Species Management Report and Plan ADF&G/DWC/SMR&P–2021–16

Nelchina Caribou Herd Management Report and Plan, Game Management Unit 13:

Report Period 1 July 2012–30 June 2017, and

Plan Period 1 July 2017–30 June 2022

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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 Todd A. Rinaldi, 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: Post-calving aggregations of caribou in Unit 13. ©2019 ADF&G. Photo by Heidi Hatcher.

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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 Unit 13 for the 5 regulatory years 2012–2016 and plans for survey and inventory management activities in the next 5 regulatory years, 2017–2021. A regulatory year (RY) begins 1 July and ends 30 June (e.g., RY14 = 1 July 2014–30 June 2015). This report is produced primarily to provide agency staff with data and analysis to help guide and record agency efforts but is also provided to the public to inform it 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 5-year report to more efficiently report on trends and to describe potential changes in data collection activities over the next 5 years. It replaces the caribou management report of survey and inventory activities that was previously produced every 2 years.

I. RY12–RY16 Management Report

Management Area

Unit 13 encompasses 23,368 mi^2 and consists of that area westerly of the east bank of the Copper River and drained by all tributaries into the west bank of the Copper River from Miles Glacier, including the Slana River drainages north of Suslota Creek; the drainages into the Delta River upstream from Falls Creek and Black Rapids Glacier; the drainages into the Nenana River upstream from the southeast corner of Denali National Park; the drainage into the Susitna River upstream from its junction with the Chulitna River; the drainage into the east bank of the Chulitna River upstream to its confluence with the Tokositna River; the drainages of the Chulitna River (south of Denali National Park) upstream from its confluence with the Tokositna River; the drainages into the north bank of the Tokositna River upstream to the base of the Tokositna Glacier; the drainages into the Tokositna Glacier; the drainages into the east bank of the Susitna River between its confluences with the Talkeetna and Chulitna Rivers; the drainages into the north and east bank of the Talkeetna River, including the Talkeetna River to its confluence with Clear Creek, the eastside drainages of a line up the south bank of Clear Creek to the first unnamed creek on the south, then up that unnamed creek to Lake 4408, along the northeast shore of Lake 4408, then southeast in a straight line to the northernmost fork of the Chickaloon River; the drainages into the east bank of the Chickaloon River below the line from Lake 4408; the drainages of the Matanuska River above its confluence with the Chickaloon River (Fig. 1).

Additional maps for Unit 13 boundaries and special management areas can be found on the ADF&G website: http://www.adfg.alaska.gov/index.cfm?adfg=maps.main.

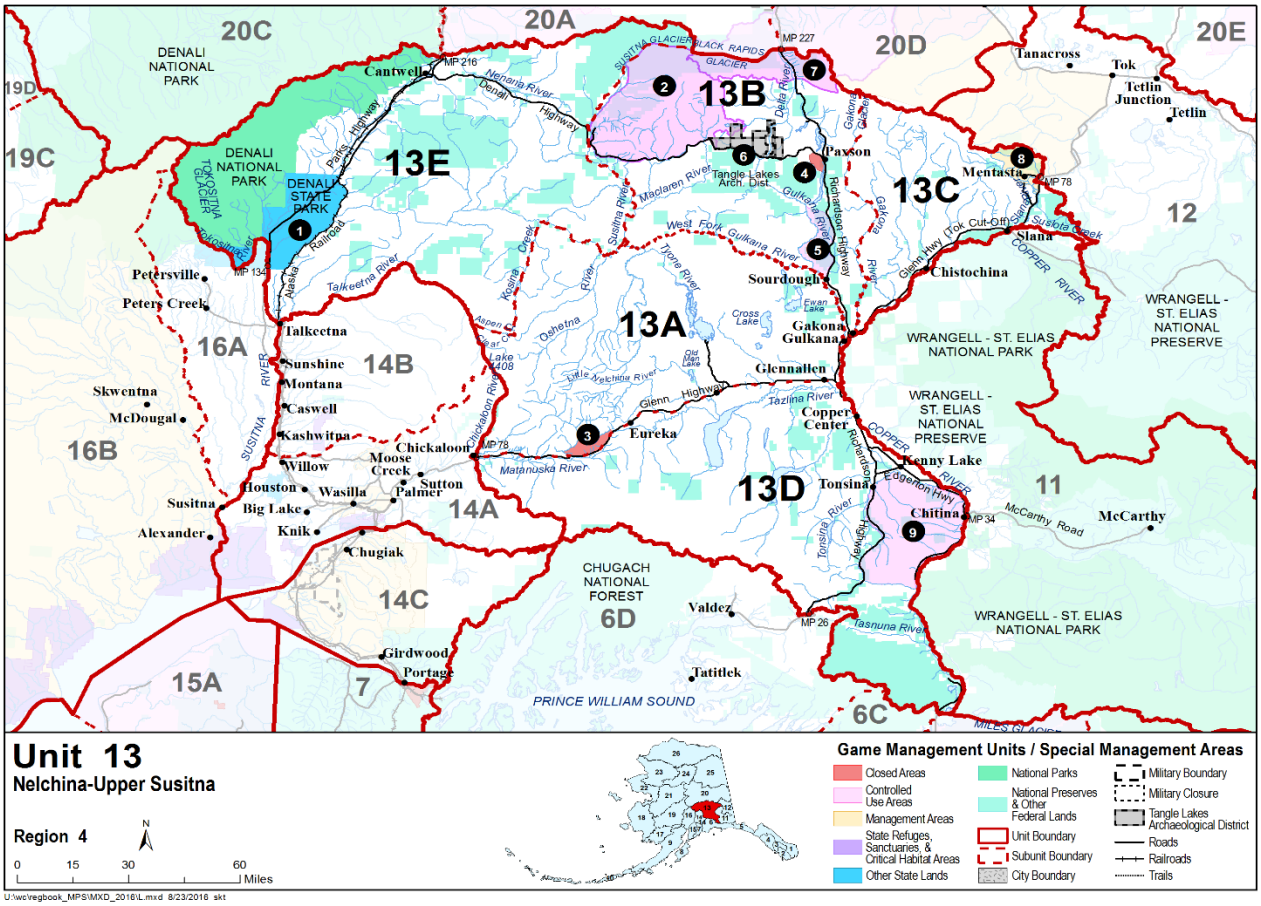

Figure 1. Game Management Unit 13 in Southcentral Alaska.

Summary of Status, Trend, Management Activities, and History of the Nelchina Caribou Herd in Unit 13

Typical of caribou herds, the Nelchina caribou herd (NCH) has fluctuated in size over time. Based on range assessments following a peak herd size of about 70,000 animals in the mid-1960s and a decline to 8,000–10,000 animals in the early 1970s, a strategy was devised to maintain the Nelchina herd below carrying capacity to minimize herd fluctuations to maintain a more stable population and to provide more consistent harvest opportunities over time (Pitcher 1990). As a result, since the late 1990s the annual population abundance objective for the herd has been 35,000–40,000 animals after the completion of the fall hunting period. Harvest quotas have been developed annually with the intent of achieving maximum sustained yield while maintaining a relatively stable herd size, according to the bounds of the abundance objectives.

The NCH is important to large numbers of hunters because of its accessibility and proximity to Anchorage and Fairbanks as well as to residents of the Copper River Basin. Caribou hunting permits have been issued for state and federal subsistence hunts in Unit 13 since regulatory year (RY) 1990 (RY90 = 1 July 1990 through 30 June 1991), and hunters in a limited drawing hunt for caribou in Unit 14 have likely harvested a few Nelchina caribou that were moving through the hunt area. Nelchina caribou are sometimes harvested in the Fortymile caribou registration

hunt in Unit 20, and portions of that hunt are closed to protect migrating Nelchina caribou in years when Nelchina harvest is limited to quotas which were achieved prior to the herd migrating out of Unit 13. Federal hunters target Nelchina caribou when they migrate across the Richardson Highway in Unit 13 and when the herd is migrating through or wintering on the Tetlin National Wildlife Refuge. More recently, the Board of Game established new drawing hunts and a Tier I subsistence hunt for Nelchina caribou in Unit 13, which have been offered since RY11. The number of permits issued and the allowable harvest fluctuate annually depending on existing hunt structures and herd status. Herd management since 1990 has allowed the harvest of more than 80,000 caribou from the NCH with an average of nearly 3,000 caribou per year.

The NCH has experienced above-average productivity in recent years, as well as high recruitment rates. Approximately 48,000 caribou were counted during a summer photographic census in 2015, and almost 50,000 were counted in 2016. In response to the increase in herd size, harvest strategies were developed to maximize harvest and attempt to lower herd abundance to within objectives (35,000–40,000 post fall hunt)

Management Direction

Existing Wildlife Management Plans

- Directions in the Nelchina Caribou Management Plan and Eureka Caribou Management Plan (ADF&G 1976) have been modified by Board of Game regulatory actions over the years. A record of these changes can be found in the division's management report series.
- Division of Wildlife Conservation strategic plan (ADF&G 2002).

Goals

- To provide the greatest opportunity to participate in caribou hunting.
- To provide for an optimum harvest of caribou.

Codified Objectives

- Maintain a fall population of 35,000–40,000 caribou, with a minimum of 40 bulls:100 cows and 40 calves:100 cows.
- Provide for an annual harvest of 3,000–6,000 caribou.

Amounts Reasonably Necessary for Subsistence Uses

The Board of Game established a positive customary and traditional use determination for the NCH in Units 12 and 13. The current amount reasonably necessary for subsistence (ANS) was determined by the Board of Game to be 600–1,000 caribou, effective 1 July 2009.

Intensive Management

The NCH has been identified by the Alaska Board of Game as important for providing high levels of harvest for human consumptive use (positive finding) and has an established harvest objective of 3,000–6,000 caribou. There is currently an Intensive Management (IM) program for

moose in Unit 13 and for the Fortymile caribou herd in Unit 12. The IM predation control program implemented for moose in Unit 13 and on NCH winter range in Unit 12 may affect predation levels on the NCH.

MANAGEMENT OBJECTIVES

The NCH is managed based on the codified population objectives established by the Alaska Board of Game noted above.

MANAGEMENT ACTIVITIES

Assessing population status and trends, monitoring harvest and mortality, and assessing habitat conditions are integral components of Nelchina caribou management programs. Survey and inventory (S&I) management activities are used to monitor sustained-yield management of the Nelchina caribou population and are described below.

1. Population Status and Trend

ACTIVITY 1.1 Monitor and evaluate caribou abundance and herd composition.

Data Needs

Since the late 1990s, the department has attempted to manage the NCH near maximum sustained yield. This management strategy proves difficult when annual composition or count data are inaccurate or unattainable. With inaccurate data the annual harvest quota may be set too high or too low and corrections must be made in subsequent years. Caribou abundance and herd composition data are necessary for determining population status in relation to management objectives and for determining annual harvestable surplus to develop appropriate harvest quotas prior to the hunt.

Fall composition results are used in conjunction with summer abundance surveys and fall harvest totals to develop a fall population estimate, which is compared to the population objectives of 35,000–40,000 caribou with 40 bulls:100 cows and 40 calves:100 cows post fall hunt. The fall population estimate contributes to modeling efforts to estimate herd size for the following summer. These results are used to improve population models and are necessary to determine the number of permits to be issued the following year, based on population objectives and sustainable yield.

Methods

Abundance surveys involve aerial counts of caribou in post-calving aggregations which occur during late June or early July and provide minimum counts annually. Survey techniques may include photo surveys from fixed-wing aircraft, direct counts from fixed-wing aircraft, or a combination thereof. Survey methods are affected annually by weather conditions and the level of aggregation demonstrated by the herd. Large, concentrated groups can be photographed effectively, whereas loosely aggregated caribou must be counted from the air.

NCH composition surveys are conducted immediately prior to or immediately following summer minimum counts and/or photo survey attempts, and again in the fall, to determine bull-to-cow

ratios, calf-to-cow ratios, and to estimate calf survival and recruitment. Herd composition surveys are conducted via helicopter, using an experienced pilot and observer to fly over groups of caribou and identify individuals as calf, cow, or bull. Bulls are further classified by antler size (small, medium, large) during the fall survey. A fixed-wing spotter plane is used to locate caribou and confirm that no groups of caribou are counted twice. The observer conducting the composition survey records observations with a digital voice recorder. An additional observer records composition data on a paper form throughout the survey. Survey location is dependent upon the distribution of the herd at the time of the survey. An effort is made to sample caribou groups at different locations to represent the spatial distribution of the herd and minimize bias that can be caused by sexual segregation. A minimum of 10% of the expected population is a desirable sample size for each composition survey (Valkenburg et al. 2016).

Annual fall population estimates are derived by subtracting cow harvest from the summer cow base (determined by summer census and composition survey) to determine fall cow base. The bull-to-cow ratio observed in the fall composition survey is used in conjunction with the fall cow base to determine fall bull estimate, and the same is done with the calf-to-cow ratio to estimate the number of calves.

Results and Discussion

During the summer survey in 2012, caribou were loosely aggregated, and a photo count could not be completed. Conditions, however, were very good for an aerial survey to achieve a minimum count without photos, as caribou were congregated above tree line and groups were relatively sedentary during the count. The fall 2012 estimate indicated an increase from 41,394 animals in the fall of 2011 to 50,646 caribou with 57 bulls:100 cows and 31 calves:100 cows (Table 1).

Table 1. Alaska Nelchina caribou fall composition counts and estimated herd size, calendar years 2012–2016.

Year	Bulls: 100 cows	Calves: 100 cows	Calves (%)	Cows (%)	Bulls (%)	Composition sample size	Estimate of Fall herd size
2012	57	31	16	54	30	5,249	50,646
2013	30	19	13	67	20	4,256	37,257
2014	42	45	24	54	22	5,079	-
2015	36	45	25	55	20	5,855	46,816
2016	57	48	23	49	28	5,122	46,673

Conditions did not allow for a photo census in the summer of 2013, but aerial surveys were conducted to estimate herd size. The fall estimate for 2013 was 37,257 animals with 30 bulls:100 cows and 19 calves:100 cows. The decline observed between the 2012 and 2013 estimates is suspected to be a result of poor survey conditions and poor aggregations for the 2013 summer survey, as well as a much less productive year for the herd.

Cool temperatures resulting in poor survey conditions persisted during the summer of 2014. Despite 2 attempts, the caribou remained scattered in a loose distribution, and a minimum count could not be accomplished in 2014. The fall composition survey resulted in 42 bulls:100 cows

and 45 calves:100 cows, indicating that the herd had a more reproductively successful summer season than in the previous year.

A successful photographic survey was completed during the summer of 2015. The survey was conducted in open tundra in the vicinity of Butte Lake. The survey area was well north of the Nelchina calving grounds, where surveys have been traditionally completed. This photographic count resulted in a minimum count of 47,800 caribou. The fall estimate was 46,816 animals with 36 bulls:100 cows and 45 calves:100 cows, indicating another very productive year for the herd.

A successful summer photographic census was again completed in 2016. Like in 2015, the main body of the NCH was north of the Susitna River, with scattered groups counted south of the river. The summer minimum count in 2016 was 49,550 with a fall estimate of 46,673 caribou with 57 bulls:100 cows and 48 calves:100 cows, the third highly productive year in a row.

The variation in calf ratios and recruitment from year-to-year can be significant in determining population trajectory and subsequent harvestable surplus. The below-average fall ratio of 31 calves per 100 cows observed in the fall of 2012 represented a fall cohort of just over 8,000 calves. The following fall's record low calf ratio of 19 calves per 100 cows equates to just over 4,000 animals. This contrasts the fall ratio of 48 calves per 100 cows that were observed in October 2016 and the resulting fall cohort of an estimated 11,000 calves. These calves must go through one full winter before they are considered recruited into the population, but variations in productivity and recruitment can cause herd abundance to fluctuate drastically. Permit numbers are set annually based on predicted harvestable surplus the following year given estimated overwinter recruitment and average herd productivity.

Herd population status and composition data are all used to set annual harvest quotas. While initial harvest quotas must be set prior to the fall hunting season, fall calf and bull ratios are used to refine the harvestable surplus estimate in those years when hunts extend past October. The fall bull ratio averaged 44 bulls per 100 cows during this reporting period (range = 30–57:100), exceeding the codified objective of 40 bulls per 100 cows all years except 2013 and 2015 (Table 1).

Bulls are also classified by antler size (small, medium, and large) during the fall. Considering many caribou hunters select for large-antlered bulls, hunting can impact this segment of the population in a short period of time (Milner et al. 2007). Between 1998 and 2001, only 13% of all bulls were classified as large-antlered. The number of bulls estimated as large antlered increased to 22% between 2002 and 2005. The percentage of large-antlered bulls has trended higher since, averaging 30% of all bulls from 2007 to 2016. During the current reporting period the percentage of bulls classified as having large antlers was 36%.

Recommendations for Activity 1.1

Modify. In some years, the Nelchina herd does not aggregate sufficiently for a reliable minimum count. Research should be implemented to develop a more reliable method to estimate abundance for the Nelchina herd, which can be scattered throughout Unit 13 and does not always behave as more northern herds in more open terrain do during post-calving aggregations.

ACTIVITY 1.2. Maintain a pool of management collars within the herd.

Data Needs

A management collar is a collar fitted onto an animal that allows tracking of the animal via radio (VHF) or satellite (GPS). Collars aid in locating and assessing distribution of the NCH. Collars also provide a means of annually evaluating parturition rates of known-age females (see Activity 3.1). Locating the herd is crucial to the success of management activities, including the annual survey and inventory efforts. Location data from collars aid efforts to delineate herd distribution, determine seasonal range use, and estimate mortality rates. Calf weights and morphometric measurements gathered during captures provide indices by which overall herd health and habitat can be monitored (see Activity 3.1).

Methods

Caribou captures are typically conducted by ADF&G staff with contracted pilot support during the first week of October, when calves are 4 or more months old, and after the fall caribou harvest season has concluded. Captures are conducted from a helicopter (Robinson R44). A fixed-wing aircraft (typically a Piper PA-18) helps to locate calf/cow caribou pairs, then the helicopter capture crew investigates to determine if a female calf is present. Once a suitable animal is located, the pilot moves into position and a crew member with a dart gun attempts to immobilize the animal. Once the calf is darted, the fixed-wing pilot will maintain visual contact with the calf to monitor its movements and drug response. An additional experienced crew member assists on the ground to process the animal once it is immobilized. After morphometric measurements have been collected and a collar has been fitted to the animal, reversal drugs are administered to counteract the immobilization drugs and the animal is observed until it stands up and moves away.

For each captured animal, the time(s) of injection, drug induction, immobilization, reversal, and recovery are noted on a data sheet per approved methods. Additional data collected includes body temperature, weight, body condition score, and lengths of mandible and metatarsus.

Results and Discussion

During this reporting period 15 VHF collars were deployed on female calves of the year in the fall of 2012 as part of the usual collaring effort for management purposes. Also, in the fall of 2012 a research project was initiated for the Susitna–Watana hydroelectric project environmental impact analysis. As part of this research an additional 15 VHF collars and 52 satellite collars were deployed on adult animals. In the spring of 2013, as part of this research effort, 9 additional VHF collars and 10 satellite collars were deployed on adults. In the fall of 2013 management VHF collars were deployed on 20 female calves of the year, 9 satellite collars were deployed on adults, and an additional 7 VHF collars were deployed on adults. In the fall of 2014 management VHF collars were deployed on 20 female calves of the year and an additional 9 VHF collars were deployed on adults. In the spring of 2015, as part of the ongoing research efforts, 62 satellite collars were deployed on adults in the herd. In the fall of 2015 management VHF collars were deployed on 15 female calves of the year. In the fall of 2016 management VHF collars were deployed on 20 female calves of the year.

All collars deployed on the Nelchina herd have been located multiple times annually, until the collared animal has died, the collar has fallen off, or the animal can no longer be located (signal is not heard for multiple years). These collars have facilitated annual census attempts (Activity 1.1) and annual parturition surveys (Activity 3.1), and associated captures contribute to annual growth indices of calves (Activity 3.1).

Recommendations for Activity 1.2

Modify. Continue to deploy 20 VHF collars on female calves of the year annually but also maintain a pool of satellite collars on adult animals in the herd to obtain information on herd movements at any given time of the year without conducting aerial surveys.

2. Mortality-Harvest Monitoring and Regulations

ACTIVITY 2.1. Monitor and analyze harvest and other mortality data.

Data Needs

The Board of Game (BOG) has identified the Nelchina caribou herd as important for providing high levels of harvest for human consumptive use and established an annual harvest objective of 3,000–6,000 animals. The BOG also established an amount necessary for subsistence (ANS) of 600–1,000. Annual harvest tracking is necessary to examine harvest relative to objectives, to help direct future harvest strategies, and to ensure a sustained yield harvest. Monitoring harvest is also essential to inform the regulatory process. In Unit 13, the timely tracking of harvest during the hunting season is imperative to successful administration of the Community Subsistence Harvest (CSH) hunt, and to ensure that allowable harvest is achieved while not exceeding annual quotas. Harvest reports are also important for understanding hunter effort and success.

Methods

Subsistence hunters may participate in Tier I hunts CC001 or RC566. Drawing permits are also issued by lottery (DC485). Individuals who obtain a caribou permit from ADF&G are required to report on their permit after successful harvest, or after the end of the season. Failure to report on either a CSH, Tier I, or a drawing permit results in reminders and eventual penalty. Hunt reports are recorded in ADF&G's WinfoNet harvest database, and include information regarding hunter residency, success, effort, hunt location, date of kill, transportation, and antler size. Hunters are required to report their harvest within 5 days; reports are received by telephone, online, or via mail on a harvest report card. An additional harvest opportunity for Nelchina caribou in Unit 13 is available for federally qualified subsistence users via federal permit issued by the Bureau of Land Management (BLM). Federal hunters in Unit 13 report harvest to the BLM. An additional federal hunt opportunity is available in the winter when Nelchina caribou are located on the Tetlin National Wildlife Refuge in Unit 12. Federal harvest information is retrieved by state wildlife managers from the Alaska Federal Subsistence Program database or BLM annually, once the information becomes available.

Season and Bag Limit

State hunts	Bag limit	Resident open seasons	Nonresident open seasons
Unit 13			
CC001	1 caribou per household	10 Aug–20 Sep 21 Oct–31 Mar	
RC566	1 caribou per household	10 Aug–20 Sep 21 Oct–31 Mar	
DC485	1 caribou	20 Aug–20 Sep 21 Oct–31 Mar	

Federal hunts	Bag limit	Local resident open seasons
Unit 13		
FC 1302	2 caribou	20 Aug–20 Sep 21 Oct–31 Mar
Unit 12		
FC1202	1 caribou	Winter Season (TBA)

Current state caribou hunt season dates and bag limits are available on the ADF&G website:

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

Results and Discussion

Harvest by Hunters-Trappers

The total reported harvest from all NCH state and federal hunts varies annually depending on hunter participation, caribou availability, and annual quotas (Table 2).

To return the Nelchina caribou population to within objectives, a liberal harvest quota of 4,000 bulls and 1,500 cows, a total of 5,500 caribou, was established in RY12. The quota was not met under the available hunt structure: a total of 4,325 caribou were taken.

Given decreased winter survival and a decrease in overall caribou numbers in 2013, the RY13 harvest quota was decreased to 2,500 caribou. A total of 2,615 caribou were harvested, exceeding the quota by 115. On October 15, all state hunts were closed by Emergency Order for RY13, and no winter season was held.

A fall quota of 1,400 bulls and 1,400 cows was established in 2014. After fall composition data were analyzed, the quota was adjusted, adding 300 bulls and subtracting 100 cows; the final quota for the season was 1,700 bulls and 1,300 cows. The season remained open through March, and a total of 1,808 bulls and 1,173 cows were harvested (2,985 total caribou).

Table 2. Alaska Nelchina caribou harvest data by state and federal permit hunt, regulatory years (RY) 2012–2016.

Hunt No.	RY	Permits Issued	Bulls	(%)	Cows	(%)	Unknown	Total Harvest
RC566	2012	5,045	1,602	63	939	37	2	2,543
	2013	6,878	1,374	87	199	13	0	1,573
	2014	5,597	1,337	59	928	41	3	2,268
	2015	7,235	1,762	61	1,148	39	1	2,911
RC566/563	2016	8,470	1,898	54	1,616	46	4	3,518
CC001	2012	403	99	66	51	34	0	150
	2013	689	101	89	13	11	0	114
	2014	569	98	68	46	32	0	144
	2015	659	121	64	69	36	1	191
CC001/002	2016	1,214	192	52	178	48	0	370
FC1302	2012	2,953	326	62	203	38	8	537
	2013	2,783	210	76	68	24	1	279
	2014	2,943	177	75	59	25	1	237
	2015	3,064	444	75	147	25	4	595
	2016	3,154	299	61	192	39	0	491
FC1202	2012	152	35	50	35	50	1	71
	2013	113	15	42	21	58	4	40
	2014	116	15	41	22	59	0	37
	2015	126	14	29	35	71	0	49
	2016	114	3	50	3	50	0	6
DC480–483	2012	3,001	1,015	99	7	1	2	1,024
Or DC485	2013	5,008	603	99	6	1	0	609
	2014	1,000	181	61	118	39	0	299
	2015	1,001	185	63	111	38	0	296
	2016	4,999	1,075	57	821	43	2	1,898
Totals for	2012	11,554	3077	71	1,235	29	13	4,325
all state and federal	2013	15,471	2,303	88	307	12	5	2,615
permit hunts	2014	10,225	1,808	61	1,173	39	4	2,985
	2015	12,085	2,526	63	1,510	37	6	4,042
	2016	17,951	3,467	55	2,810	45	6	6,283

During 2015 the initial fall quota for state hunts was set at 1,500 bulls and 1,500 cows. At the conclusion of the fall season, and after the fall composition survey, the state quota was adjusted by increasing the bull quota by 500 and the cow quota by 800, for a total of 4,300 caribou. This increase in the quota was an attempt to maximize harvest. Also, to increase harvest, drawing hunters (DC480–483) were not limited to hunting in designated permit areas, and could hunt all of Unit 13. Total harvest that year, including federal harvest, was 2,526 bulls and 1,510 cows (4,042 total caribou).

A total of 49,550 caribou were counted during the 2016 summer photographic survey. Prior to the survey completion, an initial quota of 4,000 animals was established. Upon the final survey assessment, and to lower the NCH to within the population objectives, the initial quota was eliminated, and harvest was allowed without further quotas. In 2016, drawing hunts DC480–483 were combined to make a unitwide drawing hunt (DC485). To maximize harvest opportunity, the fall hunting season for all hunts was extended to 30 September. Additionally, the bag limit was doubled in March for the Tier I hunts, and extra permits were issued (CC002, RC563) for hunters subscribing to those hunts. In addition, the winter season for federal hunters opened 6 days early (15 October). As a result of these changes, and because a large fraction of the NCH remained within Unit 13 during the winter, a record harvest was obtained. The total harvest that year reached 6,283 animals.

Unreported harvest of Nelchina caribou is an additional source of hunter-induced mortality that cannot be quantified, as is incidental take of caribou by trappers on wintering grounds. Wounding loss can be high because caribou are often shot while in groups, and more than one animal can be hit with a single shot. Additionally, identifying specific animals from a group, particularly cows and small bulls, is difficult. While some cows are mistakenly taken when a hunter is required to take only bulls, more care is exercised to be sure of the target. Wounding loss increases when large numbers of caribou migrate across the Richardson Highway during open hunt periods. Vehicle collisions on the Richardson Highway and Tok Cutoff are additional sources of mortality for which ADF&G does not have data.

Permit Hunts

Nelchina caribou may be harvested only under permit (Table 2). Through RY08, the Tier II subsistence hunt TC566 was the primary caribou hunt in Unit 13. No Tier II hunt was offered in RY09, though a winter season hunt was offered in RY10. Tier II hunts are no longer offered for the NCH.

To provide the maximum opportunity to participate in Unit 13 caribou hunts, 2 Tier I subsistence hunts are now offered (RC566 and CC001). Alaska resident hunters must apply for these hunts in November or December prior to the hunting season. The RC566 hunters and their household members are limited to hunting caribou and moose in Unit 13 for the entire regulatory year. CSH caribou hunters (CC001) and their household members are also limited to hunting caribou in Unit 13, though they may hunt moose anywhere within the community hunt area (Units 11, 13, and a small portion of 12) for the regulatory year. Community hunters apply in groups and have the added benefit that they can use designated hunters within their group to harvest caribou. They are also required to salvage all edible meat, as well as the heart, liver, and kidneys. During this reporting period the number of CSH caribou groups increased from 17 in RY12 to 45 in RY16, and household permits increased from 402 in RY12 to 1,006 in RY16. When the bag limit was

increased in March of 2017, an additional 208 permits were issued to CSH caribou hunters, which were labeled CC002. There were no antler specific regulations during this reporting period.

Beginning in RY11, 4 drawing hunts were offered in Unit 13 (DC480–483). The hunt boundaries were based on historical hunting areas within the unit. The DC480 hunt area covers Unit 13D and most of Unit 13A south of the Black River. The DC481 hunt area covers Unit 13E south of the Susitna River, and 13A north of the Black River. The DC482 hunt area covers Unit 13E north of the Susitna River, and Unit 13B west of the MacLaren River. The DC483 hunt area covers Unit 13B east of the MacLaren River, and Unit 13C.

There are 2 federal permit hunts for rural residents, one in Unit 12 (FC1202; previously FC412) and one in Unit 13 (FC1302; previously FC513 and FC514).

Hunter Residency and Success

An average of 6,645 RC566 permits were issued annually during RY12–RY16 (Table 2). The total number of permits varied, but generally increased from 5,045 in 2012 to 8,470 in 2016. Local residents (residents of Units 11, 13, or 12 along the Nabesna Road) harvested a total of 161caribou (1%), while nonlocal residents harvested 12,341 (99%). The nonlocal success rate was 56% and the local success was 33% (Table 3).

During this reporting period local CSH CC001 hunters harvested a total of 123 caribou (13% of CC001 harvest) and nonlocal residents harvested 846 (87% of CC001 harvest). Local residents experienced a 31% success rate compared to a success rate of 61% for nonlocal residents (Table 3).

Of the successful Unit 13 drawing (DC480–483 or DC485) hunters during this reporting period, only 19 were local residents and 4,104 were nonlocal residents. During the 2014 and 2015 seasons no local residents harvested a caribou on a drawing permit. Hunter success was 35% for local residents and 47% for nonlocal residents. The lower success rates for all hunters during RY13 can be attributed to the harvest quota being reached during the fall season, and the winter season being closed by emergency order that year.

While nonlocal hunters experienced higher success rates on state hunts, the federal hunt FC1302 is exclusive to local hunters. During this reporting period, an average of 428 caribou were taken each year by local hunters during the Unit 13 federal hunt.

Harvest Chronology

The fall caribou season in August and September is the most popular time to hunt Nelchina caribou (Table 4). Hunting pressure typically increases during the general moose season (1–20 September) by hunters on combination hunts. Bulls also become more vulnerable in September because of the onset of the rut and movement patterns that bring caribou closer to the roadways. Winter harvest patterns are typically dependent on caribou availability, as well as emergency closures. The NCH harvest declines during winter as the bulk of the herd migrates to the east and outside of Unit 13. However, more than 800 caribou were harvested during the 2016 winter season.

Table 3. Alaska Nelchina caribou annual hunter residency and success, regulatory years (RY) 2012–2016.

		Successful				Unsuccessful				
Hunt	RY	Local[a] resident	Nonlocal resident	Total	%	Local[a] resident	Nonlocal resident	Total	%	Total[b] hunters
RC566	2012	50	2,492	2,542	66	49	1,289	1,338	34	3,880
	2013	10	1,563	1,573	38	84	2,489	2,573	62	4,146
	2014	27	2,240	2,267	59	48	1,559	1,607	41	3,874
	2015	30	2,880	2,910	61	59	1,822	1,881	39	4,791
	2016	44	3,166	3,210	56	93	2,433	2,526	44	5,736
CC001	2012	43	107	150	63	52	36	88	37	238
	2013	8	106	114	37	65	128	193	63	307
	2014	26	118	144	54	43	79	122	46	266
	2015	17	174	191	58	48	91	139	42	330
	2016	29	341	370	58	62	204	266	42	636
DC480–486	2012	7	1,014	1,021	49	5	1,042	1,047	51	2,068
or DC485	2013	1	608	609	28	17	1,546	1,563	72	2,172
	2014	0	299	299	52	3	271	274	48	573
	2015	0	296	296	52	2	268	270	48	586
	2016	11	1,887	1,898	57	8	1,441	1,449	43	3,347

[a] Local resident is a resident of Units 11, 13, or 12 along the Nabesna Road.

[b] Total hunters include only those with known community of principal residence.

Table 4. Nelchina caribou Alaska state hunt annual harvest chronology percent by harvest period, regulatory years (RY) 2012–2016.

		Percent harvest by period													
		Weeks[a] (fall)							Months (winter)						
Hunt	RY	1	2	3	4	5	6	7	Oct	Nov	Dec	Jan	Feb	Mar	*n*
RC566	2012	15	11	6	7	15	15	11	9	3	1	1	1	4	1,470
	2013[b]	34	13	6	8	13	14	12	-	-	-	-	-	-	1,570
	2014	24	13	6	8	12	14	11	7	1	1	1	1	2	2,262
	2015	16	16	10	10	16	12	16	3	1	0	0	0	0	2,897
RC566/563	2016[c]	12	12	7	6	10	10	18	3	6	1	1	1	12	3,462
CC001	2012	9	20	5	7	5	7	11	18	9	1	2	0	5	148
	2013[b]	33	22	8	8	4	11	13	-	-	-	-	-	-	114
	2014	33	13	4	5	2	15	6	12	5	1	0	1	3	142
	2015	15	26	9	8	14	6	20	0	2	1	0	0	0	188
CC001/002	2016[c]	11	12	10	5	7	4	20	1	8	2	1	4	16	367
DC480–483	2012	-	-	11	10	14	15	11	20	6	2	1	2	8	1,022
	2013[b]	-	-	28	20	20	18	14	-	-	-	-	-	-	608
	2014	-	-	25	23	13	16	7	10	2	0	0	1	3	299
	2015	-	-	29	15	17	13	15	5	1	0	1	2	0	296
DC485	2016	-	-	17	10	11	9	19	8	12	3	2	4	6	1,896

[a] Week 1: 8/5 to 8/11, Week 2: 8/12–8/18, Week 3: 8/19–8/25, Week 4: 8/26–9/1, Week 5: 9/2–9/8, Week 6: 9/9–9/15, and Week 7: 9/16–9/22 or 9/30 in years with season extensions.

[b] Winter season closed by Emergency Order (EO) on 15 October 2013.

[c] Fall season extended to 30 September by EO; bag limit increased by EO to 2 caribou under permit numbers RC563 and CC002 starting 1 March 2017.

(-) Indicates that the season was not open.

Transport Methods

The most common methods of transportation for Nelchina caribou hunters are all-terrain vehicles (ATV) and highway vehicles (Table 5). Much of Unit 13 is accessible by road or trail, and airplanes and boats are used with some frequency by hunters attempting to avoid hunter concentrations. Percent of harvest by snowmachine increased in 2016 largely due to the increased bag limit for RC566 and CC001.

Other Mortality

Eagles are abundant on the NCH calving grounds, and during flights monitoring survival of neonatal caribou calves born to radiocollared cows there have been numerous observations of both golden and bald eagles feeding on neonates. During calf mortality studies in the Mulchatna herd during 2011–2017, bald and golden eagles were implicated as killing an average of 9% (range: 0–57%) of radiocollared neonates annually during their first couple weeks of life (D. Demma, DWC research biologist, ADF&G, Palmer, personal communication). The number of Nelchina calves taken by eagles is unknown, but predation by eagles is an important source of neonatal calf mortality.

Brown bears are considered numerous throughout the NCH summer range and are known to be important predators of caribou (Boertje et al. 1988, Boertje and Gardner 1998, Brockman et al. 2017). ADF&G staff have observed radiocollared brown bears feeding on caribou and moose on the Nelchina caribou calving grounds.

Wolves are present throughout the NCH range, and Ballard et al. (1987) reported that Unit 13 wolves preyed on caribou whenever they were available. The importance of wolf predation on caribou depends on wolf numbers, the relative availability of moose, and the size and distribution of the NCH.

The NCH is likely benefiting from the Unit 13 wolf control program associated with the intensive management plan for moose (5 AAC 92.121). Overwinter survival in relation to the intensive management program is difficult to monitor because large numbers of caribou move out of Unit 13 during winter months, but the herd is likely benefiting from decreased predation in the spring, summer, and fall in Unit 13.

Alaska Board of Game Actions and Emergency Orders

During the 2013 Southcentral BOG meeting, the board changed the draw bag limit for caribou from bull to any caribou and provided ADF&G the ability to restrict the bag limit if biologically necessary. In addition, the board increased the number of drawing permits available from 3,000 to 5,000.

In February 2017, the board approved an emergency order to increase the bag limits for the Tier I hunt RC566 and Community Subsistence Harvest CC001 in Game Management Unit 13 to 2 caribou per household. The increase in bag limit was intended to lower the population to within management objectives and provide additional harvest opportunity. ADF&G can change the bag limit for these hunts to 2 caribou in years when increased harvest is needed to achieve management objectives.

Table 5. Alaska Nelchina caribou state hunt harvest percent by transport method, regulatory years (RY) 2012–2016.

		Percent of harvest								
Hunt	RY	Airplane	Horse	Boat	ATV	OSV	ORV[a]	Highway vehicle	Airboat	*n*
RC566	2012	3	0	6	48	5	8	29	1	2,503
	2013	6	0	7	61	0	11	14	1	1,547
	2014	4	0	7	51	3	9	25	1	2,229
	2015	4	0	7	52	1	10	26	1	2,842
	2016	3	0	5	43	13	9	27	1	3,450
CC001	2012	1	0	2	43	6	7	42	0	149
	2013	2	0	8	54	0	31	5	0	114
	2014	1	0	4	43	2	24	26	0	135
	2015	0	0	1	49	1	21	28	0	183
	2016	0	0	5	41	19	12	23	0	355
DC480–483	2012	5	0	5	36	11	6	36	0	1,005
Or DC485	2013	9	0	9	53	0	9	19	1	601
	2014	6	1	7	43	4	5	34	1	294
	2015	6	0	7	44	3	9	30	0	295
	2016	4	0	5	32	11	7	40	1	1,869

[a] Over-snow vehicles (OSV) includes snowmachines and other tracked vehicles.

Recommendations for Activity 2.1.

Modify. Increase communication and coordination with the Alaska Wildlife Troopers and the Division of Transportation to improve available data for unreported harvest and vehicle collision mortality totals. Additionally, research may be necessary to determine an appropriate method of estimating wounding loss during the hunting season.

3. Habitat Assessment-Enhancement

Between 1955 and 1962, ADF&G established 39 range stations, including animal exclosures, throughout much of the Nelchina caribou range in Unit 13. Biologists examined these stations at approximately 5- to 6-year intervals from 1957 through 1989 to assess range condition. A complete description of the Nelchina caribou range, range station locations, and results of long-term monitoring was presented by Lieb (1994). Lieb concluded that lichen use was high during the 1960s, when caribou were abundant, and the result was an overall decline in lichens on the Nelchina range. Following a decline in caribou numbers, lichen increased over much of the fall and traditional winter range from the early 1970s until 1983. However, as the herd doubled in size between 1974 and 1983, increases in lichen biomass ceased in areas of substantial caribou use. Between 1983 and 1989, continued increases in caribou numbers resulted in a decline in lichen biomass. Lieb concluded that in 1989, 77% of the Nelchina range exhibited poor lichen production, 2% was considered to have fair production, and only 21% good production; this compared to 33% of the range in each category in 1983. On the important calving and summer range in the Eastern Talkeetna Mountains, Lieb (1994) reported the lowest lichen biomass ever recorded, with all the preferred lichen species virtually eliminated in 1989.

Considering the traditional calving grounds and summer range of the Nelchina herd have been heavily grazed for years, even slight annual variations in weather may be significantly impacting foraging conditions. Variations in spring and summer weather conditions that influence timing of plant emergence, rate of growth, and overall forage quality may be responsible for much of the variation observed in fall body condition. During hot summers, insect harassment may also be an important factor (Colman et al. 2003). During hot, dry summers, increased stress from low forage availability combined with insect harassment likely minimizes summer weight gain as some of the lowest NCH calf weights have been observed following these summers. Alternately, cool, cloudy summer conditions minimize insect activity as well as increase forage quality in terms of higher nitrogen levels in vascular plants (Lenart 1997).

Habitat Enhancement

Short-term caribou habitat enhancement depends more on weather conditions than any other factor. The Nelchina summer range has a short growing season due to the high average elevation of 1,256 m (4,122 ft). An early spring can provide caribou with abundant early, nutritious forage that can have a substantial impact on lactation and summer body growth. If precipitation is adequate through the rest of the summer, range conditions usually improve. Drought summers can be devastating to both vascular and nonvascular forage plants.

Long-term caribou habitat enhancement is largely dependent on limiting herd growth to historically sustainable levels, in the range of 35,000 to 40,000 caribou versus the 45,000 to 50,000 level observed during the 1990s. Between 1999 and 2009, the herd was maintained at or

below the objective range, likely allowing for range recovery. With the recent influx of calves, the herd was above the objective 2010–2016, with fall estimates averaging 44,462.

Habitat diversity, which can be achieved through the return of wildfire or controlled burns, is also important for long-term habitat advancement. The Alaska Interagency Wildland Fire Management Plan (Alaska Wildland Fire Coordinating Group 2010) provides for a natural fire regime that allows fire to function in its ecological role in remote portions of Unit 13, although large wildfires are rare in this area. While wildfire likely enhances summer range conditions by increasing forbs, sedges, and deciduous shrub growth, recent research has focused on the role of fire on winter range and the impact of fire on lichen production. Joly et al. (2003) found that Nelchina caribou routinely select winter habitat that is more than 50 years post burn, likely due to the slow growth of lichens. Collins et al. (2011) suggested that there are tradeoffs for habitat enhancement to consider, between early and mid-to-late successional vegetation, with the introduction of fire in caribou habitat. Considering wildfire may play a role in the enhancement of depleted or decadent stands of plant species important to caribou during the spring and summer months but limit the biomass of lichens important for overwintering caribou, an understanding of which seasonal forage may be limiting is important prior to the application of prescribed fire.

Long-term fire suppression increases fuel buildup and the possibility of an intense fire over a large area. This type of wildfire creates less diversity and decreases year-round habitat availability for caribou (Joly et al. 2003). Despite the current fire management plan and the benefits of wildfire, Unit 13 has had only one significant natural fire (the 5,000-acre Tazlina Lake burn) since 1950, because wildfire ignitions are rare in this area, and many of the small strikes that did take were suppressed. A controlled burn in the Alphabet Hills and north Lake Louise flats to improve moose habitat burned about 5,000 acres in 2003 and another 36,000 acres in 2004. A new burn plan is being developed, which calls for additional burning in a nearby area when conditions allow in 2021.

ACTIVITY 3.1. Monitor range condition relative to herd size through pregnancy rates of adult cows and weights and morphometric measurements of captured female calves.

Data Needs

The Nelchina management strategy relies on maintaining the herd below the carrying capacity of the range to avoid precipitous declines. It is therefore necessary to understand the relative status of the range in terms of nutritional availability. Variations in calf production generally relate to changes in body condition. Poor condition in young caribou can result in a delay in age of first reproduction. Reproductive-age cows can also skip a breeding season to regain body condition if they are nutritionally stressed (Whitten 1995). While nutritional stress can occur because of changes in annual weather patterns that negatively affect forage production, it can also occur because of an overgrazed range. So, low reproductive rates over several years, or a declining trend in reproductive rates, may indicate decreased nutritional availability on the summer range.

Assessment of overall pregnancy rates of adult females as well as pregnancy rates of 3-year-old females in the herd can provide insight into nutritional availability for the herd on its summer range (Boertje et al. 2012).

Average weight and morphometric measurements of female calves at 4 months old have been collected since 1995 for the Nelchina herd and these data also provide indices for the nutritional status of the range. While annual weather conditions such as snow depth, timing of green-up, and quality of the growing season can impact calf weights and measurements year to year, trends over time may indicate changing range conditions due to factors such as overgrazing or climate change.

Methods

Parturition rates have been collected since 1997 and are determined by observing radiocollared females 2-years-old or older from a fixed-wing aircraft during the first half of June. Caribou observed with calves, hard antlers, or distended udders were classified as parturient (Whitten 1991).

In October, calf weights, metatarsal length, and mandible length are collected for each female calf captured for which the body temperature remains below 105 degrees F. Measurements of the averages for these respective metrics are compared to data collected from the Nelchina herd since 1991. Downward trends in these metrics indicate that nutritional availability on the summer range may be declining and herd reduction should be considered.

Results and Discussion

During this reporting period parturition surveys were flown annually for all collared female caribou 3 years of age and older. The 5-year weighted average for 3-year-old parturition during RY12–RY16 was 43% (n = 56), which is below the 55% threshold, below which may indicate reduced nutritional status of the herd and suggests that the herd may being to experience more pronounced fluctuations due to stochastic weather events from year to year (Bergerud et al. 2008; Boertje et al. 2012).

During RY12–RY16 the average overall parturition rate of all collared cows 3 years of age and older was 81% (n = 462; Table 6). This is on par with the previous 5-year average of 81% (n = 155), and above the 2002–2006 average of 75% (n = 191). While overall parturition remains high, 3-year-old parturition is considered the more sensitive parameter to potential issues with range condition.

Table 6. Parturition rates of collared female caribou in Unit 13, Alaska, regulatory years 2012–2016.

Regulatory year	Parturition 3-year-olds	*n*	Overall parturition (3-year-olds+)	*n*
2012	25%	8	78%	41
2013	39%	23	73%	115
2014	0%	4	83%	101
2015	70%	10	87%	112
2016	55%	11	83%	93

Calf weights started trending down over the last 3 years of this reporting period, which were also highly productive years for the herd and resulted in more caribou on the landscape than have likely been in the herd since roughly 2010 (Table 7). The 5-year average calf weight for this reporting period is 116.4 lb, which is well below the previous 5-year average of 122.6 and is considered a statistically significant difference (Table 7). The 5-year averages for metatarsal length and mandible length are also lower during this reporting period than in the previous 5 years, although the differences are not quite statistically significant by conventional criteria (Table 7). Overall, these data combined with the 3-year-old parturition data, suggest that the NCH summer range may not be providing sufficient nutrition for the current size of the herd, and herd reduction is prudent.

Table 7. October Alaska Nelchina caribou female calf capture data, regulatory years 2012–2016.

	Weight (lb)			Metatarsal length (cm)			Mandible length (cm)		
Year	Mean	*n*	SD	Mean	*n*	SD	Mean	*n*	SD
2012	116.5	20	9.8	35.3	20	0.8	21.5	20	0.8
2013	109.5	19	9.7	34.8	18	0.7	21.3	19	0.7
2014	124.0	18	11.6	35.7	17	1.1	21.3	17	0.9
2015	117.5	13	9.4	35.5	12	0.5	21.9	12	0.5
2016	115.4	19	16.6	35.4	17	0.8	21.2	17	1.2
RY07–RY11	122.6	68	13.6	35.6	68	1.1	21.7	65	1.2
RY12–RY16	116.4	89	12.5	35.3	84	0.9	21.4	85	0.9

Note: SD = Standard deviation.

Recommendations for Activity 3.1.

Continue.

ACTIVITY 3.2. Evaluate the range condition of the Nelchina calving grounds.

Data Needs

Assessing the range condition of the Nelchina calving grounds will be necessary to determine if maintaining herd abundance within current objectives is indeed sustainable over time. Factors such as climate change or maintaining herd size over an extended period rather than allowing for natural fluctuations may result in range degradation over time, necessitating a review of objectives over time to allow for sustainable yield management. The need for evaluating range condition is lower priority than the need for an improved method of providing accurate abundance estimates annually.

Results and Discussion

No activities during this reporting period.

Recommendations for Activity 3.2.

Modify. Range assessments on calving grounds may provide information regarding nutritional availability in relation to recent abundance levels of the herd. Changes in composition,

abundance, and nutritional value of the vegetative community in relation to previous range studies will be valuable, given high caribou abundance in recent years and potential impacts of climate change on summer nutritional availability for caribou.

NONREGULATORY MANAGEMENT PROBLEMS OR NEEDS

Data Recording and Archiving

- State caribou harvest data is stored on an internal server (http://winfonet.alaska.gov/index.cfm). Federal caribou harvest data must be collected from BLM and is stored electronically on the Glennallen Area Biologist hard drive (D:\BGDIF\Caribou\Nelchina caribou\Harvest\.
- Field data sheets are stored in file folders located in the Glennallen Area Biologist's office. Additional field data is electronically stored on the Glennallen Shared Drive (O:\DWC\BGDIF\Caribou).

Agreements

A data sharing agreement exists between ADF&G and Wrangell–St. Elias National Park and Preserve to share harvest data which will expire in 2021.

Permitting

None.

Conclusions and Management Recommendations

The long-term management objective for the Nelchina caribou herd is to maintain fall abundance between 35,000 and 40,000 animals, below the estimated carrying capacity of the range, to minimize herd fluctuations and ensure maximum herd productivity and harvest opportunity. This is a management experiment, which to this point has been successful.

To achieve the desired balance between herd productivity, recruitment, and harvest, the Nelchina caribou herd must be closely monitored and actively managed. When the herd trajectory does not follow model predictions, harvest quotas must be corrected either in-season or in subsequent years. Quotas can be quite different year-to-year, adding to the already complex Nelchina caribou regulatory environment. While dynamic, the current management strategy allows for the opportunity to harvest a significant number of caribou annually. Conceptually, this scenario is far preferable to the possibility of uncontrolled herd growth resulting in a precipitous decline, followed by a period of herd recovery lasting 10 to 20 years or more.

Between 2000 and 2009 the Nelchina herd exhibited slow growth despite low harvest quotas and reduced wolf numbers across its core summer range. In 2010, a very large calf cohort boosted herd numbers significantly. With the herd above objectives since 2010, the management goal has shifted to herd reduction.

Although the population objective set for the herd has been in place for more than 20 years, annual monitoring of productivity and calf morphometric data are critical to understanding long-term herd performance. This nutritional monitoring is also used as an indirect measure of range condition.

While trends in these parameters are important in addressing overall herd and range condition, these values are highly variable. Factors likely include sensitivity to annual weather conditions, as well as the ability of caribou to search out high quality habitat.

Maintaining the NCH at or below the current population objective will continue to be the most important management tool to maintain range quality and long-term herd stability. If the herd remains above 40,000, and productivity remains moderate to high, it may be difficult to control the growth of the population as it begins to exhibit exponential tendencies. Likewise, if the Fortymile caribou herd continues to increase, there could be further negative impacts to the winter range in Unit 20E, and both herds could suffer. Overstocking and subsequent decline could result in a prolonged period of low herd productivity (Messier et al. 1988, Cameron and Ver Hoef 1994).

Harvest quotas will continue to be adjusted annually to ensure the population objective is maintained over the long term.

As the BOG continues to search for an acceptable long-term solution to allocation concerns, it will be important that the number of hunters in the field remains at a moderate level. If the number of Tier I registration hunt participants continues to rise, the board may have to readdress hunt management in coming years. Too many hunters in the field can lead to hunter conflicts, as well as a large number of caribou taken in a very short period of time. Likewise, if hunting opportunity is restricted, too few hunters could lead to undesirable herd growth.

If the herd can be held at current objective levels, given current rates of natural mortality, the projected annual harvests are expected to be about 1,000–3,000 caribou each year, with some years being as high as 6,000 or more when there are high rates of productivity and survival.

The NCH may be the only moderately sized caribou herd in Alaska that can have its upper population limit controlled by manipulation of human harvest levels. This is possible because the NCH is accessible by the road system from major population centers. Other caribou herds with less hunter access may not be manageable under the same conditions. Because of this, the NCH management strategy is considered a long-term experiment. Up to this point, this management strategy has been successful; however, it is critical that management adapt to changing annual conditions and observations. Caribou population dynamics are very difficult to predict, and often change course with little warning.

II. Project Review and RY17–RY21 Plan

Review of Management Direction

MANAGEMENT DIRECTION

No change from report.

EXISTING WILDLIFE MANAGEMENT PLANS

- This plan builds on direction in the Nelchina Caribou Management Plan and Eureka Caribou Management Plan (ADF&G 1976) have been modified by Board of Game regulatory actions over the years. A record of these changes can be found in the division's management report series. This document represents the plan going forward.
- DWC strategic plan (ADF&G 2002).

GOALS

- To provide the greatest opportunity to participate in caribou hunting.
- To provide for an optimum harvest of caribou.

CODIFIED OBJECTIVES

- Maintain a fall population of 35,000–40,000 caribou, with a minimum of 40 bulls:100 cows and 40 calves:100 cows.
- Provide for an annual harvest of 3,000–6,000 caribou.

Amounts Reasonably Necessary for Subsistence Uses

The Board of Game established a positive customary and traditional use determination for the NCH in Units 12 and 13. The current amount reasonably necessary for subsistence (ANS) was determined by the Board of Game to be 600–1,000 caribou, effective 1 July 2009.

Intensive Management

The NCH has been identified by the Board of Game as important for providing high levels of harvest for human consumptive use (positive finding) and a harvest objective has been established of 3,000–6,000 caribou. There are currently Intensive Management (IM) programs for moose in Unit 13 and for the Fortymile caribou herd in Unit 12. The IM predation control program implemented for moose in Unit 13 may also affect predation levels on the NCH.

MANAGEMENT OBJECTIVES

No change from report. The NCH is managed based on the codified population objectives established by the Alaska Board of Game.

REVIEW OF MANAGEMENT ACTIVITIES

1. Population Status and Trend

ACTIVITY 1.1 Monitor and evaluate caribou abundance and herd composition.

No change from report.

Data Needs

Since the late 1990s, the department has attempted to manage the NCH near maximum sustained yield. This management strategy proves difficult when annual composition or count data are inaccurate or unattainable. In these years, the annual harvest quota may be set too high or too low and corrections must be made in subsequent years. Accurate caribou abundance data are necessary to determine population status in relation to management objectives, which is required for developing appropriate harvest quotas annually.

Methods

In some years, the Nelchina herd does not aggregate sufficiently for a reliable minimum count nor a robust Rivest estimate. Research should be implemented to develop a more reliable method to estimate abundance for the Nelchina herd, which can be scattered throughout Unit 13 and does not always behave as more northern herds in more open terrain often behave during post-calving aggregations. Traditional minimum counts will be executed annually, until further research develops a more reliable abundance estimate for Nelchina caribou. Traditional minimum counts will be conducted with the intent of performing a photocensus, and Rivest methods will be followed when the conditions allow to provide more robust abundance estimates.

ACTIVITY 1.2 Maintain a pool of management collars within the herd.

No change from report.

Data Needs

No change from report.

Methods

No change from report.

2. Mortality-Harvest Monitoring and Regulations

ACTIVITY 2.1 Monitor and analyze harvest and other mortality data.

Data Needs

No change from report.

Methods

No change from report.

3. Habitat Assessment-Enhancement

ACTIVITY 3.1. Evaluate range condition relative to herd size through pregnancy rates of adult cows and weights and morphometric measurements of captured female calves.

Data Needs

No change from report.

Methods

No change from report.

ACTIVITY 3.2. Evaluate the range condition of the Nelchina calving grounds.

Data Needs

No change from report.

Methods

No change from report.

NONREGULATORY MANAGEMENT PROBLEMS OR NEEDS

Data Recording and Archiving

No changes from report.

Agreements

No changes from report.

Permitting

No changes from report.

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