderately short periods following precipitation	Site Description		
Soil Moisture Regime	The moisture class of the soil.	4	Mesic	Water removed somewhat slowly in relation to supply; soil may remain moist for a significant, but sometimes short period of the year. Available soil moisture reflects climatic inputs	Site Description		
Soil Moisture Regime	The moisture class of the soil.	5	Subhygric	Water removed slowly enough to keep soil wet for a significant part of growing season; some temporary seepage and possibly mottling below 20 cm	Site Description		
Soil Moisture Regime	The moisture class of the soil.	6	Hydric	Water removed slowly enough to keep soil wet for most of growing season; permanent seepage and mottling; gleyed colours common	Site Description		
Soil Moisture Regime	The moisture class of the soil.	7	Subhydric	Water removed slowly enough to keep water table at or near surface for most of year; gleyed mineral or organic soils; permanent seepage < 30 cm below surface	Site Description		
Soil Moisture Regime	The moisture class of the soil.	8	Hydric	Water removed so slowly that water table is at or above soil surface all year; gleyed mineral or organic soils	Site Description		
Soil Nutrient Regime	The nutrient class of the soil.	A	Very Poor (VP)		Site Description		
Soil Nutrient Regime	The nutrient class of the soil.	B	Poor (P)		Site Description		
Soil Nutrient Regime	The nutrient class of the soil.	C	Medium (M)		Site Description		
Soil Nutrient Regime	The nutrient class of the soil.	D	Rich (R)		Site Description		
Soil Nutrient Regime	The nutrient class of the soil.	E	Very Rich (VR)		Site Description		
Soil Nutrient Regime	The nutrient class of the soil.	F	Saline (S)		Site Description		
Elevation (m)	The elevation of the site in metres.				Site Description		
Slope (Percent)	The slope gradient measured in percent.				Site Description		
Aspect (Degrees)	The orientation of the slope, in degrees.				Site Description		
Rooting Zone Soil Texture	The size distribution of the primary mineral particles (2 mm diameter or less).	CLAYEY	(SiCL, CL, SC, SiC, C)		Site Description		
Rooting Zone Soil Texture	The size distribution of the primary mineral particles (2 mm diameter or less).	LOAMY	Loamy (SL,L,SCL,FSL)		Site Description		
Rooting Zone Soil Texture	The size distribution of the primary mineral particles (2 mm diameter or less).	ORGANIC	Organic		Site Description		
Rooting Zone Soil Texture	The size distribution of the primary mineral particles (2 mm diameter or less).	SANDY	Sandy (LS, S)		Site Description		
Rooting Zone Soil Texture	The size distribution of the primary mineral particles (2 mm diameter or less).	SILTY	Silty (SiL, Si)		Site Description		
Meso Slope Position	The position of the site relative to the localized catchment area	CR	Crest	The generally convex uppermost portion of a hill; usually convex in all directions with no distinct aspect.	Site Description		
Meso Slope Position	The position of the site relative to the localized catchment area	UP	Upper slope	The generally convex upper portion of the slope immediately below the crest of a hill; has a specific aspect.	Site Description		
Meso Slope Position	The position of the site relative to the localized catchment area	MD	Middle slope	Area between the upper and lower slope; the surface profile is generally neither distinctly concave nor convex; has a straight or somewhat sigmoid surface profile with a specific aspect.	Site Description		
Meso Slope Position	The position of the site relative to the localized catchment area	LW	Lower slope	The area toward the base of a slope; generally has a concave surface profile with a specific aspect.	Site Description		
Meso Slope Position	The position of the site relative to the localized catchment area	TO	Toe	The area demarcated from the lower slope by an abrupt decrease in slope gradient; seepage is typically present.	Site Description		
Meso Slope Position	The position of the site relative to the localized catchment area	DP	Depression	Any area concave in all directions; may be at the base of a mesoscale slope or in a generally level area.	Site Description		
Meso Slope Position	The position of the site relative to the localized catchment area	LV	Level	Any level meso-scale area not immediately adjacent to a meso-scale slope; the surface profile is generally horizontal and straight with no significant aspect.	Site Description		
Meso Slope Position	The position of the site relative to the localized catchment area	GU	Gully	An area in a double toe slope position where the receiving area is also sloped (perpendicular to the toe slopes).	Site Description		
Structural Stage	The appearance of a stand or community using the characteristic life form and certain physical attributes.	1	Non-vegetated/sparse		Site Description		

Column Name	Column Description	Code for in Column	Code Meaning	Code Description	Column For		
Structural Stage	The appearance of a stand or community using the characteristic life form and certain physical attributes.	1a	Non-vegetated		Site Description		
Structural Stage	The appearance of a stand or community using the characteristic life form and certain physical attributes.	1b	Sparse		Site Description		
Structural Stage	The appearance of a stand or community using the characteristic life form and certain physical attributes.	1c	Bryoid		Site Description		
Structural Stage	The appearance of a stand or community using the characteristic life form and certain physical attributes.	2	Herb		Site Description		
Structural Stage	The appearance of a stand or community using the characteristic life form and certain physical attributes.	2a	Forb-dominated		Site Description		
Structural Stage	The appearance of a stand or community using the characteristic life form and certain physical attributes.	2b	Graminoid-dominated		Site Description		
Structural Stage	The appearance of a stand or community using the characteristic life form and certain physical attributes.	2c	Aquatic		Site Description		
Structural Stage	The appearance of a stand or community using the characteristic life form and certain physical attributes.	2d	Dwarf shrub		Site Description		
Structural Stage	The appearance of a stand or community using the characteristic life form and certain physical attributes.	3	Shrub/herb		Site Description		
Structural Stage	The appearance of a stand or community using the characteristic life form and certain physical attributes.	3a	Low shrub		Site Description		
Structural Stage	The appearance of a stand or community using the characteristic life form and certain physical attributes.	3b	Tall shrub		Site Description		
Structural Stage	The appearance of a stand or community using the characteristic life form and certain physical attributes.	4	Pole/Sapling		Site Description		
Structural Stage	The appearance of a stand or community using the characteristic life form and certain physical attributes.	5	Young Forest		Site Description		
Structural Stage	The appearance of a stand or community using the characteristic life form and certain physical attributes.	6	Mature Forest		Site Description		
Structural Stage	The appearance of a stand or community using the characteristic life form and certain physical attributes.	7	Old Forest		Site Description		
Terrain Texture 1 - Upper	A one-letter code indicating the 1st terrain texture of the upper stratigraphic layer.	a	Blocks		Site Description		
Terrain Texture 1 - Upper	A one-letter code indicating the 1st terrain texture of the upper stratigraphic layer.	b	Boulders		Site Description		
Terrain Texture 1 - Upper	A one-letter code indicating the 1st terrain texture of the upper stratigraphic layer.	c	Clay		Site Description		
Terrain Texture 1 - Upper	A one-letter code indicating the 1st terrain texture of the upper stratigraphic layer.	d	Mixed fragments		Site Description		
Terrain Texture 1 - Upper	A one-letter code indicating the 1st terrain texture of the upper stratigraphic layer.	e	Fabric		Site Description		
Terrain Texture 1 - Upper	A one-letter code indicating the 1st terrain texture of the upper stratigraphic layer.	g	Gravel		Site Description		
Terrain Texture 1 - Upper	A one-letter code indicating the 1st terrain texture of the upper stratigraphic layer.	h	Humic		Site Description		
Terrain Texture 1 - Upper	A one-letter code indicating the 1st terrain texture of the upper stratigraphic layer.	k	Cobble		Site Description		
Terrain Texture 1 - Upper	A one-letter code indicating the 1st terrain texture of the upper stratigraphic layer.	m	Mud		Site Description		
Terrain Texture 1 - Upper	A one-letter code indicating the 1st terrain texture of the upper stratigraphic layer.	p	Pebbles		Site Description		
Terrain Texture 1 - Upper	A one-letter code indicating the 1st terrain texture of the upper stratigraphic layer.	r	Rubble		Site Description		
Terrain Texture 1 - Upper	A one-letter code indicating the 1st terrain texture of the upper stratigraphic layer.	s	Sand		Site Description		
Terrain Texture 1 - Upper	A one-letter code indicating the 1st terrain texture of the upper stratigraphic layer.	u	Mesic		Site Description		
Terrain Texture 1 - Upper	A one-letter code indicating the 1st terrain texture of the upper stratigraphic layer.	x	Angular		Site Description		
Terrain Texture 1 - Upper	A one-letter code indicating the 1st terrain texture of the upper stratigraphic layer.	y	Shells		Site Description		
Terrain Texture 1 - Upper	A one-letter code indicating the 1st terrain texture of the upper stratigraphic layer.	z	Silt		Site Description		
Terrain Texture 2 - Upper	A one-letter code indicating the 2nd terrain texture of the upper stratigraphic layer.	a	Blocks		Site Description		
Terrain Texture 2 - Upper	A one-letter code indicating the 2nd terrain texture of the upper stratigraphic layer.	b	Boulders		Site Description		
Terrain Texture 2 - Upper	A one-letter code indicating the 2nd terrain texture of the upper stratigraphic layer.	c	Clay		Site Description		
Terrain Texture 2 - Upper	A one-letter code indicating the 2nd terrain texture of the upper stratigraphic layer.	d	Mixed fragments		Site Description		
Terrain Texture 2 - Upper	A one-letter code indicating the 2nd terrain texture of the upper stratigraphic layer.	e	Fabric		Site Description		
Terrain Texture 2 - Upper	A one-letter code indicating the 2nd terrain texture of the upper stratigraphic layer.	g	Gravel		Site Description		
Terrain Texture 2 - Upper	A one-letter code indicating the 2nd terrain texture of the upper stratigraphic layer.	h	Humic		Site Description		
Terrain Texture 2 - Upper	A one-letter code indicating the 2nd terrain texture of the upper stratigraphic layer.	k	Cobble		Site Description		
Terrain Texture 2 - Upper	A one-letter code indicating the 2nd terrain texture of the upper stratigraphic layer.	m	Mud		Site Description		
Terrain Texture 2 - Upper	A one-letter code indicating the 2nd terrain texture of the upper stratigraphic layer.	p	Pebbles		Site Description		
Terrain Texture 2 - Upper	A one-letter code indicating the 2nd terrain texture of the upper stratigraphic layer.	r	Rubble		Site Description		
Terrain Texture 2 - Upper	A one-letter code indicating the 2nd terrain texture of the upper stratigraphic layer.	s	Sand		Site Description		

Column Name	Column Description	Code for in Column	Code Meaning	Code Description	Column For		
Terrain Texture 2 - Upper	A one-letter code indicating the 2nd terrain texture of the upper stratigraphic layer.	u	Mesic		Site Description		
Terrain Texture 2 - Upper	A one-letter code indicating the 2nd terrain texture of the upper stratigraphic layer.	x	Angular		Site Description		
Terrain Texture 2 - Upper	A one-letter code indicating the 2nd terrain texture of the upper stratigraphic layer.	y	Shells		Site Description		
Terrain Texture 2 - Upper	A one-letter code indicating the 2nd terrain texture of the upper stratigraphic layer.	z	Silt		Site Description		
Terrain Texture 3 - Upper	A one-letter code indicating the 3rd terrain texture of the upper stratigraphic layer.	a	Blocks		Site Description		
Terrain Texture 3 - Upper	A one-letter code indicating the 3rd terrain texture of the upper stratigraphic layer.	b	Boulders		Site Description		
Terrain Texture 3 - Upper	A one-letter code indicating the 3rd terrain texture of the upper stratigraphic layer.	c	Clay		Site Description		
Terrain Texture 3 - Upper	A one-letter code indicating the 3rd terrain texture of the upper stratigraphic layer.	d	Mixed fragments		Site Description		
Terrain Texture 3 - Upper	A one-letter code indicating the 3rd terrain texture of the upper stratigraphic layer.	e	Fabric		Site Description		
Terrain Texture 3 - Upper	A one-letter code indicating the 3rd terrain texture of the upper stratigraphic layer.	g	Gravel		Site Description		
Terrain Texture 3 - Upper	A one-letter code indicating the 3rd terrain texture of the upper stratigraphic layer.	h	Humic		Site Description		
Terrain Texture 3 - Upper	A one-letter code indicating the 3rd terrain texture of the upper stratigraphic layer.	k	Cobble		Site Description		
Terrain Texture 3 - Upper	A one-letter code indicating the 3rd terrain texture of the upper stratigraphic layer.	m	Mud		Site Description		
Terrain Texture 3 - Upper	A one-letter code indicating the 3rd terrain texture of the upper stratigraphic layer.	p	Pebbles		Site Description		
Terrain Texture 3 - Upper	A one-letter code indicating the 3rd terrain texture of the upper stratigraphic layer.	r	Rubble		Site Description		
Terrain Texture 3 - Upper	A one-letter code indicating the 3rd terrain texture of the upper stratigraphic layer.	s	Sand		Site Description		
Terrain Texture 3 - Upper	A one-letter code indicating the 3rd terrain texture of the upper stratigraphic layer.	u	Mesic		Site Description		
Terrain Texture 3 - Upper	A one-letter code indicating the 3rd terrain texture of the upper stratigraphic layer.	x	Angular		Site Description		
Terrain Texture 3 - Upper	A one-letter code indicating the 3rd terrain texture of the upper stratigraphic layer.	y	Shells		Site Description		
Terrain Texture 3 - Upper	A one-letter code indicating the 3rd terrain texture of the upper stratigraphic layer.	z	Silt		Site Description		
Surficial Material 1 - Upper	A one- or two-letter code indicating the 1st surficial material of the upper stratigraphic layer.	A	Anthropogenic		Site Description		
Surficial Material 1 - Upper	A one- or two-letter code indicating the 1st surficial material of the upper stratigraphic layer.	C	Colluvium		Site Description		
Surficial Material 1 - Upper	A one- or two-letter code indicating the 1st surficial material of the upper stratigraphic layer.	D	Weathered bedrock		Site Description		
Surficial Material 1 - Upper	A one- or two-letter code indicating the 1st surficial material of the upper stratigraphic layer.	E	Eolian		Site Description		
Surficial Material 1 - Upper	A one- or two-letter code indicating the 1st surficial material of the upper stratigraphic layer.	F	Fluvial		Site Description		
Surficial Material 1 - Upper	A one- or two-letter code indicating the 1st surficial material of the upper stratigraphic layer.	FG	Glaciofluvial		Site Description		
Surficial Material 1 - Upper	A one- or two-letter code indicating the 1st surficial material of the upper stratigraphic layer.	I	Ice		Site Description		
Surficial Material 1 - Upper	A one- or two-letter code indicating the 1st surficial material of the upper stratigraphic layer.	L	Lacustrine		Site Description		
Surficial Material 1 - Upper	A one- or two-letter code indicating the 1st surficial material of the upper stratigraphic layer.	LG	Glaciolacustrine		Site Description		
Surficial Material 1 - Upper	A one- or two-letter code indicating the 1st surficial material of the upper stratigraphic layer.	M	Morainal		Site Description		
Surficial Material 1 - Upper	A one- or two-letter code indicating the 1st surficial material of the upper stratigraphic layer.	O	Organic		Site Description		
Surficial Material 1 - Upper	A one- or two-letter code indicating the 1st surficial material of the upper stratigraphic layer.	R	Bedrock		Site Description		
Surficial Material 1 - Upper	A one- or two-letter code indicating the 1st surficial material of the upper stratigraphic layer.	U	Undifferentiated		Site Description		
Surficial Material 1 - Upper	A one- or two-letter code indicating the 1st surficial material of the upper stratigraphic layer.	V	Volcanic		Site Description		
Surficial Material 1 - Upper	A one- or two-letter code indicating the 1st surficial material of the upper stratigraphic layer.	W	Marine		Site Description		
Surficial Material 1 - Upper	A one- or two-letter code indicating the 1st surficial material of the upper stratigraphic layer.	WG	Glaciomarine		Site Description		
Surficial Material 2 - Upper	A one- or two-letter code indicating the 2nd surficial material of the upper stratigraphic layer.	A	Anthropogenic		Site Description		
Surficial Material 2 - Upper	A one- or two-letter code indicating the 2nd surficial material of the upper stratigraphic layer.	C	Colluvium		Site Description		
Surficial Material 2 - Upper	A one- or two-letter code indicating the 2nd surficial material of the upper stratigraphic layer.	D	Weathered bedrock		Site Description		
Surficial Material 2 - Upper	A one- or two-letter code indicating the 2nd surficial material of the upper stratigraphic layer.	E	Eolian		Site Description		
Surficial Material 2 - Upper	A one- or two-letter code indicating the 2nd surficial material of the upper stratigraphic layer.	F	Fluvial		Site Description		
Surficial Material 2 - Upper	A one- or two-letter code indicating the 2nd surficial material of the upper stratigraphic layer.	FG	Glaciofluvial		Site Description		
Surficial Material 2 - Upper	A one- or two-letter code indicating the 2nd surficial material of the upper stratigraphic layer.	I	Ice		Site Description		

Column Name	Column Description	Code for in Column	Code Meaning	Code Description	Column For		
Surficial Material 2 - Upper	A one- or two-letter code indicating the 2nd surficial material of the upper stratigraphic layer.	L	Lacustrine		Site Description		
Surficial Material 2 - Upper	A one- or two-letter code indicating the 2nd surficial material of the upper stratigraphic layer.	LG	Glaciolacustrine		Site Description		
Surficial Material 2 - Upper	A one- or two-letter code indicating the 2nd surficial material of the upper stratigraphic layer.	M	Morainal		Site Description		
Surficial Material 2 - Upper	A one- or two-letter code indicating the 2nd surficial material of the upper stratigraphic layer.	O	Organic		Site Description		
Surficial Material 2 - Upper	A one- or two-letter code indicating the 2nd surficial material of the upper stratigraphic layer.	R	Bedrock		Site Description		
Surficial Material 2 - Upper	A one- or two-letter code indicating the 2nd surficial material of the upper stratigraphic layer.	U	Undifferentiated		Site Description		
Surficial Material 2 - Upper	A one- or two-letter code indicating the 2nd surficial material of the upper stratigraphic layer.	V	Volcanic		Site Description		
Surficial Material 2 - Upper	A one- or two-letter code indicating the 2nd surficial material of the upper stratigraphic layer.	W	Marine		Site Description		
Surficial Material 2 - Upper	A one- or two-letter code indicating the 2nd surficial material of the upper stratigraphic layer.	WG	Glaciomarine		Site Description		
Surficial Material 3 - Upper	A one- or two-letter code indicating the 3rd surficial material of the upper stratigraphic layer.	A	Anthropogenic		Site Description		
Surficial Material 3 - Upper	A one- or two-letter code indicating the 3rd surficial material of the upper stratigraphic layer.	C	Colluvium		Site Description		
Surficial Material 3 - Upper	A one- or two-letter code indicating the 3rd surficial material of the upper stratigraphic layer.	D	Weathered bedrock		Site Description		
Surficial Material 3 - Upper	A one- or two-letter code indicating the 3rd surficial material of the upper stratigraphic layer.	E	Eolian		Site Description		
Surficial Material 3 - Upper	A one- or two-letter code indicating the 3rd surficial material of the upper stratigraphic layer.	F	Fluvial		Site Description		
Surficial Material 3 - Upper	A one- or two-letter code indicating the 3rd surficial material of the upper stratigraphic layer.	FG	Glaciofluvial		Site Description		
Surficial Material 3 - Upper	A one- or two-letter code indicating the 3rd surficial material of the upper stratigraphic layer.	I	Ice		Site Description		
Surficial Material 3 - Upper	A one- or two-letter code indicating the 3rd surficial material of the upper stratigraphic layer.	L	Lacustrine		Site Description		
Surficial Material 3 - Upper	A one- or two-letter code indicating the 3rd surficial material of the upper stratigraphic layer.	LG	Glaciolacustrine		Site Description		
Surficial Material 3 - Upper	A one- or two-letter code indicating the 3rd surficial material of the upper stratigraphic layer.	M	Morainal		Site Description		
Surficial Material 3 - Upper	A one- or two-letter code indicating the 3rd surficial material of the upper stratigraphic layer.	O	Organic		Site Description		
Surficial Material 3 - Upper	A one- or two-letter code indicating the 3rd surficial material of the upper stratigraphic layer.	R	Bedrock		Site Description		
Surficial Material 3 - Upper	A one- or two-letter code indicating the 3rd surficial material of the upper stratigraphic layer.	U	Undifferentiated		Site Description		
Surficial Material 3 - Upper	A one- or two-letter code indicating the 3rd surficial material of the upper stratigraphic layer.	V	Volcanic		Site Description		
Surficial Material 3 - Upper	A one- or two-letter code indicating the 3rd surficial material of the upper stratigraphic layer.	W	Marine		Site Description		
Surficial Material 3 - Upper	A one- or two-letter code indicating the 3rd surficial material of the upper stratigraphic layer.	WG	Glaciomarine		Site Description		
Surface Expression 1 - Upper	A one-letter code indicating the 1st surface expression of the upper stratigraphic layer.	a	Moderate slope		Site Description		
Surface Expression 1 - Upper	A one-letter code indicating the 1st surface expression of the upper stratigraphic layer.	b	Blanket		Site Description		
Surface Expression 1 - Upper	A one-letter code indicating the 1st surface expression of the upper stratigraphic layer.	c	Cone(s)		Site Description		
Surface Expression 1 - Upper	A one-letter code indicating the 1st surface expression of the upper stratigraphic layer.	d	Depression(s)		Site Description		
Surface Expression 1 - Upper	A one-letter code indicating the 1st surface expression of the upper stratigraphic layer.	f	Fan(s)		Site Description		
Surface Expression 1 - Upper	A one-letter code indicating the 1st surface expression of the upper stratigraphic layer.	h	Hummock(s)		Site Description		
Surface Expression 1 - Upper	A one-letter code indicating the 1st surface expression of the upper stratigraphic layer.	j	Gentle slope		Site Description		
Surface Expression 1 - Upper	A one-letter code indicating the 1st surface expression of the upper stratigraphic layer.	k	Moderately steep slope		Site Description		
Surface Expression 1 - Upper	A one-letter code indicating the 1st surface expression of the upper stratigraphic layer.	m	Rolling		Site Description		
Surface Expression 1 - Upper	A one-letter code indicating the 1st surface expression of the upper stratigraphic layer.	p	Plain		Site Description		
Surface Expression 1 - Upper	A one-letter code indicating the 1st surface expression of the upper stratigraphic layer.	r	ridge(s)		Site Description		
Surface Expression 1 - Upper	A one-letter code indicating the 1st surface expression of the upper stratigraphic layer.	s	Steep slope		Site Description		

Column Name	Column Description	Code for in Column	Code Meaning	Code Description	Column For		
Surface Expression 1 - Upper	A one-letter code indicating the 1st surface expression of the upper stratigraphic layer.	t	Terrace(s)		Site Description		
Surface Expression 1 - Upper	A one-letter code indicating the 1st surface expression of the upper stratigraphic layer.	u	Undulating		Site Description		
Surface Expression 1 - Upper	A one-letter code indicating the 1st surface expression of the upper stratigraphic layer.	v	Veneer		Site Description		
Surface Expression 1 - Upper	A one-letter code indicating the 1st surface expression of the upper stratigraphic layer.	w	Mantle of variable thickness		Site Description		
Surface Expression 1 - Upper	A one-letter code indicating the 1st surface expression of the upper stratigraphic layer.	x	Thin veneer		Site Description		
Surface Expression 2 - Upper	A one-letter code indicating the 2nd surface expression of the upper stratigraphic layer.	a	Moderate slope		Site Description		
Surface Expression 2 - Upper	A one-letter code indicating the 2nd surface expression of the upper stratigraphic layer.	b	Blanket		Site Description		
Surface Expression 2 - Upper	A one-letter code indicating the 2nd surface expression of the upper stratigraphic layer.	c	Cone(s)		Site Description		
Surface Expression 2 - Upper	A one-letter code indicating the 2nd surface expression of the upper stratigraphic layer.	d	Depression(s)		Site Description		
Surface Expression 2 - Upper	A one-letter code indicating the 2nd surface expression of the upper stratigraphic layer.	f	Fan(s)		Site Description		
Surface Expression 2 - Upper	A one-letter code indicating the 2nd surface expression of the upper stratigraphic layer.	h	Hummock(s)		Site Description		
Surface Expression 2 - Upper	A one-letter code indicating the 2nd surface expression of the upper stratigraphic layer.	j	Gentle slope		Site Description		
Surface Expression 2 - Upper	A one-letter code indicating the 2nd surface expression of the upper stratigraphic layer.	k	Moderately steep slope		Site Description		
Surface Expression 2 - Upper	A one-letter code indicating the 2nd surface expression of the upper stratigraphic layer.	m	Rolling		Site Description		
Surface Expression 2 - Upper	A one-letter code indicating the 2nd surface expression of the upper stratigraphic layer.	p	Plain		Site Description		
Surface Expression 2 - Upper	A one-letter code indicating the 2nd surface expression of the upper stratigraphic layer.	r	ridge(s)		Site Description		
Surface Expression 2 - Upper	A one-letter code indicating the 2nd surface expression of the upper stratigraphic layer.	s	Steep slope		Site Description		
Surface Expression 2 - Upper	A one-letter code indicating the 2nd surface expression of the upper stratigraphic layer.	t	Terrace(s)		Site Description		
Surface Expression 2 - Upper	A one-letter code indicating the 2nd surface expression of the upper stratigraphic layer.	u	Undulating		Site Description		
Surface Expression 2 - Upper	A one-letter code indicating the 2nd surface expression of the upper stratigraphic layer.	v	Veneer		Site Description		
Surface Expression 2 - Upper	A one-letter code indicating the 2nd surface expression of the upper stratigraphic layer.	w	Mantle of variable thickness		Site Description		
Surface Expression 2 - Upper	A one-letter code indicating the 2nd surface expression of the upper stratigraphic layer.	x	Thin veneer		Site Description		
Surface Expression 3 - Upper	A one-letter code indicating the 3rd surface expression of the upper stratigraphic layer.	a	Moderate slope		Site Description		
Surface Expression 3 - Upper	A one-letter code indicating the 3rd surface expression of the upper stratigraphic layer.	b	Blanket		Site Description		
Surface Expression 3 - Upper	A one-letter code indicating the 3rd surface expression of the upper stratigraphic layer.	c	Cone(s)		Site Description		
Surface Expression 3 - Upper	A one-letter code indicating the 3rd surface expression of the upper stratigraphic layer.	d	Depression(s)		Site Description		
Surface Expression 3 - Upper	A one-letter code indicating the 3rd surface expression of the upper stratigraphic layer.	f	Fan(s)		Site Description		
Surface Expression 3 - Upper	A one-letter code indicating the 3rd surface expression of the upper stratigraphic layer.	h	Hummock(s)		Site Description		

Column Name	Column Description	Code for in Column	Code Meaning	Code Description	Column For		
Surface Expression 3 - Upper	A one-letter code indicating the 3rd surface expression of the upper stratigraphic layer.	j	Gentle slope		Site Description		
Surface Expression 3 - Upper	A one-letter code indicating the 3rd surface expression of the upper stratigraphic layer.	k	Moderately steep slope		Site Description		
Surface Expression 3 - Upper	A one-letter code indicating the 3rd surface expression of the upper stratigraphic layer.	m	Rolling		Site Description		
Surface Expression 3 - Upper	A one-letter code indicating the 3rd surface expression of the upper stratigraphic layer.	p	Plain		Site Description		
Surface Expression 3 - Upper	A one-letter code indicating the 3rd surface expression of the upper stratigraphic layer.	r	ridge(s)		Site Description		
Surface Expression 3 - Upper	A one-letter code indicating the 3rd surface expression of the upper stratigraphic layer.	s	Steep slope		Site Description		
Surface Expression 3 - Upper	A one-letter code indicating the 3rd surface expression of the upper stratigraphic layer.	t	Terrace(s)		Site Description		
Surface Expression 3 - Upper	A one-letter code indicating the 3rd surface expression of the upper stratigraphic layer.	u	Undulating		Site Description		
Surface Expression 3 - Upper	A one-letter code indicating the 3rd surface expression of the upper stratigraphic layer.	v	Veneer		Site Description		
Surface Expression 3 - Upper	A one-letter code indicating the 3rd surface expression of the upper stratigraphic layer.	w	Mantle of variable thickness		Site Description		
Surface Expression 3 - Upper	A one-letter code indicating the 3rd surface expression of the upper stratigraphic layer.	x	Thin veneer		Site Description		
Geomorphological Process 1 - Upper	A one-letter code indicating the 1st geomorphological process of the upper stratigraphic layer.	A	Avalanches		Site Description		
Geomorphological Process 1 - Upper	A one-letter code indicating the 1st geomorphological process of the upper stratigraphic layer.	B	Braiding		Site Description		
Geomorphological Process 1 - Upper	A one-letter code indicating the 1st geomorphological process of the upper stratigraphic layer.	C	Cryoturbation		Site Description		
Geomorphological Process 1 - Upper	A one-letter code indicating the 1st geomorphological process of the upper stratigraphic layer.	D	Deflation		Site Description		
Geomorphological Process 1 - Upper	A one-letter code indicating the 1st geomorphological process of the upper stratigraphic layer.	E	Channeled		Site Description		
Geomorphological Process 1 - Upper	A one-letter code indicating the 1st geomorphological process of the upper stratigraphic layer.	F	Slow mass		Site Description		
Geomorphological Process 1 - Upper	A one-letter code indicating the 1st geomorphological process of the upper stratigraphic layer.	H	Kettle		Site Description		
Geomorphological Process 1 - Upper	A one-letter code indicating the 1st geomorphological process of the upper stratigraphic layer.	I	Irregular channel		Site Description		
Geomorphological Process 1 - Upper	A one-letter code indicating the 1st geomorphological process of the upper stratigraphic layer.	J	Anastomosing Channel		Site Description		
Geomorphological Process 1 - Upper	A one-letter code indicating the 1st geomorphological process of the upper stratigraphic layer.	K	Karst		Site Description		
Geomorphological Process 1 - Upper	A one-letter code indicating the 1st geomorphological process of the upper stratigraphic layer.	L	Surface seepage		Site Description		
Geomorphological Process 1 - Upper	A one-letter code indicating the 1st geomorphological process of the upper stratigraphic layer.	M	Meandering channels		Site Description		
Geomorphological Process 1 - Upper	A one-letter code indicating the 1st geomorphological process of the upper stratigraphic layer.	N	Nivation		Site Description		
Geomorphological Process 1 - Upper	A one-letter code indicating the 1st geomorphological process of the upper stratigraphic layer.	P	Piping		Site Description		
Geomorphological Process 1 - Upper	A one-letter code indicating the 1st geomorphological process of the upper stratigraphic layer.	R	Rapid mass movement		Site Description		
Geomorphological Process 1 - Upper	A one-letter code indicating the 1st geomorphological process of the upper stratigraphic layer.	S	Solifluction		Site Description		
Geomorphological Process 1 - Upper	A one-letter code indicating the 1st geomorphological process of the upper stratigraphic layer.	U	Inundation		Site Description		
Geomorphological Process 1 - Upper	A one-letter code indicating the 1st geomorphological process of the upper stratigraphic layer.	V	Gully erosion		Site Description		
Geomorphological Process 1 - Upper	A one-letter code indicating the 1st geomorphological process of the upper stratigraphic layer.	W	Washing		Site Description		
Geomorphological Process 1 - Upper	A one-letter code indicating the 1st geomorphological process of the upper stratigraphic layer.	X	Permafrost		Site Description		
Geomorphological Process 1 - Upper	A one-letter code indicating the 1st geomorphological process of the upper stratigraphic layer.	Z	Periglacial processes		Site Description		
Geomorphological Process 2 - Upper	A one-letter code indicating the 2nd geomorphological process of the upper stratigraphic layer.	A	Avalanches		Site Description		
Geomorphological Process 2 - Upper	A one-letter code indicating the 2nd geomorphological process of the upper stratigraphic layer.	B	Braiding		Site Description		
Geomorphological Process 2 - Upper	A one-letter code indicating the 2nd geomorphological process of the upper stratigraphic layer.	C	Cryoturbation		Site Description		
Geomorphological Process 2 - Upper	A one-letter code indicating the 2nd geomorphological process of the upper stratigraphic layer.	D	Deflation		Site Description		
Geomorphological Process 2 - Upper	A one-letter code indicating the 2nd geomorphological process of the upper stratigraphic layer.	E	Channeled		Site Description		

Column Name	Column Description	Code for in Column	Code Meaning	Code Description	Column For		
Geomorphological Process 2 - Upper	A one-letter code indicating the 2nd geomorphological process of the upper stratigraphic layer.	F	Slow mass		Site Description		
Geomorphological Process 2 - Upper	A one-letter code indicating the 2nd geomorphological process of the upper stratigraphic layer.	H	Kettle		Site Description		
Geomorphological Process 2 - Upper	A one-letter code indicating the 2nd geomorphological process of the upper stratigraphic layer.	I	Irregular channel		Site Description		
Geomorphological Process 2 - Upper	A one-letter code indicating the 2nd geomorphological process of the upper stratigraphic layer.	J	Anastomosing Channel		Site Description		
Geomorphological Process 2 - Upper	A one-letter code indicating the 2nd geomorphological process of the upper stratigraphic layer.	K	Karst		Site Description		
Geomorphological Process 2 - Upper	A one-letter code indicating the 2nd geomorphological process of the upper stratigraphic layer.	L	Surface seepage		Site Description		
Geomorphological Process 2 - Upper	A one-letter code indicating the 2nd geomorphological process of the upper stratigraphic layer.	M	Meandering channels		Site Description		
Geomorphological Process 2 - Upper	A one-letter code indicating the 2nd geomorphological process of the upper stratigraphic layer.	N	Nivation		Site Description		
Geomorphological Process 2 - Upper	A one-letter code indicating the 2nd geomorphological process of the upper stratigraphic layer.	P	Piping		Site Description		
Geomorphological Process 2 - Upper	A one-letter code indicating the 2nd geomorphological process of the upper stratigraphic layer.	R	Rapid mass movement		Site Description		
Geomorphological Process 2 - Upper	A one-letter code indicating the 2nd geomorphological process of the upper stratigraphic layer.	S	Solifluction		Site Description		
Geomorphological Process 2 - Upper	A one-letter code indicating the 2nd geomorphological process of the upper stratigraphic layer.	U	Inundation		Site Description		
Geomorphological Process 2 - Upper	A one-letter code indicating the 2nd geomorphological process of the upper stratigraphic layer.	V	Gully erosion		Site Description		
Geomorphological Process 2 - Upper	A one-letter code indicating the 2nd geomorphological process of the upper stratigraphic layer.	W	Washing		Site Description		
Geomorphological Process 2 - Upper	A one-letter code indicating the 2nd geomorphological process of the upper stratigraphic layer.	X	Permafrost		Site Description		
Geomorphological Process 2 - Upper	A one-letter code indicating the 2nd geomorphological process of the upper stratigraphic layer.	Z	Periglacial processes		Site Description		
Geomorphological Process 3 - Upper	A one-letter code indicating the 3rd geomorphological process of the upper stratigraphic layer.	A	Avalanches		Site Description		
Geomorphological Process 3 - Upper	A one-letter code indicating the 3rd geomorphological process of the upper stratigraphic layer.	B	Braiding		Site Description		
Geomorphological Process 3 - Upper	A one-letter code indicating the 3rd geomorphological process of the upper stratigraphic layer.	C	Cryoturbation		Site Description		
Geomorphological Process 3 - Upper	A one-letter code indicating the 3rd geomorphological process of the upper stratigraphic layer.	D	Deflation		Site Description		
Geomorphological Process 3 - Upper	A one-letter code indicating the 3rd geomorphological process of the upper stratigraphic layer.	E	Channeled		Site Description		
Geomorphological Process 3 - Upper	A one-letter code indicating the 3rd geomorphological process of the upper stratigraphic layer.	F	Slow mass		Site Description		
Geomorphological Process 3 - Upper	A one-letter code indicating the 3rd geomorphological process of the upper stratigraphic layer.	H	Kettle		Site Description		
Geomorphological Process 3 - Upper	A one-letter code indicating the 3rd geomorphological process of the upper stratigraphic layer.	I	Irregular channel		Site Description		
Geomorphological Process 3 - Upper	A one-letter code indicating the 3rd geomorphological process of the upper stratigraphic layer.	J	Anastomosing Channel		Site Description		
Geomorphological Process 3 - Upper	A one-letter code indicating the 3rd geomorphological process of the upper stratigraphic layer.	K	Karst		Site Description		
Geomorphological Process 3 - Upper	A one-letter code indicating the 3rd geomorphological process of the upper stratigraphic layer.	L	Surface seepage		Site Description		
Geomorphological Process 3 - Upper	A one-letter code indicating the 3rd geomorphological process of the upper stratigraphic layer.	M	Meandering channels		Site Description		
Geomorphological Process 3 - Upper	A one-letter code indicating the 3rd geomorphological process of the upper stratigraphic layer.	N	Nivation		Site Description		
Geomorphological Process 3 - Upper	A one-letter code indicating the 3rd geomorphological process of the upper stratigraphic layer.	P	Piping		Site Description		
Geomorphological Process 3 - Upper	A one-letter code indicating the 3rd geomorphological process of the upper stratigraphic layer.	R	Rapid mass movement		Site Description		
Geomorphological Process 3 - Upper	A one-letter code indicating the 3rd geomorphological process of the upper stratigraphic layer.	S	Solifluction		Site Description		
Geomorphological Process 3 - Upper	A one-letter code indicating the 3rd geomorphological process of the upper stratigraphic layer.	U	Inundation		Site Description		
Geomorphological Process 3 - Upper	A one-letter code indicating the 3rd geomorphological process of the upper stratigraphic layer.	V	Gully erosion		Site Description		
Geomorphological Process 3 - Upper	A one-letter code indicating the 3rd geomorphological process of the upper stratigraphic layer.	W	Washing		Site Description		
Geomorphological Process 3 - Upper	A one-letter code indicating the 3rd geomorphological process of the upper stratigraphic layer.	X	Permafrost		Site Description		
Geomorphological Process 3 - Upper	A one-letter code indicating the 3rd geomorphological process of the upper stratigraphic layer.	Z	Periglacial processes		Site Description		
Soil Drainage	The speed and extent to which water is removed from a mineral soil.	x	Very rapidly drained	Water is removed from the soil very rapidly in relation to supply. Water source is precipitation and available water storage capacity following precipitation is essentially nil. Soils are typically fragmental or skeletal, shallow, or both.	Site Description		
Soil Drainage	The speed and extent to which water is removed from a mineral soil.	r	Rapidly drained	Water is removed from the soil rapidly in relation to supply. Excess water flows downward if underlying material is pervious. Subsurface flow may occur on steep gradients during heavy rainfall. Water source is precipitation. Soils are generally coarse textured.	Site Description		

Column Name	Column Description	Code for in Column	Code Meaning	Code Description	Column For		
Soil Drainage	The speed and extent to which water is removed from a mineral soil.	w	Well drained	Water is removed from the soil readily, but not rapidly. Excess water flows downward readily into underlying pervious material or laterally as subsurface flow. Water source is precipitation. On slopes, subsurface flow may occur for short durations, but additions are equalled by losses. Soils are generally intermediate in texture and lack restricting layers.	Site Description		
Soil Drainage	The speed and extent to which water is removed from a mineral soil.	m	Moderately well drained	Water is removed from the soil somewhat slowly in relation to supply because of imperviousness or lack of gradient. Precipitation is the dominant water source in medium- to fine- textured soils; precipitation and significant additions by subsurface flow are necessary in coarse-textured soils.	Site Description		
Soil Drainage	The speed and extent to which water is removed from a mineral soil.	i	Imperfectly drained	Water is removed from the soil sufficiently slowly in relation to supply to keep the soil wet for a significant part of the growing season. Excess water moves slowly downward if precipitation is the major source. If subsurface water or groundwater (or both) is the main source, the flow rate may vary but the soil remains wet for a significant part of the growing season.	Site Description		
Soil Drainage	The speed and extent to which water is removed from a mineral soil.	p	Poorly drained	Water is removed so slowly in relation to supply that the soil remains wet for much of the time that it is not frozen. Excess water is evident in the soil for a large part of the time. Subsurface or groundwater flow (or both), in addition to precipitation, are the main water sources. A perched water table may be present. Soils are generally mottled and/or gleyed.	Site Description		
Soil Drainage	The speed and extent to which water is removed from a mineral soil.	v	Very poorly drained	Water is removed from the soil so slowly that the water table remains at or near the surface for most of the time the soil is not frozen. Groundwater flow and subsurface flow are the major water sources. Precipitation is less important, except where there is a perched water table with precipitation exceeding evapotranspiration. Typically associated with wetlands.	Site Description		
Humus Form	The structure of the humus.	R	Mor		Site Description		
Humus Form	The structure of the humus.	HR	Hemimor		Site Description		
Humus Form	The structure of the humus.	UR	Humimor		Site Description		
Humus Form	The structure of the humus.	RR	Resimor		Site Description		
Humus Form	The structure of the humus.	LR	Lignomor		Site Description		
Humus Form	The structure of the humus.	YR	Hydromor		Site Description		
Humus Form	The structure of the humus.	FR	Fibrimor		Site Description		
Humus Form	The structure of the humus.	MR	Mesimor		Site Description		
Humus Form	The structure of the humus.	D	Moder		Site Description		
Humus Form	The structure of the humus.	RD	Mormoder		Site Description		
Humus Form	The structure of the humus.	TD	Leptomoder		Site Description		
Humus Form	The structure of the humus.	MD	Mullmoder		Site Description		
Humus Form	The structure of the humus.	LD	Lignomoder		Site Description		
Humus Form	The structure of the humus.	YD	Hydromoder		Site Description		
Humus Form	The structure of the humus.	SD	Saprimoder		Site Description		
Humus Form	The structure of the humus.	L	Mull		Site Description		
Humus Form	The structure of the humus.	VL	Vermimull		Site Description		
Humus Form	The structure of the humus.	ZL	Rhizomull		Site Description		
Humus Form	The structure of the humus.	YL	Hydromull		Site Description		
Rooting Zone Coarse Fragment %	The particle size distribution within the mineral portion of the rooting zone.				Site Description		
Root Restriction Depth (cm)	The depth of the layer that restricts root penetration.				Site Description		
Root Restriction Layer	The type of layer that prevents the penetration of roots.	C	Strongly cemented horizon		Site Description		
Root Restriction Layer	The type of layer that prevents the penetration of roots.	P	Clay pan or restriction due to fines		Site Description		
Root Restriction Layer	The type of layer that prevents the penetration of roots.	K	Compacted morainal material		Site Description		
Root Restriction Layer	The type of layer that prevents the penetration of roots.	L	Lithic Contact		Site Description		
Root Restriction Layer	The type of layer that prevents the penetration of roots.	W	Excessive moisture	Roots are being restricted by excessive moisture, but does not require the presence of free water at the time of sampling.	Site Description		
Root Restriction Layer	The type of layer that prevents the penetration of roots.	X	Excessive accumulation of chemicals	Excessive accumulations of chemicals within the profile which inhibit root growth (e.g., $CaCO_3$)	Site Description		
Root Restriction Layer	The type of layer that prevents the penetration of roots.	Z	Permafrost	Ice cementation, ice lenses, or massive ice	Site Description		
Root Restriction Layer	The type of layer that prevents the penetration of roots.	N	No root restriction evident		Site Description		
SPI_SITE_OBSERVATIONS.SOIL_PH	Concentration of hydrogen ions in the mineral soil.						

Column Name	Column Description	Code for in Column	Code Meaning	Code Description	Column For		
Site Comments	Informative comment(s) about the site.□ INSTRUCTIONS: If you provide site comments, ensure that column 'Site Description Date' is also present and populated.				Site Description		
Crown Closure	The percentage of the ground surface covered when the crowns are projected vertically.				Site Description		
Insert Predefined Site Description Column	You may insert additional predefined columns and codes relevant to Site Descriptions.□ INSTRUCTIONS: Double-click on the column header again now (while Data-entry Assistant is open) to insert predefined columns and codes relevant to Site Descriptions.						
Species	The code that identifies the species or subspecies of wildlife.□ INSTRUCTIONS: Use code 'NULL' if none of the target taxa are detected.□ Codes are at:□ http://a100.gov.bc.ca/pub/eswp/□ Additional codes are at:□ https://spc-env.gov.bc.ca/wildlife/comm/Projreg/Lists/LookupSpecies%20Codes2/AllItems.aspx□ If the species is unknown, the wildlife may be identified at a higher taxonomic level such as Genus, or Family by recording the complete Genus or Family name.						
Date & Time	The date and, optionally, time of the observation(s).□ INSTRUCTIONS: For clarity, on your field forms do not use a 2-digit month format nor a 2-digit year format. A reliable format is dd-mmm-yyyy (e.g. '7 Jun 2008' or '7-Jun-2008').□ When entering the date into Excel ensure that Excel interprets it as correct date information.□ Similarly, for clarity use a 24 hour time format with colons (e.g. 13:45) and ensure that Excel interprets it as correct time information.				Incidental Observation		
Activity	The activity of the animal when it was first detected or the activity that caused the sign, e.g. GR.□ INSTRUCTIONS: If observing a group then record the exact, sub sampled, or guesstimated mode activity of all the individuals in the group.	AL	Alert	Activity with the purpose of detecting predators. E.g. guard or sentry duty.	Incidental Observation		
Activity	The activity of the animal when it was first detected or the activity that caused the sign, e.g. GR.□ INSTRUCTIONS: If observing a group then record the exact, sub sampled, or guesstimated mode activity of all the individuals in the group.	AN	Antler (not an activity)	A solid, annually deciduous horn of a cervid	Incidental Observation		
Activity	The activity of the animal when it was first detected or the activity that caused the sign, e.g. GR.□ INSTRUCTIONS: If observing a group then record the exact, sub sampled, or guesstimated mode activity of all the individuals in the group.	AP	Avoiding Pests	Avoiding pests. E.g. seeing caribou standing on snow fields during summer when insects are abundant.	Incidental Observation		
Activity	The activity of the animal when it was first detected or the activity that caused the sign, e.g. GR.□ INSTRUCTIONS: If observing a group then record the exact, sub sampled, or guesstimated mode activity of all the individuals in the group.	BA	Basking	Behaviour for the purpose of gathering warmth. E.g. Seeing a marmot or snake lying on warm rocks.	Incidental Observation		
Activity	The activity of the animal when it was first detected or the activity that caused the sign, e.g. GR.□ INSTRUCTIONS: If observing a group then record the exact, sub sampled, or guesstimated mode activity of all the individuals in the group.	BE	Bedding	Bedding, sleeping, or resting above ground; includes bedding for the purpose of cud chewing but does not include loafing.	Incidental Observation		
Activity	The activity of the animal when it was first detected or the activity that caused the sign, e.g. GR.□ INSTRUCTIONS: If observing a group then record the exact, sub sampled, or guesstimated mode activity of all the individuals in the group.	BP	Body parts (not an activity)	Incidental portions of an animal's body which are left behind, but do not indicate the animal is dead; e.g., feathers, hair, and shed skins; shed antlers are recorded as AN	Incidental Observation		
Activity	The activity of the animal when it was first detected or the activity that caused the sign, e.g. GR.□ INSTRUCTIONS: If observing a group then record the exact, sub sampled, or guesstimated mode activity of all the individuals in the group.	BU	Building	Building a nest, bed, burrow, den, lodge, or other dwelling.	Incidental Observation		
Activity	The activity of the animal when it was first detected or the activity that caused the sign, e.g. GR.□ INSTRUCTIONS: If observing a group then record the exact, sub sampled, or guesstimated mode activity of all the individuals in the group.	CA	Casting	Discharging bodily waste from the mouth. E.g. Seeing an owl or snake casting pellets.	Incidental Observation		
Activity	The activity of the animal when it was first detected or the activity that caused the sign, e.g. GR.□ INSTRUCTIONS: If observing a group then record the exact, sub sampled, or guesstimated mode activity of all the individuals in the group.	CO	Courting	Behaviour for the purpose of enticing a conspecific of the opposite sex into copulation; includes copulation, courtship feeding, and defense of mates.	Incidental Observation		
Activity	The activity of the animal when it was first detected or the activity that caused the sign, e.g. GR.□ INSTRUCTIONS: If observing a group then record the exact, sub sampled, or guesstimated mode activity of all the individuals in the group.	CR	Carcass (not an activity)	A carcass, or portions of a carcass, that indicates the animal is dead	Incidental Observation		

Column Name	Column Description	Code for in Column	Code Meaning	Code Description	Column For		
Activity	The activity of the animal when it was first detected or the activity that caused the sign, e.g. GR.□ INSTRUCTIONS: If observing a group then record the exact, sub sampled, or guesstimated mode activity of all the individuals in the group.	DE	Denning	Sleeping or hiding in a cavity, cave, or burrow; does not include hibernating.	Incidental Observation		
Activity	The activity of the animal when it was first detected or the activity that caused the sign, e.g. GR.□ INSTRUCTIONS: If observing a group then record the exact, sub sampled, or guesstimated mode activity of all the individuals in the group.	DC	Described in Comments	The activity is described in the comments field. Note: Describing the data in comments rather than using a predefined code may reduce the clarity and accessibility of data.	Incidental Observation		
Activity	The activity of the animal when it was first detected or the activity that caused the sign, e.g. GR.□ INSTRUCTIONS: If observing a group then record the exact, sub sampled, or guesstimated mode activity of all the individuals in the group.	DI	Disturbed	Behaviour for the purpose of avoiding the observer; use only if the activity before disturbance is not known.	Incidental Observation		
Activity	The activity of the animal when it was first detected or the activity that caused the sign, e.g. GR.□ INSTRUCTIONS: If observing a group then record the exact, sub sampled, or guesstimated mode activity of all the individuals in the group.	DR	Drinking		Incidental Observation		
Activity	The activity of the animal when it was first detected or the activity that caused the sign, e.g. GR.□ INSTRUCTIONS: If observing a group then record the exact, sub sampled, or guesstimated mode activity of all the individuals in the group.	EX	Excreting	Discharging waste through the anus.	Incidental Observation		
Activity	The activity of the animal when it was first detected or the activity that caused the sign, e.g. GR.□ INSTRUCTIONS: If observing a group then record the exact, sub sampled, or guesstimated mode activity of all the individuals in the group.	FD	Feeding	Consuming food items. Does not include hunting, except when animals hunt and eat simultaneously, such as grazers, browsers, and flying insectivores.	Incidental Observation		
Activity	The activity of the animal when it was first detected or the activity that caused the sign, e.g. GR.□ INSTRUCTIONS: If observing a group then record the exact, sub sampled, or guesstimated mode activity of all the individuals in the group.	FL	Fleeing	Hurried movement to avoid a conspecifics or other animal; does not include fleeing to avoid the observer.	Incidental Observation		
Activity	The activity of the animal when it was first detected or the activity that caused the sign, e.g. GR.□ INSTRUCTIONS: If observing a group then record the exact, sub sampled, or guesstimated mode activity of all the individuals in the group.	FS	Feeding, salmonid	Feeding on salmonds during a salmonid run	Incidental Observation		
Activity	The activity of the animal when it was first detected or the activity that caused the sign, e.g. GR.□ INSTRUCTIONS: If observing a group then record the exact, sub sampled, or guesstimated mode activity of all the individuals in the group.	GR	Grooming	Behaviour for the purpose of arranging and protecting the fur, feathers, skin, etc. Includes scratching and rubbing of antler velvet.	Incidental Observation		
Activity	The activity of the animal when it was first detected or the activity that caused the sign, e.g. GR.□ INSTRUCTIONS: If observing a group then record the exact, sub sampled, or guesstimated mode activity of all the individuals in the group.	HI	Hibernating	Hibernating	Incidental Observation		
Activity	The activity of the animal when it was first detected or the activity that caused the sign, e.g. GR.□ INSTRUCTIONS: If observing a group then record the exact, sub sampled, or guesstimated mode activity of all the individuals in the group.	HU	Hunting	Searching for, pursuing, and killing prey. For animals which hunt and eat simultaneously, such as grazers, browsers, and flying insectivores, the activity is recorded as eating	Incidental Observation		
Activity	The activity of the animal when it was first detected or the activity that caused the sign, e.g. GR.□ INSTRUCTIONS: If observing a group then record the exact, sub sampled, or guesstimated mode activity of all the individuals in the group.	IM	Ingesting Minerals	Ingesting minerals by eating or licking a substance for the purpose of ingesting minerals.	Incidental Observation		
Activity	The activity of the animal when it was first detected or the activity that caused the sign, e.g. GR.□ INSTRUCTIONS: If observing a group then record the exact, sub sampled, or guesstimated mode activity of all the individuals in the group.	IN	Incubating	Incubating, protecting, or laying eggs.	Incidental Observation		
Activity	The activity of the animal when it was first detected or the activity that caused the sign, e.g. GR.□ INSTRUCTIONS: If observing a group then record the exact, sub sampled, or guesstimated mode activity of all the individuals in the group.	LI	Living	Activity that could not be classified due to ignorance or the activity being too diverse.	Incidental Observation		
Activity	The activity of the animal when it was first detected or the activity that caused the sign, e.g. GR.□ INSTRUCTIONS: If observing a group then record the exact, sub sampled, or guesstimated mode activity of all the individuals in the group.	MD	Migrating Daily	Traveling that is a regular daily activity; includes traveling to or away from a communal habitat. E.g. seeing a bat on its daily flight to or from a roosting site.	Incidental Observation		
Activity	The activity of the animal when it was first detected or the activity that caused the sign, e.g. GR.□ INSTRUCTIONS: If observing a group then record the exact, sub sampled, or guesstimated mode activity of all the individuals in the group.	MS	Migrating Seasonally	Traveling that is a regular annual activity. E.g. seeing an elk or a Sandhill Crane on its migration route, or seeing a snake traveling away from a communal habitat such as a hibernaculum.	Incidental Observation		
Activity	The activity of the animal when it was first detected or the activity that caused the sign, e.g. GR.□ INSTRUCTIONS: If observing a group then record the exact, sub sampled, or guesstimated mode activity of all the individuals in the group.	RB	Reproducing, birthing	Giving birth to live young; preparing a birthing site, such as a den	Incidental Observation		

Column Name	Column Description	Code for in Column	Code Meaning	Code Description	Column For		
Activity	The activity of the animal when it was first detected or the activity that caused the sign, e.g. GR.□ INSTRUCTIONS: If observing a group then record the exact, sub sampled, or guesstimated mode activity of all the individuals in the group.	RE	Reproducing, eggs	Laying eggs (amphibians, reptiles and birds), building a nest, and feeding non-mobile young	Incidental Observation		
Activity	The activity of the animal when it was first detected or the activity that caused the sign, e.g. GR.□ INSTRUCTIONS: If observing a group then record the exact, sub sampled, or guesstimated mode activity of all the individuals in the group.	RR	Rearing	Adults feeding neonates and juveniles.	Incidental Observation		
Activity	The activity of the animal when it was first detected or the activity that caused the sign, e.g. GR.□ INSTRUCTIONS: If observing a group then record the exact, sub sampled, or guesstimated mode activity of all the individuals in the group.	SA	Standing	Standing; used when the specific purpose of standing is not known. If the purpose of standing is know then use a more specific activity such as alert or feeding.	Incidental Observation		
Activity	The activity of the animal when it was first detected or the activity that caused the sign, e.g. GR.□ INSTRUCTIONS: If observing a group then record the exact, sub sampled, or guesstimated mode activity of all the individuals in the group.	TH	Thermal Habitat	Animals using habitat for the purpose of protecting themselves from heat, cold, or precipitation	Incidental Observation		
Activity	The activity of the animal when it was first detected or the activity that caused the sign, e.g. GR.□ INSTRUCTIONS: If observing a group then record the exact, sub sampled, or guesstimated mode activity of all the individuals in the group.	SH	Security Habitat	Using habitat for protection or hiding from predators.	Incidental Observation		
Activity	The activity of the animal when it was first detected or the activity that caused the sign, e.g. GR.□ INSTRUCTIONS: If observing a group then record the exact, sub sampled, or guesstimated mode activity of all the individuals in the group.	ST	Security and Thermal	Using habitat for its security and thermal values	Incidental Observation		
Activity	The activity of the animal when it was first detected or the activity that caused the sign, e.g. GR.□ INSTRUCTIONS: If observing a group then record the exact, sub sampled, or guesstimated mode activity of all the individuals in the group.	TE	Territoriality	Behaviour for the purpose of marking or defending a territory; may include singing, drumming, winnowing, howling	Incidental Observation		
Activity	The activity of the animal when it was first detected or the activity that caused the sign, e.g. GR.□ INSTRUCTIONS: If observing a group then record the exact, sub sampled, or guesstimated mode activity of all the individuals in the group.	NT	Not Travelling	Not travelling. NT is typically used in telemetry surveys when it is only important to distinguish whether or not the animal was travelling.	Incidental Observation		
Activity	The activity of the animal when it was first detected or the activity that caused the sign, e.g. GR.□ INSTRUCTIONS: If observing a group then record the exact, sub sampled, or guesstimated mode activity of all the individuals in the group.	TU	Traveling, Unclassified	Travelling, but the method and purpose of traveling could not be or is not classified. TU is often used when individual tracks are observed, or in telemetry surveys when it is only important to distinguish whether or not the animal was travelling.	Incidental Observation		
Activity	The activity of the animal when it was first detected or the activity that caused the sign, e.g. GR.□ INSTRUCTIONS: If observing a group then record the exact, sub sampled, or guesstimated mode activity of all the individuals in the group.	TW	Traveling, Walking	Traveling by walking. TW is used when the purpose of walking is not known. If the purpose of the walking is known then use a more specific description such as migrating; does not include traveling on a path	Incidental Observation		
Activity	The activity of the animal when it was first detected or the activity that caused the sign, e.g. GR.□ INSTRUCTIONS: If observing a group then record the exact, sub sampled, or guesstimated mode activity of all the individuals in the group.	TR	Traveling, Running	Traveling by running. TR is used when the specific purpose of running is not known. If the purpose of the running is known then use a more specific activity such as disturbed or fleeing.	Incidental Observation		
Activity	The activity of the animal when it was first detected or the activity that caused the sign, e.g. GR.□ INSTRUCTIONS: If observing a group then record the exact, sub sampled, or guesstimated mode activity of all the individuals in the group.	TP	Traveling on a Path	Walking on a trail that is embedded in the ground due to animals walking the same route for many years.	Incidental Observation		
Activity	The activity of the animal when it was first detected or the activity that caused the sign, e.g. GR.□ INSTRUCTIONS: If observing a group then record the exact, sub sampled, or guesstimated mode activity of all the individuals in the group.	TS	Traveling, Swimming	Traveling by swimming. TS is used when the specific purpose of swimming is not known. If the purpose of the swimming is known then use a more specific activity such as fleeing.	Incidental Observation		
Activity	The activity of the animal when it was first detected or the activity that caused the sign, e.g. GR.□ INSTRUCTIONS: If observing a group then record the exact, sub sampled, or guesstimated mode activity of all the individuals in the group.	TF	Traveling, Flying	Traveling by flying. TF is used when the purpose of flying is not known. If the purpose of the flying is known then use a more specific description such as hunting.	Incidental Observation		
Activity	The activity of the animal when it was first detected or the activity that caused the sign, e.g. GR.□ INSTRUCTIONS: If observing a group then record the exact, sub sampled, or guesstimated mode activity of all the individuals in the group.	TO	Traveling, Other	Traveling by a method other than flying, swimming, walking, or running; if purpose of traveling is known, use a more specific activity such as fleeing or migrating.	Incidental Observation		
Activity	The activity of the animal when it was first detected or the activity that caused the sign, e.g. GR.□ INSTRUCTIONS: If observing a group then record the exact, sub sampled, or guesstimated mode activity of all the individuals in the group.	UR	Urinating	Urinating	Incidental Observation		
Actv Desc	The descriptor that indicates whether the animal was seen or heard, or gives the probable age or season of the sign.	S	Seen	The live animal was Seen	Incidental Observation		
Actv Desc	The descriptor that indicates whether the animal was seen or heard, or gives the probable age or season of the sign.	H	Heard	The live animal was Heard	Incidental Observation		

Column Name	Column Description	Code for in Column	Code Meaning	Code Description	Column For		
Actv Desc	The descriptor that indicates whether the animal was seen or heard, or gives the probable age or season of the sign.	F	Fresh	Fresh sign (<1 week old)	Incidental Observation		
Actv Desc	The descriptor that indicates whether the animal was seen or heard, or gives the probable age or season of the sign.	Y	Year	Sign is less than 1 Year old but greater than 1 week old	Incidental Observation		
Actv Desc	The descriptor that indicates whether the animal was seen or heard, or gives the probable age or season of the sign.	O	Old	Sign is Old (> 1 year old)	Incidental Observation		
Actv Desc	The descriptor that indicates whether the animal was seen or heard, or gives the probable age or season of the sign.	U	Undetermined	Undetermined (age of sign is unknown)	Incidental Observation		
Actv Desc	The descriptor that indicates whether the animal was seen or heard, or gives the probable age or season of the sign.	G	Growing season	Sign is from the Growing season	Incidental Observation		
Actv Desc	The descriptor that indicates whether the animal was seen or heard, or gives the probable age or season of the sign.	W	Winter season	Sign is from the Winter season	Incidental Observation		
Actv Count	The number of animals doing the activity, or the number of sign made by the activity.				Incidental Observation		
Adult Males	The number of adult males observed or detected.				Incidental Observation		
Adult Females	The number of adult females observed or detected.				Incidental Observation		
Adults - Unclassified Sex	The number of adults of unknown sex observed or detected.				Incidental Observation		
Juvenile Males	The number of juvenile males observed or detected. Juveniles are defined as 'fledged birds before their first winter, mammals older than neonates but still requiring parental care, and reptiles and amphibians of adult form that are significantly smaller than adult size.' For survey observations prior to December 2015, and for incidental observations prior to May 2013, the definition of juveniles included larvae (e.g. tadpoles).				Incidental Observation		
Juvenile Females	The number of juvenile females observed or detected. Juveniles are defined as 'fledged birds before their first winter, mammals older than neonates but still requiring parental care, and reptiles and amphibians of adult form that are significantly smaller than adult size.' For survey observations prior to December 2015, and for incidental observations prior to May 2013, the definition of juveniles included larvae (e.g. tadpoles).				Incidental Observation		
Juveniles - Unclassified Sex	The number of juveniles of unknown sex observed or detected. Juveniles are defined as 'fledged birds before their first winter, mammals older than neonates but still requiring parental care, and reptiles and amphibians of adult form that are significantly smaller than adult size.' For survey observations prior to December 2015, and for incidental observations prior to May 2013, the definition of juveniles included larvae (e.g. tadpoles).				Incidental Observation		
Unclassified Life Stage and Sex	The number of unknown age individuals of unknown sex observed or detected.				Incidental Observation		
Eggs	The number of eggs observed or detected.				Incidental Observation		
Egg Masses	The number of egg masses observed or detected.				Incidental Observation		
Larvae	The number of larvae observed or detected. For survey observations prior to December 2015, and for incidental observations prior to May 2013, larvae were included in the definition of juveniles.				Incidental Observation		
Pupae	The number of pupae observed or detected.				Incidental Observation		
Air Temp (C)	The air temperature in degrees Celsius.				Incidental Observation		
Wind Speed	The strength of the wind using the Beaufort Scale.	0	Calm	Less than 2 km/h	Incidental Observation		
Wind Speed	The strength of the wind using the Beaufort Scale.	1	Light Air	2 - 5 km/h	Incidental Observation		
Wind Speed	The strength of the wind using the Beaufort Scale.	2	Light Breeze	Leaves rustle (6 - 12 km/h)	Incidental Observation		
Wind Speed	The strength of the wind using the Beaufort Scale.	3	Gentle Breeze	Leaves and twigs constantly move (13 - 19 km/h)	Incidental Observation		
Wind Speed	The strength of the wind using the Beaufort Scale.	4	Moderate Breeze	Small branches move, dust rises (20 - 29 km/h)	Incidental Observation		
Wind Speed	The strength of the wind using the Beaufort Scale.	5	Fresh Breeze	Small trees sway (30 - 39 km/h)	Incidental Observation		
Wind Speed	The strength of the wind using the Beaufort Scale.	6	Strong Breeze	Large branches moving, wind whistling (40 - 50 km/h)	Incidental Observation		
Cloud Cover	The cloud-cover class.	1	Clear	Clear sky; no clouds	Incidental Observation		
Cloud Cover	The cloud-cover class.	2	Scattered (<50%)	Scattered clouds covering less than 50% of sky	Incidental Observation		
Cloud Cover	The cloud-cover class.	3	Scattered (>50%)	Scattered clouds covering more than 50% of sky	Incidental Observation		
Cloud Cover	The cloud-cover class.	4	Unbroken clouds	Unbroken cloud cover	Incidental Observation		
Precipitation	The type of precipitation that occurred during observations.	N	No Precipitation		Incidental Observation		
Precipitation	The type of precipitation that occurred during observations.	F	Foggy	Reduced visibility, like a cloud.	Incidental Observation		
Precipitation	The type of precipitation that occurred during observations.	M	Misty Drizzle	No distinct rain drops but can dampen clothing.	Incidental Observation		
Precipitation	The type of precipitation that occurred during observations.	D	Drizzle	Fine rain drops (< 0.5 mm diameter), visible on ground.	Incidental Observation		
Precipitation	The type of precipitation that occurred during observations.	LR	Light Rain	Puddles not forming quickly, < 2.5 mm rain per hour.	Incidental Observation		
Precipitation	The type of precipitation that occurred during observations.	HR	Hard Rain	Puddles form quickly, > 2.5 mm rain per hour.	Incidental Observation		
Precipitation	The type of precipitation that occurred during observations.	S	Snow		Incidental Observation		
Vegetation Layer	The vegetation layer that the plant species was found in.	TREE	Tree layer		Incidental Observation		
Vegetation Layer	The vegetation layer that the plant species was found in.	SHRUB	Shrub layer		Incidental Observation		
Vegetation Layer	The vegetation layer that the plant species was found in.	HERB	Herb layer		Incidental Observation		
Vegetation Layer	The vegetation layer that the plant species was found in.	MOSS	Moss layer		Incidental Observation		
Vegetation Layer	The vegetation layer that the plant species was found in.	EPIPHYTE	Epiphyte layer		Incidental Observation		
Percent Cover	The percentage of the ground surface, of a plot or area occupied, covered when a species' aboveground-vegetation is projected vertically onto the ground.				Incidental Observation		
Area (sq m)	The size of a circumscribed area occupied by a species, in square metres.				Incidental Observation		

Column Name	Column Description	Code for in Column	Code Meaning	Code Description	Column For		
Plants	The number of plants observed or detected.				Incidental Observation		
Comments	Informative comments about the observation.				Incidental Observation		
Incidental Observation Photos	A list of photos (or other Standard Digital Files*) that are associated with an Incidental Observation. INSTRUCTIONS: To easily add photo names to a cell, right-click on a cell and select 'WSI: Add File Names to Cell'. Photo names must not have spaces. To include comments about your photos, add a column named 'Incidental Observation Photo Comments' or 'IO Photo Comments', and enter your comments. *Standard Digital Files are recognized by most operating systems To easily add photo names to a cell, right-click on a cell and select 'WSI: Add File Names to Cell'. Photo names must not have spaces. To include comments about your photos, add a column named 'Block Photo Comments' and enter your comments. *Standard Digital Files are recognized by most operating systems and includes images, videos, and documents in formats such as PNG, JPG, JPEG, GIF, BMP, PDF, MP4, AVI, and TXT.				Incidental Observation		
IO Photo Comments	Informative comments and/or notes about the photos, or other Standard Digital Files.				Incidental Observation		
Insert Predefined Incidental Observation Column	You may insert additional predefined columns and codes relevant to Incidental Observations. INSTRUCTIONS: Double-click on the column header again now (while Data-entry Assistant is open) to insert predefined columns and codes relevant to Incidental Observations.						
Add your new column here	Add your new column here. INSTRUCTIONS: In this column, and beyond, you can add your own columns. Be sure to define your columns and associated codes in the 'User-defined Columns and Codes' worksheet. But, first review the existing columns and codes that are in worksheet 'Predefined Columns and Codes' to see if they will suffice.						
Population Unit	A code indicating the species' population unit (e.g., SnSa). Population unit is a generic term for a provincially defined, geographically discrete population of a species. E.g., for grizzly bear they are called 'population units'; for caribou they are called 'herds'; for moose they are called 'game-management zones'.	Atli	50-Atlin		Survey Summary General		
Population Unit		Bark	13-Barkerville		Survey Summary General		
Population Unit		BuPi	21-Burnt Pine		Survey Summary General		
Population Unit		Cale	29-Calendar		Survey Summary General		
Population Unit		Carc	51-Carcross		Survey Summary General		
Population Unit		CeRo	6-Central Rockies		Survey Summary General		
Population Unit		CeSe	4-Central Selkirks		Survey Summary General		
Population Unit		ChAl	31-Charlotte Alplands		Survey Summary General		
Population Unit		Chas	37-Chase		Survey Summary General		
Population Unit		Chin	25-Chinchaga		Survey Summary General		
Population Unit		CoNo	9-Columbia North		Survey Summary General		
Population Unit		CoSo	7-Columbia South		Survey Summary General		
Population Unit		Edzi	53-Edziza		Survey Summary General		
Population Unit		Finl	39-Finlay		Survey Summary General		
Population Unit		FrBo	8-Frisby-Boulder		Survey Summary General		
Population Unit		Frog	43-Frog		Survey Summary General		
Population Unit		Gata	42-Gataga		Survey Summary General		
Population Unit		GeMo	16-George Mtn		Survey Summary General		
Population Unit		Grah	24-Graham		Survey Summary General		
Population Unit		Grou	10-Groundhog		Survey Summary General		
Population Unit		HaRa	17-Hart Ranges		Survey Summary General		
Population Unit		Hors	46-Horseranch		Survey Summary General		
Population Unit		Itll	30-Itcha-Ilgachuz		Survey Summary General		
Population Unit		KeSi	20-Kennedy Siding		Survey Summary General		
Population Unit		LeKa	49-Level-Kawdy		Survey Summary General		
Population Unit		LiPl	45-Liard Plateau		Survey Summary General		
Population Unit		LiRa	47-Little Rancheria		Survey Summary General		
Population Unit		Maxh	28-Maxhamish		Survey Summary General		
Population Unit		Mobe	22-Moberly		Survey Summary General		
Population Unit		Mona	5-Monashee		Survey Summary General		
Population Unit		Musk	41-Muskwa		Survey Summary General		
Population Unit		Narr	18-Narraway		Survey Summary General		
Population Unit		NaLa	15-Narrow Lake		Survey Summary General		
Population Unit		NoCa	14-North Cariboo		Survey Summary General		
Population Unit		PiMo	40-Pink Mountain		Survey Summary General		
Population Unit		PuCe	3-Purcell Central		Survey Summary General		
Population Unit		PuSo	2-Purcells South		Survey Summary General		
Population Unit		Quin	19-Quintette		Survey Summary General		
Population Unit		Rabb	44-Rabbit		Survey Summary General		
Population Unit		Rain	32-Rainbows		Survey Summary General		
Population Unit		RePC	55-Redrock Prairie Creek		Survey Summary General		
Population Unit		Scot	23-Scott		Survey Summary General		

Column Name	Column Description	Code for in Column	Code Meaning	Code Description	Column For		
Population Unit		SnSa	26-Snake-Sahtaneh		Survey Summary General		
Population Unit		SoSe	1-South Selkirks		Survey Summary General		
Population Unit		Spat	54-Spatsizi		Survey Summary General		
Population Unit		SwLa	48-Swan Lake		Survey Summary General		
Population Unit		Takl	35-Takla		Survey Summary General		
Population Unit		Telk	34-Telkwa		Survey Summary General		
Population Unit		Thut	38-Thutade		Survey Summary General		
Population Unit		Tsen	52-Tsenaglode		Survey Summary General		
Population Unit		Twee	33-Tweedsmuir		Survey Summary General		
Population Unit		WeGN	11-Wells Gray North		Survey Summary General		
Population Unit		WeGS	12-Wells Gray South		Survey Summary General		
Population Unit		WSFN	27-Westside Fort Nelson		Survey Summary General		
Population Unit		Wolv	36-Wolverine		Survey Summary General		

Column Name	Column Description	Code for in Column	Code Meaning	Code Description
Survey Purpose	A description of the purpose for	Census	Census	Census is …
Survey Purpose		Composition	Composition	Composition is …
Survey Purpose		Recruitment	Recruitment	Recruitment is …
Survey Purpose		Reconnaissance	Reconnaissance	Reconnaissance is …
Survey Purpose		Capture	Capture	Capture is …
Survey Purpose		Survival	Survival	Survival is …
Survey Purpose		Mortality	Mortality	Mortality is …
Survey Purpose		Occupancy and Distribution	Occupancy and Distribution	Occupancy and Distribution is ..
Survey Method	Survey Method is …	Distance Sampling	Distance Sampling	Distance Sampling is …
Survey Method		Mark-Recapture	Mark-Recapture	Mark-Recapture is …
Survey Method		Pellet Group Count	Pellet Group Count	Pellet Group Count is …
Survey Method		Scat Count	Scat Count	Scat Count is …
Survey Method		Spotlight Count	Spotlight Count	Spotlight Count is …
Survey Method		Stratified Random Block	Stratified Random Block	Stratified Random Block is …
Survey Method		Snow Track Count	Snow Track Count	Snow Track Count is …
Survey Method		Remote Camera	Remote Camera	Remote Camera is …

Year	Herd	Total Caribou (tracks)	Adults	Calves	Unclassified	Percent Calves	Collars Seen/Available	Sightability Correction Factor	Survey Estimate	Confidence Interval	Comments	Source
1987	Barkerville	33	32	1		3.0						Dodd, N.L. 2017. Mountain Caribou Population Status for the Wells Gray North, Barkerville and North Cariboo Mountains-Bowron Sub-Populations, Cariboo Region, 2015-2016. Ministry of Environment, British Columbia. .
1988	Barkerville	38	32	6		15.8						Dodd, N.L. 2017. Mountain Caribou Population Status for the Wells Gray North, Barkerville and North Cariboo Mountains-Bowron Sub-Populations, Cariboo Region, 2015-2016. Ministry of Environment, British Columbia. .
1989	Barkerville	37	35	2		5.4						Dodd, N.L. 2017. Mountain Caribou Population Status for the Wells Gray North, Barkerville and North Cariboo Mountains-Bowron Sub-Populations, Cariboo Region, 2015-2016. Ministry of Environment, British Columbia. .
1991	Barkerville	31	25	6		19.4						Dodd, N.L. 2017. Mountain Caribou Population Status for the Wells Gray North, Barkerville and North Cariboo Mountains-Bowron Sub-Populations, Cariboo Region, 2015-2016. Ministry of Environment, British Columbia. .
1992	Barkerville	27	24	3		11.1						Dodd, N.L. 2017. Mountain Caribou Population Status for the Wells Gray North, Barkerville and North Cariboo Mountains-Bowron Sub-Populations, Cariboo Region, 2015-2016. Ministry of Environment, British Columbia. .
1993	Barkerville	16	11	5		31.3	3 / 4	0.750	21	17 - 53		Dodd, N.L. 2017. Mountain Caribou Population Status for the Wells Gray North, Barkerville and North Cariboo Mountains-Bowron Sub-Populations, Cariboo Region, 2015-2016. Ministry of Environment, British Columbia. .
1994	Barkerville	39	33	6		15.4	2 / 2	1.000	39	39 - 100		Dodd, N.L. 2017. Mountain Caribou Population Status for the Wells Gray North, Barkerville and North Cariboo Mountains-Bowron Sub-Populations, Cariboo Region, 2015-2016. Ministry of Environment, British Columbia. .
1995	Barkerville	12	11	1		8.3	1 / 2	0.500	24	13 - 302		Dodd, N.L. 2017. Mountain Caribou Population Status for the Wells Gray North, Barkerville and North Cariboo Mountains-Bowron Sub-Populations, Cariboo Region, 2015-2016. Ministry of Environment, British Columbia. .
1996	Barkerville	15	14	1		6.7	0 / 2	0.000	47			Dodd, N.L. 2017. Mountain Caribou Population Status for the Wells Gray North, Barkerville and North Cariboo Mountains-Bowron Sub-Populations, Cariboo Region, 2015-2016. Ministry of Environment, British Columbia. .
1997	Barkerville	50	40	10		20.0	2 / 2	1.000	50	50 - 129		Dodd, N.L. 2017. Mountain Caribou Population Status for the Wells Gray North, Barkerville and North Cariboo Mountains-Bowron Sub-Populations, Cariboo Region, 2015-2016. Ministry of Environment, British Columbia. .
1998	Barkerville	26	23	3		11.5	4 / 5	0.800	32	27 - 66		Dodd, N.L. 2017. Mountain Caribou Population Status for the Wells Gray North, Barkerville and North Cariboo Mountains-Bowron Sub-Populations, Cariboo Region, 2015-2016. Ministry of Environment, British Columbia. .
1999	Barkerville	20	15	5		25.0	2 / 5	0.400	50	26 - 237		Dodd, N.L. 2017. Mountain Caribou Population Status for the Wells Gray North, Barkerville and North Cariboo Mountains-Bowron Sub-Populations, Cariboo Region, 2015-2016. Ministry of Environment, British Columbia. .
2000	Barkerville	38	34	4		10.5	2 / 3	0.667	57	39 - 231		Dodd, N.L. 2017. Mountain Caribou Population Status for the Wells Gray North, Barkerville and North Cariboo Mountains-Bowron Sub-Populations, Cariboo Region, 2015-2016. Ministry of Environment, British Columbia. .
2001	Barkerville	35	26	9		25.7	3 / 3	1.000	35	35 - 65		Dodd, N.L. 2017. Mountain Caribou Population Status for the Wells Gray North, Barkerville and North Cariboo Mountains-Bowron Sub-Populations, Cariboo Region, 2015-2016. Ministry of Environment, British Columbia. .
2002	Barkerville	41	34	7		17.1	4 / 6	0.667	61	45 - 141		Dodd, N.L. 2017. Mountain Caribou Population Status for the Wells Gray North, Barkerville and North Cariboo Mountains-Bowron Sub-Populations, Cariboo Region, 2015-2016. Ministry of Environment, British Columbia. .
2004	Barkerville	32	29	3		9.4	4 / 7	0.571	96	96 - 131		Dodd, N.L. 2017. Mountain Caribou Population Status for the Wells Gray North, Barkerville and North Cariboo Mountains-Bowron Sub-Populations, Cariboo Region, 2015-2016. Ministry of Environment, British Columbia. .
2005	Barkerville	44	35	9		20.5	7 / 7	1.000	44	44 - 56		Dodd, N.L. 2017. Mountain Caribou Population Status for the Wells Gray North, Barkerville and North Cariboo Mountains-Bowron Sub-Populations, Cariboo Region, 2015-2016. Ministry of Environment, British Columbia. .

Year	Herd	Total Caribou (tracks)	Adults	Calves	Unclassified	Percent Calves	Collars Seen/Available	Sightability Correction Factor	Survey Estimate	Confidence Interval	Comments	Source
2006	Barkerville	44	38	6		13.6	6 / 7	0.857	51	45 - 83		Dodd, N.L. 2017. Mountain Caribou Population Status for the Wells Gray North, Barkerville and North Cariboo Mountains-Bowron Sub-Populations, Cariboo Region, 2015-2016. Ministry of Environment, British Columbia. .
2011	Barkerville	60	47	13		21.7	no collars	0.709	85			Dodd, N.L. 2017. Mountain Caribou Population Status for the Wells Gray North, Barkerville and North Cariboo Mountains-Bowron Sub-Populations, Cariboo Region, 2015-2016. Ministry of Environment, British Columbia. .
2012	Barkerville	75	65	9	1	12.2	no collars	0.857	88		2012 Barkerville block had high sightability, such that experienced surveyors indicated sightability was comparable to Wells Gray North. Increased survey intensity in one area of the Barkerville block resulted in group of 19 caribou being counted that normally would have gone undetected in low elevation, valley bottom forest.	Dodd, N.L. 2017. Mountain Caribou Population Status for the Wells Gray North, Barkerville and North Cariboo Mountains-Bowron Sub-Populations, Cariboo Region, 2015-2016. Ministry of Environment, British Columbia. .
2013	Barkerville	16	13	3		18.8	no collars				2013 surveys should be interpreted with caution for both Wells Gray North and Barkerville herds. Survey was not Ministry-led but was externally contracted; the survey quality may have been compromised by weather, snow conditions, surveyor inexperience, pilot inexperience, and lack of familiarity with survey area/methodology/caribou trailing. For Wells Gray North, 49 caribou were estimated from track without visual confirmation. Barkerville block had extremely low sightability. For Ministry-led surveys, an estimate of caribou numbers is only done if surveyors have high confidence that the 'estimated' caribou will not result in a double-count of other caribou in close proximity or on adjacent mountain slopes; typically caribou are only estimated from track in areas where no other caribou groups have been detected to avoid potential double-counts. If an estimate of caribou based on track is undertaken, this data is not included in the survey count or survey estimate; it is limited to inclusion in the population estimate if deemed appropriate.	Dodd, N.L. 2017. Mountain Caribou Population Status for the Wells Gray North, Barkerville and North Cariboo Mountains-Bowron Sub-Populations, Cariboo Region, 2015-2016. Ministry of Environment, British Columbia. .
2016	Barkerville	51	45	6		11.8	no collars	0.709	72			Dodd, N.L. 2017. Mountain Caribou Population Status for the Wells Gray North, Barkerville and North Cariboo Mountains-Bowron Sub-Populations, Cariboo Region, 2015-2016. Ministry of Environment, British Columbia. .
2018	Barkerville	41	38	3		7.3	no collars	0.709	58			Dodd, N.L. 2017. Mountain Caribou Population Status for the Wells Gray North, Barkerville and North Cariboo Mountains-Bowron Sub-Populations, Cariboo Region, 2015-2016. Ministry of Environment, British Columbia. .
2020	Barkerville	46	40	6		13.0	no collars	0.709	65			Dodd, N.L. 2017. Mountain Caribou Population Status for the Wells Gray North, Barkerville and North Cariboo Mountains-Bowron Sub-Populations, Cariboo Region, 2015-2016. Ministry of Environment, British Columbia. .
1987	Central Rockies											Reid, unpublished data July 2020
1988	Central Rockies											Reid, unpublished data July 2020
1989	Central Rockies											Reid, unpublished data July 2020
1990	Central Rockies											Reid, unpublished data July 2020
1991	Central Rockies											Reid, unpublished data July 2020
1992	Central Rockies											Reid, unpublished data July 2020
1993	Central Rockies											Reid, unpublished data July 2020
1994	Central Rockies											Reid, unpublished data July 2020
1995	Central Rockies	19							25			Reid, unpublished data July 2020
1996	Central Rockies											Reid, unpublished data July 2020
1997	Central Rockies	17							21			Reid, unpublished data July 2020
1998	Central Rockies											Reid, unpublished data July 2020
1999	Central Rockies											Reid, unpublished data July 2020
2000	Central Rockies											Reid, unpublished data July 2020
2001	Central Rockies											Reid, unpublished data July 2020
2002	Central Rockies	5							5			Reid, unpublished data July 2020
2003	Central Rockies											Reid, unpublished data July 2020
2004	Central Rockies	0							1			Reid, unpublished data July 2020
2005	Central Rockies											Reid, unpublished data July 2020
2006	Central Rockies	0							2			Reid, unpublished data July 2020
2007	Central Rockies											Reid, unpublished data July 2020
2008	Central Rockies	3										Reid, unpublished data July 2020
2009	Central Rockies											Reid, unpublished data July 2020
2010	Central Rockies											Reid, unpublished data July 2020
2011	Central Rockies											Reid, unpublished data July 2020

Year	Herd	Total Caribou (tracks)	Adults	Calves	Unclassified	Percent Calves	Collars Seen/Available	Sightability Correction Factor	Survey Estimate	Confidence Interval	Comments	Source
2012	Central Rockies											Reid, unpublished data July 2020
2013	Central Rockies											Reid, unpublished data July 2020
2014	Central Rockies											Reid, unpublished data July 2020
2015	Central Rockies											Reid, unpublished data July 2020
2016	Central Rockies											Reid, unpublished data July 2020
2017	Central Rockies											Reid, unpublished data July 2020
2018	Central Rockies											Reid, unpublished data July 2020
2019	Central Rockies											Reid, unpublished data July 2020
2020	Central Rockies											Reid, unpublished data July 2020
2020	Central Selkirks	26							26			Reid, unpublished data July 2020
1974 -2019	Central Selkirks										caribou observation data in Duncan and Nakusp blocks was redistributed for 1994-2019 surveys to reflect 2010-onwards block boundary location. Data can be found in excel template: Central Selkirks_Caribou_Survey_Summary_1994-2019_working_v30Mar2020.xls	
1975 -2019	Central Selkirks- Duncan										caribou observation data in Duncan and Nakusp blocks was redistributed for 1994-2019 surveys to reflect 2010-onwards block boundary location. Data can be found in excel template: Central Selkirks_Caribou_Survey_Summary_1994-2019_working_v30Mar2020.xls	
1976 -2019	Central Selkirks- Nakusp										caribou observation data in Duncan and Nakusp blocks was redistributed for 1994-2019 surveys to reflect 2010-onwards block boundary location. Data can be found in excel template: Central Selkirks_Caribou_Survey_Summary_1994-2019_working_v30Mar2020.xls	
1994	Columbia North	206 (209)				19.4	12 / 12		206	206-229		Serrouya et al. 2016. Population surveys of Columbia North and Columbia South mountain caribou, March 2016. prepared for Ministry of Forests, Lands, and Natural Resource Operations, Revelstoke BC
1996	Columbia North	167 (193)				19.2	11 / 11		167	167-188		Serrouya et al. 2016. Population surveys of Columbia North and Columbia South mountain caribou, March 2016. prepared for Ministry of Forests, Lands, and Natural Resource Operations, Revelstoke BC
1997	Columbia North	203 (204)				11.8	15 / 17		280	210-280		Serrouya et al. 2016. Population surveys of Columbia North and Columbia South mountain caribou, March 2016. prepared for Ministry of Forests, Lands, and Natural Resource Operations, Revelstoke BC
2002	Columbia North	145 (152)				11.7	7 / 7		145	145-175		Serrouya et al. 2016. Population surveys of Columbia North and Columbia South mountain caribou, March 2016. prepared for Ministry of Forests, Lands, and Natural Resource Operations, Revelstoke BC
2004	Columbia North	129 (136)				14	12 / 12		129	129-143		Serrouya et al. 2016. Population surveys of Columbia North and Columbia South mountain caribou, March 2016. prepared for Ministry of Forests, Lands, and Natural Resource Operations, Revelstoke BC
2006	Columbia North	125 (131)				14.3	9 / 10		138	127-181		Serrouya et al. 2016. Population surveys of Columbia North and Columbia South mountain caribou, March 2016. prepared for Ministry of Forests, Lands, and Natural Resource Operations, Revelstoke BC
2008	Columbia North	139 (142)				12.9	5 / 6		166	142-200		Serrouya et al. 2016. Population surveys of Columbia North and Columbia South mountain caribou, March 2016. prepared for Ministry of Forests, Lands, and Natural Resource Operations, Revelstoke BC
2010	Columbia North					10.4					No population estimate was conducted these years	Serrouya et al. 2016. Population surveys of Columbia North and Columbia South mountain caribou, March 2016. prepared for Ministry of Forests, Lands, and Natural Resource Operations, Revelstoke BC
2011	Columbia North	101 (123)				8.9	0 / 0				No population estimate was conducted these years	Serrouya et al. 2016. Population surveys of Columbia North and Columbia South mountain caribou, March 2016. prepared for Ministry of Forests, Lands, and Natural Resource Operations, Revelstoke BC
2012	Columbia North					12.9	0 / 0				No population estimate was conducted these years	Serrouya et al. 2016. Population surveys of Columbia North and Columbia South mountain caribou, March 2016. prepared for Ministry of Forests, Lands, and Natural Resource Operations, Revelstoke BC
2013	Columbia North	148 (152)				14.2	0 / 0					Serrouya et al. 2016. Population surveys of Columbia North and Columbia South mountain caribou, March 2016. prepared for Ministry of Forests, Lands, and Natural Resource Operations, Revelstoke BC
2014	Columbia North	115 (123)				13.3	0 / 0				The 2014 estimate is also considered to be unreliable due to a very low snow pack. This number (115 or 123) is considered very conservative.	Serrouya et al. 2016. Population surveys of Columbia North and Columbia South mountain caribou, March 2016. prepared for Ministry of Forests, Lands, and Natural Resource Operations, Revelstoke BC
2015	Columbia North					10.8					No population estimate was conducted these years; 10 adult females were collared, and 2 juveniles has ear tags. All 10 adults, 2 surviving calves, and one juvenile were located using a mix of standard census methods and telemetry	Legebokow 2017. 2017 population census of the columbia north mountain caribou subpopulation.

Year	Herd	Total Caribou (tracks)	Adults	Calves	Unclassified	Percent Calves	Collars Seen/Available	Sightability Correction Factor	Survey Estimate	Confidence Interval	Comments	Source
2016	Columbia North					11.8					No population estimate was conducted these years; 13 adults were collared and on-air during the survey along with 8 collared calves and an additional calf with ear tags only.	Legebokow 2017. 2017 population census of the columbia north mountain caribou subpopulation.
2017	Columbia North	147				14.1			147		10 adults were collared and on-air during the survey along with 2 collared calves and 2 calves with ear tags	Legebokow 2017. 2017 population census of the columbia north mountain caribou subpopulation; Reid unpublished data July 2020
1994	Columbia South	105 (117)		12.4			11 / 12		114	106-142		Serrouya et al. 2016. Population surveys of Columbia North and Columbia South mountain caribou, March 2016. prepared for Ministry of Forests, Lands, and Natural Resource Operations, Revelstoke BC
1996	Columbia South	81 (94)		12.35			9 / 10		103	94-112		Serrouya et al. 2016. Population surveys of Columbia North and Columbia South mountain caribou, March 2016. prepared for Ministry of Forests, Lands, and Natural Resource Operations, Revelstoke BC
1997	Columbia South	93 (93)		15.1			9 / 9		93	93-107		Serrouya et al. 2016. Population surveys of Columbia North and Columbia South mountain caribou, March 2016. prepared for Ministry of Forests, Lands, and Natural Resource Operations, Revelstoke BC
2002	Columbia South	29 (34)		17.2			2 / 3					Serrouya et al. 2016. Population surveys of Columbia North and Columbia South mountain caribou, March 2016. prepared for Ministry of Forests, Lands, and Natural Resource Operations, Revelstoke BC
2004	Columbia South	38 (40)		15.8			3 / 3					Serrouya et al. 2016. Population surveys of Columbia North and Columbia South mountain caribou, March 2016. prepared for Ministry of Forests, Lands, and Natural Resource Operations, Revelstoke BC
2006	Columbia South	26 (29)		2.9			0 / 1					Serrouya et al. 2016. Population surveys of Columbia North and Columbia South mountain caribou, March 2016. prepared for Ministry of Forests, Lands, and Natural Resource Operations, Revelstoke BC
2008	Columbia South	20 (20)		0			2 / 2					Serrouya et al. 2016. Population surveys of Columbia North and Columbia South mountain caribou, March 2016. prepared for Ministry of Forests, Lands, and Natural Resource Operations, Revelstoke BC
2009	Columbia South	13 (14)		15.4			3 / 3					Serrouya et al. 2016. Population surveys of Columbia North and Columbia South mountain caribou, March 2016. prepared for Ministry of Forests, Lands, and Natural Resource Operations, Revelstoke BC
2011	Columbia South	2 (7)		33.3 (2/6)*			0 / 0				* a group of 4 (including 1 calf) were seen a week prior to survey where only tracks were seen during the	Serrouya et al. 2016. Population surveys of Columbia North and Columbia South mountain caribou, March 2016. prepared for Ministry of Forests, Lands, and Natural Resource Operations, Revelstoke BC
2013	Columbia South	6		16.7			0 / 0				survey – this sighting was used to calculate the % calves	Serrouya et al. 2016. Population surveys of Columbia North and Columbia South mountain caribou, March 2016. prepared for Ministry of Forests, Lands, and Natural Resource Operations, Revelstoke BC
2016	Columbia South	4		0			0 / 0					Serrouya et al. 2016. Population surveys of Columbia North and Columbia South mountain caribou, March 2016. prepared for Ministry of Forests, Lands, and Natural Resource Operations, Revelstoke BC
2020	Columbia South	4							4			Reid, unpublished data July 2020
1987	Frisby Boulder											Reid, unpublished data July 2020
1988	Frisby Boulder											Reid, unpublished data July 2020
1989	Frisby Boulder											Reid, unpublished data July 2020
1990	Frisby Boulder											Reid, unpublished data July 2020
1991	Frisby Boulder											Reid, unpublished data July 2020
1992	Frisby Boulder											Reid, unpublished data July 2020
1993	Frisby Boulder											Reid, unpublished data July 2020
1994	Frisby Boulder	36							43			Reid, unpublished data July 2020
1995	Frisby Boulder											Reid, unpublished data July 2020
1996	Frisby Boulder	20							24			Reid, unpublished data July 2020
1997	Frisby Boulder	35							42			Reid, unpublished data July 2020
1998	Frisby Boulder											Reid, unpublished data July 2020
1999	Frisby Boulder											Reid, unpublished data July 2020
2000	Frisby Boulder											Reid, unpublished data July 2020
2001	Frisby Boulder											Reid, unpublished data July 2020
2002	Frisby Boulder	20							24			Reid, unpublished data July 2020
2003	Frisby Boulder											Reid, unpublished data July 2020
2004	Frisby Boulder	16							19			Reid, unpublished data July 2020
2005	Frisby Boulder											Reid, unpublished data July 2020
2006	Frisby Boulder	16							19			Reid, unpublished data July 2020
2007	Frisby Boulder											Reid, unpublished data July 2020
2008	Frisby Boulder	12										Reid, unpublished data July 2020
2009	Frisby Boulder											Reid, unpublished data July 2020
2010	Frisby Boulder											Reid, unpublished data July 2020
2011	Frisby Boulder	10										Reid, unpublished data July 2020
2012	Frisby Boulder											Reid, unpublished data July 2020
2013	Frisby Boulder	11										Reid, unpublished data July 2020
2014	Frisby Boulder											Reid, unpublished data July 2020
2015	Frisby Boulder											Reid, unpublished data July 2020
2016	Frisby Boulder											Reid, unpublished data July 2020
2017	Frisby Boulder											Reid, unpublished data July 2020

Year	Herd	Total Caribou (tracks)	Adults	Calves	Unclassified	Percent Calves	Collars Seen/Available	Sightability Correction Factor	Survey Estimate	Confidence Interval	Comments	Source
2018	Frisby Boulder											Reid, unpublished data July 2020
2019	Frisby Boulder											Reid, unpublished data July 2020
2020	Frisby Boulder	6										Reid, unpublished data July 2020
1999	George Mountain	5 or 6									5 or 6 caribou tracks only; no caribou observed	Watts, G. 1999. Inventory of the Yellowhead Cairbou Population, March 1999. Minsitry of Environment, Lands and Parks, Prince George British Columbia.
2002	George Mountain	3				0.0			3		3 females	Seip, D. etal., 2002. Caribou survey of the North Cariboo Mountains, Narrow Lake, and George Mountain. Unpublished report.
2003	George Mountain	0										Seip, D. etal., 2004, Omineca Region Mountain Caribou Surveys
2004	George Mountain	0							0		No caribou or caribou tracks were observed	Seip, D. etal., 2004, Omineca Region Mountain Caribou Surveys
2005	George Mountain	0							0		no evidence of caribou or tracks	Seip, D. etal. 2005. 2005 Mountain Caribou Census for George Mountain, Narrow Lake, North Cariboo Mountains and Hart Ranges
1992/1993	George Mountain	20							20			Watts, G. 1999. Inventory of the Yellowhead Cairbou Population, March 1999. Minsitry of Environment, Lands and Parks, Prince George British Columbia.
2002	Hart Ranges											in herd plan
2005	Hart Ranges											in herd plan
2006	Hart Ranges	596				17.6			718			Klaczek & Heard. 2019. 2019 Population Census of the Hart Ranges (Rangifer tarandus) Subpopulation.
2010	Hart Ranges	447				11.0			560			Klaczek & Heard. 2019. 2019 Population Census of the Hart Ranges (Rangifer tarandus) Subpopulation.
2012	Hart Ranges	459				9.0			532			Klaczek & Heard. 2019. 2019 Population Census of the Hart Ranges (Rangifer tarandus) Subpopulation.
2016	Hart Ranges	313				14.0			375			Klaczek & Heard. 2019. 2019 Population Census of the Hart Ranges (Rangifer tarandus) Subpopulation.
2019	Hart Ranges	352				19.0			377			Klaczek & Heard. 2019. 2019 Population Census of the Hart Ranges (Rangifer tarandus) Subpopulation.
2020	Hart Ranges	389				17.0			408			Klaczek & Heard. 2020. draft in progress, 2020 Population Census of the Hart Ranges (Rangifer tarandus) Subpopulation.
1987	Monashee											Reid, unpublished data July 2020
1988	Monashee											Reid, unpublished data July 2020
1989	Monashee											Reid, unpublished data July 2020
1990	Monashee											Reid, unpublished data July 2020
1991	Monashee											Reid, unpublished data July 2020
1992	Monashee											Reid, unpublished data July 2020
1993	Monashee											Reid, unpublished data July 2020
1994	Monashee	10							12			Reid, unpublished data July 2020
1995	Monashee											Reid, unpublished data July 2020
1996	Monashee											Reid, unpublished data July 2020
1997	Monashee											Reid, unpublished data July 2020
1998	Monashee											Reid, unpublished data July 2020
1999	Monashee											Reid, unpublished data July 2020
2000	Monashee											Reid, unpublished data July 2020
2001	Monashee											Reid, unpublished data July 2020
2002	Monashee	4							5			Reid, unpublished data July 2020
2003	Monashee											Reid, unpublished data July 2020
2004	Monashee	7							8			Reid, unpublished data July 2020
2005	Monashee											Reid, unpublished data July 2020
2006	Monashee	7							8			Reid, unpublished data July 2020
2007	Monashee											Reid, unpublished data July 2020
2008	Monashee	5										Reid, unpublished data July 2020
2009	Monashee											Reid, unpublished data July 2020
2010	Monashee	5										Reid, unpublished data July 2020
2011	Monashee	3										Reid, unpublished data July 2020
2012	Monashee	4										Reid, unpublished data July 2020
2013	Monashee											Reid, unpublished data July 2020
2014	Monashee											Reid, unpublished data July 2020
2015	Monashee											Reid, unpublished data July 2020
2016	Monashee	1										Reid, unpublished data July 2020
2017	Monashee											Reid, unpublished data July 2020
2018	Monashee											Reid, unpublished data July 2020
2019	Monashee											Reid, unpublished data July 2020
2020	Monashee											Reid, unpublished data July 2020
1999	Narrow Lake	67				unknown			81			Klaczek and Seip 2020, report in progress
2002	Narrow Lake	61				11.5			73			Klaczek and Seip 2020, report in progress
2004	Narrow Lake	23				unknown			28			Klaczek and Seip 2020, report in progress
2005	Narrow Lake	34				5.2			41			Klaczek and Seip 2020, report in progress
2006	Narrow Lake	33				9			40			Klaczek and Seip 2020, report in progress
2007	Narrow Lake	48				8.3			58			Klaczek and Seip 2020, report in progress
2008	Narrow Lake	40				15			48			Klaczek and Seip 2020, report in progress
2009	Narrow Lake	21				0			25			Klaczek and Seip 2020, report in progress

Year	Herd	Total Caribou (tracks)	Adults	Calves	Unclassified	Percent Calves	Collars Seen/Available	Sightability Correction Factor	Survey Estimate	Confidence Interval	Comments	Source
2010	Narrow Lake	8				0			18			Klaczek and Seip 2020, report in progress
2011	Narrow Lake	34				unknown			41			Klaczek and Seip 2020, report in progress
2012	Narrow Lake	36				6			42			Klaczek and Seip 2020, report in progress
2014	Narrow Lake	39	37	2		5.4			47			Klaczek and Seip 2020, report in progress
2016	Narrow Lake	31	26	5		16			36			Klackzek & Heard 2016. Population Assessment of Southern Mountain Caribou (Rangifer tarandus) in the Prince George Forest District.
2017	Narrow Lake	15				25			21			Klaczek and Seip 2020, report in progress
2018	Narrow Lake	15				13			21			Klaczek and Seip 2020, report in progress
2020	Narrow Lake	8				0			8			Klaczek and Seip 2020, report in progress
1999	North Cariboo	258				unknown			291			Klaczek and Seip 2020, report in progress
2002	North Cariboo	236				9.3			284			Klaczek and Seip 2020, report in progress
2005	North Cariboo	235				16.7			283			Klaczek and Seip 2020, report in progress
2006	North Cariboo	222				17.7			267			Klaczek and Seip 2020, report in progress
2010	North Cariboo										Partial Survey only. Bowron census block was not counted in 2010 or 2014	Courtier, J and D. Heard. 2014. 2014 Mountain Caribou Census in the North Cariboo Mountains and Narrow Lake, Omineca region.
2011	North Cariboo	184				9.2			222			Klaczek and Seip 2020, report in progress
2013	North Cariboo										Partial Survey only. Bowron census block was not counted in 2010 or 2014	Courtier, J and D. Heard. 2014. 2014 Mountain Caribou Census in the North Cariboo Mountains and Narrow Lake, Omineca region.
2014	North Cariboo										Partial Survey only. The Sugarbowl and Haggen census blocks were surveyed on March 23 and 24, 2014. The Bowron census block was not completed, but an estiamted 56 caribou (mean 2006 and 2011 bowron count) were used as surrogate for Bowron)	Courtier, J and D. Heard. 2014. 2014 Mountain Caribou Census in the North Cariboo Mountains and Narrow Lake, Omineca region.
2016	North Cariboo	146							210		Partial Survey only. Sugar Bowl and Haggen census blocks only. Bowron block not surveyed. Using the 2015 population estimate for the Bowron census block (Dodd 2016), and assuming caribou numbers did not change between years, we estimate the North Caribou Mountains subpopulation at 210 animals in 2016	Klackzek & Heard 2016. Population Assessment of Southern Mountain Caribou (Rangifer tarandus) in the Prince George Forest District.
2018	North Cariboo	137				12.5			187			Klaczek and Seip 2020, report in progress
2020	North Cariboo	121				15.7			145			Klaczek and Seip 2020, report in progress
1987	Purcell Central											Reid, unpublished data July 2020
1988	Purcell Central											Reid, unpublished data July 2020
1989	Purcell Central											Reid, unpublished data July 2020
1990	Purcell Central											Reid, unpublished data July 2020
1991	Purcell Central											Reid, unpublished data July 2020
1992	Purcell Central											Reid, unpublished data July 2020
1993	Purcell Central											Reid, unpublished data July 2020
1994	Purcell Central	15							18			Reid, unpublished data July 2020
1995	Purcell Central	15							18			Reid, unpublished data July 2020
1996	Purcell Central	13							17			Reid, unpublished data July 2020
1997	Purcell Central	2							14			Reid, unpublished data July 2020
1998	Purcell Central	5							6			Reid, unpublished data July 2020
1999	Purcell Central											Reid, unpublished data July 2020
2000	Purcell Central	5							6			Reid, unpublished data July 2020
2001	Purcell Central											Reid, unpublished data July 2020
2002	Purcell Central	5							6			Reid, unpublished data July 2020
2003	Purcell Central	6							10			Reid, unpublished data July 2020
2004	Purcell Central	3							6			Reid, unpublished data July 2020
2005	Purcell Central	0							1			Reid, unpublished data July 2020
2006	Purcell Central	0							0			Reid, unpublished data July 2020
2007	Purcell Central	0							0			Reid, unpublished data July 2020
2008	Purcell Central											Reid, unpublished data July 2020
2009	Purcell Central	0										Reid, unpublished data July 2020
2010	Purcell Central											Reid, unpublished data July 2020
2011	Purcell Central											Reid, unpublished data July 2020
2012	Purcell Central											Reid, unpublished data July 2020
2013	Purcell Central											Reid, unpublished data July 2020
2014	Purcell Central											Reid, unpublished data July 2020
2015	Purcell Central											Reid, unpublished data July 2020
2016	Purcell Central											Reid, unpublished data July 2020
2017	Purcell Central											Reid, unpublished data July 2020
2018	Purcell Central											Reid, unpublished data July 2020
2019	Purcell Central											Reid, unpublished data July 2020
2020	Purcell Central											Reid, unpublished data July 2020
1987	Purcell South											Reid, unpublished data July 2020
1988	Purcell South											Reid, unpublished data July 2020
1989	Purcell South											Reid, unpublished data July 2020
1990	Purcell South											Reid, unpublished data July 2020
1991	Purcell South											Reid, unpublished data July 2020
1992	Purcell South											Reid, unpublished data July 2020

Year	Herd	Total Caribou (tracks)	Adults	Calves	Unclassified	Percent Calves	Collars Seen/Available	Sightability Correction Factor	Survey Estimate	Confidence Interval	Comments	Source
1993	Purcell South	44							65			Reid, unpublished data July 2020
1994	Purcell South	54							69			Reid, unpublished data July 2020
1995	Purcell South	63							77			Reid, unpublished data July 2020
1996	Purcell South	38							56			Reid, unpublished data July 2020
1997	Purcell South	30							45			Reid, unpublished data July 2020
1998	Purcell South	13							31			Reid, unpublished data July 2020
1999	Purcell South											Reid, unpublished data July 2020
2000	Purcell South	13							16			Reid, unpublished data July 2020
2001	Purcell South											Reid, unpublished data July 2020
2002	Purcell South	14							17			Reid, unpublished data July 2020
2003	Purcell South	9							14			Reid, unpublished data July 2020
2004	Purcell South	11							14			Reid, unpublished data July 2020
2005	Purcell South	10							12			Reid, unpublished data July 2020
2006	Purcell South	16							20			Reid, unpublished data July 2020
2007	Purcell South	15							15			Reid, unpublished data July 2020
2008	Purcell South											Reid, unpublished data July 2020
2009	Purcell South	14										Reid, unpublished data July 2020
2010	Purcell South	15										Reid, unpublished data July 2020
2011	Purcell South	15										Reid, unpublished data July 2020
2012	Purcell South											Reid, unpublished data July 2020
2013	Purcell South	20										Reid, unpublished data July 2020
2014	Purcell South	19										Reid, unpublished data July 2020
2015	Purcell South	20										Reid, unpublished data July 2020
2016	Purcell South	16										Reid, unpublished data July 2020
2017	Purcell South	16										Reid, unpublished data July 2020
2018	Purcell South	4										Reid, unpublished data July 2020
2019	Purcell South											Reid, unpublished data July 2020
2020	Purcell South											Reid, unpublished data July 2020
1987	South Selkirks											Reid, unpublished data July 2020
1988	South Selkirks											Reid, unpublished data July 2020
1989	South Selkirks											Reid, unpublished data July 2020
1990	South Selkirks											Reid, unpublished data July 2020
1991	South Selkirks	47							47			Reid, unpublished data July 2020
1992	South Selkirks	47							47			Reid, unpublished data July 2020
1993	South Selkirks	51							51			Reid, unpublished data July 2020
1994	South Selkirks	45							45			Reid, unpublished data July 2020
1995	South Selkirks	52							52			Reid, unpublished data July 2020
1996	South Selkirks	39							39			Reid, unpublished data July 2020
1997	South Selkirks	39							39			Reid, unpublished data July 2020
1998	South Selkirks	45							45			Reid, unpublished data July 2020
1999	South Selkirks	48							48			Reid, unpublished data July 2020
2000	South Selkirks	34							34			Reid, unpublished data July 2020
2001	South Selkirks											Reid, unpublished data July 2020
2002	South Selkirks	34							34			Reid, unpublished data July 2020
2003	South Selkirks	41							41			Reid, unpublished data July 2020
2004	South Selkirks	33							33			Reid, unpublished data July 2020
2005	South Selkirks	35							35			Reid, unpublished data July 2020
2006	South Selkirks	37							37			Reid, unpublished data July 2020
2007	South Selkirks	43							44			Reid, unpublished data July 2020
2008	South Selkirks	46							46			Reid, unpublished data July 2020
2009	South Selkirks	46										Reid, unpublished data July 2020
2010	South Selkirks	43										Reid, unpublished data July 2020
2011	South Selkirks	36										Reid, unpublished data July 2020
2012	South Selkirks	27										Reid, unpublished data July 2020
2013	South Selkirks	27										Reid, unpublished data July 2020
2014	South Selkirks	18										Reid, unpublished data July 2020
2015	South Selkirks	14										Reid, unpublished data July 2020
2016	South Selkirks	12										Reid, unpublished data July 2020
2017	South Selkirks	11										Reid, unpublished data July 2020
2018	South Selkirks	3										Reid, unpublished data July 2020
2019	South Selkirks											Reid, unpublished data July 2020
2020	South Selkirks											Reid, unpublished data July 2020
1992	Wells Gray North	174	155	19		10.9						Dodd, N.L. 2017. Mountain Caribou Population Status for the Wells Gray North, Barkerville and North Cariboo Mountains-Bowron Sub-Populations, Cariboo Region, 2015-2016. Ministry of Environment, British Columbia. .
1993	Wells Gray North	216	179	37		17.1	13 / 15	0.867	249	222 - 333	1992 incomplete survey of the Horsefly block	Dodd, N.L. 2017. Mountain Caribou Population Status for the Wells Gray North, Barkerville and North Cariboo Mountains-Bowron Sub-Populations, Cariboo Region, 2015-2016. Ministry of Environment, British Columbia. .

Year	Herd	Total Caribou (tracks)	Adults	Calves	Unclassified	Percent Calves	Collars Seen/Available	Sightability Correction Factor	Survey Estimate	Confidence Interval	Comments	Source
1994	Wells Gray North	249	209	40		16.1	18 / 19	0.947	263	250 - 313		Dodd, N.L. 2017. Mountain Caribou Population Status for the Wells Gray North, Barkerville and North Cariboo Mountains-Bowron Sub-Populations, Cariboo Region, 2015-2016. Ministry of Environment, British Columbia. .
1995	Wells Gray North	243	203	40		16.5	14 / 17	0.824	295	256 - 398		Dodd, N.L. 2017. Mountain Caribou Population Status for the Wells Gray North, Barkerville and North Cariboo Mountains-Bowron Sub-Populations, Cariboo Region, 2015-2016. Ministry of Environment, British Columbia. .
1996	Wells Gray North	231	205	26		11.3	16 / 16	1.000	231	231 - 259		Dodd, N.L. 2017. Mountain Caribou Population Status for the Wells Gray North, Barkerville and North Cariboo Mountains-Bowron Sub-Populations, Cariboo Region, 2015-2016. Ministry of Environment, British Columbia. .
1997	Wells Gray North	205	190	15		7.3	11 / 13	0.846	242	212 - 340		Dodd, N.L. 2017. Mountain Caribou Population Status for the Wells Gray North, Barkerville and North Cariboo Mountains-Bowron Sub-Populations, Cariboo Region, 2015-2016. Ministry of Environment, British Columbia. .
1998	Wells Gray North	184	164	20		10.9	13 / 13	1.000	184	184 - 212		Dodd, N.L. 2017. Mountain Caribou Population Status for the Wells Gray North, Barkerville and North Cariboo Mountains-Bowron Sub-Populations, Cariboo Region, 2015-2016. Ministry of Environment, British Columbia. .
1999	Wells Gray North	151	128	23		15.2	7 / 8	0.875	173	153 - 269		Dodd, N.L. 2017. Mountain Caribou Population Status for the Wells Gray North, Barkerville and North Cariboo Mountains-Bowron Sub-Populations, Cariboo Region, 2015-2016. Ministry of Environment, British Columbia. .
2000	Wells Gray North	148	129	19		12.8	7 / 9	0.778	190	155 - 319		Dodd, N.L. 2017. Mountain Caribou Population Status for the Wells Gray North, Barkerville and North Cariboo Mountains-Bowron Sub-Populations, Cariboo Region, 2015-2016. Ministry of Environment, British Columbia. .
2001	Wells Gray North	154	127	27		17.5	5 / 7	0.714	216	164 - 435		Dodd, N.L. 2017. Mountain Caribou Population Status for the Wells Gray North, Barkerville and North Cariboo Mountains-Bowron Sub-Populations, Cariboo Region, 2015-2016. Ministry of Environment, British Columbia. .
2002	Wells Gray North	181	150	31		17.1	3 / 5	0.600	302	198 - 903		Dodd, N.L. 2017. Mountain Caribou Population Status for the Wells Gray North, Barkerville and North Cariboo Mountains-Bowron Sub-Populations, Cariboo Region, 2015-2016. Ministry of Environment, British Columbia. .
2003	Wells Gray North	80	72	8		10.0	5 / 9	0.556	144	---	2003 survey incomplete; low snow depth during the late winter resulted in caribou migrating up into sub-alpine, then returning to lower elevation forested habitat in March. Extremely poor sightability encountered within the Stevenson and Junction census blocks resulted in cancellation of the Horsefly, Barkerville and Bowron surveys. However, late winter observations of caribou in the Horsefly block, obtained from the Ministry's Wolf and Snowmobile Monitoring Projects, were used to estimate caribou numbers (these numbers were not collected with standard absolute abundance survey methods).	Dodd, N.L. 2017. Mountain Caribou Population Status for the Wells Gray North, Barkerville and North Cariboo Mountains-Bowron Sub-Populations, Cariboo Region, 2015-2016. Ministry of Environment, British Columbia. .
2004	Wells Gray North	187	152	35		18.7	12 / 12	1.000	187	187 - 218		Dodd, N.L. 2017. Mountain Caribou Population Status for the Wells Gray North, Barkerville and North Cariboo Mountains-Bowron Sub-Populations, Cariboo Region, 2015-2016. Ministry of Environment, British Columbia. .
2005	Wells Gray North	189	161	28		14.8	9 / 11	0.818	231	196 - 348		Dodd, N.L. 2017. Mountain Caribou Population Status for the Wells Gray North, Barkerville and North Cariboo Mountains-Bowron Sub-Populations, Cariboo Region, 2015-2016. Ministry of Environment, British Columbia. .
2006	Wells Gray North	210	175	35		16.7	7 / 8	0.875	240	212 - 375		Dodd, N.L. 2017. Mountain Caribou Population Status for the Wells Gray North, Barkerville and North Cariboo Mountains-Bowron Sub-Populations, Cariboo Region, 2015-2016. Ministry of Environment, British Columbia. .

Year	Herd	Total Caribou (tracks)	Adults	Calves	Unclassified	Percent Calves	Collars Seen/Available	Sightability Correction Factor	Survey Estimate	Confidence Interval	Comments	Source
2008	Wells Gray North	88	80	8		9.1	no collars				2008 was an incomplete survey of Wells Gray North sub-population. Objective in 2008 was a reconnaissance survey of Quesnel Lake Study Area (QLSA) for an estimate of calf recruitment. Although the initial goal was to survey the Quesnel Lake study area in its entirety, poor weather conditions and the lateness of the season did not allow completion. For this reason a combination of survey techniques was undertaken including i) rotary flight at and above treeline in a counter-clockwise direction around mountain complexes, ii) radio-telemetry to locate radio-collared caribou, and iii) specific area searches where caribou track had been observed and reported by Canadian Mountain Helicopters heli-ski operation.	Dodd, N.L. 2017. Mountain Caribou Population Status for the Wells Gray North, Barkerville and North Cariboo Mountains-Bowron Sub-Populations, Cariboo Region, 2015-2016. Ministry of Environment, British Columbia. .
2010	Wells Gray North	200	181	19		9.5	no collars	0.857	233		The Sightability Correction Factor (SCF) was estimated by calculating the mean sightability of radio-collared caribou during late winter inventories undertaken between 1996 and 2006 in the Wells Gray North sub-population (mean sightability = 0.857, n=13, standard error of mean= 0.118). Mean sightability excluded the 2003 sightability data as it was an incomplete survey. This mean SCF was used to calculate a survey estimate for Wells Gray North due to no radio-collars being present in the herd.	Dodd, N.L. 2017. Mountain Caribou Population Status for the Wells Gray North, Barkerville and North Cariboo Mountains-Bowron Sub-Populations, Cariboo Region, 2015-2016. Ministry of Environment, British Columbia. .
2011	Wells Gray North	191	168	23		12.0	no collars	0.857	223			Dodd, N.L. 2017. Mountain Caribou Population Status for the Wells Gray North, Barkerville and North Cariboo Mountains-Bowron Sub-Populations, Cariboo Region, 2015-2016. Ministry of Environment, British Columbia. .
2012	Wells Gray North	226	194	32		14.2	no collars	0.857	264			Dodd, N.L. 2017. Mountain Caribou Population Status for the Wells Gray North, Barkerville and North Cariboo Mountains-Bowron Sub-Populations, Cariboo Region, 2015-2016. Ministry of Environment, British Columbia. .
2013	Wells Gray North	180	159	21		11.7	no collars	0.857	210		2013 surveys should be interpreted with caution for both Wells Gray North and Barkerville herds. Survey was not Ministry-led but was externally contracted; the survey quality may have been compromised by weather, snow conditions, surveyor inexperience, pilot inexperience, and lack of familiarity with survey area/methodology/caribou trailing. For Wells Gray North, 49 caribou were estimated from track without visual confirmation. Barkerville block had extremely low sightability. For Ministry-led surveys, an estimate of caribou numbers is only done if surveyors have high confidence that the 'estimated' caribou will not result in a double-count of other caribou in close proximity or on adjacent mountain slopes; typically caribou are only estimated from track in areas where no other caribou groups have been detected to avoid potential double-counts. If an estimate of caribou based on track is undertaken, this data is not included in the survey count or survey estimate; it is limited to inclusion in the population estimate if deemed appropriate.	Dodd, N.L. 2017. Mountain Caribou Population Status for the Wells Gray North, Barkerville and North Cariboo Mountains-Bowron Sub-Populations, Cariboo Region, 2015-2016. Ministry of Environment, British Columbia. .
2015	Wells Gray North	164	151	13		7.9	no collars	0.857	191			Dodd, N.L. 2017. Mountain Caribou Population Status for the Wells Gray North, Barkerville and North Cariboo Mountains-Bowron Sub-Populations, Cariboo Region, 2015-2016. Ministry of Environment, British Columbia. .
2018	Wells Gray North	190	160	30		15.8	no collars	0.857	224		2 tracks added to survey estimate (222+2=224)	Lirette, D. unpublished data, 2018
2020	Wells Gray North	202	175	27		13.4	no collars	0.857	236			Kornhill, K. 2020. Mountain Caribou Population Status for the Wells Gray North and Barkerville Sub-Populations, Cariboo Region, 2020. Ministry of FLNRORD, British Columbia.
1995	Wells Gray South	199	156	43		21.6						B.Ernst, unpubl. data July 2020
1995	Wells Gray South	199	156	43		21.6						B.Ernst, unpubl. data July 2020
1999	Wells Gray South	78	65	13		16.7						B.Ernst, unpubl. data July 2020
1999	Wells Gray South	78	65	13		16.7						B.Ernst, unpubl. data July 2020
2002	Wells Gray South	40	35	5		12.5						B.Ernst, unpubl. data July 2020
2002	Wells Gray South	40	35	5		12.5						B.Ernst, unpubl. data July 2020
2006	Wells Gray South	201	163	38		18.9						B.Ernst, unpubl. data July 2020
2006	Wells Gray South	201	163	38		18.9						B.Ernst, unpubl. data July 2020
2008	Wells Gray South	159	133	26		16.4						B.Ernst, unpubl. data July 2020
2008	Wells Gray South	159	133	26		16.4						B.Ernst, unpubl. data July 2020
2010	Wells Gray South	77	62	15		19.5						B.Ernst, unpubl. data July 2020
2010	Wells Gray South	77	62	15		19.5						B.Ernst, unpubl. data July 2020
2011	Wells Gray South	166	147	19		11.4						B.Ernst, unpubl. data July 2020
2011	Wells Gray South	166	147	19		11.4						B.Ernst, unpubl. data July 2020

Year	Herd	Total Caribou (tracks)	Adults	Calves	Unclassified	Percent Calves	Collars Seen/Available	Sightability Correction Factor	Survey Estimate	Confidence Interval	Comments	Source
2013	Wells Gray South	110	93	17		15.5						B.Ernst, unpubl. data July 2020
2013	Wells Gray South	110	93	17		15.5						B.Ernst, unpubl. data July 2020
2015	Wells Gray South	66	56	10		15.2						B.Ernst, unpubl. data July 2020
2015	Wells Gray South	66	56	10		15.2						B.Ernst, unpubl. data July 2020
2017	Wells Gray South	123	95	28		22.8						B.Ernst, unpubl. data July 2020
2017	Wells Gray South	123	95	28		22.8						B.Ernst, unpubl. data July 2020
2018	Wells Gray South	102	82	20		19.6						B.Ernst, unpubl. data July 2020
2018	Wells Gray South	102	82	20		19.6						B.Ernst, unpubl. data July 2020
2019	Wells Gray South	119	96	23		19.3						B.Ernst, unpubl. data July 2020
2019	Wells Gray South	119	96	23		19.3						B.Ernst, unpubl. data July 2020
2020	Wells Gray South	135	113	22		16.3						B.Ernst, unpubl. data July 2020
2020	Wells Gray South	135	113	22		16.3						B.Ernst, unpubl. data July 2020

$1995

1993 CARIBOU SURVEY OF SUGARBOWL AND HAGGEN MOUNTAIN[1]

Caribou were surveyed on Sugarbowl Mountain and Haggen Mountain in order to determine herd locations and population size estimates. On March 16, 1993, 69 caribou were observed during an aerial survey of Sugarbowl Mountain. There were 11 groups, ranging in size from 2 to 11 animals, and 6 of the 11 previously radio collared individuals were sighted. Subsequently the population size was estimated at 127. On the second survey, March 24, 1993, 79 caribou were observed, with 5 of the 11 radio collared individuals sighted. Population size was estimated at 179. The average population size estimate for Sugarbowl Mountain is 150 caribou. Age and sex composition are not available for these two surveys.

Haggen Mountain was surveyed on March 16. 1993. 150 caribou were observed within 23 groups ranging in size from 2 to 22, and 4 of the 7 radio collared individuals were sighted. The subsequent population size was estimated at 263. 15% of the population were calves, 61% cows, 12% bulls, and 12% unknown adults.

On March 16 and 17, 1995, Sugarbowl Mountain and Bearpaw Ridge were surveyed. A total of 216 caribou were observed within 24 groups ranging in size from 2 to 23. 33% were bulls, 41% were cows, 20% were calves, 5% were unidentified adults, and 1% was identified as yearlings.

Doug Heard

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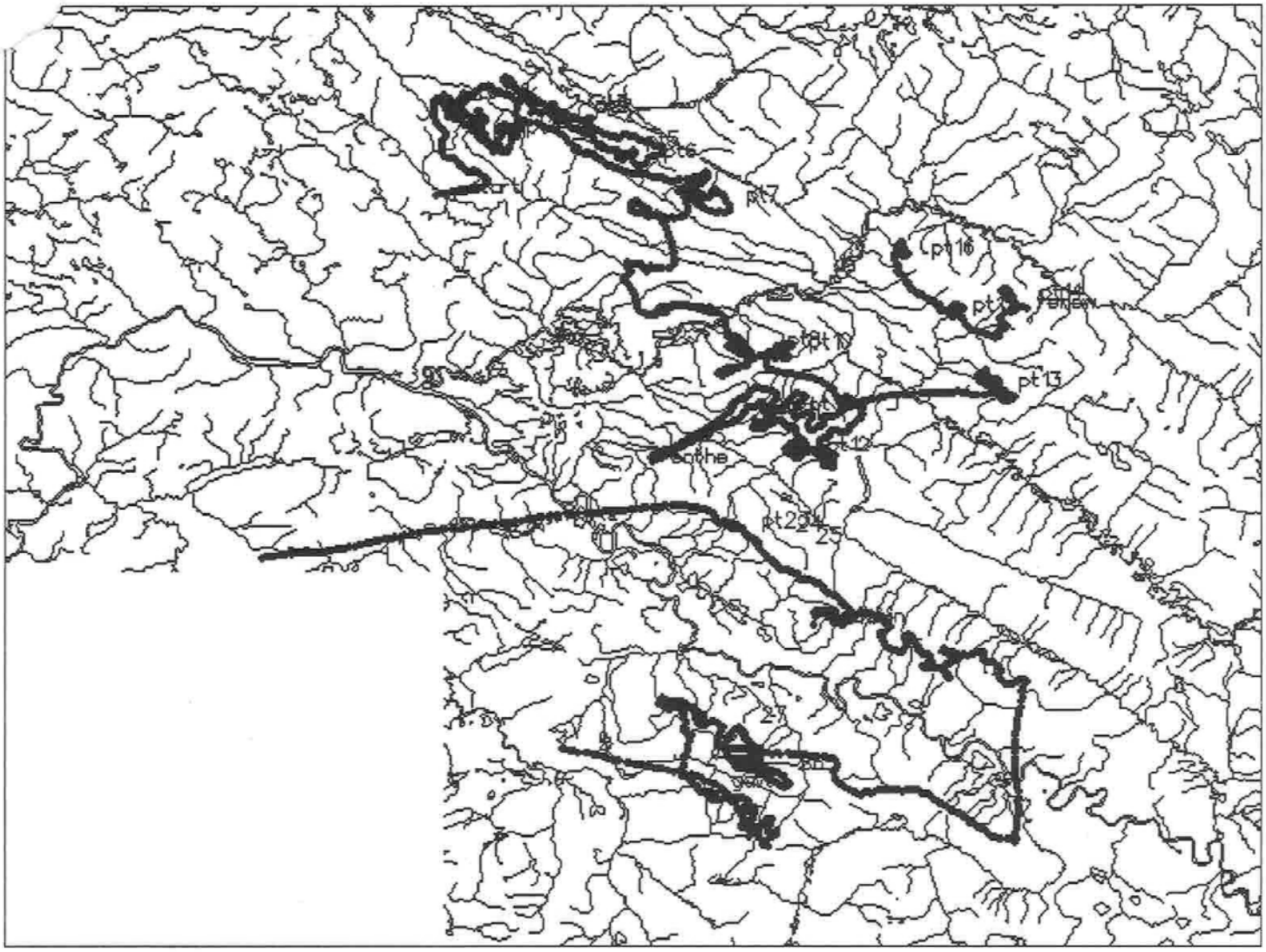
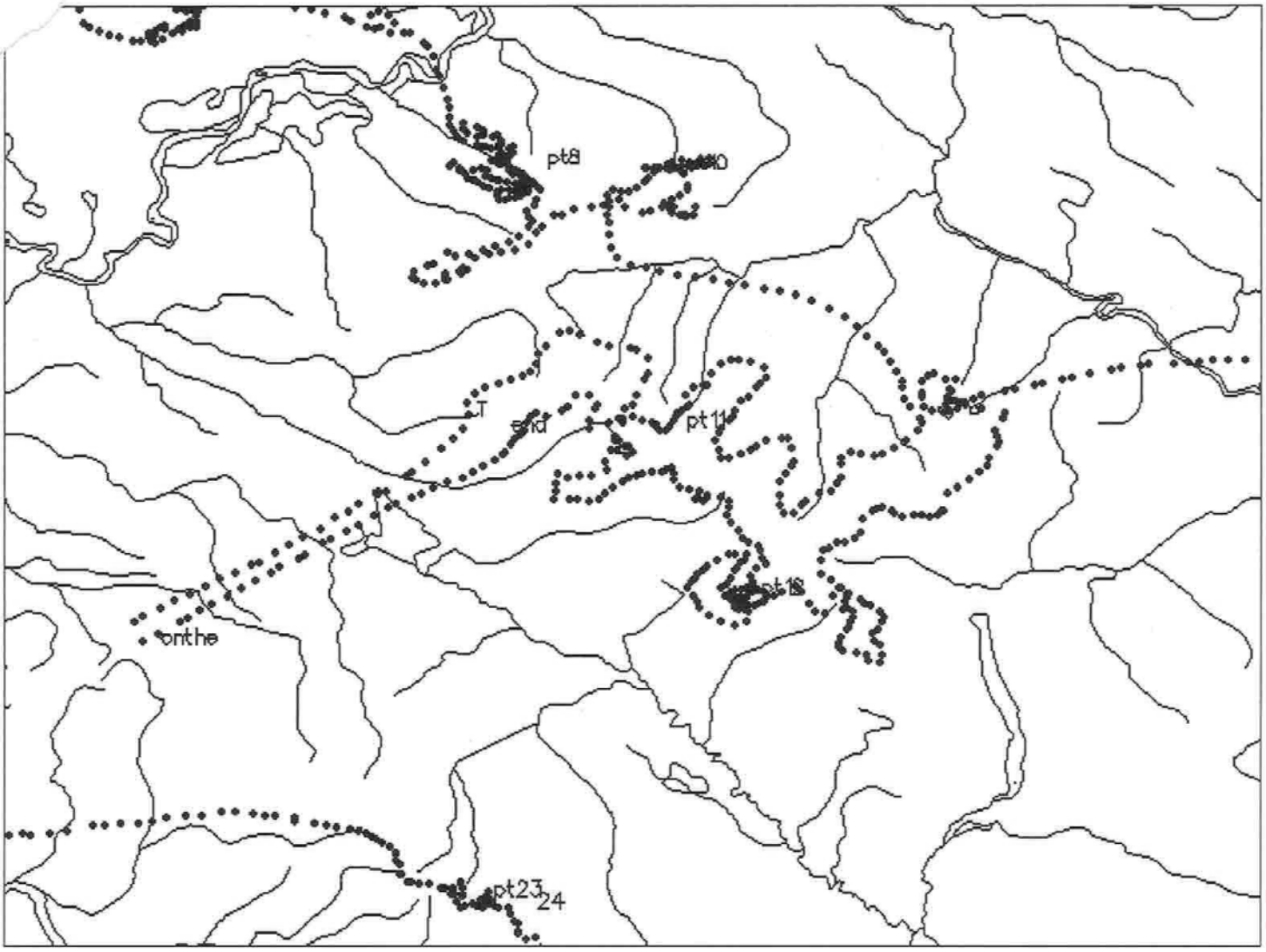
[1] NOTE: flight route on quickmap, filename "flight.dbf".

Table 1. Total number of caribou surveyed on Sugarbowl Mountain, Haggen Mountain and Bearpaw Ridge and the percentage of caribou bulls, cows, unknown adults and calves.

Date	Location	Bull (%)	Cow (%)	Unknown Adult (%)	Calf (%)	Sample Size (n)	Population estimate
Mar 16/93	Sugarbowl	-	-	-	-	69	127
Mar 24/93	Sugarbowl	-	-	-	-	79	179
		-	-	-	-		avg=150
Mar 16/93	Haggen	12	61	12	15	150	263
Mar 16 & 17/95	Sugarbowl /Bearpaw	33	41	6	20	216	-



Mar 95 Sugarbowl Mtn. Caribou Survey Flight Path.



Mar. 95. Sugarloaf Mtn. Caribou Survey Flight Path.

INVENTORY OF THE YELLOWHEAD CARIBOU POPULATION MARCH 1999

GLEN S. WATTS, British Columbia
Ministry of Environment, Lands and Parks
325 -1011 Fourth Avenue
PRINCE GEORGE, BC, CANADA V2L 3H9

Final Report For

Line Ministry Fund
Project No. 99-21
November 1999

INTRODUCTION

The mountain caribou population east of Prince George including Narrow Lake, George Mountain and the Yellowhead herds (Heard & Vagt 1998) represents approximately one third of the entire provincial mountain caribou populations. The maintenance of this population over the long term remains a concern in light of the impacts of forestry development, access development and backcountry recreational activities such as snowmobiling, heli skiing etc.

This population has recently been the source population for caribou transplants to the South Selkirk range which borders British Columbia with Idaho and Washington State. 36 caribou were moved over the three-year period ending in March of 1998.

Surveys were conducted on the 16 to 18 of March 1999 and on March 31. Glen Watts, Doug Heard, Ian Hatter and John Metcalfe acted as observers.

OBJECTIVES

The objectives of the survey was to:

1) Determine the distribution and relative abundance of caribou within the Prince George Mountain caribou range.

2) Determine the productivity of the population.

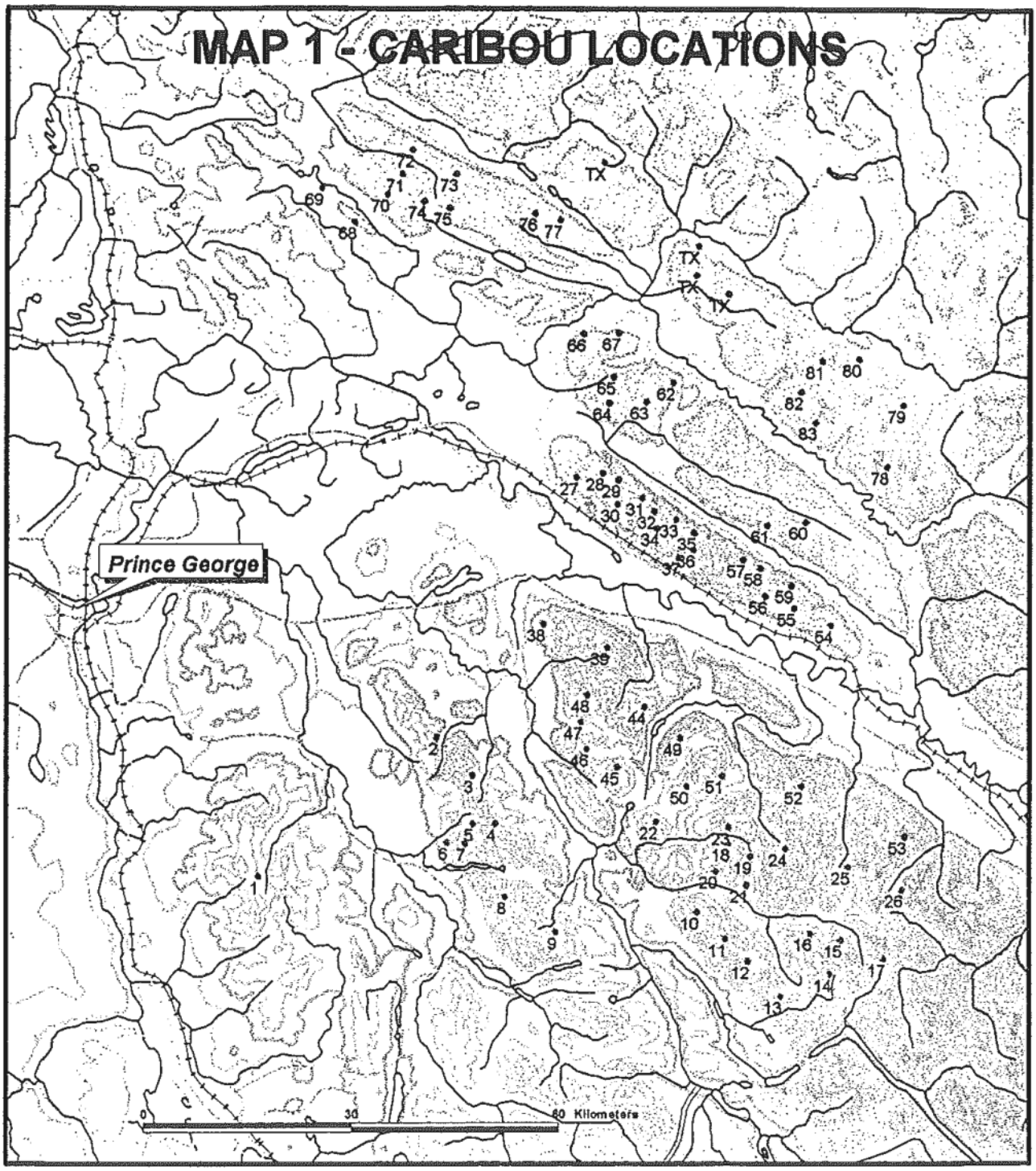
SURVEY AREA

The survey area included the engleman spruce subalpine fir biogeoclimatic zone and portions of the alpine tundra above 1,370 meters in elevation. The area extended from Bowron Lake Provincial Park in the south and extended past Otter Lake in the north. This includes portions of management units 7-06, 7-07, 7-08, 7-09, 7-16,7-17 and 7-18 (map 1). The area was broken into seven sub populations to allow comparison with previous surveys.

They include:

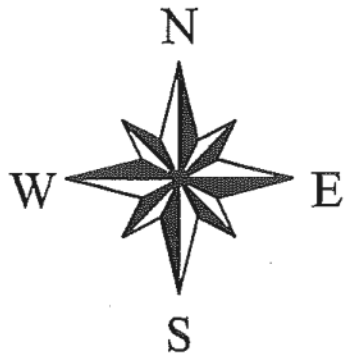
1) George mountain
2) Narrow Lake
3) Haggen Creek
4) Sugarbowl Mountain
5) Bear Paw Ridge
6) Captain Otter
7) Dezaiko Range

The area includes the Caribou Mountain and the Hart Range Ecosection. The area is characterized by gentle rolling mountains with trees extending to near the tops. Many include wide gentle basins and parkland type habitats.



● Caribou locations

Inset Location



METHODS

A Bell 206 helicopter was chartered from Northern Mountain Helicopters Ltd. with pilot Greg Altoft. Contours were flown over alpine and sub alpine areas that appeared to be suitable caribou habitat. Search intensity was dependent on visibility, tracks observed and habitat suitability.

The helicopter crew consisted of a pilot and a navigator in the front seats and two observers in the rear. The navigator recorded the flight line on 1:250,000 topographic maps and recorded the number of animals seen on wildlife survey forms. Caribou were classified to adults and calves only as it was felt that males and females could not be reliably separated.

SURVEY CONDITIONS

Weather conditions varied greatly over the survey period. Periods of low cloud and fog were interspersed with sunny periods. New snow had fallen two days prior to the start of the survey but as time passed the number of tracks made finding groups of animals more difficult. On March 18 we decided to stop the survey and wait for new snow. The survey was continued on March 31 but snow conditions were still poor.

The general distribution of the caribou was lower in elevation than is normal for a late winter survey. This made finding groups of caribou more difficult as most were in the trees rather than in the subalpine.

RESULTS

A total of 82 groups totaling 604 caribou was seen during the survey. This included 541 adults and 63 calves giving 10.4 % calves. Table 1 provides the break down of caribou by survey location. The mean group size was 7.4 animals and ranged from 1 to a maximum of 28 animals.

Table 1
NUMBERS AND COMPOSITION OF CARIBOU OBSERVED MARCH 1999

	ADULTS	CALVES	TOTAL	%CALVES	
George Mountain	5 or 6 tracks only				
Narrow Lake	60	7	67	10	
Haggen Creek	140	16	156	10	
Sugarbowl Mountain	72	7	79	9	
Bear paw Ridge	177	28	205	14	
Captain Otter	64	4	68	6	
Dezaiko Range	28	1	29	3	
TOTALS	**541**	**63**	**604**	**10**	

Table 2
NUMBERS AND COMPOSITION OF CARIBOU OBSERVED MARCH 1992 AND 1993

	ADULTS	CALVES	TOTAL	%CALVES	
George Mountain	20		20 est		
Narrow Lake	40		40 est		
Haggen Creek	127	23	150	15	
Sugarbowl Mountain	79		79	Incl calves	
Bear paw Ridge	128	18	146	12	
Captain Otter	86	7	93	8	
Dezaiko Range	61	13	74	18	
TOTALS	**541**	**61**	**602**	**13**	

DISCUSSION

The primary purpose of this survey is to compare trends in population numbers of caribou over time. If the total number of animals counted in the 1992 and 1993 census (table 2) are compared to the overall number of caribou observed in the two surveys are very similar with 602 observed in 92/93 (Watts unpub. data 1993) and 604 in 1999. This would suggest a stable caribou population. A March 1989 survey of the northern portion of the study area including Bear Paw Ridge Captain Otter and the Dezaiko Range showed the number of caribou observed as 291 caribou (Watts 1989) versus 302 in 1999 and 275 in 1992 respectively.

Calf ratios were 10% of the population down from 13% in the 1992 and 1993 surveys and from 17% in 1989. This level of calf survival is minimal to maintain a stable population with an annual adult mortality estimated at 8.5% between 1988 and 1993 (Terry 1993). If Bergerud 1992 or Young 1999 is used to estimate adult mortality you would suspect a declining population because the estimate of adult mortality is high at

10% calves. Using both our count our and our past estimate of 8.5% adult mortality a stable trend is suggested. The problem is that the % calves is declining.

Sightability trials of caribou on Sugarbowl Mtn and the Haggen Creek areas (Heard 1993) using radio-collared animals conducted in March 1993 estimated sightability of caribou in the Sugarbowl area at 50% and in the Haggen Creek area at 57%. These sightability estimates are much lower than those estimated by Seip (pers com) for the Quesnel Highland caribou herd. If these sightability figures are used with the 1999 data an overall caribou population of more than 1200 animals is possible. A limiting factor of the 1999 survey was that there were no radio-collared animals available to estimate sightability.

RECOMMENDATIONS

1) Marked caribou are required prior to the next survey in order that a sightability correction factor can be calculated to provide a more precise population estimate.

2) Efforts should be made to address the snowmobiling and backcountry recreation impacts on caribou populations since lots of snowmobile tracks were observed in areas near caribou.

3) Use of the herd, as a transplant population should be stopped until calf recruitment levels indicate an increasing population.

ACKNOWLEGEMENTS

Funding for this inventory was provided by the Ministry of Aboriginal Affairs in order to provide base line inventory data for Land Claim negotiations.

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APPENDIX 1

SUMMARY OF OBSERVATION DATA

GROUP NO.	TOTAL GROUP	CLASSICATION	COMMENTS
1.	0	tracks	4 or 5
2.	14	0 calves	
3.	0	tracks	5 or 6
4.	11	4 calves	
5.	1	1 bull	
6.	15	0 calves	
7.	6	0 calves	
8.	12	2 calves	
9.	8	1 calf	
10.	3	0 calves	
11.	16	2 calves	
12.	5	0 calves	
13.	7	7 bulls	
14.	4	4 bulls	
15.	16	3 calves	
16.	7	0 calves	
17.	6	1 calf	
18.	9	2 calves	
19.	3	1 calf	
20.	10	0 bulls	
21.	2	0 calves	
22.	9	1 calf	
23.	17	4 calves	
24.	7	0 calves	
25.	2	0 calves	
26.	4	0 calves	
27.	4	4 bulls	
28.	5	2 calves	
29.	6	2 calves	
30.	2	2 bulls	
31.	7	2 calves	
32.	4	0 calves	
33.	19	2 calves	
34.	6	0 calves	
35.	6	0 calves	
36.	3	0 calves	
37.	4	0 calves	
38.	1	1 adult	
39.	4	2 calves	
40.	12	0 calves	
41.	12	1 calf	
42.	12	2 calves	
43.	5	0 calves	
44.	6	0 calves	
45.	10	2 calves	
46.	5	1 calf	
47.	5	1 calf	
48.	7	7 bulls	

APPENDIX 1.....cont.

SUMMARY OF OBSERVATION DATA

GROUP NO.	TOTAL GROUP	CLASSICATION	COMMENTS
49.	5	5 bulls	
50.	7	1 calf	
51.	9	0 calves	
52.	7	1 calf	
53.	1	1 bull	
54.	4	0 calves	
55.	6	0 calves	
56.	4	0 calves	
57.	14	0 calves	
58.	8	0 calves	
59.	18	6 calves	
60.	16	3 calves	
61.	11	1 calf	
62.	4	1 calf	
63.	2	0 calves	
64.	28	3 calves	
65.	6	2 calves	
66.	7	1 calf	
67.	11	3 calves	
68.	4	0 calves	
69.	6	6 bulls	
70.	4	4 bulls	
71.	5	0 calves	
72.	11	2 calves	
73.	11	0 calves	
74.	8	0 calves	
75.	3	0 calves	
76.	4	1 calf	
77.	12	1 calf	
78.	4	0 calves	
79.	4	0 calves	
80.	5	0 calves	
81.	9	0 calves	
82.	5	1 calf	
83.	2	2 bulls	

Herd Name	BC_Ecotype_Grouping	Population Estimate Year	Population Estimate	Population Estimate Description	Current Trend	Long-term Trend	Comment
South Selkirks	Southern Mountain_southern group	2019	0	Expert Knowledge	Extirpated	Extirpated	3 remaining adult female caribou translocated to Columbia North Jan -March 2019
Purcells South	Southern Mountain_southern group	2020	2	Expert Knowledge	Extirpated	Extirpated	Functionally extirpated in 2019. 1 adult female translocated to Columbia North in Jan 2019; 2 adults remaining in Purcells South
Purcell Central	Southern Mountain_southern group	2006	0	Observed Total Count	Extirpated	Extirpated	
Central Selkirks	Southern Mountain_southern group	2020	26	Minimum Number Known Alive	Deceasing	Decreasing	Duncan and Nakusp herds amalgamated in 2015; all population data post -2014 recorded as Central Selkirks
Monashee	Southern Mountain_southern group	2016	1	Observed Total Count	Extirpated	Extirpated	Functionally extirpated in 2016. 1 adult remaining.
Central Rockies	Southern Mountain_southern group	2008	3	Observed Total Count	Extirpated	Extirpated	Functionally extirpated.
Columbia South	Southern Mountain_southern group	2020	4	Observed Total Count	Deceasing	Decreasing	
Frisby-Boulder	Southern Mountain_southern group	2020	6	Observed Total Count	Deceasing	Decreasing	
Columbia North	Southern Mountain_southern group	2017	147	Observed Total Count	Stable	Decreasing	Current stable trend attributed to predator management
Groundhog	Southern Mountain_southern group	2020	31	Observed Total Count	Stable	Decreasing	
Wells Gray North	Southern Mountain_southern group	2020	236	Model or Correction	Stable	Stable	
Wells Gray South	Southern Mountain_southern group	2020	135	Minimum Number Known Alive	Stable	Decreasing	
Barkerville	Southern Mountain_southern group	2020	65	Model or Correction	Stable	Stable	
North Cariboo	Southern Mountain_southern group	2020	145 (111-246)	Model or Correction	Decreasing	Decreasing	
Narrow Lake	Southern Mountain_southern group	2020	8	Observed Total Count	Decreasing	Decreasing	
George Mtn	Southern Mountain_southern group	2003	0	Expert Knowledge	Extirpated	Extirpated	
Hart Ranges	Southern Mountain_southern group	2020	408 (399-455)	Model or Correction	Decreasing	Decreasing	
Narraway	Southern Mountain_central group	2020	35[a]	Observed Sampled Count	Stable	Decreasing	[a]not a population estimate; represents caribou observed only.
Quintette	Southern Mountain_central group	2019	88	Minimum Number Known Alive	Increasing	Decreasing	Current increasing trend attributed to predator management
Kennedy Siding	Southern Mountain_central group	2020	87	Observed Total Count	Increasing	Decreasing	Current increasing trend attributed to predator management and supplemental feeding
Burnt Pine	Southern Mountain_central group	2014	1	Observed Total Count	Extirpated	Extirpated	Functionally extirpated in 2016. 1 adult male remaining.
Moberly	Southern Mountain_central group	2020	85	Minimum Number Known Alive	Increasing	Decreasing	Current increasing trend attributed to predator management and maternity pen. Moberly and Scott herds amalgamated in 2014
Scott	Southern Mountain_central group	---	---	---	---	---	Moberly and Scott herds amalgamated in 2014
Redrock-Prairie Creek	Southern Mountain_central group	---	---	---	Unknown	Unknown	not available
Graham	Southern Mountain_northern group	2016	298	Model or Correction & Expert Knowledge	Unknown	Decreasing	
Itcha-Ilgachuz	Southern Mountain_northern group	2019	385	Model or Correction	Decreasing	Decreasing	Precipitous decline from early 2000's (~2500 individuals)
Charlotte Alplands	Southern Mountain_northern group	2001	23	Observed Total Count	Decreasing	Decreasing	
Rainbows	Southern Mountain_northern group	2016	32	Observed Total Count	Decreasing	Decreasing	
Tweedsmuir	Southern Mountain_northern group	2019	160	Minimum Number Known Alive	Decreasing	Decreasing	
Telkwa	Southern Mountain_northern group	2019	32	Observed Total Count	Increasing	Decreasing	
Takla	Southern Mountain_northern group	2020	43	Model or Correction	Decreasing	Decreasing	
Wolverine	Southern Mountain_northern group	2019	264 (252-316)	Model or Correction	Decreasing	Decreasing	
Chase	Southern Mountain_northern group	2019	572 (518-683)	Model or Correction	Stable	Stable	
Thutade	Northern Mountain	2019	116	Observed Sampled Count	Unknown	Unknown	Survey area does not include Russell Range and South Sustut
Finlay	Northern Mountain	2020	116	Observed Total Count	Unknown	Unknown	
Pink Mountain	Northern Mountain	2018	237[a]	Observed Sampled Count	Unknown	Decreasing	[a]not a population estimate; represents caribou observed only.
Muskwa	Northern Mountain	2004	738	Model or Correction	Stable	Decreasing	
Gataga	Northern Mountain	2007	138[a]	Observed Sampled Count	Unknown	Unknown	[a]not a population estimate; represents caribou observed only.
Frog	Northern Mountain	2020	114[a]	Observed Sampled Count	Unknown	Unknown	[a]not a population estimate; represents caribou observed only.
Rabbit	Northern Mountain	2007	1133[a]	Observed Sampled Count	Unknown	Unknown	[a]not a population estimate; represents caribou observed only.
Liard Plateau	Northern Mountain	2017	87	Observed Sampled Count	Unknown	Unknown	
Horseranch	Northern Mountain	1999	600 (400-800)[b]	Expert Knowledge	Unknown	Unknown	[b]1999 survey included both Little Rancheria and Horseranch, with combined modelled estimate of 1767 (1817-1876)
Little Rancheria	Northern Mountain	1999	1200 (800-1600)[b]	Expert Knowledge	Unknown	Unknown	[b]1999 survey included both Little Rancheria and Horseranch, with combined modelled estimate of 1767 (1817-1876)
Swan Lake	Northern Mountain	2007	700 (600-800)	Expert Knowledge	Unknown	Unknown	
Level-Kawdy	Northern Mountain	1999	1500 (1000-2000)	Expert Knowledge	Unknown	Unknown	
Atlin	Northern Mountain	2018	1527 (1077-1927)	Model or Correction	Increasing	Increasing	
Carcross	Northern Mountain	2008	775 (642-935)[c]	Model or Correction	Increasing	Increasing	[c]2008 population estimate is for Laberge (Yukon) and Carcross herds combined; 2019 population estimate *in prep.*
Tsenaglode	Northern Mountain	2015	712	Expert Knowledge	Unknown	Unknown	
Edziza	Northern Mountain	2017	75	Expert Knowledge	Unknown	Unknown	
Spatsizi	Northern Mountain	1996	3000 (2000-4000)	Expert Knowledge	Unknown	Unknown	
Chinchaga	Boreal	2010	250	Expert Knowledge	Decreasing	Decreasing	
Snake-Sahtaneh	Boreal	2010	360	Expert Knowledge	Decreasing	Decreasing	
Westside Fort Nelson	Boreal	2010	79	Expert Knowledge	Decreasing	Decreasing	
Maxhamish	Boreal	2010	300	Expert Knowledge	Stable	Decreasing	
Calendar	Boreal	2010	290	Expert Knowledge	Decreasing	Decreasing	

Mountain Caribou Population Status for the Wells Gray North and Barkerville Sub-Populations, Cariboo Region, 2020

Prepared by:

Kristina Cornhill
FLNRORD
March 2020

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SUMMARY

In March 2020 the Wells Gray North and Barkerville caribou herds were counted by aerial surveys. The crew encountered excellent survey conditions, giving them high confidence in the counts. The Wells Gray North herd had 202 individuals observed, giving a population estimate of 236. Calf recruitment was below the stabilizing threshold at 13.4%. The Barkerville herd had a population estimate of 65 individuals from 46 individuals observed. The calf recruitment rate was also below the stabilizing threshold at 13.0%. Both herds have remained stable over the last 20 years.

INTRODUCTION

The Cariboo Region has three mountain caribou sub-populations: Wells Gray North, Barkerville and a portion of the North Cariboo herd. It ie recommended that caribou populations without predator management be censused once every three years. These three herds were last surveyed in March 2018, however, all other caribou in the Southern mountain caribou designatable unit (DU9) are being censused this year (2020). Given the fact that all other DU9 herds are being census, it was identified that these herds should also be censused in order to have a complete count for DU9 to allow for comparisons. There was already an intent to survey the North Cariboo herd and it had been decided that that census would happen out of the Omineca region, where the rest of the herd is located, in order to consulate resources. Therefore, only the Wells Gray North and Barkerville populations were censused within region. Objectives of the caribou surveys were to obtain minimum caribou counts, survey and population estimates, and calf recruitment rates to assess population trend over time.

METHODS

Both herds were censused using aerial surveys conducted inside survey blocks (Figure 1). The Wells Gray North herd is currently broken up into three blocks: Junction, Stevenson and Horsefly and the Barkerville herd is all one block. Modifications to the survey block boundaries have occurred over the years and should be considered in when assessing long-term population trends. Prior to deployment of radio-collars in the mid-1980s and early 1990s, delineation of survey area boundaries was often based on limited knowledge of caribou distribution. Over the years, survey boundaries have been refined based on collared animal movements during winter. Since 1994, the flight path has been fairly consistent and provides coverage of known caribou winter range for the Wells Gray North and Barkerville herds. Each survey block encompasses a mountain complex containing an area of winter range that caribou generally remain in throughout an entire winter. The survey blocks do not comprise discrete caribou populations as several shifts by radio-collared caribou have been recorded between Barkerville and Wells Gray North sub-populations (Young and Freeman, 2002). Surveys in the late 1980s and early 1990s occurred on the northside of Quesnel Lake. The Quesnel Lake Study Area (QLSA) described by Seip (1992), overlaps portions of the Stevenson and Junction blocks; some additional areas were surveyed, and these caribou observations were recorded separately. The QLSA is bounded to the south by Quesnel Lake from Quesnel Forks to Niagara Falls in the East Arm, to the east by Niagara River, at the northern boundary by Penfold Creek and Little River, and to the west Cariboo Lake and Cariboo River.

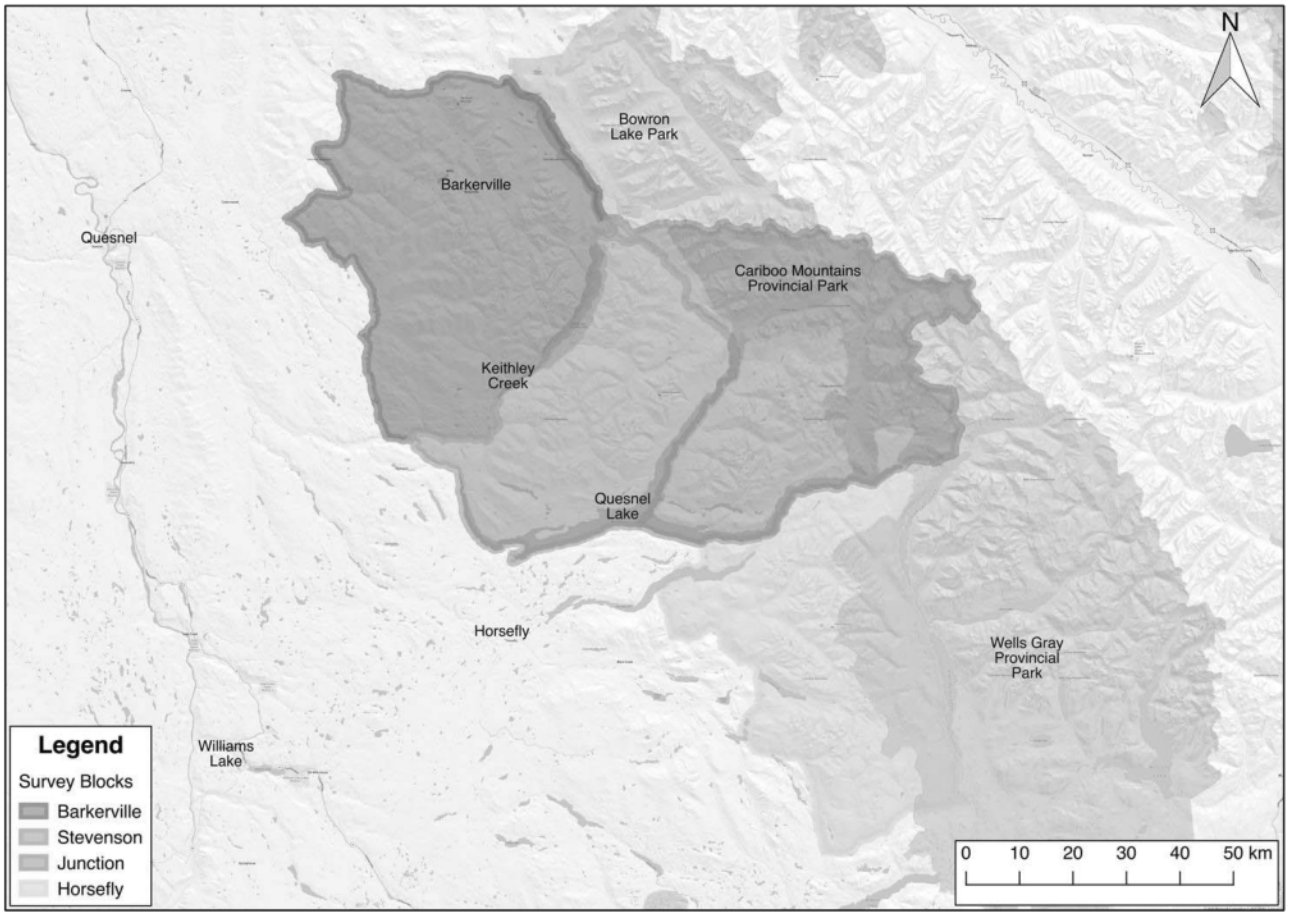

Figure 1: Map of survey areas showing all four blocks were caribou census were conducted

Using a Bell 206 Jet Ranger, mountain complexes were flown counter clockwise near treeline and included coverage of all suitable caribou subalpine/alpine habitat. Generally, only one pass was made of each slope, however, if a group of animals was located in an area with an abundance of fresh and older track, additional passes were made to ensure no groups were overlooked. All fresh tracks were followed in an attempt to visually locate animals. Caribou were classified as adults or calves. In cases where fresh track descended into dense forest and animals could not be visually located, an estimate of the number of caribou within the group was made and recorded as 'unclassified caribou estimated from track'. An estimate of caribou numbers was only done if surveyors had high confidence that the 'estimated' caribou would not result in a double-count of other caribou in close proximity or on adjacent mountain slopes; typically caribou are only estimated from track in areas where no other caribou groups have been detected to avoid potential double-counts. Flight tracks (Figure A1) and caribou locations (Figure 2) were recorded using a handheld GPS unit. Incidental sightings of mountain goats were counted but not classified and areas were illegal snowmobile activity was also recorded.

Sightability correction factors were applied to the survey counts (i.e. total caribou observed) to produce survey estimates that accounted for caribou not detected during the survey. The correction factors were estimated by calculating the mean sightability of radio-collared caribou during late winter inventories undertaken between 1996 and 2006 in the Wells Gray North sub-population (mean sightability = 0.857, n=13, standard error of mean= 0.118) and Barkerville sub-population (mean sightability = 0.709, n=13, standard error of mean= 0.294).

RESULTS & DISCUSSION

The Wells Gray North and Barkerville caribou census was completed over 5 days from March 12 till March 16, 2020. A total of 248 caribou were observed in 33 sightings (Figure 2) as well as mountain goats and a wolverine. Heli-skiing and snowmobile tracks were also observed both in areas where this type of activity is allowed and not allowed.

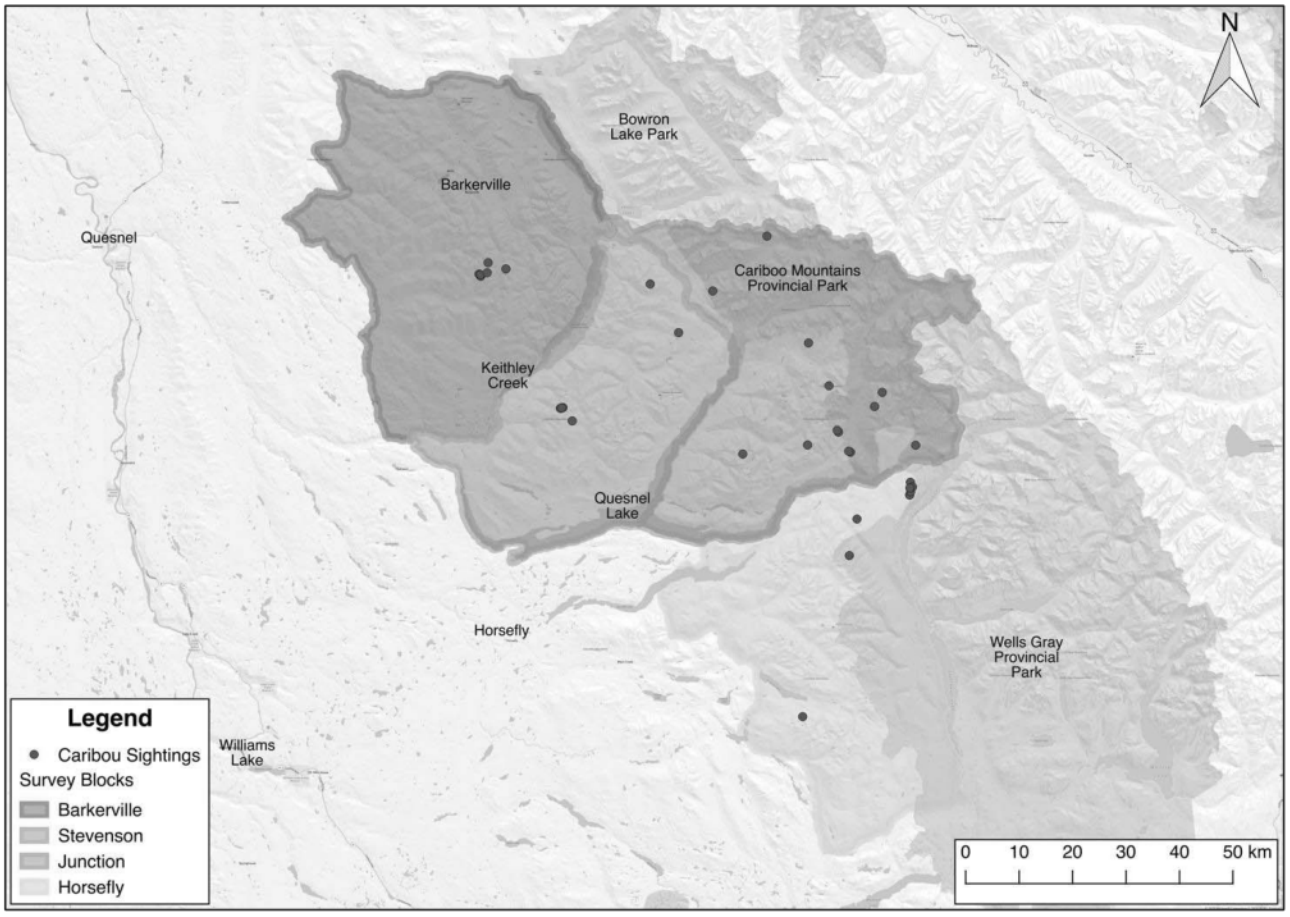

Figure 2: Map of the 33 caribou sightings during the 2020 survey

Survey Conditions

Ideal conditions occurred with fresh snow falling as late as March 11th in most areas and there was complete snow cover over the entire survey area. On March 12th the Barkerville block was flown initially with partially cloudy skies, negligible winds and temperatures from -4 to -12°C. However, after stopping for fuel, the wind picked up and more clouds rolled in causing us to call-off the survey for the day. On March 13th, the Barkerville block was finished and the Junction block was started in the northern corner. The conditions were good with clear skies and moderate winds. The Junction block was finished on March 14th during excellent condition, clear sunny skies, negligible winds and cold temperatures (-22°C). The Horsefly block was conducted next on March 15th, again, we encountered excellent conditions same as the previous day but with slightly warmer temperatures (-8°C to -15°C). Finally, on March 16th the Stevenson block was flown, trailing was a little bit harder being at least five days removed from fresh snow, but we were still able to trail out the caribou. Again, we had excellent conditions, but slightly warmer temperatures (-3°C).

Wells Gray North Herd

For the Wells Gray North herd, a total of 202 caribou were counted consisting of 175 adults and 27 calves. A population estimate of 236 individuals was calculated and calf recruitment was 13.4%. Given the excellent conditions encountered during the survey we have high confidence in our count. The population is considered stable, fluctuating between 200 and 265 individuals in the last 20 years and calf recruitment has ranged from 8-19% over that same time (Figure 3).

In the Horsefly block, 66 individuals (57 adults, 9 calves) were counted with a calf recruitment of 13.6% almost double the 37 individuals in 2018 but calf recruitment decreased from 16.2%. 52 individuals (47 adults, 5 calves) in the Stevenson block were recorded, compared to 68 individuals in 2018, calf recruitment went from down to 9.6% from 14.7% in 2018. In the Junction block, 84 individuals (71 adults, 13 calves) were observed with a calf recruitment of 13.6% compared to 85 individuals and 16.5% in 2018.

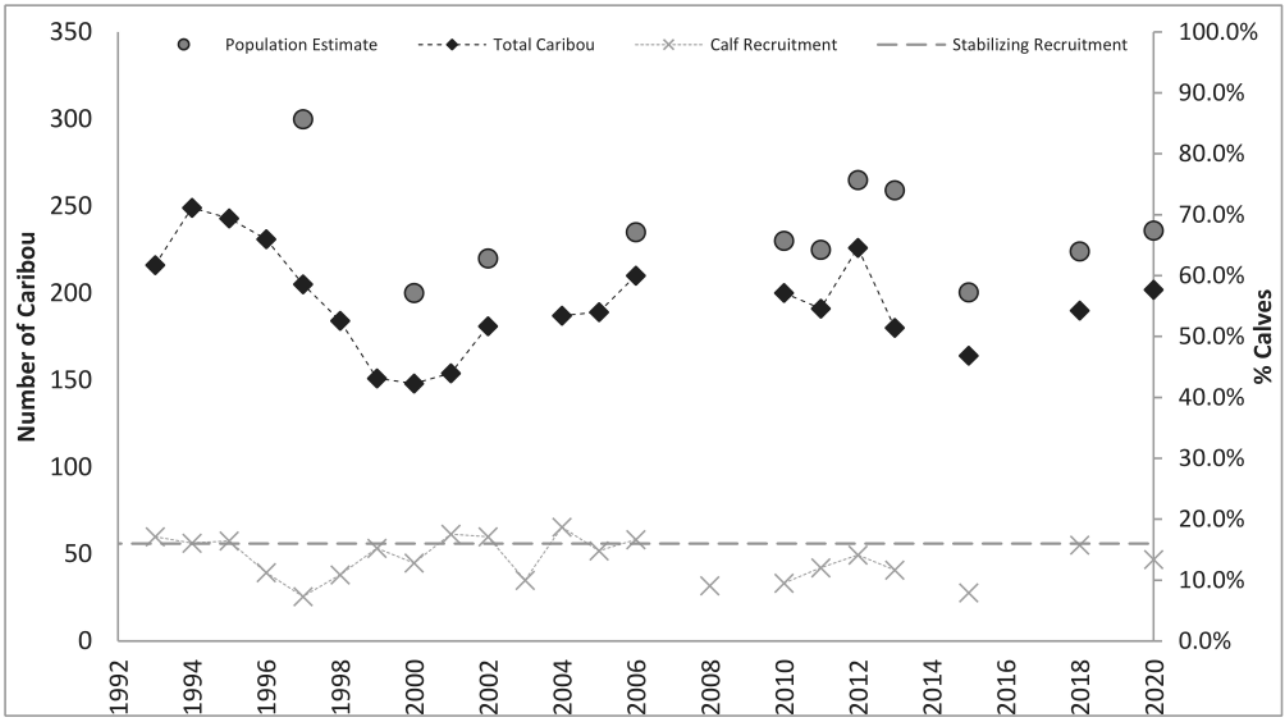

Figure 3: Late winter minimum count, population estimate and calf recruitment trends for the Wells Gray North herd, 1993-2020

Barkerville Herd

In March 2020, we observed a total of 46 caribou consisting of 40 adults and 6 calves. A population estimate of 65 individuals was calculated. We are very confident in our survey count and if anything, we feel that this population estimate could be an overestimate. Sightability is influenced by several things including surveyor experience and survey conditions and in this case, we had experienced surveyors on board all flights and excellent survey conditions, so the use of an averaged sightability factor, where conditions might not have been as ideal could provide an overestimate. Calf recruitment was calculated as 13.0%.

The population is considered stable, fluctuating between 50 and 90 individuals in the last 20 years and calf recruitment has ranged from 7-26% over that same time (Figure 4).

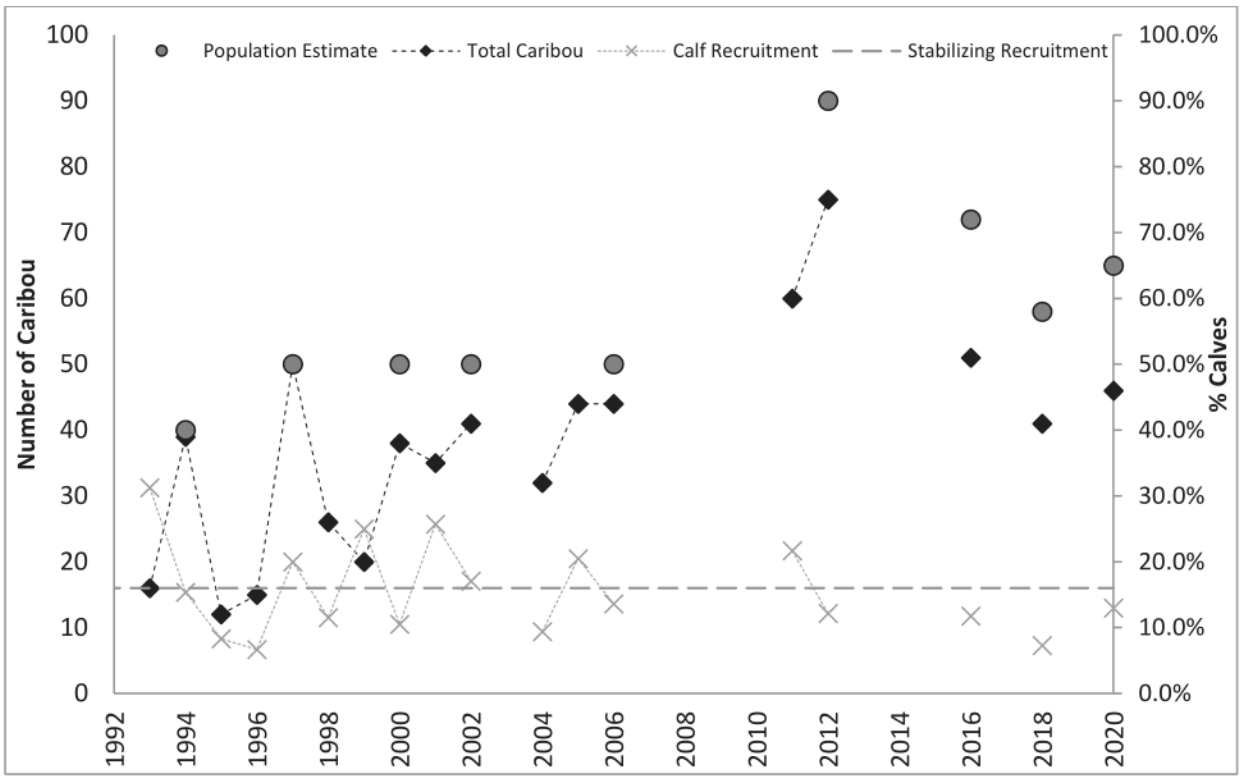

Figure 4: Late winter minimum count, population estimate and calf recruitment trends for the Barkerville herd, 1993-2020. Counts prior to 1994 may be underestimated due to smaller survey area

Survey Cost

The total survey cost was $34,711.43 including GST. The survey was conducted in a total of 27.5 flight hours with a breakdown of the blocks as follows; Barkerville 8.1 hours, Junction 7.9 hours, Stevenson 4.9 hours, and Horsefly 6.6 hours.

ACKNOWLEDGEMENTS

Funding for these surveys was provided by the Mountain Caribou Recovery Implementation Program. Arduini Helicopter Ltd. Was contracted to conduct the flights. The flights were navigated for four days by Kristina Cornhill and one day by Pat Dielman. The left rear observer for four days was Pat Dielman and Courtney Jones for one day. The right rear observer was Emily Blythe for three days and Courtney Jones for two.

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APPENDIX

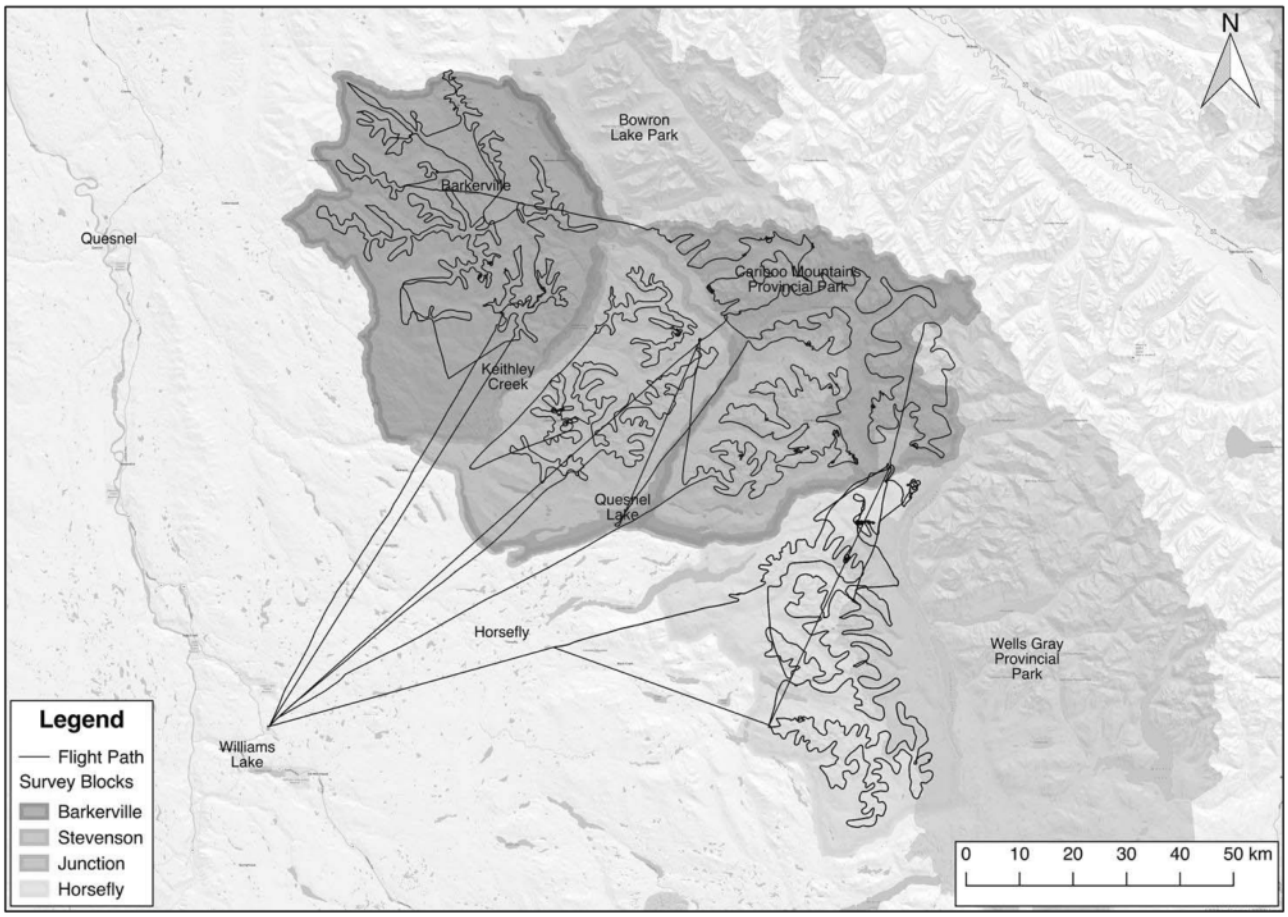


Figure A1: Map of survey flight routes for late winter mountain caribou census for the Wells Gray North and Barkerville herds

2014 Mountain Caribou Census in the North Cariboo Mountains and Narrow Lake

Jessica Courtier, Doug Heard

March 2014

We censused mountain caribou on the North Caribou Mountain and Narrow Lake Ranges in March, 2014. The census followed the standard mountain caribou survey protocol of flying in a helicopter (Bell 206) along treeline searching for caribou tracks. When fresh tracks were located, the area was intensively searched to locate and count sighted caribou. Caribou were classified as either adults or calves. When caribou could not be located, the number of animals was estimated based on the number of tracks. The flight route was recorded on an IPAD (app GPSkit) and a GPS. Caribou locations were recorded on a GPS.

We used a sightability correction factor of 83% to produce a population estimate that accounted for caribou that were not located during the survey (Seip 1990, Young and Roorda 1999), and that was comparable to past surveys.

NORTH CARIBOO MOUNTAINS

The Sugarbowl and Haggen census blocks were surveyed on March 23 and 24, 2014. The Bowron census block was not completed. Survey conditions were fair on both March 23 and 24 with variable weather (sun, cloud, light snow). There had not been any new snow for several days prior to the survey. The flight route is shown Figure 1.

Results:

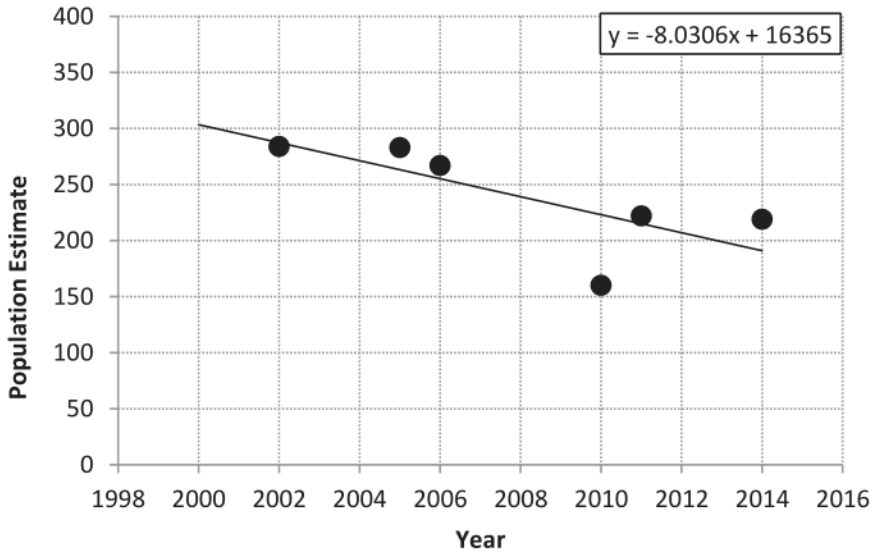
A total of 121 caribou was observed, including 7 calves and 114 adults. An additional five animals were estimated from tracks for a total of 126. Applying a sightability correction of 0.83 provides a population estimate of 152. Proportion of calves was exceptionally low at 6.1%. Incidental sightings of two mule deer and one mountain goat were also recorded.

Census Block	Calves	Adults	Estimated From Tracks	Total	Sightability Corrected Estimate	% Calves of Observed Caribou
Sugarbowl	3	49	5	57	69	6.1
Haggen	4	65	0	69	83	6.1
Total	7	114	5	126	152	6.1

Population Trend:

The Bowron census block was not counted in 2010 or 2014. Assuming 56 caribou were in the Bowron block (mean of 2006 and 2011 counts), a total estimate of 219 can be obtained for the North Cariboo Mountains.

Year	Count	Population Estimate	% Calves	Reference
2002	236	284	9.3	Seip *et al.* 2002
2005	235	283	16.7	Seip *et al.* 2005
2006	222	267	17.7	Seip *et al.* 2006
2010	133	160	14.0	Heard *et al.* 2010
2011	184	222	9.2	Seip *et al.* 2011
2014	182	219	6.1	-



Discussion:

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NARROW LAKE

The Narrow Lake range was surveyed on March 25, 2014. Survey conditions were good with clear skies and light wind. There had been no fresh snow for several days prior to the survey. The flight route and locations of caribou are shown in Figure 2.

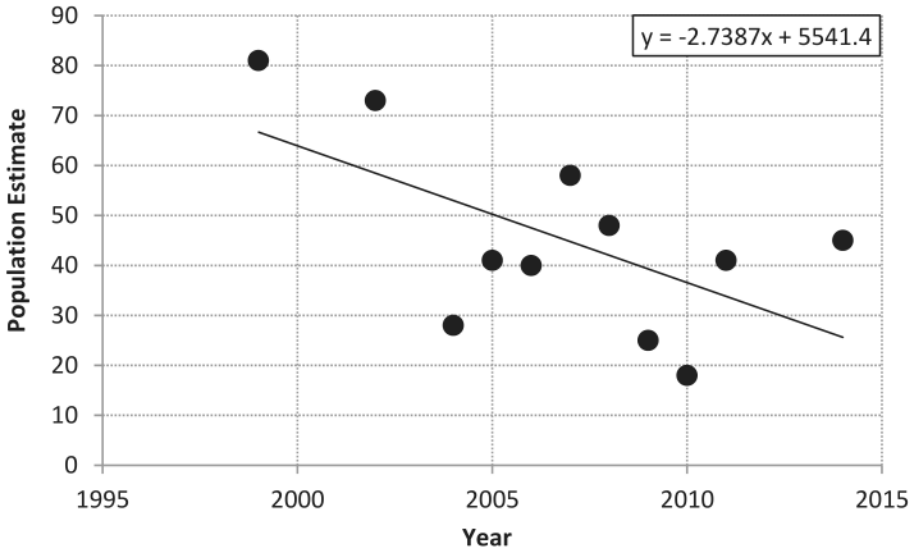
Results:

A total of 39 caribou were observed, including 2 calves and 37 adults (5.4% calves). No additional animals were estimated from tracks. Applying a sightability correction of 0.83 provides a population estimate of 47.

Census Block	Calves	Adults	Estimated From Tracks	Total	Sightability Corrected Estimate	% of Calves in Population
Narrow Lake	2	37	0	39	47	5.4

Population Trend:

Year	Count	Population Estimate	Reference
1999	67	81	Watts, 1999
2002	61	73	Seip, D.R. *et al.* 2002
2004	23	28	Seip, D.R. *et al.* 2004
2005	34	41	Seip, D.R. *et al.* 2005
2006	33	40	Seip, D.R. *et al.* 2006
2007	48	58	Seip, D.R. *et al.* 2007
2008	40	48	
2009	21	25	Heard, D.C., *et al.* 2009
2010	8	18	Heard, D.C., *et al.* 2010
2011	34	41	Seip, D.R. *et al.* 2011
2014	39	47	-



Discussion:

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ACKNOWLEDGEMENTS

Funding for this project was provided by the Ministry of Forests, Lands and Natural Resource Operations. We thank Mike Bridger, Duncan McColl and Ray Pillipow for their observational skills counting caribou and our pilot Ken Knight for providing safe and skillful flying.

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SURVEY CREW

Area	Date	Navigator	Observers	Pilot
North Cariboo	March 23	Jessica Courtier	Duncan McColl Mike Bridger	Ken Knight
North Cariboo	March 24	Doug Heard	Jessica Courtier Ray Pillipow	Ken Knight
Narrow Lake	March 25	Doug Heard	Jessica Courtier Mike Bridger	Ken Knight

Figure 1. Flight lines representing the areas covered during the North Cariboo Mountain census (March 23-24, 2014). Green dots indicate locations of sighted caribou; red flag = mule deer sighting, blue flag = mountain goat sighting.

Figure 2. Flight line representing the area covered during the Narrow Lake census (March 25, 2014). Red dots indicate locations of sighted caribou.

Mountain Caribou Population Status for the

Wells Gray North, Barkerville and North Cariboo Mountains-Bowron Sub-Populations,

Cariboo Region, 2015-2016

Prepared by:

Nicola L. Dodd
Ministry of Environment
Nov 6, 2017

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Introduction

Three mountain caribou sub-populations occur within the Cariboo Region: Wells Gray North, Barkerville and the North Cariboo Mountains. Aerial inventory of the Wells Gray North and North Cariboo Mountains sub-populations was undertaken in March 2015 as part of a long-term provincial monitoring program. The Barkerville sub-population was not attempted in 2015 due to poor survey conditions related to lack of fresh snowfall, incomplete snow coverage and hard-pan conditions at lower elevations that would have made differentiation of fresh and old caribou track in forested habitat extremely challenging; as a result the Barkerville survey was completed in March 2016. Objectives of the caribou surveys were to obtain minimum caribou counts, survey and population estimates, and calf recruitment rates to assess population trend.

Methods

The aerial caribou census used total count for absolute abundance (Resource Information Standards Committee, 2002). Survey area included known caribou range for the Wells Gray North sub-population as well as the south-western range of the North Cariboo Mountains sub-population (Appendix 1-Map 1). The remainder of the North Cariboo Mountains sub-population falls within the Omineca Region and was not surveyed in late winter 2015; this portion is generally surveyed by Ministry biologists from the Prince George regional office.

Modifications to the survey block boundaries have occurred over the years and should be considered in when assessing long-term population trends (Appendix 2). Prior to deployment of radio-collars in the mid-1980s and early 1990s, delineation of survey area boundaries was often based on limited knowledge of caribou distribution. Over the years, survey boundaries have been refined based on collared animal movements during winter. Since 1994, the flight path has been fairly consistent and provides coverage of known caribou winter range for the Wells Gray North (Horsefly, Junction and Stevenson blocks), Barkerville (Barkerville block), and North Cariboo Mountains (Bowron block) sub-populations. Each survey block encompasses a mountain complex containing an area of winter range that caribou generally remain in throughout an entire winter, with exception of the Bowron block, which follows an administrative boundary on its north and east borders. The survey blocks do not comprise discrete caribou populations as several shifts by radio-collared caribou have been recorded between Barkerville and Wells Gray North sub-populations (Young and Freeman, 2002); however, rugged terrain and less suitable caribou habitat separating the ranges of the Wells Gray North and Northern Cariboo Mountains sub-populations likely limits caribou movement between these two sub-populations. Surveys in the late 1980s and early 1990s occurred on the northside of Quesnel Lake. The Quesnel Lake Study Area (QLSA) described by Seip (1992), overlaps portions of the Stevenson and Junction blocks; some additional areas were surveyed and these caribou observations were recorded separately. The QLSA is bounded to the south by Quesnel Lake from Quesnel Forks to Niagara Falls in the East Arm, to the east by Niagara River, at the northern boundary by Penfold Creek and Little River, and to the west Cariboo Lake and Cariboo River.

Using a Bell 206 Jet Ranger, mountain complexes were flown counter clockwise near treeline and included coverage of all suitable caribou subalpine/alpine habitat. Generally only one pass was made of each slope, however if a group of animals was located in an area with an abundance of fresh and older track,

additional passes were made to ensure no groups were overlooked. All fresh tracks were followed in an attempt to visually locate animals. Caribou were classified as adults or calves. In cases where fresh track descended into dense forest and animals could not be visually located, an estimate of the number of caribou within the group was made and recorded as `unclassified caribou estimated from track'. An estimate of caribou numbers was only done if surveyors had high confidence that the 'estimated' caribou would not result in a double-count of other caribou in close proximity or on adjacent mountain slopes; typically caribou are only estimated from track in areas where no other caribou groups have been detected to avoid potential double-counts. Flight path and caribou locations were recorded using a handheld GPS unit and mapped on 1:250 000 topographic maps during the flight (Appendix 1- Map 1). Incidental sightings of mountain goats were counted but not classified.

Data analysis and reporting used the survey and population measures as defined in Table 1. Sightability correction factors were applied to the survey counts (i.e. total caribou observed) to produce survey estimates that accounted for caribou not detected during the survey. The correction factors were estimated by calculating the mean sightability of radio-collared caribou during late winter inventories undertaken between 1996 and 2006 in the Wells Gray North sub-population (mean sightability = 0.857, n=13, standard error of mean= 0.118) and Barkerville sub-population (mean sightability = 0.709, n=13, standard error of mean= 0.294).[1] No sightability correction factor was applied to the North Cariboo Mountains caribou count.

The population estimate was obtained from subjective assessment of previous survey estimates and calf recruitment rates, survey conditions, and unclassified caribou estimated from fresh track sign (i.e., not visually detected).

Population trends definitions were adapted from Thomas and Gray (2002), such that a population was *declining* or *increasing* over the long term (three generation lengths, where 1 generation=6.7 years) if change in population numbers was greater than twenty percent (>20%). A long term change less than 20% was defined as *stable*. Short-term changes in caribou numbers can vary considerably due to influence of survey conditions, weather and predators, thus short-term (~7-10 years) trends were *declining or growing* population with change greater than 20%, *stable-to-declining or stable-to-growing* population with change between 10% - 20%, and *relatively stable* with change <10%. Current trend was defined as *up* or *down* by a >10% change in the population estimate over the previous two or three years; any change < 10% was considered *stable*.

[1] Mean sightability excluded the 2003 sightability data as it was an incomplete survey.

Table 1. Definitions of survey metrics for caribou surveys conducted in the Cariboo Region.

Survey count	The total number of caribou observed during the defined survey period and defined survey area for a given classification category.
Minimum count	The total number of caribou observed during the defined survey period and defined survey area, plus any caribou observed post-survey. Post-survey observations are caribou missed (i.e., not counted) during the defined survey period and defined survey area. Minimum count may be presented instead of a survey estimate or population estimate if the outcome of the survey is viewed with low confidence.
Survey estimate	An adjustment of the survey count using mark-resight statistical methodology (e.g. Lincoln-Petersen Index; Joint Hypergeometric Estimator) or a sightability correction factor. Correction factors are derived through ratios of observed collared animals and total available collared animals. Confidence intervals should accompany survey estimates.
Population estimate	An estimate based on subjective assessment of the survey count, post-survey observations, survey estimate, and recent survey trends. Error cannot be quantified for the population estimate.

Results & Discussion

Survey Conditions

The Wells Gray North and North Cariboo Mountains caribou census was completed over 10 days between March 16 and April 5, 2015 (Appendix 1-Map 2). Snow conditions were not ideal leading up to the late winter survey with limited snowfall occurring in February and a lack of fresh snow immediately prior to commencement of the census.[2] Snowfall did occur in the mountains in both February and March however it was variable and patchy across the caribou range (Michelle Arcand-FLNR, pers comm 2015). However, snow cover was complete over the entire caribou range at the time of the survey. The Bowron block was flown on March 16 in 8.7 hours; conditions were excellent with clear sunny skies, negligible winds, temperatures of -4°C to -8°C, some fresh snow at higher elevation and hard-pan conditions at lower elevation. The Stevenson block was flown on March 17 in 6.4 hours; conditions were good with clear skies in the morning deteriorating to light overcast in the afternoon, winds of 10-20 km/hr, temperatures between -2°C to +7°C, shallow powder at high elevation caribou habitat and compact snow at lower elevations. Survey of the Junction block was initiated on March 18 (5.6 flight hours) in moderate conditions of overcast and broken cloud, 10-15 km/hr winds, blowing snow at higher elevation in the morning, shallow powder at higher elevation and hard-pan conditions at lower elevation. Completion of the Junction block required several attempts on March 28 (2.5 hours), March 30 (4.8 hours), and April 2 (2.9 hours); scattered snow flurries and fog patches in the mountain valleys caused survey delays during this time, however the fresh snow did provide good conditions for tracking of caribou groups. The Horsefly block was initially attempted on March 22 (1.5 hours), but was cancelled due to poor weather. The survey was completed on April 2 (2.8 hours) and April 5 (5.7 hours); survey conditions were moderate, ranging

[2] The winter of 2014-2015 was the 2nd year of an El Niño event

from scattered snow flurries and fog patches to high scattered cloud; visibility was good with fresh snow within the previous 24hours.

The Barkerville caribou census was completed in 11.2 hrs over 2 days on March 3 and 7, 2016 (Appendix 1-Map 3). Survey conditions were good with high scattered cloud, no wind, and a temperatures range of -1°C to +1°C.

Wells Gray North sub-population

For the Wells Gray North sub-population, a total of 164 caribou (13 calves, 151 adults) were counted with 7.9% calves (Table 1). Within the survey blocks, 81 caribou with 4.9% calves were observed in the Stevenson block, 58 caribou with 13.8% calves in the Junction block, and 25 caribou with 4.0% calves in the Horsefly block (Appendix 3). A total of 9 caribou were estimated from fresh track (i.e., not visually detected).

Caribou counts in the Stevenson block were fairly consistent compared to previous year, but calf recruitment was poor. Observed caribou in the Junction were down, yet calf recruitment was comparable to previous survey years. Caribou counts in the Horsefly block were down from the 2012 survey but have remained fairly consistent since 2011; however calf recruitment was much lower than previously observed (Appendix 5). Young and Freeman (2003) provide history of population trends and habitat fragmentation in the Stevenson, Junction and Horsefly survey blocks.

Table 1. Wells Gray North, North Cariboo Mountains (Bowron), and Barkerville caribou census, March 2015 and 2016.

Sub-population	Survey Year	Survey Block	Total Caribou	Adults	Calves	% Calves[a]	Survey Estimate	Caribou estimated from track	Population Estimate
Wells Gray North	2015	Horsefly	25	24	1	4.0%	---	0	---
		Stevenson	81	77	4	4.9	---	8	---
		Junction	58	50	8	13.8%	---	1	---
		Total	164	151	13	7.9%	191[b]	9	200
North Cariboo Mountains	2015	Bowron	55	51	4	7.3%	55[c]	9	64
Barkerville	2016	Barkerville	51	45	6	11.8%	72[d]	0	72

[a] percent calves = (total calves)/(total caribou-total unclassified caribou)*100
[b] Wells Gray North survey estimate is the survey count adjusted for sightability with a correction factor of 0.857.
[c] Bowron survey estimate is equivalent to the minimum count.
[d] Barkerville survey estimate is the survey count adjusted for sightability with a correction factor of 0.709.

The survey estimate was 191 caribou and the population estimate was 200 caribou (Figure 1; Appendix 5). Since 2002 the Wells Gray North sub-population has appeared fairly stable between 220 and 235 animals; however an increase in caribou counted in 2012 corresponded to an increase in the population estimate to 265 caribou. Since 2008 calf recruitment has been below the 15-16% recommended by Bergerud (1992) as stabilizing, suggesting that the increase in caribou numbers in 2012 may have been attributed to adult survival or immigration.

Long-term trend data for the Wells Gray North sub-population has consistently pointed towards a declining population since the mid-1990s when the herd was estimated at 300 caribou (1997-2015, -33%). In the past 10 years (2006-2015) the population appears to be *stable-to-decreasing* (-15%), however since 2012 the trend is down (-25%).

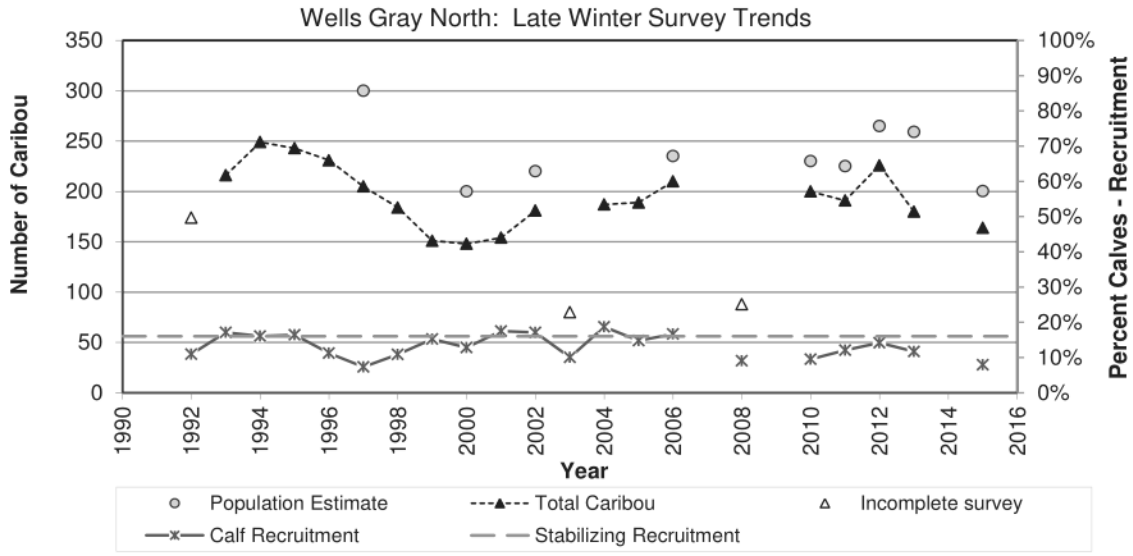

Figure 1. Late winter caribou count, calf recruitment and population trend for the Wells Gray North caribou sub-population, 1992-2015. Prior to 1991, the survey area was the Quesnel Lake Study Area (QLSA; data in Appendix 2).

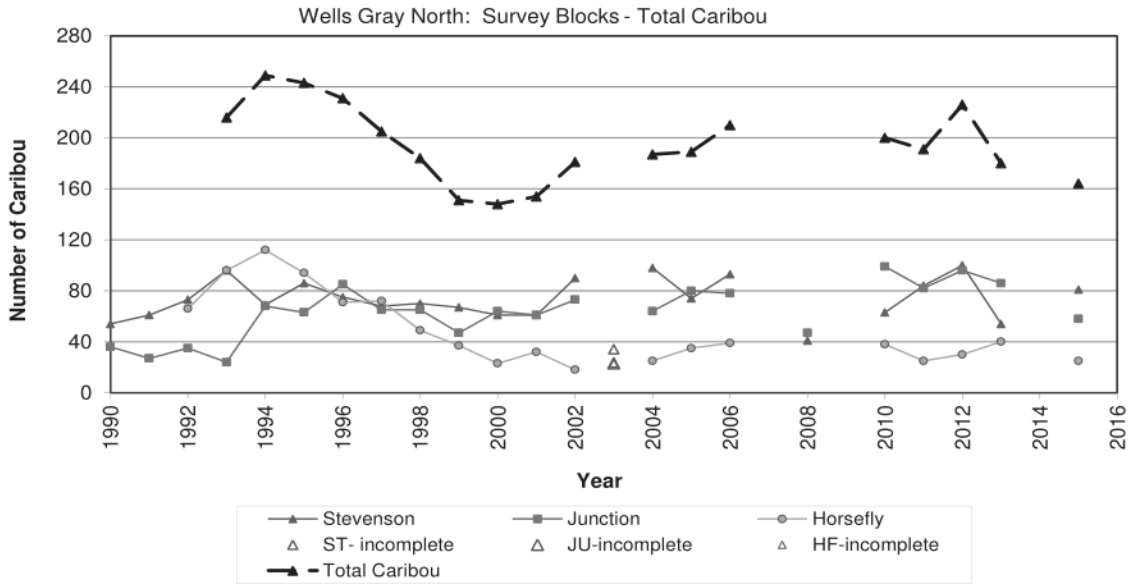

Figure 2. Late winter caribou count for the Wells Gray North survey blocks, 1992-2015.

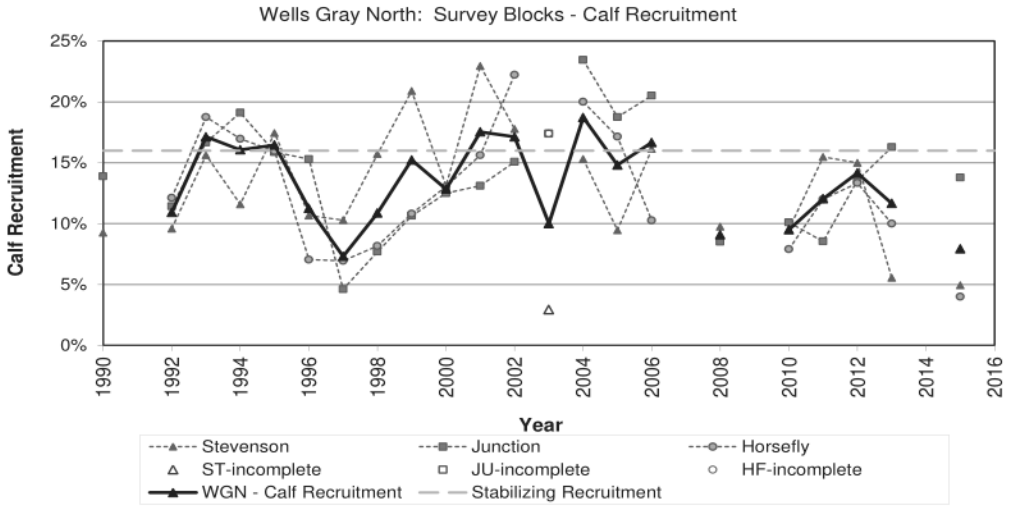

Figure 3. Late winter calf recruitment for the Wells Gray North survey blocks, 1992-2015.

North Cariboo Mountains sub-population – Bowron block

For the Bowron survey block, a total of 55 caribou (4 calves, 51 adults) were counted with 7.3% calves (Table 1; Figure 4; Appendix 3). Observed caribou numbers in the Bowron block reflect only a portion of the Northern Cariboo Mountains sub-population. Caribou likely move frequently in and out of this survey block from the north and east resulting in shifting caribou distribution within the range; this may be one explanation for the large fluctuations in observed animal numbers between survey years. No animals have been radio-collared within the Bowron block; consequently a sightability correction factor for survey estimate was unavailable. An estimated 9 caribou were not visually detected, but were recorded with confidence as 'caribou estimated from track'; these additional caribou sign were included in the population estimate. Caribou numbers and calf recruitment in 2015 was consistent with the 2011 survey (Appendix 5).

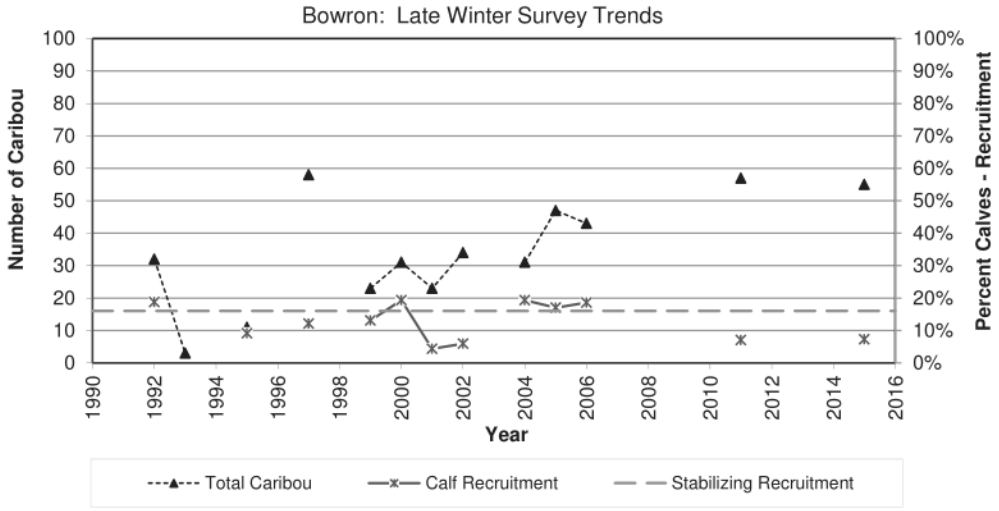

Figure 4. Late winter caribou count and calf recruitment for the North Cariboo Mountains – Bowron block sub-population, 1992-2015.

Barkerville sub-population

Barkerville caribou inhabit lower elevation forest with less alpine meadow habitat compared to the adjacent Wells Gray North sub-population; continuous Englemann Spruce-Subalpine Fir (ESSF) forest occurs at higher elevations and Sub-Boreal-Spruce (SBS) dominates the valley bottoms.

In 2016, a total of 51 caribou were observed and calf recruitment was estimated at 11.8%; corrected for sightability, the population was estimated at 72 caribou (Table 1, Figure 5, Appendix 4). Long-term trend data for the Barkerville sub-population suggests an increasing population over the past 20 years (1997-2016, +44%), although this growth is recent as the herd appeared to be stable at ~50 animals between 1997 and 2011 (Appendix 5). In 2012, surveyors counted 75 caribou and estimated the population at 90 caribou (Freeman 2012). This variability is not surprising given that sightability of the Barkerville caribou is heavily influenced by i) forested habitat and ii) by surveyor experience and caribou trailing/tracking ability, and iii) survey conditions including snow age, coverage, condition, and light/shadows.

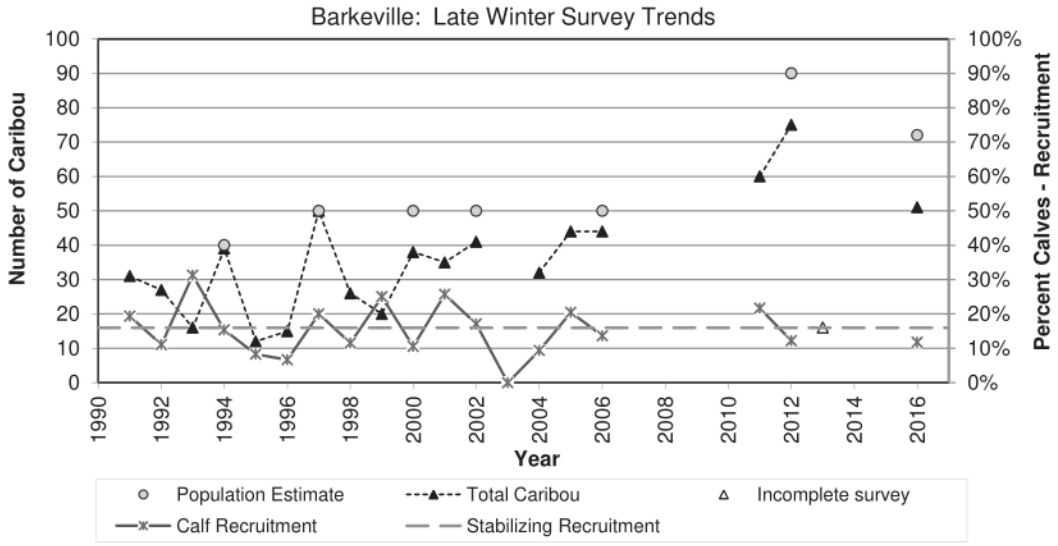

Figure 5. Late winter caribou count, calf recruitment and population trend for the Barkerville mountain caribou sub-population, 1991-2016. Counts prior to 1994 may be underestimated due to smaller survey area (*see* Appendix 2).

Survey Cost

In 2015, a total of 40.9 helicopter flight hours were used to complete the mountain caribou census: the Horsefly block required 10 hrs, the Stevenson block took 6.4 hrs, the Junction was 15.8 hrs, and the Bowron was 8.7 hrs. Total survey costs were $45,575. In 2016, the Barkerville survey was completed in 11.2 helicopter flight hours with total survey cost of $12,393.

Conclusion

- The 2015 Wells Gray North sub-population estimate was 200 caribou, with a survey count of 164 caribou and calf recruitment estimate of 7.9%.
- Long-term trend data for the Wells Gray North sub-population has consistently pointed towards a declining population since the mid-1990s when the herd was estimated at 300 caribou (1997-2015, -33%). In the past 10 years (2006-2015) the population appears to be *stable-to-decreasing* (-15%), however since 2012 the trend is down (-25%).
- The 2016 Barkerville sub-population estimate was 72 caribou, with a survey count of 51 caribou and calf recruitment estimate of 11.8%.
- Long-term trend data for the Barkerville sub-population suggests an increasing population over the past 20 years (1997-2016, +44%), although this growth is recent as the herd appeared to be stable at ~50-60 animals between 1997 and 2011.

Acknowledgements

The caribou census was undertaken by the Wildlife Section of the Ministry of Forests Lands and Natural Resource Operations (FLNRO). The 2015 survey flights were navigated by Pat Dielman, with Becky Cadsand, serving as the rear left observer. The 2016 flights were navigated by Pat Dielman, with Becky Cadsand and Dan Lirette serving as the rear left observer. Thanks are extended to Michelle Arcand, Alyssa Boivin, Larry Davis, Carla Grimson, Kim Keogh, Alex Tranq, and James Zucchelli for serving as observers during flights. Frontline Helicopters was contracted for the surveys undertaken in March 2015; Arduini Helicopters Ltd. was contracted for flights in April 2015 and March 2016. The project manager was Nicola Dodd in 2015 and Dan Lirette in 2016. Funding for the surveys was provided by the Mountain Caribou Recovery Implementation Program and FLNRO.

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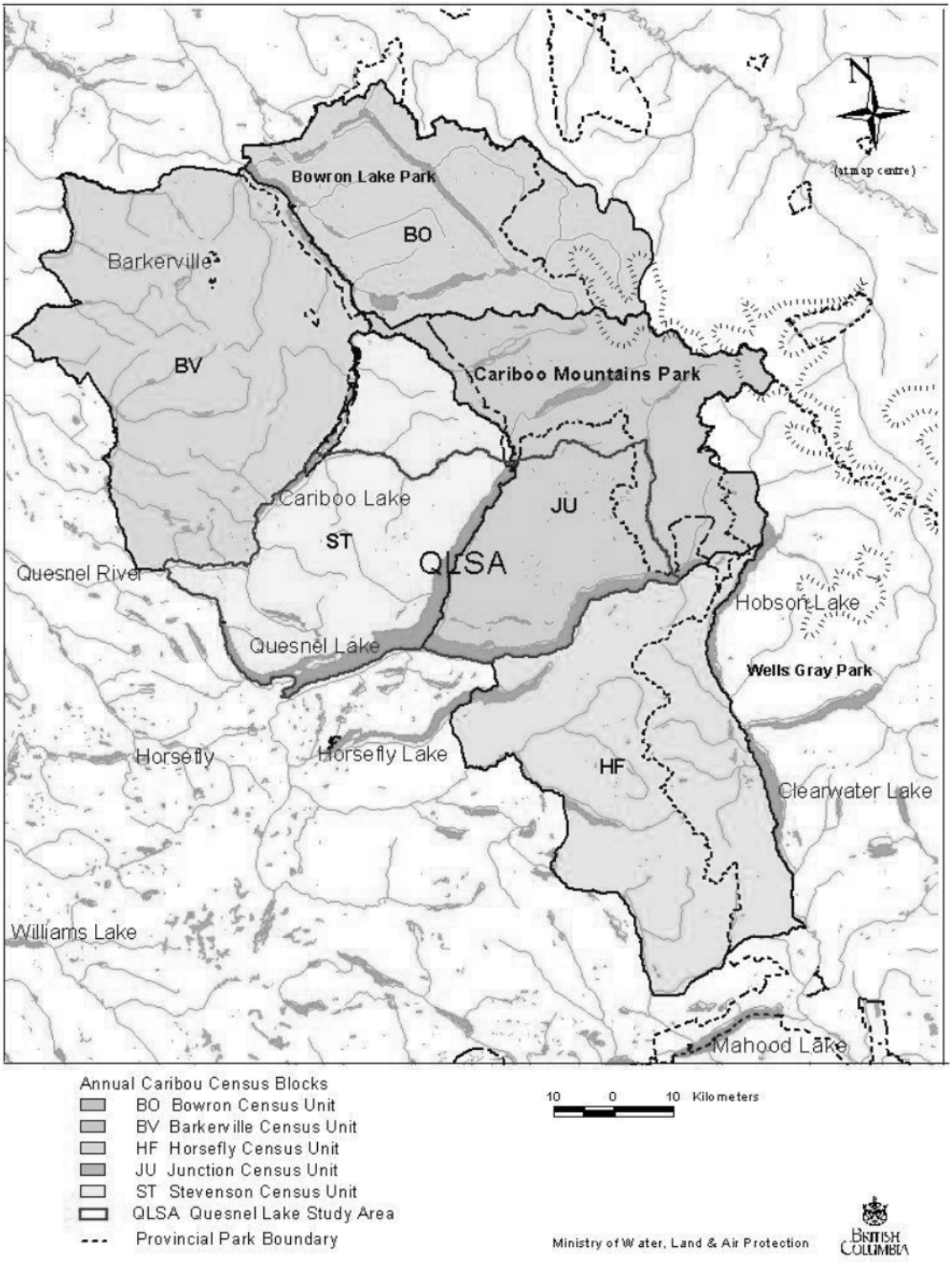
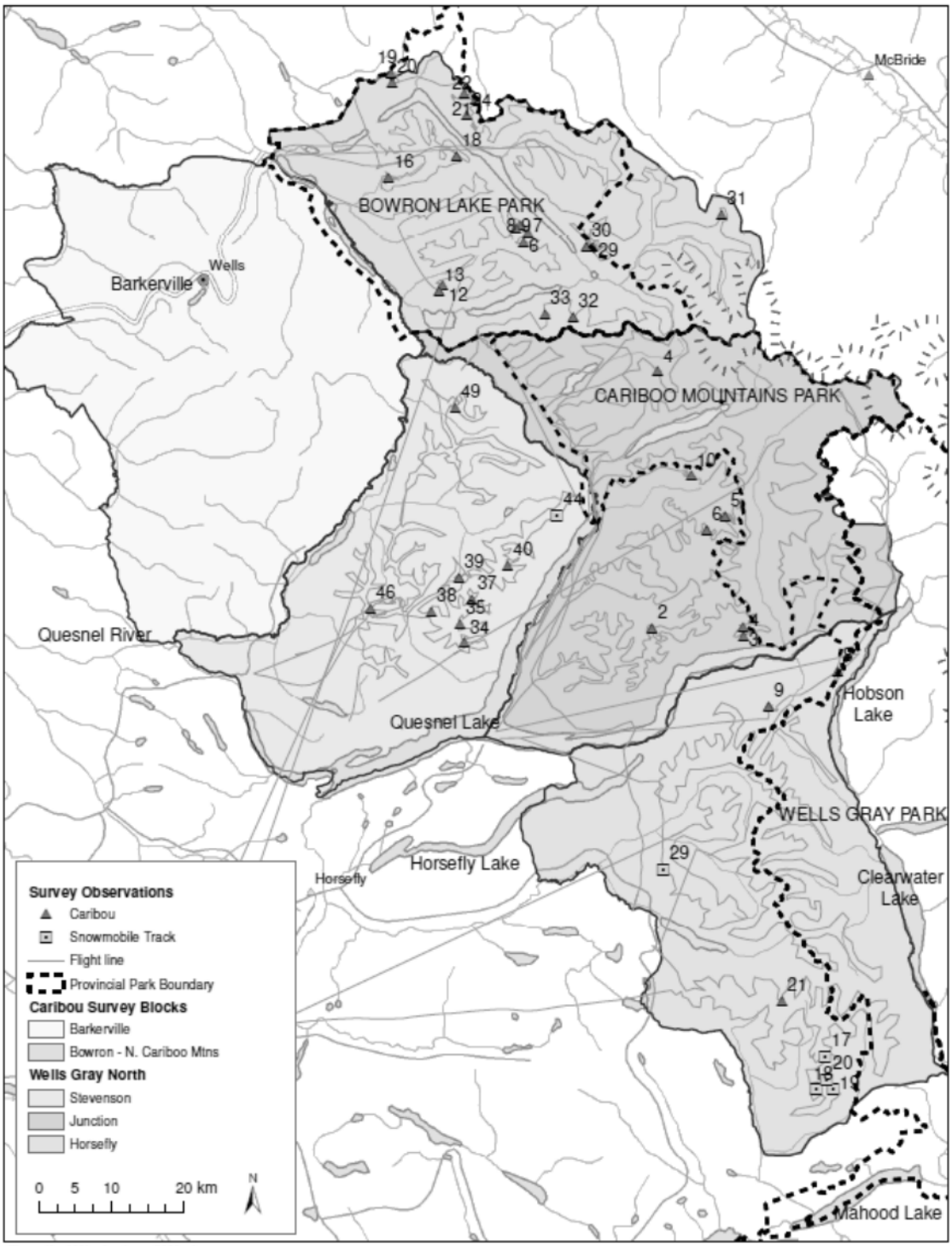
Appendix 1. Maps of survey blocks, observations and flight routes for late winter mountain caribou census for the Wells Gray North, Barkerville, and North Cariboo Mountains sub-populations.

Map 1: Survey blocks for the mountain caribou census, Cariboo Region



Map 2: Observations and flight route for the 2015 late winter mountain caribou census for the Wells Gray North (Stevenson, Junction, Horsefly) and North Cariboo Mountains (Bowron).



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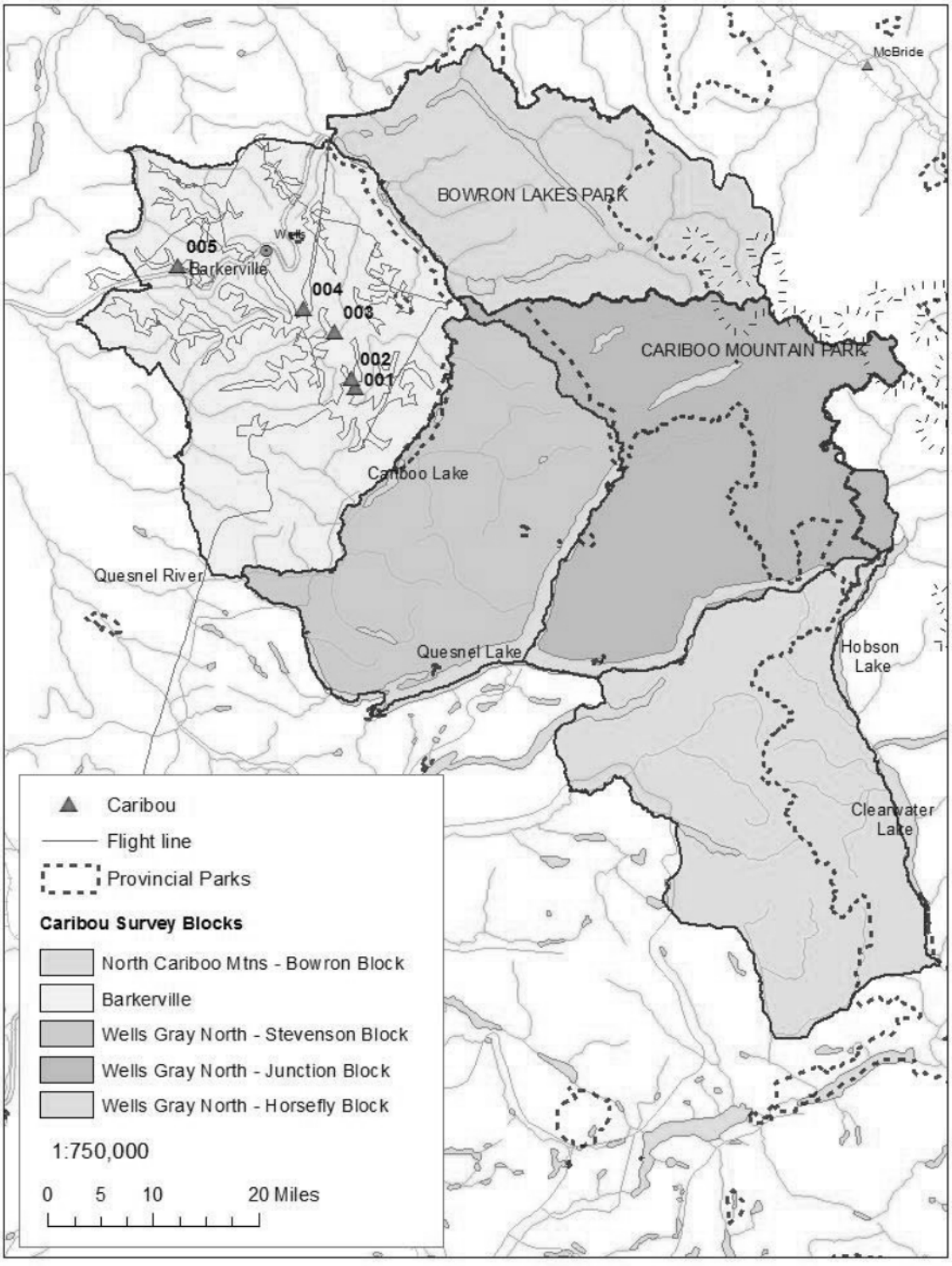
Map 3: Observations and flight route for the 2016 late winter mountain caribou census for the Barkerville mountain caribou sub-population.



Appendix 2. Mountain caribou survey boundary adjustments for Wells Gray North and Barkerville caribou sub-populations.

Modifications to the census boundaries have occurred over the years and should be considered in when assessing long-term population trends. Modifications (*from* Freeman and Stalberg 2006) include the following:

Barkerville Block

Knowledge of the distribution of mountain caribou within the Barkerville sub-population was limited prior to deployment of 4 radio-collars in February 1993. The Barkerville census area greatly expanded from surveys in the late 1980's and early 1990s following monitoring of collared caribou movement. In the 1980s, surveys were conducted south of the Barkerville highway and included the Milk Ranch Mountain, Cariboo Mountain, Yanks Peak-Roundtop Mountain, and Meridian Mountain complexes; additional areas surveyed included the higher elevation habitat of Mount Tinsdale, Sliding Mountain and Two Sisters Mountain (Jim Young, pers. Comm.). In 1993, the survey extended north of the highway to incorporate the Eaglenest Ridge area but bypassed Mt. Tom and Hardscrabble Mountain, an area now known to be used extensively by caribou for winter range. It was not until 1994, that all the new areas were included in the flight path used to this day (Jim Young, pers. Comm). As a result, caribou herd estimates for the Barkerville block were likely underestimated prior to 1994 and the inclusion of the additional winter range.

Wells Gray North: Junction Block

Prior to 2000, the northern boundary of the Junction block was the Matthew River. In March 2000 for more complete coverage, this was extended north from the Matthew River to the height of land along the administrative boundary of Bowron Provincial Park, thereby including the mountain slopes on the north side of the Matthew River from Ishpa Mountain east to the headwaters of the Matthew River. The Junction block extension likely had very little impact on observed caribou numbers as caribou were rarely seen between the Matthew River and the administrative park boundary due to the extremely rugged and steep terrain.

Appendix 3. Wells Gray North and North Cariboo Mountains (Bowron) caribou survey data, March 2015.

Block	Date	Group Label	Zone	Northing	Easting	Total	Calf	Adult	U/C	Sign	Estimated caribou from fresh track	Comments
Horsefly	2015-Apr-02	8	10	5827332	680952					track		old tracks, not counted
	2015-Apr-02	9	10	5823032	671246	7		7				
	2015-Apr-05	21	10	5782428	671301	18	1	17				
TOTAL						**25**	**1**	**24**	**0**		**0**	
Stevenson	2015-Mar-17	34	10	5833645	629565					track		old tracks, not counted
	2015-Mar-17	35	10	5836189	629119					track		old tracks, not counted
	2015-Mar-17	37	10	5839476	630879	38	2	36				
	2015-Mar-17	38	10	5837998	625203	11	1	10				
	2015-Mar-17	39	10	5842566	629210	8		8				
	2015-Mar-17	40	10	5843816	636009	12	1	11				
	2015-Mar-17	46	10	5838740	616797					beds	8	8 to 10 (10 beds)
	2015-Mar-17	49	10	5865848	629697	12		12				
TOTAL						**81**	**4**	**77**	**0**		**8**	
Junction	2015-Mar-18	2	10	5834472	655581	11	1	10				
	2015-Mar-18	3	10	5834042	668168	8	2	6				
	2015-Mar-18	4	10	5832814	668170					track	1	1-2 track
	2015-Mar-18	5	10	5849433	666313	7	1	6				
	2015-Mar-18	6	10	5847621	663700	9		9				
	2015-Mar-18	10	10	5855135	661891	11	2	9				
	2015-Mar-30	4	10	5869653	657889	12	2	10				
TOTAL						**58**	**8**	**50**	**0**		**1**	
Bowron	2015-Mar-16	6	10	5888218	640097	2		2		track		old track, not counted
	2015-Mar-16	7	10	5889440	640774					track		old track, not counted
	2015-Mar-16	8	10	5890637	639820					track		track, not counted
	2015-Mar-16	9	10	5890113	639121	10	1	9				
	2015-Mar-16	12	10	5882727	628710					track	1	single animal track
	2015-Mar-16	13	10	5882054	628165	2		2				
	2015-Mar-16	16	10	5897938	621882					track	6	6 to 7 fresh track
	2015-Mar-16	18	10	5900521	631355	7		7				
	2015-Mar-16	19	10	5912149	622839					track		track, not counted
	2015-Mar-16	20	10	5910929	622876	7		7				
	2015-Mar-16	21	10	5908952	632825	3		3				
	2015-Mar-16	22	10	5908139	634328	3		3				
	2015-Mar-16	24	10	5905971	633011	8	2	6				
	2015-Mar-16	29	10	5887240	649668					track	1	
	2015-Mar-16	30	10	5887307	648781	6		6				
	2015-Mar-16	31	10	5890876	667637	1		1				
	2015-Mar-16	32	10	5877707	646534	6	1	5				
	2015-Mar-16	33	10	5878236	642671					track	1	single animal track
TOTAL						**55**	**4**	**51**	**0**		**9**	

	Total	Calves	Adults	U/C	Estimated caribou from fresh track	Percent Calves*	Survey Estimate	2015 Population Estimate
Wells Gray North	**164**	**13**	**151**	**9**	**9**	**7.9%**	191	**200**
Horsefly block	25	1	24	0	0	4.0%	---	
Stevenson block	81	4	77	0	8	4.9%	---	
Junction block	58	8	50	0	1	13.8%	---	
North Cariboo Mountains	---	---	---	---	---	---	---	---
Bowron block	**55**	**4**	**51**	**0**	**9**	**7.3%**	---	**64**

*percent calves = (total calves)/(total caribou-total unclassified caribou) *100
U/C= unclassified caribou, can include adults or calves

Appendix 4. Barkerville caribou survey data, March 2016.

Block	Date	Group Label	Zone	Northing	Easting	Total	Calf	Adult	U/C	Sign	Estimated caribou from fresh track	Comments
Barkerville	2016-Mar-3	1	10	5863421	608270	6		6				
	2016-Mar-3	2	10	5864827	607750	5	2	3				
	2016-Mar-3	3	10	5872084	605396	13	1	12				
	2016-Mar-3	4	10	5875851	600844	13	2	11				
	2016-Mar-7	5	10	5883073	581780	14	1	13				
TOTAL						**51**	**6**	**45**	**0**		**0**	

	Total	Calves	Adults	U/C	Estimated caribou from fresh track	Percent Calves*	Survey Estimate	2015 Population Estimate
Barkerville	**51**	**6**	**45**	**0**		**11.8%**	---	**72**

*percent calves = (total calves)/(total caribou-total unclassified caribou) *100

U/C= unclassified caribou, can include adults or calves

Appendix 5. Survey and population trend data for Wells Gray North, Barkerville, and North Cariboo Mountains (Bowron block) mountain caribou sub-populations. Survey estimates derived from Joint Hypergeometric Estimator for 1993-2006 (NOREMARK, White, 1996); estimate 2011-2015 derived from average annual collar sightability for 1996-2006 (excluding 2003) period.

* Footnotes are located at the end of the summary tables.
** SCF= Sightability Correction Factor
***CI= Confidence Interval

WELLS GRAY NORTH SUB-POPULATION										
YEAR	Total	Adult	Calf	U/C	Calf Recruitment	Collars Seen/Available	SCF	Survey Estimate[a]	95% CI	Population Estimate
1985[b]										
1986[b]										
1987[b]										
1988[b]										
1989[b]										
1990[b]										
1991[b]										
1992[c]	174	155	19		10.9%					
1993	216	179	37		17.1%	13 / 15	0.867	249	222 - 333	
1994	249	209	40		16.1%	18 / 19	0.947	263	250 - 313	
1995	243	203	40		16.5%	14 / 17	0.824	295	256 - 398	
1996	231	205	26		11.3%	16 / 16	1.000	231	231 - 259	
1997	205	190	15		7.3%	11 / 13	0.846	242	212 - 340	300
1998	184	164	20		10.9%	13 / 13	1.000	184	184 - 212	
1999	151	128	23		15.2%	7 / 8	0.875	173	153 - 269	
2000	148	129	19		12.8%	7 / 9	0.778	190	155 - 319	200
2001	154	127	27		17.5%	5 / 7	0.714	216	164 - 435	
2002	181	150	31		17.1%	3 / 5	0.600	302	198 - 903	220
2003[d]	80	72	8		10.0%	5 / 9	0.556	144	---	
2004	187	152	35		18.7%	12 / 12	1.000	187	187 - 218	
2005	189	161	28		14.8%	9 / 11	0.818	231	196 - 348	
2006	210	175	35		16.7%	7 / 8	0.875	240	212 - 375	235
2007	no survey									
2008[e]	88	80	8		9.1%	---	---	---	---	
2009	no survey									
2010[f]	200	181	19		9.5%	---	0.857	233	---	230
2011	191	168	23		12.0%	---	0.857	223	---	225
2012[g]	226	194	32		14.2%	---	0.857	264	---	265
2013[h]	180	159	21		11.7%	---	0.857	210	---	259
2014	no survey									
2015	164	151	13		0.079268293	---	0.857	191.36523	---	200.365228
2016	no survey									

Wells Gray North survey blocks

YEAR	STEVENSON CENSUS BLOCK					JUNCTION CENSUS BLOCK					HORSEFLY CENSUS BLOCK				
	Total	Adult	Calf	Calf Recruit	Collars Seen/Avail	Total	Adult	Calf	Calf Recruit	Collars Seen/Avail	Total	Adult	Calf	Calf Recruit	Collars Seen/Avail
1985[b]	67	63	4	6.0%	5 / 6	51	46	5	9.8%	4 / 6	no survey				
1986[b]	118	96	22	18.6%	8 / 8	65	65	0	0.0%	6 / 6	no survey				
1987[b]	104	93	11	10.6%	8 / 9	51	48	3	5.9%	3 / 5	no survey				
1988[b]	51	49	2	3.9%	unknown	40	35	5	12.5%	unknown	no survey				
1989[b]	65	43	4	6.2%	---	35	33	2	5.7%	---	no survey				
1990[b]	54	49	5	9.3%	---	36	31	5	13.9%	---	no survey				
1991[b]	61	unknown	unknown	unknown	---	27	unknown	unknown	unknown	---	no survey				
1992[c]	73	66	7	9.6%	---	35	31	4	11.4%	---	66	58	8	12.1%	---
1993	96	81	15	15.6%	7 / 7	24	20	4	16.7%	2 / 4	96	78	18	18.8%	4 / 4
1994	69	61	8	11.6%	5 / 5	68	55	13	19.1%	6 / 6	112	93	19	17.0%	7 / 8
1995	86	71	15	17.4%	4 / 6	63	53	10	15.9%	6 / 6	94	79	15	16.0%	4 / 5
1996	75	67	8	10.7%	6 / 6	85	72	13	15.3%	6 / 6	71	66	5	7.0%	4 / 4
1997	68	61	7	10.3%	6 / 7	65	62	3	4.6%	3 / 3	72	67	5	6.9%	2 / 3
1998	70	59	11	15.7%	6 / 6	65	60	5	7.7%	5 / 5	49	45	4	8.2%	2 / 2
1999	67	53	14	20.9%	5 / 5	47	42	5	10.6%	0 / 1	37	33	4	10.8%	2 / 2
2000	61	53	8	13.1%	2 / 4	64	56	8	12.5%	2 / 2	23	20	3	13.0%	3 / 3
2001	61	47	14	23.0%	2 / 4	61	53	8	13.1%	2 / 2	32	27	5	15.6%	1 / 1
2002	90	74	16	17.8%	1 / 3	73	62	11	15.1%	1 / 1	18	14	4	22.2%	1 / 1
2003[d]	34	33	1	2.9%	2 / 5	23	19	4	17.4%	3 / 4	23	20	3	13.0%	---
2004	98	83	15	15.3%	5 / 5	64	49	15	23.4%	5 / 5	25	20	5	20.0%	2 / 2
2005	74	67	7	9.5%	2 / 3	80	65	15	18.8%	5 / 6	35	29	6	17.1%	2 / 2
2006	93	78	15	16.1%	2 / 2	78	62	16	20.5%	4 / 5	39	35	4	10.3%	1 / 1
2007	no survey					no survey					no survey				
2008[e]	41	37	4	9.8%	---	47	43	4	8.5%	---	no survey				
2009	no survey					no survey					no survey				
2010[f]	63	57	6	9.5%	---	99	89	10	10.1%	---	**38**	35	3	7.9%	---
2011	84	71	13	15.5%	---	82	75	7	8.5%	---	**25**	22	3	12.0%	---
2012[g]	100	85	15	15.0%	---	96	83	13	13.5%	---	30	26	4	13.3%	---
2013[h]	54	51	3	5.6%	---	86	72	14	16.3%	---	40	36	4	10.0%	---
2014	no survey					no survey					no survey				
2015	81	77	4	4.9%	---	58	50	8	13.8%	---	25	24	1	4.0%	---

BARKERVILLE SUB-POPULATION										
YEAR	Total	Adult	Calf	U/C	Calf Recruitment	Collars Seen/Available	SCF	Survey Estimate[a]	95% CI	Population Estimate
1985[b]										
1986[b]										
1987[b]	33	32	1		3.0%	---	---	---	---	
1988[b]	38	32	6		15.8%	---	---	---	---	
1989[b]	37	35	2		5.4%	---	---	---	---	
1990[b]						---	---	---	---	
1991[b]	31	25	6		19.4%	---	---	---	---	
1992[c]	27	24	3		11.1%	---	---	---	---	
1993	16	11	5		31.3%	3 / 4	0.750	21	17 - 53	
1994	39	33	6		15.4%	2 / 2	1.000	39	39 - 100	40
1995	12	11	1		8.3%	1 / 2	0.500	24	13 - 302	
1996	15	14	1		6.7%	0 / 2	0.000	47	---	
1997	50	40	10		20.0%	2 / 2	1.000	50	50 - 129	50
1998	26	23	3		11.5%	4 / 5	0.800	32	27 - 66	
1999	20	15	5		25.0%	2 / 5	0.400	50	26 - 237	
2000	38	34	4		10.5%	2 / 3	0.667	57	39 - 231	50
2001	35	26	9		25.7%	3 / 3	1.000	35	35 - 65	
2002	41	34	7		17.1%	4 / 6	0.667	61	45 - 141	50
2003[d]	no survey									
2004	32	29	3		9.4%	4 / 7	0.571	96	96 - 131	
2005	44	35	9		20.5%	7 / 7	1.000	44	44 - 56	
2006	44	38	6		13.6%	6 / 7	0.857	51	45 - 83	50
2007	no survey									
2008[e]	no survey									
2009	no survey									
2010[f]	no survey									
2011	60	47	13		21.7%	---	0.709	85	---	
2012[g]	75	65	9	1	12.2%	---	0.857	88	---	90
2013[h]	16	13	3		18.8%	---	---	---	---	
2014	no survey									
2015	no survey									
2016	51	45	6		11.8%	---	0.709	72	---	72

BOWRON CENSUS BLOCK										
YEAR	Total	Adult	Calf	U/C	Calf Recruitment	Collars Seen/Available	SCF	Survey Estimate[a]	95% CI	Population Estimate
1985[b]	no survey									
1986[b]	no survey									
1987[b]	no survey									
1988[b]	no survey									
1989[b]	no survey									
1990[b]	no survey									
1991[b]	no survey									
1992[c]	32	26	6		18.8%					
1993	3	3	0		0.0%					
1994	no survey									
1995	11	10	1		9.1%					
1996	no survey									
1997	58	51	7		12.1%					
1998	no survey									
1999	23	20	3		13.0%					
2000	31	25	6		19.4%					
2001	23	22	1		4.3%					
2002	34	32	2		5.9%					
2003[d]	no survey									
2004	31	25	6		19.4%					
2005	47	39	8		17.0%					
2006	43	35	8		18.6%					
2007	no survey									
2008[e]	no survey									
2009	no survey									
2010[f]	no survey									
2011	57	53	4		7.0%					
2012[g]	no survey									
2013[h]	no survey									
2014	no survey									
2015	55	51	4		0.072727273					64
2016	no survey									

Footnotes:

[a] Survey estimates derived from Joint hypergeometric Estimator for 1993-2006 (NOREMARK: WHITE, 1996); estimate in 2010 derived from average collar sightability for 1996-2002 & 2004-2006 period. For 2010 onward, the Sightability Correction Factor (SCF) was estimated by calculating the mean sightability of radio-collared caribou during late winter inventories undertaken between 1996 and 2006 in the Wells Gray North sub-population (mean sightability = 0.857, n=13, standard error of mean= 0.118). Mean sightability excluded the 2003 sightability data as it was an incomplete survey. This mean SCF was used to calculate a survey estimate for Wells Gray North due to no radio-collars being present in the herd.

[b] 1985-1991, the caribou survey area was the Quesnel Lake Study Area (QLSA). Caribou observed outside of the QLSA study area were reported separately as additional observations. These additional observations have been included in the total caribou observed columns in the Stevenson and Junction blocks based on the reported geographic location of the observation (see Appendices in Young & Freeman. 2003. Mountain caribou population status and trends: Summary of the mountain caribou surveys within the Quesnel Highland and Cariboo Mountains, Cariboo Region, up to and including 2002). The QLSA total is limited to those caribou observations within the QLSA boundary.

[c] 1992 incomplete survey of the Horsefly block

[d] 2003 survey incomplete; low snow depth during the late winter resulted in caribou migrating up into sub-alpine, then returning to lower elevation forested habitat in March. Extremely poor sightability encountered within the Stevenson and Junction census blocks resulted in cancellation of the Horsefly, Barkerville and Bowron surveys. However, late winter observations of caribou in the Horsefly block, obtained from the Ministry's Wolf and Snowmobile Monitoring Projects, were used to estimate caribou numbers (these numbers were not collected with standard absolute abundance survey methods).

[e] 2008 was an incomplete survey of Wells Gray North sub-population. Objective in 2008 was a reconnaissance survey of Quesnel Lake Study Area (QLSA) for an estimate of calf recruitment. Although the initial goal was to survey the Quesnel Lake study area in its entirety, poor weather conditions and the lateness of the season did not allow completion. For this reason a combination of survey techniques was undertaken including i) rotary flight at and above treeline in a counter-clockwise direction around mountain complexes, ii) radio-telemetry to locate radio-collared caribou, and iii) specific area searches where caribou track had been observed and reported by Canadian Mountain Helicopters heli-ski operation.

[f] The Sightability Correction Factor (SCF) was estimated by calculating the mean sightability of radio-collared caribou during late winter inventories undertaken between 1996 and 2006 in the Wells Gray North sub-population (mean sightability = 0.857, n=13, standard error of mean= 0.118). Mean sightability excluded the 2003 sightability data as it was an incomplete survey. This mean SCF was used to calculate a survey estimate for Wells Gray North due to no radio-collars being present in the herd.

[g] 2012 Barkerville block had high sightability, such that experienced surveyors indicated sightability was comparable to Wells Gray North. Increased survey intensity in one area of the Barkerville block resulted in group of 19 caribou being counted that normally would have gone undetected in low elevation, valley bottom forest.

[h] 2013 surveys should be interpreted with caution for both Wells Gray North and Barkerville herds. Survey was not Ministry-led but was externally contracted; the survey quality may have been compromised by weather, snow conditions, surveyor inexperience, pilot inexperience, and lack of familiarity with survey area/methodology/caribou trailing. For Wells Gray North, 49 caribou were estimated from track without visual confirmation. Barkerville block had extremely low sightability. For Ministry-led surveys, an estimate of caribou numbers is only done if surveyors have high confidence that the 'estimated' caribou will not result in a double-count of other caribou in close proximity or on adjacent mountain slopes; typically caribou are only estimated from track in areas where no other caribou groups have been detected to avoid potential double-counts. If an estimate of caribou based on track is undertaken, this data is not included in the survey count or survey estimate; it is limited to inclusion in the population estimate if deemed appropriate.

Population Assessment of Southern Mountain Caribou (*Rangifer tarandus*) in the Prince George Forest District

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Abstract

In March 2016, we conducted an aerial survey for woodland caribou (*Rangifer tarandus*) within the Prince George Forest District (DPG). Caribou in the DPG are part of the Southern Mountain Designatable Unit (DU 9), and in 2014 were most recently assessed as *Endangered* by COSEWIC. Using the standard total count survey method corrected for sightability, we estimated the number of caribou within 4 subpopulations:

Hart South	246
Parsnip	129
Narrow Lake	36
North Cariboo Mountains[a]	146

Our survey results suggest that all 4 subpopulations declined by 40–50% over the last decade. The Parsnip, Narrow Lake and North Cariboo Mountain subpopulations appear stable since 2012, however, the Hart South declined by 40% during this period.

[a]Sugar Bowl and Haggen census blocks only

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Introduction

Population monitoring of woodland caribou (*Rangifer tarandus*) is used to document and track changes in the population status of each herd over time. In British Columbia, caribou populations are typically monitored by aerial census every 3 years, or more frequently for very small populations or to assess recovery actions. Currently listed as *Threatened* under the federal *Species at Risk Act*, caribou within the Prince George Forest District (DPG) are part of Designatable Unit (DU) 9, Southern Mountain Caribou. In 2014, the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) recommended the Southern Mountain ecotype to be up-listed to *Endangered* because most subpopulations experienced considerable population declines and now occur in small populations (i.e. < 50 individuals; COSEWIC 2014). Currently there are 4 subpopulations (or herds) of Southern Mountain caribou within the DPG: the Hart South and Parsnip (collectively known as the Hart Ranges); North Cariboo Mountains; and Narrow Lake (Figure 1). These caribou make up the northern extent of the distribution for the Southern Mountain ecotype and together represent approximately 45% of the total remaining population (Environment Canada 2014). The George Mountain subpopulation, also within the DPG, was estimated at 20 individuals in 1993 (Watts 1999). However, this subpopulation was extirpated in the early 2000s (Seip et al. 2004).

Ministry Biologists (MOE and FLNRO) have been monitoring caribou within the DPG consistently since the late 1990s. Estimated at 404 individuals in 2012, the Hart South was the largest remaining caribou subpopulation within the Southern Mountain ecotype (Environment Canada 2014). The Parsnip and North Cariboo Mountains (Sugar Bowl and Haggen blocks) subpopulations were estimated at 121 and 126 animals in 2013 and 2014, respectively. The Narrow Lake subpopulation was most recently estimated at 42 animals in 2014 (Courtier and Heard 2014). Survey results suggest that all 4 subpopulations have declined since 2005. Consistent with population decline, data on calf recruitment revealed rates below the 15% considered necessary for a stable population (Bergerud 1992).

We counted caribou within the DPG to assess the population status for each subpopulation. Our primary objective was to count the total number of caribou and assess the

proportion of calves in each subpopulation to estimate recruitment. We compare data collected in 2016 with past estimates to assess population trends over time.

Study Area & Methods

The study area is located in the subalpine and alpine zones of the Rocky and Cariboo Mountains, approximately 70–120 km east of Prince George, British Columbia (Figure 1). Extending from Bowron Lake Provincial Park in the south up to Reynolds Creek in the north, the study area includes portions of Wildlife Management Units 7–06, 7–07, 7–08, 7–09, 7–16, 7–17, 7–18, and 7–23. Four caribou subpopulations were surveyed. The Hart South, North Cariboo Mountains, and Narrow Lake subpopulations were broken into smaller census blocks to allow comparisons with previous surveys.

1) Hart South
    a. Bear Paw Ridge
    b. Severied
    c. Torpy
    d. Sande
    e. Captain Otter
    f. Mount Hedrick
    g. Walker Creek
    h. Arctic Pacific

2) Parsnip

3) North Cariboo Mountains
    a. Sugarbowl/Raven
    b. Haggen

4) Narrow Lake
    a. North
    b. South

Each study area is characterized by gentle rolling mountains with trees extending near the tops. Southern mountain caribou remain at mid-high elevations during most of the year (Seip 1990, 1992, Simpson et al. 1997, Hamilton et al. 2000, Terry et al. 2000, Apps et al. 2001). During late-winter, caribou move into mature forest when consolidated snow allows them to feed on arboreal lichens (RISC 2002). As such, the survey area included the spruce subalpine fir biogeoclimatic zone and portions of the alpine tundra above 1300 m. Using a helicopter (Bell 206) we used a total count method to fly near treeline searching for caribou tracks (RISC 2002). When tracks were located, we intensively searched the area to locate and count caribou in each group. Caribou were classified as either adults or calves. Seip (1990) estimated that 83% of mountain caribou can be seen in March using a helicopter. We used his estimate to correct for sightability bias during our survey (RISC 2002). We used an iPad (PDF Maps) connected to a GPS to navigate during the survey and record flight lines. Caribou locations were recorded on an independent GPS.

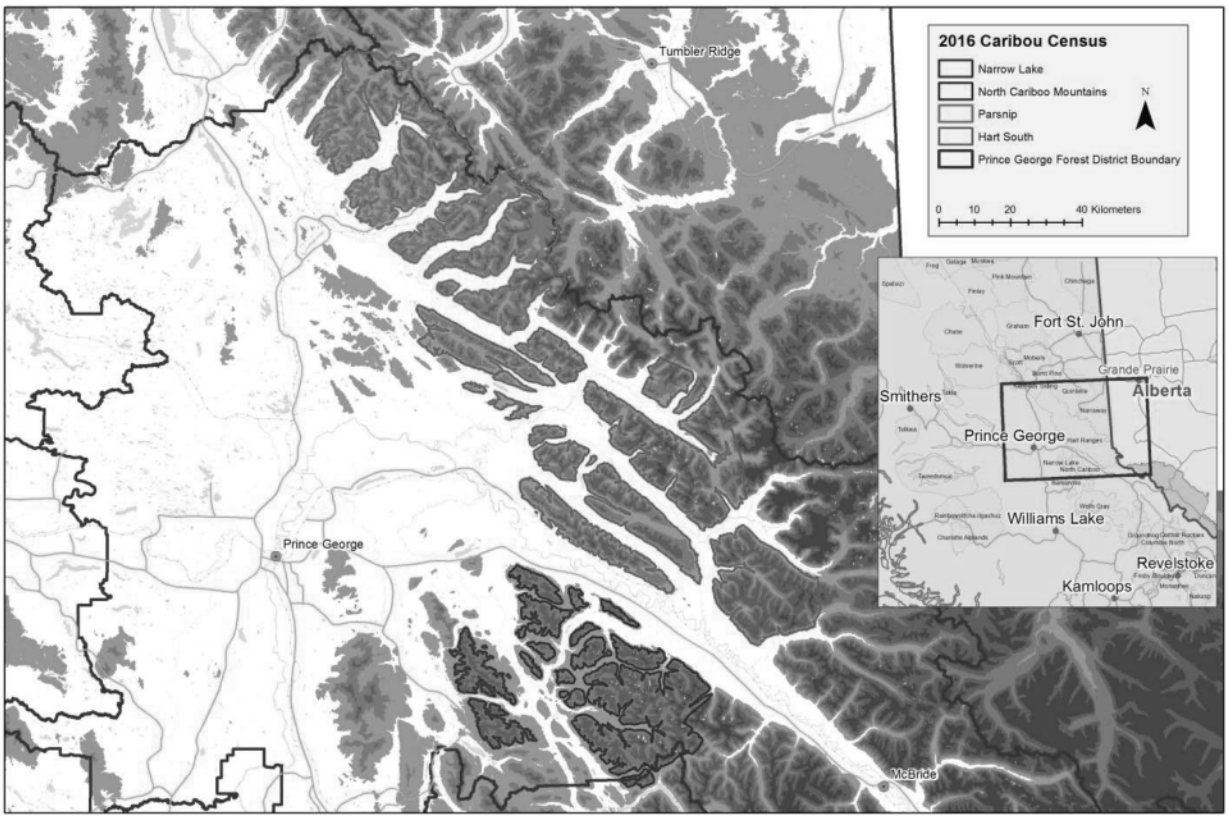

Figure 1. Areas surveyed during the 2016 mountain caribou census within the Hart South, Parsnip, North Cariboo Mountains, and Narrow Lake caribou ranges.

Results

We conducted our survey from March 5th–17th using 77.1 hours of helicopter support (including approximately 15 hours of ferry time). Survey conditions ranged from good to excellent. Fresh snowfall, occurring every 1–4 days, helped distinguish old tracks from new which created good-excellent conditions for tracking. Temperatures ranged from -10ºC to +6 ºC. We counted 463 caribou during the survey. In 3 locations we found tracks but could not locate the caribou, so we estimated an additional 6 caribou based on the number of tracks in the area.

Hart South

We surveyed the Hart South range from March 5th–9th, 2016 and counted 197 caribou with an additional 6 animals estimated from tracks. Application of the sightability correction factor (SCF) resulted in a population estimate of 246 animals. The Hart South population had 13% calves (Table 1). This recruitment estimate is similar to 2010, 2012, and 2013 surveys when the percentage of calves was estimated at 10%, 13%, and 11% respectively (Heard et al. 2010, 2012, and 2013). Heard et al. (2013) noted a population decline in 2013 when they counted a portion of the Hart South range (survey excluded the Walker Creek and Mt. Hedrick blocks). When comparing counts between the same mountain blocks, results from the 2013 survey suggested that caribou had declined approximately 16% from the 2012 total (Appendix D, Heard et al. 2013). Our results suggest the Hart South appears to have declined by approximately 40% since 2012 when the subpopulation was estimated at 404 animals (Figure 2).

Parsnip

We surveyed the Parsnip caribou range from March 10th–13th and observed 110 caribou with no additional animals estimated from tracks (i.e. every time we saw tracks, we located the caribou). After application of the SCF, we estimated the subpopulation at 129 animals, 16% of which were calves (Table 1). The 2016 recruitment estimate was higher than the last 4 surveys conducted in the Parsnip where the percent calves was 13%, 9%,15% and 12% in 2010, 2012, 2013 and 2015, respectively (Heard et al. 2010, 2012, 2013, 2015). Our population estimate was similar to 2012 (129 caribou) and 2013 (121 caribou) but lower than the 2015 estimate (177 caribou). Survey conditions during the 2015 survey were moderate where lack of recent snow made it difficult to distinguish recent tracks from those up to 2 weeks old (Heard et al. 2015).

During that survey, Heard et al. (2015) estimated an additional 28 animals in 7 groups from tracks where the animals could not be located. If these missing animals were removed from the 2015 estimate then the population would have been estimated at 130 animals – similar to the 2012, 2013 and 2016 estimates, suggesting the population has been stable since 2012. However, these recent population estimates (2012, 2013 and 2016) also suggest that the Parsnip caribou subpopulation declined by approximately 45% since 2006 (Figure 2).

Narrow Lake

The Narrow Lake subpopulation was surveyed on March 15th, 2016. We did not observe any caribou (or tracks) on the north census block. We counted 31 caribou within the south census block; 26 adults and 5 calves (16% calves) and did not estimate any additional animals from tracks (Table 1). With the SCF, the Narrow Lake subpopulation was estimated at 36 animals. Watts (1999) estimated 80 animals in the Narrow Lake subpopulation. By 2003, the subpopulation declined by over 50%, however, the population trajectory appears to have stabilized since the mid-2000s (Figure 2).

North Cariboo Mountains

We surveyed the Sugar Bowl and Haggen census blocks from March 15th–17th 2016 and counted 125 caribou with 15% calves. With the SCF, the combined Sugarbowl and Haggen blocks were estimated at 146 animals (Table 1). Our results were similar to the 2011 and 2014 counts that estimated 145 and 152 animals, respectively. Long-term population trend data suggest that caribou in the Sugar Bowl and Haggen Blocks have declined by 35% since 2005 when the combined number counted was 218 animals (Figure 2; Seip et al. 2005). The Bowron census block was not counted in 2016, however, in March 2015, staff from the Cariboo region estimated 64 caribou in that block. Similar to the Haggen and Sugar Bowl census blocks, caribou numbers in the Bowron block appeared stable between 2011 and 2015 (Dodd 2016). Using the 2015 population estimate for the Bowron census block, and assuming caribou numbers did not change between years, we estimate the North Caribou Mountains subpopulation at 210 animals in 2016; slightly lower than the 2014 estimate of 219 animals (Courtier and Heard 2014).

Table 1. Results from the March 2016 mountain caribou census within the Prince George Forest District, British Columbia.

Study Area	Census block	Adults	Calves	Tracks	Total Minimum Count	Sightability Corrected Estimate
Hart South	Bearpaw	52	4	2	58	70
	Severied	13	3	2	18	22
	Torpy	29	2	2	33	40
	Sande	0	0	0	0	0
	Captain-Otter	30	7	0	37	45
	Mount Hedrick	16	4	0	20	24
	Walker Creek	22	5	0	27	33
	Arctic-Pacific	9	1	0	10	12
Parsnip	Parsnip	92	18	0	110	129
Narrow Lake	North	0	0	0	0	0
	South	26	5	0	31	36
North Cariboo Mountains	Sugar Bowl	32	7	0	39	46
	Haggen	74	12	0	86	100
Total		**395**	**68**	**6**	**469**	**557**

Discussion

The primary objective of this survey was to assess the population status of each caribou subpopulation and compare population numbers over time. After remaining stable during the 1990s (Watts 1999), Southern Mountain caribou within the DPG have declined by approximately 40% over the past decade. Population trajectories in 3 of 4 subpopulations appear stable since 2012, however, the Hart South has since declined by over 40% during this period and low calf recruitment suggests this subpopulation may continue to decline. Within the Narrow Lake range, the absence of any sign of caribou (animals or tracks) in the north census block is also

concerning. Although the population size of the Narrow Lake subpopulation remained relatively stable since 2003, low population size (36 caribou) in addition to a decline in distribution increases the risk of local extirpation (COSEWIC 2014).

Lower snow accumulations during the winter of 2015/16 may have made low elevation habitats more attractive to caribou. Thus, groups of caribou using these areas would have gone undetected as our survey focused on high elevation winter range. However, we expect this survey bias to be minimal as visibility and snow tracking conditions ranged from good to excellent. Only once during the survey did we observe caribou tracks leading from high elevation range down to forested stands in an adjacent valley that we did not survey. Further, we did not observed any additional caribou tracks in low elevation forests while in transit to fuel caches or between survey blocks while tracks of other animals, such as moose, hare, porcupine, and wolverine were visible.

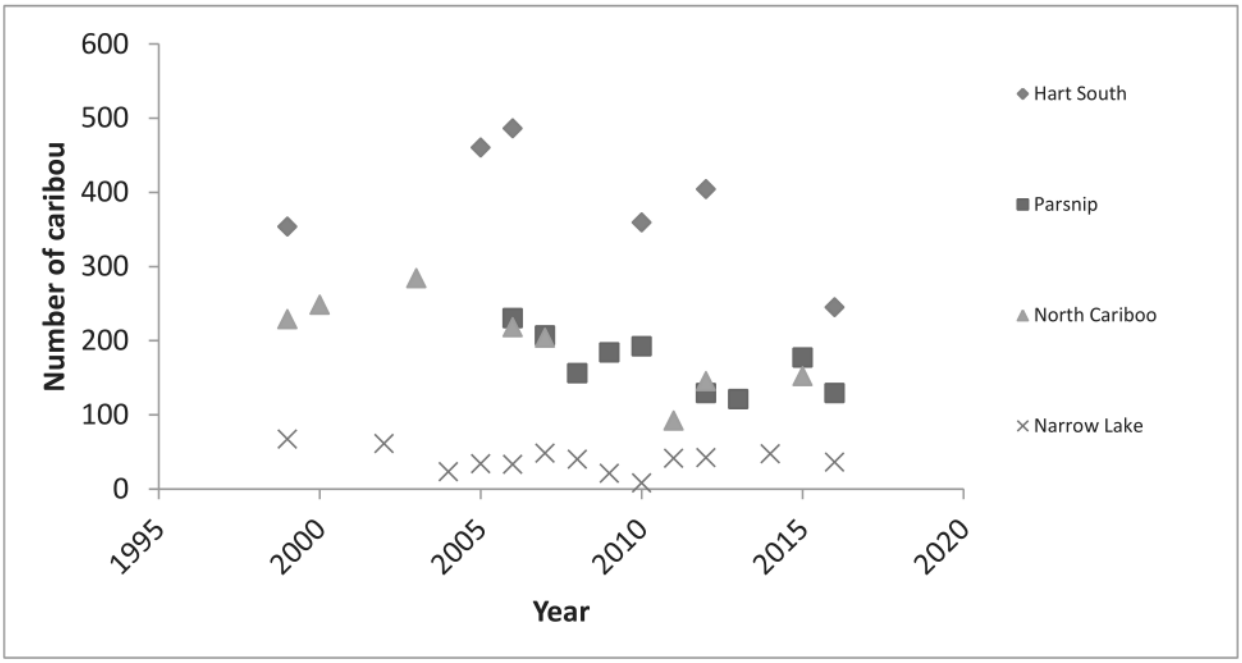

Figure 2. Population estimates for Southern Mountain Caribou within the Prince George Forest District between 1999 and 2016. The North Cariboo Mountains population trend includes the Sugar Bowl and Haggen census blocks only.

We observed 1 wolf (*Canis lupus*) pack (n = 4 wolves) during the survey within the Parsnip study area. These wolves moved straight across a section of high elevation caribou

range between the Table and Homika river valleys. They did not appear to be hunting caribou as the tracks went directly, in single file, between the adjacent valleys, missing a small group of 6 caribou by approximately 700 m. We did not observe any other sign of wolf activity within high elevation caribou habitat during the survey. Wolverine (*Gulo gulo*) tracks were observed in high elevation caribou range within all four study areas. We observed 4 adult female caribou with old VHF collars during the survey. One collared female was observed in the Mt Hedrick census block (Hart South range) and 3 collars were observed in the Parsnip range. Collars were last deployed on caribou in this area during the initial phases of the Parsnip Caribou Recovery Trial 2006–2009 (Gillingham et al. 2008, Steenweg et al. 2009; Heard et al. 2013).

Since 2007, a number of management actions have been implemented to support Mountain Caribou recovery including: 1) the establishment of Ungulate Winter Range polygons over much of the high elevation habitat to minimize forestry-related activities, 2) Motor Vehicle Closures which prohibit the operation of snowmobiles, 3) restrictions and increased scrutiny of commercial heli-skiing operations, and 4) an alternate prey reduction experiment (Parsnip) aimed at reducing wolf densities through a reduction in moose densities to ultimately reduce predation pressure on caribou. While these actions increase the probability of recovery for these subpopulations, altered predator/prey dynamics from past forest harvesting or other landscape change remain a key threat (Environment Canada 2014). Ongoing management actions are essential to ensure the persistence and eventual recovery of these subpopulations, including the monitoring and management of predators and alternate prey where required to promote calf recruitment and adult female survival (MCRIP 2007). Continued monitoring of caribou subpopulations in the DPG is essential to determine population status and assess the efficacy of recovery actions.

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Appendix A: Survey flight lines within each caribou range.

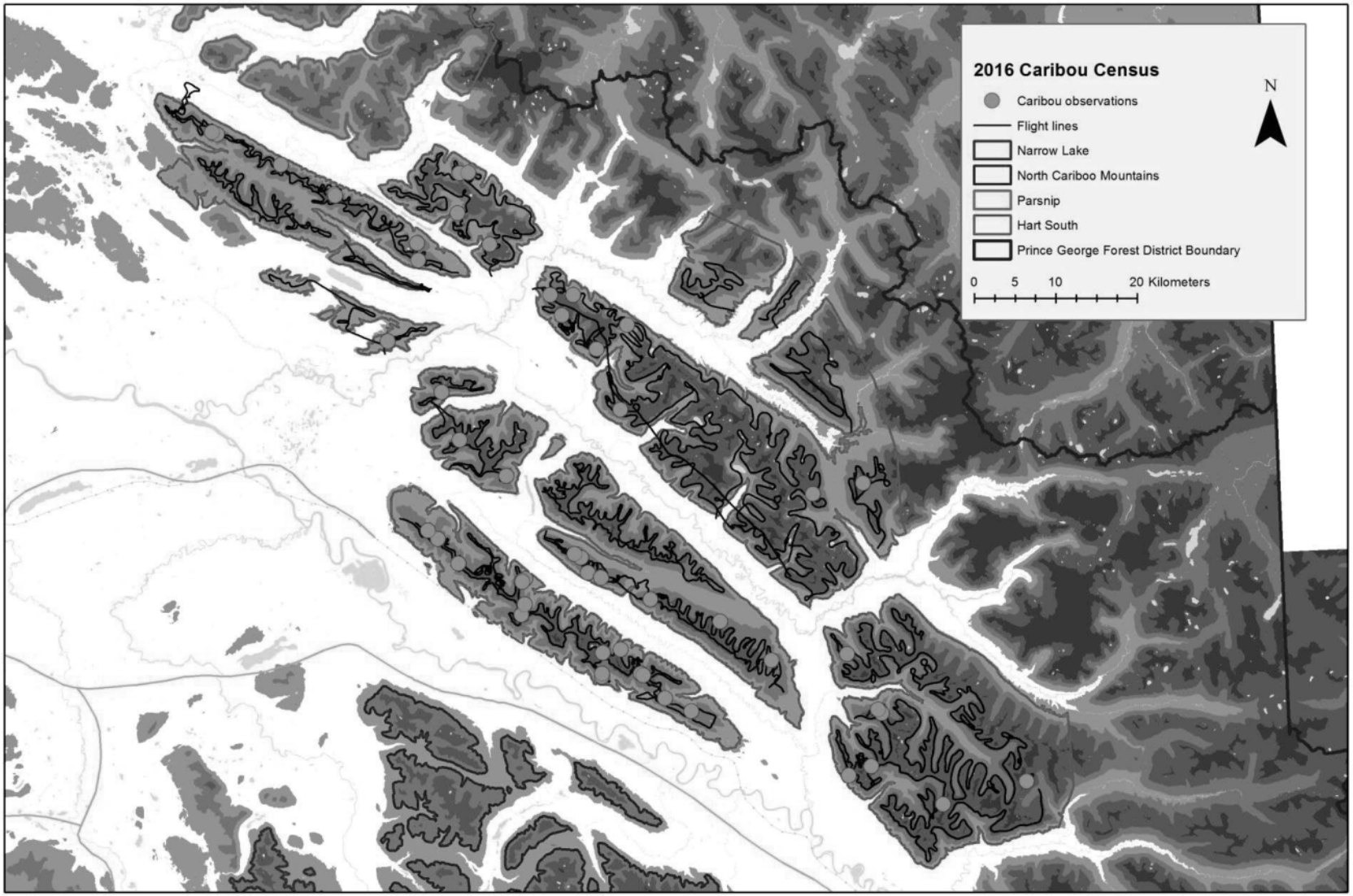

Figure 3. Flight lines representing the area covered during the 2016 late-winter mountain caribou census within the Hart South caribou range. Green circles indicate locations of caribou groups.

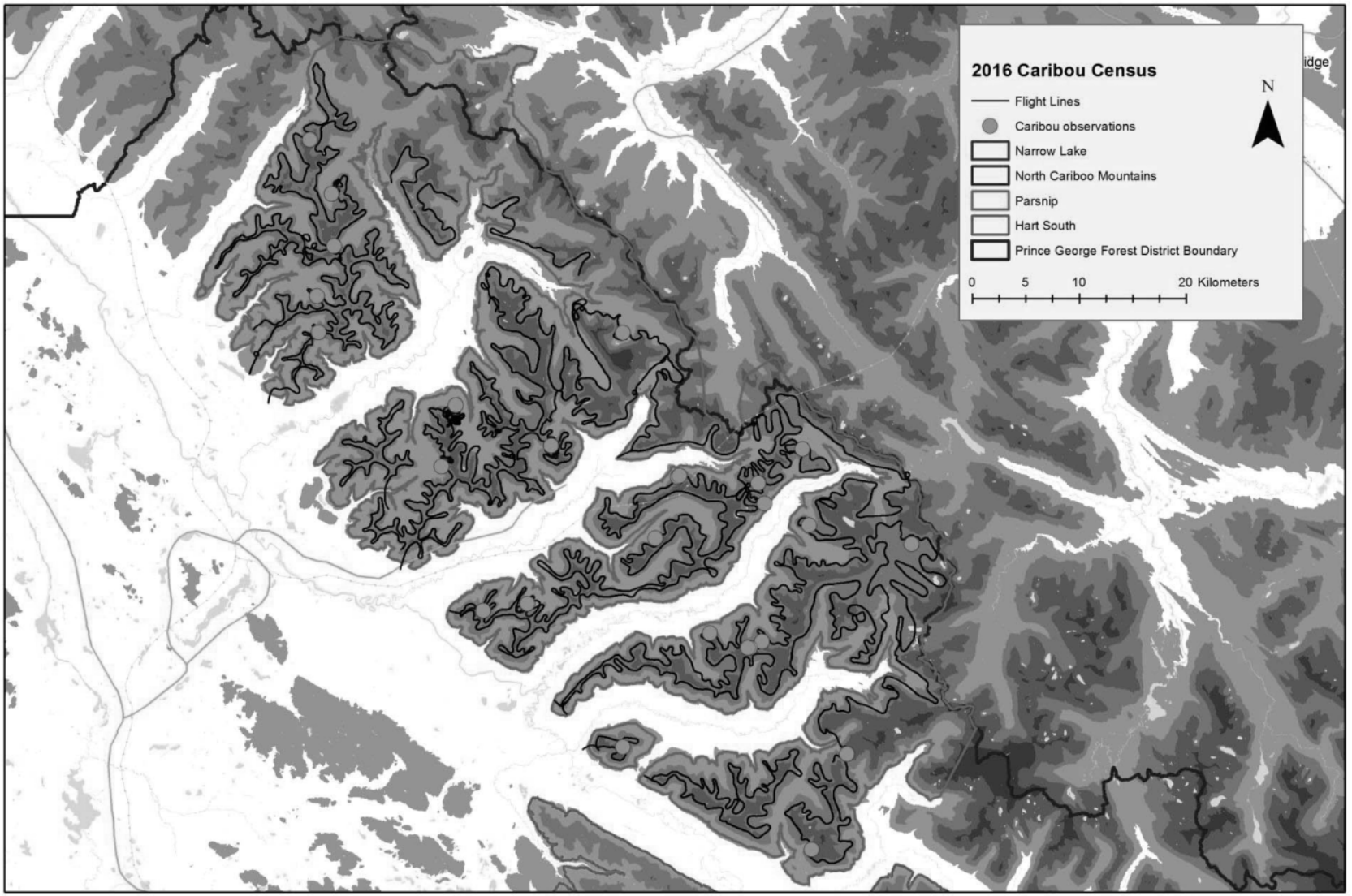

Figure 4. Flight lines representing the area covered during the 2016 late-winter mountain caribou census within the Parsnip caribou range. Green circles indicate locations of caribou groups.

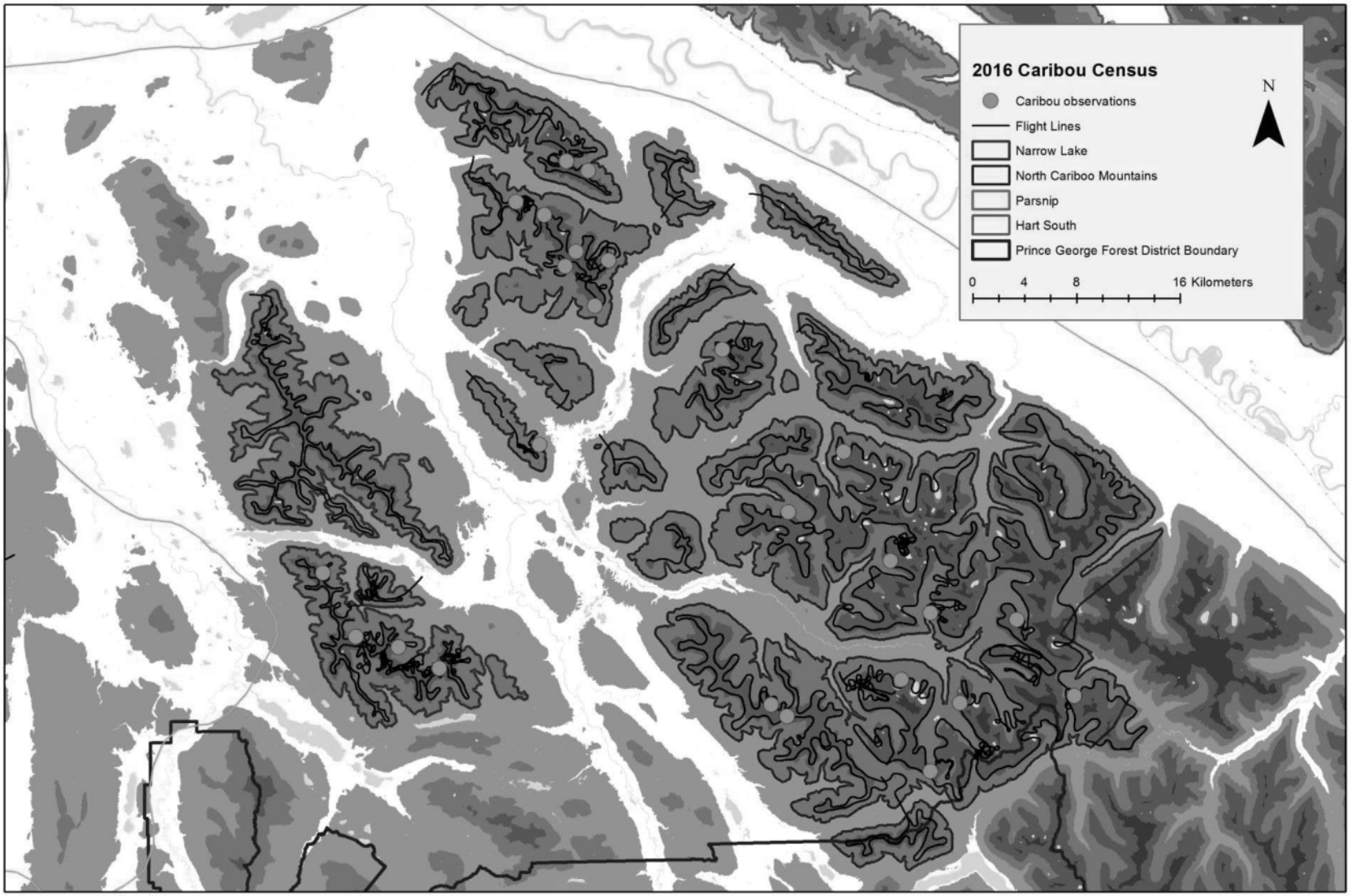

Figure 5. Flight lines representing the area covered during the 2016 late-winter mountain caribou census within the Narrow Lake and North Cariboo Mountains (Sugar Bowl and Haggen census blocks) ranges. Green circles indicate locations of caribou groups.

Appendix B: Caribou population trends in the Prince George Forest District

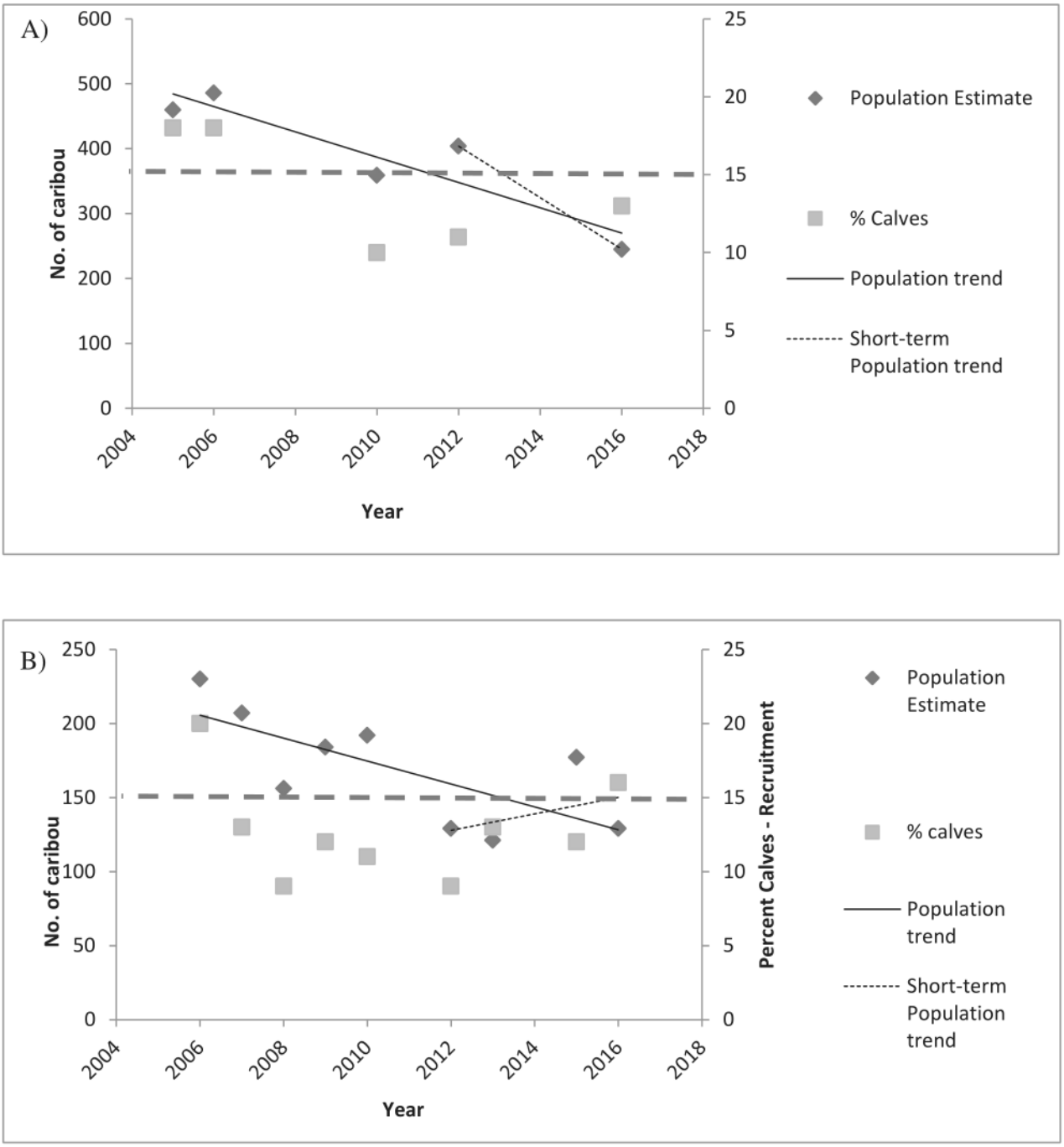

Figure 6. Late winter population estimates and calf recruitment for the A) Hart South and B) Parsnip subpopulations, 2006–2016. The blue-dashed lined shows the calf recruitment rate indicative for a stable population (Bergerud 1992).

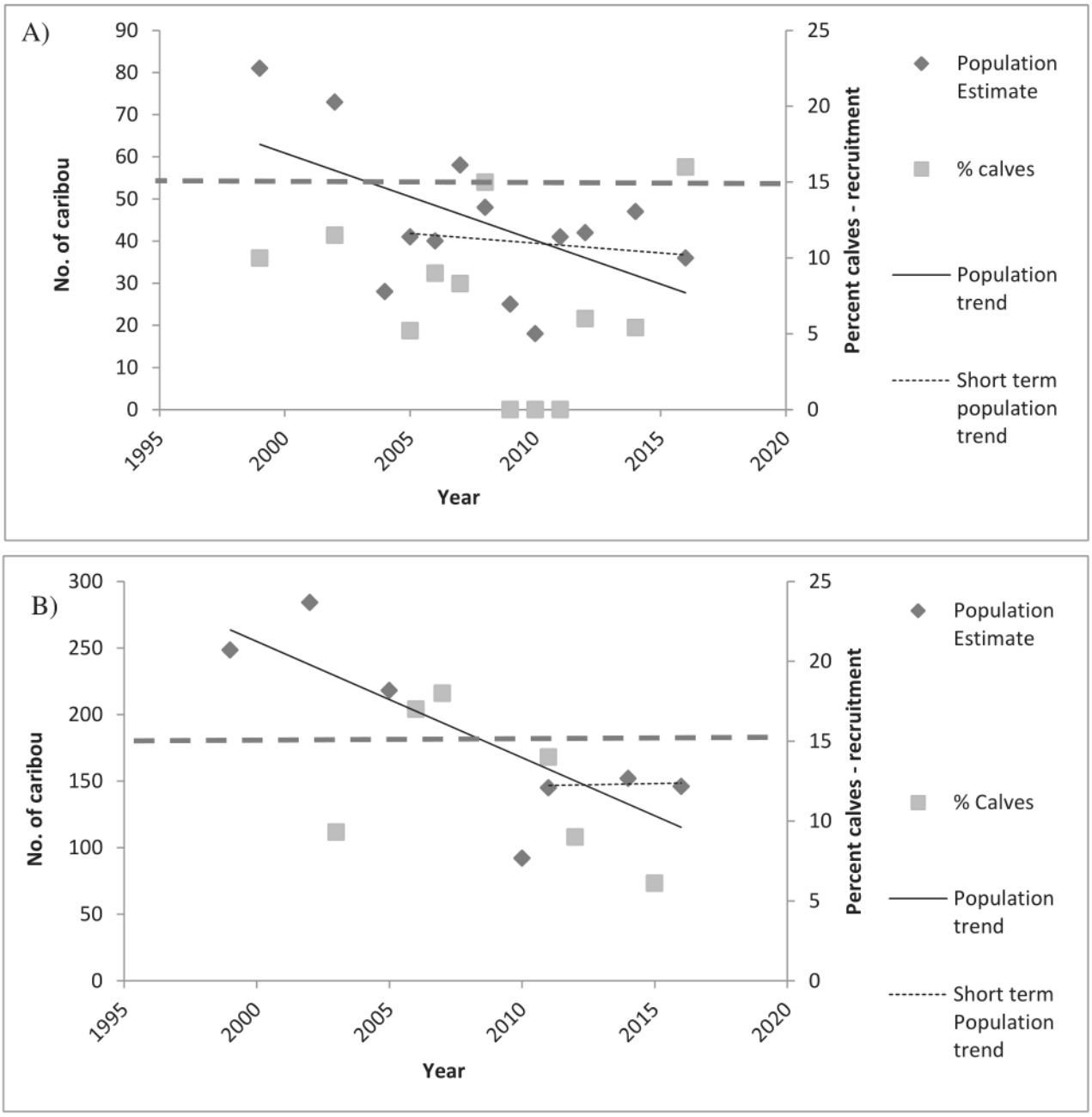

Figure 7. Late winter population estimates and calf recruitment for the A) Narrow Lake and B) North Cariboo Mountain (Sugarbowl and Haggen blocks) subpopulations, 1999–2016. The blue-dashed lined shows the calf recruitment rate indicative for a stable population (Bergerud 1992).

Appendix C: Survey schedule

Table 2. Crew names, date and location of the caribou census flights conducted in the Prince George Forest District, March 2016.

Date (2016)	Crew	Census block/Caribou range
March 5	MK, DH, AB, KK	Bearpaw, Severied
March 6	MK, DH, AB, KK	Captain Otter (weathered)
March 7	MK, DH, AB, KK	Captain Otter, Sande, Torpy
March 8	MK, AB, MR, KK	Walker, Arctic Pacific
March 9	MK, AB, DM, KK	Hedrick
March 10	MK, DH, AB, KK	Parsnip (weathered)
March 11	MK, AB, DS, KK	Parsnip
March 12	MK, DH, DS, KK	Parsnip
March 13	MK, DH, JB, KK	Parsnip
March 15	MK, RP, JJ, KK	Narrow Lake, Sugar Bowl
March 16	MK, JC, MS, KK	Sugar Bowl, Haggen
March 17	MK, MS, ZS, KK	Haggen

MK Michael Klaczek, DH Doug Heard, AB Adrian Batho, DS Dale Seip, MR Mark Racicot, DM Duncan McColl, JB Jeff Brown, RP Ray Pillipow, JJ James Jacklin, JC Jessica Courtier, MS Matt Scheideman, Zsolt Sary, KK Ken Knight (pilot)

Appendix D. Detailed survey results from census blocks within the Hart South subpopulation.

Table 3. Total counts (uncorrected) of caribou and calf recruitment rates documented during late-winter aerial surveys within the Hart South census blocks, 2005–2016.

Block	2005		2006		2010		2012		2013		2016	
	Total	% Calves	Total	% Calves	Total	% Calves	Total	% Calves	Total	% Calves	Total	% Calves
Bearpaw	88	24	142	14	78	8	155	12	112	14	58	7
Captain-Otter	106	15	65	17	45	16	62	10	72	12	37	18
Hedrick	36	19	42	14	31	13	32	9	-	-	20	20
Severied	46	13	39	15	36	8	53	11	35	17	18	19
Sande	2	0	22	27	43	14	7	14	12	16	0	0
Torpy	72	19	30	20	22	18	30	10	22	5	33	6
Walker	27	18	55	16	30	0	9	22	-	-	27	18
Arctic-Pacific	5	0	10	20	13	0	0	0	4	0	10	10
Hart South Total	382	18	405	18	298	10	348	11	257[a]	11	203	13

[a] Total count does not include the Hedrick and Walker census blocks.

2019 Population Census of the Hart Ranges (*Rangifer tarandus*) Subpopulation

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September 30th, 2019

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Abstract

In March 2019, an aerial survey for woodland caribou (*Rangifer tarandus*) was conducted for the Hart Ranges caribou subpopulation in the Rocky Mountains, east of Prince George, British Columbia. Hart Ranges caribou are a subpopulation of Southern Mountain Designatable Unit 9 and are listed as *Threatened* under the federal *Species at Risk Act*. The survey of the Hart caribou range followed a mark-resight technique for population estimation using a total of 46 active radio-collars to assess sightability. The 2019 population was estimated at 377 caribou (95% CI 356 – 422 caribou) with calves representing 19% of the population. Results from the 2019 mark-resight survey were similar to the previous total count survey conducted in 2016 (population estimate = 375 caribou), however, these recent inventories confirm that the subpopulation declined by 47% since 2006 when 718 caribou were estimated within the range (Seip et al. 2006). Since 2006, the Hart Ranges subpopulation declined about 5% per year (λ_{census} = 0.95, 2006-2019). Adult female survival in 2018-2019 was estimated at 0.86 (95% CI = 0.77 – 0.96) suggested that the relatively high calf recruitment observed in 2019 contributed to a short-term stable population trend (λ_{RM} = 1.02, 95% CI = 0.92-1.15). However, since 2006 most surveys (78%, n = 14) covering all or part of the Hart Ranges estimated calf recruitment below 15% calves (average = 12.8%), the rate generally considered necessary for a stable population. The Hart Ranges subpopulation will likely continue to decline without management actions to increase survival and calf recruitment.

Acknowledgements

Thanks to Duncan McColl, Christine Friedrichsmeier, Jeff Werner, Morgan Anderson, Cole Ryley, Lauren Runge, Alaysia Adrian, Kai Breithaupt, Franz Kirshbaum, Tammie Windsor and Bryan Seymour for participating as observers during the surveys. Thanks to pilots Keith Varga and Rob Altoft (Yellowhead Helicopters) for the many hours of safe and skilled flying. Funding for this project was provided by the B.C. Ministry of Forests, Lands, Natural Resource Operations and Rural Development.

Table of Contents

Citation:

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Introduction

Hart Ranges caribou (*Rangifer tarandus*) are a subpopulation of Southern Mountain Caribou (Designatable Unit 9; Committee on the Status of Endangered Wildlife in Canada 2014) and are currently listed as *Threatened* under the federal *Species at Risk Act* (Environment Canada 2014). In 2014, the Committee on the Status of Endangered Wildlife in Canada re-evaluated the status of the Southern Mountain caribou population and recommended their status be upgraded to *Endangered* because of ongoing population declines throughout their distribution and many subpopulations are isolated and have less than 50 individuals (COSEWIC 2014). Results from aerial censuses conducted in the Hart Ranges since 2010 suggest the subpopulation is declining (Klaczek and Heard 2016). The most recent census in 2016 estimated 375 caribou, a decline of 47% since the 2006 when over 700 caribou were estimated within the range (Seip et al. 2006, Klaczek and Heard 2016).

Sightability correction factors used assess the status of mountain caribou subpopulations are generally high for most subpopulations (>85%; Serrouya et al. 2017). However, rates can vary between years and study areas. For example, the percent of radio-collared caribou observed in the Parsnip study area in 2007, 2008, 2009 and 2010 was estimated at 77%, 78%, 80% and 82%, respectively (Heard et al. 2010). Sightability in the adjacent North Cariboo Mountains subpopulation is generally lower (0.50 and 0.57, Heard 1993; 0.62, Seip et al. 2002; 0.73 Klaczek and Lirette 2018). Previous population estimates within the Hart Ranges followed the total count survey method and used Seip's (1990) fixed correction factor to correct the population estimates (0.83; Seip et al. 2006, Heard et al. 2010 and 2012, Klaczek and Heard 2016). In 2018, a comprehensive population assessment was initiated for the Hart Ranges caribou subpopulation when a total of 52 GPS collars were deployed on adult female caribou in the range. The key objectives of the study are to assess annual survival rates, infer calf survival and recruitment through movement patterns of the GPS-collared female and follow-up calf surveys, determine the primary causes of adult female caribou mortality and improve the accuracy and precision of population estimates by providing an opportunity to correct for variation in sightability. The primary objective of this population census was to estimate the total number of caribou using a sample of marked adult female caribou to estimate sightability. In this report, we compare data

collected in 2019 to past population estimates to assess population trend and changes in calf recruitment over time.

Study Area & Methods

The Hart Ranges study area is located within the Rocky Mountains approximately 70-120 km east of Prince George, British Columbia (Figure 1). The 12,465 km^2 study area extends from Walker Creek in the south to Reynolds Creek in the North. The major watersheds within the study area include the McGregor, Herrick, and Torpy rivers in the south and the Parsnip, Missinka, Hominka, Table, Anzac rivers in the north. The study area was broken into smaller census blocks to allow comparisons with previous surveys.

1) Hart South
    a. Bear Paw Ridge
    b. Severied
    c. Torpy
    d. Sande
    e. Captain Otter
    f. Mount Hedrick
    g. Walker Creek
    h. Arctic Pacific

2) Parsnip

The study area is characterized by gentle rolling mountains with trees extending near the mountain tops. Southern mountain caribou remain at mid-high elevations during most of the year (Seip 1990, 1992, Hamilton et al. 2000, Terry et al. 2000, Apps et al. 2001). During late-winter, caribou move into mature forest when consolidated snow allows them to feed on arboreal lichens (RISC 2002). As such, the survey area included the spruce subalpine fir biogeoclimatic zone and portions of the alpine tundra above 1300 m, an area 5426 km^2 in size. Using 2 helicopters (Bell 206) we used a total count method to fly near treeline searching for caribou tracks (RISC 2002). When tracks were located, we intensively searched the area to locate and count caribou in each group. Caribou were

classified as either adults or calves. The population survey followed the standard mark-resight technique using GPS-collared adult female caribou as the marked sample to assess sightability. A population estimate, with 95% confidence intervals, was calculated using the joint hypergeometric maximum likelihood estimator (JHE) in NOREMARK (White 1996). We used an iPad (Avenza PDF Maps) connected to a GPS to navigate during the survey and record flight lines. Caribou locations were recorded on an independent GPS. Where possible, photographs were taken of each group. Photos helped confirm the field call of distinguishing calves from yearlings where identification was challenging and also helped account for failed collars that could not be scanned using the telemetry receiver.

With a value of 1 representing population stability, annual population change (λ) was calculated using corrected estimates from aerial census data as $\lambda_{census} = (N_t/N_0)(^{1/t})$ where N was the population estimate, and t was the interval or number or years between estimates (Caughley 1977). Ongoing monitoring of GPS-collared adult female caribou in the Hart Ranges since March 2018 allowed for an indirect comparison of λ (Serrouya et al. 2017) using a stochastic version of Hatter and Bergerud's (1991) Recruitment-Mortality (R-M) equation. The R-M equation was calculated as $\lambda_{R\text{-}M} = S/(1\text{-}R_{RM})$ where S is the survival rate and R is the calf recruitment rate (Hatter and Bergerud 1991). Survival was calculated using a Kaplan-Meier estimator (Pollock et al. 1989) estimated from GPS-collared adult female caribou during the 2018/19 survival year (May 1st to April 30th). The recruitment parameter (R_{RM}) was estimated using equation 3 from DeCesare et al. (2012) based on % calves observed during the census with an assumed sex ratio of 0.6 males/female (Serrouya et al. 2017). Variance for $\lambda_{R\text{-}M}$ was calculated using the Monte Carlo PopTools extension in Excel (25,000 simulations; Hervieux et al. 2013).

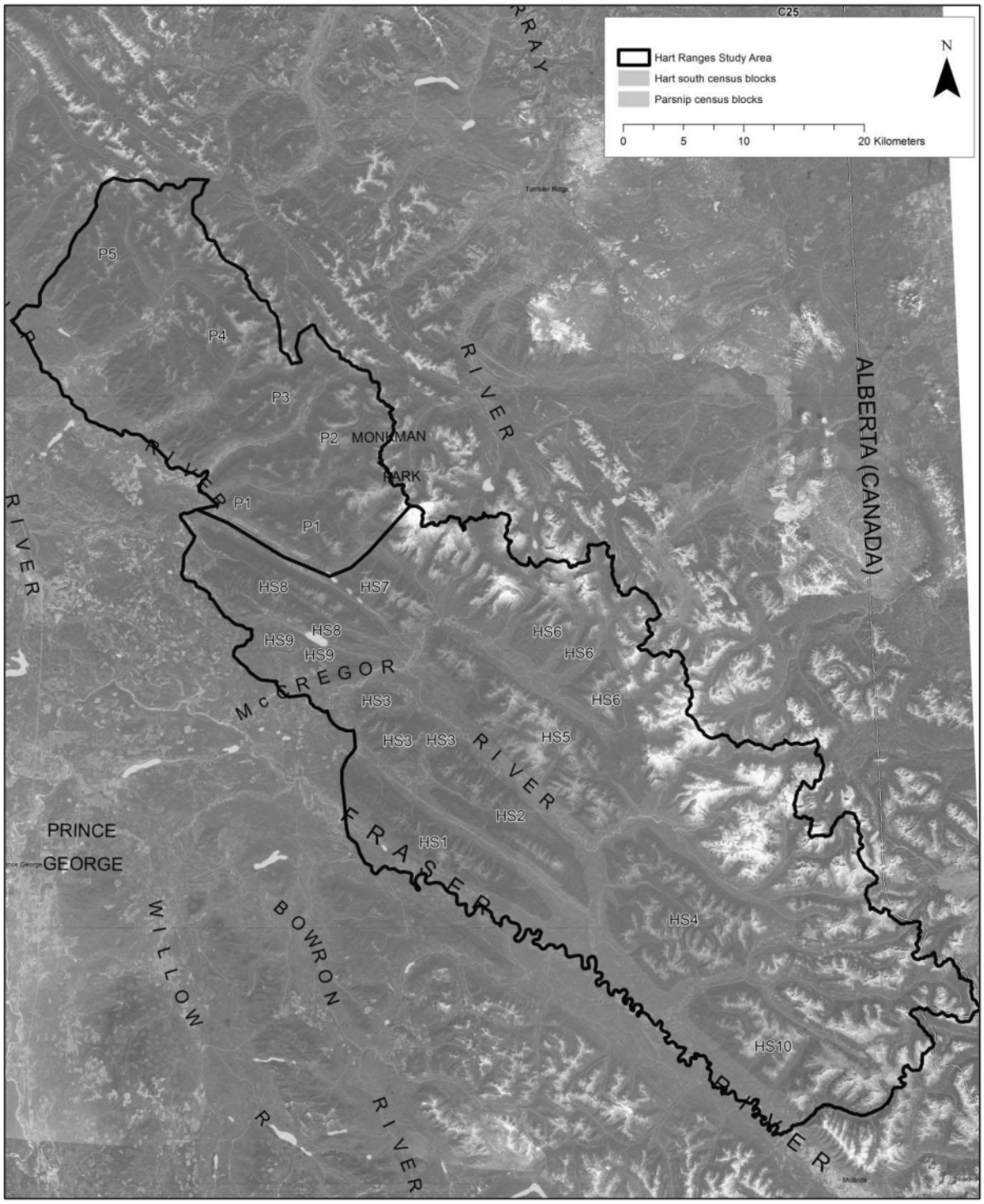

Figure 1. Areas surveyed during the 2019 mountain caribou census within the Hart Ranges.

Results

The survey was conducted from March 7th –10th based out of Prince George, British Columbia using 2 Bell 206 helicopters equipped with rear bubble windows and aerial telemetry antennae. We used 53.6 hours of helicopter support (including ferry time) to complete the surveys. Survey conditions ranged from good to excellent. A deep snow pack, accumulated during the winter of 2018/19, appeared to push most of the caribou to high elevations. Based on a post-hoc analysis, all of the GPS-collared females were within the survey zones in the subalpine or alpine suggesting all of the caribou in the subpopulation would be in areas with high sightability during the census. Fresh snowfall, occurring 1 day prior to the survey helped distinguish old tracks from new which created good-excellent conditions for tracking. Temperatures ranged from -10°C to +6°C.

We counted 345 caribou during the survey, 235 in the Hart South and 110 in the Parsnip. An additional 7 caribou were added to the minimum count after radio-tracking GPS-collared females that were missed during the survey. No caribou or tracks were observed within low elevation habitats, with the exception of 1 group that appeared to be chased off the alpine by wolves in the Hominka River area, however, tracks from that group were first observed in the alpine during the survey. Forty two of the 46 adult female caribou with functioning radio-collars were observed without using telemetry and an additional 7 caribou were counted when radio-tracking the 4 collared animals that were missed (Table 1). Of the 4 collared caribou that were missed during the census, 1 collared female, within a group of 4, was in a heavily tracked area of subalpine parkland forest (Anzac); 1 collared female (single) was missed in parkland subalpine fir forests (Bearpaw); and 2 collared females (unknown group size) were missed in the high alpine in the Walker creek survey block. Based on the mark-resight analysis, the population estimate of the Hart Ranges subpopulation was 377 caribou (95% CI 356 – 407). Calf recruitment (19%) was higher than previous estimates in 2010, 2012, and 2016 estimates when the percentage of calves ranged from 10-16% (Table 2, Appendix B). Results from the 2019 survey suggest the Hart Ranges subpopulation remained stable since 2016 when the subpopulation was estimated at 375 caribou (λ_{census} = 1.00, 2016-2019). The vital rate RM equation (i.e., where population change was estimated from survival of radio-collared adult female caribou and recruitment data (19%) collected in 2018/19 also suggested a stable population (λ_{RM} = 1.02, 95% CI = 0.92-1.15, Figure 4, Appendix D). However, the long-term trend indicated the population was declining at 5% per year (λ_{census} = 0.95, 2006-2016)

and recent surveys in 2016 and 2019 confirmed the population declined by 47% since 2006 when 718 caribou were estimated in the Hart Ranges (Seip et al. 2006; Figure 2).

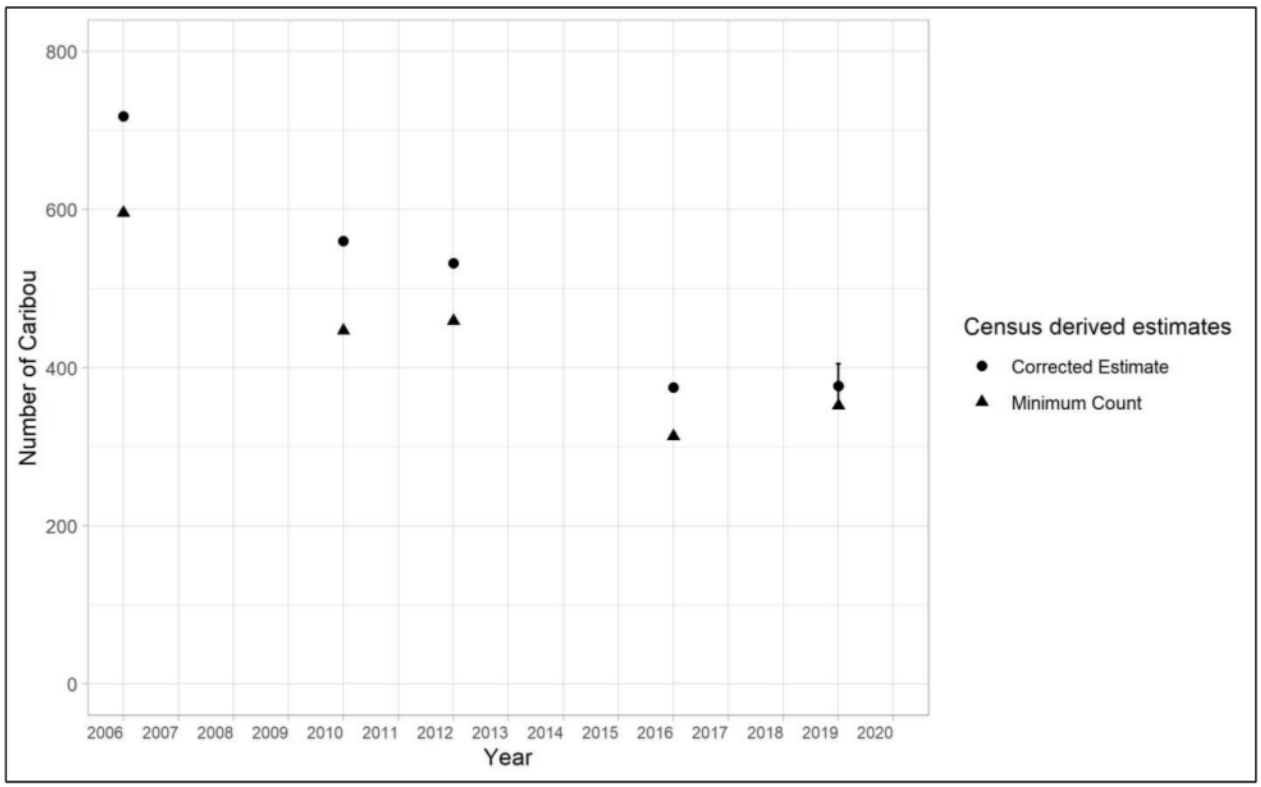

Figure 2. Late-winter population estimates for the Hart Ranges caribou subpopulation. The black circles represent corrected population estimates and the black triangles represent the minimum number of caribou counted during the surveys.

Table 1. Number of caribou counted in March 2019 during the southern mountain caribou census within the Hart Ranges, British Columbia.

Census area	Survey Zone	Zone Number	Total Counted	# of Calves	# GPS collared caribou observed
Hart South	Bearpaw	HS1	79	11	12
	Sande/Torpy	HS2	17	4	3
	Severied	HS3	23	7	3
	Walker Creek	HS4	33	6	3
	Mt Hedrick	HS5	35	6	6
	Herrick	HS6	3	0	0
	Arctic Pacific	HS7	7	0	2
	Captain Otter	HS8	38	9	2
	Seeback	HS9	0	0	0
	Morkill**	HS10	NA	NA	NA
Parsnip	Upper Parsnip	P1	9	1	2
	Missinka	P2	13	3	3
	Hominka	P3	23	7	1
	Table	P4	27	4	3
	Anzac	P5	38	8	3
		Survey Count	**345**	**67**	**42**
		Minimum Count*	**352**	**68**	**46**
		Population Estimate	**377 caribou (95% CI 245- 312)**		

*Includes GPS collared caribou, and other caribou within their associated groups, that were missed during the survey and were located by radio-telemetry post-survey.

**The Morkill survey zone was not surveyed during the 2019 census.

Discussion

Similar to previous surveys for mountain caribou, we used the standard total count method but estimated sightability using a sample of GPS-collared adult female caribou as a marked sample to correct for variation in sightability. We used a mark-resight analysis (White 1996) to estimate population size which allowed for the population estimate to be expressed with confidence intervals to assess survey precision. We observed a total 42 of the 46 functioning collars (91%) without using telemetry suggesting that most of the caribou within Hart Ranges study area were counted. Given that population change for caribou is often estimated between

5-10% per year (positive or negative), variation in estimates due to changes in sightbility (in this study area ranging from 76%-91%) may make annual assessment of population change uncertain. Variation in sightbility could be especially problematic if recovery planning moves forward in Hart Ranges under an adaptive management approach where annual caribou response metrics, such as changes in population growth, will be used to help guide and evaluate recovery efforts (Seip and Jones 2018, Wilson 2019, DeMars and Serrouya 2019). We recommend maintaining a sample of GPS-collared caribou within the Hart Ranges study area to ensure accurate and precise population estimates. In addition, GPS-collars are used to assess adult female survival, calf recruitment, and main causes of mortality which can also act as key response variables to assess the efficacy of any future population management actions.

Estimated at 718 caribou in 2006, the Hart Ranges caribou subpopulation declined by approximately 5% per year for over a decade contributing to a 47% reduction in caribou abundance by 2016 (Klaczek and Heard 2016). Population vital rates (i.e. calf recruitment, and adult female survival) monitored during the 2018/19 survival year were within ranges expected for a stable population (λ_{RM} = 1.02, 95% CI = 0.92-1.15) and were consistent with a stable population trend where 375 and 377 caribou were estimated in 2016 and 2019, respectively.

However, it is unlikely the population will remain stable over the long-term unless calf recruitment consistently increases above the 15% recruitment threshold that is generally considered necessary for a long-term stable population (Bergerud 1992). Since 2006, calf recruitment estimated in the Hart Ranges was only 12.8% over 14 surveys covering all or part of the study area. Short term periods of stability, like 2016-2019, are not uncommon even with declining long terms trends. The Hart Ranges subpopulation was stable (560 – 532 caribou) between 2010 and 2012, (Heard et al. 2012) but then declined by 40% (λ_{CENSUS} = 0.85) from 2012 to 2016 (Klaczek and Heard 2016). Likewise, the adjacent North Cariboo Mountains subpopulation declined from 284 to 187 between 2002 and 2018 but was stable between 2002 and 2005 at 284 and between 2011 and 2014 at ~220 caribou (Courtier and Heard 2014, Klaczek and Lirette 2018). The Hart Ranges subpopulation will likely continue to decline without management actions to increase survival and recruitment.

Even with significant population decline, the Hart Ranges subpopulation currently represents the largest remaining subpopulation within the Southern Mountain DU comprising 31% of remaining 1201 individuals within the overall population (unpublished data, pers comm N. Dodd Sept 2019). Since 2007, 4 management actions have been implemented to support caribou recovery within the Hart Ranges: 1) the establishment of Ungulate Winter Range polygons over much of the high elevation habitat to minimize habitat loss through forestry-related activities, 2) the implementation of Motor Vehicle Closures which prohibit the operation of snowmobiles to minimize disturbance on key caribou winter range, 3) the placement and evaluation of restrictions of commercial heli-skiing operations, and 4) the increase in moose hunting permits in the northern portion of the range (i.e. Parsnip area) to reduce moose numbers and by extension, reducing wolf density to ultimately reduce predation pressure on caribou. In spite of those actions, the Hart Ranges subpopulation declined. It appears that further recovery actions aimed improving adult female survival and calf recruitment will be required in the short term to achieve population growth.

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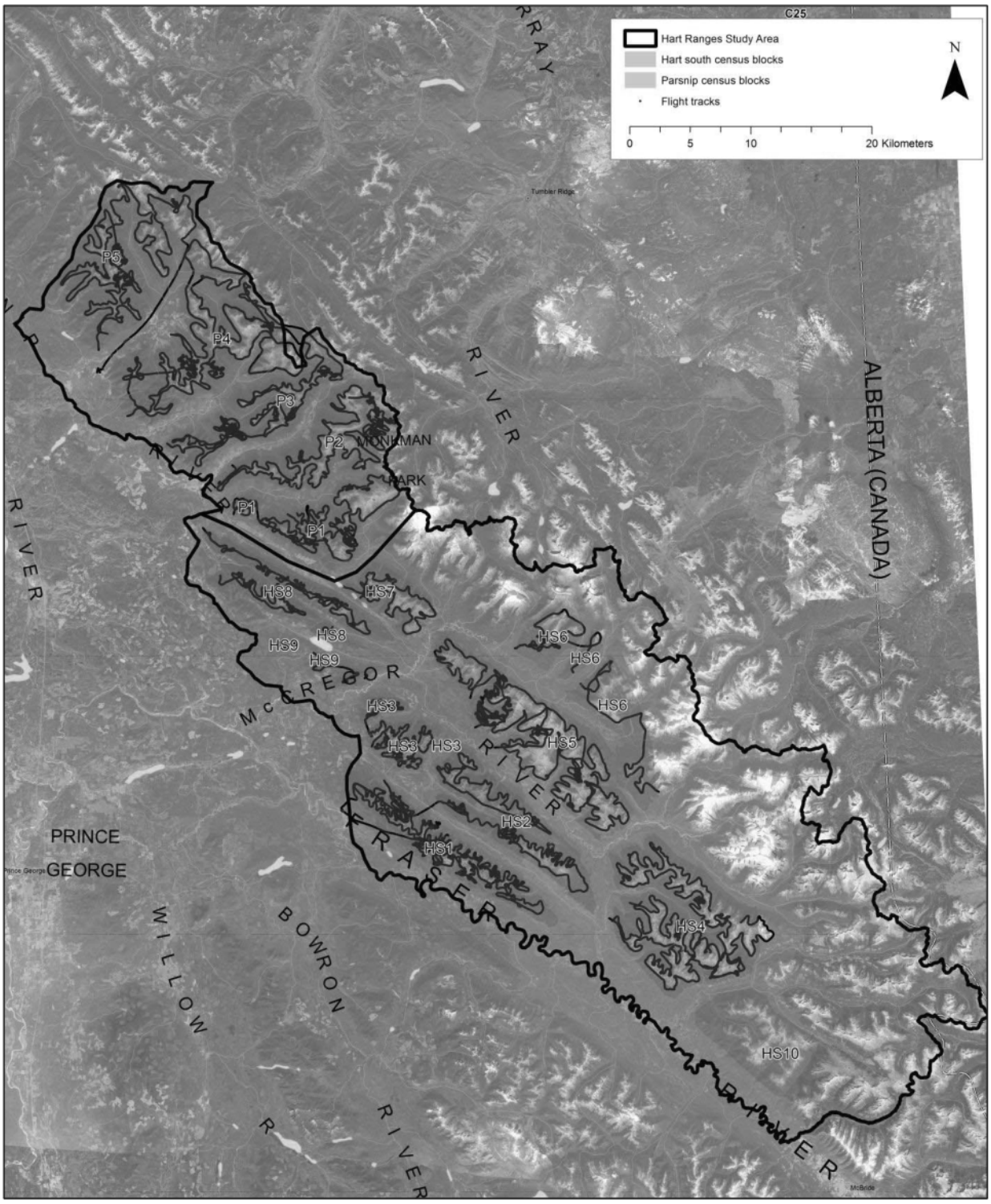

Figure 3. Flight lines representing the area covered during the 2019 late-winter caribou census within the Hart Ranges.

Appendix B: Caribou population trends for the Hart Ranges subpopulation, 2006-2019

Table 2. Number of caribou and per cent calves in the Hart Ranges, British Columbia between 2006 and 2019.

Year	Minimum Count	Population Estimate	% Calves	Reference
2006	596	718	17.6	Seip et al. 2006
2010	447	560	11	Heard et al. 2010
2012	459	532	9	Heard et al. 2012
2016	313	375	14	Klaczek and Heard 2016
2019	352	377	19	Klaczek and Heard 2019

Appendix C: Survey results summarized by census block, 2006-2019.

Table 3. Minimum counts (uncorrected) of caribou and calf recruitment rates documented during late-winter aerial surveys within the Hart South and Parsnip census blocks, 2005–2019.

Block	2005		2006		2010		2012		2013		2016		2019	
	Total	% Calves	Total	% Calves	Total	% Calves	Total	% Calves	Total	% Calves	Total	% Calves	Total	% Calves
Bearpaw (HS1)	88	24	142	14	78	8	155	12	112	14	58	7	79	14
Captain-Otter (HS8)	106	15	65	17	45	16	62	10	72	12	37	18	38	24
Hedrick (HS5)	36	19	42	14	31	13	32	9	-	-	20	20	35	17
Severied (HS3)	46	13	39	15	36	8	53	11	35	17	18	19	23	30
Sande (HS2-north)	2	0	22	27	43	14	7	14	12	16	0	0	0	0
Torpy (HS2-south)	72	19	30	20	22	18	30	10	22	5	33	6	17	24
Walker (HS4)	27	18	55	16	30	0	9	22	-	-	27	18	33	18
Arctic-Pacific (HS7)	5	0	10	20	13	0	0	0	4	0	10	10	7	0
Hart South Total	382	18	405	18	298	10	348	11	257[a]	11	203	13	204	18
Parsnip Total	NA	NA	230	20	149	13	111	9	121	13	110	16	110	21

[a] Total count does not include the Hedrick and Walker census blocks.

Appendix D. Survival Rates estimated for adult female caribou in the 2018/19 survival year.

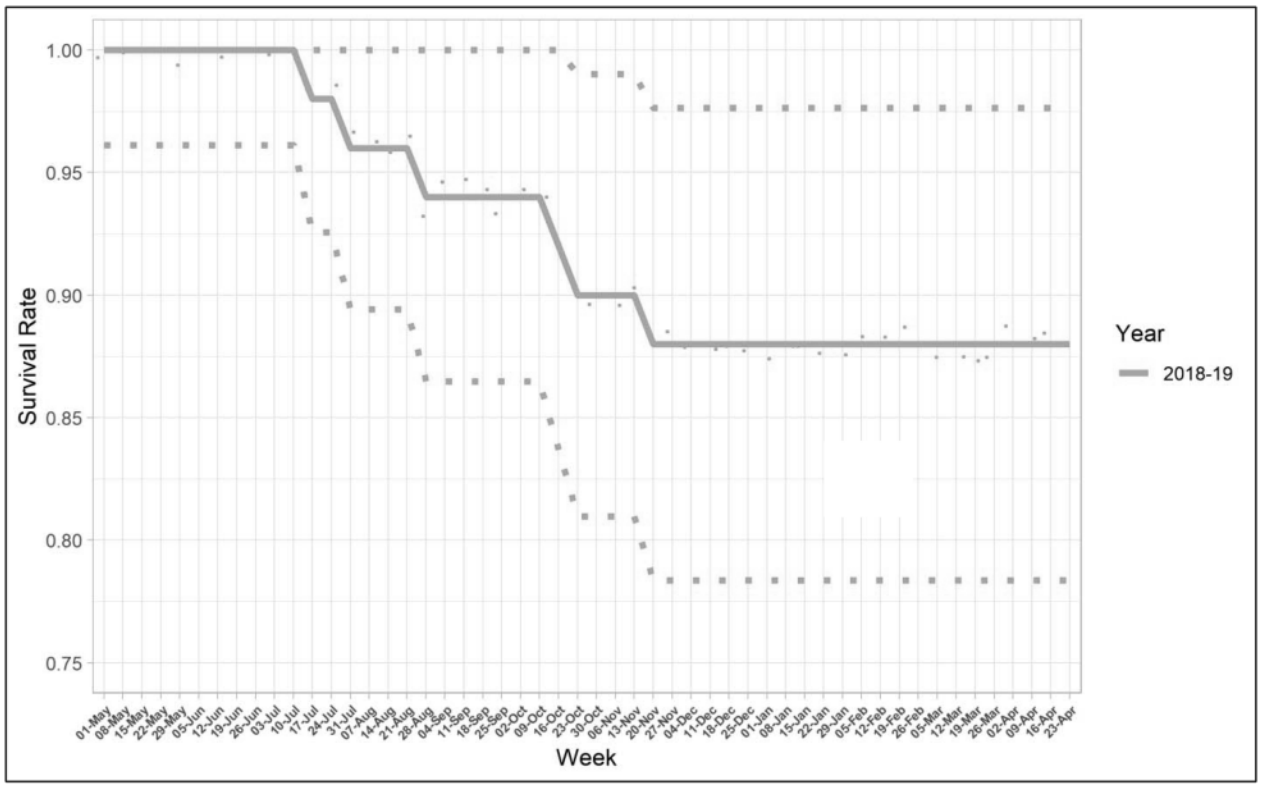

Figure 4. Kaplan-Meier annual adult survival rate estimated for adult female caribou within the Hart Ranges calculated during the 2018/19 survival year (May 1st to April 30th). The dotted lines represent 95% confidence intervals around the survival estimate (n = 52 adult female caribou).

2017 POPULATION CENSUS OF THE COLUMBIA NORTH MOUNTAIN CARIBOU SUBPOPULATION

April 2017

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Summary

Southern mountain populations of woodland caribou (*Rangifer tarandus caribou)* inhabit the North Columbia Mountains near Revelstoke, British Columbia. Commonly referred to as "mountain caribou," they were studied using radio-telemetry from 1992 to 2009. Populations remained relatively stable until the mid to late 1990s with between 290 and 375 caribou distributed amongst 4 subpopulations (Columbia North, Columbia South, Frisby-Queest and Kinbasket South). Population censuses for the Columbia North (CN) subpopulation have taken place since the 1980s, and most recently in April 2017, which this report summarizes.

Overall, there was a population increase of 19.5% since the 2014 census (from 123 to 147 individuals); however, survey conditions were not ideal in 2014. Results are best compared with the 2013 census which was considered to have suitable survey conditions. Survey numbers declined marginally from 2013 to 2017 (152 to 147) but overall the CN subpopulation has been stable since 2004, when the estimate was 136 (129-143) animals. Recruitment rates were tracked separately for wild calves vs. calves that were recruited as part of a maternity penning project that began in 2014. Wild calf recruitment was 14.1% (19 out of 135 non-penned animals), whereas recruitment including penned animals was 15.6% (23 out of 147 total animals). The composition within "The Hub" portion of CN, an area of densely populated high-value habitat, was 16.1% (15 of 93 animals, including penned calves). Continued intensive management is required to recover the caribou subpopulations in the Revelstoke area.

Contents

Introduction

Mountain caribou are woodland caribou (*Rangifer tarandus caribou*) that are behaviorally adapted to the deep snowpacks of southeastern British Columbia. They access arboreal lichens in the canopy of subalpine forests during late winter by walking on top of the deep snow. Due to their low numbers, decreasing population trend, shrinking and fragmented distribution, these caribou are listed as *Threatened* under Schedule 1 of the Federal *Species at Risk Act*. They were added to the Red-list (Extirpated, Endangered or Threatened) by the British Columbia Conservation Data Centre in 2002.

Mountain caribou in British Columbia range from north of Prince George, south to the Canada-US border, with one subpopulation partially overlapping into Idaho and Washington States. Subpopulations south of Revelstoke are small and isolated while those north of Revelstoke are relatively contiguous. Mountain caribou censuses of the Revelstoke area subpopulations occurred initially from 1981-1985 by Simpson and Woods (1987), and at regular intervals until present.

This report updates the Revelstoke area Columbia North (CN) subpopulation inventory to include the April 2017 census (the last CN census with suitable conditions was in 2013). The most recent censuses for other Revelstoke-area caribou subpopulations were: Columbia South (2016), Monashee South (2016), Frisby-Queest (2013) and Kinbasket (2008).

Study Area

The 2017 census covered the CN subpopulation (4526 km^2) as described by Wittmer et al. (2005a). This area includes all known late-winter caribou habitat in the Monashee Mountains from Bourne Creek north to Howard Creek, along with the Selkirk Mountains north of Downie Creek (excluding the Esplanade Range and other areas south of Windy Creek) and the Cummins and Wood Rivers in the Rocky Mountains (including Pacific, Jeffry, Molson and Harvey Creeks; **Figure 1**). Census values were summarized for this entire area, but also subdivided into "The Hub" (Figure 1), a 693 km^2 area of high value habitat (**Figure 1**) that is 'densely' populated in late winter, relative to the rest of the CN subpopulation range.

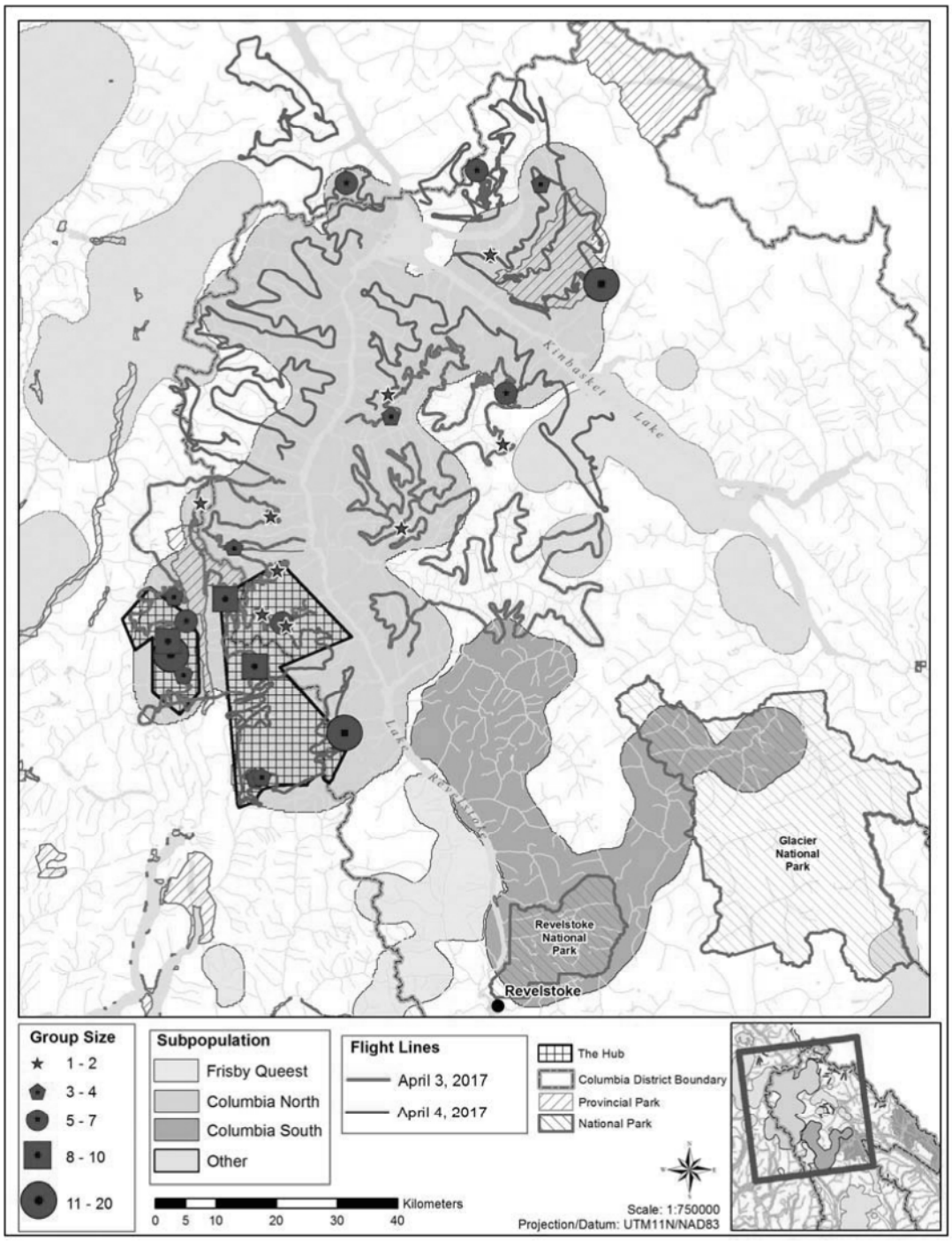

Figure 1. Flight paths and caribou groups – 2017 caribou census. Subpopulation boundaries are 95% kernel home ranges (Wittmer et al. 2005a). "The Hub" is represented by cross hatching.

Methods

Caribou were censused during late-winter, when they were in open subalpine parkland (Simpson and Woods 1987, McLellan et al. 1994, Seip 1992). Flaa and McLellan (2000) identified snowpacks >300 cm as an indicator of caribou presence in subalpine late-winter habitat in this area. Snowpack depth was determined using data provided by Parks Canada for Mt. Fidelity in Glacier National Park, British Columbia.

All suitable late-winter habitat within the study area (**Error! Reference source not found.**) was surveyed using a Bell 206 Jet Ranger helicopter with three experienced observers. We flew a contour path near treeline (1800–2130 m; see Wittmer et al. 2015a for details) until tracks were observed, and followed them until caribou were sighted. The total number of caribou, including the number of calves, were determined and subsequently confirmed amongst observers. High resolution digital photographs using a 300-mm telephoto lens were taken of each group, and their locations were recorded with a GPS.

All-male groups were easily identifiable; however, discrimination of young males from adult females in mixed groups was difficult and would have required additional harassment. We therefore limited our classification to calves and adults, as per most provincial mountain caribou censuses. Differentiation between calves and yearlings in the field can be problematic. As a result, photographs were subsequently examined carefully to confirm calf numbers within the mixed groups. The abundance of calves was calculated as a percent of the total caribou observed. If the photo analyses were unclear the field value was used.

Prior to 2010, animals with radio-collars were used as marks for mark-resight estimates of the population size. Although there were collared caribou within the census area, the number (10) was not deemed suitable to estimate sightability to determine census confidence limits, and because they were all from penned animals, the sample was not representative of the population.

Results

All suitable late-winter habitat was flown over two consecutive days (April 4th and 5th) in the CN subpopulation (**Figure 1**). A total of 16.6 hrs of helicopter time was used during the census. Actual flying time was about 15 – 20% greater than survey time due to ferrying and re-fueling.

Conditions for the census were considered to be very good. The snowpack depth in Glacier National Park on Mt. Fidelity reached 300 cm by about March 20th and remained above 300 cm

through the census period with values for census days being approximately 320 cm. This provided sufficient opportunity for animals to ascend into their late-winter range, thereby increasing census confidence. New snow was recorded at Mt. Fidelity on April 1st with no new snow thereafter during the census dates. This recent snowfall reduced the extent of caribou tracks. Winds were considered light during the census period and lighting was primarily sharp with some instances of flat light.

A total of 147 caribou in 27 groups were enumerated over the two-day census (**Figure 1**). Twelve (12) of 24 groups included calves and 15.6% of all observed caribou were calves.

The total includes 7 animals from Molson Creek which is an area not searched consistently prior to 2009. These animals are presumed to be part of the CN subpopulation.

Discussion

The 2017 CN census confirms that this subpopulation has been relatively stable since 2004, when the estimate was 136 (129-143) animals. The CN subpopulation, along with the Parsnip subpopulation (northeast of Prince George, BC) is one of the few stable caribou subpopulations out of roughly 65 herds in BC and Alberta. The reduction of moose to historic levels is thought to have contributed to population stability (Serrouya et al. 2017). Furthermore, eleven wolves were removed from the CN area in February and March 2017, the first time this management action was used in the Revelstoke area. It will be particularly important to count these caribou again in 2018, to determine if there is a population response to the removal of wolves.

At 15.6%, recruitment for CN in 2017 was the highest observed since 1996 (19.2%), though if penned calves are excluded, recruitment was 14.1% in 2017 (**Table 1**). Bergerud (1992) states that a calf recruitment rate of 15% is required for a stable population, but this rule of thumb will depend on the survival rate of adult females. The maternity pen resulted in a modest increase in recruitment, from 14.1 to 15.6%. Penning began in 2014, and over the course of 3 years, has added a net of 6 to 8 calves over the wild population. For penning to add a substantial amount to the population, a greater proportion of the herd will need to be penned, with some supplemental predator control to increase the chance of success (Boutin and Merrill 2016, Serrouya and McLellan 2016).

Calf recruitment within “The Hub” portion of the CN subpopulation was 16.1%, (including wild and penned calves) as was the case in 2013. These are the highest values within “The Hub” since 1994, when recruitment was 21.3% (**Table 2**). It is hypothesized that alternate prey

reduction through increased moose harvesting quotas has indirectly reduced wolf populations and possibly increased caribou survival within "The Hub" and other portions of the CN subpopulation range (Serrouya et al. 2017). Further assistance such as increased calf recruitment through maternity penning, may have supported the increased recruitment within "The Hub."

Although the vast majority of the CN late-winter range is now closed to snowmobiling, use continues in late-winter habitat at Bourne/Pettipiece Pass, Mt. Grace, and Bischoff Lakes, where only partial closures or permitted openings are in effect. Heli-skiing is also active throughout the vast majority of the CN late-winter range. In the spring of 2013, a moratorium on new commercial backcountry recreation tenures within high value late-winter habitat was renewed for another 5 years.

The stable trend of the CN subpopulation is an encouraging pattern and suggests that a moose reduction experiment aimed at reducing wolf numbers may be working (Serrouya et al. 2017). Continued monitoring and maintaining the primary reduction treatment will be important to gauge the applicability of this management approach as a recovery tool.

Additional intensive management action will be required to reverse population declines. The most proximate threats are small population sizes that increase the chance of extinction from stochastic factors and Allee effects (e.g. Hebblewhite et al. 2010, McLellan et al. 2010), coupled with unsustainable predation rates (Wittmer et al. 2005b). Short-term but immediate actions to reverse these threats include transplants, reducing predators and alternate prey, as well as maternity pens. Additional habitat preservation and backcountry recreation management would help minimize risk over the longer term (Seip et al. 2007, Lewis and McLellan 2007). Boutin and Merrill (2016) recommended that population management tools be applied simultaneously to recover herds.

Acknowledgements

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Table 1. Population censuses results and recruitment values (% calves) for the Columbia North caribou subpopulation. Adapted from (McLellan et al. 2006).

Columbia North	Observed (+ Tracks)	Calves (%) (+ Pen)	Number Collared	Collars Observed	Calculated Estimate	90% CL
1994	206 (209)	19.4	12	12	206	206-229
1996	167 (193)	19.2	11	11	167	167-188
1997	203 (204)	11.8	17	15	280	210-280
2002	145 (152)	11.7	7	7	145	145-175
2004	129 (136)	14.0	12	12	129	129-143
2006	125 (131)	14.3	10	9	138	127-181
2008	139 (142)	12.9	6	5	166	142-200
2010	NA[a]	10.4	0	NA	NA	NA
2011	101 (123)[b]	8.9	0	0	NA	NA
2012	NA[a]	12.9	0	NA	NA	NA
2013	148 (152)	14.2	0	0	NA	NA
2014	115[c] (123)	13.3	0	NA	NA	NA
2015	NA[a]	10.8(11.5)	NA[d]	NA	NA	NA
2016	NA[a]	11.8(14.8)	NA[e]	NA	NA	NA
2017	147	14.1(15.6)	NA[f]	NA	NA	NA

[a] No population estimate was conducted these years, only a calf composition count was done.

[b] This number includes groups of 16 tracks seen at Pettepiece Pass, but these were likely from the same animals actually observed at Caribou Basin 7 days later (see Results). No double-counting occurred because the 16 were not included in the value 101 presented above.

[c] The 2014 estimate is considered to be unreliable due to a very low snowpack. This number (115 or 123) is considered to be very conservative.

[d] 10 adult females were collared, and 2 juveniles had ear tags. All 10 adults, 2 surviving calves, and one juvenile were located using a mix of standard census methods and telemetry.

[e] 13 adults were collared and on-air during the survey along with 8 collared calves and an additional calf with ear tags only.

[f] 10 adults were collared and on-air during the survey along with 2 collared calves and 2 calves with ear tags only.

Table 2. Percent calves recorded in "The Hub" portion of the Columbia North subpopulation (see text for details). Sample size (calves/total number seen) should not be used to infer population trend because some years the area surveyed varied considerably. This summary is presented as a sample to show how recruitment varied in the core caribou habitat ("The Hub") of the Columbia North subpopulation.

Year	Percent calves	Sample size
1989	14.3	(5/35)
1990	16.2	(6/37)
1991	18.2	(6/33)
1994	21.3	(19/89)
1996	15.2	(5/33)
1997	10.4	(5/48)
2002	10.4	(5/48)
2004	14.5	(10/69)
2006	13.2	(5/38)
2008	15.5	(9/58)
2010	11.1	(5/45)
2011	7.9	(6/76)
2012	13.3	(8/60)
2013	16.1	(15/93)
2014	14.9	(10/67)
2016	14.8[a]	(12/81)

Year	Percent calves	Sample size
2017	16.1[a]	(15/93)

[a] Inclusive of both “wild” recruitment and recruitment contributions from the maternity pen.

Appendix 1. Details of individual caribou groups observed

Date	Total Observed	Adult Females	Adult Bulls	Yearlings	Calves (phot confirmed)	Location
2017-04-03	1				*0*	Groundhog
2017-04-03	1				*NA*	Bigmouth
2017-04-03	6				*2*	Bigmouth
2017-04-03	3				*1*	Bigmouth
2017-04-03	2			1	*1*	Fernie
2017-04-03	3				*0*	Hoskins
2017-04-03	1		1		*0*	Sibley
2017-04-03	10		3		*1*	Seymour
2017-04-03	2		1		*0*	Oliver
2017-04-03	3	3			*0*	Bischoff
2017-04-03	6	5	1		*0*	Cayenne
2017-04-03	8				*2*	Cayenne
2017-04-03	14				*2*	Cayenne
2017-04-03	3				*0*	Cayenne
2017-04-03	10				*3*	Blais
2017-04-03	1		1		*0*	Kirbyville
2017-04-03	2			1	*0*	Kirbyville
2017-04-03	6				*1*	Kirbyville
2017-04-03	4				*0*	Anstey
2017-04-03	3				*0*	Anstey
2017-04-03	22				***6***	Seymour
2017-04-04	2				***1***	Birch
2017-04-04	16				*0*	Cummins
2017-04-04	1				*0*	Wood
2017-04-04	3				*0*	Wood
2017-04-04	7				*1*	Molson
2017-04-04	7				*2*	Foster

2005 Mountain Caribou Census
for
George Mountain, Narrow Lake, North Cariboo Mountains and Hart Ranges

Dale Seip, Glen Watts, Doug Heard, and Doug Wilson

We censused mountain caribou populations in the Omineca Region in March 2005. The censuses followed the standard mountain caribou survey protocol of flying in a helicopter along treeline within each watershed searching for tracks or caribou. Three experienced observers and the pilot were present for all flights. When tracks were found, the area was intensively searched to locate and count the caribou. Caribou were classified as adults or calves. The flight route and location of all caribou were recorded on a GIS. We used a sightability correction factor of 83% to account for caribou that were not seen during the censuses (Seip 1990, Young and Roorda 1999).

George Mountain:

George mountain was surveyed on March 9 and again on March 30. There was no evidence of caribou or tracks. This marks the 3rd year in a row that no caribou have been found on George Mountain during March surveys. Four years ago, in March 2002, there were 3 caribou remaining on George mountain (Seip et al. 2002a).

Narrow Lake:

The Narrow Lake herd was censused on March 24. Many of the tracks and caribou were located in mid elevation forest rather than open subalpine parkland. Also it had been several days since the last new snowfall making it more difficult to locate the caribou when tracks were found. Consequently, the sightability of caribou during this survey was possibly lower than normal.

Adults:	18
Calves:	1
Total count:	19
Estimated from tracks	15
Total	34
Sighability corrected estimate	41

Percent calves in the population: 5.2%

The count (19-34) is a significant decline from the 67 caribou counted in 1999 (Watts 1999) and 61 caribou counted in 2002 (Seip et al. 2002). In 2004, 23 caribou were counted at Narrow Lake (Seip et al. 2004). At that time, it was believed that the 2004

number was an underestimate because no caribou north of Narrow Lake were not found during the survey. However, that low number in combination with the 2005 count and the very low calf recruitment suggests that the Narrow Lake population has significantly declined since 2002.

This population is a high priority for a census under good conditions in 2006.

North Cariboo Mountains:

The Sugarbowl/Raven Lake block was censused on March 24. Most of the tracks were in mid-elevation forest and it had been several days since the last snowfall making it difficult to locate caribou when tracks were found. The Haggen block was censused on March 30 in clear conditions following a fresh snowfall which provided excellent conditions for locating caribou. WLAP in Williams Lake counted the Bowron census block on March 25 under very good conditions and provided the information for this report.

Census Block	Adults	Calves	Total Count	Estimated from tracks	Total	Sightability Corrected Estimate
Sugarbowl	37	4	41	13	54	65
Haggen	103	24	127	0	127	153
Bowron	39	8	47	7	54	65
TOTAL	179	36	215	20	235	283

Percent calves in the population: 16.7%

This count is a slight decrease from the 2002 count of 236 caribou (Seip et al. 2002) but is generally indicative of a stable population. The calf recruitment is also indicative of a stable population.

Hart Ranges:

Bearpaw ridge, Mount Severied, Sande Ridge, and Torpy Ridge blocks were censused on March 22. Captain-Otter and Logan-Hedrick blocks were censused on March 23. The abundance of tracks and lack of new snow may have resulted in slight lower sightablity. The Walker Creek block was censused on March 25 under ideal conditions and likely yielded very high sightability. The Parsnip and Arctic Lake portion of the Hart Ranges herd was censused on April 14. The lack of new snow made it difficult to locate caribou when tracks were found. Also, we only surveyed the lower half of the watersheds flowing into the Parnsip because this is where most of the caribou live. However, we know that we missed some mountain caribou that were at the back ends of those watersheds because we had radio-collared caribou beyond the area that was censused.

The Parnsip count is separated from the other census blocks because prior to 2002, this area was not censused as part of the Hart Ranges herd.

Census Block	Adults	Calves	Total Count	Estimated from tracks	Total	Sightability Corrected Estimate
Bearpaw	67	21	88	0	88	106
Mt. Severeid	40	6	46	0	46	55
Sande Ridge	0	0	0	2	2	2
Torpy Ridge	57	13	70	2	72	87
Captain-Otter	82	14	96	10	106	128
Logan-Hedrick	29	7	36	0	36	43
Walker Creek	22	5	27	0	27	33
Arctic	5	0	5	0	5	5
TOTAL	302	66	368	14	382	460
Parsnip	57	11	68	13	81	98
Overall total	359	77	436	27	463	558

Percent calves in the population: 17.7%

This count within the traditional census area represents a signficant increase from the 2002 count of 275 and corrected estimate of 345 caribou (Seip 2002). Caribou numbers were higher in all areas, but the major increase was the number of caribou on Torpy ridge. The relatively high calf number this year and in 2002 (17.4%, Seip 2002) suggests that the increase may represent a real population increase over the past 3 years.

The population estimate for the Parnsip area was virtually identical to the 2002 estimate of 99 caribou (Seip 2002). We know that this is an underestimate because some radiocollared caribou were living in areas beyond where we censued. Overall, the population estimate for the Hart Ranges, including the Parnsip portion, is 558 caribou.

OverallTotal:

The total number of mountain caribou counted during these surveys was 670, yielding a population estimate of 882.

Group Sizes:

	North Cariboo	Hart Ranges
Number of Groups	29	52
Group Size Range	1 – 18	1 - 23
Mean Group Size (SE)	7.4 (0.85)	7.0 (0.62)
Typical Group Size[1]	10.2	9.8

[1]/ typical group size is where half the caribou are in groups larger than the typical group size and half are in groups less than the typical group size.

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Population surveys of Columbia North and Columbia South mountain caribou, March 2016

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Abstract

The Columbia North and Columbia South mountain caribou subpopulations were surveyed in March 2016. Due to poor snow conditions, Columbia North was partially surveyed and cannot be used to infer population trend, but can be used to track recruitment. Recruitment remains low at 11.8%, but when penned calves are included the recruitment rate was 14.8%. The estimate for Columbia South was 4 animals, down from an estimate of 106 – 142 (90% CI) animals in 1994. This population does not appear to be stabilizing.

Contents

Introduction

Mountain caribou are a "red listed[1]" in British Columbia and populations are usually censused every two to three years to help evaluate the success of recovery actions. In the Revelstoke region, the last reliable census was conducted in 2013, but over the past three years the late-winter snowpack has been inconsistent and has not provided suitable conditions for census. Therefore, recent surveys have been limited to estimates of recruitment, rather than complete censuses. This report presents results of the recruitment census for the Columbia North subpopulation, and a complete census of the Columbia South subpopulation, both of which were conducted during March 2016. The recruitment census of the Columbia North subpopulation can be used to evaluate the effect of the maternity pen (Serrouya et al. 2015), among other recovery measures conducted in this ecosystem (see details in Serrouya (2013)).

Methods

There are three subpopulations that are usually counted in the Revelstoke Region: Columbia North, Columbia South, and Frisby-Queest. Due to constraints caused by inconsistent snow conditions (e.g., a relatively narrow time window when animals could be counted), only the Columbia North and South subpopulations were surveyed. An adjacent population south of Highway 1 that is sometimes counted with the aforementioned ones is the Monashee South (Blanket) herd, which was counted in March 2016 by van Oort and Laubman (2016).

This census followed similar protocols that have been used repeatedly since 1992 (Wittmer et al. 2005, McLellan et al. 2006). Briefly, mountains are contoured at treeline using a Bell 206 Jet Ranger helicopter at speeds of approximately 130 - 160 km/hr. This elevation is where caribou are most often found during late winter (Apps et al. 2001). Compared to other north-American large mammals, sightability is extremely high for mountain caribou in late March, when snow in the mountains is deep and provides the lift needed to access arboreal lichens in the canopy of trees in the subalpine where tracks are highly visible at this time of year. High sightability is not strictly required for a recruitment census since it does not require a count of the entire population. Yet, poor sightability may be a concern if a subset of the population (e.g. bull groups) are less likely to be visualized during a poor snow year. To conduct a full population census requires a minimum of 300 cm of settled snow at Mt. Fidelity, where snow is manually recorded by Parks Canada staff. This threshold is based on an empirical relationship demonstrating that caribou sightability is greater than 90% when the snowpack reaches 300 cm (Flaa and McLellan 1999). To re-confirm this pattern, particularly in the context of climate change, we re-evaluated the relationship between sightability as a function of snow depth. We added 4 years of census data from this ecosystem to the original analysis conducted by Flaa and McLellan (1999).

When caribou tracks are encountered they are followed to locate caribou and count their numbers. Since 2013, we began taking high-resolution photographs of each group so that numbers and composition (% calves in the population) can be verified in the office, and to minimize animal harassment. Caribou are usually classified as either adult (including juveniles) or calves, but in some cases they can also be classified as adult males.

[1] This term is equivalent to the Federal Species at Risk Act listing of "endangered."

We provide totals of the number of caribou seen, plus those estimated from tracks. To calculate the percent of caribou calves in the population, we divided the number of calves seen by the total number of caribou seen, not the total number including those estimated from tracks. Only the number of caribou seen should be used in the denominator, because caribou estimated from tracks would have an unknown number of calves.

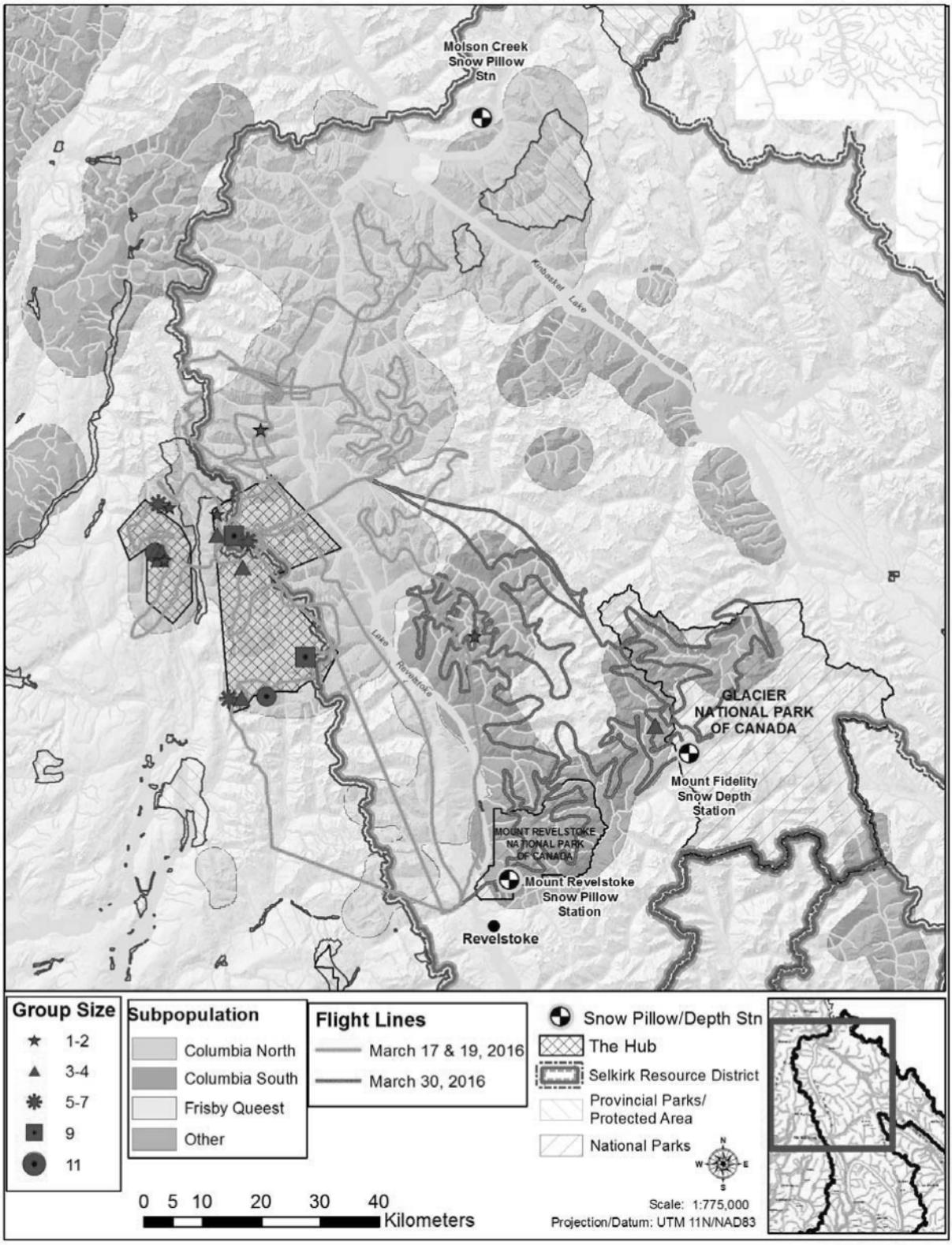

Figure 1. Flight path of the Columbia North and Columbia South census, along with locations of caribou groups (graduated symbols). Also show is the Mt. Fidelity snow station that is typically used to

determine if the snow is deep enough to conduct a census, and also the location of 2 automated snow pillow stations (Mt Revelstoke and Molson Crk).

Results

The Columbia North subpopulation was flown on March 17 and 19, 2016 using a total of 6.5 hrs of search time. The Columbia south census was flown on March 30, 2016 with 4:48 hrs of survey time and 6:04 hrs of total flying time. Snow conditions during mid-March were too shallow for adequate sight-ability, which explains why we only did a recruitment survey for Columbia North. Snow tracking conditions improved slightly at the end of March, so we elected to do a complete census for Columbia South. Snow depths at Mt. Fidelity ranged from 287-295 cm during the Columbia North census, was 290 cm during the Columbia South census, and 283 cm on March 31st, 2016. These values are below the 1965-2015 average (Appendix 1). Snow pillow data from Molson creek in the northern portion of the study area indicated that snow depths were ~3% below average during the census.

Weather on March 17th and 19th was clear, with good sighting conditions. However, snow conditions were wind-affected in some areas, with more extensive caribou tracking than ideal for a full census.

We found 17 groups of caribou in the Columbia North subpopulation (Figure 1; Table 1, Appendix 2). All of these groups were found within the "hub"[2] area. The total number of caribou seen was 81, and none were estimated from tracks. The number of calves seen was 12, and when this is divided by 81, the calf percentage is 14.8. However, 4 of the caribou calves were produced from the maternity pen, so it is relevant to calculate the recruitment rate excluding adults and calves that were in the pen the previous year. We use the term "wild" recruitment rate to mean the value that excludes animals (cows and calves) released from the maternity pen the previous summer. So in this case the denominator is 81 minus 9 adults and 4 calves from the pen, resulting in 68. The numerator is 12 calves seen during the survey, minus 4 calves from the pen, leaving 8 wild calves. So 8 ÷ 68 = 11.8% as an estimate of wild recruitment. It could be argued then that the pen increased recruitment rate from 11.8 to 14.8% within the portion of the subpopulation surveyed (Figure 1).

Two groups of caribou were found in the Columbia south subpopulation (Fig. 1; Table 2). One group consisted of three animals and the other had a lone bull, for a total estimate of 4 animals. No calves were observed.

[2] The hub is a core area of the Columbia north (CN) subpopulation, where population size and trend has been greater than other areas within CN. See figure 1 for a map of the hub.

Table 1. Population census results and recruitment values (% calves) for the Columbia North caribou subpopulation. Adapted from McLellan et al. (2006).

Columbia North	Observed (+ Tracks)	Calves (%)	Number Collared	Collars Observed	Calculated Estimate	90% CL
1994	206 (209)	19.4	12	12	206	206-229
1996	167 (193)	19.2	11	11	167	167-188
1997	203 (204)	11.8	17	15	280	210-280
2002	145 (152)	11.7	7	7	145	145-175
2004	129 (136)	14.0	12	12	129	129-143
2006	125 (131)	14.3	10	9	138	127-181
2008	139 (142)	12.9	6	5	166	142-200
2010	NA[a]	10.4		NA	NA	NA
2011	101 (123)[a]	8.9	0	0	NA	NA
2012	NA[a]	12.9	0	NA	NA	NA
2013	148 (152)	14.2	0	NA	NA	NA
2014	115[b] (123)	13.3	0	NA	NA	NA
2015	NA[a]	11.5	NA[c]	NA	NA	NA
2016	NA[a]	14.8	NA[d]	NA	NA	NA

[a]No population estimate was conducted these years.

[b]The 2014 estimate is also considered to be unreliable due to a very low snow pack. This number (115 or 123) is considered very conservative.

[c]10 adult females were collared, and 2 juveniles had ear tags. All 10 adults, 2 surviving calves, and one juvenile were located using a mix of standard census methods and telemetry.

[d] 13 adults were collared and on-air during the survey along with 8 collared calves and an additional calf with ear tags only.

Table 2. Population census results and recruitment values (% calves) for the Columbia South caribou subpopulation. Adapted from McLellan et al. (2006).

Columbia South	Observed (+ Tracks)	Calves (%)	Number Collared	Collars Observed	Calculated Estimate	90% CL
1994	105 (117)	12.4	12	11	114	106-142
1996	81 (94)	12.35	10	9	103	94-112
1997	93 (93)	15.1	9	9	93	93-107
2002	29 (34)	17.2	3	2	NA	NA
2004	38 (40)	15.8	3	3	NA	NA
2006	26 (29)	2.9	1	0	NA	NA
2008	20(20)	0	2	2	NA	NA
2009	13(14)	15.4	3	3	NA	NA
2011	2(7)	33.3 (2/6)[a]	0	0	NA	NA
2013	6	16.7	0	0	NA	NA
2016	4	0	0	NA	NA	NA

[a]A group of 4 (including 1 calf) were seen a week prior to survey where only tracks were seen during the survey – this sighting was used to calculate the % calves

Results from our updated sightability analysis confirm that when the snow depth at Mt Fidelity snow station (1905m ASL) is ≥ 300 cm in March, sightability is high (Figure 2). This sample is based on 9 censuses and 153 radio collars (including data from Columbia North, Columbia South, Frisby-Queest, Monashee South, Kinbasket), from 1983 to 2008. One hundred thirty five of the 153 collared animals were detected during the censuses (88.2%), including data from all end of March snow depths. When censuses were restricted to those when the snow depth was ≥ 300cm at the end of March, sightability was 92.7 % (114 out of 123 collared animals were detected).

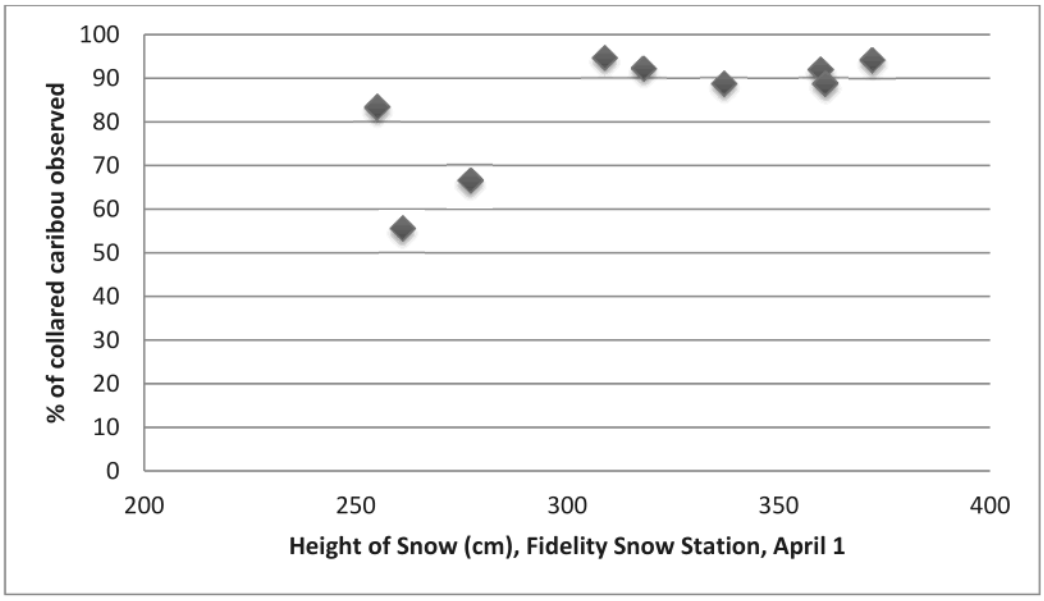

Figure 2. The relationship between the height of snow recorded at the Fidelity snow station (Glacier National Park, on April 1 with the percentage of collared caribou (n= 9-26) sighted during late March censuses (1983-2008). After 2008 very few caribou (<3) were collared; not enough to provide a meaningful estimate of sightability. The two lowest values were recorded in 1983 and 1984.

Discussion

The estimate of 4 caribou for Columbia South indicates the continued decline of this subpopulation. This group, whose range overlaps substantially with provincial lands and Mt Revelstoke and Glacier National Parks (Figure 1), is in imminent danger of extinction (Serrouya and Wittmer 2010).

For the Columbia North subpopulation, population trend cannot be inferred from the 2016 survey because it was not a complete census. However, calf recruitment remains low, even when the four animals recorded from the maternity pen are included in the sample. Nonetheless, partitioning animals that were penned from the survey suggests that it is possible to detect an effect of the pen – even with a relatively small number of cows penned. Eleven calves were released from the pen in July 2015 along with 16 collared adult females. Nine calves survived until March 2016. One calf was not detected during the recruitment survey, though her radio-collared mother was detected (the calf collar was not functioning at the time). This calf collar resumed functioning in April, and the calf was confirmed alive at that time. Four calf/cow pairs were not detected during the survey. All adults and most calves had radio collars, so it was possible to determine that they were indeed missed, mostly because they were at or below treeline during census. These missed animals suggest a low detection rate (much less than typical values that average > 90%), supporting our decision not to conduct a complete census this winter.

It appears as though the maternity pen caused a modest increase in recruitment from 11.8 to 14.8% in a portion of the subpopulation range. This is an encouraging result, but still not enough to effect any meaningful change in the population growth rate (λ). Nonetheless, this result was caused by penning a modest number of adult females (18), with 15 of them birthing calves, and 9 of them surviving to the following March (2016). If more cows are penned, and mortality in the pen can be reduced (four calves

died in the pen), then this management lever has the potential to help increase λ for the Columbia North subpopulation.

Acknowledgements

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Appendix 1 – Snow station data. See figure 1 for the location of each station.

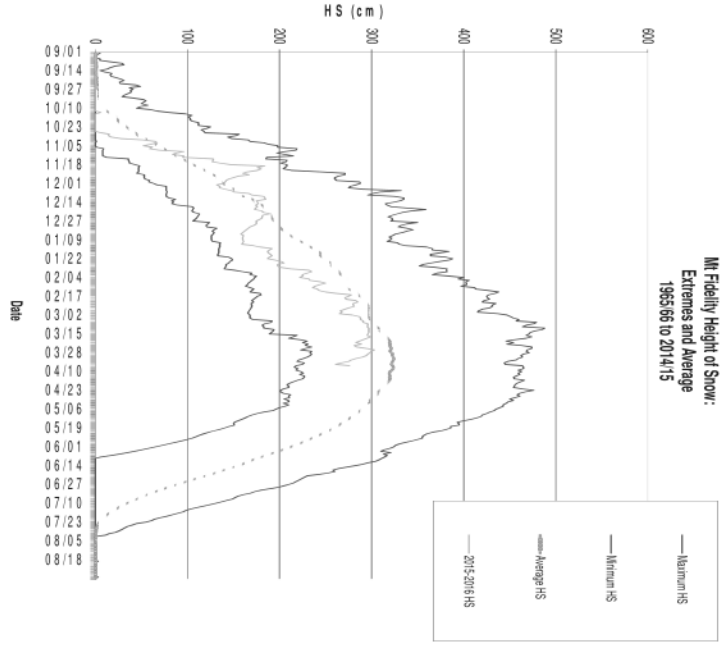

Figure 3. Manually recorded snow depths at the Fidelity Snow Station (1905 m ASL) in Glacier National Park. 2015-16 winter data. Data courtesy of Parks Canada.

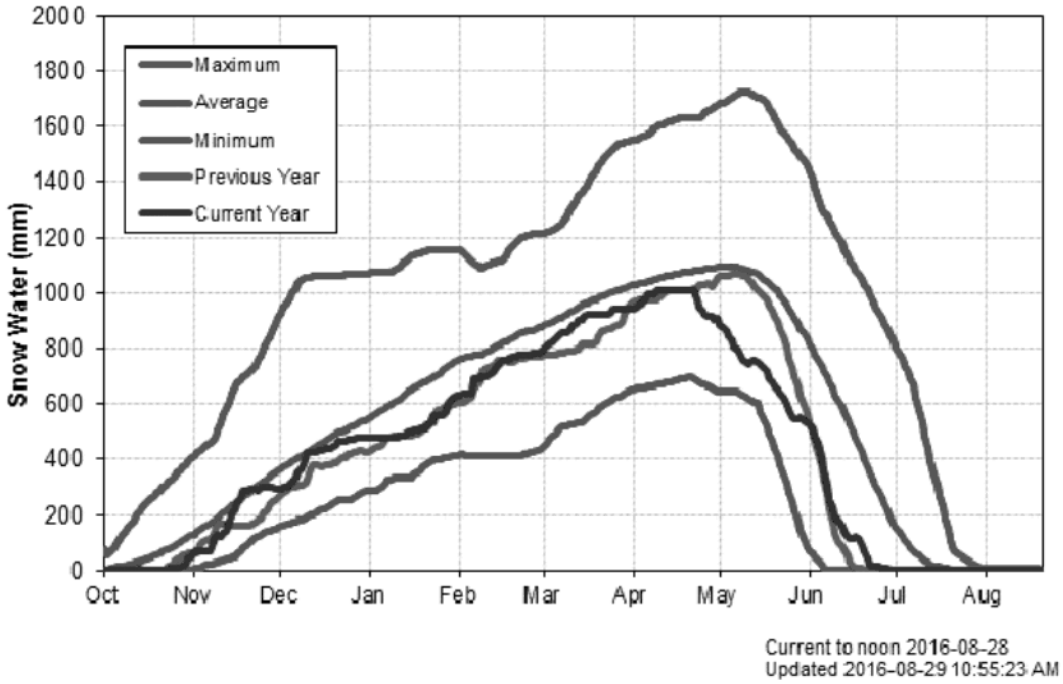

Figure 4. Snow water equivalents (mm of melted snow) recorded during the 2015/16 winter at the Molson Automated Snow station (1930m) in the Rocky Mountains (BC Ministry of Forests, Lands and Natural Resource Operations, http://bcrfc.eShanv.gov.bc.ca/data/asp/realtime/asp_pages/asp_2A21P.html).

Appendix 2 – Details of caribou groups seen during census. Only records of sightings valid for the census count are included. Observers were March 17th and 19th, 2016 (Kevin Bollefer, Kelsey Furk, Shawn McFarlane), March 30th (Cory Legebokow and Alex Taylor).

SUB-POPULATION	DATE	ZONE	DATUM	EASTING	NORTHING	TOTAL	TOTAL W/ TRACKS	CALF	CALF from (2015) PEN	ADULT from (2015) PEN	UNCLASSIFIED ADULT	MALES ADULT	FEMALES ADULT	FREQUENCY 1	FREQUENCY 2	NOTES	DRAINAGE
Columbia North	17-Mar-16	11	NAD83	373324	5685143	5	5	1	0	0	4					In Trees.	Antsey N
Columbia North	17-Mar-16	11	NAD83	375445	5685199	3	3	0	0	0	2	1				In Trees.	Antsey N
Columbia North	17-Mar-16	11	NAD83	379708	5685548	11	11	2	0	0	9						Antsey Ridge East
Columbia North	17-Mar-16	11	NAD83	386300	5692221	9	9	2	0	0	7						Pettipeace
Columbia North	17-Mar-16	11	NAD83	375613	5707355	3	3	0	0	0	0	3					Blais Creek
Columbia North	17-Mar-16	11	NAD83	362373	5708526	1	1	0	0	1	1			150.390 (#17)		Solo, but calf found alive in April via VHF	Cayenne Creek
Columbia North	17-Mar-16	11	NAD83	361446	5708763	4	4	1	1	1	3			150.140 (#3)	151.48 (calf #3)		Cayenne Creek
Columbia North	17-Mar-16	11	NAD83	361879	5710006	3	3	1	1	1	2			150.330 (#10)		Dropped calf (#10) collar 151.470 found and	Cayenne Creek

														recovered, cow seen with calf.	
Columbia North	17-Mar-16	11	NAD 83	361134	5710322	3	3	1	0	0	2				Cayenne Creek
Columbia North	17-Mar-16	11	NAD 83	360772	5709945	11	11	0	0	0	11			possible but unlikely calf - check photos.	Bischoff
Columbia North	17-Mar-16	11	NAD 83	361356	5718197	7	7	2	0	0	7			possibly 1 juvenile	Bischoff
Columbia North	17-Mar-16	11	NAD 83	363262	5717458	1	1	0	0	0		1			Bischoff
Columbia North	17-Mar-16	11	NAD 83	371298	5716338	1	1	0	0	1	1		150.320 (#9)		Seymore E
Columbia North	17-Mar-16	11	NAD 83	371370	5712921	3	3	0	0	1	3		150.170 (#5)	Stop for fuel at Gothics	Kirbyville
Columbia North	17-Mar-16	11	NAD 83	374147	5712749	9	9	0	0	3	9		150.235 (#6)	Uncollared caribou w/ green ear tags in group ; #6 was transmitting, #1 and #15 were in group but not transmitti	Kirbyville

															ng, identified using photos.	
Columbia North	17-Mar-16	11	NAD 83	376547	5711871	5	5	1	1	1	4			#16 collar	Collar #16 with calf. Calf collar was dropped in February.	Kirbyville
Columbia North	19-Mar-16	11	NAD 83	378749	5730665	2	2	1	1	0	1			151.420 (calf #7)	This was calf #7 (adult killed last fall) it was with a calf born in 2014 In the pen (yellow eartag)	S. Ruddock
Columbia South	30-Mar-16	11	NAD 83	415065	5695631	1	1	0	0	0	0	1				
Columbia South	30-Mar-16	11	NAD 83	445692	5680520	3	3	0	0	0	0		3			