Species Management Report and Plan ADF&G/DWC/SMR&P–2020–33

Galena Area Caribou Management Report and Plan, Game Management Units 20F, 21B, 21C, 21D, 24A, 24B, and 25D:

Report Period 1 July 2012–30 June 2017, and

Plan Period 1 July 2017–30 June 2022

Sara Longson

2020

Alaska Department of Fish and Game Division of Wildlife Conservation

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Species management reports and plans provide information about species that are hunted or trapped and management actions, goals, recommendations for those species, and plans for data collection. Detailed information is prepared for each species every 5 years by the area management biologist for game management units in their areas, who also develops a plan for data collection and species management for the next 5 years. This type of report is not produced for species that are not managed for hunting or trapping or for areas where there is no current or anticipated activity. Unit reports are reviewed and approved for publication by regional management coordinators and are available to the public via the Alaska Department of Fish and Game's public website.

This species management report and plan was reviewed and approved for publication by Doreen Parker McNeill, Management Coordinator for the Division of Wildlife Conservation.

Species management reports and plans are available via the Alaska Department of Fish and Game's public website (www.adfg.alaska.gov) or by contacting Alaska Department of Fish and Game's Division of Wildlife Conservation, PO Box 115526, Juneau, AK 99811-5526; phone: (907) 465-4190; email: dfg.dwc.publications@alaska.gov. The report may also be accessed through most libraries, via interlibrary loan from the Alaska State Library or the Alaska Resources Library and Information Services (www.arlis.org).

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Cover Photo: Wolf Mountain caribou. ©2020 ADF&G. Photo by Sara Longson.

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Purpose of this Report

This report provides a record of survey and inventory management activities for caribou in Units 20F, 21B, 21C, 21D, 24A, 24B, and 25D for the 5 regulatory years 2012–2016 and plans for survey and inventory management activities in the 5 regulatory years 2017–2021. A regulatory year (RY) runs from 1 July through 30 June (e.g., RY14 = 1 July 2014–30 June 2015). This report is produced primarily to provide agency staff with data and analyses to help guide and record its own efforts but is also provided to the public to inform them of wildlife management activities. In 2016 the Alaska Department of Fish and Game's (ADF&G, the department) Division of Wildlife Conservation (DWC) launched this new type of 5-year report to more efficiently report on trends and describe potential changes in data collection activities over the next 5 years. It replaces the caribou management reports of survey and inventory activities that were previously produced every 2 years.

I. RY12–RY16 Management Report

Management Area

The management area includes Galena Mountain, Kokrines Hills, Ray Mountains, and the Hodzana Hills which encompasses portions of Game Management Units 20F, 21B, 21C, 21D, 24A, 24B, and 25D (9,980 mi^2). There are 4 caribou herds within this area including Galena Mountain, Wolf Mountain, Ray Mountain, and Hodzana Hills.

Summary of Status, Trend, Management Activities, and History of Caribou in Units 20F, 21B, 21C, 21D, 24A, 24B, and 25D

These 4 caribou herds are named for their distinct calving areas; near Galena Mountain (Galena Mountain Herd; GMH), Wolf Mountain in the Kokrines Hills (Wolf Mountain Herd; WMH), Ray Mountains (Ray Mountains Herd; RMH), and the Hodzana Hills (Hodzana Hills Herd; HHH; Fig. 1). The Galena Mountain Herd is less than 150 animals, typically calves east of Galena Mountain, and winters west of Galena Mountain. The Wolf Mountain Herd (300–500 animals) calves and winters to the north and east of Wolf Mountain in the Melozitna and Little Melozitna River drainages. WMH and a portion of GMH are occasionally sympatric during calving season in the portion of their ranges near Black Sand Creek in Unit 21C. The Ray Mountains Herd (1,200–1,500 animals) calves in the Ray Mountains near Kilo Hot Springs; winters to the north in the Kanuti and Kilolitna River drainages, and to a lesser degree, also winters in the Tozitna River drainage to the south.

Since 2003, efforts have been made by the Alaska Department of Fish and Game (ADF&G) and the federal Bureau of Land Management (BLM) to gather better information about the small groups of caribou in the Hodzana Hills, northeast of the Ray Mountains. Previously they were considered part of RMH but are now considered to be a separate herd referred to as the Hodzana Hills Herd (Hollis 2007). HHH (700–1,000 animals) resides and calves mainly in the hills at the headwaters of the Dall, Kanuti, and Hodzana rivers. The origin of these 4 herds is unknown. Some residents speculated they were reindeer *(Rangifer tarandus)* from a commercial operation in the Kokrines Hills that ended around 1935. However, strong evidence indicates

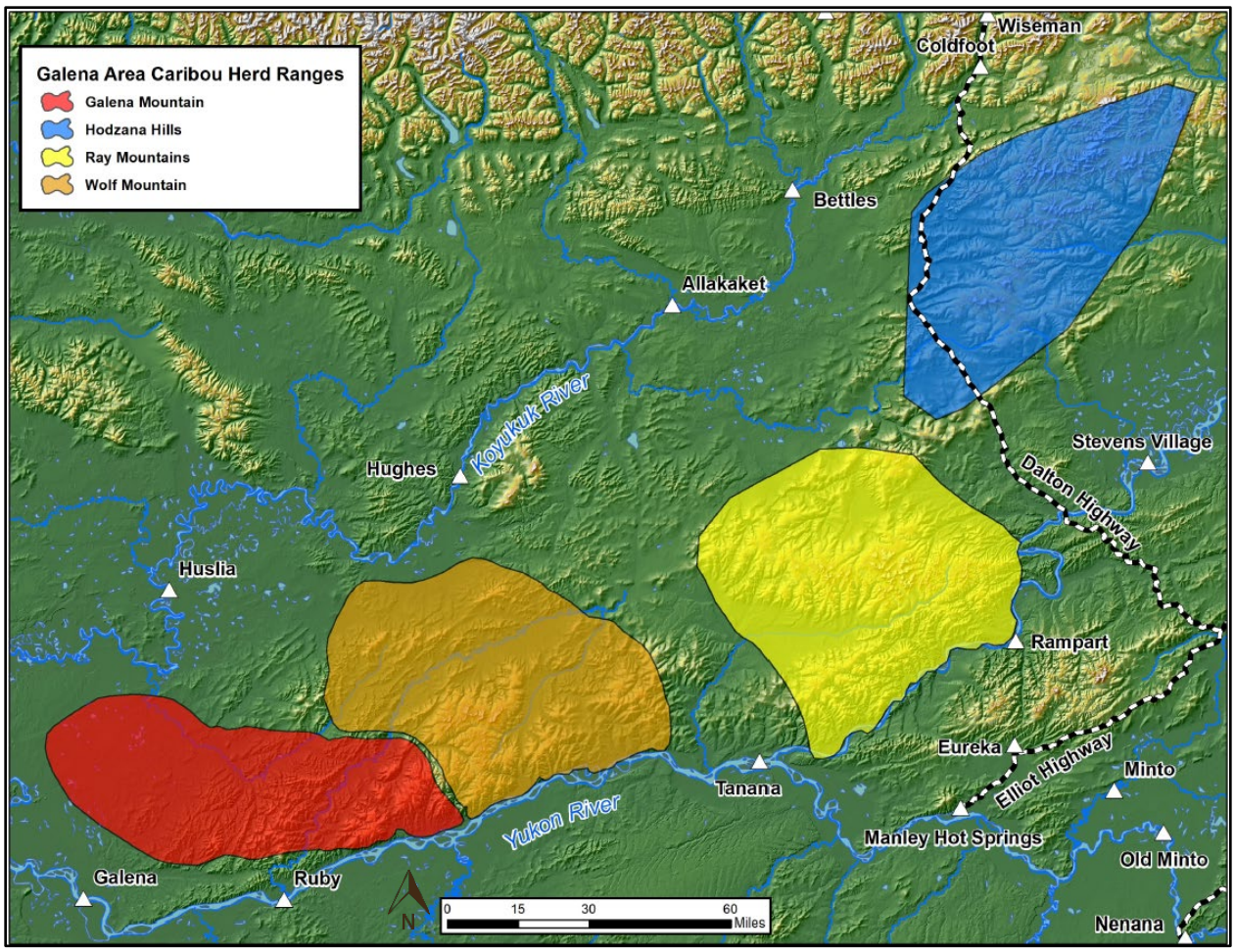

Figure 1. Map showing the range distribution of Galena area caribou herds including Galena Mountain, Wolf Mountain, Ray Mountains, and Hodzana Hills herds, Interior Alaska.

these animals are caribou *(Rangifer tarandus granti)* for 3 key reasons: physical characteristics are more like caribou than reindeer, reindeer alleles were not found when tested (Cronin et al. 1995), and timing of calving for these herds is more consistent with caribou than reindeer. (Saperstein 1997; Jandt 1998). Traditional ecological knowledge suggests that these herds are relict populations of the once vast herds that migrated across western Alaska. Currently, there is no accepted criteria for what degree of genetic difference constitutes a distinct population (COSEWIC 2002). Mager (2012) found genetic evidence that GMH and WMH herds appear to be genetically distinct, although the sample sizes were too small to draw firm conclusions.

Determining the size of all 4 of these herds has been difficult due to the limited use of radio collars relative to other herds in Alaska. The Galena Mountain Herd population likely declined from approximately 250–500 caribou prior to RY02 to less than 125 caribou by RY05 (Pamperin 2015). The greatest number of GMH caribou observed since RY05 was 162 animals in April 2012. All hunting seasons were closed in the area of GMH beginning in RY04 due to population declines observed in that herd. The first comprehensive fall composition survey of WMH was in

October 1995, when 346 caribou were counted. We counted 368 caribou in June 2010 and 462 caribou in June 2011. The Ray Mountain Herd was first surveyed by ADF&G and BLM during the fall of 1983 when 400 caribou were counted. Surveys were regularly conducted during the 1990s and 2000s. Efforts since 2003 by ADF&G and BLM to gain better information on HHH includes radiocollaring caribou east of the Dalton Highway in the Hodzana Hills. In 2009, ADF&G conducted a comprehensive survey of HHH, and 775 caribou were counted. Using telemetry data from 2005 to 2009, Horne at al. (2014) estimated 1,000–1,500 animals in HHH.

Aerial surveys of GMH and WMH are difficult due to small group size, small number of active radio collars, and poor sightability in the dense black spruce forests where they frequently occur. Similarly, aerial surveys of RMH and HHH are difficult due to frequent fog, clouds, and high winds.

Few animals are harvested from these caribou herds because they are relatively inaccessible during the hunting season, and few people outside the local area are aware of their existence. The combined average of reported and known unreported harvest from all 4 herds since 1991 was less than 10 caribou per year. The Galena Mountain herd is subject to illegal harvest when it is near the Galena-Huslia winter trail during winter months, however, that area is closed to prevent overharvest. The Wolf Mountain herd is not easily accessible for hunting because of the scarcity of aircraft landing areas, but there has been reports of Argo use to access the area from the Melozitna River area. Moose hunters on the Melozitna River rarely take Wolf Mountain caribou incidentally in September. Hunter access to RMH is limited to lengthy snowmachine trips during the winter or to a few ridgetop landing areas during snow free months. The Hodzana Hills caribou are accessible primarily by aircraft, with occasional access from the Dalton Highway.

Management Direction

Existing Wildlife Management Plans

A wildlife management plan for the Galena Mountain, Wolf Mountain, Ray Mountain, and Hodzana Hills caribou herds exists in the 2015 caribou management survey and inventory report for Units 20F, 21B, 21C, 21D, 24A, 24B, and 25D (Pamperin 2015).

Goals

G1. Ensure harvest does not result in a long-term population decline.

G2. Provide sustained opportunity for participation in caribou hunting.

Codified Objectives

Amounts Reasonably Necessary for Subsistence Uses

C1. There was a positive customary and traditional use finding for caribou in Units 20F, 21B, 21C, 21D and 24 (GMH, WMH, RMH; 5 AAC 99.025), with the amount reasonably necessary for subsistence (ANS) set at 150–200 caribou.

Intensive Management

The Alaska Board of Game made a negative determination for Intensive Management (5 AAC 92.108). Therefore, there are no Intensive Management objectives for these 4 caribou herds.

MANAGEMENT OBJECTIVES

Provide sustained opportunity for an annual harvest of up to:

M1. 10 cows and up to 25 bulls from the Galena Mountain herd.

M2. 10 cows and up to 25 bulls from the Wolf Mountain herd.

M3. 50 cows and up to 75 bulls from the Ray Mountains herd.

M4. 10 cows and up to 25 bulls from the Hodzana Hills herd.

MANAGEMENT ACTIVITIES

1. Population Status and Trend

ACTIVITY 1.1. Monitor minimum abundance and age-sex composition by aerial counts (M1–M4).

Data Needs

Estimates of abundance and age-sex composition are commonly used to inform managers of herd status.

Methods

Caribou from these herds were monitored through cooperative radiotelemetry flights conducted by ADF&G, U.S. Fish and Wildlife Service (USFWS), and BLM. Radio collars were placed on both adult and short-yearling (caribou less than 1-year old) cows and were used to locate the herds for composition counts, to locate calving areas, and to delineate seasonal ranges. The number of radiocollared caribou varied; during RY12–RY13 there were 3–8 active radio collars on GMH caribou, 3–6 on WMH caribou, 8 on RMH caribou, and 9 on HHH caribou. In RY16 and RY17, the number of active radio collars decreased to 22 total for all 4 herds (4 on GMH caribou, 6 on WMH caribou, 7 on RMH caribou, and 5 on HHH caribou).

Aerial surveys were conducted by helicopter (Robinson R-44) and fixed-wing aircraft (Piper PA-18 or Bellanca Scout) with techniques that are outlined by Eagan (1993). Minimum abundance and composition of small groups were estimated visually and from high-quality digital photographs (Canon EOS REBEL T5i; 18-35/55-250mm zoom lenses; 18.0 megapixels) of large aggregated groups (generally >20 caribou) that were opportunistically located by radiotracking collared caribou. Herd size estimates were obtained using methods similar to the direct count aerial photocensus technique (Valkenburg et al. 1985) using digital photographs taken with handheld cameras from fixed-wing aircraft. A thorough way to conduct a survey is to collect composition data in addition to numerical counts when the caribou are well aggregated and all

radiocollared animals are accounted for in the groups. Due to budget constraints, data is often collected opportunistically in conjunction with another project.

In cooperation with BLM and USFWS, the following radiotracking flights were performed in RY16: 2 flights targeting GMH (19 May 2017, and 27 May 2017), 2 flights targeting WMH (27 May 2017, and 14 June 2017), 2 flights targeting RMH (30/31 May 2017, and 14 June 2017), and 2 flights targeting HHH (31 May 2017, and 2 June 2017). In addition, using a Robinson R-44, 3 collar retrieval flights were flown in RY16 (6 June 2017, and 26 June 2017) and 16 collars were retrieved (5 from GMH, 6 from WMH, 3 from RMH, and 2 from HHH).

Results and Discussion

GALENA MOUNTAIN HERD

Minimum counts from GMH radiotracking surveys ranged from 31 to 91 caribou during RY12–RY16 (Table 1). Percent calves ranged from 4% to 35%. On 4 June 2014, 26 bulls were counted which was the highest number of bulls counted at a GMH survey since 1996 (Table 1).

Table 1. Galena Mountain caribou herd composition counts by survey, Interior Alaska, 2012–2017.

Survey date		Calves				
(month/year)	# Cows	#	(%)	# Bulls	# Unclassified	Total
Jun 2012[b]	40	9	(17)	2	1	52
Sep 2012[b]	45	10	(15)	11	0	66
Oct 2012[b]	76	4	(04)	11	0	91
Apr 2013[b]	5	2	(04)	8	37	52
Feb 2014[b]	25	5	(10)	1	18	49
Jun 2014[b]	46	15	(17)	26	0	87
Apr 2015[a]	–	–	–	–	–	85
May 2015[b]	19	4	(13)	8	0	31
May 2016[c]	30	14	(31)	1	0	45
May 2017[c]	20	11	(35)	0	0	31
Jul 2017[c,d]	18	7	(28)	0	0	25

[a] Fixed-wing survey, no composition classifications.
[b] Fixed-wing survey, composition classification without photographs.
[c] Photocensus (fixed-wing aircraft).
[d] The July 2017 survey is outside of the reporting period.

During RY12–RY16 radiotracking surveys were flown to obtain a minimum count using collared animals to locate groups of caribou. Herd abundance was not estimated for GMH because only 4 radio collars remained active in GMH caribou which made locating the entire herd difficult due to their large range. Only 31 caribou were observed on 31 May 2017, and only 25 caribou were observed on 3 July 2017 (Table 1), but it is likely that a large number of animals were missed on these survey flights due to low radiocollar numbers. Small groups cannot be easily located in a large, dense area, and the herd size has probably declined, making it even more difficult to locate these groups. Poor survival in the herd was likely due to predation and movement from GMH to WMH (Stout 2001).

Wolf Mountain Herd

Minimum counts from WMH radiotracking surveys ranged from 76 to 390 caribou during RY12–RY16 (Table 2).

Table 2. Wolf Mountain caribou herd composition survey counts, Interior Alaska, 2012–2017.

Survey date (month/year)	# Cows	Calves #	Calves (%)	# Bulls	# Unclassified	Total
Apr 2012[a]	–[a]	–[a]	–[a]	–[a]	220	220
Apr 2013[b]	62	10	(05)	17	109	198
Apr 2014[b]	35	4	(04)	4	65	105
Jun 2014[c]	62	11	(14)	3	0	76
May 2015[b]	14	6	(04)	5	131	156
Jun 2015[c]		10	(06)	4	153	167
May 2016[d]	106	28	(24)	2	–	136
Jun 2016[c]	–	–	–	–	334	334
May 2017[d]	–	28	(21)	–	103	131
Jun 2017[c]	–	115	(29)	–	275	390

[a] Fixed-wing survey, no composition classifications.
[b] Fixed-wing survey, composition classifications without photographs.
[c] Photocensus (fixed-wing aircraft).
[d] Fixed-wing survey, composition classifications with photographs.

The 14 June 2017 survey resulted the second highest calf count ever recorded (Table 2) and the highest total count since 2011 (462 caribou). In addition, 6 radio collars were active during this survey. Since WMH is widely dispersed throughout the year, surveys that are conducted during summer months, or surveys of post-calving aggregations increase sightability and therefore will increase the number of caribou observed.

Ray Mountains Herd

The 2014 photocensus was the highest count recorded during 2014–2017 which resulted in a minimum count of 841 caribou (Table 3) and no composition data was recorded.

Table 3. Ray Mountains caribou herd composition survey counts, Interior Alaska, 2014–2017.

Survey date (month/year)	Unclassified	Cows	Calves	Bulls	Total
Jun 2014[a]	841	–	–	–	841
Dec 2014[b]	508	–	–	–	508
Jun 2016[c]	668	–	–	–	668
May 2017[b]	152	–	–	–	152
Jun 2017[c]	534	–	37	–	571
Jul 2017[c]	652	–	–	–	652

[a] Photocensus (fixed-wing aircraft).
[b] Fixed-wing survey conducted by BLM.
[c] Fixed-wing survey, no composition classifications.

The most recent count, from RY16, is 652 caribou. This falls below the 1994–2012 population range estimate of 656–1,564 caribou (Horne et al. 2014). With only 7 active collars on adult cows, it is unlikely that the entire herd was represented in the count.

Composition surveys for RMH were also conducted by BLM during RY14–RY16 (Table 4). The 25 September 2014 composition survey had the highest number of bulls, cows, and total caribou, but the fewest number of calves recorded (Table 4). The 24 September 2015 composition survey had the highest number of calves recorded since 2009 (167).

Table 4. Ray Mountains caribou herd composition survey counts, 2014–2016, Interior Alaska.

Survey date	Bulls:	Calves:	Calves		Cows		Bulls		
(month/year)	100 cows	100 cows	#	(%)	#	(%)	#	(%)	Total
Sep 2014	39	11	64	(07)	569	(67)	220	(56)	853
Sep 2015	25	24	127	(16)	523	(67)	133	(17)	783
Sep 2016	32	20	77	(13)	386	(66)	126	(21)	589

HODZANA HILLS HERD

ADF&G biologists did not conduct a comprehensive survey to estimate abundance for HHH during RY12–RY16, however, we did obtain minimum counts (Table 5). The most recent survey that occurred on 31 May and 2 June 2017 was prior to the post-calving aggregation. From the 5 active radio collars located, the biggest group was 34 caribou, followed by a group of 8, a group of 2, and 2 groups of 1, for a total of 46 caribou (Table 5). With only 5 active radio collars, along with poor aggregation, the total number of caribou observed was likely not representative of the actual herd size.

Table 5. Hodzana Hills caribou herd minimum count survey, Interior Alaska, 2013–2017.

Survey date (month/year)	Unclassified	Cows	Calves	Bulls	Total
Jul 2012[a]	13	–	–	–	13
Jun 2013[a]	508	–	–	–	508
Jun 2013[a]	344	–	–	–	344
May 2014[a]	26	–	–	–	26
Dec 2014[b]	50	–	–	–	50
Sep 2015[b]	715	–	–	–	715
May 2017[b]	46	–	–	–	46

[a] Fixed-wing survey, no composition classifications
[b] Fixed-wing survey conducted by BLM

BLM conducted composition surveys for HHH during RY14–RY16 (Table 6). The most recent composition count on 30 September 2016 showed an increase in percent calves as well as the ratio of calves:100 cows. The total number of bulls from the 25 September 2014 composition count was the highest number of bulls recorded since 2009 (206).

Table 6. Hodzana Hills caribou herd composition survey counts, 2014–2016, Interior Alaska.

Survey date	Bulls:	Calves:	Calves		Cows		Bulls		
(month/year)	100 cows	100 cows	#	(%)	#	(%)	#	(%)	Total
Sep 2014	30	12	56	(08)	465	(70)	141	(21)	662
Sep 2015	23	22	90	(15)	418	(69)	95	(16)	603
Sep 2016	26	25	83	(17)	329	(66)	84	(17)	496

Recommendations for Activity 1.1

Continue collecting data on the 4 Galena area caribou herds to evaluate abundance and trends.

2. Mortality, Harvest, Monitoring and Regulations

ACTIVITY 2.1. Monitor hunter effort and success (Objectives M1–M4).

Data Needs

Hunter effort and success data are needed to assess harvest trends and corroborate population trends.

Methods

Hunting mortality was monitored using hunter harvest reports. Harvest reports submitted by hunters were entered into ADF&G's Wildlife Information Network database (WinfoNet). These data were summarized for each regulatory year and included total harvest, harvest location, hunter residency and success, harvest chronology, and the types of transportation used.

Season and Bag Limit

In RY16 the exception in 5 AAC 92.010(g) was deleted that allowed the harvest of caribou without requiring a harvest ticket or harvest report for residents residing north of the Yukon River. All persons hunting caribou north of the Yukon River must have a harvest ticket in possession and have obtained a harvest report.

Hunting regulations during RY12–RY16 are found in the Alaska hunting regulations booklets numbers 53–57. Current caribou season dates and bag limits are available online at: http://www.adfg.alaska.gov/index.cfm?adfg=wildliferegulations.hunting.

Season and Bag Limit during RY16–RY17

Area	Herd	Bag Limits		Open Seasons	
		Resident	Nonresident	Resident/Subsistence	Nonresident
Unit 20F, North of the Yukon River.	Ray Mountains	1 caribou	1 caribou	10 Aug–31 Mar[1]	10 Aug–30 Sep[1]
Unit 21B, that portion north of the Yukon River and downstream from Ukawutni Creek.	Galena Mountain	none	none	No open season	No open season
Remainder of Unit 21B.	Wolf Mountain	1 caribou	1 caribou	10 Aug–30 Sep	10 Aug–30 Sep
Unit 21C, that portion within the Dulbi River drainage and that portion within the Melozitna River drainage downstream from Big Creek.	Galena Mountain	none	none	No open season	No open season
Remainder of Unit 21C.	Wolf Mountain	1 caribou	1 caribou	10 Aug–30 Sep	10 Aug–30 Sep
Unit 21D, that portion north of the Yukon River and east of the Koyukuk River.	Galena Mountain	2 caribou	2 caribou	Winter season to be announced	No open season
Remainder of Unit 21D.	Western Arctic	5 caribou/day; calves may not be taken	5 caribou; calves may not be taken.	1 Jul–30 Jun	1 Jul–30 Jun
Unit 24A, that portion south of the south bank of the Kanuti River.	Ray Mountains and Hodzana Hills	1 caribou	1 caribou	10 Aug–Mar 31	10 Aug–30 Sep
Unit 24B, that portion south of the south bank of the Kanuti River, upstream from and including that portion of the Kanuti Kilolitna River drainage, bounded by the southeast bank of the Kodosin Nolitna Creek, then downstream along the east bank of the Kanuti Kilolitna River to its confluence with the Kanuti River.	Ray Mountains	1 caribou	1 caribou	10 Aug–31 Mar	10 Aug–30 Sep
Unit 25D, that portion drained by the west fork of the Dall River, west of the 150°W long.	Ray Mountains and Hodzana Hills	1 bull	1 bull	10 Aug–31 Mar	10 Aug–30 Sep

[1] General hunt only.

Results and Discussion

Harvest by Hunters

Reported harvest during the reporting period was low (5-year average: GMH = 0, WMH = 0.2, RMH = 4.0, HHH = 1.8; Table 7). The highest reported harvest was in RY14 when 9 bulls and 1 cow from RMH and 2 cows from HHH were harvested. An increase in the number of successful nonresident hunters contributed to the high reported harvest (Table 8). Most recently in RY16, 7 caribou were reported harvested including 1 bull from WMH, 3 bulls and 1 cow from RMH, and 1 bull and 1 cow from HHH (Table 7).

Table 7. Ray Mountains, Galena Mountain, Wolf Mountain, and Hodzana Hills caribou reported harvest, regulatory years 2012–2016.

Regulatory year	Ray Mountains		Galena Mountain		Wolf Mountain		Hodzana Hills		Total
	Bulls	Cows	Bulls	Cows	Bulls	Cows	Bulls	Cows	
2012	2	2	0	0	0	0	2	0	6
2013	2	0	0	0	0	0	0	0	2
2014	9	1	0	0	0	0	0	2	12
2015	0	0	0	0	0	0	2	1	3
2016	3	1	0	0	1	0	1	1	7

It is estimated that 1–2 caribou were taken (but not reported) each year along the Yukon River near Ruby, and an additional 3–5 unreported caribou were likely taken along the Yukon River between Rampart and Tanana each year (Osborne 1995). These caribou, usually bulls, can be found on remaining snowfields near the river in August or wander to the river during September. An additional 5–7 caribou are probably taken during the winter by hunters from Tanana using snowmachines (Osborne 1995), and likely another 5–10 from Allakaket (pers comm Stout 2018).

Hunter Residency and Success

In RY16, a total of 7 caribou were harvested by 5 local residents, 1 nonlocal resident and 1 nonresident among all 4 herds (Table 8).

Table 8. Galena Mountain, Wolf Mountain, Ray Mountains, and Hodzana Hills caribou hunter residency and success, regulatory years 2000–2016.

	Successful				Unsuccessful				
Regulatory year	Local resident[a]	Nonlocal resident	Nonresident	Total	Local resident[a]	Nonlocal resident	Nonresident	Total	Total hunters
2012	3	2	1	6	5	6	3	14	20
2013	2	0	0	2	14	4	1	19	21
2014	6	1	5	12	12	7	4	23	35
2015	3	0	0	3	9	4	3	16	19
2016	5	1	1	7	8	8	9	25	32

[a] Residents of Units 20, 21B, 21C, 21D, and 24.

Over the past 5 years, residents (both local and nonlocal) made up 79% of the 127 reported hunters; 23 (18%) residents were successful, and 7 (6%) nonresidents were successful. The average number of hunters has increased over the past 17 years. RY12–RY16 averaged 25.2 hunters (range 19–35) compared to the RY00–RY16 average of 22.2 hunters (range 12–35).

Other Mortality

Predation is likely the main limiting factor in these herds, but there have not been studies to determine cause-specific mortality (Stout 2001). Black bears were likely the primary predators on the calving grounds of GMH and WMH (Paragi and Simon 1993); they were observed following green-up along the hillsides as the snow melts which put them in proximity to cows prior to calving (Paragi and Simon 1993). Observations made during aerial surveys revealed that the boreal forest has been expanding in the hills towards the calving grounds of GMH and WMH. This limits visibility for caribou on the landscape which would allow them to detect predators and escape. Grizzly bears are found throughout the calving ranges of all 4 herds, and calf mortality studies in other areas indicate that grizzlies are important predators of caribou calves (Boertje et al. 1995).

Recommendations for Activity 2.1

Continue to monitor reported harvest.

3. Habitat Assessment and Enhancement

None.

NONREGULATORY MANAGEMENT PROBLEMS OR NEEDS

During the summer of 2014 General Communications Inc. (GCI) initiated construction of 2 telecommunications towers within the ranges of GMH and WMH. ADF&G staff worked with GCI and its contractors to minimize potential disturbances to nearby caribou (Pamperin 2015). While we lack specific data on the extent and concentration of calving areas for these 2 herds, it is believed that most calving takes place in close proximity to the 2 tower sites (G. Stout, ADF&G, personal communication 2015).

Data Recording and Archiving

The caribou radiotracking form used in surveys is included as Appendix A.

Garmin© MapSource data, capture cards, memoranda, and radiotracking forms are stored in the Galena Management Area Caribou database on ADF&G's Wildlife Information Network (WinfoNet), an internal server. Caribou captures were entered into the department's Capture and Handling Records in the WinfoNet database.

All other electronic data are located on a hard drive in the Galena area biologist's office at ADF&G's Region III headquarters office in Fairbanks and are backed-up on ADF&G Fairbanks network drive (i.e., H:\ drive). Field data sheets, paper files, hard copies, and any other relevant data are located in a file cabinet in the Galena area biologist's office.

Conclusions and Management Recommendations

Although open hunting seasons for caribou existed for most of these herds, few animals were harvested due to limited access. Poor survival due to predation is likely the primary factor restricting herd growth (Stout 2001).

The decline in GMH was not due to harvest because there has been no reported harvest in the GMH since 2000. With no caribou reported harvested from the GMH in over 20 years, the department is confident that the decline was not related to harvest; therefore, we met our first management goal (G1), to ensure harvest does not result in a population decline. However, the second goal, to provide opportunity for people to participate in caribou hunting, was not achieved because there was no open season for GMH during this report period. Additionally, the management objective (M1) for GMH was not achieved because harvest opportunity was not available. The management objectives (M2–M4) for WMH, RMH, and HHH were met as harvest opportunity was available, but did not exceed the objective. Harvest of bulls and cows remained within our objectives for all 4 herds.

The declining number of radio collars in each herd affected our ability to adequately survey the herds and estimate population abundance and composition, therefore our recommendation is to maintain 10 active collars in each herd (Pamperin 2015). Because of low consumptive demand for these herds, other management activities directed towards these 4 herds will remain a low priority.

The new management objectives will include changing from a harvest objective to a population objective. There is no open season for GMH, and the population of the herd could not sustain further mortality originating from harvest: therefore, a harvest objective is unattainable at this point. Harvest in WMH, RMH and HHH remains low. By changing to a population objective, ADF&G can closely monitor size of the herd and our primary role will be to allow hunting when population levels are high enough. Our new management goals will align with the new objectives, focusing on the caribou population and its long-term viability rather than harvest.

II. Project Review and RY17–RY21 Plan

Review of Management Direction

MANAGEMENT DIRECTION

Management of these 4 herds is confined to monitoring only, due to limited research, funding, low harvest demand, and relatively few animals. Recent survey data indicate that the abundance of these 4 herds has declined (Pamperin 2015). Caribou herd declines can vary over time between herds due to interactions between weather, predation, movement, and nutrition (Keech and Valkenburg 2007; Valkenburg et al. 2016). However, predation is likely the limiting factor in these Galena area herds (Stout 2001). Gaillard et al. (2000) found that high predation on caribou calves limits recruitment and results in limited population growth; ADF&G biologists suspect these 4 herds are susceptible to high predation. It is important to gather frequent, comparable data to determine if these herds are viable and to distinguish long-term population trends from short-term variability. Gathering abundance, production, location, age, and sex data will allow for the development of herd-specific guidelines and management activities that are custom to small, nonmigratory caribou herds.

GOALS

G1. Maintain sustainable caribou populations for the Galena Mountain Herd (GMH), Wolf Mountain Herd (WMH), Ray Mountains Herd (RMH), and Hodzana Hills Herd (HHH).

CODIFIED OBJECTIVES

Amounts Reasonably Necessary for Subsistence Uses

C1. Units 20F, 21B, 21C, 21D and 24 (GMH, WMH, RMH; 5 AAC 99.025), has a positive finding for customary and traditional uses for caribou with the amounts reasonable necessary for subsistence uses (ANS) set at 150–200 caribou.

Intensive Management

The Alaska Board of Game made a negative determination for Intensive Management (5 AAC 92.108). Therefore, there are no Intensive Management objectives for these caribou herds.

MANAGEMENT OBJECTIVES

The new management objectives are changing from a harvest objective to a population objective. Our previous harvest objectives are unattainable due to low demand, few animals and poor reporting. There is no open season for GMH and the population of the herd could not sustain further mortality originating from harvest. By changing to a population objective, ADF&G biologists can closely monitor size of the herd and manage for sustainability.

Minimum counts of:

M1. GMH: 150–250 caribou.

M2. WMH: 300–400 caribou.

M3. RMH: 800–900 caribou.

M4. HHH: 700–800 caribou.

REVIEW OF MANAGEMENT ACTIVITIES

1. Population Status and Trend

ACTIVITY 1.1. Conduct abundance counts, and composition surveys (Objectives M1–M4).

Data Needs

Minimum abundance counts, calf counts, and composition (age and sex) counts to evaluate population size, productivity, ratios, and trends through aerial surveys are necessary to monitor population status, and inform the public, advisory committees, and the Board of Game.

Methods

Caribou will be monitored through cooperative radiotelemetry studies by ADF&G, USFWS, and BLM. Aerial surveys will be conducted with helicopters (Robinson R-44) and fixed-wing aircraft (Piper PA-18 or Bellanca Scout) following techniques outlined by Eagan (1993). Minimum abundance surveys will be conducted from fixed-wing aircraft by taking high-quality digital photographs of large, concentrated groups in late-June or early-July during post-calving aggregations, when the entire herd may be contained in a few groups. Visual searching of the range between groups will aid in locating uncollared caribou opportunistically. Each caribou from the photographs will be classified and counted by bringing the photos into GIS and running a counting tool within the software. The tool works by clicking on a caribou in the photograph and assigning it as a male, female, calf, or unknown by placing a color-coded dot on each animal. It then keeps track of the totals and ensures that animals are not double counted. A minimum count of the herd will be obtained from the photos. Additionally, we will follow methods described by Valkenburg et al. 1985 in conducting herd counts and aerial photography. Composition surveys will be conducted in the fall using fixed-wing aircraft and a helicopter. Caribou will be classified into the following groups: calves, cows, small bulls, medium bulls, and large bulls. Locations, waypoints, and track logs will be recorded with either handheld GPS devices, or camera mounted GPS devices. Data will be recorded on caribou radiotracking forms (Appendix A).

ACTIVITY 1.2. Collect caribou telemetry data (Objectives M1–M4).

Data Needs

An adequate sample size of radiocollared caribou is needed to monitor caribou distribution, calving locations, and movement patterns. Distribution information will help define herd range

and overlap among these herds and other sympatric herds. Additionally, an adequate sample of radiocollared animals in each herd will improve our ability to locate caribou groups for abundance and composition surveys (Valkenburg et al. 2016).

Understanding movement during rut is also important to determine if there is opportunity for genetic exchange with neighboring herds (Roffler 2012). Movement data are needed for these small herds because they are a low-density, non-migratory ecotype that differs from the larger migratory herds, described by Bergerud (1996). Compared to those large caribou herd ecotypes, little research has been conducted on small herds in Alaska.

Maintaining at least 10 active radio collars in each herd is essential to locating groups of caribou during aerial surveys. Currently the only active collars are on adult cows. We need to include a sample of radiocollared bulls to monitor bull distribution and improve our abundance and composition counts. Bulls are frequently dispersed into small groups away from the post-calving aggregations that are targeted for surveys, as a result they may not be counted which leads to underestimating herd abundance.

Methods

Radiocollared caribou will be located seasonally to determine range distribution, herd size and movements. We will attempt to maintain a minimum of 10 radio collars in each herd. When the number of radio collars within each herd falls below 10, additional caribou will be captured and fitted with radio collars to increase sample sizes to ≥ 10. Caribou captures follow the protocols and policies established in the ADF&G Division of Wildlife Conservation Animal Welfare Policy and the corresponding wildlife capture and restraint manual. For each immobilized animal, a VHF radio collar will be fitted, body conditions will be assessed, and biological samples will be taken. All radio collars (Telonics, Inc., Mesa, AZ) will have a frequency of 150–151 MHz and contain movement-sensitive mortality switches. Radiotracking relocations will be conducted at 24–48 hours post-capture and 2–4 weeks post-capture to determine if there are any capture-related mortalities. Subsequent flights will be conducted opportunistically.

During relocation flights, the radiocollared animals will be located using a fixed-wing aircraft equipped with 2 antennas and a frequency scanner/receiver. Once a radiocollared animal is located, a GPS coordinate is recorded along with the number of individuals in the group (Appendix A). High-resolution digital photographs are taken of each group and caribou are classified from the photographs. Abundance will be estimated using statistical models based on the size of each group along with the number of individuals with radio collars. Telemetry data will also be used to determine distribution and movement patterns.

ACTIVITY 1.3. Initiate nonintensive management (Objectives M1–M4).

Data Needs

If a herd's population falls below the management objective, nonintensive management will be initiated. A feasibility assessment will be performed to evaluate biological, economic, and social factors. The abundance of GMH and WMH is very low and represents a conservation concern. Alaska's State Constitution Article VIII, Section 4 Sustained-yield, requires ADF&G to manage populations (herds) on a sustainable basis. GMH and WMH are identified as distinct populations

in regulation (5 AAC 92.108 and 5AAC 99.025), therefore ADF&G is responsible for managing these distinct herds for sustainability. Although GMH and WMH do not have a positive finding for intensive management, they are managed to provide hunting opportunities.

Methods

Biological factors such as survival, recruitment and habitat will be evaluated in multiple phases of the project. In addition, economic factors that estimate the cost and the benefits of an intensive management program will be defined. Social factors including public expectations and acceptability will be investigated. Since most of the caribou occur and are harvested on state or BLM land, both intensive and nonintensive management options could be considered.

Calf survival factors, mortality factors, and habitat enhancement potential will be investigated in the first phase of the project. The second phase will assess habitat response to prescribed fire and assess caribou calf survival response to habitat enhancement. In the final phase, predator control would be implemented. Predation rates and herd abundance would then be determined, and the response to predation control would be assessed.

2. Mortality and Harvest Monitoring

ACTIVITY 2.1. Monitor harvest (Objectives M1–M4).

Data Needs

Harvest data are needed to evaluate trends in hunter demand and determine if harvest levels are sustainable for these herds and does not result in a population decline. This activity changed slightly from monitoring hunter effort and success to focusing on a population-based management objective.

Methods

Hunting mortality is monitored using hunter harvest reports and adjusting those results to account for unreported harvest, as outlined by Osborne (1995). Harvest reports submitted by hunters are entered into ADF&G's Wildlife Information Network database (WinfoNet). These data are summarized for each regulatory year, and include total harvest, harvest location, hunter residency, success, number of days hunted, harvest chronology, and the types of transportation used.

3. Habitat Assessment and Enhancement

None at this time. If a nonintensive management program is initiated, there will be a habitat assessment and enhancement component which is included in Activity 1.3 (initiate nonintensive management).

NONREGULATORY MANAGEMENT PROBLEMS OR NEEDS

Continue to work with other resource management agencies and identify cost-sharing opportunities with federal cooperators.

Continue to participate in Unicom/GCI reconnaissance flights to monitor for caribou during the site visits through the remainder of their 30-year lease which ends in 2044.

Data Recording and Archiving

- Caribou radiotracking form (Appendix A).
- Caribou capture card (Appendix B).
- Harvest data will be stored on WinfoNet.

Garmin© MapSource data, capture cards, memos and radiotracking forms are stored in the Galena Management Area Caribou database on ADF&G's Wildlife Information Network (WinfoNet; http://winfonet.alaska.gov/index.cfm), an internal server. Caribou captures will be entered into the department's Capture and Handling Records in the WinfoNet database. All other electronic data will continue to be located on the computer in the Galena Area Biologist's office at ADF&G's Fairbanks office and backed-up on the Fairbanks H:\ drive. Field data sheets, paper files, hard copies, etc. will be stored in a file cabinet located in the Fairbanks ADF&G building in offices numbers 149 and 150.

Agreements

Unicom/GCI 30-year lease, which ends in 2044.

Permitting

No changes.

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Appendix A. Caribou Radiotracking Form.

HHH CARIBOU TRACKING RELOCATION DATA SHEET

Flight No.	**Date:**	Pilot:	Observ	Aircraft:
Start Time: pm	End Time: pm	Total Time:____hrs	Ceiling:	Temp:
Wind:	Sky (circle): 1 - Clear	2-Ovrcst 3-Scat.clouds	% Snow Cover %	Lighting: Excl - Good - Fair

HERD	# FREQ SEX AGE	TOT.# CARIBOU	# CALVES	# SHORT YRL.	# BULLS	# COWS	LATITUDE	LONGITUDE	WPT/ HABITAT
HHH									
HHH									
HHH									
HHH									
HHH									
HHH									
HHH									
HHH									
HHH									
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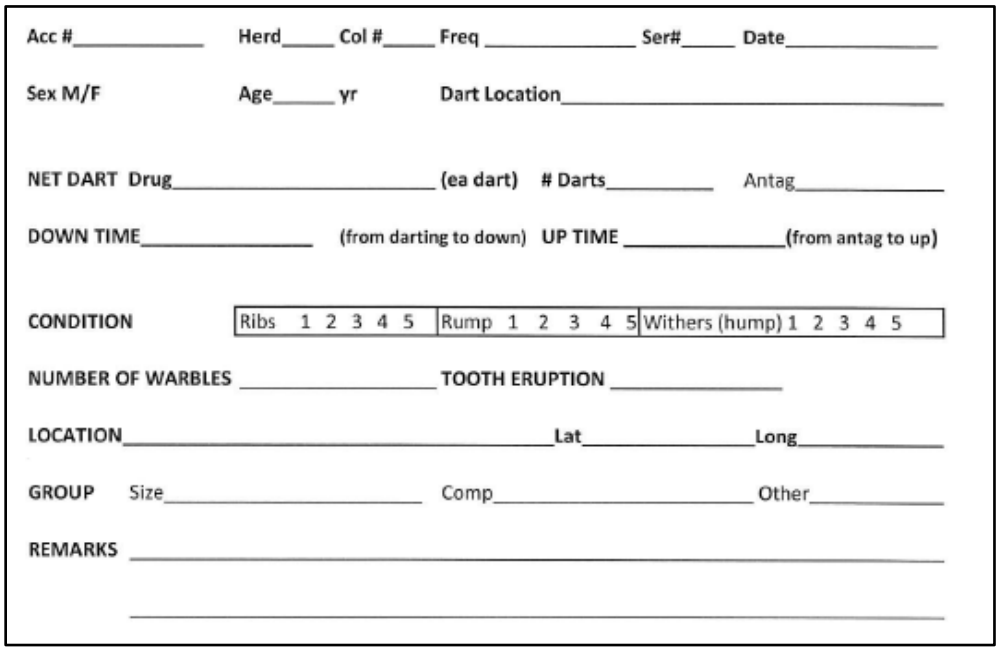
HHH									
HHH									

Appendix B. Caribou capture card.



Acc #_____ Herd_____ Col #_____ Freq _____ Ser#_____ Date_____

Sex M/F Age_____ yr Dart Location_____

NET DART Drug_____ (ea dart) # Darts_____ Antag_____

DOWN TIME_____ (from darting to down) UP TIME _____(from antag to up)

CONDITION

Ribs 1 2 3 4 5	Rump 1 2 3 4 5	Withers (hump) 1 2 3 4 5

NUMBER OF WARBLES _____ TOOTH ERUPTION _____

LOCATION_____Lat_____Long_____

GROUP Size_____ Comp_____ Other_____

REMARKS _____

_____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