Unimak Island Caribou Herd Management Report and Plan, Game Management Unit 10:

Report Period 1 July 2017–30 June 2022, and

Plan Period 1 July 2022–30 June 2027

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Alaska Department of Fish and Game Division of Wildlife Conservation

Species Management Report and Plan ADF&G/DWC/SMR&P-2025-30

Unimak Island Caribou Herd Management Report and Plan, Game Management Unit 10:

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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 Rinaldi, Management Coordinator for Region IV for the Division of Wildlife Conservation.

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Please contact the authors or the Division of Wildlife Conservation at (907) 465-4190 if you have questions about the content of this report.

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Purpose of this Report

This report provides a record of survey and inventory management activities for caribou (*Rangifer tarandus granti*) in Game Management Unit 10 for the 5 regulatory years 2017–2021 and plans for survey and inventory management activities in the next 5 regulatory years, 2022–2026. A regulatory year (RY) begins 1 July and ends 30 June (e.g., RY15 = 1 July 2015–30 June 2016). 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 report more efficiently 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. RY17–RY21 Management Report

Management Area

Unimak Island is easternmost in the chain of Aleutian Islands extending from the southwestern tip of the Alaska Peninsula (Fig. 1), and the only one with indigenous populations of caribou, brown bears (*Ursus arctos*), wolverines (*Gulo gulo*), and wolves (*Canis lupus*). Unimak Island is volcanic with ongoing volcanic activity, and its habitats include mostly unvegetated glaciers, snowfields, ash flats at elevations over 1,000 ft (300 m; Pitcher et al. 1990), extensive unvegetated lava flows, and lightly vegetated areas of volcanic ash, sand, and cinder (known as cinder blows) at lower elevations. Vegetative communities on Unimak Island lack caribou lichens and have a relatively low willow component, both of which can be an important part of summer diets for caribou (Legner 2014). However, the island has relatively diverse and abundant forb species, such as sedges, which are adequate forage for caribou.

Predators of caribou occur on Unimak Island at varying densities. These can include bald eagles (*Haliaeetus leucocephalus*), brown bears, golden eagles (*Aquila chrysaetos*), wolverines, and wolves. The range of the Unimak Island caribou herd (UCH) is the entire island (approximately 1,500 mi^2). The community of False Pass is the only occupied human settlement on the island.

Summary of Status, Trend, Management Activities, and History of Caribou in Unit 10

Skoog (1968) speculated that the Alaska Peninsula was marginal habitat for sustaining large caribou populations because of severe icing conditions and ash from frequent volcanic activity affecting food supply and availability, conditions which are also present on Unimak Island. Calving occurs primarily on the Bering Sea end of the island, ranging from several thousand feet in elevation (which is primarily ash and snow habitat) down to the coastal tundra plains where heavy alder stands are used to avoid predators.

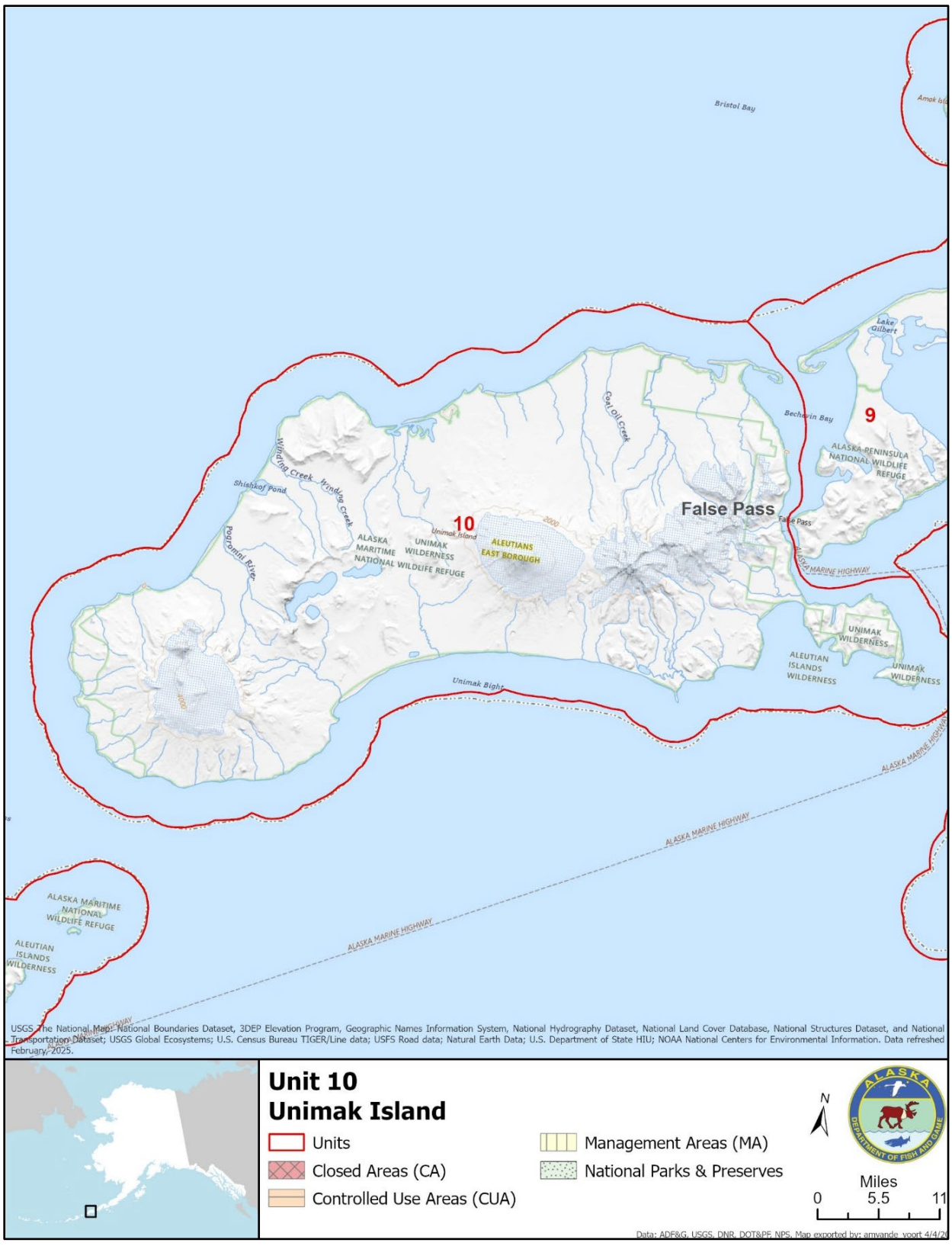

Figure 1. Unit 10, Unimak Island, Alaska Peninsula, regulatory years 2017–2021.

There are historical reports of caribou moving between the Alaska Peninsula and Unimak Island, including what may have been a substantial immigration of the Unimak caribou herd (UCH) in 1976 (Pitcher et al. 1990). Recently, genetic studies have determined that UCH is genetically isolated from mainland caribou, with sufficient fidelity to calving areas on the island to be designated a separate herd from the Southern Alaska Peninsula caribou herd (SAP), which ranges on the mainland (Zittlau et al. 2009, Mager 2012).

Caribou numbers on Unimak Island have cycled widely over the decades, as have the Northern Alaska Peninsula (NAP) and SAP caribou herds. Sellers et al. (1999, page 2) summarized a history of UCH, with comparison to mainland SAP, as follows:

> Caribou numbers in Unit 9D and on Unimak have fluctuated widely, but not synchronously. In 1925 Murie (in Skoog 1968) estimated 5,000 caribou between Port Moller and the tip of the Alaska Peninsula and another 7,000 on Unimak Island. By 1949 the FWS [U.S. Fish and Wildlife Service] estimated 500 caribou on the mainland. Surveys in 1949 and 1953 by the FWS reported no caribou on Unimak Island; but by 1960 Skoog (1968) reported "1,000 south (of Port Moller, author's note), most…being on Unimak Island". By 1975 the SAP had increased to at least 2,267 in [Unit] 9D and 3,334 on Unimak Island (Irvine 1976). The winter of 1975–76 was severe and reports of dead caribou on the island suggested a die off. Conceivably emigration from Unimak could have contributed to population growth in Unit 9D during the late 1970s. By the early 1980s, only a few hundred caribou remained on Unimak. Meanwhile the mainland segment grew continuously to peak at 10,200 by 1983.

Following this precipitous decline in the late 1970s and early 1980s, the UCH population began growing again. By RY97 the herd had grown to at least 600 caribou, and by RY00, to approximately 1,000 (Butler 2009). The population was relatively stable until RY05 (or possibly earlier, prior to commencement of annual surveys) when annual composition surveys began indicating low calf-to-cow ratios. This continued through RY12, when ratios bottomed out at 3 calves per 100 cows. Population size and bull-to-cow ratios declined to 6:100 and approximately 250 animals, and predation on calves was suspected to be the cause of poor calf survival. The pregnancy rate appeared to be normal (85%) in 2008, but from 2009–2013, it ranged from 65–70%. Predation by brown bears is likely a limiting factor on caribou population growth due to the low number of bears harvested on Unimak each year (Crowley 2023). The current caribou population is approximately 400–500 animals.

The department's monitoring of the herd using radiocollared cows began in 1997 and satellite collars were added in 2011. Lem Butler, former King Salmon area biologist (ADF&G, personal communication) investigated calf survival on Unimak Island in 2010 but poor weather conditions, protracted parturition, and a low number of calves available for capture limited the collection of data and inference. Most of the collared calves died during the first weeks of life when predation was the most likely cause of death. The efforts in 2010 highlighted the logistical and weather-related difficulties associated with conducting research on Unimak Island.

Given the declining population size and poor calf survival of UCH, the department recommended implementing a wolf removal program in 2009, when the herd numbered around

400 animals. During peak calving season, wolves were to be removed on UCH's calving grounds using the same strategy employed for wolf removal on SAP's calving grounds (Butler 2009). However, because nearly all calving grounds are on federal wilderness lands, the program was neither supported nor authorized by the U.S. Fish and Wildlife Service (USFWS). Because of UCH's small population size and isolation from mainland caribou, ADF&G biologists were concerned that without management intervention caribou could be extirpated from Unimak Island. However, the window of opportunity for intervention had likely passed as the herd continued to decline to approximately 250 animals by 2011, and the risk of losing the herd to a stochastic event such as severe icing or volcanic ash fallout outweighed the high cost of predator control. However, an increase in population size was recorded in 2015 after calf-to-cow ratios had increased from single digits to 22:100 in 2014. UCH has since continued to increase, and predator control is no longer necessary.

Traditionally, residents of False Pass hunted caribou on the mainland in Unit 9D (Fall et al. 1990,1996; USFWS 2010). State and federal hunts were closed by emergency orders in 1993 when the populations of SAP and UCH, which were at that time combined, declined below 2,500 caribou. The federal subsistence season reopened in RY00 when UCH reached 1,000 animals and management of that herd was officially separated from SAP (Sellers 2003). The state general season reopened in RY01. State and federal UCH hunts were once again closed in RY09 following the most recent decline in RY08. The federal hunt remained closed until 2018 when it reopened to federally managed subsistence harvest, while the state hunt has remained closed.

Management Direction

Management direction for UCH is monitoring mode only. The herd size is increasing, state hunting is closed, and predation control is currently not an option. ADF&G manages caribou on the sustained yield principle using the best scientific knowledge available for the benefit of the resource and people of Alaska.

Existing Wildlife Management Plans

- Alaska Wildlife Management Plans: Southwestern Alaska (ADF&G 1976)
- Division of Wildlife Conservation Strategic Plan (ADF&G 2002)

Goals

Goals identified in the Alaska Wildlife Management Plans: Southwestern Alaska can be abbreviated to provide the following opportunities:

- The greatest sustained opportunity to participate in hunting caribou.
- To hunt caribou under aesthetically pleasing conditions.
- To take large-antlered caribou.

Providing a population level for sustainable harvest also allows for other uses such as photography and viewing, especially by local community residents. These goals outline the role of DWC when faced with land use practices, such as mining or reindeer herding, which may put a caribou herd at risk.

The first goal implies that the department should avoid population declines to prevent hunting closures and allow population recovery. However, controlling the population size of UCH may not be possible given remoteness, access difficulty, hunter limitations, and land status designations. Of the few local hunters, most are limited to coastal areas only (by boat) whereas most caribou are associated with alpine and subalpine habitat. Additionally, land status designation can prohibit certain management strategies, such as predator control, which could increase calf survival and allow for faster population recovery.

CODIFIED OBJECTIVES

Amounts Reasonably Necessary for Subsistence Uses

During RY17–RY20, when UCH was combined with SAP, the amounts reasonably necessary for subsistence (ANS) for the combined herd was 100–150 caribou. In 2021, the Board of Game (BOG) separated these herds and gave UCH a positive customary and traditional use designation. Due to current limited hunting opportunity, an ANS has not been established for UCH.

Intensive Management

The intensive management population objective for UCH was 1,000 caribou, but a harvest objective has not been set due to the current limited hunting opportunities. ADF&G staff believe that the population range should be 800–1,000 caribou given the peak of 1,200 and subsequent decline. The harvest objective will need to be established by BOG; ADF&G would recommend 20–150 caribou.

MANAGEMENT OBJECTIVES

1. Sustain a total UCH population with a minimum of 800 caribou and a maximum of 1,000 caribou.

2. Maintain a minimum UCH fall bull-to-cow ratio of 35:100.

MANAGEMENT ACTIVITIES

1. Population Status and Trend

ACTIVITY 1.1. Conduct fall composition surveys to estimate sex and age ratios, productivity, mortality, and trends.

Data Needs

ADF&G biologists use the fall composition survey to monitor bull-to-cow ratio; to monitor the number and percent of bulls in the population, which determines harvest quota; to provide

maximum hunting opportunity; to provide input into the population model; and calf parameters are also used in the model to monitor productivity and survival. Additionally, composition surveys have provided a means to monitor population trend.

Methods

Department staff attempted to conduct aerial surveys annually in October using fixed-wing aircraft and a helicopter to assess population composition. During RY17–RY21, surveys were able to be completed in 2018 and 2020. Pilots located caribou groups with radiotelemetry equipment and biologists aboard an R-44 helicopter determined the composition of each group (cow, calf, yearling, and bull: small, medium, or large). Because UCH groups are small and scattered, all caribou encountered during the survey were included in the sample[1], and therefore the sample sizes can be considered an index to population trend. We assessed survey comprehensiveness using the proportion of radiocollared caribou encountered relative to total number of radiocollared caribou. Composition data were entered into a deterministic computer model (an Excel spreadsheet) to help calculate predicted herd dynamics and size based on observed composition parameters and harvest.

Results and Discussion

The data indicate that UCH ended the decline it underwent during RY12–RY16 and began increasing. Department staff conducted composition surveys of UCH in October during RY18 and RY20 (Table 1). The population exceeded the objective bull-to-cow ratio of 35:100. Proportion of calves increased and then decreased in the most recent composition survey. Using survey results as input parameters, the population size calculated by the computer model continued to increase during RY17–RY21. Minimum counts by Izembek National Wildlife Refuge (INWR) were not performed during the reporting period due to staff turnover, weather, and other factors.

Table 1. Unimak Island caribou herd composition and predicted population size, regulatory years 2016–2021, Alaska.

Regulatory year	Bull-to-cow[a]	Calf-to-cow[a]	Percent calves	Percent cows	Percent bulls	Sample size	Predicted population size[b]
2016	32.9	40.3	23.3	57.8	24.7	258	346
2017[c]	–	–	–	–	–	–	370
2018	80.0	44.0	19.6	44.6	35.8	413	409
2019[c]	–	–	–	–	–	–	423
2020	78.5	33.9	16.0	47.1	37.0	257	460
2021[c]	–	–	–	–	–	–	498

[a] Ratios are 1:100.
[b] Calculated by Excel spreadsheet, no confidence intervals.
[c] No composition survey was completed in the indicated year.

[1] A sample includes the total number of caribou sampled that year except for those collared caribou detected by radio signal without visual confirmation while in the clouds.

Recommendations for Activity 1.1

Composition surveys should be continued in order to provide input parameters for the population model and to monitor any declines in calf ratios, productivity, and increases in mortality.

ACTIVITY 1.2. Conduct parturition surveys to estimate pregnancy rates and minimum abundance.

Data Needs

Pregnancy rate indicates reproductive potential and nutritional condition of cows and is a parameter used in the department's population simulation model for UCH. We will continue to refine sample size, precision, and statistical power of pregnancy rate (e.g., binomial confidence interval). Typically, obtaining a large sample size for the UCH parturition survey has been relatively easy if enough radio collars are deployed.

Methods

ADF&G staff attempted to fly parturition surveys annually in late May or early June to sample at least 25% of the herd. Fixed-wing aircraft pilots located caribou groups with radiotelemetry equipment and biologists aboard an R-44 helicopter counted and determined composition and pregnancy status of each sample. Observers classified caribou on the calving grounds as parturient cow (with calf at heel, hard antlers, or distended udder), nonparturient cow, yearling, or bull (Whitten 1995). Biologists also observed radiocollared females to potentially document age-specific pregnancy rates. The data were entered into a computer model to help assess and predict herd size.

Results and Discussion

Department biologists successfully flew parturition surveys in 3 of the years during RY17–RY21 (Fig. 2) and determined that UCH pregnancy rate was stable, although markedly lower than it was during RY12–RY16. The current rate is sufficient to allow continued population growth, but at a much slower pace. A lower pregnancy rate with occasional spikes in productivity may be normal for this isolated island herd.

Recommendations for Activity 1.2

Continue parturition surveys.

ACTIVITY 1.3. Maintain an adequate sample of widely distributed radiocollared caribou on Unimak Island.

Data Needs

Population size, composition, seasonal movements, and survival rate are monitored periodically through radiotracking collared caribou. Maintaining an adequate number of collared animals for surveys aids in locating an appropriate survey sample size and obtaining a widely distributed sample, particularly when the population is at low density.

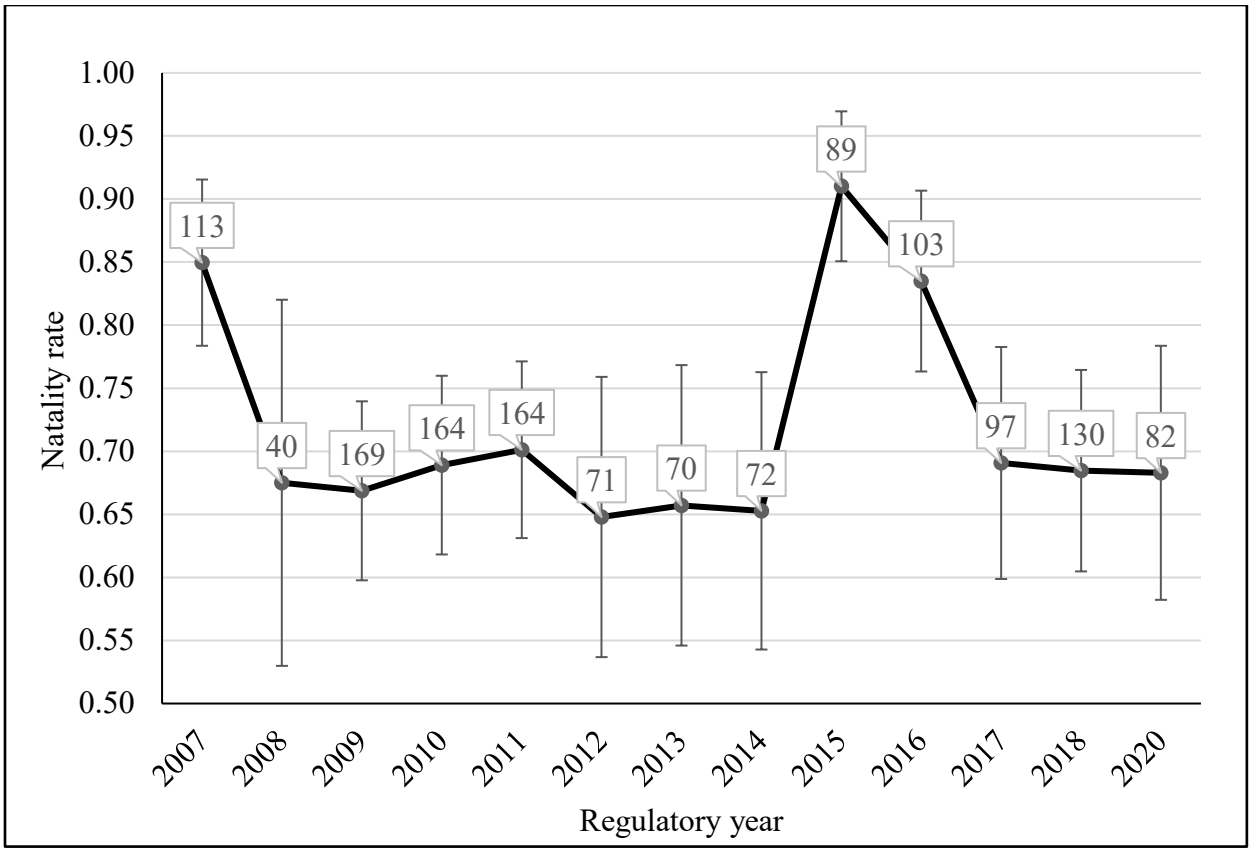

Figure 2. Unimak Island caribou parturition rate with 95% confidence intervals and sample sizes during regulatory years 2007–2020, Alaska.

Methods

No caribou were captured during RY17–RY21.

Results and Discussion

A capture was planned for 2019 but was unable to be completed. As of May 2021, there were 7 active collars deployed on Unimak Island caribou.

Recommendations for Activity 1.3

Continue, but there may not need to be as many collars deployed on Unimak Island if they are strategically placed.

ACTIVITY 1.4. Investigate calf mortality to determine factors limiting calf survival.

Data Needs

As needed, repeat calf mortality study to determine factors limiting calf survival. A study was not initiated during RY17–RY21 given the current status of the herd, including its increasing population size and adequate calf-to-cow ratio (25 or higher), which indicate a healthy population. Calf survival is an index of recruitment to the population and is used in a computer

model to predict population size and trend. An assessment of calf predators is important in developing intensive management projects to more aggressively manage the caribou population.

Methods

A calf mortality study was not initiated during RY17–RY21.

Results and Discussion

None.

Recommendations for Activity 1.4

This activity is not currently necessary due to intensive management prohibitions by the managing land agency in federally designated wilderness. ADF&G staff recommend repeating this activity in the instance that intensive management is reactivated.

2. Mortality-Harvest Monitoring and Regulations

ACTIVITY 2.1. Monitor the caribou harvest through hunter harvest reports and contact with hunters. This is a routine management activity for most caribou herds in Southcentral and Southwestern Alaska.

Data Needs

Harvest data will, upon resumption of hunting, be an important component of managing UCH for sustained yield. This activity should continue.

Methods

Hunting for UCH caribou opened in RY18 for federally qualified subsistence users, with 1–10 permits distributed annually.

Results and Discussion

Harvest by Hunters-Trappers

Harvest consisted of bulls only, through federal registration permits. Reported harvest peaked at 3 bulls in RY18, with no bulls reported harvested in the remaining years (L. Melendez, Izembek National Wildlife Refuge, personal communication).

Alaska Board of Game Actions and Emergency Orders

BOG created a tiered hunt structure and opened a hunt for UCH during the March 2022 meeting. Seasons were set as 1 August–30 September and 15 November–31 March for residents and 1 August–30 September and 15 November–31 December for nonresidents. If the harvestable surplus is 25–100 caribou, the bag limit will be 1 bull by registration permit only; if it is 100–200, the bag limit will be 3 caribou; and if it exceeds 200 caribou, the bag limit will be 4 caribou (5 AAC 85.025).

Recommendations for Activity 2.1

Continue to collect harvest information during years when state or federal seasons are open. The intensive management harvest objective for Unimak Island has not been set since UCH split from SAP. Ideally, codifying harvest objectives based on unreliable population counts should be avoided for a population as small and remote as UCH. Harvest levels should be reviewed annually and revised as necessary, but the state would recommend a harvest level of 20–150 caribou as UCH continues to grow.

3. Habitat Assessment-Enhancement

ACTIVITY 3.1. Evaluate range condition through body condition assessment of captured females and pregnancy rates.

Data Needs

Assessment of body condition is an index to the nutritional status of the range.

Methods

Body condition is a subjective ranking from 1 (emaciated) through 5 (obese) based on palpation of soft tissue at withers, ribs, and hips (Gerhart et al. 1996) and warble load (low, medium, or high), and agreed upon by the ADF&G staff working on each animal.

Results and Discussion

No captures occurred during RY17–RY21.

Recommendations for Activity 3.1

Continue performing this activity during captures. This is not an annual activity.

Nonregulatory Management Problems or Needs

No nonregulatory problems occurred during RY17–RY21.

Data Recording and Archiving

Digital data are backed up daily on an in-house server. Paper records are stored in the area biologist's and assistant area biologist's offices. Archived records are stored in boxes, indexed and labeled, on the second floor of the warehouse.

Agreements

None.

Permitting

The INWR Special Use Permit (#2017-1) expired in April 2018.

Conclusions and Management Recommendations

Population metrics of UCH indicate a continued slow increase in total caribou numbers. Bull-to-cow ratios drastically exceeded the management objective of 35:100 (Table 1 above). Calf-to-cow ratios decreased from 40:100 in RY16 to approximately 34:100 in RY20. Model-predicted population size and counts indicated a population size of approximately 450 to 500 caribou by RY21. The population size is still below the population objective, but with the high bull-to-cow ratio, increase in population size, and particularly considering limited traditional harvest, ADF&G biologists recommend an increase in bull harvest.

II. Project Review and RY22–RY26 Plan

Review of Management Direction

Management Direction

Management for UCH is in monitoring phase until a state hunt is reinstated.

Goals

Goals identified in the Alaska Wildlife Management Plans: Southwestern Alaska (ADF&G 1976) can be abbreviated to provide the following opportunities:

- The greatest sustained opportunity to participate in hunting caribou.
- To hunt caribou under aesthetically pleasing conditions.
- To take large-antlered caribou.

Providing a population level great enough for sustainable harvest also provides other uses such as photography and viewing, especially by local community residents. These goals outline the role of DWC when faced with land use practices, such as mining or reindeer herding, that may put a caribou herd at risk.

The first goal implies that we should avoid population crashes to prevent hunting closures and allow population recovery. However, controlling the population size of UCH may not be possible given remoteness, access difficulty, hunter limitations, and land status designations. Of the few local hunters, most are limited to coastal areas only (by boat), whereas most caribou are associated with alpine and subalpine habitat. Land status designation can prohibit certain management strategies, such as predator control, which could increase calf survival.

Codified Objectives

<u>Amounts Reasonably Necessary for Subsistence Uses</u>

ANS for UCH has not been established since 2021, when it shared a combined ANS with SAP.

Intensive Management

None.

MANAGEMENT OBJECTIVES

1. Sustain a total population with a minimum of 800 caribou and a maximum of 1,000 caribou.

2. Maintain a minimum fall bull-to-cow ratio of 35:100.

REVIEW OF MANAGEMENT ACTIVITIES

1. Population Status and Trend

ACTIVITY 1.1. Conduct fall composition surveys to estimate sex and age ratios, productivity, mortality, and trends.

Data Needs

Fall composition survey data are used to monitor bull-to-cow ratios and total overall numbers to determine harvest quota, provide maximum hunting opportunity, and provide input to the population model. Calf-to-cow ratios are also obtained to monitor productivity and survival and are an important input into the population model. Fall composition surveys also provide a means to monitor population trends.

Methods

ADF&G biologists attempt to conduct aerial surveys annually in October using fixed-wing aircraft to assess population composition. Pilots locate caribou groups with radiotelemetry equipment and biologists aboard an R-44 helicopter determine composition of each group (cow, calf, yearling, and bull: small, medium, or large). Because UCH groups are small and scattered, all caribou encountered during the survey are included in the sample (except for those collared caribou detected by radio signal without visual confirmation while in the clouds), and therefore sample sizes can be considered an index to population trends. Survey comprehensiveness is assessed using the proportion of radiocollared caribou encountered relative to total number of radiocollared caribou. Composition data will be entered into a deterministic computer model to predict herd dynamics and size.

ACTIVITY 1.2. Conduct parturition surveys to estimate pregnancy rates and a minimum estimate of abundance.

Data Needs

Pregnancy rates indicate reproductive potential as well as nutritional condition of cows.

Methods

Parturition surveys are conducted using fixed-wing aircraft to locate animals and an R-44 helicopter with ADF&G observers to determine composition and pregnancy status of each sample. Caribou are classified as parturient cow (with calf at heel, hard antlers, or distended udder), nonparturient cow, yearling, or bull.

ACTIVITY 1.3. Maintain an adequate sample of radiocollared caribou in UCH.

Data Needs

This is a routine management activity to aid in locating animals during parturition and composition surveys to obtain adequate sample sizes. Maintaining 20–30 marked cows in the population has been adequate for management activities, but it has been recommended that fewer collars would suffice for UCH due to it being an island population.

Methods

All caribou will be immobilized from an R-44 helicopter with a fixed-wing spotter plane using standard techniques approved by an Animal Care and Use Committee and fitted with a radio collar.

2. Mortality-Harvest Monitoring

ACTIVITY 2.1. Monitor the caribou harvest through hunter harvest reports and contact with hunters and guides.

Data Needs

Harvest data are an important component of managing UCH for sustained yield to determine harvest percentages and more accurate population modeling.

Methods

Harvest reporting will be required for any hunt that is implemented.

3. Habitat Assessment-Enhancement

ACTIVITY 3.1. Evaluate range condition through body assessment of captured females and pregnancy rates.

Data Needs

Assessment of caribou body condition is an index to the nutritional status of the range. Pregnancy rates, which are obtained through parturition surveys, are also an indicator of habitat conditions.

Methods

Assessment of caribou body condition is performed during captures and collaring. Body condition is a subjective ranking from 1 (emaciated) through 5 (obese) based on palpation of soft

tissue at withers, ribs, and hips and warble load, and agreed upon by the ADF&G staff working on each animal. Pregnancy rates are obtained during parturition surveys.

NONREGULATORY MANAGEMENT PROBLEMS OR NEEDS

There are no nonregulatory management problems or needs anticipated for RY22–RY26.

Data Recording and Archiving

Data will be saved digitally to make data sharing and analysis more efficient. Department staff will work toward digitizing archived records to make them more accessible.

Agreements

None.

Permitting

Special Use Permits with INWR are anticipated for future caribou capture and radiocollaring efforts.

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