

STATE OF ALASKA

DEPARTMENT OF FISH AND GAME DIVISION OF WILDLIFE CONSERVATION

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MEMORANDUM

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CC: Porcupine Caribou Technical Committee Members

FROM: Jason Caikoski – Assistant Area Biologist, Northeast Alaska, Alaska Dept. of Fish and Game

DATE: 20 December, 2010

SUBJECT: Porcupine Caribou Herd – Fall 2010 Composition Survey

Overview

The Alaska Dept. of Fish and Game (ADF&G) and the Department of Environment, Government of Yukon (YDOE) conducted a composition survey of the Porcupine Caribou Herd (PCH) on their winter range during 16-18 October, 2010. Most of the PCH were in the upper East Fork Chandalar River drainage, Alaska and few PCH were in the Old Crow Flats and foothills of the Richardson Mountains, Yukon. For the portion of PCH in Alaska, caribou were radiotracked and classified by ADF&G staff from a chartered Cessna 182 operated by Tundra Air and a Robinson 44 helicopter operated by Quicksilver Air. For the portion of PCH in Yukon, caribou were radiotracked and classified by YDOE staff from a chartered Cessna 206 operated by Great River Aviation and a Bell 206 helicopter operated by Fireweed Helicopters.

Sampling Methods

We surveyed near peak of rut to take advantage of increased mixing of bulls, cows, and calf caribou. Peak of rut was estimated as the date 228 days (gestation period) prior to the median calving date of the PCH, 2002-2010. The survey occurred from 231-233 days prior to the median calving date. Caribou groups were located by radiotracking collared caribou (both bulls and cows) from fixed wing aircraft. Group location and the number of radiocollars in each group was determined by fixed wing aircraft and relayed to the helicopter immediately prior to the arrival of the helicopter to each caribou group. We defined a group as caribou that were lumped together and spatially separated or distinguishable from neighboring caribou or caribou groups. We attempted to locate most radiocollared caribou and sample across the full spatial expanse of the herd.

The number of caribou classified per caribou group was weighted based on the number of radiocollars present in each group. Approximately 200 random caribou were classified by helicopter per radiocollar per caribou group. If caribou groups contained less than 200 caribou per radiocollar, all or most of the caribou in those groups were classified. Caribou were classified as small bull, medium bull, large bull, cow, or calf (caribou were classified as bull, cow or calf in Canada). Group samples were recorded independently. We did not count or estimate the total number of caribou in each group.

Results

For composition sampling, we located 53 radiocollared caribou in Alaska and Yukon and sampled 29 caribou groups containing 1-12 radiocollars per group (Figures 1 and 2). Most caribou groups contained one radiocollared caribou (n=17), seven groups contained two radiocollared caribou, and five groups contained three or more radiocollared caribou. Twenty-three groups were located by radiocollared cows, four groups were located by radiocollared bulls, and two groups were located by radiocollared bulls and cows. The number of individuals classified per group ranged from 8-2,000 caribou and varied based on the number of radiocollared caribou present per group and the total number of caribou available for classification in each group. The number of individuals classified per radiocollar ranged from 8-370 caribou and averaged 193 caribou. A total of 11,207 caribou were classified of which 9,221 were adults. The estimated bull:cow ratio was 57 bulls per 100 cows and the estimated calf:cow ratio was 34 calves per 100 cows (Table 1).

In addition to the 53 radiocollared caribou used for sampling, we located 25 radiocollared caribou that were not sampled. Combined, we located 82% of all radiocollared caribou known to be alive since the photocensus in July, 2010. During the survey period, 92% of satellite collared caribou (n=13) and 95% of located VHF collared caribou (n=65) were in the upper East Fork Chandalar River Drainage, Alaska (Figure 2). The remaining satellite and located VHF collared caribou were in the Old Crow Flats or foothills of the Richardson Mountains, Canada. In Alaska, the PCH was slightly mixed with the Central Arctic Herd (CAH) on the southern and western extent of their distribution. Therefore, we bounded the survey area to the south and west to minimize samples mixed with PCH and CAH caribou (Figure 2). The survey did, however, include five cow caribou originally collared as CAH caribou.

Discussion

Previous caribou composition surveys (PCH 2009, CAH 2009, Teshekpuk 2009) identified sources of bias associated with estimating compositions of large caribou herds (ADF&G files). In particular, substantial heterogeneity in calf:cow and bull:cow ratios were observed between caribou groups sampled using radiocollared bulls and those identified using radiocollared cows. In addition, spatial heterogeneity in composition was observed for the PCH in 2009 when the herd was split between Alaska and Yukon.

In 2010, bias was likely minimized compared to the 2009 PCH survey due to spatial distribution and mixing of the herd. Over 90% of the PCH was congregated in one geographic region in Alaska and we sampled proportionally to the distribution. In addition, we sampled more groups identified by bull collars and several groups contained radiocollared bulls and cows.

Although five CAH radiocollared caribou were among PCH groups that were sampled for composition, three of the five caribou were collared as short yearlings in 2008, were never located in 2009 but were located with the PCH during the summer and fall of 2010. It is possible that these animals were

incorrectly collared as CAH caribou, have switched herds, or exhibit no fidelity to either herd. One of the five CAH collared caribou may have switched herds as it was located with the PCH in summer 2010 and has remained with the PCH since, including a fall movement from Alaska to Yukon and then back to Alaska. The remaining CAH collared caribou has been located and calved with the CAH in all years since 1999.

Due to mixing of the PCH with the CAH on the periphery of the PCH distribution, sampling was limited to the core area of the PCH distribution. If composition differed from caribou groups on the periphery of the distribution compared to the core area, then composition estimates would be biased to the core area.

Funding

Operational survey funding was provided by YDOE. ADF&G conducted the portion of the survey that occurred in Alaska and YDOE conducted the portion of the survey that occurred in Yukon. USFWS provided a pre-survey telemetry flight. ADF&G provided data analysis and reporting.

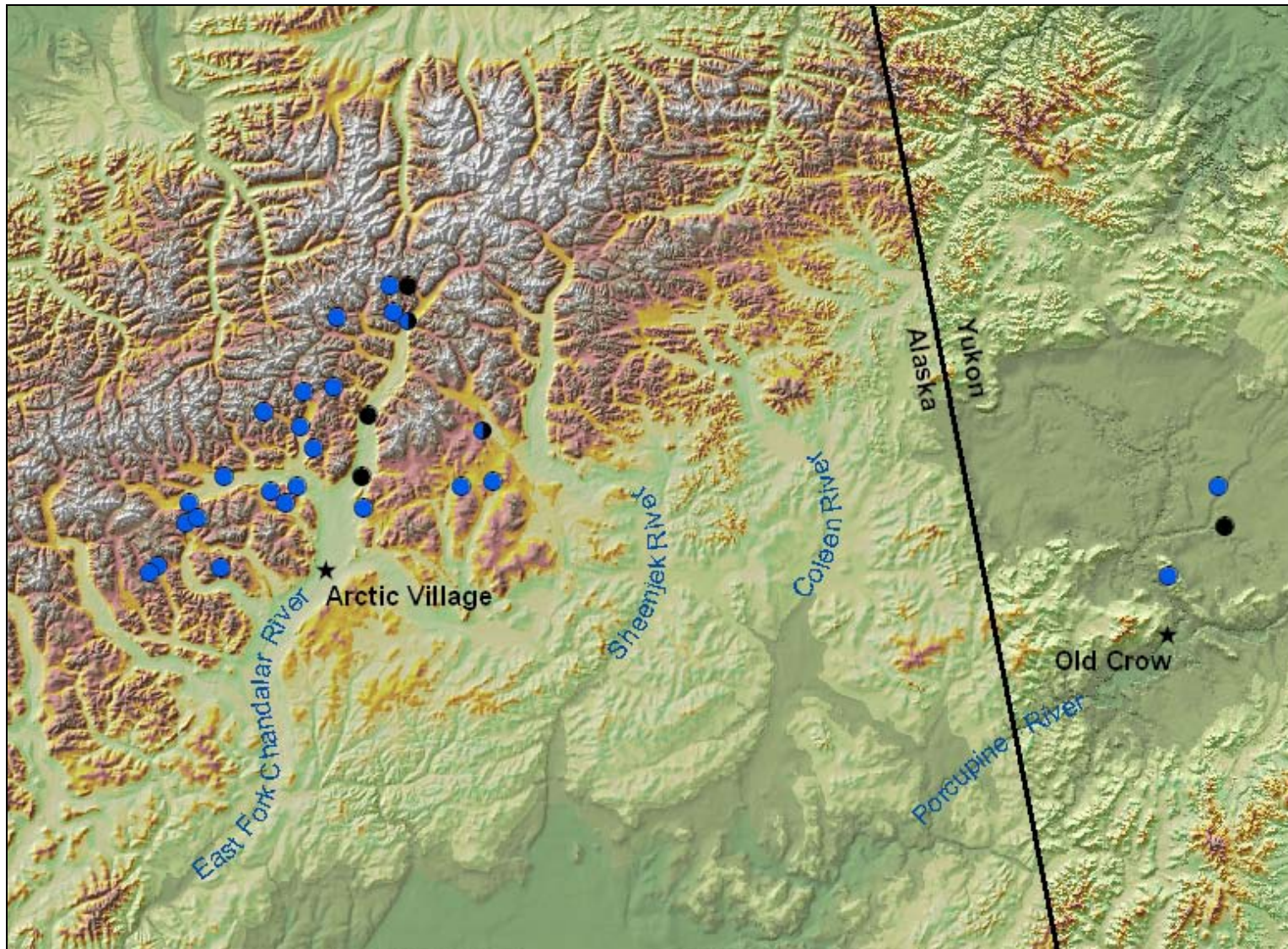


Figure 1. Locations of caribou groups sampled for composition in Alaska and Yukon, October, 2010

Figure Key:

Blue circle = sampled caribou group containing radiocollared cow(s) only

Black circle = sampled caribou group containing radiocollared bull(s) only

Blue/black circle = sampled caribou group containing radiocollared cow(s) and bull(s)

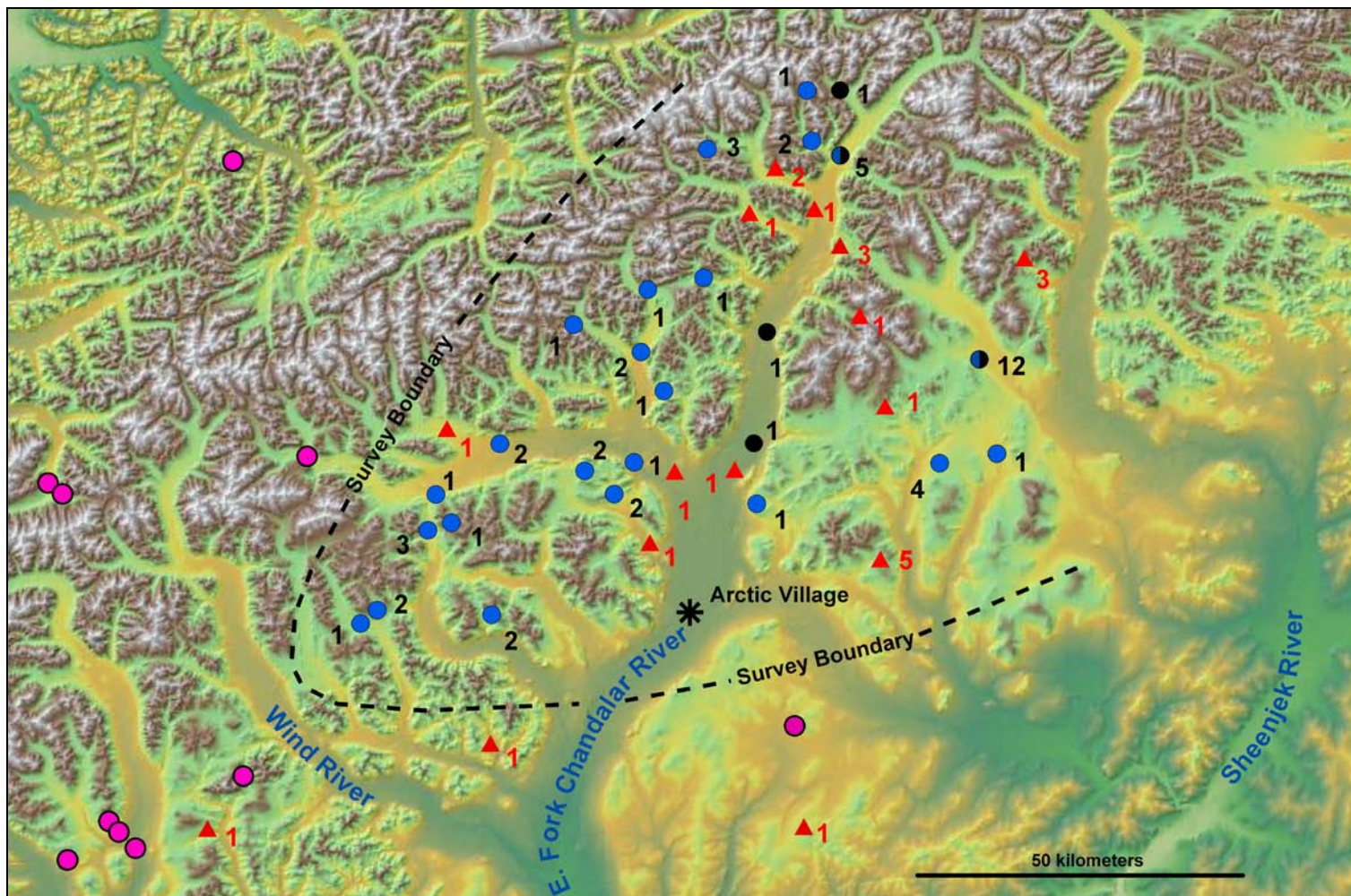


Figure 2. Locations of caribou groups sampled for herd composition, October 2010. Not depicted, three sampled groups and one group located but not sampled Yukon, Canada. All groups in Yukon, Canada contained one radiocollared caribou.

Figure Key:

- Blue circle** = sampled caribou group containing radiocollared cow(s) only
- Black circle** = sampled caribou group containing radiocollared bull(s) only
- Blue/black circle** = sampled caribou group containing radiocollared cow(s) and bull(s)
- Red triangle** = caribou groups located by radiocollar but not sampled
- Pink circle** = locations of satellite collared Central Arctic Herd caribou
- Number next to symbol** = number of radiocollars present in group
- Black dashed line** = western and southern extent of survey

Table 1. Sex and age composition of Porcupine Caribou groups (n=29) sampled by helicopter during 16-18 October, 2010 in Alaska and Canada.

Group #	Location ^a	Number of Radiocollars ^b	# sampled ^c	# small Bulls	# med. Bulls	# large bulls	# total bulls	# cows	# calves	Bull:cow	Calf:cow
1	AK	1C	17	3	0	0	3	13	1	0.23	0.08
2	AK	2C	302	36	23	24	83	144	75	0.58	0.52
3	AK	2C	406	58	35	17	110	219	77	0.50	0.35
4	AK	1C	370	38	30	25	93	203	74	0.46	0.36
5	AK	3C	683	93	67	56	216	287	180	0.75	0.63
6	AK	1C	242	26	24	4	54	125	63	0.43	0.50
7	AK	2C ^d	422	50	34	28	112	207	103	0.54	0.50
8	AK	1C	281	54	25	16	95	123	63	0.77	0.51
9	AK	2C	458	56	45	44	145	204	109	0.71	0.53
10	AK	2C	418	57	47	36	140	181	97	0.77	0.54
11	AK	1C	262	47	18	33	98	136	28	0.72	0.21
12	AK	1B	215	24	21	32	77	110	28	0.70	0.25
13	AK	1B	216	21	16	18	55	130	31	0.42	0.24
14	AK	9C, 3B ^d	2,000	226	147	214	587	1,204	209	0.49	0.17
15	AK	1C	320	23	35	17	75	194	51	0.39	0.26
16	AK	4C ^d	714	71	63	45	179	427	108	0.42	0.25
17	AK	2C ^d	440	69	60	31	160	199	81	0.80	0.41
18	AK	1C	207	39	15	22	76	95	36	0.80	0.38
19	AK	1C	205	29	20	16	65	105	35	0.62	0.33
20	AK	1C	71	7	2	10	19	34	18	0.56	0.53
21	AK	1C	245	33	20	26	79	127	39	0.62	0.31
22	AK	4C, 1B ^d	1,125	138	95	108	341	602	182	0.57	0.30
23	AK	2C	434	44	34	26	104	236	94	0.44	0.40
24	AK	1B	10	0	2	3	5	3	2	1.67	0.67
25	AK	1C	44	5	4	7	16	18	10	0.89	0.56
26	AK	1C	656	116	42	68	226	303	127	0.75	0.42
27	YT	1B	8	--	--	--	2	3	3	0.67	1.00
28	YT	1C	213	--	--	--	71	114	28	0.62	0.25
29	YT	1C	223	--	--	--	71	118	34	0.60	0.29
SUM		58^e	11,207	1363^f	924^f	926^f	3,357	5,864	1,986	0.57	0.34

^a AK = Alaska, USA YT = Yukon Territory, Canada

^b #C = number of radiocollared cow(s), #B = number of radiocollared bull(s)

^c Number of caribou classified per group, total group size unknown

^d Includes one radiocollared cow caribou collared as Central Arctic Herd

^e Includes five cow caribou radiocollared as Central Arctic Herd

^f Small, medium, and large bull classifications were only conducted in Alaska