

Mountain Goat Management Report and Plan, Game Management Unit 4:

Report Period 1 July 2013–30 June 2018, and
Plan Period 1 July 2018–30 June 2023

Stephen Bethune



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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.

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Cover Photo: Mountain goat BG79, is one of approximately 88 goats that are or have been part of ongoing research on Baranof Island. This research helps inform and direct management decisions. BG79 is a 6-year-old male. ©2020 ADF&G. Photo by Stephen Bethune.

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Purpose of this Report

This report provides a record of Unit 4 mountain goat (*Oreamnos americanus*) survey and inventory management activities for the 5 regulatory years 2013–2017 and plans for survey and inventory management activities in the following 5 regulatory years, 2018–2022. A regulatory year (RY) begins 1 July and ends 30 June (e.g., RY13 = 1 July 2013–30 June 2014). This report is produced primarily to provide agency staff with data and analysis to help guide and record agency efforts but is also available 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 format to report more efficiently on trends and describe potential changes in data collection activities over the next 5 regulatory years. It replaces the mountain goat management report of survey and inventory activities that was previously produced every 2 years.

I. RY13–RY17 Management Report

Management Area

Game Management Unit 4 encompasses Admiralty, Baranof, Chichagof, and adjacent islands (Fig. 1). It consists of approximately 5,820 square miles of land and includes more than 5,000 miles of shoreline. Approximately 90% of the unit is in the Tongass National Forest. Unit 4 is part of the larger Southeast Alaska Alexander Archipelago. The archipelago consists of more than 2,000 islands and contains the largest expanse of remaining temperate old-growth forest in the world. The region is known for its endemic mammal species and is a model for island conservation and biogeography (MacDonald and Cook 1996; Cook and MacDonald 2001; Dawson et al. 2007). Research indicates that portions of the archipelago acted as refugia during the last glacial maximum (Cook et al. 2006; Shafer et al. 2010) which potentially has important implications regarding the history of mountain goats on Baranof Island. Sitka, located on Baranof Island, is the largest community in the unit, with approximately 8,500 residents. Other communities include Hoonah, Pelican, Elfin Cove, and Tenakee Springs on Chichagof Island, and Angoon on Admiralty Island. Baranof Island (approximately 1,865 mi²) is the only island in Unit 4 inhabited by mountain goats.

The South Baranof Wilderness, within the Tongass National Forest, is 319,568 acres and encompasses much of the southern half of Baranof Island. This wilderness area was designated by Congress in 1980 as part of the Alaska National Interest Lands Conservation Act. Some of the protections afforded this wilderness area include prohibitions on commercial enterprises (except guides and outfitters), building new roads, timber harvest, the use of motorized land vehicles (except snowmachines), and landing of helicopters.

Unit 4, like most of Southeast Alaska, has a maritime climate with moderate summer and winter temperatures and high precipitation (Harris et al. 1974). Fahrenheit temperatures range from the mid-20s in the winter to mid-60s in the summer. Rainfall in Sitka averages approximately 85 inches per year, but totals are highly variable from year to year and within the unit. For example, Little Port Walter on the southeast coast of Baranof Island is one of the rainiest places in North America, averaging 225 inches per year. Sitka averages 33 inches of snow annually. With the

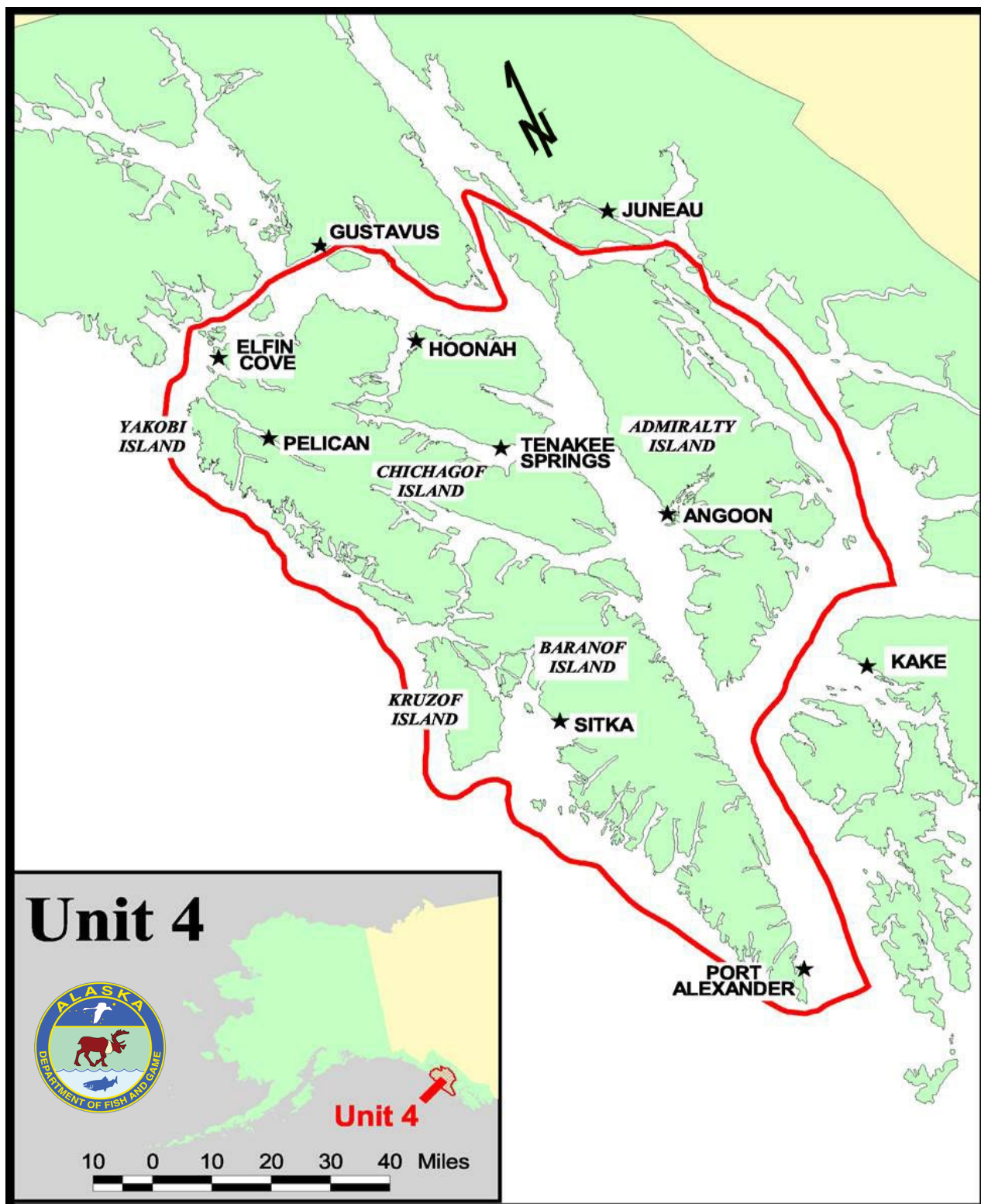


Figure 1. Map of Game Management Unit 4.

high variability in precipitation, in some years deep and persistent snow can accumulate at sea level in the northern and eastern portions of the unit.

The landscape of Unit 4 is characterized by steep and rugged terrain with mountains, fjords, old-growth forests, wetlands, estuaries, muskegs, and short swift rivers. Elevation within Unit 4 ranges from sea level to 5,328 feet. Predominant vegetative communities occurring at low-moderate elevations (<1,500 ft) are dominated by western hemlock (*Tsuga heterophylla*) and Sitka spruce (*Picea sitchensis*), with western red cedar (*Thuja plicata*) and Alaska yellow cedar (*Chamaecyparis nootkatensis*) old-growth coniferous forests. Mixed-conifer muskeg and deciduous riparian forests are also common. A subalpine, timberline band between 1,500 and 2,500 feet in elevation consists mainly of mountain hemlock (*Tsuga mertensiana*) forest. Because of the high rainfall, most natural disturbance to the forest occurs via wind-throw events and landslides rather than fire.

Unit 4 is relatively isolated from the mainland of Southeast Alaska and supports a limited diversity of land mammals. Sitka black-tailed deer (*Odocoileus hemionus sitkensis*) and brown bears (*Ursus arctos*) are the only large native land mammals.

Summary of Status, Trend, Management Activities, and History of Mountain Goats in Unit 4

It was accepted for nearly a century that mountain goats on Baranof Island all descended from animals that had been transplanted. However, cooperative research the department began in 2006 with geneticist Aaron Shafer of the University of Alberta on tissue samples of hunter-harvested goats indicates 2 distinct genetic lineages, one tracing directly to the Tracy Arm area, and another representing a refugial lineage that is believed to have occurred on Baranof Island since the last glacial maximum. Researchers continue to explore this finding. Comprehending population genetic structure has future management and conservation implications (Shafer et al. 2011a, Shafer et al. 2011b, and Shafer et al. 2012).

In the early 1900s it was thought no mountain goats existed in Unit 4 and efforts were made to introduce them. Goats from the Tracy Arm area on the Southeast Alaska mainland were transplanted in 1923 to Baranof Island (Paul 2009). Additional transplants were attempted on Chichagof Island between 1952 and 1956. (Paul 2009). The last documented observation of goats on Chichagof was in 1978; however, ADF&G biologists (Johnson 1981) were unable to confirm the report. It is accepted that goats no longer persist on Chichagof Island, but the Baranof Island population has grown.

The 1923 transplant to Baranof Island was recognized as successful when the Alaska Game Commission observed 41 goats in 1937. The first aerial census was conducted in 1954, when biologists counted 263 goats and estimated the population at 400. The population has grown and expanded since then, with Mooney (2006) reporting that a survey analysis in 2004 yielded a population estimate of more than 1,500 goats.

The first regular open hunting season for Baranof mountain goats occurred in 1949. The season has always been 1 August through 31 December. Initially, the annual bag limit was 2 goats. The

bag limit was reduced to 1 goat in 1975. Annual harvests had averaged 20–30 goats until then. In 1976, the RG150 registration hunt was established and between 1976 and 2005 annual harvests ranged between 28 and 75 goats with an average of 53. Females composed up to 50% of the harvest (see harvest information presented in the Mortality-Harvest Monitoring section below). In 2006 the department instituted a harvest point system to encourage a lower percentage of females (nannies) in the harvest. Under the points system, a billy counts as 1 point and a nanny counts as 2. In 2006, the harvest quota for RG150 was 78 points. This was reduced to 56 points or 18 nannies in 2010 (Mooney 2014).

Mountain goats became so well established that they were added as a customary and traditional subsistence animal by the Federal Subsistence Board (FSB) in the 1990s. Currently, a federal hunting season runs concurrently with the state season. In 2004 the FSB issued, via the U.S. Forest Service, a 5-year permit to the Sitka Tribe of Alaska to allow the spring harvest of up to 3 goats annually. The purpose of the special harvest permit was to obtain goat hair for spinning and weaving ceremonial robes as a cultural/educational project. The permit was renewed in 2009 for an additional 5 years and for up to 5 goats annually. In total, 3 male goats (billies) have been harvested under this permit, 2 in 2010 and 1 in 2012 (Mooney 2010, Mooney 2014). Terry Rofkar, a Sitka-based Tlingit weaver, was the main driver behind this project. She passed away in 2016. The permit has since expired, and the program is no longer active.

During the winters of 2006–2007, 2007–2008, and 2008–2009 the Sitka area, as well as much of Southeast and Southcentral Alaska, had record-breaking amounts of snowfall. The snowpack, along with 3 consecutive late and cold springs, resulted in reductions to the goat population. That mortality was likely exacerbated by high female harvests preceding these bad winters. The islandwide estimate of more than 1,500 animals in 2004 (Mooney 2006) dropped to 700–850 goats in 2009 (Mooney 2014). Biologists were particularly concerned about goat populations in core areas such as the Blue Lake, Nakwasina, Katlian, and Glacial River watersheds.

A regionwide effort was launched in 2008 to better educate hunters on the management implications of female harvest and on how to select billies over nannies. A brochure was developed with field photos of goats and descriptions of the characteristics used to identify sex. An online quiz was added and became a requirement for obtaining a registration permit; however, taking the quiz is on the honor system. Despite the department's efforts to educate hunters, the point system was not sufficient to reduce female harvest. As a result, new management strategies were developed for the 2011 season.

The department's current research and monitoring program (2011–present) was initiated due to concerns about apparent harvest-mediated declines in areas of close proximity to Sitka (i.e., particularly high female harvest) prior to 2011. In order to understand the extent to which the areas have been historically harvested, annual harvest during RY07–RY11 was summarized (male = 1 point, female = 2 points) for each area and cross-referenced with aerial survey minimum counts. The number of harvest points taken per mountain goats seen during surveys was compared to a 0.06 points/goat (or 6 points per 100 goats seen) guideline to assess whether guideline harvests were exceeded in given areas. Overall, guideline harvests were exceeded in many areas. In some exceptional instances, harvest rates were 5–8 times higher than guideline harvest recommendations. Such localized overharvest occurred because the entire island was

largely managed as one unit and did not explicitly consider mountain goat distribution and movement patterns.

Since 2011, hunt management strategies have been used and refined that subdivide the island into many different geographically discrete units to ensure that harvest spatially mimics mountain goat distribution across the island, thereby increasing the likelihood that mountain goat harvest opportunities will be consistent and sustainable in localized areas over the long term. It is particularly important to carefully manage areas with good access to ensure that those opportunities persist over time. For details on these strategies, see the Management Strategy section below.

Management Direction

EXISTING WILDLIFE MANAGEMENT PLANS

- Southeast Alaska mountain goat management plan in the 1976 Alaska wildlife management plans (ADF&G 1976).

While the overall goals of the original plan are important, the management objectives and harvest management strategies have changed since the plan was written based on public comment, staff recommendations, and Alaska Board of Game actions. These periodic changes in management planning have been reported in the division's previous mountain goat management reports for Unit 4.

GOALS

1. To provide for a sustainable harvest of mountain goats in Unit 4.
2. To provide the greatest opportunity to participate in hunting of mountain goats in Unit 4 while maintaining aesthetically pleasing hunt conditions.
3. Provide an opportunity for nonconsumptive uses (viewing and photographing) of mountain goats in Unit 4.
4. Discourage land use practices that adversely affect mountain goat habitat.

CODIFIED OBJECTIVES

Amounts Reasonably Necessary for Subsistence Uses

The Alaska Board of Game made a negative finding for customary and traditional use of mountain goats in Unit 4 during the November 2006 Southeast Regional meeting (5 AAC 99.025(7)).

Intensive Management

Not applicable.

MANAGEMENT OBJECTIVES

1. Maintain an islandwide population in excess of 1,500 goats.
2. Monitor sex composition of the harvest and maintain female component at <15% of the islandwide harvest or <1% of the estimated islandwide population.
3. Maintain overall harvest rate at $\leq 4\%$ of the islandwide population.

MANAGEMENT STRATEGY

As described in the Summary section above, ADF&G biologists began managing the Unit 4 goat harvest using an islandwide point system in 2006. Beginning with the RY11 season, Baranof Island was divided into 9 zones (Fig. 2). Each zone was assigned a quota for billies and a “one and done” concept was instituted for female harvest, meaning the harvest of 1 nanny would result in automatic closure of that zone to additional harvest by emergency order (EO).

The current hunt management strategy focuses on breaking Baranof Island into even smaller hunt zones to allow managers the option of closing a zone to protect the goat population in a small area without closing hunting in other areas. This increases hunting opportunity and helps spatially spread hunting pressure.

During this reporting period, RY13–RY16 mountain goat hunting on Baranof Island was managed based on the 9 zones and “one and done” concept for female harvest established with the RY11 season. An islandwide maximum harvest of 9 females was set. In addition to these zones, the Blue Lake and Medvejie Lake drainages along with the south fork Katlian River watershed were closed to all harvest. The combination of closed areas, reduced nanny harvest, and a series of mild winters resulted in the recovery of the Baranof goat herd (see detailed discussion of population status in Population Status and Trend below).

Beginning in RY17, hunt managers and researchers deemed the population adequately recovered to begin expanding hunt opportunities and reopening some areas that were closed in 2011. For RY17 a revised strategy was put in place for RG150. Baranof Island was divided into 34 new hunt zones (Fig. 3) with the goal of better distributing hunter effort and harvest. Each zone is assigned a quota based on the most recent population surveys. The “one and done” concept has been retained. Creating these hunt zones allows biologists to manage at the subpopulation level, which affords hunters more opportunity, and reduces the possibility of localized overharvest. Under the previous management strategy, quotas were based on larger geographical areas, which meant the quota for a zone could be reached after several goats were taken from a small area around a localized access point. This resulted in the entire large geographical area being closed by EO when additional harvest opportunity still remained in more remote portions of that larger zone. This new strategy provides more opportunity for hunters by allowing more remote zones to stay open after zones with easier access close (See Appendix A for answers to frequently asked questions [FAQ] regarding this new management approach).

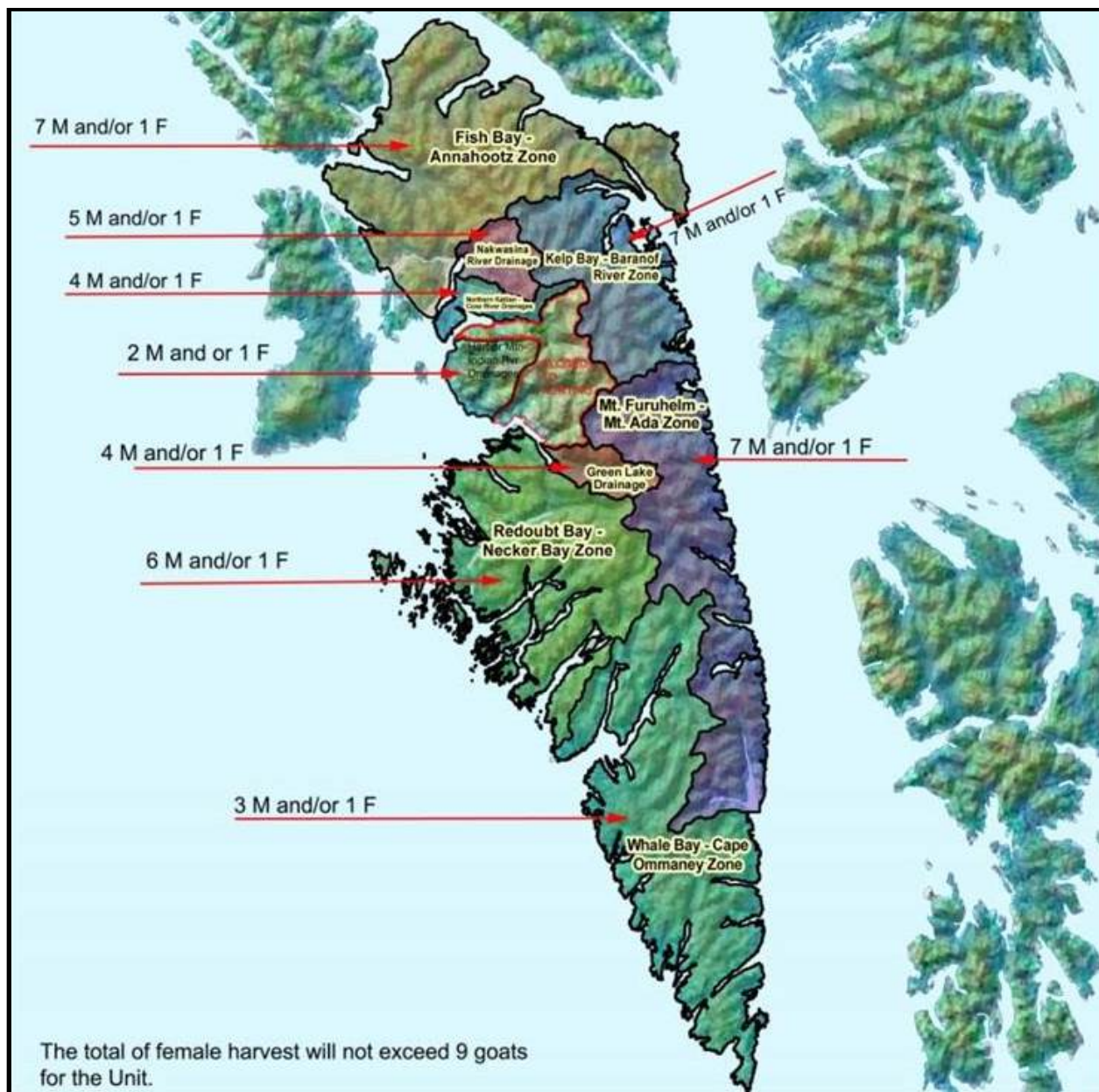


Figure 2. Baranof Island, Alaska, hunt zones for registration hunt RG150 during regulatory years 2011–2016.

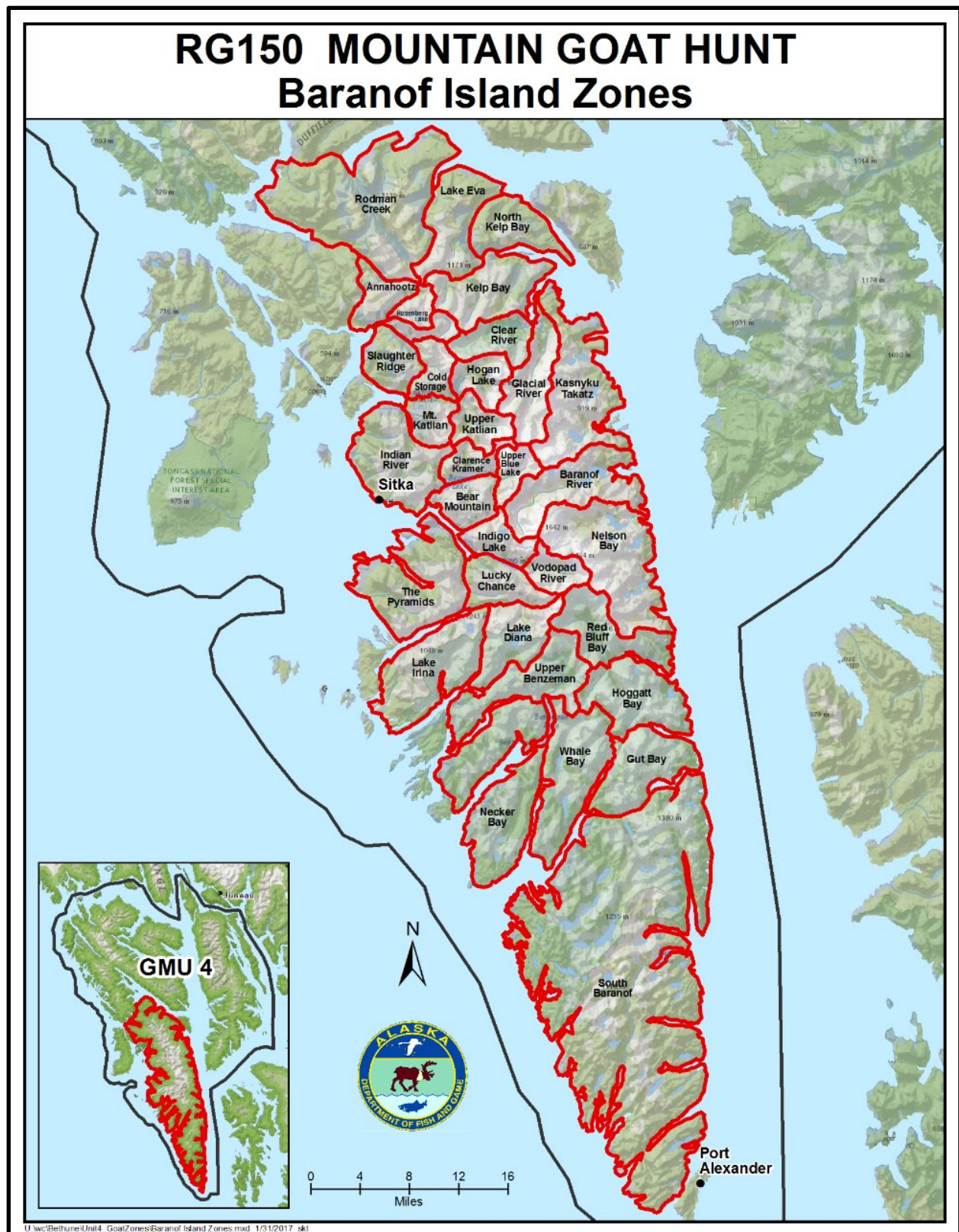


Figure 3. Baranof Island, Alaska, hunt zones implemented for registration hunt RG150 beginning in regulatory year 2017.

Hunt zones were determined considering a variety of factors: 1) Global Positioning System (GPS) collar data were used to identify subpopulations and general home ranges, 2) historical aerial survey zones were incorporated to provide continuity of previous survey data, 3) harvest records were used to identify primary access locations, 4) geographical features prohibitory to goat movements such as large valley bottoms were used when possible, 5) distinct geographical features to help hunters identify boundaries in the field were considered, and 6) local knowledge from experienced Baranof Island goat hunters was considered.

Mountain goat research efforts, initially associated with the expansion of the existing Blue Lake hydroelectric project and potential Takatz Lake project, have contributed greatly to the department's understanding of mountain goat ecology on Baranof Island and have helped shape new management strategies that went into effect for the RY17 season. This research, although no longer tied to the hydroelectric projects, is ongoing and involves the capture and radiocollaring of goats. In addition to helping to determine potential impacts of development projects (White and Gregovich 2016, White et al. 2013), researchers have studied habitat selection, seasonal movement patterns, home range size, and survival, have monitored reproductive success, and have used collared animals to obtain sightability correction factors to better enumerate the island's population (White et al. 2016).

Despite the current robust population, there are areas of apparently suitable mountain goat habitat that are largely uninhabited, suggesting that there is potential for the population to move spatially. Therefore, managers may choose in some cases to close zones to hunting opportunity in an effort to encourage range expansion, potentially creating new opportunities in the future. Since there are so few animals in some of these zones, retaining some closed areas has minimal effect on hunting opportunity (K. White, ADF&G research biologist, personal communication).

Quotas in the individual zones are based loosely on ADF&G's general goat management strategy of 6 goat "points" per 100 animals. Under this system, billies count as 1 point and nannies as 2 points. This equates to roughly needing to observe 30 goats in a zone in aerial surveys for it to be opened ($100/6 \times 2 = \sim 30$). However, managers are using an adaptive approach and in some cases zones with lower numbers of goats have been opened by combining them with adjacent zones or because they have historically low or no harvest. In some cases, multiple years of survey data are averaged to help adjust for anomalies in survey data. An example of how the RG150 hunt is managed differently from other areas of the state is that typically the 6 points per 100 goats refers to observed goats. On Baranof, goat population estimates for the purpose of setting quotas are adjusted for sightability. Based on the observed population growth on Baranof, harvest simulations, and the literature (Hamel et al. 2006, Rice and Gay 2010), ADF&G wildlife managers expect Baranof Island can sustain a harvest between 2 and 4 percent of the population (K. White, personal communication). However, the literature noted discusses native populations of mountain goats. Introduced populations of goats are less sensitive to harvest than native populations and can sustain higher rates of harvest (Festa-Bianchet and Côté' 2008). Sustainable harvest rates for introduced populations of mountain goats vary widely. Herbert and Turnbull (1977) suggested up to 4%, Adams and Bailey (1982) reported 7% was sustainable, and Williams (1999) suggested a harvest rate between 15% and 20%. There is strong caution, though, in the literature regarding such high harvest rates (Côté et al. 2001).

MANAGEMENT ACTIVITIES

1. Population Status and Trend

ACTIVITY 1.1. Monitor the mountain goat population in Unit 4.

Data Needs

Current management strategies for mountain goats in Unit 4 rely on annual population monitoring. Managers collect information on total population, population per hunt zone, adult-to-kid ratios, sightability, survival, and fecundity.

Methods

Traditional aerial mountain goat surveys are conducted annually. The department attempts to survey the entire island but at a minimum the consistently surveyed core area is flown (Fig. 4). A sightability correction factor is determined for each survey based on the number of known marked animals in the population that are observed (White et al. 2017). For example, if 7 out of 10 marked goats are observed during a survey, that 70% sightability correction factor can be applied to the entire survey and used to apply confidence intervals around the point estimate.

Results and Discussion

During this reporting period the mountain goat population on Baranof Island has been trending up, perhaps reaching or exceeding record high numbers.

It is important to note that surveys are not always comparable year to year due to variances in areas surveyed. So, managers rely on data from the consistently surveyed core area each year for reliable apples-to-apples comparisons. Over time, the area that constitutes the core area has shrunk. This occurs when an area is missed on an annual survey. The result is that core area estimates from earlier survey memos may be slightly different from later estimates. The 2013 estimate for the consistently surveyed core area was 574 with a 95% confidence interval (CI) range of 441–707. The 2018 estimate for the consistently surveyed core area was 750 (95% CI = 595–905). This represents an average annual growth rate of 6.4%. The percentage of kids in the core area has averaged 19% (Table 1).

During this reporting period we were able to conduct islandwide surveys in 2015, 2016, and 2018. Based on available survey data, islandwide population estimates with a 95% confidence interval were 1,457 (range = 1,138–1,776) in 2015,¹ 1,389 (range = 1,047–1,731),² and 1,717 (range = 1,358–2,076) in 2018³ (Fig. 5). Survey results for 2019, although outside this reporting period, indicate the population is continuing to expand, and at the time of this writing it appears that the Baranof goat population is at an historic high. The estimate in 2019 was 1,882 (range = 1,329–2,435).⁴ The previous high was approximately 1,800 goats in 2004.

¹ Kevin White, Research Biologist, ADF&G, Juneau, Baranof Island aerial survey summary, 8 January 2019.

² Ibid.

³ Ibid.

⁴ Email from Kevin White, Research Biologist, to Stephen Bethune, Area Biologist, 11 June 2021.

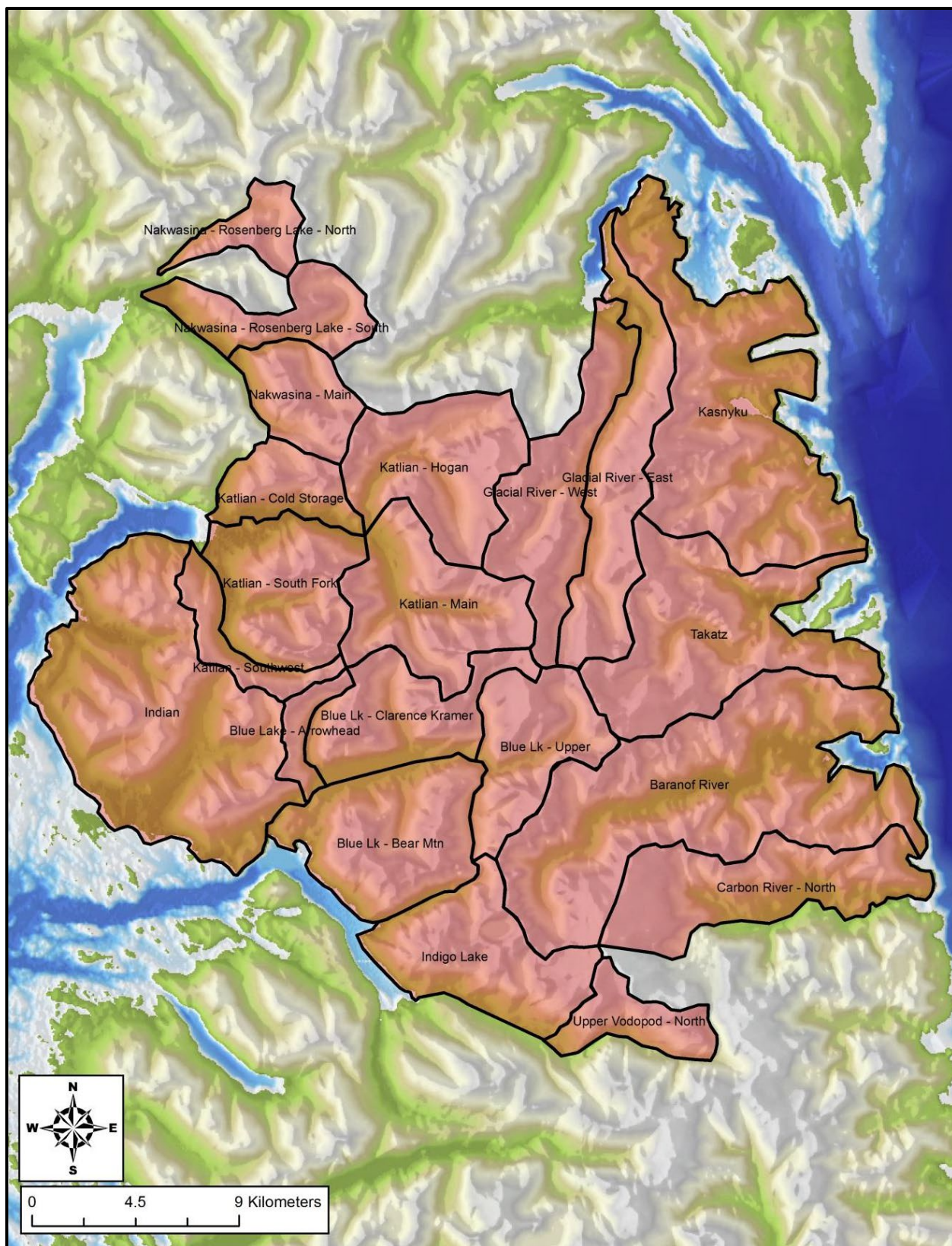


Figure 4. Consistently surveyed core area (orange highlighted) of Baranof Island, Alaska 2011–2016.

Table 1. Baranof Island, Alaska, mountain goat survey results for consistently surveyed core area, regulatory years 2011–2018.

Year	Minimum Count					Mark-resight of collared animals			Population estimate for core area			
	Adults	Kids	Total	Percent kids	No. groups	Total	Seen	Sighting probability	Estimate	SE	95% CI range	% CI
2011	325	77	402	19.2	180	17	12	0.71	625	87	455–795	0.27
2012	229	28	257	10.9	129	20	10	0.50	530	104	327–733	0.38
2013	319	82	401	20.4	181	22	16	0.73	574	68	441–707	0.23
2014	321	86	407	21.1	173	25	18	0.72	615	70	478–752	0.22
2015	365	87	452	19.2	218	21	16	0.76	637	70	499–775	0.22
2016	352	91	443	20.5	203	26	18	0.69	638	76	489–787	0.23
2017	409	102	511	20.0	216	29	26	0.90	568	33	503–633	0.11
2018	451	99	550	18.0	268	29	21	0.72	750	79	595–905	0.21

Note: Data in this table are drawn from or based on data in the following: Kevin White, Research Biologist, ADF&G, Juneau, Baranof Island aerial survey summary, 8 January 2019. SE= Standard Error; CI= Confidence Interval; % CI is a measure of precision.

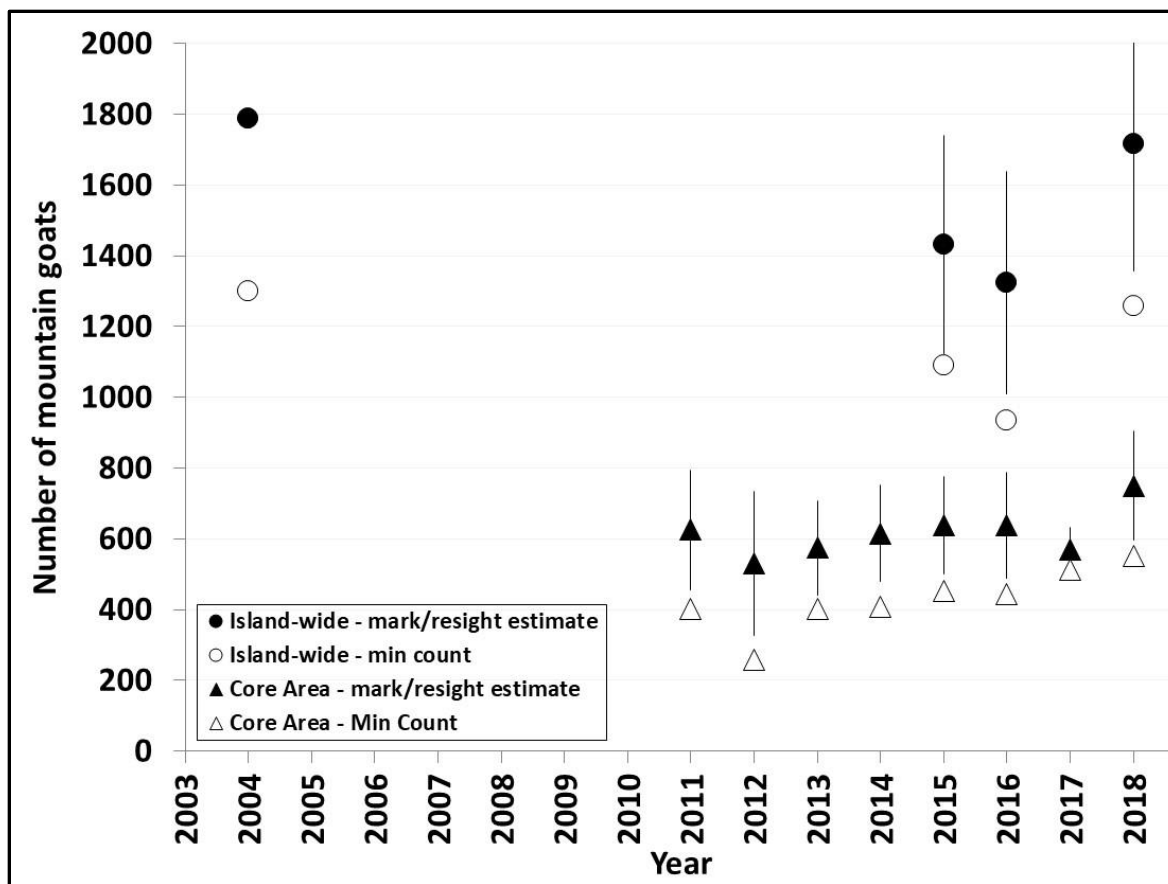


Figure 5. Baranof Island, Alaska, mountain goat survey results with 95% confidence intervals, regulatory years 2004 and 2011–2018.

Recommendations for Activity 1.1

Continue.

2. Mortality–Harvest Monitoring and Regulations

ACTIVITY 2.1. Monitor mountain goat harvests through mandatory sealing.

Data Needs

Unit 4 mountain goats are managed in-season via quotas per hunt zone based on recent population estimates. Therefore, timely reporting of harvest is crucial for not going over harvest objectives in each zone, particularly in regard to female harvest. Anecdotal information about hunt conditions and populations is collected as well.

Methods

ADF&G collected harvest data by sealing mountain goats harvested by hunters. Location and date of harvest, method of take, mode of transportation, horn measurements (total length, basal circumference, inter horn width and annuli increments) were recorded, sex was verified, and DNA tissue samples collected. In addition, although not mandatory we collected nasal swabs opportunistically as part of ADF&G’s on-going *Mycoplasma ovipneumoniae* (M. ovi)

surveillance (<https://www.adfg.alaska.gov/index.cfm?adfg=hottopics.movi>). Sealing must occur by ADF&G within 5 days of harvest. These data are entered into an ADF&G database (WinfoNet). Harvest data were summarized by regulatory year.

Season and Bag Limit

Season

1 August – 31 December

Bag Limit

Resident and nonresident hunters:
1 goat. Nannies with kids prohibited.

Results and Discussion

Harvest by Hunters

Harvests decreased annually between 2007 and 2011, reaching a low of 18 goats harvested in 2011 (Fig. 6). The average annual harvest during that 5-year period (RY07–RY11) was 29 goats and female harvest remained high at 41%. Since RY12 harvests have been trending upwards and female harvest rates have improved dramatically. During this reporting period hunters averaged 22 goats per year and less than 10% female harvest (Fig. 6, Table 2).

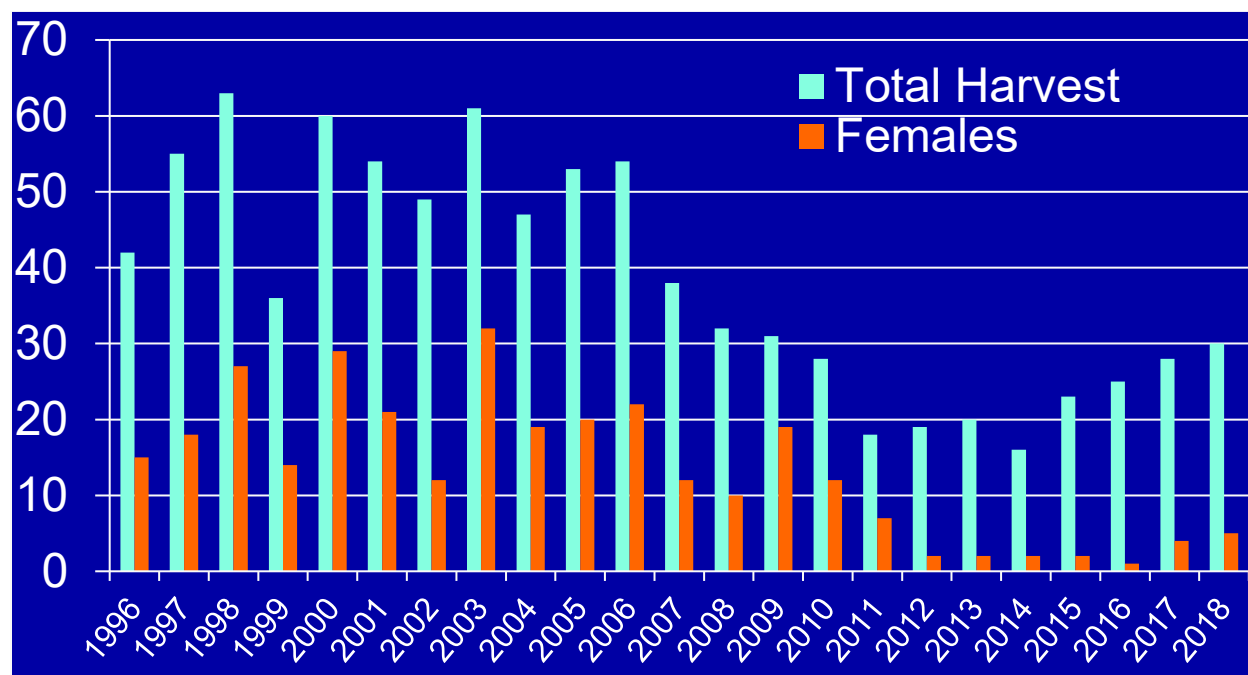


Figure 6. Unit 4, Baranof Island, Alaska, mountain goat harvest, regulatory years 1996–2018.

Permit Hunts

All mountain goat hunting in Unit 4 is by registration permit only. During this reporting period an average of 166 permits were issued annually (range = 139–196). Of those permits issued, 66% of permit holders reported that they did not hunt mountain goats. Hunters that did participate enjoyed an average 39% success rate (Table 2).

Table 2. Unit 4, Alaska, mountain goat harvest data for RG150, regulatory years 2013–2017.

Regulatory year	Permits issued	Did not report	Did not hunt	Unsuccessful hunters	Successful hunters	Males	Females	Sex unknown	Illegal	Total harvest
2013	139	1	93	26	20	18	2	0	0	20
2014	149	0	98	35	16	14	2	0	0	16
2015	165	1	112	29	23	21	2	0	0	23
2016	196	1	127	43	25	24	1	0	0	25
2017	179	1	109	41	28	24	4	0	0	28
Average	166	1	108	35	22	20	2	0	0	22

Hunter Residency and Success

Mountain goat hunters in Unit 4 are mostly local residents (live on Baranof Island). During this reporting period approximately 75% of hunters were local. Nonlocals (Alaskans residing outside of Baranof Island) made up about 10% of the hunters and nonresidents accounted for 15% of the hunters. Those percentages mirror closely the residency of successful hunters as well (Table 3).

Harvest Chronology

August is the most popular month to goat hunt. Long daylight hours, more predictable weather, and the likely chance of bagging an alpine buck if goat hunting proves unfruitful make this month appealing. The next most popular month for hunting during this reporting period was September. Hunting effort drops off as the year progresses, but a handful of goats are still taken every year in October, November, and December (Table 4).

Transport Methods

During this reporting period small planes and boats were used nearly equally by successful goat hunters and represent the majority of transport methods used (Table 5). During the previous reporting period (RY08–RY12) boats were used more than airplanes by more than a 3 to 1 margin. Use of airplanes is highly variable. The availability of even one commercial transporter can swing percentages heavily toward planes. Use of planes is expected to decline during the next reporting period. During this reporting period one small operator (Bellows Air Service) went out of business and one local pilot was killed in a tragic plane accident. Another local flight service is going out of business in 2019 (Harris Air). There is currently one transporter operating out of Port Alexander. Otherwise, plane access will be limited to those with access to private planes. During this reporting period 2 goats annually were taken by walk-in access. These are usually hatchery workers on the east side of Baranof Island who have good access to goat habitat directly from their residence.

Alaska Board of Game Actions and Emergency Orders

At the January 2013 Board of Game (BOG) meeting in Sitka, there was a proposal (#31) to penalize hunters who harvest a nanny, in that they would be prohibited from hunting mountain goats in Unit 4 for the next 5 regulatory years. This is similar to the strategy currently in place on the Kenai Peninsula in Units 7 and 15. The board did not pass the proposal. Board members argued that the Kenai system is a limited draw whereas the Unit 4 hunt is a registration hunt, and, thus, the proposal would unduly punish goat hunters who may want to hunt annually in Unit 4. At its 2015 meeting in Juneau, the board heard a proposal (#8) to change goat hunting in Unit 4 from a registration to a draw hunt. The board decided that the current registration hunt was sufficient to appropriately manage harvest.

Table 3. Unit 4, Alaska, mountain goat hunter residency and success for RG150, regulatory years 2013–2017.

Regulatory year	Successful				Unsuccessful				Total hunters
	Local ^a resident	Nonlocal resident	Nonresident	Total	Local ^a resident	Nonlocal resident	Nonresident	Total	
2013	13	3	4	20	15	6	5	26	46
2014	16	0	0	16	27	3	5	35	51
2015	15	2	6	23	22	6	1	29	52
2016	22	1	2	25	35	4	4	43	68
2017	19	3	6	28	32	2	7	41	69
Average	17	2	4	23	26	4	5	35	58

^a Residents of Baranof Island.**Table 4. Unit 4, Alaska, mountain goat harvest chronology by month for registration hunt RG150, regulatory years 2013–2017.**

Regulatory year	Month					
	August	September	October	November	December	Total
2013	8	7	2	1	2	20
2014	9	4	2	0	1	16
2015	8	6	4	2	3	23
2016	7	7	10	0	1	25
2017	9	4	5	6	4	28
Average	8.2	5.6	4.6	1.8	2.2	22.4

Table 5. Unit 4, Alaska, mountain goat harvest by transport method used by successful hunters for hunt RG150, regulatory year 2013–2017.

Regulatory year	Airplane	Boat	Snow machine	Off-road Vehicle	Vehicle	Walked	Total
2013	8	10	0	0	0	2	20
2014	8	6	0	0	0	2	16
2015	11	10	0	0	0	2	23
2016	13	8	0	1	0	2	25 ^a
2017	6	16	0	4	0	2	28
Average	9.2	10	0	1	0	2	22.4

^a Includes one unknown.

Emergency orders (EOs) are used extensively as a management strategy for mountain goat hunting in Unit 4. Typically, an EO is issued prior to the start of the season closing some hunt zones to harvest and then additional EOs are issued in-season, closing areas as quotas are reached. Occasionally, an area will be opened by EO or a quota increased if a recent aerial survey indicates the goat population can sustain additional hunting opportunity (i.e., there are more goats) than managers anticipated at the start of the season. The following EOs were issued during this reporting period:

2013

01-01-13 (22 July): Pre-season closure for Blue Lake/Medveji Lake drainages and the south fork of the Katlian River drainage. 01-03-13 (23 August): Closure for the Nakwasina River drainage. Guideline harvest objective of 5 males met.

01-04-13 (11 September): Closure for the Redoubt Bay–Necker Zone. Guideline harvest objective of 1 female met.

01-12-13 (24 December): Closure for the North Fork Katlian River area. Guideline harvest objective of 1 female met.

2014

01-02-14 (30 July): Pre-season closure for Blue Lake/Medveji Lake drainages and the south fork of the Katlian River drainage.

01-04-14 (29 August): Closure for the North Fork Katlian River area. Guideline harvest objective of 1 female met.

2015

01-02-15 (29 July): Preseason closure for Blue Lake/Medveji Lake drainages and the south fork of the Katlian River drainage.

01-09-15 (7 October): Closure for the North Fork Katlian River area. Guideline harvest objective of 4 males met.

01-17-15 (2 November): Closure for the Nakwasina River drainage. Guideline harvest objective of 5 males met.

01-19-15 (18 December): closure for the Mt. Furuhelm–Mt. Ada Zone. Guideline harvest objective of 1 female met.

2016

01-02-16 (29 July): Preseason closure for Blue Lake/Medveji Lake drainages, Harbor Mountain, Indian River drainages and the south fork of the Katlian River drainage.

01-06-16 (21 September): Closure for the Nakwasina River drainage. Guideline harvest objective of 5 males met.

01-09-16 (1 October): Portion of Katlian River drainage opened.

01-16-16 (11 October) Closure for the Redoubt–Necker Bay zone. Guideline harvest objective of 6 males met.

01-28-16 (28 December): Closure for the North Katlian zone. Guideline harvest objective of 1 female met.

2017

01-01-17 (July 21): New management strategy implemented. Thirteen of 34 hunt zones on Baranof closed prior to season opening.

01-03-17 (14 August): Closure for Lake Diana zone. Harvest quota of 1 female met.

01-11-17 (7 October): Whale Bay zone opened.

01-12-17 (12 October): Upper Blue Lake zone closed. Harvest quota of 2 males met.

01-16-17 (18 October): Rodman Creek zone closed. Harvest quota of 1 female met.

01-19-17 (22 November): Cold Storage zone closed. Harvest quota of 3 males met.

Recommendations for Activity 2.1

Continue.

ACTIVITY 2.2. Measure mountain goat horns for trends in growth and size.

Data Needs

Age and horn growth data give ADF&G information on age classes being harvested and information to track horn size over time. Age class of mountain goats harvested helps indicate

hunter preference and is an index to the age structure of the goats being harvested. Horn measurements help managers understand harvest trends and the overall health of the herd through the measurement of annuli.

Methods

When hunters harvest a mountain goat, they are required to present the horns at the Sitka area office for measurements within 5 days of kill. Managers record days hunted, method of transportation, date of kill, location, age of goat by annuli, sex, horn length and basal circumference, length of annuli on the longest horn, whether each horn was broken, and the width between horns.

Results and Discussion

Average age of harvested goats was 4.5 years old during this reporting period (Table 6). Horn length averaged 8.3 inches long with a basal circumference of 4.9 inches. This is nearly identical to the previous 5-year period (RY08–RY12, Table 7) in which harvested goats averaged 4.9 years old, 8.2-inch horns, and 4.7-inch basal circumference. Mountain goats on Baranof Island are not known for producing trophy quality horns; goat horns from Baranof rarely exceed 9 inches. For example, during this same reporting period, goats harvested from Unit 1A had average horn lengths of 8.9 inches (Dorendorf *In Prep*). Goats from Unit 1A frequently have horns large enough for record book entry but goats on Baranof rarely do. Average age and horn size were consistent throughout the reporting period. This suggests stability in harvest from the current management strategy.

Recommendations for Activity 2.2

Continue measuring horns for the next reporting period.

Table 6. Average and range of horn measurements and ages from harvested Unit 4, Alaska mountain goats, regulatory years 2013–2017.

Regulatory year	Age	Length longest horn	Basal circumference largest horn
2013	5.4 (1.5–10.5)	8.6 (5.3–10.6)	5.0 (2.0–5.9)
2014	4.3 (1.5–10.5)	7.9 (6.1–8.9)	4.8 (3.9–5.4)
2015	4.4 (1.5–11.5)	8.2 (6.6–9.8)	4.9 (4.0–5.4)
2016	3.9 (1.5–9.5)	8.1 (7.0–9.6)	4.9 (3.6–5.4)
2017	4.8 (1.5–12.5)	8.6 (6.7–9.9)	4.9 (3.9–5.4)
Average	4.5	8.3	4.9

Table 7. Average and range of horn measurements and ages from harvested Unit 4, Alaska, mountain goats, regulatory years 2008–2012.

Regulatory year	Age	Length longest horn	Basal circumference largest horn
2008	4.5 (1.5–10.5)	7.8 (5.4–9.3)	--
2009	4.6 (1.5–9.5)	8.0 (5.8–8.8)	--
2010	5.8 (0.5–10.5)	8.2 (2.3–9.5)	4.6 (3.6–5.4)
2011	4.8 (1.5–9.5)	7.9 (5.6–9.1)	4.6 (3.1–5.6)
2012	4.5(1.5–8.5)	8.5 (7.1–9.1)	5.0 (4.1–5.4)
Average	4.9	8.2	4.7

3. Habitat Assessment-Enhancement

ACTIVITY 3.1. Conduct mountain goat summer habitat field surveys.

Data Needs

Characterize mountain goat diets and assess the relative quality of the food items goats are consuming and how or if quality varies spatially. A goal of this research is to address how forage quality varies across the island in order to help explain and predict population variability across the island.

Methods

During June and July of 2016, 2017, and 2018 research and management staff collected 44 vegetation samples from 11 commonly consumed mountain goat forages from 9 different alpine locations on and near Baranof Island. Samples were sent to the Washington State University – Wildlife Nutritional Analysis Laboratory for analysis. All samples were successfully analyzed for digestible energy and protein concentration.

Results and Discussion

Results from a microhistology analysis are available (Appendix B) but we are still awaiting genetic-based diet analysis.

Recommendations for Activity 3.1

Continue.

NONREGULATORY MANAGEMENT PROBLEMS OR NEEDS

Data Recording and Archiving

Aerial Surveys - All records and data analysis related to mountain goat aerial surveys are archived on network servers in the Douglas, Region I, office. Hard copy files are located in the

Area Biologist's files as well as stored electronically on the Region 1 mountain goat researcher's desktop.

Hunt Reports – all data derived from mountain goat hunt reports are archived electronically in WinfoNet.

Horn sealing data is stored in the Sitka Area Biologist's desktop and backed up to local servers (S: drive).

Agreements

ADF&G and the U. S. Fish & Wildlife Service, Office of Subsistence Management, have agreed to manage both the state and federal mountain goat hunt in Unit 4 using the State of Alaska's RG150 permit hunt and following the state's permit hunt conditions. Season dates are concurrent and the U.S. Forest Service issues emergency orders in conjunction with ADF&G. Bag limits are the same; however, federally qualified hunters can hunt mountain goats for other federally qualified rural residents under the federal designated hunter program (see Federal Subsistence Management Regulations for the harvest of wildlife on federal public lands in Alaska at www.doi.gov/subsistence).

Permitting

None

Conclusions and Management Recommendations

Mountain goat harvests between 1976 and 2005 annual harvests ranged between 28 and 75 goats with an average of 53. Females composed up to 50% of the harvest (Fig. 6). Severe winters with heavy snowfall between 2006 and 2009 may have reduced the island wide population by up to 50% from estimates of over 1,500 animals to 700–850. Harvests decreased annually between 2007 and 2011, reaching a low of 18 goats harvested in 2011. The average annual harvest during that 5-year period (RY07-RY11) was 29 goats and female harvest remained high at 41%. High female harvest in conjunction with severe weather likely exacerbated the population decline. The department began an aggressive educational effort in 2008 to attempt to reduce the take of female goats but these efforts had minimal effect on reducing female harvest. In 2011, the mountain goat management strategy was revised. The island was divided into 9 hunt zones, quotas for each zone were established, female harvest was limited with the “one and done” strategy, and many core areas were closed to the taking of mountain goats. These efforts in conjunction with several consecutive mild winters kickstarted the recovery of the Baranof Island goat population. Harvests have been steadily increasing beginning in 2012 and female harvest has been reduced to approximately 11% of the harvest (RY12–RY18, Fig. 6). In response to findings from research initiated in 2011 and the apparent recovery of the goat population, a new harvest strategy was implemented for the 2017 season. This strategy aims to expand harvest opportunities for billies, spread harvest spatially, and continue to reinforce keeping female harvest to a minimum. To date, this new strategy appears to be successful and has received considerable support from the local hunting community. Anecdotally, it appears there has been a

“culture shift” within the goat hunting community where it is now considered socially unacceptable to purposefully harvest a nanny.

This new strategy requires a much higher level of active in-season management than what has occurred historically. However, the workload appears sustainable, and the strategy has enough adaptability to respond to changing conditions to allow managers to increase or decrease harvest opportunity and maintain sustainability. In addition, the robust ongoing research of mountain goats in Southeast Alaska continues to increase our knowledge of population dynamics, which directly influences this adaptive management approach.

Management objectives were met during this reporting period. Total harvest, female harvest, and percentage of females in the harvest were all well within management objectives. Confidence intervals for island wide population estimates exceeded 1,500 goats and the population is continuing to trend upward.

Mountain goat populations are highly variable in regard to predation rates, weather patterns, survival, fecundity, and hunt management. It is important for managers to be adaptive and tailor hunt strategies to their specific herds. Department wildlife managers feel that the current Baranof Island strategy strikes a good balance between conservatism and providing optimum opportunity while providing the flexibility to adjust hunt management based on changes in the population. Smith (1984) summarized goat management well when he stated that goat harvest philosophy should be entirely different than for other ungulates, recognizing that goats may not be as resilient as other ungulates and there may simply be times when goat populations can withstand additive mortality and times when they cannot. Traditional sustained yield principles (Caughley 1977) may be inappropriate. In reality, the number of hunters on Baranof Island physically capable of successfully hunting mountain goats is limited. Goat hunting on Baranof Island is extremely difficult. There are no alpine landing areas and few alpine lakes suitable for float planes. Hunters must climb 3,000–4000 feet from salt water through spruce forests and alder slides and may have to traverse 3 to 5 miles to reach goats. Most of Baranof goat habitat is extremely steep and rugged. Successful hunters are rewarded with a trek back to their boat with up to 85 pounds of meat, plus hide, horns, and camping gear. Goats on Baranof do not produce Boone and Crockett sized trophy horns so it is unlikely Baranof will ever become a highly sought destination for nonresident and nonlocal hunters. If female harvest rates remain low, the difficulty of hunting goats on Baranof Island means that sport hunting will likely be a minimal factor in regulating or controlling goat numbers (ADF&G 1976).

It is worth commenting on the “one and done” policy. This policy was first implemented by former ADF&G Area Biologist Phil Mooney for the RY11 season and has been the most effective strategy for reducing female mountain goat harvest ever implemented in Alaska. At that time there were many areas of population concern, and any additional female harvest was likely to have negative impacts. Female harvest rates the previous several years had been approaching 50%. The strategy was a way to allow some areas to remain open to hunting despite justification to close other areas. Because the strategy has been so effective in reducing female harvest in contrast to other strategies, such as a 5-year prohibition on goat hunting on the Kenai Peninsula (McDonough and Selinger 2006), the strategy has been retained even for areas where harvest of one female no longer represents a significant population concern. Baranof Island goat hunters have largely responded positively to this strategy and maintaining the policy helps encourage a

culture of selecting for billies. This “culture shift” could be critical in the future if populations return to low levels again and there is increased biological justification for limited nanny take. In addition, ensuring low female harvest creates more harvest opportunity via male harvest. In summary, the “one and done” policy has been retained not necessarily because there are current population concerns but because it is an effective tool to reduce female harvest and maintain high harvest opportunities for males. It helps keep hunters focused on avoiding female harvest. Maintaining high male harvest opportunities is desirable in areas that have good access as it allows more people to participate in a hunt that is otherwise very difficult to access over a vast majority of its range. However, in remote areas of the island with large subpopulations and historically low harvests, managers are exploring options to relax the “one and done” policy. In these cases, it may be excessively restrictive to close an area where there is no biological justification to do so.

II. Project Review and RY18–RY22 Plan

Review of Management Direction

MANAGEMENT DIRECTION

The existing management direction and goals appropriately direct the management of mountain goats in Unit 4. The management direction for Unit 4 ensures that mountain goats will persist as part of the natural ecosystem and ensures continued hunting and viewing opportunities. There is no indication that the long-term sustainability of the mountain goat population or that goals for human uses cannot be met. Therefore, the RY18-RY22 plan will be to continue management practices outlined in the RY13–RY17 management direction.

GOALS

1. To provide for a sustainable harvest of mountain goats in Unit 4.
2. To provide the greatest opportunity to participate in hunting of mountain goats in Unit 4 while maintaining aesthetically pleasing hunt conditions.
3. Provide an opportunity for nonconsumptive uses (viewing and photographing) of mountain goats in Unit 4.
4. Discourage land use practices that adversely affect mountain goat habitat.

CODIFIED OBJECTIVES

Amounts Reasonably Necessary for Subsistence Uses

The Alaska Board of Game made a negative finding for customary and traditional use of mountain goats in Unit 4 during the November 2006 Southeast Regional meeting (5 AAC 99.025(7)).

Intensive Management

Not applicable.

MANAGEMENT OBJECTIVES

1. Maintain an islandwide population in excess of 1,500 goats.
2. Monitor sex composition of the harvest and maintain the female component at <15% of the harvest or <1% of the estimated islandwide population.
3. Maintain the overall harvest rate at $\leq 4\%$ of the islandwide population.

REVIEW OF MANAGEMENT ACTIVITIES

1. Population Status and Trend

ACTIVITY 1.1. Monitor the mountain goat population in Unit 4.

Data Needs

Current management strategies for mountain goats in Unit 4 rely on annual population monitoring. ADF&G will continue to collect information on total population, population per hunt zone, adult to kid ratios, sightability, survival and fecundity.

Methods

Traditional aerial mountain goat surveys will be conducted annually. Biologists will attempt to survey the entire island but at a minimum will survey the core area, also referred to as areas consistently surveyed each year.

2. Mortality-Harvest Monitoring

ACTIVITY 2.1. Monitor mountain goat harvests through mandatory sealing.

Data Needs

Unit 4 mountain goats are managed in-season via quotas per hunt zone based on recent population estimates. Therefore, timely hunter reporting of harvest is crucial for not going over harvest objectives in each zone, particularly in regard to female harvest. Anecdotal information about hunt conditions and populations is collected from hunters as well.

Methods

ADF&G will continue to collect harvest data by sealing mountain goats harvested by hunters. Managers will record location and date of harvest, method of take, mode of transportation, measure horns (total length, basal circumference, inter horn width and annuli increments), verify sex, collect DNA tissue samples, and collect nasal swabs as part of ADF&G's on-going *Mycoplasma ovipneumoniae* (M. ovi) surveillance (<https://www.adfg.alaska.gov/index.cfm?adfg=hottopics.movi>). Sealing must occur by ADF&G within 5 days of harvest. These data will be entered into an ADF&G database (WinfoNet). Harvest data will be summarized by regulatory year (RY), which begins 1 July and ends 30 June (e.g., RY15 = 1 July 2015–30 June 2016).

ACTIVITY 2.2. Measure mountain goat horns for trends in growth and size.

Data Needs

Age and horn growth data give the department information on age classes being harvested and information to track horn size over time. Age class of mountain goats harvested helps indicate hunter preference and is an index to the age structure of the goats being harvested. Horn measurements help managers understand trends in harvest and the overall health of the herd through the measurement of annuli.

Methods

No changes to RY13–RY17 methods.

3. Habitat Assessment–Enhancement

ACTIVITY 3.1. Conduct mountain goat summer habitat field surveys.

Data Needs

Characterize mountain goat diets and assess the relative quality of the food items goats are consuming and how or if quality varies spatially.

Methods

Research and management biologists will continue to collect vegetation samples from commonly consumed mountain goat forages from alpine locations on Baranof Island. Samples will be sent to the Washington State University – Wildlife Nutritional Analysis Laboratory for analysis. All samples will be successfully analyzed for digestible energy and protein concentration.

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and the U.S. Forest Service issues emergency orders in conjunction with ADF&G. Bag limits are the same; however, federally qualified hunters can hunt mountain goats for other federally qualified rural residents under the federal designated hunter program (See Federal Subsistence Management Regulations for the harvest of wildlife on federal public lands in Alaska at www.doi.gov/subsistence).

Permitting

None

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Unit 4 RG150 Mountain Goat Hunt FAQs

Q: Why did ADF&G create new hunt zones?

A: Dividing Baranof Island into more zones allows biologists to manage at the subpopulation level, which should afford hunters more opportunities and reduce the possibility of localized overharvest. Under the previous management strategy, quotas were based on larger geographical areas, which sometimes included several subpopulations. The quota for a large zone could be reached after several goats were taken from a small area around a single access point. That resulted in the large area being closed while additional harvest opportunity remained in more remote portions of that larger zone. This new strategy of subdividing large zones is providing more opportunity for hunters by allowing more remote zones to stay open after zones with easier access close.

Q: How were the zone boundaries determined?

A: A variety of factors were taken into account: 1) GPS collar data was used to identify subpopulations and their general ranges, 2) historical aerial survey zones were incorporated to provide continuity of previous survey data, 3) harvest records were used to identify primary access locations, 4) geographical features prohibitory to goat movements such as large valley bottoms or steep ridges were used when possible, 5) distinct geographical features to help hunters identify boundaries in the field, and 6) local knowledge from experienced Baranof Island goat hunters were all taken into consideration. Our goals were to create boundaries that encompassed subpopulations of goats and that hunters could readily identify in the field.

Q: Will the zone boundaries change again?

A: Under RG150, hunt zone boundaries are discretionary for the area management biologist, so changes are possible. Part of wildlife management is being adaptive, allowing for changes to best respond to the situation. However, year to year continuity and tradition is a goal of managers, so it is our hope that these boundaries will remain long-term. A great amount of time and effort has been spent to insure these boundaries are appropriate. No changes will be made without adequate notice.

Q: Does the increased number of zones mean the nanny harvest can increase?

A: ADF&G and US Forest Service biologists would like to see the take of nannies remain low, similar to what it has been in the recent past. Goat populations are slow to grow or rebuild and vulnerable to over-harvest, particularly overharvest of nannies. Nannies do not breed until they are four to six years old and twins are rare. A critical component to the Baranof Island goat population recovery and our ability to implement this new management strategy is hunters' proven ability and willingness to select billies over nannies. ADF&G will continue to educate and encourage hunters to select billies, and implement management actions to keep the nanny harvest at low levels, including emergency closure of a zone when one nanny is harvested.

Hunters who select billies are actively participating in the sound management of goats and creating more opportunities for themselves and other hunters in the future.

Q: What if more than one nanny is harvested in a zone before it can be closed by emergency order?

A: Managers will attempt to implement necessary emergency orders as soon as practical and re-evaluate population levels on an annual basis. If a zone is over-harvested one year, it may be necessary to limit harvest in subsequent years.

Q: Why retain the “One and Done” policy, especially with high populations on Baranof Island?

A: This strategy has been the most effective for reducing female mountain goat harvest ever implemented in Alaska. When implemented in 2011, there were many areas of population concern and any additional female harvest was likely to have negative impacts. The strategy was a way to allow some areas to remain open to hunting despite justification to close more areas. Because the strategy has been so effective in reducing female harvest it has been retained even for areas where harvest of one female no longer represents a significant population concern. Baranof Island goat hunters have largely responded positively to this strategy and maintaining the policy helps retain a culture of selecting for billies. This “culture shift” could be critical in the future if populations return to low levels and there is increased biological justification for limited nanny take. In addition, ensuring low female harvest creates more harvest opportunity via male harvest. In summary, we have retained the one and done policy not necessarily because we currently have population concerns but because it is an effective management tool. It helps keep hunters focused on avoiding female harvest. It also maintains high male harvest opportunities in areas that have good access, allowing more people to participate in a hunt that is otherwise difficult to access over a vast majority of its range.

Q: Areas of Baranof Island are not included in a hunt zone; can I harvest a goat in these places?

A: Although goats explore unoccupied areas, some parts of Baranof Island likely are not goat habitat, and may never support hutable subpopulations. Therefore, we did not include them as hunt zones. If you encounter a goat in one of these closed areas, you may not shoot it. Those goats are likely dispersers and if they survive, can contribute to gene flow and colonization of unused habitat. Sitka ADF&G is interested in your pictures and videos of goats in unusual locations.

Q: Is Blue Lake going to open?

A: Hunt zones north (Clarence Kramer) and east (Upper Blue Lake) of Blue Lake opened again in 2017. These areas had not had an open season since 2010. These areas had been closed from 2011-2016 because of previous high harvests, especially females, and the relative ease of access making goats vulnerable to overharvest. In addition to the Blue Lake zones, the Mt. Katlian Zone also opened in 2017. This area had been closed since 2010 and has historically been a popular goat hunting area. Managers will closely monitor harvests in these particular zones and take conservative actions when necessary.

Q: Why are some zones closed to hunting?

A: ADF&G manages goats on a system of 6 goat “points” per every 100 goats in the subpopulation; a billy counts as 1 point, a nanny counts as 2 points. Different area offices use slight variations of this strategy depending on their unique situation. Hunt managers determine a quota or number of allowable harvest points per zone prior to the season based on survey information. On Baranof, managers have determined that a zone needs to have a subpopulation capable of supporting a harvest of 2 points (or one female). This equates to a minimum subpopulation size of about 30-35 goats.

Q: What happens if a zone closes while I am in the field?

A: ADF&G strives to provide adequate notice to hunters prior to closing a hunt area. Emergency orders (EOs) for RG150 hunt zones are usually announced 48-72 hours before they become effective. An EO may also be issued prior to a quota being met in anticipation of additional harvest from hunters currently in the field. While ADF&G makes every effort to notify hunters of emergency orders, it is also the hunter’s responsibility to stay up to date on current closures.

Q: How do I find out which zones are open or closed?

A: The easiest way is to visit the ADF&G office in Sitka. Notices and maps will be available to the public. They will also be posted to the ADF&G website and at harbor ramps and vendors in town. If you are on our voluntary email distribution list, you will be notified via email when announcements are made. Please contact the ADF&G office in Sitka (747-5449) to be added to this distribution list.

Q: Is it okay to harvest collared goats?

A: Every collared mountain goat represents approximately \$7,000 worth of equipment, salary and helicopter time as well as some level of risk to personnel involved in the captures. It is an extreme effort. The information collected from these goats is invaluable in our efforts to provide you with the highest quality goat hunting opportunity as well as the highest level of mountain goat conservation in North America. We sincerely appreciate your willingness to pass on opportunities to harvest collared animals. If a collared goat is harvested, the hunter is required to submit the collar to the Sitka ADF&G office.

Q: How many collared goats are there now? Are you planning to collar more?

A: Researchers attempt to maintain about 30 goats “on air” annually. Some things we learn from our collaring efforts include: home ranges, travel corridors, seasonal movement patterns, adult survival, kid recruitment, and survey sightability. We also collect biological samples and take morphological measurements that are used for DNA analysis, disease monitoring, habitat quality assessments, and a number of other analyses. We plan to continue collaring goats as funding research priorities allow.

Q: What does Benchmark mean?

A: The Nelson Bay and Red Bluff Bay zones use the term, “benchmark”, as part of their description. This is a U.S. Geological Survey (USGS) monument set in the ground as a survey marker.

Appendix B. Nutritional characteristics of alpine plants collected during June–July 2016–2018 on Baranof Island, Alaska.

Species	Location	Date	%CP	GE (cals/g)	DP (g/100g)	%DDM	%DE	DE (kcal/g)
<i>Athyrium filix-femina</i>	Harbor Mtn	7/17/18	14.2	4720	9.3	57.2	57.1	2.7
<i>Carex macrochaeta</i>	Bear Lake	7/5/16	16.8	4892	11.7	64.9	65.1	3.2
<i>Carex macrochaeta</i>	Gavan Hill	6/30/17	13.1	4604	8.3	74.3	74.9	3.4
<i>Carex macrochaeta</i>	Glacial River	6/25/18	16.5	4734	11.5	76.5	77.1	3.6
<i>Carex macrochaeta</i>	Goat Lake	6/24/18	16.3	4757	11.3	75.3	75.9	3.6
<i>Carex macrochaeta</i>	Harbor Mtn	7/4/16	16.4	4793	11.4	61.0	61.0	2.9
<i>Carex macrochaeta</i>	Harbor Mtn	7/17/18	12.2	4582	7.4	73.9	74.5	3.4
<i>Carex macrochaeta</i>	Lake Diana	7/5/17	16.4	4746	11.3	73.5	74.0	3.5
<i>Carex macrochaeta</i>	Lake Diana	7/6/17	20.4	4865	15.0	72.3	72.8	3.5
<i>Carex macrochaeta</i>	Mt Edgecumbe	7/13/18	13.4	4983	8.6	75.6	76.2	3.8
<i>Carex macrochaeta</i>	Mt Edgecumbe	7/13/18	17.0	4835	11.9	75.2	75.8	3.6
<i>Carex macrochaeta</i>	Starrigavan	7/3/16	15.7	4796	10.7	64.5	64.7	3.1
<i>Carex macrochaeta</i>	Verstovia	6/29/17	19.1	4683	13.9	75.5	76.1	3.5
<i>Cornus canadensis</i>	Lake Diana	7/6/17	7.7	4398	3.3	73.5	74.0	3.2
<i>Epilobium angustifolium</i>	Harbor Mtn	7/17/18	18.0	4612	12.9	78.5	79.2	3.6
<i>Epilobium angustifolium</i>	Lake Diana	7/6/17	21.1	4635	15.7	79.1	79.8	3.7
<i>Geum calthifolium</i>	Lake Diana	7/6/17	10.6	4472	6.0	76.8	77.4	3.4
<i>Juncus mertensianus</i>	Bear Lake	7/5/16	13.4	4861	8.6	60.5	60.5	2.9
<i>Juncus mertensianus</i>	Harbor Mtn	7/17/18	12.1	4809	7.4	69.2	69.6	3.3
<i>Juncus mertensianus</i>	Lake Diana	7/5/17	12.2	4872	7.4	68.9	69.2	3.4
<i>Juncus mertensianus</i>	Starrigavan	7/3/16	13.4	4787	8.6	59.7	59.6	2.9
<i>Lupinus nootkaensis</i>	Bear Lake	7/5/16	22.9	4994	17.3	68.9	69.2	3.4
<i>Lupinus nootkaensis</i>	Harbor Mtn	7/4/16	23.1	5112	17.5	65.8	66.0	3.4
<i>Lupinus nootkaensis</i>	Harbor Mtn	7/17/18	26.7	4972	20.9	76.2	76.8	3.8
<i>Lupinus nootkaensis</i>	Lake Diana	7/5/17	24.8	5040	19.2	73.2	73.7	3.7
<i>Lupinus nootkaensis</i>	Lake Diana	7/6/17	25.1	4937	19.4	74.1	74.6	3.7
<i>Lupinus nootkaensis</i>	Verstovia	6/29/17	21.8	4959	16.4	73.5	74.1	3.6
<i>Luzula parviflora</i>	MF Kelp	6/28/18	25.2	4881	19.6	71.1	71.5	3.5
<i>Nephrophyllidium crista-galli</i>	Bear Lake	7/5/16	14.9	4598	10.0	62.9	63.0	2.9
<i>Nephrophyllidium crista-galli</i>	Gavan Hill	6/30/17	19.8	4852	14.5	59.9	59.9	2.9
<i>Nephrophyllidium crista-galli</i>	Harbor Mtn	7/4/16	15.8	4685	10.8	55.8	55.6	2.6
<i>Nephrophyllidium crista-galli</i>	Harbor Mtn	7/17/18	7.6	4695	3.2	74.3	74.9	3.5
<i>Nephrophyllidium crista-galli</i>	Lake Diana	7/6/17	17.6	4765	12.5	70.2	70.6	3.3
<i>Nephrophyllidium crista-galli</i>	MF Kelp	6/28/18	18.1	4883	13.0	68.8	69.1	3.4
<i>Nephrophyllidium crista-galli</i>	Mt Edgecumbe	7/13/18	13.6	4762	8.7	76.9	77.5	3.7
<i>Nephrophyllidium crista-galli</i>	Starrigavan	7/3/16	18.1	4874	12.9	57.6	57.5	2.8
<i>Nephrophyllidium crista-galli</i>	Verstovia	6/29/17	17.9	4723	12.7	68.7	69.0	3.2
<i>Salix</i> sp.	Glacial River	6/26/18	20.2	5217	13.8	62.5	62.6	3.3
<i>Vaccinium</i> sp.	Goat Lake	6/23/18	11.4	5292	5.8	53.4	53.2	2.8
<i>Vaccinium</i> sp.	Lake Diana	7/6/17	15.9	5176	10.9	58.2	58.1	3.0
<i>Vaccinium</i> sp.	MF Kelp	6/27/18	16.9	5220	10.8	70.5	70.9	3.7
<i>Vaccinium</i> sp.	Mt Edgecumbe	7/13/18	13.4	5150	8.6	62.3	62.4	3.2
<i>Vaccinium</i> sp.	Verstovia	6/29/17	14.8	5271	9.9	51.3	51.0	2.7

