

Caribou Management Report and Plan, Game Management Units 19, 21A, and 21E:

Report Period 1 July 2017–30 June 2022, and
Plan Period 1 July 2023–30 June 2027

Mike Ebinger



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PREPARED BY:

Mike Ebinger
Assistant Area Biologist

APPROVED BY:

Jason R. Caikoski
Management Coordinator

PUBLISHED BY:

June C. Younkings
Publications Coordinator

Susan Erben
Technical Reports Editor

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Alaska Department of Fish and Game
Division of Wildlife Conservation
PO Box 115526
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This species management report and plan was reviewed and approved for publication by Jason R. Caikoski, Management Coordinator for Region III for the Division of Wildlife Conservation.

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Purpose of this Report

This report provides a record of survey and inventory management activities for caribou (*Rangifer tarandus*) in Game Management Units 19, 21A, and 21E during the 5 regulatory years 2017–2021, along with plans for the next 5 regulatory years 2022–2026. A regulatory year (RY) begins on 1 July and ends on 30 June (e.g., RY17 = 1 July 2017–30 June 2018). This report is primarily produced to provide agency staff with data and analysis to help guide and record agency efforts. It is also made available to the public to inform them about wildlife management activities. The Alaska Department of Fish and Game's (ADF&G, the department) Division of Wildlife Conservation (DWC, the division) publishes these reports on a 5-year cycle to document trends and describe potential changes in data collection activities for caribou.

I. RY17–RY21 Management Report

Management Area

This report covers Units 19, 21A, and 21E. Unit 19 comprises Units 19A, 19B, 19C, 19D, and 19E. It includes the Kuskokwim River drainage above Lower Kalskag and totals approximately 36,486 mi². Units 21A and 21E include the entire Innoko River drainage and the portion of the Yukon River between Paimiut and Blackburn Island. Arhymot Lake, which drains into the Kuskokwim River, is located in Unit 21E. Together, Units 21A and 21E encompass approximately 18,792 mi².

Summary of Status, Trend, Management Activities, and History of Caribou in Units 19, 21A, and 21E

Historically, caribou have played an important role in the McGrath area. In the 1800s, caribou occurred sporadically in far greater numbers and over a broader range than at present (Murie 1935). Discussions with community elders and reports of early explorers corroborate this, although documentation is limited (Hemming 1971).

Several small herds persist in the McGrath area. Current data are scant, but recognized herds south of the Kuskokwim River include the Tonzona, Farewell-Big River (formerly Big River), and Rainy Pass caribou herds. Herds north of the Kuskokwim River include the Beaver Mountains (formerly Kuskokwim Mountains) and Sunshine Mountains herds. Hunting effort and harvest for the 5 McGrath-area caribou herds have been, and continue to be, low.

In the early 1980s, Pegau (1986) radiocollared caribou in the Beaver Mountains and Sunshine Mountains herds and in the Farewell-Big River herd near Farewell Airport. Radiocollared caribou from the Beaver Mountains herd ranged south almost to Horn Mountain. Radiocollared caribou from the Farewell herd remained in the Farewell area for the first year, moved near the Swift River the following year, and did not return for at least 2 years (Pegau 1986). Pegau (1986) also found that the Beaver Mountains herd calved in the Beaver Mountains, but postcalving groups occurred throughout the herd's range. Wintering areas included the north side of the Kuskokwim Mountains from the Iditarod River east to the Dishna River.

In addition to the smaller resident herds discussed in this report, the Mulchatna caribou herd (MCH) once roamed throughout the Kuskokwim basin. As numbers declined in the late 1990s, the bulk of the herd retreated south (Whitman 1997). The MCH has declined substantially from a peak of over 200,000 animals in the mid-1990s (Woolington 2011). Although the MCH has declined in population size, surveys from the past 3 years (2020–2022) show a stable population trajectory. Parturition and survival rates are high, and it is currently unclear why these demographic rates have not resulted in increased survey numbers. However, the herd’s good physical condition and strong reproductive potential leave optimism that this herd can grow, barring stochastic events and mortality factors that could offset reproductive potential (Barten 2015). The Dillingham area office produces all subsequent management reports regarding this herd and its status.

Significant numbers of caribou from the Western Arctic herd have wintered in Unit 21E as recently as the early 1990s (Machida and Dau 1995). Large numbers of caribou from the MCH also used Unit 21E during the same time (L. Van Daele, wildlife biologist, ADF&G, Kodiak, 1998, unpublished memorandum). However, coincident with the return of Western Arctic caribou to the Seward Peninsula during the mid- to late 1990s (Dau 2001), caribou sightings became rare in Unit 21E.

Management Direction

EXISTING WILDLIFE MANAGEMENT PLANS

None.

GOALS

- G1. Provide an opportunity for sustainable harvest of caribou across existing herds in Units 19, 21A, and 21E.

CODIFIED OBJECTIVES

Amounts Reasonably Necessary for Subsistence Uses

- C1. The MCH in Units 19A (that portion south of the Kuskokwim River), 19E, and 19B: 2,100–2,400 caribou.
- C2. The Farewell-Big River and Rainy Pass herds in Units 16B, 19B, 19C, and 19D: 50–70 caribou.
- C3. The Tonzona herd in Unit 19: 20–30 caribou.
- C4. The Beaver Mountains and Sunshine Mountains herds in Units 19A, 19D, 19E, 21A, and 21E: 5 caribou.

Intensive Management

The Farewell-Big River, Beaver Mountains, Rainy Pass, and Tonzona caribou herds have negative findings for intensive management (5 AAC 92.108).¹

The MCH has a positive finding for intensive management with a population objective of 30,000–80,000 caribou and a harvest objective of 2,400–8,000 caribou.

MANAGEMENT OBJECTIVES

- M1. Provide for a harvest of up to 100 bull caribou from the Farewell-Big River herd in Unit 19.
- M2. Provide for a harvest of up to 75 bull caribou from the Rainy Pass herd in Units 16B and 19C.
- M3. Provide for a combined harvest of up to 25 caribou from the Beaver Mountains and Sunshine Mountains herds in Units 19A, 19D, 19E, 21A, and 21E.
- M4. Provide for a harvest of up to 50 caribou from the Tonzona herd in Units 19C and 19D.

MANAGEMENT ACTIVITIES

1. Population Status and Trend

Activity 1.1. Conduct minimum population counts through annual aerial surveys (objectives M1, M2, M3, and M4).

Data Needs

The minimum population count approach allows division staff to 1) estimate an index of population size for the different caribou herds and 2) document their spatial distributions. Integrating annual aerial surveys with spatial information from newly acquired telemetry and GPS collar data is the most efficient and cost-effective method for producing a minimum population count index, which is assumed to change proportionately with true abundance.²

Methods

Minimum population counts were conducted in June 2019 and July 2021 for the Beaver Mountains and Sunshine Mountains herds. The 2019 survey was the first for these herds since 2013. Survey flights were conducted in a Piper PA-18 Super Cub aircraft during late June and early July, when warm weather conditions tend to concentrate caribou on snow patches and on higher, open terrain where they seek insect relief. We enumerated caribou observed from the air and recorded their numbers and locations. Surveys lasted approximately 7–8 hours, depending on the location and herd being surveyed. Caribou were searched for on and between snow patches at

¹ AAC is an abbreviation for the Alaska Administrative Code.

² GPS is an abbreviation for Global Positioning System.

higher elevations within their respective ranges. Adequate snow patches are important to the surveys because they concentrate caribou into larger groups, and bare tundra and open habitat provide good sightability of caribou.

We did not attempt minimum counts for the Tonzona, Farewell-Big River, or Rainy Pass herds during RY17–RY21. In the absence of minimum count data, McGrath area caribou population estimates are approximated using historic data, harvest data, and hunter information. Without minimum count indices, strong conclusions about population size and trend cannot be drawn.

Population and harvest data were summarized by regulatory year. These data exclude the Unit 19 Mulchatna herd harvest, which is reported by the Dillingham area office.

Results and Discussion

Population Size

BEAVER MOUNTAINS AND SUNSHINE MOUNTAINS CARIBOU HERDS

We completed minimum-count surveys within the range of both the Beaver Mountains and Sunshine Mountains herds in June 2019 and July 2021, counting 505 and 287 caribou, respectively. The 2019 survey was the first since 2013, and its total count of 505 caribou represented a 3.5% increase from the 2013 total of 488. We found fewer caribou during the 2021 survey. This survey occurred from 15 July to 18 July, later than average survey dates for these herds ($\bar{x}_{2007-2021} = 27$ June; range = 13 June–18 July). The delayed survey timing may have resulted in fewer caribou aggregations near snow patches and likely accounts for the lower number of caribou observed in 2021. This conclusion is supported by a 2021 fall (22 October) telemetry flight for the Beaver Mountains herd using VHF collars to locate caribou groups, which totaled 386 individuals.³ The combined herds are estimated to be stable at 1,000–1,250 caribou; we determined these estimates by extrapolating for caribou we believe were missed.

TONZONA CARIBOU HERD

We have limited population data for the Tonzona herd. Insufficient data on seasonal ranges, movements, and distributions make regular minimum-count surveys impractical. During the RY12–RY16 report period, efforts were made to search the summer range reported by Del Vecchio (1995) to locate and count caribou. Few caribou were located, and it was determined that without a radiomonitored sample to help locate animal groups, regular survey efforts were not cost-effective (Barton 2020). Locating small herds within their large range is challenging, especially if they are not well aggregated. No minimum population counts were attempted during RY17–RY21. Currently, the number of caribou in the Tonzona herd is unknown.

RAINY PASS AND FAREWELL-BIG RIVER CARIBOU HERDS

We have limited population data for the Rainy Pass and Farewell-Big River herds, and we do not know how many caribou are in these herds at present. During surveys for bison and Dall sheep, we regularly observe caribou, primarily in scattered groups of 5–50.

³ VHF is an abbreviation for very high frequency.

Population Composition

Composition surveys were not conducted during RY17–RY21. However, during minimum count surveys of the Beaver Mountains and Sunshine Mountains herds in 2019 and 2021, we gathered composition (i.e., adults versus calves) alongside minimum count data. In 2019 and 2021, we observed 72 and 43 calves, respectively, within the range of both herds. These calves accounted for 14.3% (2019) and 15% (2021) of the total caribou counted across both herds. Although these calf components were relatively low, they are within the historic range observed for these herds ($\bar{x}_{2007-2013} = 15.4\%$; range = 10.0–19.8%).

During these surveys, we typically see high numbers of bears. During the 2021 survey, we observed 7 grizzlies (including 4 yearlings; *Ursus arctos*) and 11 black bears (including 4 cubs of the year; *Ursus americanus*). Calf predation, although unknown, is likely to be a significant source of neonate mortality.

Distribution and Movements

BEAVER MOUNTAINS CARIBOU HERD

Current distribution of the Beaver Mountains herd is thought to include habitat from Swinging Dome in the south, through the Beaver Mountains, to the Innoko River in the north. Caribou are regularly observed in this area during summer surveys; however, their annual range may extend beyond this region. Few movement data are available, but public reports indicate caribou are found west of the Beaver Mountains. This information is corroborated by our observations of caribou and caribou tracks during winter surveys for other species, as well as by recently collected GPS-radiocollar locations. During surveys of the ranges of the Beaver Mountains and Sunshine Mountains herds, small groups of caribou were observed continuously. It is likely that these 2 herds were mixed; however, Pegau (1986) did not document range overlap between these herds during his 4-year study.

On 6 April 2021, we radiocollared 7 adult female caribou from the Beaver Mountains herd using a combination of VHF ($n = 5$) and GPS ($n = 2$) collars. Radiomonitoring surveys were conducted at regular intervals, and as of 30 June 2022, all 7 of the deployed radio collars were still actively monitoring caribou.

SUNSHINE MOUNTAINS CARIBOU HERD

The Sunshine Mountains caribou are found predominantly in the Nixon Fork drainages, from the Innoko River to Von Frank Mountain, and in the headwaters of the Susulatna and Nowitna rivers, including Fossil Mountain and the Cripple Creek Mountains. Calving occurs throughout the range, and recent GPS and VHF collars confirm calving in the Von Frank and Mystery mountains to the east and southeast of the Sunshine Mountains. Wintering areas include the Sunshine Mountains and parts of the Nowitna River drainages. In midsummer, these caribou are found predominantly in the Sunshine Mountains; however, small groups are regularly observed in the Cloudy and Paige mountains and in the surrounding drainages of the Nowitna River.

On 6–7 April 2021, we radiocollared 7 adult female caribou from the Sunshine Mountains herd, including those from the Nixon Flats area, using a combination of VHF ($n = 5$) and GPS ($n = 2$)

collars. As of 30 June 2022, 6 of the 7 deployed radio collars were still actively monitoring caribou. The cause of the single mortality is unknown.

BEAVER MOUNTAINS AND SUNSHINE MOUNTAINS GPS COLLAR DATA

The 4 GPS collars deployed on caribou in the Beaver Mountains and Sunshine Mountains herds were scheduled to collect locations every 6 hours. As of 30 June 2022, 3 collars were still actively tracking caribou, while the fourth collar indicated a mortality event on 27 April 2022. GPS-fix success rates exceeded 99% for all collars, totaling 6,919 caribou locations through 30 June 2022. Daily distances traveled varied by individual and by time of year (\bar{x} = 4.2 km/day; σ = 2.1 km/day; range = 0.2–12.1 km/day).⁴ Elevation (feet MSL)⁵ use varied by season ($\bar{x}_{Apr-May}$ = 1,249'; $\bar{x}_{Jun-Aug}$ = 2,404'; $\bar{x}_{Sep-Oct}$ = 1,276'; $\bar{x}_{Nov-Mar}$ = 530').

GPS collars from the Beaver Mountains herd showed distinct seasonal ranges, with caribou traveling approximately 40–50 km (approximately 25–31 mi) between summer and winter ranges. Winter ranges occurred west of the Dishna River at low elevations and were followed by a southeasterly spring transition to mid-elevations during the calving period. Summer ranges were located primarily at higher elevations in the Beaver Mountains.

GPS collars from the 2 Sunshine Mountains caribou showed tightly clustered seasonal ranges in the vicinity of Cloudy Mountain and drainages surrounding White Mountain Creek, with seasonal movements between summer and winter ranges of 20–40 km (approximately 12–25 mi). Winter ranges included the northern slopes of Mystery Mountain and the Nixon Flats areas. Calving areas were associated with eastern benches of Cloudy Mountain and benches in the Browns Fork and White Mountain Creek drainages.

TONZONA CARIBOU HERD

We do not have current data on the range, movement, or distribution of the Tonzona herd; however, Del Vecchio et al. (1995) reported that this herd was distinct from the Denali herd and ranged from the Herron River to the lower Tonzona River near Telida, extending north to Otter Lake. Summer concentrations were found in the northern foothills of the Alaska Range, and the winter range included lower elevations from Telida up the Swift River and north to the Otter Lake area.

FAREWELL-BIG RIVER CARIBOU HERD

There is little recent information on the range of the Farewell-Big River herd. It is thought to include habitats in the South Fork Kuskokwim River drainage, extending southwest to the Swift River. Summering areas are in the foothills on the north side of the Alaska Range. Wintering areas are on the flats north of the summer range.

RAINY PASS CARIBOU HERD

The range of the Rainy Pass herd is not well known. The first documented count of the herd occurred in 1996 during a sheep survey conducted by staff from both the ADF&G Palmer office

⁴ One kilometer (km) is approximately 0.622 miles.

⁵ MSL is an abbreviation for mean sea level.

and Denali National Park and Preserve. That survey documented 1,093 caribou. The herd has been found from the confluence of the Post River south through Rainy Pass to the west side of Cook Inlet. Caribou have been observed throughout the Alaska Range in summer in both Units 16B and 19C.

Caribou in the Rainy Pass herd were fitted with radio collars in October 1999 and October 2000. Female 5-month-old calves were fitted with radio collars. Radio collars were deployed to facilitate composition counts and general monitoring. The duration for which these collars were active is unknown. Identified wintering areas of radiocollared individuals included the Post Lake area, upper South Fork, and upper Ptarmigan Valley (Boudreau 2003).

Recommendations for Activity 1.1

Continue. When conducting minimum population counts, we can estimate population size, herd composition, distribution, and recruitment. This index, supplemented with newly acquired radio- and GPS-collar data in Units 19D and 21A, has significantly contributed to caribou herd management in Units 19, 21A, and 21E.

2. Mortality-Harvest Monitoring and Regulations

ACTIVITY 2.1. Monitor annual caribou harvest from harvest tickets and registration permits (objectives C1, C2, C3, C4, M1, M2, M3, and M4).

Data Needs

Annual summaries of caribou harvest provide necessary data to manage caribou in congruence with codified objectives, management objectives, subsistence needs, and sustained yield. Harvest data is necessary to analyze population trends and make recommendations to the Alaska Board of Game.

Methods

The statewide harvest reporting system is used to estimate harvest. Reporting on registration permits and general season hunts is collected from hunters and archived in the division's WinfoNet (Wildlife Information Network) database.

Season and Bag Limit

Hunting regulations for Units 19 and 21 during RY17–RY21 are found in the Alaska Hunting Regulations (numbers 58, 59, 60, 61, and 62). Current hunting regulations for Units 19 and 21 are available on the ADF&G website.⁶

⁶ <http://www.adfg.alaska.gov/index.cfm?adfg=wildliferegulations.hunting>.

Results and Discussion

Harvest by Hunters

Reported harvest for local caribou herds in the McGrath area during RY17–RY21 ($\bar{x} = 67$) was approximately 20% higher than during RY12–RY16 ($\bar{x} = 56$). However, the RY12–RY16 period (Barton 2020) showed a noticeable upward trend, with low values pulling the average for that period down. RY17–RY21 lacked a noticeable trend and instead showed a leveling off of the RY12–RY16 increase, with high interannual variation in caribou harvest (Table 1).

Hunter effort showed a similar pattern with a higher average number of hunters during RY17–RY21 ($\bar{x} = 193$) than during RY12–RY16 ($\bar{x} = 173$), driven by the increasing trend during RY12–RY16 and the low hunter numbers during 2012–2014 ($\bar{x} = 150$). In general, hunter effort has been stable to slightly decreasing since RY15, and RY17–RY21 showed considerable variation among the different herds (Tables 2–7).

Hunter Residency and Success

During RY17–RY21, local hunters (defined as hunters from Units 19A, 19D, 19E, and 21E) accounted for about 3.5% of the reported harvest of local caribou herds. Although caribou hunters from communities within Unit 19A were most often associated with hunting the Mulchatna herd, we included Unit 19A in this analysis because some residents hunted McGrath-area caribou. During RY17–RY21, nonlocal residents took 20% of harvested caribou, nonresidents took 76%, and hunters with unknown residency took <1% (Tables 2–7).

Harvest Chronology

Most caribou harvested during RY17–RY21 were taken in August (46%) and September (52%; Table 8).

Transport Methods

Aircraft were the most common means of transportation for hunters accessing caribou herds in the McGrath area. During RY17–RY21, 70% of successful caribou hunters used aircraft, consistent with previous trends. Four-wheelers (11%) and horses (9%) were the next most common modes of transport. Infrequently, boats (1.5%), off-road vehicles (<1%), highway vehicles (0%), and unknown methods (<1%) were also reported (Table 9).

Other Mortality

The small sample size of radiocollared animals ($n = 14$) during RY17–RY21 prevented a robust estimate of adult survival and cause-specific mortality factors for the Beaver Mountains and Sunshine Mountains herds. However, 13 of 14 (93%) collars were still active as of 30 June 2022, suggesting survival was at or above typical rates for adult female caribou during RY17–RY21. No calves were monitored, and predation on this cohort is likely an important limiting factor for population growth. Black bears and grizzly bears are present throughout the known calving areas, and previous studies have demonstrated that ursids can have significant impacts on neonate caribou survival (Boertje et al. 1995, 2011; Paragi and Simon 1993).

Table 1. McGrath area caribou harvest by herd, regulatory years 2017–2021, Interior Alaska.

Regulatory year	Beaver Mountains			Farewell-Big River			Rainy Pass ^a			Sunshine Mountains			Tonzona			Unknown			Total harvest		
	M	F	Total	M	F	Total	M	F	Total	M	F	Total	M	F	Total	M	F	Total	M	F	Total
2017	2	0	2	24	0	25 ^b	28	0	28	0	0	0	6	0	7 ^a	8	1	9	68	1	71 ^b
2018	0	0	0	22	0	22	26	0	26	0	0	0	1	0	1	11	0	11	60	0	60
2019	2	0	2	27	0	27	45	0	45	0	0	0	4	0	4	2	0	2	80	0	80
2020	1	0	1	16	0	16	17	0	17	0	0	0	1	0	2 ^a	13	0	13	48	0	49 ^a
2021	3	0	3	31	0	32 ^b	35	0	35	0	1	1	3	0	3	1	0	1	73	1	75 ^b

Note: Mulchatna caribou herd animals taken in Unit 19 are not included in this table.

^a Includes harvest in Unit 16B.

^b Includes caribou of unknown sex.

Table 2. McGrath area caribou hunter residency and success, regulatory years 2017–2021, Interior Alaska.

Regulatory year	Successful						Unsuccessful						Total hunters
	Local resident ^a	Nonlocal resident	Nonresident	Unknown	Total	(%)	Local resident ^a	Nonlocal resident	Nonresident	Unknown	Total	(%)	
2017	3	17	50	1	71	(36)	6	58	61	0	125	(64)	196
2018	2	12	47	0	61	(33)	7	49	70	0	126	(67)	187
2019	1	15	64	0	80	(41)	4	57	55	1	117	(59)	197
2020	4	11	34	0	49	(27)	7	64	60	1	132	(73)	181
2021	2	14	60	0	76	(38)	7	55	64	0	126	(62)	202

Note: Mulchatna caribou herd animals taken in Unit 19 are not included in this table.

^a Local resident is any resident of Units 19A, 19D, 19E, or 21E.

Table 3. Beaver Mountains herd caribou hunter residency and success, regulatory years 2017–2021, Interior Alaska.

Regulatory year	Successful						Unsuccessful						Total hunters
	Local resident ^a	Nonlocal resident	Nonresident	Unknown	Total	(%)	Local resident ^a	Nonlocal resident	Nonresident	Unknown	Total	(%)	
2017	1	1	0	0	2	(14)	1	8	3	0	12	(86)	14
2018	0	0	0	0	0	(0)	0	3	2	0	5	(100)	5
2019	0	1	1	0	2	(14)	1	5	5	1	12	(86)	14
2020	1	0	0	0	1	(20)	0	1	3	0	4	(80)	5
2021	0	0	3	0	3	(50)	0	2	1	0	3	(50)	6

^a Local resident is any resident of Units 19A, 19D, 19E, or 21E.

Table 4. Farewell-Big River herd caribou hunter residency and success, regulatory years 2017–2021, Interior Alaska.

Regulatory year	Successful						Unsuccessful						Total hunters
	Local resident ^a	Nonlocal resident	Nonresident	Unknown	Total	(%)	Local resident ^a	Nonlocal resident	Nonresident	Unknown	Total	(%)	
2017	2	7	16	0	25	(45)	0	18	12	0	30	(55)	55
2018	2	5	15	0	22	(42)	1	16	14	0	31	(58)	53
2019	1	4	22	0	27	(54)	0	16	7	0	23	(46)	50
2020	3	2	11	0	16	(31)	1	26	8	0	35	(69)	51
2021	1	6	25	0	32	(41)	1	27	18	0	46	(59)	78

^a Local resident is any resident of Units 19A, 19D, 19E, or 21E.

Table 5. Rainy Pass herd caribou hunter residency and success, regulatory years 2017–2021, Interior Alaska.

Regulatory year	Successful						Unsuccessful						Total hunters
	Local resident ^a	Nonlocal resident	Nonresident	Unknown	Total	(%)	Local resident ^a	Nonlocal resident	Nonresident	Unknown	Total	(%)	
2017	0	6	21	1	28	(35)	0	22	30	0	52	(65)	80
2018	0	4	22	0	26	(36)	0	20	26	0	46	(64)	72
2019	0	9	36	0	45	(45)	0	26	29	0	55	(55)	100
2020	0	7	10	0	17	(22)	0	25	35	0	60	(78)	77
2021	0	8	27	0	35	(44)	0	19	25	0	44	(56)	79

^a Local resident is any resident of Units 19A, 19D, 19E, or 21E.

Table 6. Sunshine Mountains herd caribou hunter residency and success, regulatory years 2017–2021, Interior Alaska.

Regulatory year	Successful						Unsuccessful						Total hunters
	Local resident ^a	Nonlocal resident	Nonresident	Unknown	Total	(%)	Local resident ^a	Nonlocal resident	Nonresident	Unknown	Total	(%)	
2017	0	0	0	0	0	(–)	0	0	0	0	0	(–)	0
2018	0	0	0	0	0	(0)	1	0	1	0	2	(100)	2
2019	0	0	0	0	0	(0)	2	2	1	0	5	(100)	5
2020	0	0	0	0	0	(0)	2	1	0	0	3	(100)	3
2021	1	0	0	0	1	(33)	1	1	0	0	2	(67)	3

^a Local resident is any resident of Units 19A, 19D, 19E, or 21E.

Table 7. Tonzona herd caribou hunter residency and success, regulatory years 2017–2021, Interior Alaska.

Regulatory year	Successful						Unsuccessful						Total hunters
	Local resident ^a	Nonlocal resident	Nonresident	Unknown	Total	(%)	Local resident ^a	Nonlocal resident	Nonresident	Unknown	Total	(%)	
2017	0	1	6	0	7	(64)	0	0	4	0	4	(36)	11
2018	0	1	0	0	1	(14)	0	1	5	0	6	(86)	7
2019	0	0	4	0	4	(67)	0	1	1	0	2	(33)	6
2020	0	0	2	0	2	(29)	0	3	2	0	5	(71)	7
2021	0	0	3	0	3	(60)	0	1	1	0	2	(40)	5

^a Local resident is any resident of Units 19A, 19D, 19E, or 21E.

Table 8. McGrath area caribou harvest chronology by month, regulatory years 2017–2021, Interior Alaska.

Regulatory year	Harvest chronology by month										<i>n</i>
	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Unknown		
2017	26	44	0	0	0	0	0	0	1	71	
2018	30	29	0	0	0	1	0	0	0	60	
2019	37	42	1	0	0	0	0	0	0	80	
2020	23	22	0	0	0	0	3	0	1	49	
2021	37	37	0	0	0	1	0	0	0	75	

Note: Mulchatna caribou herd animals taken in Unit 19 are not included in this table.

Table 9. McGrath area transportation method of successful caribou hunters, regulatory years 2017–2021, Interior Alaska.

Regulatory year	Harvest by transport method														<i>n</i>
	Airplane (%)	Horse (%)	Boat (%)	ATV ^a (%)	Snowmachine (%)	ORV ^b (%)	Highway vehicle (%)	Unk ^c (%)							
2017	53 (75)	4 (6)	1 (1)	8 (11)	0 (0)	4 (6)	0 (0)	1 (1)	71						
2018	43 (72)	8 (13)	0 (0)	6 (10)	1 (2)	1 (2)	0 (0)	1 (1)	60						
2019	55 (69)	8 (10)	0 (0)	6 (7)	0 (0)	9 (11)	0 (0)	2 (3)	80						
2020	39 (80)	3 (6)	1 (2)	3 (6)	3 (6)	0 (0)	0 (0)	0 (0)	49						
2021	45 (60)	8 (11)	3 (4)	15 (20)	1 (1)	3 (4)	0 (0)	0 (0)	75						

Note: Mulchatna caribou herd animals taken in Unit 19 are not included in this table.

^a ATV represents all-terrain vehicles (four-wheelers).

^b ORV represents off-road vehicles.

^c Unk represents unknown.

Alaska Board of Game Actions and Emergency Orders

In March 2020, the Alaska Board of Game took action on two proposals. First, Proposal No. 114 established a winter registration hunt, RC795, for antlerless caribou in Units 19D and 21A. It also removed the winter harvest ticket hunt in Unit 19D Remainder. Second, Proposal No. 115 required that meat be left on the bone for caribou, moose, and bison in Units 19, 21A, and 21E. The board then took action on a proposal in March 2021; Proposal No. 171 divided Unit 19A into Units 19A and 19E. As for emergency orders, none were issued during RY17–RY21.

Recommendations for Activity 2.1

Continue. Harvest tickets and registration permits provide accurate data on the minimum numbers of caribou harvested from each herd and area. This data helps area biologists manage within harvest guidelines and objectives.

3. Habitat Assessment-Enhancement

During RY17–RY21, no caribou habitat assessment or enhancement activities were conducted for caribou in the McGrath area (Units 19, 20A, and 20E).

Given their small size relative to the intact habitat in Units 19, 21A, and 21E, the McGrath caribou herds may be best described as low-density populations. Although nutritional limitation in ungulates is often considered density-dependent, recent research suggests that nutrition may limit ungulates independent of density (DeYoung et al. 2008, 2019; Cook et al. 2016).

Vegetation phenology, quantity, and quality interact with caribou avoidance of biting insects and predators to determine individuals' ability to acquire nutrients at rates that adequately support recovery of body fat and juvenile growth and development (Cook et al. 2021).

We currently do not have measures of nutritional condition (e.g., ingesta-free body fat) that provide context for understanding the relative contributions of habitat or other extrinsic factors (e.g., predation) that may be responsible for observed population performance, and, consequently, the type of intervening habitat enhancement actions that might be needed to yield a positive population response.

NONREGULATORY MANAGEMENT PROBLEMS OR NEEDS

Little is known about the distribution and movements of caribou in Units 19, 21A, and 21E. Maintaining a minimum sample of radio collars in each caribou herd would benefit our management efforts by providing more accurate surveys (e.g., minimum population counts and composition), seasonal distributions, and movement data. For example, because calving ground location and fidelity are poorly understood, radiocollaring can help identify unique and potentially shared calving areas to support herd identification, assess overlap, and inform management.

Data Recording and Archiving

Caribou survey data hard copies are located in the McGrath office and archived electronically in the WinfoNet database.

Agreements

None.

Permitting

None.

Conclusions and Management Recommendations

Harvest remained low during RY17–RY21 for all McGrath-area caribou herds, and management objectives were met. The Farewell-Big River herd was managed to provide a harvest of up to 100 bulls per year, with an average of 24 bulls harvested annually. The objective for the Rainy Pass herd was a harvest of up to 75 bulls, and the average reported harvest was 30. The objective for the Sunshine Mountains and Beaver Mountains herds was to provide for a combined harvest of up to 25 caribou, and the total reported harvest was 9 caribou for RY17–RY21. The Tonzona herd objective was a harvest of up to 50 caribou, and the average reported annual harvest was 3. Currently, harvest levels are believed to be sustainable because the bull-only harvest is relatively low across all units.

Recent movement and distribution data for the Farewell-Big River, Rainy Pass, Beaver Mountains, Sunshine Mountains, and Tonzona caribou herds in Units 19, 21A, and 21E are scant. In accordance with the previous RY12–RY16 management report and plan, radio collars were deployed in the Beaver Mountains and Sunshine Mountains herds. We recommend continuing these efforts with additional GPS collars to better define these herds and to clarify their population size and movements when budgets and office priorities allow. Radio collars can help refine objectives to better address harvestable surplus and harvest levels.

The number of caribou hunters in the McGrath area increased from an average of 173 per year (RY12–RY16) to 193 per year (RY17–RY21). Although this represents a 9% increase from RY12–RY16, overall hunter effort in the McGrath area remains relatively low. This pattern most likely reflects the small size of the McGrath-area caribou herds, the relative difficulty of locating and accessing them during open seasons, and the opportunistic nature of the caribou harvest during hunts for other species. No changes to hunting regulations are recommended.

II. Project Review and RY22–RY26 Plan

Review of Management Direction

MANAGEMENT DIRECTION

Our current goals and objectives are adequate for monitoring harvest among caribou herds in Units 19, 21A, and 21E. Caribou populations appear stable; however, large data gaps exist. While harvest and hunting pressure are low in the Beaver Mountains and Sunshine Mountains herds, the size of the Alaska Range herds is unknown. Therefore, establishing a harvestable surplus for these herds is difficult. In particular, harvest of Rainy Pass and Farewell-Big River caribou can be high in some years, and it is uncertain what impact this may have on these herds.

We plan to continue monitoring and providing opportunity for the sustainable harvest of caribou across existing herds in Units 19, 21A, and 21E. Potential changes to our management direction include formalizing herd-specific monitoring frameworks rooted in GPS-collar technology to fill knowledge gaps in herd population dynamics and movement ecology while minimizing monitoring and staff time associated with monitoring these small caribou populations. This includes improving our baseline information on these herds' movements, geographic range delineation, composition, and calving grounds using radio collars.

Gathering better composition data through helicopter surveys and aerial photography would improve our understanding of herd health and status. Limited financial resources would prohibit helicopter time in most cases; however, photographs taken during fixed-wing aerial surveys may help clarify counts and classification (e.g., adults and calves).

GOALS

No change from the RY17–RY21 period.

CODIFIED OBJECTIVES

Amounts Reasonably Necessary for Subsistence Uses

No change from the RY17–RY21 period.

Intensive Management

There are no plans to implement intensive management for caribou (excluding the MCH) during RY22–RY26.

MANAGEMENT OBJECTIVES

No change from the RY17–RY21 period.

REVIEW OF MANAGEMENT ACTIVITIES

1. Population Status and Trend

ACTIVITY 1.1 Assess populations, trends, and composition through annual aerial surveys (M1, M2, M3, and M4).

Data Needs

No change from the RY17–RY21 period.

Methods

We will continue to use the minimum population count approach as described in the report section to estimate the sizes and distributions of the Beaver Mountains and Sunshine Mountains

caribou herds. Without additional collars, the Alaska Range herds will remain difficult to enumerate.

We will continue to use fixed-wing aircraft, as described in the report section, to record minimum population counts and identify trends within caribou herds. Detailed composition data, such as bull-to-cow and cow-to-calf ratios and annual recruitment, can be used in estimating population trends and herd productivity.

2. Mortality-Harvest Monitoring

Activity 2.1. Monitor annual caribou harvest from harvest tickets and registration permits. (C1, C2, C3, C4, M1, M2, M3, and M4).

Data Needs

Annual harvest summaries are necessary to understand harvest in relation to our management objectives, subsistence, and sustained yield. Analysis of harvest data also informs department recommendations to the Board of Game.

Methods

Harvest data will be assessed using the WinfoNet database. We will follow methods from RY17–RY21, as these are the most effective and accurate means of gathering and analyzing harvest data and trends.

3. Habitat Assessment-Enhancement

No activities for caribou habitat assessment or enhancement are expected for Units 19, 21A, and 21E during RY22–RY26; however, we recommend collecting indices of body condition during proposed capture and collaring events. Body condition represents an integrated measure of the environment in which an animal resides, including forage resources, weather, and animal density (Monteith et al. 2014). The capacity for population growth is ultimately contingent on sufficient nutritional resources. Thus, assessing body condition can efficiently indicate potential bottom-up limitations on population performance and suggest whether further investigation of habitat quality and enhancement projects is warranted.

NONREGULATORY MANAGEMENT PROBLEMS OR NEEDS

Data Recording and Archiving

Caribou mortality data from harvest tickets and registration permits will be archived in the WinfoNet database. Electronic data and files, such as survey memos, will be uploaded and archived as they are completed. Hard copies of data and files will be located in the McGrath area office. Historic data will be archived in WinfoNet as time allows.

Agreements

None are expected for RY22–RY26.

Permitting

None are expected for RY22–RY26.

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