Species Management Report and Plan ADF&G/DWC/SMR&P–2025–48

Mountain Goat Management Report and Plan, Game Management Unit 6:

Report Period 1 July 2018–30 June 2023, and

Plan Period 1 July 2023–30 June 2028

Charlotte L. Westing

2025

Alaska Department of Fish and Game Division of Wildlife Conservation

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

This species management report and plan was reviewed and approved for publication by Jeffery S. Selinger, Management Coordinator for Region II 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 mountain goats (*Oreamnos americanus*) in Game Management Unit 6 for the 5 regulatory years 2018–2022 and plans for survey and inventory management activities in the next 5 regulatory years, 2023–2027. A regulatory year (RY) begins 1 July and ends 30 June (e.g., RY18 = 1 July 2018–30 June 2019). 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 mountain goat management report of survey and inventory activities that was previously produced every 3 years.

I. RY18–RY22 Management Report

Management Area

Unit 6 covers approximately 10,140 mi^2 of land, including Prince William Sound, the Copper River Delta, and the North Gulf Coast of Alaska (Fig. 1). Unit 6 is divided into 4 administrative units (6A, 6B, 6C, and 6D), which are also referred to as subunits. Terrain includes rugged mountains, old-growth forest, coastal wetlands, and muskeg meadows.

Summary of Status, Trend, Management Activities, and History of Mountain Goats in Unit 6

Mountain goats are endemic to the mainland in Unit 6, and Bainbridge, Culross, and Knight islands. Their presence was documented in one or more of these areas by Captain Cook in 1785 (Beaglehole 1966), Edmond Heller in 1908 (Heller 1910), and Cordova district staff in contributions to Alaska Game Commission reports (Clarence Rhode, Alaska Game Commission 1938; Fred Robards, Alaska Game Commission 1952). Robards estimated a population size of 4,350 goats between Cape Fairfield and Bering Glacier, which includes most of Unit 6. Coastal mountain goat populations were reduced by hunting pressure during much of the twentieth century, probably starting in the 1940s when Art Sheets (former Alaska Territorial wildlife biologist in Cordova) reported that military personnel stationed in Whittier reduced goat numbers in Port Wells. Goat numbers remained low during the late 1970s and 1980s because of hunter harvest (Griese 1988a) and predation (Reynolds 1981, Griese 1988b).

Habitat for mountain goats includes steep escape terrain for refuge from predators in proximity to areas with adequate forage. In the spring, goats utilize avalanche chutes and low elevation south-facing slopes. During the summer when most of the snowpack has melted, they use the high elevation alpine and subalpine habitats. Deep winter snow pushes goats into heavily forested areas or to windswept slopes with little snow cover. During some heavy snow events, goats may even descend to forested coastlines (Fox et al. 1989). While winter snow depth can influence goat survival, hot summer temperatures may also affect survival the following winter (White et al. 2011).

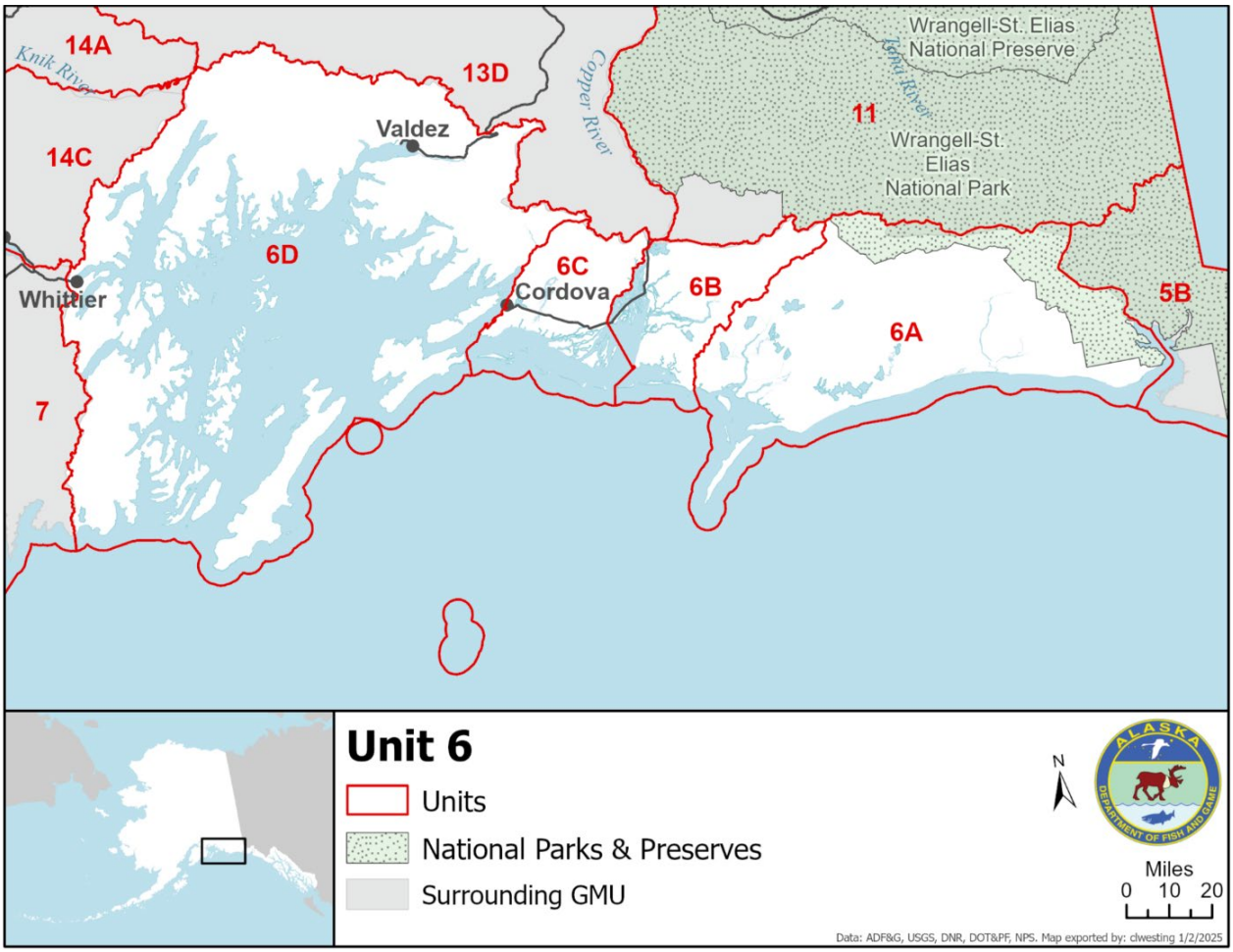

Figure 1. Game Management Unit 6 administrative units, Southcentral Alaska, regulatory years 2018–2022.

Goats are considered generalist feeders, taking advantage of a wide range of foods including alder, rhizomes, new shoots of ferns, early emergent sedges, and forbs. Winter diet is severely limited but may include conifers, mosses, lichens, shrubs, forbs, ferns, and grasses (Fox and Smith 1988).

Mountain goats exhibit lower fecundity compared to other ungulates. Females generally do not reach sexual maturity until 4 years of age and rarely produce twins. The mean number of kids produced in a nanny's lifetime averages 5–6 goats (Festa-Bianchet and Cote 2008). Monitoring the number of kids per 100 adults gives managers an indication of population robustness. Observations of 15–17 kids per 100 adults may indicate stability. Observations above or below this range may indicate growth or decline respectively.

Harvest management evolved and important lessons were learned as biologists recognized the need to manage mountain goats based on small geographic units to reduce harvest and to distribute hunting pressure (Foster 1977). Long seasons with bag limits of 1–2 goats were in effect from statehood through 1975. The bag limit was reduced to 1 goat in 1976, and the first permit hunt was established in 1980. By 1986, the present system of registration permit hunts

was in place. By 1987, the goat population had declined to 3,400 and continued decreasing to 3,000 by 1994. This trend continued despite the implementation of more conservative management, such as reduced harvest and no hunting of small discreet populations of goats (<60, Nowlin 1996). Conservative harvest strategies finally allowed the population to rebound to approximately 4,000 goats by 1999.

Following the success of a tracking harvest strategy (Caughley 1977, Smith 1984) on the Kenai Peninsula (Del Frate and Spraker 1994), Nowlin (1998) established a similar strategy for Unit 6 to guide goat management decisions. The 3 important elements for implementation of the strategy were 1) improved aerial survey methods for obtaining trend information, 2) registration permit hunts allowing careful monitoring of harvest distribution and magnitude, and 3) a formalized minimum population objective of 2,400 goats for Unit 6.

The Alaska Department of Fish and Game (ADF&G) began flying aerial surveys in 1969 to determine mountain goat population size and sex and age composition. Griese (1988a) improved and standardized methods in 1986 by establishing count areas that were systematically searched. From the late 1980s to the late 1990s extensive aerial surveys were flown with most survey areas flown every year. However, since that time fuel costs have increased, and budgets have not kept pace. The current budget allows for flying only a sample of areas. Therefore, interpolation is required between survey years, which delivers questionable estimates. During RY08–RY17 the population has probably remained between 4,000 and 4,500 goats, declining during winters of heavy snow, and recovering after mild winters.

Harvests have been monitored since 1972 using hunter reports. Both successful and unsuccessful hunters have been required to report, except during 1980 through 1985, when only successful hunters reported. Annual harvest reached a historic high of 182 animals in regulatory year 1983 and declined to a historic low of 27 goats (weighted by sex) in RY96. Average harvest for the 10 years prior to this reporting period (RY08–RY17) was 40 goats; average harvest for RY98–RY07 was 38 goats.

Management Direction

Existing Wildlife Management Plans

A formal plan for goat management in Unit 6 has not been developed. Goat hunts are administered using a 3–5% harvest rate and a *goat points* system, with billies counting as 1 point and nannies counting as 2 points. The goat points system is also referred to as weighted harvest (Del Frate 1992).

Goals

Manage goat populations to provide sustained annual use by hunters and wildlife viewers.

CODIFIED OBJECTIVES

Amounts Reasonably Necessary for Subsistence Uses

Goats in Unit 6 have a positive customary and traditional use finding. The amount necessary for subsistence is 15–26 goats.

Intensive Management

There is a negative intensive management finding for goats in Unit 6.

MANAGEMENT OBJECTIVES

- Conduct aerial surveys of high priority areas at least every 3 years.
- Maintain a minimum population in Unit 6 of at least 2,400 goats.
- Use educational materials to achieve >70% males in the harvest.

MANAGEMENT ACTIVITIES

1. Population Status and Trend

ACTIVITY 1.1. Conduct aerial minimum count surveys during peak snow melt. Survey areas are selected with consideration of the length of time since the last survey, past survey quality, hunt pressure, and population trend. Classify young of the year (kids) during aerial minimum count surveys.

Data Needs

Minimum count surveys are used to determine appropriate level of harvest. Quantifying kids may help to anticipate the population trajectory and guide setting of appropriate harvest rates.

Methods

We conducted aerial surveys to estimate mountain goat population size, trend, and composition in permit hunt areas (Fig. 2). Individual hunt areas were surveyed during August and September. Surveys were prioritized based on management needs which included factors such as high harvest, high participation, or high nanny take. Each area was divided into 1 or more sample units. Further details on methods of data collection are outlined in *Unit 6 Mountain Goat Management Report* (Westing 2014).

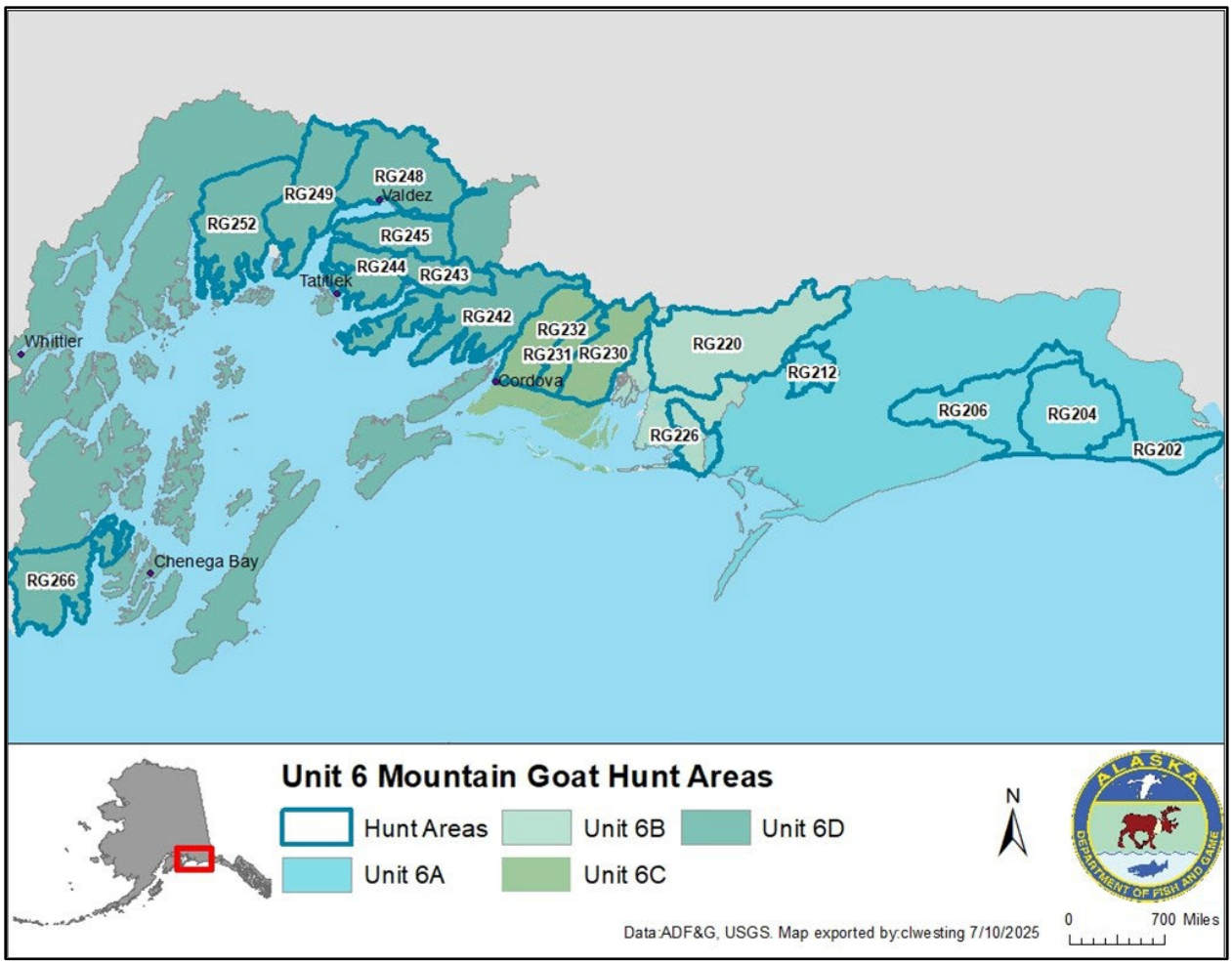

Figure 2. Mountain goat registration hunt areas in Unit 6, Southcentral Alaska, regulatory years 2018–2022.

Results and Discussion

We flew complete surveys in 10 out of 17 open permit hunt areas during RY18–RY22 (Table 1). Additionally, 2 areas were completed twice. Data from these surveys are presented with historical minimum counts for comparison in Figs. 3–12. Two of these areas (RG204 and RG206) had previously not been surveyed for more than 10 years. In 4 of the surveyed areas, the minimum count was the highest ever observed. One of the areas, RG248, had a low count that is probably related to survey conditions and not reflective of a change in the population. All other areas had survey results within the normal range.

Long gaps in goat survey data exist with some areas only very recently being updated. Therefore, estimating the unitwide goat population reliably is not possible. Compiling the most recent minimum counts for each area gives an estimate of about 4,500 goats. Recognizing that this is a conservative estimate, the actual population is probably between 4,000 and 5,500 goats.

Goat minimum counts are contextualized by considering them relative to observable suitable area surveyed (OSAS). Goat densities range from 1–6 goats observed per square mile of OSAS. Densities are highly variable, with hunt areas within each subunit representing nearly the full

range of goat densities. Considering the most recent minimum count, Unit 6A has the highest average goat density (4 goats per square mile of OSAS) and Unit 6D has the lowest average goat density (2 goats per square mile of OSAS). Goat densities in Unit 6B and Unit 6C fall between these two (almost 3 goats per square mile of OSAS in both areas).

Table 1. Most recent summer mountain goat composition and minimum counts, Unit 6, Southcentral Alaska, regulatory years 2018–2022.

Unit	Area	Regulatory year	Survey coverage	Older goats[a] (%)	Kids (%)	Kids:100 older goats[b]	Total goats observed
6A	RG202	2018–2022	None	–	–	–	–
	RG204	2018	Full	474 (85)	86 (15)	18	560
	RG206	2019	Full	423 (85)	74 (15)	17	497
	RG208	2018–2022	None	–	–	–	–
	RG212	2018–2022	None	–	–	–	–
	RG215	2018–2022	None	–	–	–	–
	Brower Ridge	2018–2022	None	–	–	–	–
6B	RG220	2018–2022	None	–	–	–	–
	RG226	2021	Full	134 (85)	23 (15)	17	157
6C	RG230	2022	Full	133 (93)	10 (7)	8	143
	RG231	2020	Full	134 (94)	9 (6)	7	143
	RG232	2019	Full	269 (84)	50 (16)	19	319
6D	RG242	2018	Full	346 (86)	56 (14)	16	402
	RG243	2018–2022	None	–	–	–	–
	RG244	2018–2022	None	–	–	–	–
	RG245	2018–2022	None	–	–	–	–
	RG248	2020	Full	69 (82)	15 (18)	22	84
	RG249	2018	Full	207 (88)	28 (12)	14	235
	RG252	2019	Full	387 (84)	72 (16)	19	459
	RG266	2018–2022	None	–	–	–	–

Note: En dashes represent where no surveys were flown in the reporting period.
[a] Older goats include yearlings.

Population Composition

In any given year, surveyed areas may show a high amount of variability with some areas showing poor kid counts (<15 kids per adult), and some showing exceptional kid counts (>20 kids per adult). This may be a result of variable snow loads, icing or avalanche conditions, or simply classification error. Low kid counts were observed during two surveys (Unit 6C in 2020 and 2022) but are impossible to interpret on a larger scale. An exceptional kid count was observed during one survey (RG248 in 2020) in this reporting period (RY18–RY22).

Recommendations for Activity 1.1.

Continue.

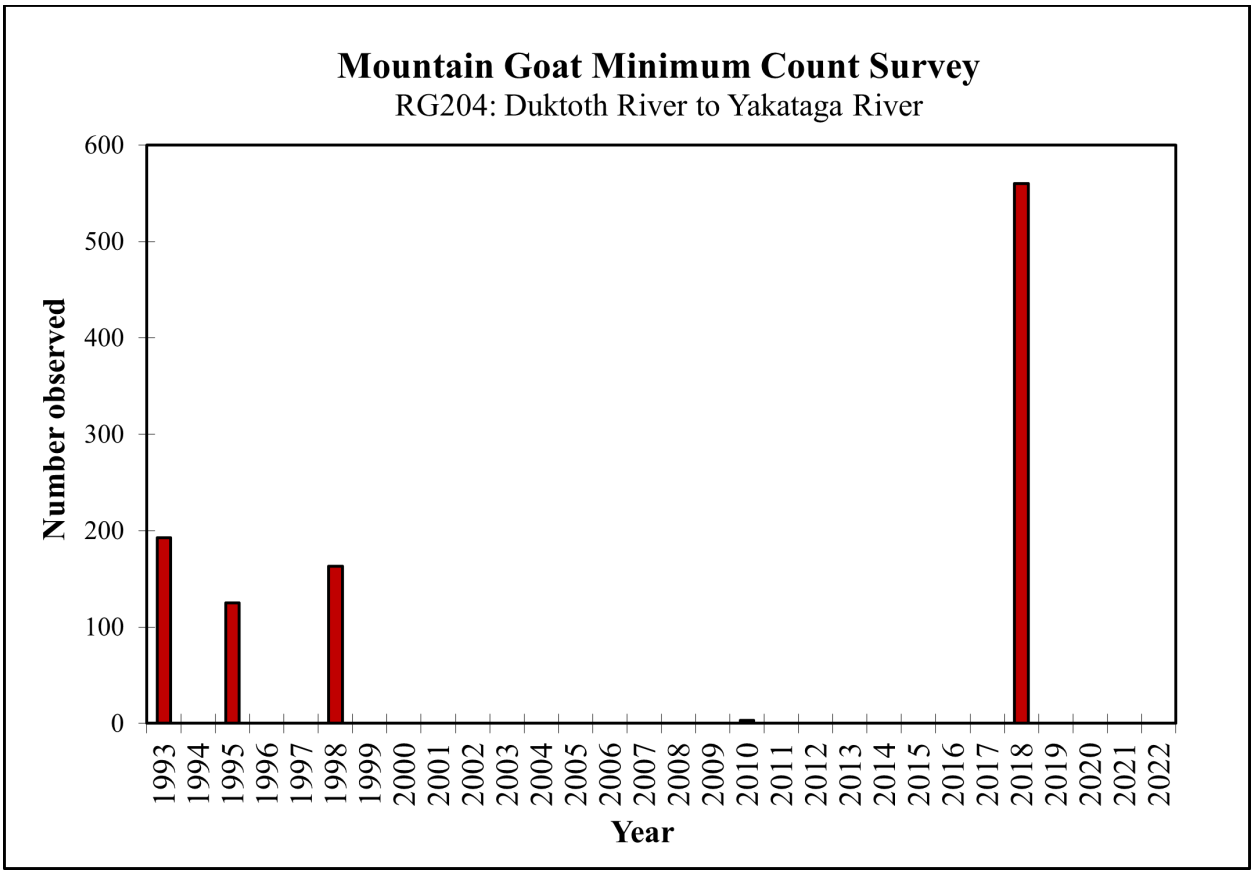

Figure 3. RG204 hunt area, Duktoth River to Yakataga River, Southcentral Alaska, mountain goat minimum count surveys conducted from 1993 to 2022.

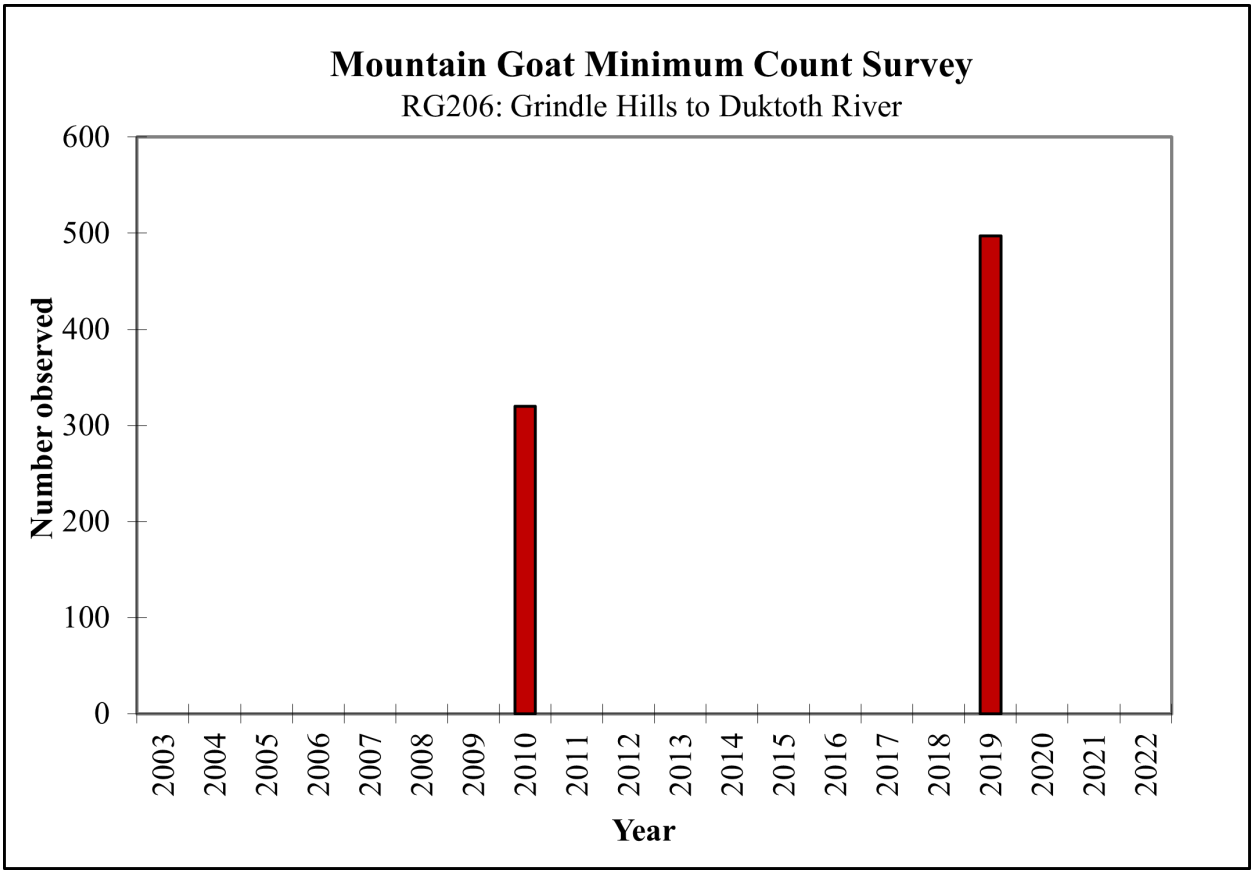

Figure 4. RG206 hunt area, Grindle Hills to Duktoth River, Southcentral Alaska, mountain goat minimum count surveys conducted from 2003 to 2022.

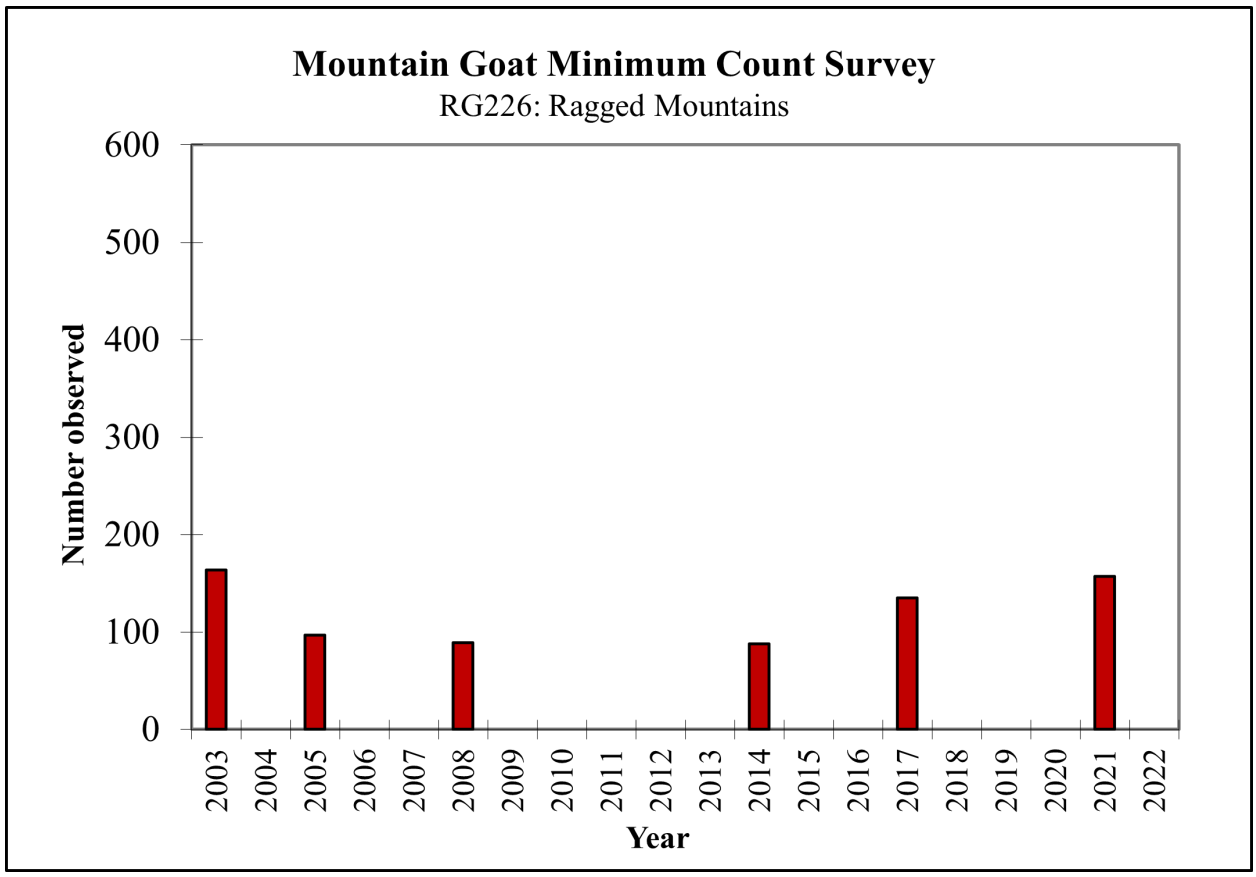

Figure 5. RG226 hunt area, Ragged Mountains, Southcentral Alaska, mountain goat minimum count surveys conducted from 2003 to 2022.

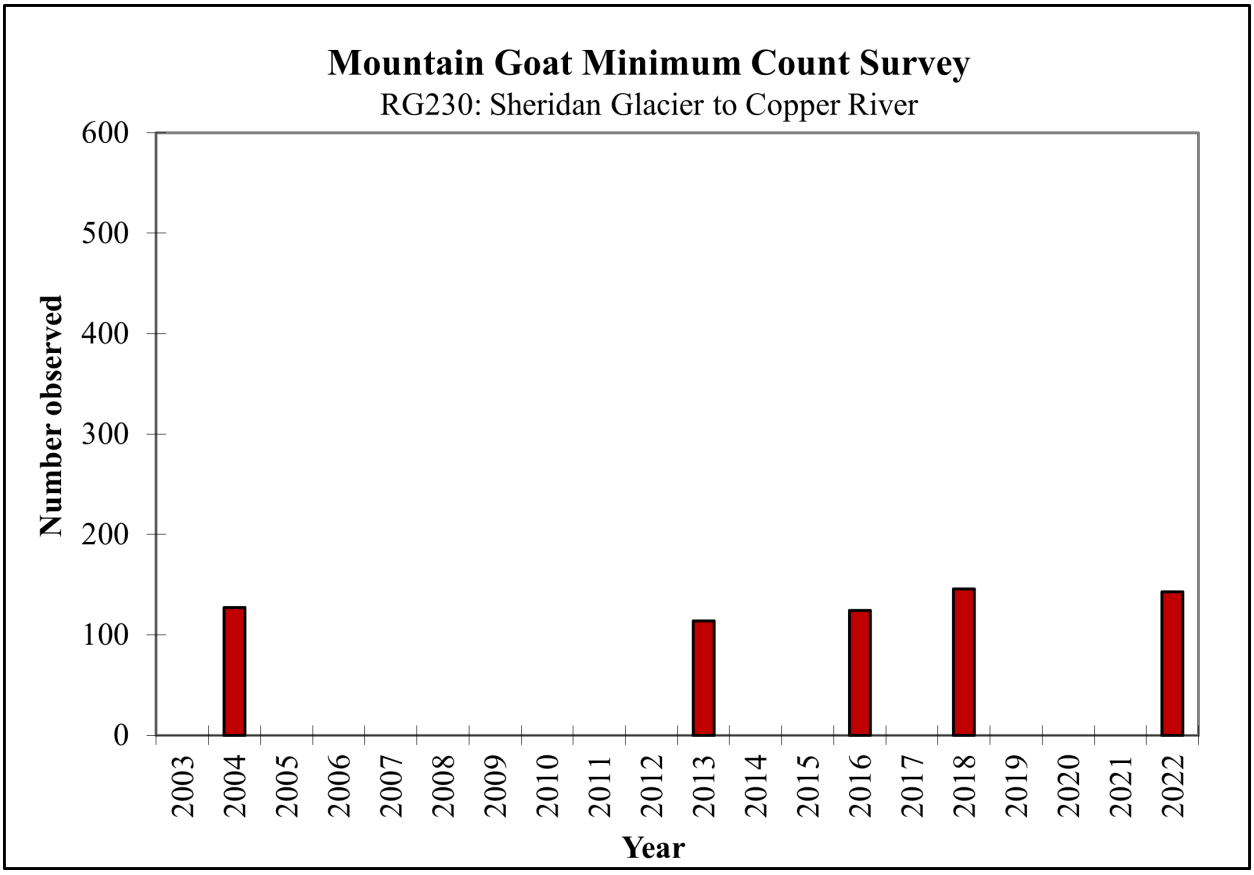

Figure 6. RG230 hunt area, Sheridan Glacier to Copper River, Southcentral Alaska, mountain goat minimum count surveys conducted from 2003 to 2022.

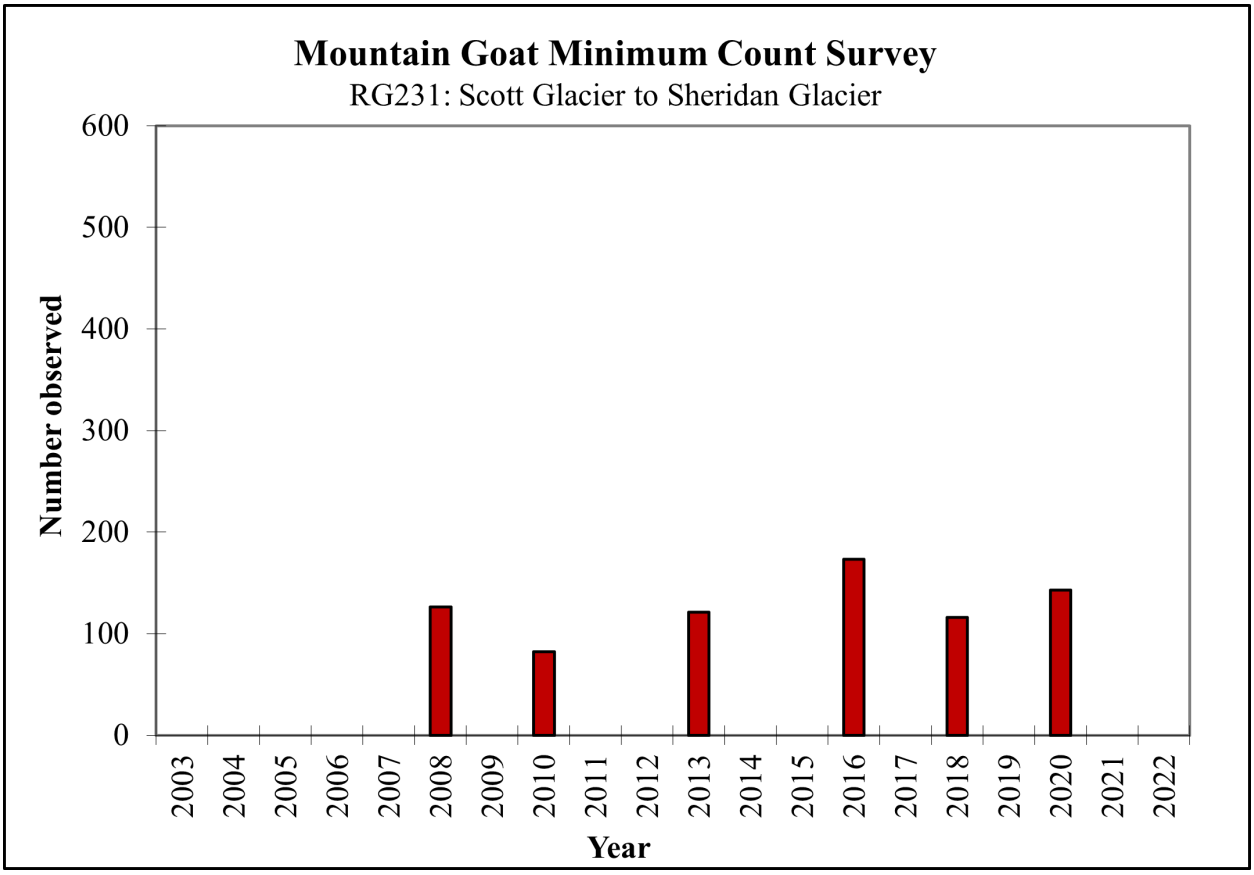

Figure 7. RG231 hunt area, Scott Glacier to Sheridan Glacier, Southcentral Alaska, mountain goat minimum count surveys conducted from 2003 to 2022.

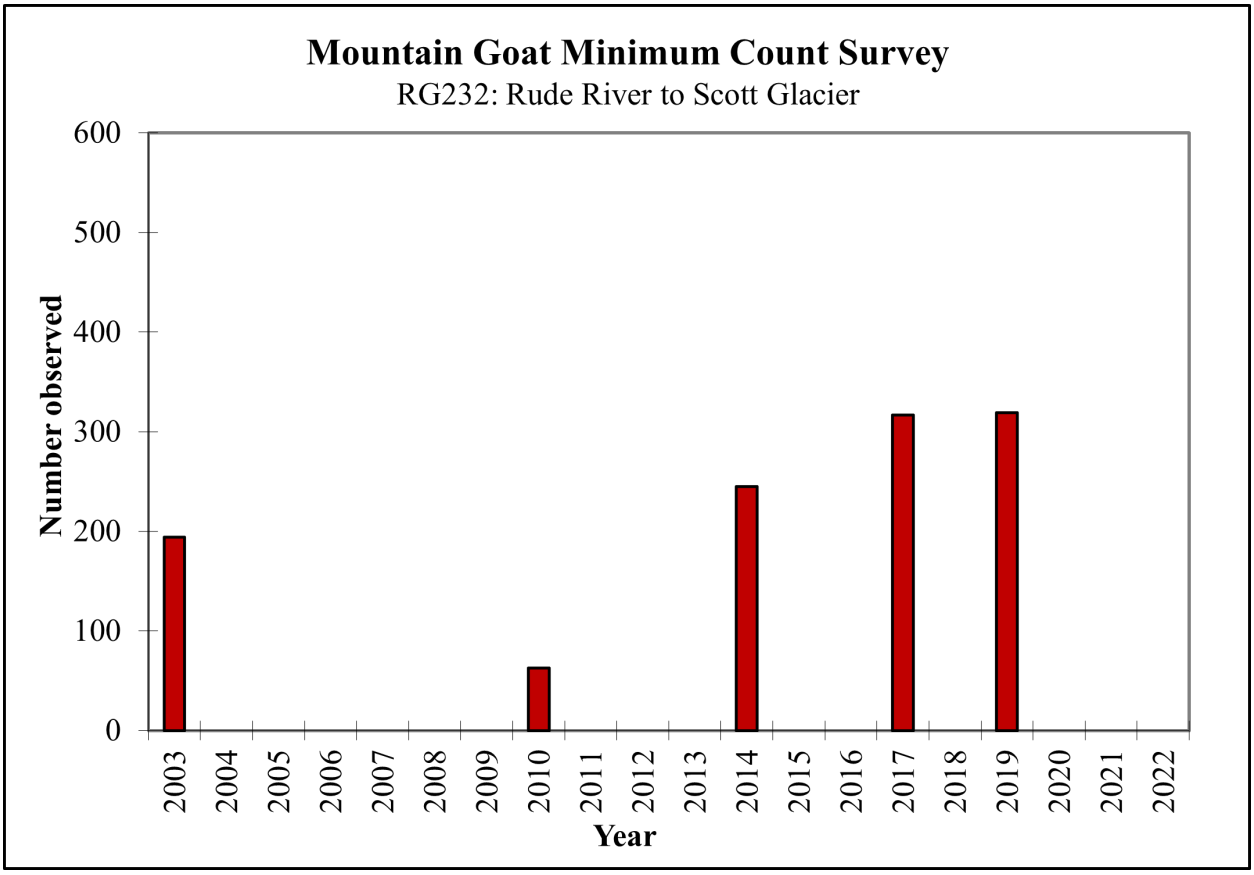

Figure 8. RG232 hunt area, Rude River to Scott Glacier, Southcentral Alaska, mountain goat minimum count surveys conducted from 2003 to 2022.

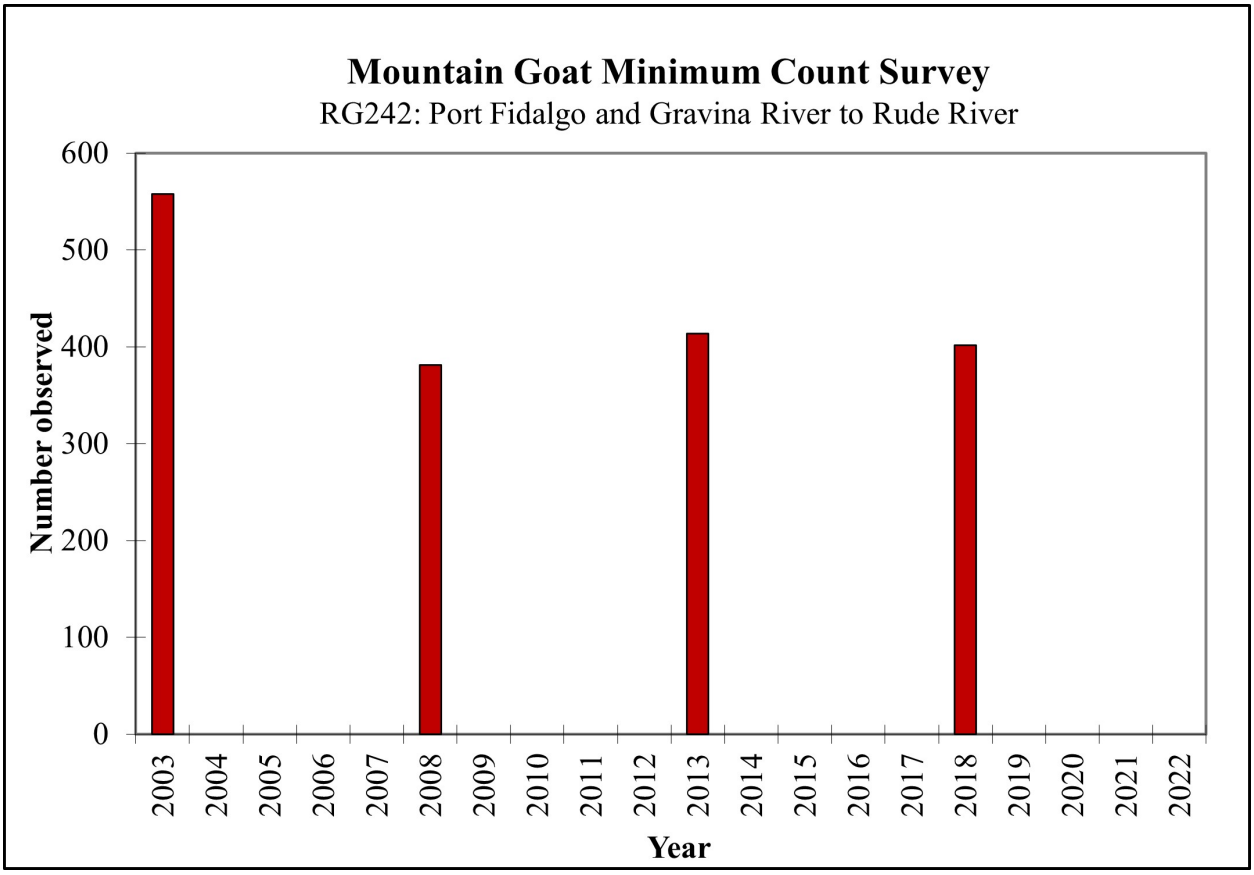

Figure 9. RG242 hunt area, Port Fidalgo and Gravina River to Rude River, Southcentral Alaska, mountain goat minimum count surveys conducted from 2003 to 2022.

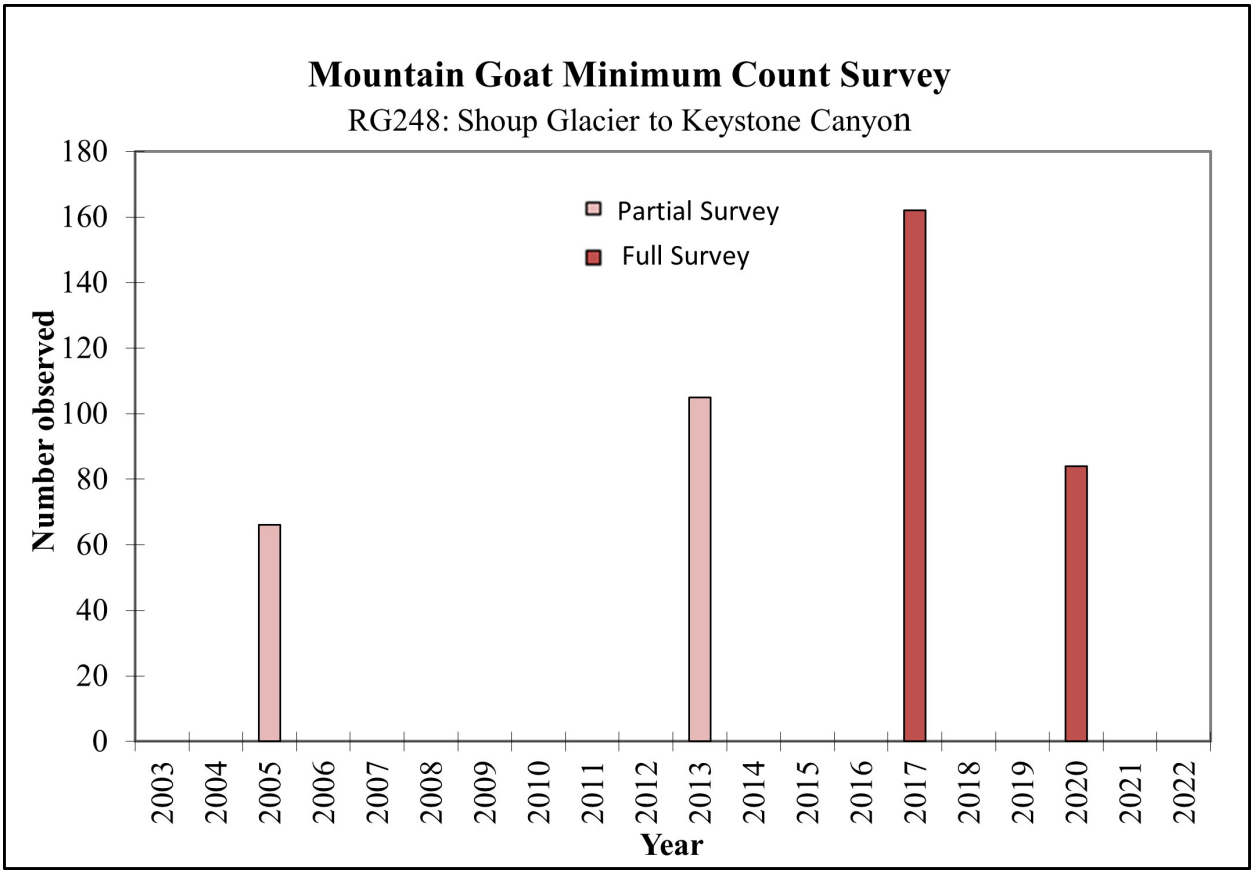

Figure 10. RG248 hunt area, Shoup Glacier to Keystone Canyon, Southcentral Alaska, mountain goat minimum count surveys conducted from 2003 to 2022.

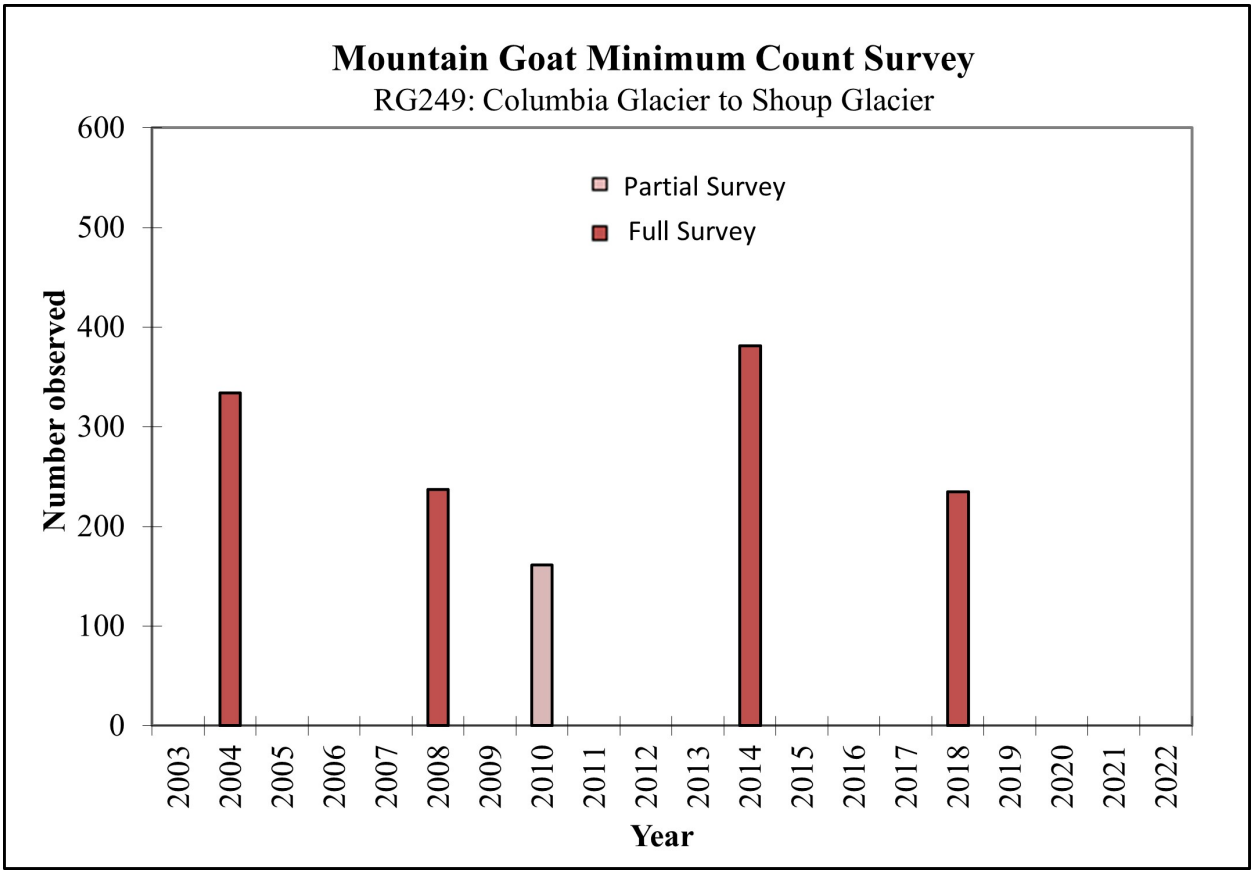

Figure 11. RG249 hunt area, Columbia Glacier to Shoup Glacier, Southcentral Alaska, mountain goat minimum count surveys conducted from 2003 to 2022.

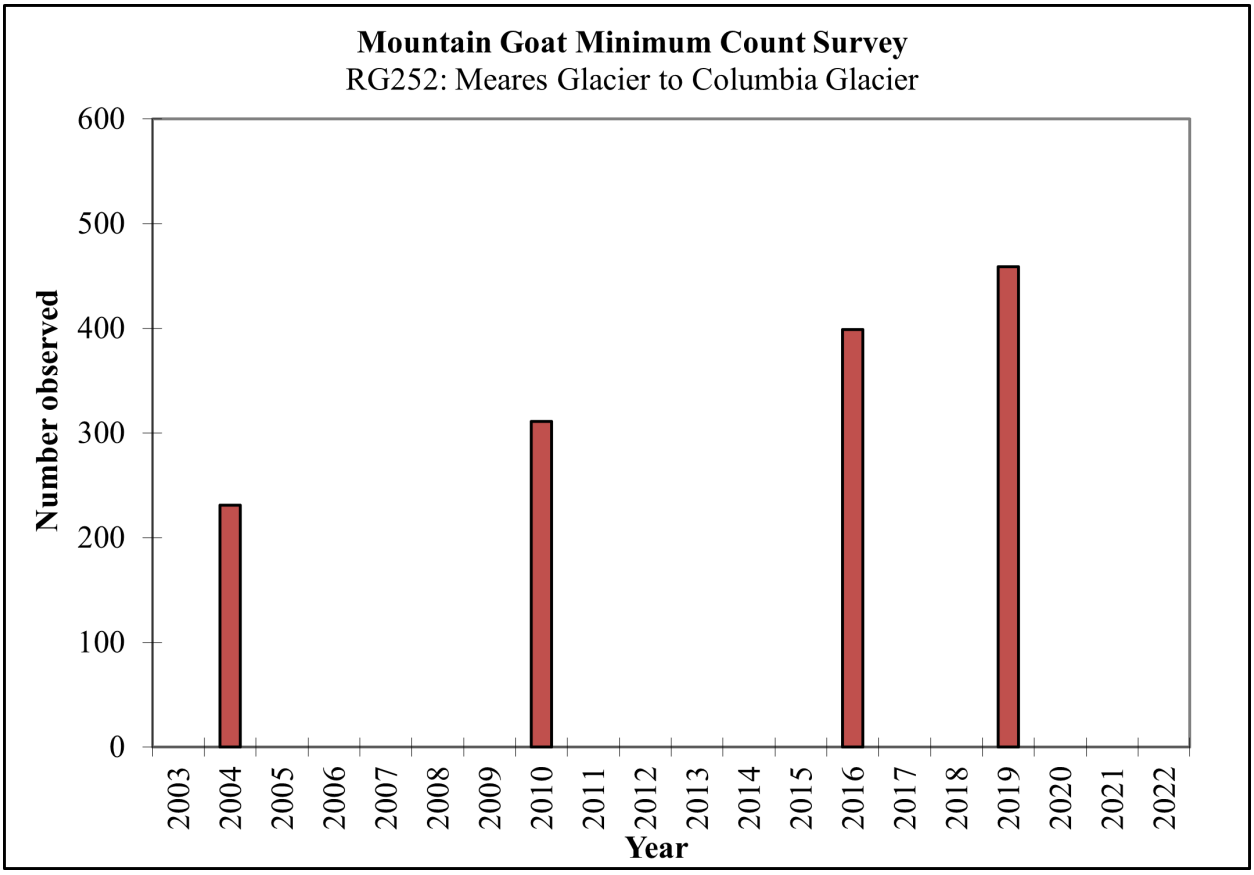

Figure 12. RG252 hunt area, Meares Glacier to Columbia Glacier, Southcentral Alaska, mountain goat minimum count surveys conducted from 2003 to 2022.

2. Mortality-Harvest Monitoring and Regulations

ACTIVITY 2.1. Monitor mortality and harvest in Unit 6 annually.

Data Needs

Annual summaries of harvest are needed to establish maximum allowable harvest (MAH) for sustained yield management.

Methods

We established MAH for each year and each permit hunt. It was calculated as a percentage of goats observed during the most recent survey. The percentage applied ranged from 3–5%, depending on count trends, nanny harvest, and elapsed time since the last survey. Permit hunts were closed by emergency order if the weighted harvest (goat points) was reached or anticipated to reach MAH.

We monitored harvest through permit hunt reports that were required from all hunters. Hunters who failed to report were sent up to 2 reminder letters per department policy. In addition to

standard ADF&G harvest parameters, we calculated a weighted total harvest by multiplying the number of females taken by 2, and lost goats or unknowns by 1.5 (unless the sex of a lost goat had been identified by a guide).

Season and Bag Limit

The mountain goat season in Units 6A and 6B (RG202–RG220) was 20 August–31 January with no seasons closed by emergency order during RY18–RY22. RG230–RG232 in Unit 6C opened 7 October, until RY22 when the season started 1 October to allow more harvest opportunity. Unit 6D (RG242–RG266) hunts, except for RG248, opened 15 September. Hunt RG248 in Unit 6D opened 1 October until the season was increased in RY21 to include the whole month of October, to allow permit holders more time to fill their permit. The RG248 hunt area was opened consistently for 10 consecutive years, and interest in that hunt area may be declining. Some areas of Unit 6D rarely closed (RG242–RG244), and in RG245 the MAH was reached variably from year to year. Three areas in Unit 6D (RG249, RG252, and RG266) nearly always closed in less than two weeks (Table 2). While at least one hunt area in Unit 6C closed each year by emergency order, in numerous years the season closed with many goats still available for harvest (Table 2). All hunts that did not close early closed 31 January by regulation. The bag limit was 1 goat, by registration permit only, for all of Unit 6. The taking of nannies accompanied by kids was prohibited. It is illegal to hunt mountain goats in Unit 6 for 5 years after shooting a nanny.

Table 2. Season length in number of days for hunt areas that were closed early during regulatory years 2018–2022, Unit 6, Southcentral Alaska.

Regulatory year	Hunt area						
	RG230	RG231	RG245	RG248	RG249	RG252	RG266
2018	116	3	138	8	13	14	18
2019	116	37	78	10	21	19	19
2020	116	28	32	10	16	22	33
2021	116	116	27	10	14	8	15
2022	74	122	138	31	15	12	19

Results and Discussion

Harvest by Hunters

Goat points (goat harvest weighted by sex) during RY18–RY22 for Units 6A and 6B were well below MAH, except for RG226, which reached the MAH in RY21 (Tables 3 and 4). In Unit 6C, the harvest in RG230 and RG232 was at or below the MAH in all years of this reporting period (Table 5). In RG231, MAH was exceeded in RY18 and RY20, but harvest was below MAH for the other three years of the reporting period. In Unit 6D, weighted harvest was at or under the MAH in all areas except RG245, RG248, RG249, RG252, and RG266 during RY18–RY22 (Table 6). In RG249, RG252, and RG266, the MAH has been consistently exceeded. The likelihood of exceeding the MAH is greatly increased by nanny harvest and/or delayed reporting. In RY22, the reporting period for hunts in Unit 6D was changed from 5 days to 3 days to improve communication about harvested animals.

Two females were taken during this reporting period (RY18–22) in Unit 6A (Table 3). There was 1 female harvested in Unit 6B during RY18–RY22. In Unit 6C, the harvest of nannies exceeded 30% in all hunt areas for 1–3 years of this reporting period (Table 5). Under discretionary permit authority, ADF&G requires that hunters participating in the RG230, RG231, RG232, and RG248 road-system based hunts complete an online hunter education program focusing on reducing the harvest of nannies. In Unit 6D, nanny harvest exceeded 30% in at least 1 of the years of the reporting period in hunts RG244, RG248, RG245, and RG266 (Table 6). However, in Unit 6 overall, the percentage of nannies in the annual harvest ranged 7–26%, which was within the objective of 30% maximum females in the harvest.

Harvest varies wildly from year to year and is largely influenced by weather. Fall weather can be dominated by small craft advisories and heavy rain. Prolonged breaks in the weather when conditions are cool and clear leads to dramatic increases in hunting by Alaskans. In Unit 6C where commercial guiding is not permitted by the U.S. Forest Service, success rates may be greatly influenced by weather. For example, success rates in RY19 (42%) and RY20 (44%), which had fair weather for hunting, were considerably higher than the following two years, RY21 (23%) and RY22 (27%), which had more typical fall weather. Harvest has been relatively stable in Units 6A, 6B, and 6C. However, harvest in Unit 6D has been steadily increasing over the last 25 years (RY98–22; Fig. 13). Much of this increase is due to higher MAH, which is due to high survey counts. High interest and high harvest resulted in seasons routinely lasting less than 20 days in some hunt areas (Table 2).

In most years, very few goats (1–2) were deemed unrecoverable by their respective hunters. However, 5 goats were reported as unrecoverable in RY19. This increase is both unusual and concerning. RY19 had an especially dry hunting season, and dry weather can attract more hunters and more novice hunters. It is unknown if that is the cause of the increase in unrecovered goats.

Permit Hunts

The number of registration permits issued during RY18–RY22 in Unit 6 is difficult to interpret because most hunters get permits for numerous areas but will only hunt one. In Unit 6A and 6D, several hunt areas saw an increase in the number of permits issued between RY21 and RY22 which may have been related to rescheduled guided hunts from RY20. (Tables 3–6). The largest number of permits issued were for hunts RG242, RG245, and RG252 (Table 6). Hunts RG242 and RG252 have relatively easy access and the largest MAH, which probably drives interest. RG266 does not have a large MAH and probably experiences a disproportionate amount of interest due to proximity to Seward and cliff dwelling goats (usually nannies) near the water's edge. RG248 continues to have a limited number of permits issued because of the high level of interest in road system accessible goat hunts. All hunt areas in Unit 6 except RG248 have an unlimited number of permits that can be issued.

Table 3. Unit 6A mountain goat harvest data by permit hunt, Southcentral Alaska, regulatory years 2018–2022.

Hunt area	Regulatory year	Permits issued	Did not hunt (%)	No. Hunters	Success (%)	No. Male	Male (%)[a]	No. Female	Female (%)[a]	Unknown	Total goats	Total points[b]	MAH[c]
RG202	2018	5	(80)	1	(0)	–	–	–	–	–	–	–	9
	2019	3	(67)	1	(100)	1	(100)	0	(0)	0	1	1.0	9
	2020	16	(88)	2	(100)	2	(100)	0	(0)	0	2	2.0	9
	2021	6	(100)	0	–	–	–	–	–	–	–	–	9
	2022	5	(40)	3	(100)	3	(100)	0	(0)	0	3	3.0	9
RG204	2018	20	(60)	8	(97)	5	(83)	1	(17)	0	6	7.0	22
	2019	23	(65)	8	(38)	3	(100)	0	(0)	0	3	3.0	22
	2020	30	(63)	11	(82)	9	(100)	0	(0)	0	9	9.0	22
	2021	15	(93)	1	(100)	0	–	0	–	1	1	1.5	22
	2022	26	(81)	5	(40)	2	(100)	0	(0)	0	2	2.0	22
RG206	2018	22	(73)	6	(93)	3	(100)	0	(0)	0	3	3.0	10
	2019	23	(74)	6	(100)	5	(83)	1	(17)	0	6	7.0	15
	2020	30	(80)	6	(67)	4	(100)	0	(0)	0	4	4.0	15
	2021	10	(40)	6	(67)	4	(100)	0	(0)	0	4	4.0	15
	2022	10	(50)	5	(20)	1	(100)	0	(0)	0	1	1.0	15
RG212	2018	1	(100)	0	–	–	–	–	–	–	–	–	2
	2019	2	(100)	0	–	–	–	–	–	–	–	–	2
	2020	1	(100)	0	–	–	–	–	–	–	–	–	2
	2021	6	(83)	1	(100)	1	(100)	0	(0)	0	1	1.0	2
	2022	1	(100)	0	–	–	–	–	–	–	–	–	2

Note: En dash represents years with no known harvest.

[a] Percentages based on animals of known sex only.

[b] Goat points are calculated with males counted as 1, females counted as 2, and unknowns counted as 1.5.

[c] Maximum allowable harvest.

Table 4. Unit 6B mountain goat harvest data by permit hunt, Southcentral Alaska, regulatory years 2018–2022.

Hunt area	Regulatory year	Permits issued	Did not hunt (%)	Hunters	Success (%)	No. Male	Male (%)[a]	No. Female	Female (%)[a]	Unknown	Total goats	Total points[b]	MAH[c]
RG220	2018	5	(80)	1	(100)	1	(100)	0	(0)	0	1	1	9
	2019	4	(75)	1	(100)	1	(100)	0	(0)	0	1	1	9
	2020	5	(80)	1	(100)	1	(100)	0	(0)	0	1	1	9
	2021	0	–	0	–	–	–	–	–	–	–	–	9
	2022	4	(100)	0	–	–	–	–	–	–	–	–	9
RG226	2018	18	(50)	9	(56)	5	(100)	0	(0)	0	5	5	7
	2019	12	(58)	5	(100)	5	(100)	0	(0)	0	5	5	7
	2020	11	(45)	6	(67)	4	(100)	0	(0)	0	4	4	7
	2021	18	(44)	10	(60)	5	(83)	1	(17)	0	6	7	7
	2022	10	(40)	6	(33)	2	(100)	0	(0)	0	2	2	7

Note: En dash represents years with no harvest.

[a] Percentages based on animals of known sex only.

[b] Goat points are calculated with males counted as 1, females counted as 2 and unknowns counted as 1.5.

[c] Maximum allowable harvest.

Table 5. Unit 6C mountain goat harvest data by permit hunt, Southcentral Alaska, regulatory years 2018–2022.

Hunt area	Regulatory year	Permits issued	Did not hunt (%)	Hunters	Success (%)	No. Male	Male (%)[a]	No. Female	Female (%)[a]	Unknown	Total goats	Total points[b]	MAH[c]
RG230	2018	47	(81)	9	(11)	1	(100)	0	(0)	0	1	1.0	6
	2019	48	(75)	12	(25)	1	(50)	1	(50)	1	3	4.5	6
	2020	46	(89)	5	(40)	2	(100)	0	(0)	0	2	2.0	6
	2021	27	(78)	6	(33)	1	(50)	1	(50)	0	2	3.0	6
	2022	36	(72)	10	(70)	7	(100)	0	(0)	0	7	7.0	7
RG231	2018	37	(73)	10	(50)	3	(60)	2	(40)	0	5	7.0	6
	2019	46	(74)	12	(42)	5	(100)	0	(0)	0	5	5.0	6
	2020	41	(71)	12	(58)	6	(86)	1	(14)	0	7	8.0	7
	2021	33	(70)	10	(20)	0	(0)	2	(100)	0	2	4.0	7
	2022	45	(60)	18	(17)	2	(67)	1	(33)	0	3	4.0	7
RG232	2018	55	(47)	29	(34)	8	(89)	1	(11)	1	10	11.5	12
	2019	54	(65)	19	(53)	8	(89)	1	(11)	1	10	11.5	12
	2020	56	(61)	22	(36)	7	(100)	0	(0)	1	8	8.5	12
	2021	36	(61)	14	(21)	2	(67)	1	(33)	0	3	4.0	12
	2022	42	(69)	13	(8)	1	(100)	0	(0)	0	1	1.0	12

[a] Percentages based on animals of known sex only.
[b] Goat points are calculated with males counted as 1, females counted as 2 and unknowns counted as 1.5.
[c] Maximum allowable harvest.

Table 6. Unit 6D mountain goat harvest data by permit hunt, Southcentral Alaska, regulatory years 2018–2022.

Hunt area	Regulatory year	Permits issued	Did not hunt (%)	Hunters	Success (%)	No. Male	Male (%)[a]	No. Female	Female (%)[a]	Unknown	Total goats	Total points[b]	MAH[c]
RG242	2018	61	(67)	20	(70)	11	(79)	3	(21)	0	14	17.0	20
	2019	66	(64)	24	(63)	13	(93)	1	(7)	1	15	16.5	20
	2020	58	(74)	15	(67)	9	(90)	1	(10)	0	10	11.0	20
	2021	49	(59)	20	(70)	11	(79)	3	(21)	0	14	17.0	20
	2022	56	(73)	15	(47)	7	(100)	2[d]	(0)	0	9	11.0	20
RG243	2018	20	(65)	7	(100)	6	(86)	1	(14)	0	7	8.0	10
	2019	16	(88)	2	(100)	2	(100)	0	(0)	0	2	2.0	10
	2020	19	(84)	3	(67)	2	(100)	0	(0)	0	2	2.0	10
	2021	20	(75)	5	(60)	3	(100)	0	(0)	0	3	3.0	10
	2022	31	(87)	4	(75)	3	(100)	0	(0)	0	3	3.0	10
RG244	2018	23	(65)	8	(63)	4	(80)	1	(20)	0	5	6.0	12
	2019	38	(74)	10	(90)	7	(78)	2	(22)	0	9	11.0	12
	2020	25	(80)	5	(20)	1	(100)	0	(0)	0	1	1.0	12
	2021	32	(69)	10	(50)	3	(60)	2	(40)	0	5	7.0	12
	2022	38	(79)	8	(75)	4	(67)	2	(33)	0	6	8.0	12
RG245	2018	59	(59)	24	(29)	7	(100)	0	(0)	0	7	7.0	8
	2019	54	(80)	11	(73)	8	(100)	0	(0)	0	8	8.0	8
	2020	51	(57)	22	(36)	7	(88)	1	(12)	0	8	9.0	8
	2021	50	(62)	19	(26)	3	(60)	2	(40)	0	5	7.0	8
	2022	46	(72)	13	(54)	5	(71)	2	(29)	0	7	9.0	8
RG248	2018	12	(8)	12	(42)	4	(100)	0	(0)	0	4	4.0	5
	2019	12	(0)	11	(55)	5	(100)	0	(0)	1	6	6.5	5
	2020	12	(8)	11	(36)	4	(100)	0	(0)	0	4	4.0	5
	2021	12	(25)	9	(33)	1	(33)	2	(67)	0	3	5.0	5
	2022	12	(42)	7	(29)	1	(50)	1	(50)	0	2	3.0	5

-continued-

Table 6. Page 2 of 2.

Hunt area	Regulatory year	Permits issued	Did not hunt (%)	Hunters	Success (%)	No. Male	Male (%)[a]	No. Female	Female (%)[a]	Unknown	Total goats	Total points[b]	MAH[c]
RG249	2018	38	(53)	18	(72)	11	(85)	2	(15)	0	13	15.0	12
	2019	42	(55)	19	(74)	14	(100)	0	(0)	0	14	14.0	12
	2020	36	(56)	16	(75)	10	(83)	2	(17)	0	12	14.0	12
	2021	32	(47)	17	(82)	10	(77)	3	(23)	1	14	17.5	12
	2022	55	(78)	12	(75)	8	(89)	1	(11)	0	9	10.0	12
RG252	2018	52	(54)	24	(71)	14	(88)	2	(12)	1	17	19.5	19
	2019	57	(51)	28	(64)	15	(88)	2	(12)	1	18	20.5	22
	2020	76	(53)	36	(67)	23	(96)	1	(4)	0	24	25.0	22
	2021	43	(40)	26	(77)	18	(90)	2	(10)	0	20	22.0	22
	2022	52	(54)	24	(67)	11	(73)	4	(27)	1	16	20.5	22
RG266	2018	39	(54)	19	(68)	10	(77)	3	(23)	0	13	16.0	10
	2019	28	(61)	11	(73)	7	(88)	1	(12)	0	8	9.0	10
	2020	53	(58)	22	(50)	9	(82)	2	(18)	0	11	13.0	10
	2021	36	(72)	10	(70)	3	(43)	4	(57)	0	7	11.0	10
	2022	39	(64)	14	(50)	5	(71)	2	(29)	0	7	9.0	10

[a] Percentages based on animals of known sex only.
[b] Goat points are calculated with males counted as 1, females counted as 2, and unknowns counted as 1.5.
[c] Maximum allowable harvest. MAH are managed with consideration of the following federal MAH: RG242-2, RG243-4, RG244/RG245-2, RG249-4, RG252-1, and RG266-4.
[d] Illegal harvest.

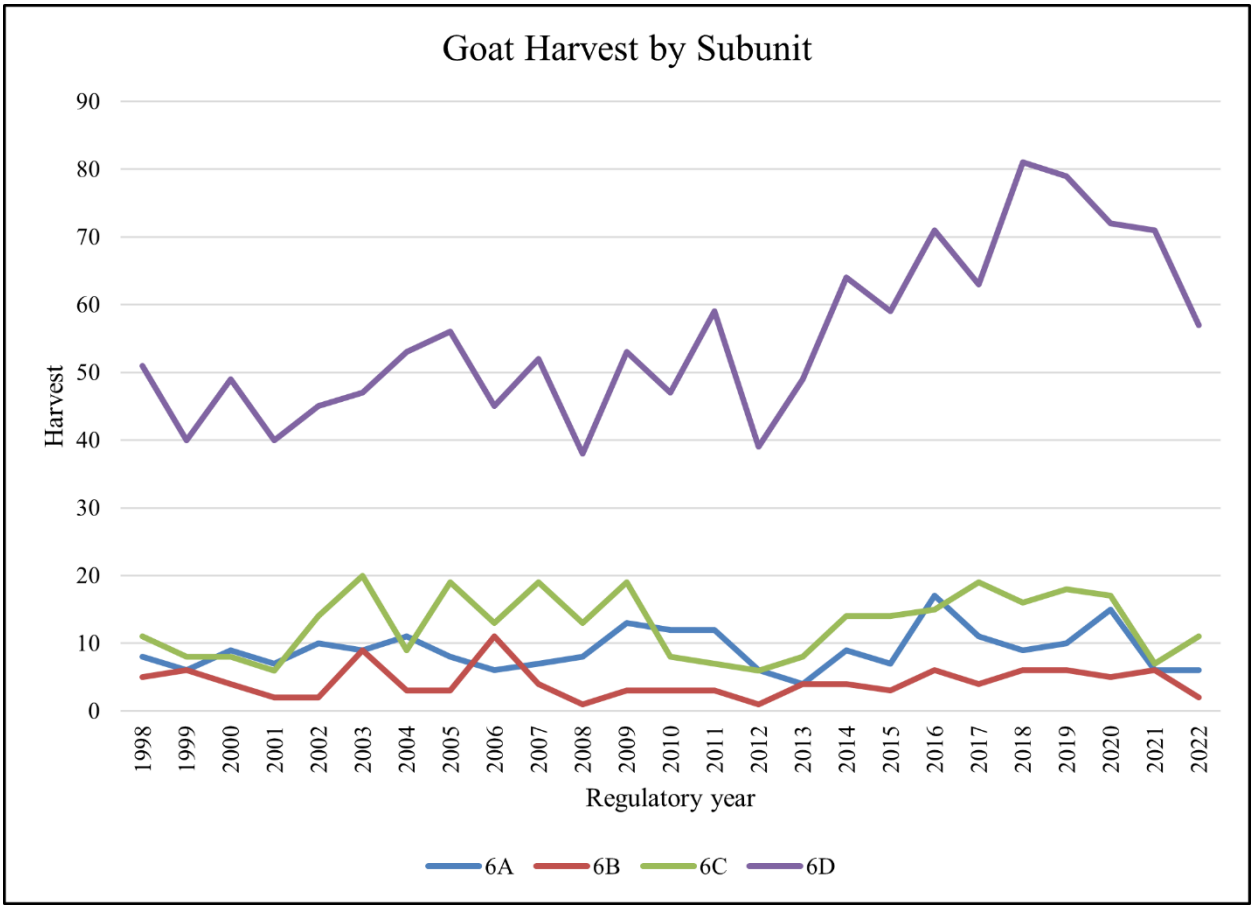

Figure 13. Mountain goat annual harvest by subunit in Unit 6, Southcentral Alaska, regulatory years 1998–2022.

Hunter Residency and Success

Participation is highest in Unit 6D with an annual average of 118 hunters during RY18–RY22. Participation was higher during RY18–22 than the 5 years prior (RY13–17) in Units 6C and 6D but stable in Units 6A and 6B. Despite travel limitations in 2020, that season had the second highest number of hunters (Table 7). Differences in effort seem to be most influenced by fall weather with early snow and heavy rain leading to hunters choosing to end their hunt early.

Nonresidents primarily focused their efforts in Unit 6A, where they make up nearly 100% of participants, and 6D, where they make up 50–60% of successful participants each year. Nonlocal resident hunters also predominantly focused their time in Unit 6D. The majority of local residents hunted in Unit 6C; however, local residents also hunt in Unit 6D closest to Valdez and Cordova (Table 7).

Unitwide hunter success rates during RY18–RY22 averaged about 55% (Table 7). Success rates are highest in Unit 6A, Unit 6B and Unit 6D (averaging 65%, 65%, and 61% respectively; Table 7), probably due to the preponderance of guided hunters. Unit 6C had much lower success rates (averaging 34%, Table 7), due to a high proportion of first-time hunters, and the ease and affordability of day trips.

Harvest Chronology

Most goats are harvested in September and October (Table 8). However, Unit 6A has a significant number of hunters that take advantage of the season in August which is only available in Units 6A and 6B. Unit 6B has more participation in September and October. In most years, harvest in Unit 6C takes place almost entirely in October. This is due to the late season start date and the onset of fall weather. If hunting conditions are poor in the fall, MAH will likely not be reached, even though the season extends into winter. Most hunters are not equipped for or interested in pursuing a goat across snow and ice. In Unit 6D, nearly all harvest occurs in September and October, this is due to the late season start (15 September) and the fact that the most popular hunt areas have met MAH by 1 November.

Transport Methods

Airplanes were the most important means of hunter transport in Units 6A and Unit 6B (Table 9). In Unit 6C highway vehicles were the primary means of transportation; however, 3- or 4-wheelers and boats were also popular. In Unit 6D boats are the most utilized means of transportation but airplanes are also used by many hunters.

Other Mortality

Predation studies on goats in Unit 6 have not been conducted. However, many local residents and long-time guides are concerned about the potential for wolf predation, particularly in lower lying areas such as the Don Miller Hills and Suckling Hills that have seen goat population declines. Predation by carnivores undoubtedly occurs, but the magnitude of it is currently unknown.

Alaska Board of Game Actions and Emergency Orders

The Board of Game met and considered issues regarding Unit 6 in 2019 and 2023. No changes were made to regulations at either meeting.

For RY18–RY22 between 4 and 5 emergency orders were issued annually to close registration permit hunts when MAH was reached (Table 2). The shortest season occurred in RG231, when the RY18 season lasted 3 days. The longest seasons were in Units 6A and 6B, where no areas closed early.

Recommendations for Activity 2.1

Continue to monitor harvest data and mortality data.

3. Habitat Assessment-Enhancement

There were no habitat assessment or enhancement projects for mountain goats in Unit 6 during RY18–RY22.

Table 7. Mountain goat hunter residency and success, Unit 6, Southcentral Alaska, regulatory years 2018–2022.

		Successful					Unsuccessful					
Unit	Regulatory year	Local resident	Nonlocal resident	Nonresident	Total	(%)	Local resident	Nonlocal resident	Nonresident	Total	(%)	Total hunters
6A	2018	0	0	9	9	(60)	0	0	6	6	(40)	15
	2019	0	0	10	10	(67)	0	2	3	5	(33)	15
	2020	0	0	15	15	(79)	0	0	4	4	(21)	19
	2021	0	0	6	6	(75)	0	1	1	2	(25)	8
	2022	0	0	6	6	(46)	0	0	7	7	(54)	13
6B	2018	0	1	5	6	(60)	0	0	4	4	(40)	10
	2019	0	0	6	6	(100)	0	0	0	0	(0)	6
	2020	0	1	4	5	(71)	0	1	1	2	(29)	7
	2021	0	2	4	6	(60)	1	2	1	4	(40)	10
	2022	1	0	1	2	(33)	0	0	4	4	(67)	6
6C	2018	5	10	1	16	(33)	22	7	3	32	(67)	48
	2019	15	2	1	18	(42)	20	4	1	25	(58)	43
	2020	11	5	1	17	(44)	16	5	1	22	(56)	39
	2021	6	1	0	7	(23)	13	9	1	23	(77)	30
	2022	9	2	0	11	(27)	22	7	1	30	(73)	41
6D	2018	10	32	39	81	(61)	11	37	3	51	(39)	132
	2019	7	30	42	79	(68)	14	20	3	37	(32)	116
	2020	6	26	40	72	(55)	11	36	11	58	(45)	130
	2021	7	22	42	71	(61)	11	24	10	45	(39)	116
	2022	9	16	32	57	(59)	10	18	12	40	(41)	97
Unit 6 total	2018	15	43	54	112	(54)	34	44	16	94	(46)	205
	2019	22	32	59	113	(63)	34	26	7	67	(37)	180
	2020	17	32	60	109	(56)	27	42	17	86	(44)	195
	2021	13	25	52	90	(55)	25	36	13	74	(45)	164
	2022	19	18	39	76	(48)	32	25	24	81	(52)	157

Table 8. Mountain goat harvest chronology percent by month, Unit 6, Southcentral Alaska, regulatory years 2018–2022.

Unit	Regulatory year	August	September	October	November	December	January	*n*
6A	2018	33	67	0	0	0	0	9
	2019	40	50	10	0	0	0	10
	2020	60	27	13	0	0	0	15
	2021	67	33	0	0	0	0	6
	2022	17	17	17	0	50	0	6
6B	2018	17	0	83	0	0	0	6
	2019	0	33	67	0	0	0	6
	2020	40	20	40	0	0	0	5
	2021	17	83	0	0	0	0	6
	2022	0	100	0	0	0	0	2
6C	2018	0	0	94	0	0	6	16
	2019	0	0	72	22	6	0	18
	2020	0	0	88	12	0	0	17
	2021	0	0	100	0	0	0	7
	2022	0	0	45	27	9	18	11
6D	2018	0	70	29	0	0	1	80
	2019	0	48	48	4	0	0	79
	2020	0	50	50	0	0	0	72
	2021	0	62	35	0	3	0	71
	2022	0	65	32	4	0	0	57
Unit 6 total	2018	4	56	39	0	0	1	110
	2019	4	40	50	6	1	0	113
	2020	10	38	50	2	0	0	109
	2021	6	57	36	0	2	0	90
	2022	1	52	31	6	5	4	77

Table 9. Mountain goat harvest percent by transport method, Unit 6, Southcentral Alaska, regulatory years 2018–2022.

Unit	Regulatory year	Airplane		Boat		3- or 4-wheeler		Snowmachine		ORV		Highway vehicle		Unknown		Total
		n	(%)	*n*	(%)	*n*	(%)	*n*	(%)	*n*	(%)	*n*	(%)	*n*	(%)	*n*
6A	2018	5	(56)	0	(0)	3	(33)	0	(0)	0	(0)	0	(0)	1	(11)	9
	2019	10	(100)	0	(0)	0	(0)	0	(0)	0	(0)	0	(0)	0	(0)	10
	2020	13	(87)	1	(7)	0	(0)	0	(0)	0	(0)	1	(7)	0	(0)	15
	2021	6	(100)	0	(0)	0	(0)	0	(0)	0	(0)	0	(0)	0	(0)	6
	2022	6	(100)	0	(0)	0	(0)	0	(0)	0	(0)	0	(0)	0	(0)	6
6B	2018	6	(100)	0	(0)	0	(0)	0	(0)	0	(0)	0	(0)	0	(0)	6
	2019	5	(83)	0	(0)	0	(0)	0	(0)	0	(0)	0	(0)	1	(17)	6
	2020	5	(100)	0	(0)	0	(0)	0	(0)	0	(0)	0	(0)	0	(0)	5
	2021	5	(83)	0	(0)	0	(0)	0	(0)	0	(0)	0	(0)	1	(17)	6
	2022	1	(50)	1	(50)	0	(0)	0	(0)	0	(0)	0	(0)	0	(0)	2
6C	2018	1	(6)	3	(19)	0	(0)	0	(0)	1	(6)	11	(69)	0	(0)	16
	2019	0	(0)	5	(28)	2	(11)	0	(0)	0	(0)	11	(61)	0	(0)	18
	2020	0	(0)	0	(0)	3	(18)	0	(0)	1	(6)	13	(76)	0	(0)	17
	2021	0	(0)	0	(0)	2	(29)	0	(0)	0	(0)	5	(71)	0	(0)	7
	2022	0	(0)	0	(0)	2	(18)	0	(0)	0	(0)	9	(82)	0	(0)	11
6D	2018	23	(29)	47	(59)	1	(1)	0	(0)	0	(0)	7	(9)	2	(3)	80
	2019	19	(24)	48	(61)	0	(0)	0	(0)	0	(0)	10	(13)	2	(3)	79
	2020	19	(26)	42	(58)	1	(1)	0	(0)	2	(3)	5	(7)	3	(4)	72
	2021	22	(31)	39	(55)	1	(1)	0	(0)	0	(0)	5	(7)	4	(6)	71
	2022	16	(28)	37	(65)	0	(0)	0	(0)	0	(0)	1	(2)	3	(5)	57
Unit 6 total	2018	35	(32)	50	(45)	4	(4)	0	(0)	1	(1)	18	(16)	3	(3)	111
	2019	34	(30)	53	(47)	2	(2)	0	(0)	0	(0)	21	(19)	3	(3)	113
	2020	37	(34)	43	(39)	4	(4)	0	(0)	3	(3)	19	(17)	3	(3)	109
	2021	33	(37)	39	(43)	3	(3)	0	(0)	0	(0)	10	(11)	5	(6)	90
	2022	23	(30)	38	(50)	2	(3)	0	(0)	0	(0)	10	(13)	3	(4)	76

NONREGULATORY MANAGEMENT PROBLEMS OR NEEDS

An increasing number of commercial operators using helicopters to support backcountry skiing and other activities are utilizing areas of Unit 6. Studies in other areas suggest that goats are impacted by helicopters (Goldstein et al. 2005). Helicopter exposure effects may be exacerbated in winter when goats are in reduced body condition. While any given operation may have a relatively low impact, the cumulative effects of these activities should be considered. As these businesses become more prevalent, the Alaska Department of Fish and Game should develop guidelines for minimizing impacts. This may include limiting commercial use of helicopters, or limiting access in critical wintering areas, or developing travel corridors that focus use on areas not used by goats.

Federal records have not been updated in ADF&G's Wildlife Information Network (WinfoNet) system since 2010. Records in WinfoNet from 2001–2010 contain errors and omissions. Federal harvest data is currently inadequately handled and could lead to overharvest in areas with shared quotas.

Data Recording and Archiving

- Harvest data are stored in WinfoNet, an internal database housed on a state server (http://winfonet.alaska.gov/index.cfm).
- Survey data from data sheets are entered, scanned, and stored on the Cordova ADF&G server (O:\DWC\Goat).
- Original datasheets are stored in file folders located in the Cordova area biologist's office.
- Historical survey notes and data sheets are being digitized and scanned for permanent storage on the file server.

Agreements

Alaska Department of Fish and Game and the U.S. Forest Service (USFS) Chugach National Forest have a cooperative agreement that allows for financial support and the sharing of harvest data.

Permitting

None.

Conclusions and Management Recommendations

Previous management reports stated that areas were to be surveyed on a 2- to 3-year rotation (Crowley 2004). However, the average length of time between surveys is 10 years. While survey schedules can be severely limited by difficult weather, distance to survey areas, and pilot availability, more frequent collection of population data is necessary for setting appropriate harvest levels. Since 2013, all survey areas except one have been flown at least once. Some areas have been flown for the first time in over 20 years. We continue to pursue additional pilots to help complete surveys.

We achieved our objective to maintain a minimum population size of 2,400 goats. The estimated number of goats at the end of RY22 was between 4,000 and 4,500 goats. The population has probably been high and stable during RY18–RY22, suggesting that weighted harvest rates have been appropriate. While overall the objective to achieve 70% or more males in the harvest was met, some areas routinely experience high nanny take that results in large reductions in MAH (RG230, RG231, RG232, RG248, and RG266). The mandatory education requirement may have helped inform hunters about the importance of selecting billies. The 5-year average nanny take (17%; RY18–RY22) in Unit 6C where education is required was lower than the previous 10-year average (29%; RY08–RY17). This may have been influenced by the regulation that prevents individual hunters from participating in mountain goat hunts in Unit 6 for 5 years following a nanny harvest. While Unit 6D also had improvement in nanny take, it was more slight in comparison. This may suggest that the change had more of an effect where serial nanny harvesters are more common.

II. Project Review and RY23–RY27 Plan

Review of Management Direction

Management Direction

A formal plan for goat management in Unit 6 has not been developed. Goat hunts are administered using a 3–5% harvest rate and a *goat points* system, with billies counting as 1 point and nannies counting as 2 points. This goat point system has proven to be a good long-term management strategy throughout Alaska.

Goals

Manage goat populations to provide for sustained annual use by hunters and wildlife viewers.

Codified Objectives

Amounts Reasonably Necessary for Subsistence Uses

Goats in Unit 6 have a positive customary and traditional use finding by the Board of Game. The amount necessary for subsistence is set at 15–26 goats.

Intensive Management

Goats in Unit 6 have a negative intensive management finding.

MANAGEMENT OBJECTIVES

- Conduct aerial surveys of high priority areas at least every 3 years.
- Maintain a minimum population in Unit 6 of at least 2,400 goats.
- Use educational materials to achieve >70% males in the harvest.

REVIEW OF MANAGEMENT ACTIVITIES

1. Population Status and Trend

ACTIVITY 1.1. Conduct aerial minimum count surveys during peak snow melt. Survey areas are selected with consideration of the length of time since the last survey, past survey quality, hunt pressure, and population trend. Classify young of the year (kids) during aerial minimum count surveys.

Data Needs

No change from RY18–RY22.

Methods

No change from RY18–RY22.

2. Mortality-Harvest Monitoring

ACTIVITY 2.1. Monitor mortality and harvest in Unit 6 annually.

Data Needs

No change from RY18–RY22.

Methods

No change from RY18–RY22.

3. Habitat Assessment-Enhancement

No habitat assessment or enhancement projects for mountain goats are planned.

NONREGULATORY MANAGEMENT PROBLEMS OR NEEDS

There are data sharing issues between federal and state agencies that must be resolved at higher levels. Federal records have not been updated in the WinfoNet system since 2010, and records that exist in the system contain errors and omissions. As of RY23, we have access to these records using the informal sharing of an excel spreadsheet between the USFS subsistence biologist and ADF&G. Data should be stored in a way that protects records from erroneous modification, while documenting changes, and using password protection. Additionally, the current form of data sharing is dependent on positive relationships among parties and is not a viable long-term solution. Entering these data into a secure database would ensure that all parties can access secure information and that hunt records are collected consistently and accurately.

Data Recording and Archiving

- Harvest data are stored on WinfoNet, an internal database housed on a server (http://winfonet.alaska.gov/index.cfm).
- Survey data and data sheets are entered, scanned, and stored on the Cordova ADF&G server (O:\DWC\Goat).
- Original datasheets are stored in file folders located in the Cordova area biologist's office.
- Historical survey notes and data sheets are digitized and scanned for permanent storage on the file server.

Agreements

Alaska Department of Fish and Game and USFS Chugach National Forest have a cooperative agreement that allows for financial support and the sharing of harvest data.

Permitting

None.

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