Alaska Department of Fish and Game
Division of Wildlife Conservation

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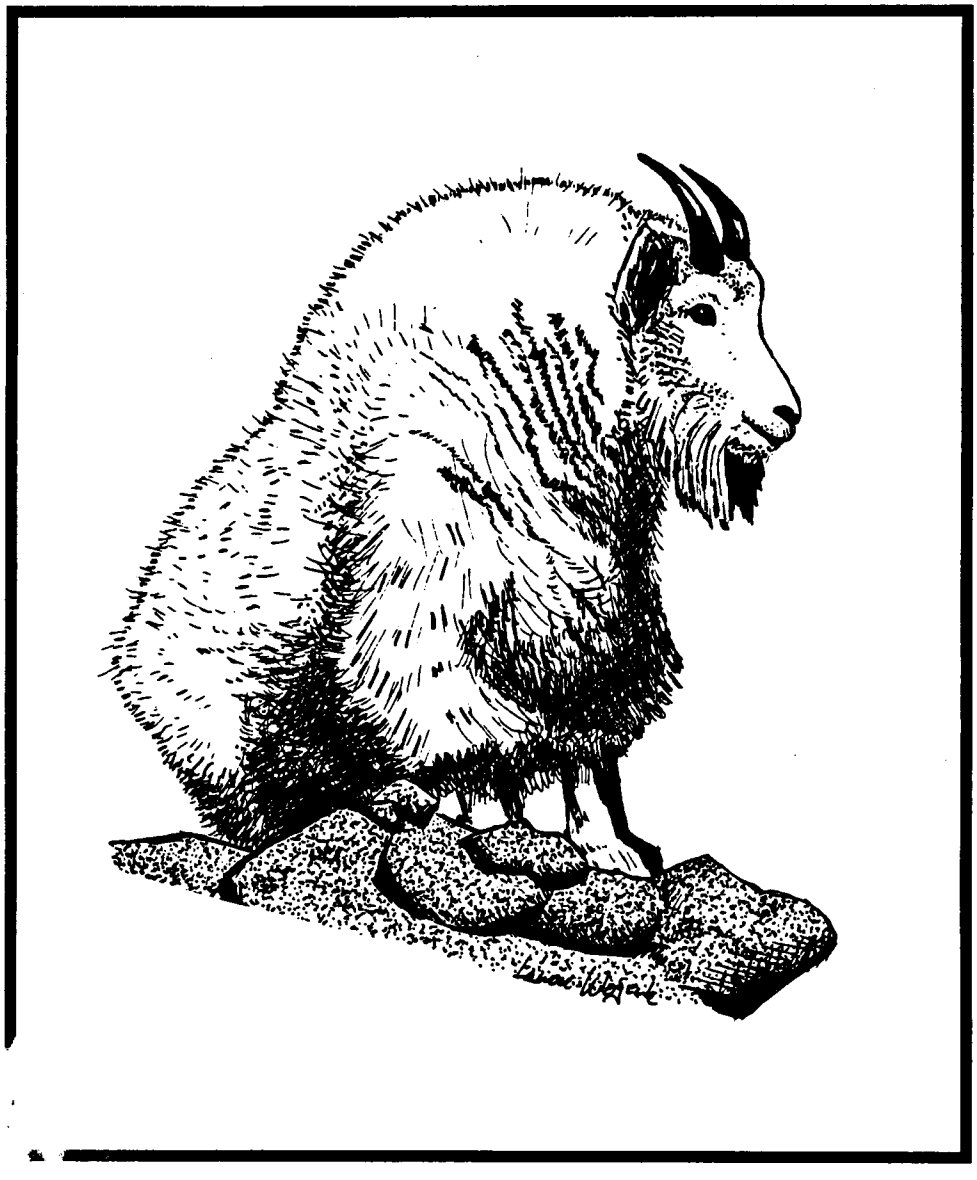
MOUNTAIN GOAT

Susan M. Abbott, Editor



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LOCATION

Game Management Unit: Subunit 1A (5,000 mi^2)

Geographical Description: Ketchikan area including mainland areas draining into Behm and Portland canals

BACKGROUND

Mountain goat population densities in Subunit 1A have remained moderately high and stable since 1981. Although indigenous populations of goats occur only on the mainland portion of the subunit, introduced populations now exist on Revillagigedo Island as a result of transplants to Swan Lake (17) in 1983 and Upper Mahoney Lake (15) in 1991 (ADF&G unpubl. data, Ketchikan). The Swan Lake population is currently estimated at 95 to 133 goats. Goats radio-collared as part of the Mahoney Lake transplant are being located as opportunities allow.

Harvests from Subunit 1A averaged 45 goats per year during 1972-1988. The average annual harvest during the past three seasons dropped to just under 20 as a result of the 1989 legislative law requiring nonresident goat hunters to hire and hunt with registered guides. Most goats are harvested from Subunit 1A during September when weather conditions are most conducive to accessing hunting areas. Hunters generally access areas by airplanes during the early part of the season and use boats later in the season.

Nearly every year since the late 1960s, fall surveys have been conducted from a PA-18 Supercub in trend count areas (TCAs) established throughout Subunit 1A. Survey results seem to reflect population trends accurately.

MANAGEMENT DIRECTION

Management Objectives

The management objective for Subunit 1A is to maintain goat population densities above 20 goats per hour of survey time during fall surveys.

METHODS

Up to 10 TCAs are surveyed each fall as weather allows. TCAs vary in size from 23 to 200 mi^2. Surveys are generally flown during September or early October between 1700-1900 hours under conditions as similar as possible from year to year. A pilot and observer in a PA-18 Supercub are used to search for goats. The same survey pilot has been used since 1968. Both the pilot and observer search for goats, and the observer

records goat locations on 1:63,360 scale topographic maps. Goats are classified as either adults or kids. No effort is made to ascertain sex or distinguish any other age groups.

Harvest and hunter data are obtained through a mandatory hunt report which is part of a required registration permit. Data collected includes areas and numbers of days hunted, hunter success, dates of hunts and kills, and transport methods and commercial services used. Successful hunters who obtain a second goat permit are treated as separate hunters in calculating hunt and harvest figures.

RESULTS AND DISCUSSION

Population Status and Trend

Goat populations in Subunit 1A remained relatively high and stable for the past several years. Surveys conducted during 1990 found 85 goats/hour and 32 kids/100 adults (Tables 1 and 2). While the number of goats observed per hour (85) was down slightly from previous surveys, it was well within acceptable management limits. The fact that more time was spent surveying in 1990 than during any of the previous eight years may account for some of the disparity. Survey results for 1980, where survey time and observations were nearly identical to those of 1990, support this possibility (Table 1).

Although inclement weather precluded formal surveys during 1991, incidental observations made while searching for and capturing goats for the Mahoney Lake transplant in July and August 1991, suggested that the Subunit 1A population remained stable at relatively high levels. Because goat surveys were not conducted during 1991, they will be among the highest priorities in 1992.

The Swan Lake goat population was surveyed during 1990 (Table 2). The 31 adults and 13 kids observed during 1990 were nearly identical 8in number to the 29 adults and 14 kids observed in 1988 (Wood 1990). Based on these similarities, the Swan Lake population remained unchanged between 1988 and 1990.

No formal surveys of the Swan Lake population were conducted during 1991, though staff observed 22 adults and six kids on 22 October on an informal look at the area using a Bell 206 Jet Ranger in 1.9 hours of flying. A light but extensive snowcover on ridge-tops impaired goat observability, and bright afternoon sunlight added to survey difficulties. For these reasons these results were not directly comparable to past survey findings.

Ten nannies and five billies were transplanted to Upper Mahoney Lake on 10 August 1991 (ADF&G unpubl. data, Ketchikan). Seven of the 15 transplanted goats were radio-collared before release (two billies, five nannies). As of December 1991, all but one of the radiocollars was transmitting on active status. The single collar emitting a

mortality signal had not been recovered at the time of this report and we presumed the nannie outfitted with that radiocollar is dead.

Population Size: Population estimates for goats inhabiting Subunit 1A were developed during 1990 using survey data and a sightability correction factor developed by Smith and Bovee (1984). After delineating the percent of each Wildlife Analysis Area (WAA) containing what was considered usable goat habitat, a survey-derived estimate of 1.27 goats/mi^2 was applied to these percentages, resulting in a mainland estimate ranging from 7,376 to 10,282 goats (ADF&G unpubl. data, Ketchikan). Using the same technique and assumptions, the Swan Lake population was estimated at 95 to 133 goats. The recently-introduced Mahoney Lake population now contains a maximum of 14 goats.

Population Composition: The 1990 productivity estimate of 32 kids/100 adults represents the second highest productivity estimate since 1983 (Table 1). Productivity estimates for individual TCAs ranged from 13 to 42 (Table 2). No spring recruitment surveys were conducted in 1990 or 1991.

Distribution and Movement: Goats continue to inhabit the mainland portion of Subunit 1A from the tip of the Cleveland Peninsula to the eastern border of the subunit with Portland Canal. Survey information obtained for the Swan Lake population on Revillagigedo Island indicates that these goats remained within a 6-mile radius of the original release site. To date, goats transplanted to Upper Mahoney Lake on Revillagigedo Island remained largely within a 5-mile radius of the release site; one nannie moved 10 miles north from the release site after being released. It subsequently frequented an area about seven miles from the release site, and was most recently located five miles from the release site.

Mortality

Season and Bag Limit:

Unit 1(A), Revillagigedo Island	No Open Season	
Remainder of Unit 1(A)	1 Aug. - 31 Dec.	Two goats by registration permit only. (Hunt #801)

Hunter Harvest: Fourteen male and six female goats were reported harvested from Subunit 1A by 101 hunters who spent a combined total of 327 days hunting in 1990 (Table 3). In 1991, 96 hunters spent 272 days hunting and reported harvesting 10 males, five females, and one goat of unreported sex (Table 3).

Permit Hunts: Goat hunting in Subunit 1A has been regulated through registration permits for the past 12 years. Beginning in 1982, second permits have been made

available to hunters who killed goats and returned their first permit hunt reports. During the 1990 season, Ketchikan office staff issued 201 first and seven second permits (Table 3). Ketchikan office staff issued 241 first and four second permits during the 1991 season (Table 3). Although the bag limit was two goats, no individual hunters took two goats in 1990 or 1991.

Hunter Residency and Success: No nonresident hunters hunted goats in Subunit 1A during 1990 or 1991 (Table 4). Subunit 1A residents took most goats harvested in 1990 (85%) and 1991 (94%) (Table 4). Eighteen percent of the local resident hunters were successful during 1990 and 17% were successful in 1991. Thirty-three percent and 12% of the non-local residents were successful during 1990 and 1991, respectively (Table 4). Overall, 20% of the 1990 hunters and 17% of the 1991 hunters were successful. The average number of hunting days per goat by all hunters (successful and unsuccessful) was 16.3 in 1990, and 17.0 in 1991. Successful hunters averaged 2.4 days per goat in 1990, and 3.1 days per goat in 1991.

Harvest Chronology: Most of the 1990 goat harvest occurred during August and September (Table 5). In 1991 the harvest was fairly evenly distributed throughout the season, with the highest takes occurring in August and October (Table 5). The paucity of snow throughout fall 1991 enabled hunters to get afield later than usual.

Transport Methods: Before the nonresident guide requirement was instituted in 1989, airplanes were used more frequently than boats to access hunting areas. This was because most nonresidents chartered aircraft for transportation to hunting areas. In the absence of nonresident hunters, and given that many resident hunters use boats to travel to the mainland, the use of airplanes and boats is now fairly evenly divided (Table 6).

Nonregulatory Management Problems and Needs

Proposals calling for the introduction of goats onto previously uninhabited areas of southern southeast Alaska continue to be submitted to the department. A Ketchikan sports group recently submitted a proposal to introduce goats to Prince of Wales Island. Evaluation of public interest, habitat suitability, and cost/benefits is currently under way.

CONCLUSIONS AND RECOMMENDATIONS

The Subunit 1A mountain goat population remained stable at high levels. Harvest remained low the past three seasons and was evenly distributed throughout the subunit. Winters have not significantly impacted adult or kid survival.

State legislation which took effect in July 1989, requires all nonresident goat hunters to be accompanied by a registered guide or an Alaska resident over 19 years of age within the second degree of kindred. This law essentially eliminated the nonresident harvest.

The Swan Lake goat population should be surveyed regularly in the future to ascertain the status and trend of the population, and to determine when a harvestable surplus exists. Depending on survey results, a limited number of hunt permits may be justifiable within the next few years. The newly introduced Upper Mahoney Lake goat population should be radio-tracked and monitored as frequently as time and money allow. Finally, because inclement weather precluded surveys during 1991, they should be among the highest management priorities for the next report period.

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Submitted by:

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Table 1. Mountain goat survey data for Subunit 1A, 1968-1991.

Survey[a] dates	No. of kids	No. of adults	Total goats	Kids Per 100 adults	Count time (Hrs.)	Goats/ hour
Aug. 20 - Sept. 18, 1968	162	553	715	29	4.92	145
Sept. 13 - Sept. 16, 1971	111	357	468	31	3.88	121
Aug. 16 - Sept. 16, 1973	35	149	184	23	2.50	74
Aug. 27 - Sept. 21, 1974	14	50	64	28	1.83	35
Aug. 12 - Sept. 11, 1975	84	270	354	31	7.63	46
Sept. 1 - Sept. 11, 1976	73	283	356	26	8.01	44
Aug. 31 - Sept. 6, 1977	165	354	519	47	6.33	82
Sept. 5 - Sept. 9, 1978	126	404	530	31	5.17	103
Sept. 18 - Sept. 21, 1979	62	238	300	26	3.78	79
Aug. 20 - Sept. 12, 1980	215	617	832	35	9.63	86
Aug. 26 - Sept. 21, 1981	153	461	614	33	5.98	103
Aug. 29 - Sept. 18, 1982	167	515	682	32	6.87	99
Aug. 30 - Sept. 23, 1983	177	658	835	27	7.55	111
Sept. 5 - Sept. 24, 1984	174	666	840	26	7.09	118
Sept. 12 - Sept. 15, 1986	64	359	423	18	4.05	104
Sept. 23 - Oct. 8, 1987	39	182	221	21	2.03	109
Sept. 3 - Sept. 19, 1988	104	304	408	34	4.37	93
Sept. 10 - Sept 13, 1989	124	415	539	30	5.55	97
Sept. 6 - Oct. 3, 1990	193	603	796	32	9.30	85

[a] Most comparable data is from 1975-1990. No surveys were flown in 1991.

Table 2. Subunit 1A mountain goat composition surveys, September - October 1990.

Survey Area	Date	No. Adults	No. kids	Total goats	Hours of survey time	No. goats observed/hr	Kids:100 adults	Survey rating
K-3	(no survey)							
K-4	12 Sept. 90	71	26	97	0.9	108	37	Good
K-5	6 Sept. 90	153	46	199	2.0	99	30	Good
K-6	(no survey)							
K-7	5 Sept. 90	166	62	228	2.0	114	37	Good
K-8	(no survey)							
K-9	8 Sept. 90	81	22	103	1.5	69	27	Good
K-10	9 Sept. 90	86	22	108	0.9	120	26	Good
K-11	9 Sept. 90	15	2	17	0.3	57	13	Good
K-12[a]	3 Oct. 90	31	13	44	1.7	26	42	Good
Totals		603	193	796	9.3	85	32	

[a] Revillagigedo Island (Swan Lake) transplanted population.

Table 3. Mountain goat harvest data for permit Hunt 801, Subunit 1A, 1985-1991.

Year	Permits issued[a]	Did not hunt	Unsuccessful hunters	Successful hunters	M	F	Total
1985	261	122	88	51	29	22	51
1986	244	122	71	51	16	33	51
1987	195	107	61	27	14	3	27
1988	201	87	66	33	14	19	33
1989	182	87	56	23	14	9	23
1990	208	90	81	20	14	6	20
1991	245[b]	128	80	16	10	5	16[c]

[a] Number of permits issued from the Ketchikan office. Second permit holders are treated as separate hunters.
[b] Three permits not returned.
[c] The sex of 1 goat was not reported.

Table 4. Goat hunter residency and success, 1985-91, Subunit 1A.

	Successful				Unsuccessful			
Year	Local[a] res.	Nonlocal res.	Nonres.	Totals	Local[a] res.	Nonlocal res.	Nonres.	Total
1985		30	21	51		67	21	88
1986		39	12	51		48	23	71
1987	15	0	12	27	44	3	14	1
1988	19	0	14	33	35	0	31	66
1989	18	4	1	23	45	10	1	56
1990	17	3	0	20	75	6	0	81
1991	15	1	0	16	73	7	0	80

[a] Local and non-local residents combined during 1985-86. Local resident hunters reside in Subunit 1A.

Table 5. Subunit 1A goat harvest chronology, 1985-91.

Year	Aug	Sept	Oct	Nov	Dec
1985	14	49	29	0	8
1986	16	59	8	2	16
1987	33	30	22	7	7
1988	24	58	15	3	0
1989	17	30	17	13	22
1990	9	8	2	1	0
1991	5	3	4	1	3
Totals	118	237	97	27	57

Table 6. Subunit 1A, transportation methods used by successful goat hunters, 1985-91.

Year	% Using Airplane	%Using Boat
1985	90	10
1986	82	18
1987	64	36
1988	85	15
1989	48	52
1990	53	47
1991	49	51

LOCATION

Game Management Unit: Subunit 1B (3,300 mi^2)

Geographical Description: Southeast Alaska mainland from Cape Fanshaw to Lemesurier Point

BACKGROUND

Mountain goats are indigenous to Subunit 1B and are distributed throughout appropriate subunit habitat. Goats reside in alpine and subalpine areas from spring until fall. During winter, when most alpine and subalpine areas are under deep snow, goats use wind-blown or other steep snow-free slopes where forage is obtainable. The necessity of snow-free areas for obtaining food also results in use of adjacent forests and beaches. Limited information suggests an overall stable the goat population since 1959 with the notable exception of the late 1960s and early 1970s when severe winter weather probably caused significant reductions in animal numbers. Generally mild winters from the mid-1970s to the present reduced natural mortality rates of goats that now appear to experience ideal conditions for population growth. Data, both direct and indirect, are insufficient to make a meaningful estimate of goat numbers in Subunit 1B.

Hunter accessibility dictates hunting pressure distribution. Accessible areas receive a disproportionate share of harvest and must be closely monitored, while less accessible areas receive little or no harvest. The kill ranged from 33 to 50 goats from 1985 to 1990.

MANAGEMENT DIRECTION

Management Goals

Management goals and objectives for Subunit 1B are being developed.

METHODS

Fixed-wing aerial surveys within established trend count areas were flown to obtain data on the numbers of goats and the proportion of kids in the population. Trend count lines were established to make surveys more consistent from year to year. Harvest was closely monitored through a registration permit system. All permit holders are required to report and those that hunted must include the location and duration of the hunt, transportation used, date of kill, and sex of kill.

RESULTS AND DISCUSSION

Population Status and Trend

Data are insufficient to determine precise goat population trends in Subunit 1B. The population is probably stable, if not increasing slightly.

Population Composition: Table 1 shows the past five years of age composition data from aerial trend counts. Differences in sample size occurred because of inclement weather which makes completing surveys difficult. Survey data do not suggest an up or down trend in kid production; an upward trend is a supposition consistent with recent mild winters. Annual differences in survey intensity (i.e., minutes/mi^2 search time) and survey methods, as well as lack of information about seasonal goat movements, make it difficult to interpret goat abundance.

Mortality

Season and Bag Limit.

Unit 1B that portion between the Muddy River and LeConte Bay including drainages into the north shore of LeConte Bay.	1 Aug. - 31 Dec.	One goat, by registration permit, except kids or nannies with kids.
Remainder of Units 1A and 1B	1 Aug. - 31 Dec.	Two goats by registration permit only.

Board of Game Actions and Emergency Orders. No emergency orders were issued during the past five years. Three regulatory changes did occur. The bag limit for Subunit 1B (including all the Cleveland Peninsula) increased from one to two goats for the 1984 season and has remained in effect. The regulation changed because hunting pressure was light and goat populations were healthy. The second regulatory change instituted a bag limit of one male goat only for the Horn Cliffs area (Hunt 807) effective for the 1987 and 1988 season. The third regulatory change, beginning in 1989, removed the "male only" restriction from the Horn Cliffs area and prohibited the harvest of kids or females accompanied by kids. The one goat limit was retained.

Hunter Harvest. The 1989 total harvest of 46 goats and 50 in 1990 for Subunit 1B was higher than the 5-year average of 39. Table 2 data suggest a slight harvest increase. The number of hunters has varied from 86 to 118 in the past five years with 110 hunters participating in 1989 and 114 this year. The male component of the harvest dropped slightly in 1990 but was still more than 50%. Care should be taken with this data as it is from hunter's reports and is unverified. With the removal of the "males only"

restriction for the Hunt 807, we distributed literature to hunters and encouraged them to take males. This may have influenced other Subunit 1B hunters to be more selective.

Hunter Residency and Success: New legislation requiring all nonresidents to be accompanied by a guide reduced the nonresident kill to six in 1989 and one in 1990, reversing the trend of increasing nonresident kill (Table 3). Local and nonlocal success increased in 1990 from previous years. Table 2 shows permit data. The number of hunters in Subunit 1B remained relatively constant the past five years, varying from 101 to 118. Other harvest parameters also suggest relative stability during the past five years.

Harvest Chronology. Harvest chronology data in Table 4 shows that September was the most active time for goat hunting. The highest kill occurred in September, but in 1990 an early snowfall led to almost 25% of the goats being taken in December. Local hunters shifted efforts to later in the season when goats were driven to low elevations by snow.

Transport Methods. Transportation methods of goat hunters in Subunit 1B remained relatively stable during the most recent 5-year period (Table 5).

CONCLUSIONS AND RECOMMENDATIONS

Goat populations appear stable or slightly increasing in Subunit 1B. The Alaska Legislature passed legislation effective 1 July 1989 requiring nonresident goat hunters to be accompanied by a guide. This reduced the nonresident kill from 13 in 1988 to six in 1989 to one in 1990 and should continue to influence the nonresident harvest.

The shift in harvest from early in the season to late November and December could lead to an overharvest of those goat herds accessible from salt water. Before 1989 no more than 18% of the harvest was taken after 1 November while in 1990 the total kill increased and 30% were killed in November and December.

I recommend reducing the goat hunting season to end on 30 November to prevent exploitation of goats driven down by snow.

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Table 1. Subunit 1B summer aerial mountain goat composition counts and estimated population size, 1985-91.

Regulatory year[a]	Adults (%)	Kids (%)	Unknown	Kids: 100 adults	Total goats observed	Goats /hour
1985/86	67 93	5 7	0	7	74	na
1986/87	78 78	22 22	0	28	100	29
1987/88	138 76	43 24	0	31	181	39
1988/89	141 77	42 23	0	30	183	39
1989/90	84 75	28 25	0	33	112	32
1990/91	122 67	50 33	0	41	182	28

[a] Different portions of area flown in different years so data not directly comparable.

Table 2. Subunit 1B mountain goat harvest data by permit hunt, 1985-91.

Hunt No.	Reg. year	Permits issued	Percent[a] did not hunt	Percent[b] unsuccessful hunters	Percent[b] successful hunters	Males (%)	Females (%)	Unk.	Illegal	Total harvest
801	1985/86	202	44	71	29	14 42	19 58	0	0	33
	1986/87	194	44	62	38	17 41	24 59	0	0	41
	1987/88	169	51	57	43	16 44	20 56	0	0	36
	1988/89	155	46	61	39	22 67	10 30	1	0	33
	1989/90	159	50	54	46	25 65	13 35	0	0	38
	1990/91	190	59	53	47	19 54	16 46	0	0	35
807[c]	1987/88	59	75	100	0	0 0	0	0	0	0
	1988/89	81	58	82	18	6 100	0 0	0	0	6
	1989/90	87	61	75	25	7 87	1 13	0	0	8
	1990/91	112	67	59	41	10 67	5 33	0	0	15
Combined										
	1985/86	203	44	71	29	14 42	19 58	0	0	33
	1986/87	194	44	62	38	17 41	24 59	0	0	41
	1987/88	228	57	63	37	16 44	20 56	0	0	36
	1988/89	236	50	67	33	28 72	10 26	1	0	39
	1989/90	246	54	63	37	32 70	14 30	0	0	46
	1990/91	302	62	54	46	29 58	21 42	0	0	50

[a] Of permittees
[b] Those hunting
[c] New in 1987

Table 3. Subunit 1B mountain goat hunter residency and success, 1985-91.

Regulatory year	Successful					Unsuccessful					Total Hunters
	Local[a] resident	Non-local resident	Nonres.	Total	(%)	Local[a] resident	Nonlocal resident	Nonres.	Total	(%)	
1985/86	10	15	8	33	30	35	32	12	79	70	112
1986/87	16	16	9	41	38	50	8	9	67	62	108
1987/88	19	8	11	38	44	21	13	14	48	56	86
1988/89	25	1	13	39	33	51	13	15	79	67	118
1989/90	29	11	6	46	42	42	20	2	64	58	110
1990/91	43	6	1	50	44	40	20	4	66	56	114

[a] Residents of Petersburg and Wrangell

Table 4. Subunit 1B mountain goat harvest chronology percent by time period, 1985-91.

Regulatory year	Harvest periods					Total Harvest
	August	September	October	November	December	
1985/86	24	48	9	9	9	33
1986/87	32	54	7	5	2	41
1987/88	19	33	42	6	0	36
1988/89	21	46	15	8	10	39
1989/90	30	33	15	17	4	46
1990/91	14	34	22	6	24	50

Table 5. Subunit 1B mountain goat harvest percent by transport methods, 1985-91.

Regulatory year	Percent of harvest			Total Harvest
	Airplane	Boat	ORV	
1985/86	55	45	0	33
1986/87	63	37	0	41
1987/88	71	24	5	38
1988/89	54	46	0	39
1989/90	43	56	0	46
1990/91	22	78	0	50

LOCATION

Game Management Subunit: Subunit 1C (6,500 mi^2)

Geographical Description: Southeast Alaska mainland from Cape Fanshaw to the latitude of Eldred Rock

BACKGROUND

Mountain goats arrived in southeast Alaska from southern refugia sometime after the retreat of Pleistocene glaciation (Chadwick, 1983). Because mountain goats use alpine and subalpine zones in summer and the upper reaches of coniferous forests in winter, the coastal mountains of British Columbia and Alaska have promoted range expansion. Mountain goats now inhabit most of southeast Alaska's Coastal Range where steep forested slopes broken by rock outcrops are common.

A popular species for both local sport hunters and trophy hunters from around the world, mountain goat populations in easily accessed areas near Juneau have been reduced significantly from historically high numbers. Goat populations in the Juneau area may have been reduced to low numbers early this century as mining activity increased. Sport hunting of depleted populations contributed to further declines. Low goat numbers prompted the Board of Game's decision to close the area between the Taku Glacier and Eagle Glacier/River to hunting in 1985.

Mountain goats were re-introduced on Mt. Juneau during summer 1989. Funding for the project became available through efforts of the Audubon Society in Juneau. Goats were relocated from the Whiting River area, 50 miles south of Juneau. This re-introduction, if successful, will provide goats for viewing and the animals will be the nucleus of a population that should contribute to repopulating the area now closed to hunting.

MANAGEMENT OBJECTIVES

Population management objectives for Subunit 1C are to:

1) Maintain goat densities resulting in the observation of at least 30 goats per hour during fall surveys in the area between Eagle River/Glacier and the Antler River and in the Chilkat Range north of the Endicott River;
2) Maintain goat densities resulting in the observation of at least 50 goats per hour during fall surveys in the area south of Taku Inlet; and
3) Retain the existing closure of the Chilkat Range south of the Endicott River until surveys reveal at least 80 goats in the area between William Henry Mountain and Tear Drop Lake.

METHODS

Harvest data were obtained from registration permit returns for the 1989 and 1990 fall hunts. Aerial surveys of much of the subunit (excluding the Chilkat Range) were conducted in late summer 1989.

RESULTS AND DISCUSSION

Population Status and Trend

Aerial survey data contain the highest kid:adult ratio seen in the past five years, as well as the greatest number of animals seen per survey hour since 1985 (Table 1). Some bias was introduced by not surveying the sparsely populated Chilkat Range, but indications are that the population in the remainder of the unit is at least stable. The ratio of kids to adults in the 1989 surveys (33:100) was virtually the same as was measured in 1988 (32:100). This level is an improvement from the ratios seen in the three previous survey years (mean=25:100).

Mortality

Harvest:

Season and Bag Limit.

Unit 1C, that portion draining into Lynn Canal and Stephens Passage between Antler River and Eagle Glacier and River	1 Oct. - 30 Nov.	One goat by registration permit only.
Unit 1C, that portion draining into Stephens Passage and Taku Inlet between Eagle Glacier and River and Taku Glacier, and all drainages of the Chilkat Range south of the Endicott River.	No open season	
Remainder of Unit 1C.	1 Aug. - 30 Nov.	One goat by registration permit only.

Hunter Harvest. Forty-two goats were harvested in Subunit 1C in 1989 (28 males, 11 females, and three goats of unknown sex), and 30 were taken in 1990 (19 males, 10 females, and one unknown) (Table 2). Harvests during this report period compared to 5-year means of 38 for 1989 and 37 for 1990.

Hunter Residency and Success: Local residents harvested 25 goats in 1989, other Alaskan residents took nine, nonresidents took five (Table 3). Approximately 44% of local residents, 82% of nonlocal residents, and 73% of nonresidents that hunted were successful. In 1990, local residents took 16 goats, nonlocal residents took four, and nonresidents took 10. Forty-four percent of local residents, 50% of nonlocal residents, and 91% of nonresidents who hunted were successful in 1990.

Success rates and harvest per unit effort were high for that portion of the subunit open to goat hunting. The overall success rate of 79% for 1989 goat hunters was an increase over the 45% success rate in 1988 and above the 5-year mean of 50%. The 1990 success rate of 55% was higher than a 5-year mean of 47%. The average number of days hunting required to bag a goat, which had steadily increased since the early 1980s to a high of 3.6 hunter days per goat in 1987, had dropped to 3.2 in 1989, and to 2.8 in 1990. The percentage of females in the harvest declined from 1987 and 1988, when more nannies were taken than billies, to 28% of the known sex harvest in 1989 and 34% in 1990. This parameter may be an unreliable indicator of population status given the difficulty of identifying sex in the field.

Permit Hunts: Permit hunt areas 802 and 803 have been covered by one permit since 1988.

Harvest Chronology: The November harvest continued as the highest of the 4-month season with 48% (n=20) of the take in 1989 and 50% (n=15) in 1990 (Table 5). The seasons differed in that a high proportion of the harvest occurred during August in 1989 (26%) while a low proportion occurred in that month during 1990 (3%). The late season kills probably reflect hunter desire to take an animal in prime winter pelage.

Transport Methods: Most hunters continue to use boats to reach the hunt area, with lesser numbers reporting use of airplanes and highway vehicles (Table 6).

Natural Mortality: There is little data available concerning natural mortality. Holroyd (1967) cited several instances of goats killed in falls, rock slides, and avalanches. Up to 50% of the deaths of radio-collared goats in a study conducted near Haines, Alaska could be attributed to falls (Dinneford pers. comm.).

Many wolf fecal samples collected between Eagle River and the Mendenhall Glacier in the early 1980s contained goat hair, but whether the animals had been killed or scavenged was not ascertainable (Zimmerman unpubl. data). There were several reports of wolf packs traveling through alpine areas close to goat herds during spring 1989, a period

when kids were most vulnerable. Within a 2-week period centered around the peak of kidding, such wolf activity was reported near Berners Bay, on the Chilkat Peninsula, and on the north side of Taku Inlet.

Habitat Assessment

Winter and summer goat range within the subunit is extensive. Currently, in most parts of the subunit, goat numbers are probably well below carrying capacity, with the possible exception of the Tracy and Endicott arm areas.

Some loss of critical winter range could be expected if proposed mining projects in Subunit 1C are developed. The A-J Mine proposal stands to have the most impact in the near term. There, the damming of a large portion of the Sheep Creek valley for tailings disposal would cause direct loss of winter range. This area may currently be utilized by the largest remaining group of goats in the Eagle River-Taku Glacier closed area. In addition to habitat loss, related mining activity could further limit use of the valley by wintering mountain goats.

Development of the Kensington Mine north of Berners Bay would remove old growth timber which serves as winter goat habitat. Mining activities may also displace goats using the Lion's Head Mountain area.

CONCLUSIONS AND RECOMMENDATIONS

Goat sighting rates in the surveyed portions of the subunit varied; the Taku Glacier-Eagle River area and portions of the area south of Taku Inlet met management objectives, while other areas south of the Taku River did not. Total hunter effort in Subunit 1C dropped somewhat although hunter success and harvest per unit of effort both increased.

Continued efforts to conduct aerial surveys should be made, since survey information is sparse. As weather and funding permit, surveys should be conducted in the coming year to determine population composition and status for the subunit. Predation by wolves or bears should be considered a possible limiting factor in both closed areas. Goats, particularly breeding females, added to the Juneau area population via the proposed Mt. Juneau re-introduction may hasten population expansion regardless of the growth-limiting predation factors that may be operating.

Easily accessed areas may be receiving heavy hunting pressure in relation to the unit as a whole. For this reason, fine scale management of goat populations through harvest guidelines for hunt subareas is being used for northern southeast Alaska. This will allow monitoring of harvest pressure in discrete areas within permit hunt boundaries. To minimize the amount of paper carried by the hunter, we will continue to administer 2 or more permit hunt areas under one permit.

Although the percentage of nannies in the kill was substantially lower than in previous years, we must continue to direct hunting pressure away from females. Educational materials provided to all permittees will encourage hunters to select for billies. Harvest guidelines established for each permit hunt area which give harvested females twice the value as males will continue to be used for the 1991 season, and will further encourage hunters to select for males.

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Table 1. Subunit 1C. Mountain goat composition counts, 1986-90.

Year	Kids	Adults	Kids: 100 adults	Total Goats	Goats /hr.
1986	55	192	22	247	42
1987[a]	--	---	--	---	--
1988[b]	26	81	32	107	26
1989	169	514	33	683	51
1990[a]	--	---	--	---	--

[a] No surveys flown in 1987 or 1990.
[b] Surveys limited because of weather, not representative of entire unit.

Table 2. Subunit 1C. Mountain goat harvest by sex, 1986-90.

Year	Males	Females	Unknown	Total
1986	33	10	0	43
1987	15	16	1	32
1988	14	19	3	26
1989	28	11	3	42
1990	19	10	1	30

Table 3. Subunit 1C. Hunter residency and success, 1986-90.

	Successful				Unsuccessful			
Year	Local Res.	Nonlocal Res.	Nonres.	Total	Local Res.	Nonlocal Res.	Nonres.	Total
1986	35	7	1	43	32	6	4	41
1987	25	3	4	32	52	3	13	68
1988	30	3	3	36	39	2	3	44
1989	25	9	8	42	32	2	3	37
1990	16	4	10	30	20	4	1	25

Table 4. Subunit 1C. Harvest data by permit hunt, 1986-90.

Hunt No.	Year	Permits issued	Did not hunt	Unsuccessful hunters	Successful hunters	Males	Females	Unknown	Total
802	1986	55	37	12	6	5	1	0	6
	1987	52	34	15	3	0	3	0	3
803	1986	163	97	29	37	28	9	0	37
	1987	163	81	3	29	15	13	1	29
802/	1988	169	89	44	36	14	19	3	36
803[a]	1989	173	94	37	42	28	11	3	42
	1990	140	85	25	30	19	10	1	30

[a] Beginning in 1988 Hunts 802 and 803 were administered under one permit.

Table 5. Subunit 1C. Harvest chronology, 1986-90.

Year	Aug	Sept	Oct	Nov
1986	6	11	2	18
1987	9	2	7	14
1988	6	7	8	15
1989	11	5	6	20
1990	1	6	7	15

Table 6. Subunit 1C. Successful hunter transport methods, 1986-90.

Year	Airplane	Boat	Highway Vehicle	Other
1986	15	25	3	
1987	11	21	0	
1988	5	26	2	
1989	10	25	2	5
1990	2	26	0	2

LOCATION

Game Management Subunit: Subunit 1D (2,600 mi^2)

Geographical Description: The southeast Alaska mainland north of the latitude of Eldred Rock, excluding Sullivan Island and the drainages of Berners Bay

BACKGROUND

Subunit 1D contains three registration permit hunt areas (804, 805, and 806). Hunt area 804, the smallest of the three, is bounded by the Taiya River, the Yukon and White Pass Railroad, and the Canadian border. This area was closed by Board of Game action in 1984 because of a sharp decline in goat numbers as evidenced by fewer sightings, reduced hunter success, and a greater proportion of females harvested. Aerial composition counts conducted between 1983 and 1987 suggested that the Hunt 804 goat population had not recovered despite the closure. During the 1980s the rest of the subunit's mountain goat populations remained below levels of the late 1960s and 1970s.

Hundertmark *et al.* (1983) examined winter habitat use by mountain goats in the Chilkat Valley. They felt that increased access afforded by timber and mineral development would result in increased hunting pressure and illegal harvest. This added hunting pressure and the ability to access previously unhunted areas were considered detrimental to goat populations as the habitat loss from logging and mining.

MANAGEMENT OBJECTIVES

Population management objectives for Subunit 1D are as follows:

- Hunt 804 (Skagway) - increase the goat population to 100 animals.
- Hunt 805 (Haines North) - increase the estimated goat population from 600 to 1,000 goats and maintain hunter success of 25%.
- Hunt 806 (Haines South) - increase the estimated goat population from 300 to 500 goats and maintain hunter success of 25%.

METHODS

We conducted aerial surveys along established routes between late June and August 1989. Harvest parameters, including hunting pressure and hunter success rates, were determined for areas 805 and 806 jointly, as a single registration permit was used for both hunts.

RESULTS AND DISCUSSION

Population Status and Trend

Population status is difficult to estimate using only occasional surveys. Survey data from recent years had suggested that in easily accessed areas receiving heavy hunting pressure goat numbers have decreased. An extremely good survey flown in 1989 found animals at a rate far surpassing previous surveys (Table 1). We do not know whether these data result entirely from fortuitous survey conditions or from a population change. Despite being closed to hunting since 1987, Hunt Area 804 has shown no significant population increase. Other northern southeast Alaska areas have exhibited similar low growth rates even after several years of protection.

Population Size: Conservative estimates based on the 1989 survey data yield a minimum population of 350 goats in Hunt Area 805 and 290 goats in the 806 area. The goat population of Hunt Area 804 has probably declined from more than 150 in 1981 to between 40 and 60 goats today.

Mortality

Harvest:

Season and Bag Limit.

Unit 1(D), that portion lying east of Taiya Inlet and River between the Chilkoot Trail and the White Pass and Yukon Railroad	No open season	
Unit 1(D), that portion lying north of the Katzehin River and east of the Haines Highway	15 Sep. - 30 Nov.	One goat by registration permit only.
Remainder of Unit 1(D).	1 Aug.- 31 Dec.	One goat by registration permit only.

Hunter Harvest: During 1989 and 1990 hunters in Subunit 1D took 23 and 31 goats, respectively (Table 2). In 1989, 14 were male and nine female; in 1990 males predominated 18 to 12. The 1989 harvest was similar to 1986 levels and somewhat above

the previous 5-year average (21) (Table 3). In 1990, harvest rose to 31, well above the 5-year average of 20.

Hunter Residency and Success: Hunters were issued 156 and 193 registration permits for Hunts 805/806 in 1989 and 1990, respectively (Table 4). In 1989, 29% who hunted were successful, compared to a mean success rate for the previous 5-year period of 26%. In 1990, 23% of hunters were successful.

In 1989, 81% of participating hunters were Subunit 1D residents; 18% were other Alaskan residents, and no nonresidents hunted. In 1990, 72% of the people who hunted were local residents, with 26% being nonlocal state residents, and 2% being nonresidents.

Harvest Chronology: Goats can be hunted in Subunit 1D from the 1 August until 31 December. No goats were taken during December in this report period (Table 5). The August take represented 27% (1989) and 6% (1990) of the harvest. The September take represented 36% and 19% of the total, while October claimed 36% and 32% of the kill. During November, no goats were taken in 1989, while 42% were harvested in 1990.

Transport Method: Of successful hunters, 36% (1989) and 48% (1990) reported using boats for transport. Nine percent (1989) and 23% (1990) used highway vehicles, and 55% (1989) and 29% (1990) used other means (Table 6).

CONCLUSIONS AND RECOMMENDATIONS

Finer scale management of mountain goats becomes more necessary as hunting pressure increases. The two currently open permit hunt areas (805 and 806) have been further subdivided, with harvest guidelines developed for each subarea. To meet the division's goal of simplifying regulations and permits, a single permit will continue to be used for multiple hunts in Subunit 1D. However, the use of permits to monitor harvest monitor becomes more complex as we attempt to track the harvest in various hunt subareas. Careful population and harvest monitoring is necessary and closures may be required to avoid excessive harvest in areas where hunting pressure is concentrated.

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Table 1. Subunit 1D mountain goat composition counts, by hunt area, 1986-90.

Area	Year	No. of kids	No. of adults	Kids:100 adults	Total goats	Count time (hrs)	Goats/ hr
804	1986	No Survey					
	1987	0	7	0	7	0.7	11
	1988	No Survey					
	1989	6	17	35	23	0.7	35
	1990	No Survey					
805	1989	48	128	38	176	4.3	41
	1990	No Survey					
806	1986	No Survey					
	1987	4	14	29	18	1.6	11
	1988	No Survey					
	1989	33	111	30	144	1.4	106
	1990	No Survey					

Table 2. Subunit 1D. Mountain goat harvest by sex, 1986-90.

Year	Males	Females	Unknown	Total
1986	9	13	3	25
1987	8	9	1	18
1988	9	10	0	19
1989	14	9	0	23
1990	18	12	1	31

Table 3. Subunit 1D. Hunter residency and success, 1986-90.

	Successful				Unsuccessful			
Year	Local Res.	Nonlocal Res.	Nonres.	Total	Local Res.	Nonlocal Res.	Nonres.	Total
1986	21	2	2	25	40	10	4	54
1987	9	7	2	18	39	8	5	52
1988	12	1	6	19	43	13	1	57
1989	20	2	0	23	51	14	0	65
1990	20	9	2	31	54	18	0	72

Table 4. Subunit 1D. Harvest data by permit hunt, 1986-90.

Hunt No.	Year	Permits issued	Did not hunt	Unsuccessful hunters	Successful hunters	Total hunters	Percent successful
805/ 806[a]	1986	143	64	54	25	79	32
	1987	169	99	52	18	70	26
	1988	168	92	57	19	76	25
	1989	156	80	54	22	76	29
	1990	193	90	103	31	134	23

[a] During the report period one permit was used for hunt areas 805 and 806.

Table 5. Subunit 1D. Harvest chronology, 1986-90.

Year	Aug	Sept	Oct	Nov	Dec
1986	0	9	13	2	1
1987	1	6	6	4	1
1988	0	10	5	4	0
1989	6	8	8	0	0
1990	2	6	10	13	0

Table 6. Subunit 1D. Successful hunter transport methods, 1986-90.

Year	Boat	Highway vehicle	Other
1986	9	15	1
1987	12	4	2
1988	6	7	6
1989	8	2	12
1990	15	7	9

LOCATION

Game Management Unit: 4 (5,700 mi^2)

Geographical Description: Admiralty, Baranof, Chichagof, and adjacent islands

BACKGROUND

In Unit 4, a huntable mountain goat population is found only on Baranof Island (Permit Registration Hunt Area 815). This population resulted from a 1923 transplant of 18 goats from Tracy Arm on the southeast Alaska mainland. Forty-one goats were observed on Baranof Island by 1937, and the first hunting season was held in 1949 (Burris and McKnight 1973). A registration goat permit system was implemented in 1976, and since then, average annual goat harvests on Baranof Island have varied from 28 to 75 animals.

Chichagof Island, immediately north of Baranof, also received a transplant of mountain goats. The USFWS released 50 mountain goats there in the mid-1950s (Burris and McKnight 1973). Sightings have been reported sporadically since 1957 (ADF&G files, Sitka); the latest record was in 1978 when a professional guide reported seeing 10 goats near Stag Bay on west Chichagof Island (Johnson 1981). While no other sightings have been reported, a small herd of goats may still exist in a remote area on the island. Other than humans, the only potential predators on the two islands are brown bears and bald eagles, both have been suspected of goat predation elsewhere (Chadwick 1983).

Admiralty Island has no indigenous or introduced mountain goat populations, and goats were not reported in known historic records. No other goat populations are known to exist in Unit 4.

MANAGEMENT DIRECTION

Management Objectives

Management objectives for Unit 4 mountain goats are to: 1) maintain a population sufficient to provide an annual harvest of at least 35 goats; and 2) maintain a mountain goat population sufficient to provide an annual hunter success rate of at least 25%.

METHODS

Goat hunting registration permits (required in Unit 4 since 1976) were issued to hunters. Registration permits were free and not limited in number. Permit holders were required

to return a portion of the permit with specific hunt information including area hunted, date of hunt, number of animals harvested, and transportation used.

Successful permit holders were required to report goat harvests within five days of kill. Unsuccessful hunters and permittees who did not hunt were required to report within 15 days of the close of the season. We asked hunters to bring in horns, and we counted age rings on horns presented for inspection.

A Jet Ranger helicopter with two observers was used to survey goat populations. We also flew surveys to determine kid production in August 1989 and June 1991.

RESULTS AND DISCUSSION

Population Status and Trend

Population Size: Based on previous surveys (Johnson 1987) and using a sightability index of 50% (H. Griese, pers. comm.), approximately 1,000 goats exist in the survey area.

Population Composition: The percent females killed was 41% in 1990 and 33% in 1989 (Table 1). Table 2 shows goat composition counts and estimated population size from 1986-90. In 1991, kids comprised 12% of the goats observed in a 1-hour survey flight over the Katlian River drainage and Cold Storage Lake areas. These were the lowest kid percentages since 1970 (Sitka area office records). Winter 1990-91 had an exceptionally heavy snow pack according to Soil Conservation Service snow records near Juneau and Petersburg. Kid production probably declined as a result. Fewer kids in the population means decreased numbers of reproductive animals in the future.

Hunters were not legally required to present goat horns for examination, but they were encouraged to submit horns for measurement and age determination. The average age of females in 1990 was 3.9 (n=11) and the male age was 4.9 (n=21). The average age of goats harvested in 1989 was 5.7 years for females (n=6) and 4.2 years for males (n=19) as compared to 7.4 years for females and 3.8 years for males in 1988 (Young 1989).

Mortality

Harvest:

Season and Bag Limit.

Unit 4	1 Aug.-31 Dec.	One goat by registration permit only

Hunter Harvest. Sport hunters took 42 goats in 1990 and 33 goats in 1989 (Table 1). Katlian Mountain was the leading hunting area in 1990 with 26% of the harvest. Rosenburg Lake, a popular fly-in hunting area, yielded 12% of the kill in 1989 and 19% in 1990. Three Sisters Mountain, within hiking distance of Sitka, provided 12% of the 1989 harvest. No other areas contributed noticeably to the harvest.

Hunter Residency and Success. Nonresident hunters did not kill any goats in 1989; however, 3 nonresidents were successful in 1990 (Table 3). Seven nonresidents acquired permits in 1989 and 8 permits were issued in 1990. As an example of how the regulation affected harvest distribution, in 1988 nonresident hunters accounted for 32% of the harvest (Young 1989). Eighty-four percent of permit holders were Sitka residents in 1989, while in 1990, 85% were the same. In 1990, 42 (32%) of the 129 permit holders were successful. Of the 131 permit holders who hunted in 1989, 33 (25%) were successful (Tables 1 and 3).

Harvest Chronology. In 1989, 60% of the goats were harvested in August and September (Table 3). In 1990, 43% were harvested in August and September, while 36% were taken in October (Table 4).

Transport Methods. Boats were used more than any other transportation means by successful mountain goat hunters in Unit 4. In 1989, 64% of the successful hunters listed boats as their transport method, 18% of the hunters used airplanes, and 18% walked into the hunting area from the Sitka road system (Table 5). In 1990, 69% of the successful hunters listed boats as transportation, 24% used airplanes, and 7% walked into the hunting area (Table 5).

CONCLUSIONS AND RECOMMENDATIONS

The mountain goat population objectives for Unit 4 are to maintain an annual harvest of at least 35 goats and to maintain a hunter success rate of at least 25%. The success rate objective was met both years. Hunters harvested 33 mountain goats in 1989 and 42 in 1990. The goat season in Unit 4 lasts for five months to allow for poor weather conditions, which can impede goat hunting efforts.

Accessible areas should be monitored to ensure that overharvest does not occur, but helicopter time is expensive and surveys cannot be conducted every year. The single charter helicopter in Sitka is busy during August and scheduling is difficult. Surveys are most economically done by slow flying fixed-wing aircraft which are unavailable in Sitka during survey periods.

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Table 1. Unit 4 mountain goat harvest data by permit hunt, 1986-91.

Hunt No.	Regulatory year	Permits issued	Percent did not report	Percent did not hunt	Percent unsuccessful hunters	Percent successful hunters	Males (%)	Females (%)	Unk.	Illegal	Total harvest
815	1986/87	270	1	51	61	39	28 (56)	22 (44)	0	0	50
	1987/88	244	0	44	73	27	20 (56)	16 (44)	1	0	37
	1988/89	259	1	52	70	30	22 (60)	15 (40)	0	0	37
	1989/90	322	2	58	75	25	22 (67)	11 (33)	0	0	33
	1990/91	306	1	57	67	33	24 (57)	17 (41)	1	0	42

Table 2. Unit 4 aerial mountain goat composition counts and estimated population size, 1986-91.

Area	Regulatory year	Adults (%)	Kids (%)	Unk.(%)	Kids: 100 adults	Total goats observed	Goats/ hour	Estimated population size[a]
Northern Baranof	1988/89	403 (78)	114 (27)	6 (1)	28	523	101	1,046[a]
Bear Mountain Katlian/	1989/90	51 (72)	21 (29)	0 (0)	41	71	35	no estimate[b]
Cold Storage Lake Kelp Bay/	1990/91	71 (89)	9 (12)	0 (0)	13	80	37	no estimate[b]
Rodman Bay	1990/91	55 (92)	5 (8)	0 (0)	9	60	74	no estimate[b]

[a] Based on 50% sightability.
[b] Survey conducted to determine kid survival in specific areas; not to determine size.

Table 3. Unit 4 mountain goat hunter residency and success, 1986-91.

Regulatory year	Successful				Unsuccessful				Total hunters
	Local[a] resident	Nonlocal resident	Non-resident	Total (%)	Local[a] resident	Nonlocal resident	Non-resident	Total (%)	
1986/87	39	5	6	50 (39)	70	6	2	78 (61)	128
1987/88	31	2	4	37 (27)	78	8	13	99 (73)	136
1988/89	23	2	12	37 (30)	76	5	5	86 (70)	123
1989/90	31	2	0	33 (25)	82	11	5	98 (75)	131
1990/91	37	2	3	42 (33)	75	6	5	86 (67)	128

[a] Residents of Baranof Island.

Table 4. Unit 4 mountain goat harvest chronology percent by time period, 1986-91.

Area	Regulatory year	Harvest periods					n
		August	September	October	November	December	
815	1986/87	10	48	16	4	22	50
	1987/88	32	11	19	5	32	37
	1988/89	16	32	24	0	27	37
	1989/90	30	30	21	9	9	33
	1990/91	17	26	36	7	14	43

Table 5. Unit 4 mountain goat harvest percent by transport method, 1985-1991.

Regulatory Year	Percent of harvest			n
	Airplane	Boat	Walked	
1986/87	40	50	10	50
1987/88	30	60	10	37
1988/89	35	60	5	37
1989/90	18	64	18	33
1990/91	24	69	7	42

LOCATION

Game Management Unit: 5 (6,235 mi^2)

Geographical Description: Cape Fairweather to Icy Bay, eastern Gulf of Alaska Coast

BACKGROUND

Mountain goats have been present in the eastern Gulf of Alaska coast region since recorded history began. Klein (1965) surmised that goats extended north and west from a southern refugium and that the present northern and western limits of distribution may be the result of relatively recent arrival to the area. Unlike other large mammals in the Yakutat Forelands area (*i.e.*, moose and bear), mountain goats may have come "up the coast" rather than down the Tatshenshini/Alsek River corridor.

Alaska Natives used mountain goat hides for clothing and other domestic purposes. Recreational hunting was occurring at least by the early 1970s, and probably earlier because Yakutat was the site of a large Army base during World War II.

Aerial surveys were first conducted by the ADF&G in 1971. That year, staff counted 283 goats (33 kids:100 adults) between Gateway Knob and Harlequin Lake in the Brabazon Mountains. By 1973, division biologists had documented a significant decline in area goat numbers, attributed primarily to severe winter weather. Counts in this one part of Subunit 5A have increased over the years, and in the Subunit 5B portion of Icy Bay counts appear higher than in the early 1970s.

MANAGEMENT OBJECTIVES

Management objectives for mountain goat populations in Unit 5 are to increase the estimated population from 850 to 1,250 goats and maintain a hunter success rate of 25%.

METHODS

We conducted aerial surveys from Harlequin Lake to the Variegated Glacier at the entrance to Nunatak Fiord in July 1989 (Table 1). This continued a survey conducted in June from Gateway Knob to Harlequin Lake. Goats were classified as kids or adults (including yearlings); the number of goats/hour was calculated; and the kid:100 adult ratio was determined. No surveys were flown in 1990. During the report period, hunters were required to obtain registration permits from local ADF&G offices which allowed inseason monitoring of harvest effort and intensity. Anecdotal information was gathered from hunters, ADF&G field personnel, and other agencies.

RESULTS AND DISCUSSION

Population Status and Trend

Surveys conducted in 1989 covered the area between Gateway Knob and the Variegated Glacier in Subunit 5A. The highest total count was recorded for this area since the first surveys were conducted in 1980, and the ratio of 45 kids:100 adults surpasses all previous counts (Table 1). Although the goat/hour value in 1984 was higher, the 1989 effort covered much more area, particularly the Nunatak Fiord area, which is noticeably devoid of goats. The healthy kid:adult ratio and high total count suggests a stable or growing population. An increasing goat/hour value during surveys also points to an expanding herd. The Unit 5 population is around 1,000 animals, and appears to be slowly increasing.

Mortality

Harvest:

Season and Bag Limits.

Unit 5	1 Aug.-31 Dec.	One goat by registration permit.

Hunter Harvest: Eight mountain goats were reported harvested in Unit 5 during 1989 (7 male and 1 female), slightly above the 1985-1989 average of seven (Table 2). In 1990, 13 goats were taken compared to a 5-year average of eight. Since 1983, when the third highest annual harvest of 23 was recorded, the kill has been significantly reduced. The reduced kill seems to be because of decreased effort rather than a reduced success rate. While illegal harvest remains unquantified, it is probably small.

Hunter Residency and Success: The hunter success rate has varied from 15% to 50% in the last five years (Table 3), with the 1989 and 1990 success rates (42% and 43%, respectively) falling within those extremes and above the mean of 35%. During 1989 two successful hunters were local residents and six were nonresidents. In 1990 three successful hunters were local residents, four were nonlocal residents, and six were nonresidents. Since 1986, nonresidents took an average of 65% of the harvest, while local and nonlocal residents took 18% and 16% of the kill, respectively. The relatively low harvest by local and nonlocal Alaskans is partly because of low interest by local hunters and access to other huntable goat populations for other residents. However, the perception of the opportunity to hunt goats here may be getting better relative to situations elsewhere in the state, since most of the difference between the 1989 and 1990 harvests in Unit 5 was the increase in nonlocal resident hunters.

The requirement that nonresidents be accompanied by an outfitter/guide is not believed to have affected goat hunting in the area. Perhaps some hunters decided against a hunt here, but effort has been so low since 1984 that the net consequence is indeterminate.

Permit Hunts: In 1989, for the fifth year in a row, the smallest number of registration permits was issued for Hunt 817 since registration permit use began in 1980 (Table 4). This may be partly because of more restrictions on moose hunting for nonlocals in Subunit 5A during 1985 and 1987 through 1989, which reduced chances for a mixed-bag hunt. In 1990, 46 registration permits were issued, the greatest number since 1987.

Since 1986, an average of only 45% of the permittees have actually hunted. During the 1989 season 48% of the permitted hunters reported hunting, and in 1990 the number climbed to 65%. The registration permit format remains a viable method to effectively manage goat hunting in the unit.

Harvest Chronology: The harvest is spread throughout the season, although the greatest number of goats are taken during September and October (Table 5). Few goats have been taken in August and November. In 1989, 25% were taken in August, and 38% in both September and October. In 1990, 31% were killed in August, and 54% were taken in September and October combined.

Transport Methods: Four goats taken in 1989 were accessed via aircraft and the other four were reached by boat.

CONCLUSIONS AND RECOMMENDATIONS

When goat numbers documented during aerial surveys in the Brabazon Mountains of Subunit 5A are compared to past years in the same area, indications are the goat population is probably increasing. The small Unit 5 harvest should not be construed as an indicator of population health or trend. The management objective of 25% hunter success was achieved in 1989 when 42% of all hunters were successful. The population is apparently growing, but has probably not yet reached 1,250 animals.

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Table 1. Unit 5. Mountain goat composition counts, 1986-90.

Year	Number of adults	Number of kids	Total goats	Kids:100 adults	Percent Kids	Goats/ hour
1986	36[a]	11	47	31	23	40
1987	196	53	249	27	21	60
1988	140	53	193	38	27	56
1989	64	29	93	45	31	47
1990		No Survey				

[a] Incomplete survey

Table 2. Unit 5. Annual harvest, 1986-90.

Year	Males	Females	Unknown	Total
1985	2	6	0	8
1986	5	4	0	9
1987	2	0	1	3
1988	2	3	0	5
1989	7	1	0	8
1990	11	2	0	13

Table 3. Unit 5. Hunter residency and success, 1986-90.

Year	Successful				Unsuccessful			
	Local res.[a]	Nonlocal res.	Nonres.	Total	Local res.	Nonlocal res.	Nonres.	Total
1986	4	1	4	9	0	2	7	9
1987	0	0	3	3	3	3	11	17
1988	0	2	3	5	5	1	8	14
1989	2	0	6	8	4	3	4	11
1990	3	4	6	13	3	11	3	17

[a] Local residents are those persons living in Unit 5.

Table 4. Unit 5. Harvest data by permit hunt, 1986-90.

Hunt No.	Year	Permits issued	Did not hunt	Unsuccessful hunters	Successful hunters	Billies	Nannies	Total
817	1986	53	35	9	9	5	4	9
	1987	52	33	16	3	2	0	3
	1988	44	25	4	5	2	3	5
	1989	40	21	11	8	7	1	8
	1990	46	16	17	13	11	2	13

Table 5. Unit 5. Harvest chronology, 1986-90.

Year	Aug	Sept	Oct	Nov	Dec
1986	0	2	3	2	2
1987	0	1	2	0	0
1988[a]	1	1	2	0	0
1989	2	3	3	0	0
1990	4	2	5	0	2

[a] One kill date unknown.

LOCATION

Game Management Unit: 6 (10,140 mi^2)

Geographical Description: Prince William Sound and north Gulf of Alaska Coast

BACKGROUND

Mountain goats are endemic to the mainland mountains of Unit 6 and to Bainbridge, Culross and Knight islands. Their presence was documented by Captain Cook in 1785 (Beaglehole 1966), Edmund Heller (1910) in 1908, Clarence Rhode (ADF&G files) in 1938, and Fred Robards in 1952 (ADF&G files). Robards estimated 4,350 goats between Cape Fairfield and Bering Glacier, which includes most of Unit 6. In 1988, Griese (1990) estimated the unit population at 3,180 to 3,780 animals.

Several significant events apparently caused population reductions. In 1961 Art Sheets, Game Biologist with ADF&G, reported evidence that goat numbers in Port Wells were reduced in the 1940s by military personnel stationed in Whittier. He reported similar evidence for reductions by military personnel stationed in Seward in the Puget Bay area during the 1950s. Populations may also have suffered significant natural mortality during the severe winters of 1971 and 1975, and been unable to recover because of predation (Reynolds 1981) and hunter harvest. Hunting during the early 1980s caused additional declines in subpopulations (Griese 1988a), while predation increased (Griese 1988b).

Population surveys began with aerial composition flights in 1969. Methods were not standardized until 1986, when Griese (1988a) improved survey methods by establishing 70-150 mi^2 count areas that were systematically searched.

Harvest has been monitored since 1972 using hunter reports. Both successful and unsuccessful hunters were required to report, with the exception of 1980 through 1985, when only successful hunters reported. Annual harvest reached an historic high of 182 animals in 1983/84 and declined to an historic low of 41 goats in 1990/91.

Unit goals are to provide maximum hunting opportunity, aesthetically pleasing hunting conditions, and observation opportunities. To reach these goals, a registration permit system was adopted in 1986 that allows maximum hunter participation, but restricts harvest to encourage population recovery.

MANAGEMENT DIRECTION

Management Objective

The management objective for Unit 6 mountain goats is to increase the goat population to at least 4,500 and sustain an annual harvest of 160 goats, including a maximum of 30% females and an average male age of 6.0 years, by the year 2000.

METHODS

We conducted composition and trend surveys in most permit hunt areas. During 1989 and 1990, we surveyed 5 of 11 and 6 of 9 hunt areas, respectively. We conducted additional surveys at 5 other locations closed to hunting.

We completed aerial surveys between 1 August and 2 October using a Piper PA-12 in early morning or late evening. Goat habitat between 1,000 and 3,000 ft elevation was extensively surveyed. We noted observations of goats on USGS 1:125,000 maps, and identified the number of adults and kids.

A conservative maximum allowable harvest (MAH) for each year was established for each permit hunt area. It was calculated as a percent of goats observed during the most recent survey. The percent applied ranged from 2% to 7%, depending upon population trend, estimated mortality, and elapsed time since the last survey. For example, areas with decreasing population trend, high mortality, and survey data several-years-old had a MAH of no more than 2% or 3% of goats observed in the last survey.

All permit hunters were provided a handout that presented methods of differentiating sexes of goats at a distance and explained the benefits of selectively harvesting males. Successful hunters were required to have horns checked by ADF&G staff to correctly identify the goat's sex and age. Hunters who did not report effort were sent up to 2 reminder letters.

Fifteen goats fitted with radiocollars were monitored to identify habitat and subpopulations in eastern Prince William Sound. This was a cooperative project with U.S. Forest Service (USFS). Objectives were to: identify, characterize and predict habitat requirements; and validate goat subpopulation integrity as related to summer/fall goat composition counts and calculated allowable harvest levels for count areas. We collected data during 14 aerial relocation flights, and completed a progress report.

RESULTS AND DISCUSSION

Population Status and Trend

Results of aerial surveys conducted during 1989 and 1990 suggested a lower total population in Unit 6 than estimated in 1988 (Griese 1990). Numbers appeared either stable or declining in most hunt areas (Tables 1-4). The possible exceptions were increasing numbers in the Duktoth River portion of Hunt Area 820 within Subunit 6A (Table 1) and in Hunt Areas 830 and 829 in Subunit 6D (Table 4).

Population Size: Total population estimates in Unit 6 indicated declining numbers. In 1990/91 there were perhaps 2,700 to 3,300 goats. The greatest numbers were in Subunit 6D, followed by 6A, 6B, and 6C. We estimated the 1988/89 unit total at 3,180 to 3,780.

Population Composition: The mean kid:adult ratio for all areas counted in 1989/90 and 1990/91 was 29:100 and 25:100, respectively. During each year, the range of values between count areas was 13-43:100 and 17-43:100, respectively (Tables 1-4). Unitwide ratios show some improvement compared to the previous three years. Results from 1986/87-1988/89 were 24:100, 23:100, and 25:100.

Mortality

Harvest:

Season and Bag Limit. In the Ragged Mountains (Hunt 826) and Don Miller Hills (Hunt 825), the open season for resident and nonresident hunters during 1989/90 was 20 August to 30 November. This season was also opened to subsistence hunters during 1990/91. During both years, the bag limit was 1 goat by drawing permit only, with up to 25 permits authorized.

In the remainder of Unit 6, the 1989/90 season was 1 August to 31 January for subsistence hunters and 1 September to 30 November for resident and nonresident hunters. The 1990/91 season was 20 August to 31 January for all hunters. During both years, the bag limit in the remainder of Unit 6 was one goat by registration permit. Seasons were closed by emergency order if MAH was reached before the end of season.

Board of Game Actions and Emergency Orders. The Board of Game adjusted seasons for all hunters from 1989/90 to 1990/91. A subsistence season was added for drawing permit hunts in Ragged Mountains and Don Miller Hills. One uniform season was established for all hunters in the registration permit areas in the remainder of Unit 6.

No emergency orders were issued during 1989/90. During 1990/91, six registration hunts were closed by emergency order. Hunts 823 and 824 were closed before the State of Alaska season opened because surveys indicated populations could not support harvest.

Additional closures made when MAH was reached included: Brower Ridge and Khitrov Hills portions of Hunt 820; and all of hunts 828, 829, and 830.

Hunter Harvest. Goat harvest in Unit 6 was conservative. Hunters reported taking 41 and 66 goats during 1989/90 and 1990/91, respectively (Table 5). Estimated MAH was 110 and 79, respectively, for the entire unit each year. Among permit areas, the MAH was reached in only 4 of 20 hunts open during the two regulatory years.

The reported take included 32 (78%) males and 7 (17%) females during 1989/90. In 1990/91, the sex composition was 46 males (70%) and 19 (29%) females. Three animals of unknown sex were taken during the two years.

In the 1989/90 harvest, the average age of 31 male goats was 6 years (range 2-11) and the average age of 7 females was 7 years (range 4-12). The average age of both males and females during 1990/91 was 6 years. Ages were determined for 44 males (range 3-15) and for 17 females (range 2-12).

We estimated the illegal, unrecovered, and unreported harvest at eight goats in 1989/90 and 13 in 1990/91. Hunters were asked to report goats killed and not recovered with no legal implications. Over the past five years, these have accounted for up to 7% of the total take.

Harvests this report period were the lowest documented in Unit 6 since 1972 when harvest monitoring began. The lower take was primarily because of declining populations that have reduced the opportunity to hunt. Compared to the previous three years, less area was open to hunting, and MAH was reduced in many areas that remained open.

The *Exxon Valdez* oil spill was probably another factor depressing harvest. The oiled beaches and massive clean-up effort probably deterred hunters from visiting Prince William Sound and the remainder of Unit 6 as well. This seems likely in 1989/90, when the MAH for Unit 6 was 110 goats, and only 41 goats actually taken, and no individual hunt areas were closed by emergency order because MAH was reached.

Permit Hunts. Number of permits issued during the report period dipped to an historic low for Unit 6. Permits were first required in the entire unit in 1981/82. Permits issued reached a high of 796 in 1983/84 and has steadily declined since then to the 1989/90 low of 235. The downward trend reflects the long-term reduction in hunting opportunity.

Hunter Residency and Success. Over the past two years, most goat hunters were Alaska residents (Table 6), most of who came from outside Unit 6. This was also true during 1986/87 and 1988/89. However, during 1987/88 nonresidents outnumbered residents.

Hunter success improved during this report period. In 1989/90 and 1990/91, it was 48% and 50%, respectively. During the previous three years hunter success averaged 34%.

Harvest Chronology. September and October were consistently the most productive months for goat harvest (Table 7). Seventy-eight percent and 84% of the harvest occurred in this time period during 1989/90 and 1990/91, respectively. The same pattern occurred the previous three years.

Some variation occurred in August and November harvests because of regulatory actions. During 1987-1990, no harvest occurred in August because the season did not open for most hunters until 1 September. November harvest varied because of emergency closures and changes in hunter eligibility for permit areas near major community centers.

Transport Methods. Airplanes were the most important means of hunter transport (Table 8). They provided transportation for 68% and 58% of hunters during 1989/90 and 1990/91, respectively. They were similarly important during previous years.

Other Mortality: Predation by wolves was probably an important source of natural mortality. Wolves have expanded their range and increased in number since 1972. This may have reduced the goat population in areas where escape terrain was inadequate. These areas included: Brower Ridge, Mount McPherson, Suckling Hills, and Mount Hamilton in Subunit 6A; Shepard Glacier in Subunit 6C; and Rude River in Subunit 6D.

CONCLUSIONS AND RECOMMENDATIONS

The population and annual harvest objectives probably cannot be achieved by the year 2000. A 50% increase in numbers would be required over the next nine years to reach the desired population of 4,500 and harvest of 160. This is unrealistic given the current declining population trend, increasing wolf predation, and potential logging impacts. I recommend establishing a more conservative objective of 3,500 goats with a harvest of 100 animals.

Harvest composition objectives were achieved and should remain in place. Desired age of males and proportion of females in the harvest were both achieved because of ongoing hunter education efforts. This program should continue.

Harvest and number of permits issued reached historic lows. This was primarily because of a declining population that offers reduced opportunity to hunt. However, hunters were probably deterred by oiled beaches and cleanup activities from the *Exxon Valdez* oil spill. Goat hunting opportunities have increased in adjacent units (7, 14, 15) during the last six years, perhaps drawing hunters away from Unit 6.

Reversing the downward population trend should be a top priority for goat management in Unit 6. I recommend the following four steps.

1. Continue the present conservative harvest strategy to facilitate population recovery. MAH should not exceed 5% of goats observed during aerial surveys.

2. Evaluate the potential for goat introductions on Montague and Knight islands to increase the population.
3. Quantify the role of wolf predation and implement any appropriate change in wolf management strategy.
4. Complete current studies of habitat and population identity and use results to develop habitat capability models, assess the impact of logging, and refine survey methods.

Steps 1 and 4 are in progress and require no additional commitment of fiscal resources. I recommend that steps 2 and 3 be implemented through cooperative efforts with USFS. USFS plans to collect habitat data on Montague Island that would be useful for assessing a potential goat introduction. A USFS pilot study of wolves in Subunit 6C could be expanded as a joint effort.

Changes to hunting season dates and bag limits are not warranted at this time. MAH for hunt areas needs to be adjusted annually within the recommended range, as dictated by the previous year's harvest composition, winter severity, varying levels of predation and population status and trend. Frequent surveys and diligent harvest monitoring are essential under this strategy.

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Table 1. Subunit 6A summer/fall aerial mountain goat composition counts and estimated population size, 1986-91.

Hunt No. or Area	Regulatory year	Adults(%)	Kids(%)	Unk.	Kids: 100 adults	Total goats observed	Goats/ hour	Estimated population size
820	1986/87	122(80)	31(20)	0	25	153	170	900-1,000
	1987/88[a]	--	--	--	--	--	--	----
	1988/89[a]	--	--	--	--	--	--	----
	1889/90[a]	433(76)	139(24)	4	32	576	68	800-900
	1990/91[a]	--	--	--	--	--	--	----
825	1986/87	35(76)	11(24)	0	31	46	115	50-60
	1987/88[a]	--	--	--	--	--	--	----
	1988/89[a]	--	--	--	--	--	--	----
	1989/90[a]	--	--	--	--	--	--	----
	1990/91	34(74)	12(26)	2	35	48	80	50-60
Suckling Hills	1986/87	9(69)	4(31)	0	44	13	33	14-17
	1987/88[a]	--	--	--	--	--	--	----
	1988/89[a]	--	--	--	--	--	--	----
	1989/90[a]	--	--	--	--	--	--	----
	1990/91	6(86)	1(14)	0	17	7	12	8-10
Monument Mtn.	1986/87	18(82)	4(18)	0	22	22	73	25-29
	1987/88[a]	--	--	--	--	--	--	----
	1988/89[a]	--	--	--	--	--	--	----
	1989/90[a]	--	--	--	--	--	--	----
	1990/91[a]	--	--	--	--	--	--	----
Mt. Hamilton	1986/87	8(80)	2(20)	0	25	10	18	11-14
	1987/88[a]	--	--	--	--	--	--	----
	1988/89[a]	--	--	--	--	--	--	----
	1989/90[a]	--	--	--	--	--	--	----
	1990/91	7(70)	3(30)	0	43	10	17	11-14

[a] No survey or incomplete survey

Table 2. Subunit 6B summer/fall aerial mountain goat composition counts and estimated population size, 1986-91.

Hunt No. or Area	Regulatory year	Adults(%)	Kids(%)	Unk.	Kids: 100 adults	Total goats observed	Goats/ hour	Estimated population size
826	1986/87	93(77)	28(23)	0	30	121	100	130-160
	1987/88[a]	--	--	--	--	--	--	----
	1988/89[a]	--	--	--	--	--	--	----
	1989/90[a]	--	--	--	--	--	--	----
	1990/91	114(83)	24(17)	0	21	138	115	150-180
878	1986/87[a]	--	--	--	--	--	--	----
	1987/88	100(79)	25(20)	1	25	126	109	140-160
	1988/89[a]	--	--	--	--	--	--	----
	1989/90	58(83)	12(17)	0	21	70	56	80-90
	1990/91[a]	--	--	--	--	--	--	----

[a] No surveys or incomplete surveys

Table 3. Subunit 6C summer/fall aerial mountain goat composition counts and estimated population size, 1986-91.

Hunt No. or Area	Regulatory year	Adults(%)	Kids(%)	Unk.	Kids: 100 adults	Total goats observed	Goats/ hour	Estimated population size
821	1986/87[a]	--	--	--	--	--	--	----
	1987/88[a]	--	--	--	--	--	--	----
	1988/89	87(83)	18(17)	0	21	105	--	120-140
	1989/90[a]	--	--	--	--	--	--	----
	1990/91[a]	--	--	--	--	--	--	----

[a] No surveys

Table 4. Subunit 6D summer/fall aerial mountain goat composition counts and estimated population size, 1986-91.

Hunt No. or Area	Regulatory year	Adults(%)	Kids(%)	Unk.	Kids: 100 adults	Total goats observed	Goats/ hour	Estimated population size
822	1986/87	278(82)	61(18)	0	22	339	--	380-440
	1987/88[a]	--	--	--	--	--	--	----
	1988/89[a]	--	--	--	--	--	--	----
	1989/90	221(76)	68(24)	0	31	289	62	320-380
	1990/91[a]	166(79)	43(21)	0	26	209	65	300-360
823	1986/87	145(77)	44(23)	0	30	189	--	210-250
	1987/88[a]	--	--	--	--	--	--	----
	1988/89[a]	--	--	--	--	--	--	----
	1989/90	92(88)	12(12)	0	13	104	80	110-140
	1990/91	76(74)	27(26)	0	36	103	50	110-130
824	1986/87	96(81)	22(19)	0	23	118	--	130-150
	1987/88[a]	--	--	--	--	--	--	----
	1988/89[a]	--	--	--	--	--	--	----
	1989/90	86(76)	27(24)	0	31	113	--	120-150
	1990/91	81(85)	14(15)	0	17	95	51	100-120
828	1986/87	64(79)	17(21)	0	27	81	--	90-110
	1987/88[a]	--	--	--	--	--	--	----
	1988/89[a]	--	--	--	--	--	--	----
	1989/90[a]	65(81)	15(19)	0	23	80	50	90-100
	1990/91[a]	--	--	--	--	--	--	----
829	1986/87[a]	35(81)	8(19)	0	23	43	--	140-170
	1987/88	138(79)	36(21)	0	26	174	105	190-230
	1988/89[a]	--	--	--	--	--	--	----

Table 4. Continued.

Hunt No. or Area	Regulatory year	Adults(%)	Kids(%)	Unk.	Kids: 100 adults	Total goats observed	Goats/ hour	Estimated population size
829	1989/90[a]	--	--	--	--	--	--	----
	1990/91	215(81)	49(19)	4	23	268	92	290-350
830	1987/87[a]	--	--	--	--	--	--	----
	1987/88[a]	--	--	--	--	--	--	----
	1988/89	230(79)	61(21)	0	27	291	94	320-380
	1989/90[a]	--	--	--	--	--	--	----
	1990/91[a]	--	--	--	--	--	--	----
879	1986/87[a]	--	--	--	--	--	--	----
	1987/88	92(82)	20(18)	0	22	112	43	120-150
	1988/89[a]	--	--	--	--	--	--	----
	1989/90[a]	--	--	--	--	--	--	----
	1990/91[a]	--	--	--	--	--	--	----
Valdez	1986/87	35(78)	10(22)	0	29	45	--	50-60
	1987/88[a]	--	--	--	--	--	--	----
	1988/89[a]	--	--	--	--	--	--	----
	1989/90	43(74)	15(26)	0	35	58	39	60-70
	1990/91[a]	--	--	--	--	--	--	----
College Fjord	1986/87[a]	--	--	--	--	--	--	----
	1987/88	33(80	8(20)	0	24	41	26	45-53
	1988/89[a]	--	--	--	--	--	--	----
	1989/90[a]	--	--	--	--	--	--	----
	1990/91[a]	--	--	--	--	--	-	----

Table 4. Continued.

Hunt No. or Area	Regulatory year	Adults(%)	Kids(%)	Unk.	Kids: 100 adults	Total goats observed	Goats/ hour	Estimated population size
Whittier	1986/87[a]	--	--	--	--	--	--	----
	1987/88	31(86)	5(14)	0	16	36	11	40-47
	1988/89[a]	--	--	--	--	--	--	----
	1989/90[a]	--	--	--	--	--	--	----
	1990/91[a]	--	--	--	--	--	--	----
Sargent Icefield	1986/87[a]	--	--	--	--	--	--	----
	1987/88[a]	--	--	--	--	--	--	----
	1988/89	8(89)	1(11)	0	13	9	9	10-12
	1989/90[a]	--	--	--	--	--	--	----
	1990/91[a]	--	--	--	--	--	--	----
Mt. Castner	1986/87[a]	--	--	--	--	--	--	----
	1987/88[a]	--	--	--	--	--	--	----
	1988/89[a]	--	--	--	--	--	--	----
	1989/90	14(70)	6(30)	0	43	20	11	22-26
	1990/91[a]	--	--	--	--	--	--	----
Heiden Canyon	1986/87[a]	19(90)	2(10)	0	11	21	--	26-31
	1987/88[a]	--	--	--	--	--	--	----
	1988/89[a]	--	--	--	--	--	--	----
	1989/90	16(84)	3(16)	0	19	19	15	21-25
	1990/91[a]	--	--	--	--	--	--	----

[a] No surveys or incomplete surveys.

Table 5. Unit 6 mountain goat harvest data by permit hunt, 1986-91.

Subunit/ hunt no.	Regulatory year	Permits issued	Percent did not hunt	Percent Unsuccessful hunters	Percent successful hunters	Males(%)	Females(%)	Unk.	Total harvest	Maximum allowable harvest
6A/820[a]	1987/88	60	45	27	28	11(65)	2(24)	2	17	41
	1988/89	56	29	39	32	8(44)	10(56)	0	18	33
	1989/90	23	35	0	65	14(93)	0 (0)	1	15	31
	1990/91	43	37	19	44	12(63)	6(32)	1	19	23
6A/825[a]	1987/88	5	80	0	20	1(100)	0 (0)	0	1	2
	1988/89	4	50	0	50	0 (0)	2(100)	0	2	2
	1989/90	3	33	33	33	1(100)	0 (0)	0	1	2
	1990/91	3	67	0	33	1(100)	0 (0)	0	1	2
6A(Total)[a]	1987/88	65	48	25	28	12(67)	4(22)	2	18	43
	1988/89	60	37	37	33	8(40)	12(60)	-	20	35
	1989/90	26	35	4	62	15(94)	0 (0)	1	16	33
	1990/91	46	39	17	43	13(65)	6(30)	1	20	25
6B/826	1987/88	10	50	40	10	1(100)	0 (0)	0	1	6
	1988/89	10	40	40	20	2(100)	0 (0)	0	2	5
	1989/90	14	71	14	14	2(100)	0 (0)	0	2	5
	1990/91	14	50	21	29	3(75)	1(25)	0	4	6
6B/878	1988/89	0	0	0	0	0(0)	0 (0)	0	0	0
	1989/90	6	67	0	33	2(100)	0 (0)	0	2	4
	1990/91	5	40	40	20	1(100)	0 (0)	0	1	3
6B(Total)	1987/88	10	50	40	10	1(1000	0 (0)	0	1	6
	1988/89	10	40	40	20	2(100)	0 (0)	0	2	5
	1989/90	20	70	10	20	4(100)	0 (0)	0	4	9
	1990/91	19	47	26	26	4 (80)	1(20)	0	5	9

Table 5. (Con't.).

Subunit/ hunt no.	Regulatory year	Permits issued	Percent did not hunt	Percent Unsuccessful hunters	Percent successful hunters	Males(%)	Females(%)	Unk.	Total harvest	Maximum allowable harvest
6C/821	1987/88	28	54	43	4	1(100)	0(0)	0	1	5
	1988/89	22	82	9	9	1(50)	1(50)	0	2	2
6D/822	1987/88[b]	222	37	47	13	16(57)	10(36)	2	28	39
	1988/89	89	44	43	8	4(57)	2(29)	1	7	17
	1989/90	32	81	16	3	1(100)	0(0)	0	1	18
	1990/91	39	72	15	13	4(80)	1(20)	0	5	12
6D/823	1989/90	20	75	25	0	0(0)	0(0)	0	0	8
6D/824	1989/90	30	77	20	3	0(0)	1(100)	0	1	6
6D/828	1988/89	20	50	25	25	4(80)	1(20)	0	5	4
	1989/90	24	63	21	17	1(25)	2(50)	1	4	5
	1990/91	32	66	28	6	2(100)	0(0)	0	2	2
6D/829	1988/89[a]	112	52	31	17	12(63)	6(32)	1	19	15
	1989/90	22	68	14	18	2(50)	2(50)	0	4	8
	1990/91	54	31	33	33	13(72)	5(28)	0	18	16
6D/830	1986/87	28	32	36	32	4(44)	5956)	0	9	--
	1987/88	61	62	21	15	7(78)	2(22)	0	9	9
	1988/89	84	45	33	21	10(56)	6(33)	2	18	20
	1989/90	51	53	31	16	6(75)	2(25)	0	8	17
	1990/91	41	51	17	32	8(62)	5(38)	0	13	10
6D/879	1986/87[b]	518	42	35	21	71(64)	34(31)	6	111	--
	1987/88[b]	90	37	46	16	9(64)	4(7)	1	14	20
	1988/89	38	29	39	32	9(75)	2(17)	1	12	7
	1989/90	10	60	10	30	3(100)	0(0)	0	3	6
	1990/91	34	53	35	9	2(67)	1(33)	0	3	5

Table 5. (Con't.).

Subunit/ hunt no.	Regulatory year	Permits issued	Percent did not hunt	Percent Unsuccessful hunters	Percent successful hunters	Males(%)	Females(%)	Unk.	Total harvest	Maximum allowable harvest
6D(Total)	1986/87	546	42	35	22	75(63)	39(33)	6	120	--
	1987/88	373	41	42	14	32(63)	16(31)	3	51	68
	1988/89	343	47	35	18	39(64)	17(28)	5	61	63
	1989/90	189	67	22	11	13(62)	7(33)	1	21	68
	1990/91	200	51	26	20	29(71)	12(29)	0	41	45
Total	1986/87	546	42	35	22	75(63)	39(33)	6	120	--
	1987/88	476	43	40	15	46(65)	20(28)	5	71	117
	1988/89	435	46	34	20	50(59)	30(35)	5	85	103
	1989/90	235	64	19	17	32(78)	7(17)	2	41	110
	1990/91	265	49	24	24	46(70)	19(29)	1	66	79

[a] No hunts in 1986/87

[b] Harvest not comparable to other regulatory years because of changes in the hunt area boundary.

Table 6. Unit 6 mountain goat hunter residency and success, 1986-91.

Regulatory year	Successful				Unsuccessful				Total hunters
	Local[a] resident	Nonlocal resident	Nonresident	Total(%)[b]	Local resident	Nonlocal resident	Nonresident	Total(%)[b]	
1986/87	25	43	50	120(38)	50	63	77	192(62)	312
1987/88	2	28	41	71(29)	18	79	74	171(71)	242
1988/89	7	30	48	85(36)	13	48	88	149(64)	234
1989/90	7	15	19	41(48)	10	23	11	44(52)	85
1990/91	9	41	16	66(50)	21	40	6	67(50)	133

[a] Resident of Unit 6
[b] Includes hunters of unknown residency

Table 7. Unit 6 mountain goat harvest chronology percent by time period, 1986-91.

Regulatory year	Harvest Periods						n
	August	September	October	November	December	January	
1986/87	13	48	37	1	1	0	119
1987/88[a]	0	60	33	6	0	1	70
1988/89[a]	0	73	16	11	0	0	85
1989/90[a]	0	37	41	22	0	0	41
1990/91	13	42	42	1	1	0	66

[a] Important registration permit hunts for nonlocals was 1 Sept. - 30 Nov.

Table 8. Unit 6 mountain goat harvest percent by transport method, 1986-91.

Regulatory year	Airplane	Boat	3-or 4-wheeler	Snowmachine	ORV	Highway vehicle	Unknown	n
1986/87	53	29	2	0	2	8	7	120
1987/88	66	30	0	1	0	0	3	71
1988/89	79	16	0	0	0	1	4	85
1989/90	68	21	3	5	0	3	0	38
1990/91	58	39	1	0	0	1	0	66

LOCATION

Game Management Units: 7 and 15 (8,397 mi^2)

Geographical Description: Kenai Peninsula

BACKGROUND

Mountain goats occur throughout the Kenai Mountains, which represents the westernmost extension of the species' continental range. Goats are most abundant in the highly glaciated coastal mountains and least abundant along the relatively dry west slope and interior portions of the Kenai Mountain range where they coexist with Dall sheep (Holdermann, 1986).

The Kenai Peninsula has been a popular mountain goat hunting area since statehood because of its proximity to Anchorage and relatively good accessibility to goats. By the late 1970s, wildlife managers recognized that long general seasons with bag limits of two goats, combined with moderate to severe winters had led to local population declines. Consequently, permit hunt systems were implemented in 1978 to reduce harvest rates and to distribute hunters. Since 1982 goat harvests on the Kenai Peninsula have been managed by a combination of drawing and registration permit hunts.

Goats within the Kenai Fjords National Park (KFNP) were protected from hunting when the park was established in 1980. Holdermann (1989) provided a summary of the Kenai Peninsula mountain goat management system.

In addition to KFNP, most goat habitat on the Kenai Peninsula lies within the Kenai National Wildlife Refuge, Chugach National Forest, or Kachemak Bay State Park, and remains virtually unaffected by human development. However, several exceptions warrant concern. Portions of the Bradley Lake hydroelectric project were constructed within goat winter range. To determine the effects of hydroelectric project construction activities on the winter goat population, ADF&G monitored the number, sex, age composition, and distribution of mountain goats along the Bradley River drainage. Markets for Alaska wood products may also facilitate extensive logging on Native corporation lands in Blying Sound and Kachemak Bay, which could adversely effect goat populations.

MANAGEMENT DIRECTION

Management Objectives

Management objectives for mountain goat in Units 7 and 15 are to 1) maintain a population of at least 3,000 mountain goats with a harvest goal of predominantly (66% minimum) males, and 2) develop a mountain goat management plan for the Kenai Peninsula by 1993.

METHODS

The Kenai Peninsula goat range, excluding KFNP, is divided into 31 count areas which correspond with individual hunt areas. Since the early 1970s, ADF&G has routinely monitored goat populations in these areas by midsummer aerial surveys according Lentfer's (1955) techniques. We fly surveys using a Piper PA-18 Super Cub with an observer during early morning and evening hours in July and August before hunting season. Flights follow along drainage contours beginning at the subalpine zone and progress upward into the alpine zone by 150-200 m increments. Within each area, we count goats and classify them as either kids (< 4 months) or older goats, and record data on standardized forms.

In 1987, staff modified survey procedures to improve the consistency and accuracy of goat censuses. We established three goat population trend areas, each consisting of two or three contiguous count areas in three separate geographic regions of the Kenai Peninsula (Holdermann 1986). These areas became primary sampling units to monitor trends in goat production and abundance for regions they represented. Discrepancies in the description of trend areas led us to reanalyze past data to ensure uniformity.

The Blying Sound region contains coastal influenced lands exposed to the Gulf of Alaska including Kenai Fjords National Park and count areas 845, 846, and 847. Count areas 845 and 846 represent Blying Sound.

The West Slope region is bounded by the Blying Sound region on the east, the Kenai lowlands on the west, and includes area 857 as the southernmost count area. Count areas 855, 856, and 857 represent the West Slope area.

The Kachemak Bay region includes all areas south of count area 857 and west of KFNP. Count areas 858, 859, and 860 represent the Kachemak Bay region. We will continue aerial surveys of individual count areas to adjust hunt area permit quotas.

We estimated the number of mountain goats in the population by combining the most recent aerial count of each count area. The composite estimate was expressed as a range by assuming 70% to 90% of the goats present during aerial surveys were observed. We derived the number of goats in the KFNP from 1985 and 1990 surveys of KFNP (Adams 1985, Rice and Adams 1990).

RESULTS AND DISCUSSION

Population Status and Trend

Population Size: Surveys of count areas totaled 3,619 goats observed on the Kenai Peninsula. We estimated between 4,000 (90% observability) and 5,200 goats (70% observability) on the Kenai Peninsula, including approximately 800-1,000 goats within KFNP.

Blying Sound. Approximately 300 goats were in the Blying Sound trend area between 1968-71. Goat numbers declined during the mid-1970s and steadily increased to at least 458 goats by 1983 (Table 1). The 1987 survey revealed 461 goats, similar to the 1983 count. Minimum density in this trend area has varied between 3.1 and 4.8 goats/mi^2 of suitable alpine range and was considered very high (Holdermann 1989). The population density of the Blying Sound region appeared stable at 4.7-4.8 goats/mi^2.

West Slope. The formations along the west slope of the Kenai Mountains from Chickaloon Bay to Tustemena Glacier supported the lowest mountain goat density on the Kenai Peninsula. Nevertheless, goats in this area have expanded their range and undergone rapid growth during the last two decades. Surveys indicated goat numbers declined in the mid-1970s, then began increasing through the 1980s, and decreased slightly by 1991 (Table 1). Since 1968 minimum density in suitable habitat ranged between 0.01 and 0.5 goat/mi^2.

Kachemak Bay. Habitat quality and goat abundance in the upper Kachemak Bay trend area appeared to be between those of Blying Sound and the West Slope. Distributions of goats and Dall sheep overlapped in the northern one-third of this trend area. Complete survey data for this area before 1980 were limited. However, this population grew substantially throughout the 1980s, and may have peaked in 1990 (Table 1).

Population Composition: In 1989, we surveyed 4 count areas with 394 goats and 20% kids. In 1990, we flew surveys in 11 count areas and 2 closed areas. We counted 946 mountain goats with 23% kids in the population. Table 2 provides a 5-year summary of completed surveys for all count areas on the Kenai Peninsula.

From 1968 to 1987, kids:100 older goats and the percent kids observed in the trend area population sample ranged from 20:100 to 44:100 and 17-31%, respectively (Table 1). With good weather and limited harvest levels, increasing populations were characterized by 30-48 kids:100 older goats and 23-32% kids. Survey samples with 25-30 kids:100 older goats and consisting of 20-23% kids were associated with stable populations. Declining populations, characterized by kid percentages below 20%, may indicate habitat-related limitations.

Mortality

Harvest:

Season and Bag Limit. Beginning in 1989 nonresidents were required to be accompanied by a guide. The 1989 and 1990 sport seasons were the same with a 10 August to 30 September drawing permit hunt followed by a 15 October to 30 November registration hunt. In 1989 subsistence hunters in areas 852W, 863W, 864W, and 865W hunted from 1 August to 31 October by registration permit. The 1990 subsistence season was from 28 September to 18 December. Hunt areas 852, 863, and 864 were combined into hunt 875T and 865W was renamed, 865T. The bag limit was one goat for all hunts.

Board of Game Actions and Emergency Orders. During its spring 1989 meeting, the Alaska Board of Game authorized the subsistence harvest of up to three goats in Hunt Area 864 (Seldovia River) by Seldovia residents at the request of the Seldovia Fish and Game Advisory Committee. This registration hunt opened 1 August 1989. The Board also moved the opening date from 10 August to 1 August for registration hunts 852W and 863W-865W at the request of English Bay residents. The subsistence season closed 31 October 1989.

During a 1990 emergency session, the Board changed the subsistence hunts to Tier II subsistence drawing hunts. These hunts could not be limited to rural residents but required determination of customary and traditional uses of the resource. Hunt areas 852W, 863W, and 864W were grouped into a single hunt, 875T, while area 865W was renamed 865T.

Hunter Harvest. Hunters reported taking 103 mountain goats on the Kenai Peninsula in 1989. Hunters harvested 86 goats (46 males and 22 females) from 26 hunt areas during the drawing permit hunt (Table 3). Hunters took 32 (18 males, 13 females, 1 unspecified) from 10 hunt areas (Table 4). Seldovia subsistence hunters took three goats in Hunt Area 864 (Table 5). Port Graham and English Bay subsistence hunters did not report harvesting any goats.

In 1990, hunters reported taking 98 mountain goats on the Kenai Peninsula. Fifty-five goats (36 males, 18 females, 1 unspecified) were harvested from 23 open areas during the drawing permit season (Table 6). Thirty-six goats (23 males, 12 females, 1 unspecified) were taken from eight hunt areas during the registration permit hunt (Table 7). Two Unit 6 goat hunters illegally harvested two goats in hunt area 845. Subsistence hunters also took three goats (2 females and 1 male) in Hunt Area 875T. Port Graham and English Bay subsistence hunters harvested 2 female goats in subsistence Hunt Area 865T (Table 5). Tables 7 and 8 provide historical harvest summaries from 1984 to 1990 for drawing and registration hunts, respectively. The number of goats harvested in drawing (Table 8), registration (Table 9), and Tier II (Table 10) hunts were within the allowable harvest guidelines of less than 6% of the total goats counted. Tables 11 and 12 summarize the annual goat harvest for both drawing and registration hunts.

Hunter Residency and Success. Nonresident hunters comprised approximately 5% of the total hunters (Tables 13 and 14). The overall success rate of nonresidents was usually greater than 50% because nonresidents were required to hunt with a guide.

Harvest Chronology. Harvest chronology information was not available for summary but anecdotal information suggested that most hunters harvested goats during the first 10 days of both drawing and registration hunts.

Transport Methods. Approximately 42% of successful goat hunters used airplanes with boats (25%) and highway vehicles (21%) the next most frequently used means of transportation (Table 15). Drawing permit hunters that used aircraft as their primary source of transportation were the most successful.

Airplanes, boats, and highway vehicles were the most common methods of transportation for registration hunts (Table 16). Registration hunts were not always open at the same time and access varied among hunt areas.

CONCLUSIONS AND RECOMMENDATIONS

The management objective of maintaining approximately 3,000 mountain goats on the Kenai Peninsula is presently being met. An estimated 4,000-5,200 mountain goats inhabit the area including an estimate of 800-1,000 in KFNP. We recommend increasing the management objective to maintain a population of 4,000-4,500 mountain goats. The carrying capacity of the Kenai Peninsula mountain goat range appears within this range. The harvest rates for individual count areas should not exceed 6% of total countable goats.

The system of mountain goat harvest management developed on the Kenai Peninsula may apply in other areas of the state. Advantages are: 1) allocation of permits by hunt areas effectively disperses hunting effort, alleviating the problem of localized overharvest in areas with easy access; 2) allocation of hunting permits to areas with relatively small harvest quotas to avoid over harvests; 3) use of hunt areas that correspond with population count or trend areas allow the manager easy cross reference capability; and 4) long-term use of trend areas that correspond with several adjacent hunt areas will greatly facilitate assessing of hunting and environmental effects on mountain goats. I recommend no changes in goat harvest management at this time.

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Table 1. Kenai Peninsula mountain goat trends, 1968-91.

Trend Area	Year	Kids: 100 older Goats	% Kids	Total Count	Population Trend[a]
Blying Sound	1968	34.1	25.4	299	
(Count areas	1971	23.6	19.1	308	+3
845,846)	1974	38.0	27.5	258	-16
	1977	21.1	17.4	333	+29
	1978	39.2	28.1	366	+10
	1983	33.9	25.3	458	+25
	1985	20.3	16.9	397	-13
	1987	25.6	20.4	461	+16
	1991	24.2	19.5	385	-16
West Slope	1968	44.0	30.6	36	
(Count areas	1977	25.0	20.0	25	-31
855,856,857)	1978	31.6	24.0	25	+0
	1979	40.6	28.9	45	+80
	1980	27.1	21.3	61	+36
	1981	34.6	25.7	70	+15
	1983	43.2	30.2	106	+51
	1987	44.1	30.6	160	+51
	1990	37.5	27.3	110	-31
	1991	33.3	25.0	128	+16
Kachemak Bay	1968	42.4	29.8	289	
(Count areas	1978	32.9	24.8	105	-64
858,859,860)	1980	29.3	22.7	172	+64
	1987	27.5	21.6	301	+75
	1990	32.7	24.6	463	+54

[a] Population trend expressed as % change between successive surveys.

Table 2. Units 7 & 15 aerial mountain goat composition counts and estimated population size, 1986-91.

Area	Regulatory year	Adults	Kids	Unk.	Kids: 100 adults	Total goats observed	Goats /hour	Estimated population size[a]
831	1986/87[a]	--	--	--	--	--	--	--
	1987/88[a]	--	--	--	--	--	--	--
	1988/89[a]	--	--	--	--	--	--	--
	1989/90[a]	--	--	--	--	--	--	--
	1990/91[a]	--	--	--	--	--	--	--
832	1986/87[a]	--	--	--	--	--	--	--
	1987/88[a]	--	--	--	--	--	--	--
	1988/89[a]	--	--	--	--	--	--	--
	1989/90[a]	--	--	--	--	--	--	--
	1990/91[a]	--	--	--	--	--	--	--
833	1986/87[a]	--	--	--	--	--	--	--
	1987/88[a]	--	--	--	--	--	--	--
	1988/89[a]	--	--	--	--	--	--	--
	1989/90[a]	--	--	--	--	--	--	--
	1990/91[a]	--	--	--	--	--	--	--
834	1986/87[a]	--	--	--	--	--	--	--
	1987/88[a]	--	--	--	--	--	--	--
	1988/89	14	3	0	21	17	--	17
	1989/90[a]	--	--	--	--	--	--	--
	1990/91[a]	--	--	--	--	--	--	--
835	1986/87[a]	--	--	--	--	--	--	--
	1987/88[a]	--	--	--	--	--	--	--
	1988/89[a]	--	--	--	--	--	--	--
	1989/90[a]	--	--	--	--	--	--	--
	1990/91[a]	--	--	--	--	--	--	--

Table 2. (Continued).

Area	Regulatory year	Adults	Kids	Unk.	Kids: 100 adults	Total goats observed	Goats /hour	Estimated population size[a]
836	1986/87[a]	--	--	--	--	--	--	--
	1987/88[a]	--	--	--	--	--	--	--
	1988/89[a]	--	--	--	--	--	--	--
	1989/90[a]	--	--	--	--	--	--	--
	1990/91[a]	--	--	--	--	--	--	--
837	1986/87[b]	22	13	0	59	35	--	--
	1987/88[c]	31	8	0	26	39	--	--
	1988/89	27	8	0	30	35	--	--
	1989/90	16	3	0	19	19	--	--
	1990/91	16	3	0	19	19	--	19
838	1986/87[a]	--	--	--	--	--	--	--
	1987/88	4	2	0	50	6	--	--
	1988/89[a]	--	--	--	--	--	--	--
	1989/90[a]	--	--	--	--	--	--	--
	1990/91	12	3	0	25	15	--	15
839	1986/87[a]	--	--	--	--	--	--	--
	1987/88	58	26	0	45	84	--	84
	1988/89[a]	--	--	--	--	--	--	--
	1989/90[a]	--	--	--	--	--	--	--
	1990/91[a]	--	--	--	--	--	--	--
840	1986/87	34	9	0	26	43	--	--
	1987/88[a]	--	--	--	--	--	--	--
	1988/89[a]	--	--	--	--	--	--	--
	1989/90[a]	--	--	--	--	--	--	--
	1990/91[a]	--	--	--	--	--	--	43

Table 2. (Continued).

Area	Regulatory year	Adults	Kids	Unk.	Kids: 100 adults	Total goats observed	Goats /hour	Estimated population size[a]
841	1986/87[a]	--	--	--	--	--	--	--
	1987/88[a]	--	--	--	--	--	--	--
	1988/89[a]	--	--	--	--	--	--	--
	1989/90[a]	--	--	--	--	--	--	--
	1990/91[a]	--	--	--	--	--	--	--
842	1986/87[a]	--	--	--	--	--	--	--
	1987/88[a]	--	--	--	--	--	--	--
	1988/89[a]	--	--	--	--	--	--	--
	1989/90[a]	--	--	--	--	--	--	--
	1990/91[a]	--	--	--	--	--	--	--
843	1986/87[a]	--	--	--	--	--	--	--
	1987/88[a]	--	--	--	--	--	--	--
	1988/89[a]	--	--	--	--	--	--	--
	1989/90[a]	--	--	--	--	--	--	--
	1990/91	34	8	0	23	42	--	42
844	1986/87[a]	--	--	--	--	--	--	--
	1987/88[a]	--	--	--	--	--	--	--
	1988/89[a]	--	--	--	--	--	--	--
	1989/90[a]	--	--	--	--	--	--	--
	1990/91[a]	--	--	--	--	--	--	--
845	1986/87[a]	--	--	--	--	--	--	--
	1987/88	222	66	0	30	288	--	288
	1988/89[a]	--	--	--	--	--	--	--
	1989/90[a]	--	--	--	--	--	--	--
	1990/91[a]	--	--	--	--	--	--	--

Table 2. (Continued).

Area	Regulatory year	Adults	Kids	Unk.	Kids: 100 adults	Total goats observed	Goats /hour	Estimated population size[a]
846	1986/87[a]	--	--	--	--	--	--	--
	1987/88	145	28	0	19	173	--	173
	1988/89[a]	--	--	--	--	--	--	--
	1989/90[a]	--	--	--	--	--	--	--
	1990/91[a]	--	--	--	--	--	--	--
847	1986/87[a]	--	--	--	--	--	--	--
	1987/88[a]	--	--	--	--	--	--	--
	1988/89[a]	--	--	--	--	--	--	--
	1989/90[a]	--	--	--	--	--	--	--
	1990/91[a]	--	--	--	--	--	--	--
848	1986/87[a]	--	--	--	--	--	--	--
	1987/88[a]	--	--	--	--	--	--	--
	1988/89[a]	--	--	--	--	--	--	--
	1989/90[a]	--	--	--	--	--	--	--
	1990/91	142	32	0	23	174	--	174
849	1986/87[a]	--	--	--	--	--	--	--
	1987/88[a]	--	--	--	--	--	--	--
	1988/89[a]	--	--	--	--	--	--	--
	1989/90[a]	--	--	--	--	--	--	--
	1990/91[a]	--	--	--	--	--	--	--
850	1986/87[a]	--	--	--	--	--	--	--
	1987/88[a]	--	--	--	--	--	--	--
	1988/89[a]	--	--	--	--	--	--	--
	1989/90[a]	--	--	--	--	--	--	--
	1990/91[a]	--	--	--	--	--	--	--

Table 2. (Continued).

Area	Regulatory year	Adults	Kids	Unk.	Kids: 100 adults	Total goats observed	Goats /hour	Estimated population size[a]
851	1986/87[a]	--	--	--	--	--	--	--
	1987/88[a]	--	--	--	--	--	--	--
	1988/89[a]	--	--	--	--	--	--	--
	1989/90[a]	--	--	--	--	--	--	--
	1990/91[a]	--	--	--	--	--	--	--
852	1986/87[a]	--	--	--	--	--	--	--
	1987/88[a]	--	--	--	--	--	--	--
	1988/89[a]	--	--	--	--	--	--	--
	1989/90[a]	--	--	--	--	--	--	--
	1990/91[a]	--	--	--	--	--	--	--
853	1986/87	1	0	0	N/A	1	--	1
	1987/88[a]	--	--	--	--	--	--	--
	1988/89[a]	--	--	--	--	--	--	--
	1989/90[a]	--	--	--	--	--	--	--
	1990/91[a]	--	--	--	--	--	--	--
854	1986/87	60	11	0	18	71	--	--
	1987/88	65	14	0	22	79	--	--
	1988/89	60	14	0	23	74	--	--
	1989/90[a]	--	--	--	--	--	--	--
	1990/91[a]	59	12	0	20	71	--	71
855	1986/87[a]	--	--	--	--	--	--	--
	1987/88	30	16	0	53	46	--	--
	1988/89[a]	--	--	--	--	--	--	--
	1989/90[a]	--	--	--	--	--	--	--
	1990/91	11	3	0	27	14	--	14

Table 2. (Continued).

Area	Regulatory year	Adults	Kids	Unk.	Kids: 100 adults	Total goats observed	Goats /hour	Estimated population size[a]
856	1986/87[d]	12	2	0	17	14	--	--
	1987/88	31	13	0	42	44	--	--
	1988/89[a]	--	--	--	--	--	--	--
	1989/90[a]	--	--	--	--	--	--	--
	1990/91	25	14	0	56	39	--	39
857	1986/87[a]	--	--	--	--	--	--	--
	1987/88	50	20	0	40	70	--	--
	1988/89	35	8	0	23	43	--	--
	1989/90	52	17	0	33	69	--	--
	1990/91	44	13	0	29	57	--	57
858	1986/87	63	24	0	38	87	--	--
	1987/88	60	21	0	35	81	--	--
	1988/89[a]	--	--	--	--	--	--	--
	1989/90[a]	--	--	--	--	--	--	--
	1990/91	72	23	0	32	95	--	95
859	1986/87[d]	71	23	0	32	94	--	--
	1987/88	87	23	0	26	110	--	--
	1988/89[a]	--	--	--	--	--	--	--
	1989/90[a]	--	--	--	--	--	--	--
	1990/91	128	14	0	34	172	--	172
860	1986/87[a]	--	--	--	--	--	--	--
	1987/88	89	21	0	24	110	--	--
	1988/89[a]	--	--	--	--	--	--	--
	1989/90[a]	--	--	--	--	--	--	--
	1990/91	149	47	0	32	196	--	196

Table 2. (Continued).

Area	Regulatory year	Adults	Kids	Unk.	Kids: 100 adults	Total goats observed	Goats /hour	Estimated population size[a]
861	1986/87[a]	--	--	--	--	--	--	--
	1987/88	49	12	0	25	61	--	61
	1988/89[a]	--	--	--	--	--	--	--
	1989/90[a]	--	--	--	--	--	--	--
	1990/91[a]	--	--	--	--	--	--	--
862	1986/87[a]	--	--	--	--	--	--	--
	1987/88[a]	--	--	--	--	--	--	--
	1988/89[a]	--	--	--	--	--	--	--
	1989/90[a]	--	--	--	--	--	--	--
	1990/91[a]	--	--	--	--	--	--	--
863	1986/87[a]	--	--	--	--	--	--	--
	1987/88[a]	--	--	--	--	--	--	--
	1988/89[a]	--	--	--	--	--	--	--
	1989/90[a]	--	--	--	--	--	--	--
	1990/91[a]	--	--	--	--	--	--	--
864	1986/87[a]	--	--	--	--	--	--	--
	1987/88[a]	--	--	--	--	--	--	--
	1988/89[a]	--	--	--	--	--	--	--
	1989/90	104	26	0	25	130	--	130
	1990/91[a]	--	--	--	--	--	--	--
865	1986/87[a]	--	--	--	--	--	--	--
	1987/88[a]	--	--	--	--	--	--	--
	1988/89[a]	--	--	--	--	--	--	--
	1989/90	141	29	0	21	170	--	170
	1990/91[a]	--	--	--	--	--	--	--

[a] No survey.
[b] Cooper Mountain survey only.
[c] First year open since early 1970s with 3 permits.
[d] Partial count.

Table 3. Kenai Peninsula mountain goat drawing permit hunt summary, 1989[a].

Hunt Area	Permits issued	Number of Hunters	Percent Success	Harvest			
				Male	Female	Unknown	Total
831	2	2	100		2		2
833	6	6	67	2	2		4
834	4	4	25	1			1
835	4	3	67	1	1		2
836	20	10	50	4	1		5
837	5	5	40	2			2
839	13	11	27	2	1		3
840	15	2	0				0
842	6	2	0				0
843	2	0	0				0
844	15	6	17	1			1
845	38	14	28	3	1		4
846	40	17	29	4	1		5
847	12	4	0				0
852	20	2	100	1	1		2
854	10	4	25	1			1
855	5	4	25		1		1
856	3	1	0				0
857	10	5	60	3			3
858	8	2	100	2			2
859	16	12	92	8	3		11
860	20	8	43	1	2		3
861	18	9	89	5	3		8
862	10	7	57	2	2		4
863	16	3	100	3			3
864	6	3	33		1		1
Totals	324	146	47	46	22	0	68

[a] Season dates: 10 August - 30 September.

Table 4. Kenai Peninsula mountain goat registration permit hunt summary, 1989[a].

Hunt Area	Permits issued	Number of Hunters	Percent Success	Harvest			
				Male	Female	Unknown	Total
840		0	0				0
844		38	11	3	1		4
845		12	25	2	1		3
846		42	31	9	3	1	13
847		9	22		2		2
852		1	0				0
858		7	29		2		2
860		3	33		1		1
862		9	22	2			2
863		6	83	2	3		5
Totals	[b]	127	25	18	13	1	32

[a] Season dates: 15 October - 30 November.
[b] Original permits were lost.

Table 5. Kenai Peninsula subsistence harvest, 1986-90.

Year	Season Dates	No. Permits Issued	No. Hunters	Percent Success	Harvest			
					M	F	U	Total
1986	6 Sept. - 31 Oct.	15	6	50	1	2	0	3
1987	10 Aug. - 31 Oct.	7	5	40	1	1	0	2
1988	10 Aug. - 31 Oct.	7	3	0	0	0	0	0
1989[a]	1 Aug. - 31 Oct.				0	0	3	3
1990[b]	28 Sept.-. 18 Dec.				1	4	0	5

[a] Subsistence hunts 852W, 863W, 864W, and 865W. Effort was unavailable.
[b] Tier II Subsistence hunts 865T and 875T. Effort was unavailable.

Table 6. Kenai Peninsula mountain goat drawing permit hunt summary, 1990[a].

Hunt Area	Permits issued	Number of Hunters	Percent Success	Harvest			
				Male	Female	Unknown	Total
831	2	1	0				0
833	6	4	0				0
834	4	4	75	1	2		3
835	4	3	33	1			1
836	20	16	31	2	2	1	5
837	3	2	50	1			1
839	13	10	10	1			1
840	15	6	17	1			1
842	6	4	50	2			2
843	2	1	100	1			1
844	15	9	0				0
845	38	14	7		1		1
846	40	18	56	5	5		10
847	12	6	0				0
854	10	4	0				0
855	5	4	25	1			1
856	3	2	50	1			1
857	10	6	83	1	4		5
858	8	3	67	2			2
859	16	10	50	3	2		5
860	20	7	43	3			3
861	18	11	82	8	1		9
862	10	6	50	2	1		3
Totals	280	151	36	36	18	1	55

[a] Season dates: 10 August - 30 September.

Table 7. Kenai Peninsula mountain goat registration permit hunt summary, 1990[a].

Hunt Area	Permits issued	Number of Hunters	Percent Success	Harvest			
				Male	Female	Unknown	Total
839	91	48	27	9	4		13
840	18	7	0				0
845	34	20	35	6	1		7
847	55	25	24	2	3	3	8[b]
854	14	7	43	2	1		3
855	26	12	25	1	2		3
858	8	3	33		1		1
859	9	3	100	3			3
Totals	255	125	29	23	12	3	38

[a] Season dates: 15 October - 30 November.
[b] 2 illegal goats included in harvest.

Table 8. Units 7 & 15 mountain goat harvest data by drawing permit hunt, 1986-91.

Hunt No. /Area	Regulatory year	Permits issued	Percent did not hunt	Percent unsuccessful hunters	Percent successful hunters	Males	Females	Unk.	Illegal	Total harvest
831	1986/87	2	0	0	100	1	1	--	--	2
	1987/88	2	100	0	0	--	--	--	--	0
	1988/89	2	0	50	50	0	1	--	--	1
	1989/90	2	0	0	100	0	2	--	--	2
	1990/91	2	50	100	0	0	0	--	--	0
832	1986/87	0	--	--	--	--	--	--	--	--
	1987/88	0	--	--	--	--	--	--	--	--
	1988/89	0	--	--	--	--	--	--	--	--
	1989/90	0	--	--	--	--	--	--	--	--
	1990/91	0	--	--	--	--	--	--	--	--
833	1986/87	0	--	--	--	--	--	--	--	--
	1987/88	8	0	75	25	1	1	--	--	2
	1988/89	8	63	66	33	1	0	--	--	1
	1989/90	6	0	33	66	2	2	--	--	4
	1990/91	6	33	100	0	0	0	--	--	0
834	1986/87	4	25	66	33	0	1	--	--	1
	1987/88	4	25	33	66	2	0	--	--	2
	1988/89	4	50	100	0	0	0	--	--	0
	1989/90	4	0	75	25	1	0	--	--	1
	1990/91	4	0	25	75	1	2	--	--	3
835	1986/87	4	25	100	0	0	0	--	--	0
	1987/88	4	50	0	100	2	0	--	--	2
	1988/89	4	50	100	0	0	0	--	--	0
	1989/90	4	25	33	66	1	1	--	--	2
	1990/91	4	25	66	33	1	0	--	--	1

Table 8. (Continued).

Hunt No. /Area	Regulatory year	Permits issued	Percent did not hunt	Percent unsuccessful hunters	Percent successful hunters	Males	Females	Unk.	Illegal	Total harvest
836	1986/87	0	--	--	--	--	--	--	--	--
	1987/88	20	45	82	18	1	1	--	--	2
	1988/89	20	55	66	33	1	2	--	--	3
	1989/90	20	50	50	50	4	1	--	--	5
	1990/91	20	20	69	31	2	2	1	--	5
837	1986/87	0	--	--	--	--	--	--	--	--
	1987/88	3	0	66	33	1	0	--	--	1
	1988/89	3	33	33	33	0	1	--	--	1
	1989/90	5	0	60	40	2	0	--	--	2
	1990/91	3	33	33	33	1	0	--	--	1
839	1986/87	16	50	50	50	1	3	--	--	4
	1987/88	16	38	60	40	2	1	1	--	4
	1988/89	16	6	47	53	4	4	--	--	8
	1989/90	13	15	73	27	2	1	--	--	3
	1990/91	13	23	90	10	1	0	--	--	1
840	1986/87	0	--	--	--	--	--	--	--	--
	1987/88	15	93	100	0	0	0	--	--	0
	1988/89	15	73	100	0	0	0	--	--	0
	1989/90	15	87	100	0	0	0	--	--	0
	1990/91	15	60	83	17	1	0	--	--	1
842	1986/87	11	27	25	75	4	2	--	--	6
	1987/88	8	38	20	80	3	1	--	--	4
	1988/89	8	25	66	33	2	0	--	--	2
	1989/90	6	66	100	0	0	0	--	--	0
	1990/91	6	33	50	50	2	0	--	--	2

Table 8. (Continued).

Hunt No. /Area	Regulatory year	Permits issued	Percent did not hunt	Percent unsuccessful hunters	Percent successful hunters	Males	Females	Unk.	Illegal	Total harvest
843	1986/87	2	0	50	50	1	0	--	--	1
	1987/88	2	0	50	50	1	0	--	--	1
	1988/89	2	50	0	100	1	0	--	--	1
	1989/90	2	100	0	0	0	0	--	--	0
	1990/91	2	50	0	100	1	0	--	--	1
844	1986/87	0	--	--	--	--	--	--	--	--
	1987/88	26	71	100	0	0	0	--	--	0
	1988/89	15	87	50	50	1	0	--	--	1
	1989/90	15	60	83	17	1	0	--	--	1
	1990/91	15	40	100	0	0	0	--	--	0
845	1986/87	0	--	--	--	--	--	--	--	--
	1987/88	38	61	27	73	9	2	--	--	11
	1988/89	38	74	60	40	4	0	--	--	4
	1989/90	38	63	71	29	3	1	--	--	4
	1990/91	38	63	93	7	0	1	--	--	1
846	1986/87	40	63	40	60	6	3	--	--	9
	1987/88	40	60	63	37	3	3	--	--	6
	1988/89	40	50	90	10	2	0	--	--	2
	1989/90	40	58	71	29	4	1	--	--	5
	1990/91	40	55	34	66	5	5	--	--	10
847	1986/87	12	58	80	20	0	1	--	--	1
	1987/88	12	66	100	0	0	0	--	--	0
	1988/89	12	58	60	40	1	1	--	--	2
	1989/90	12	66	100	0	0	0	--	--	0
	1990/91	12	50	100	0	0	0	--	--	0

Table 8. (Continued).

Hunt No. /Area	Regulatory year	Permits issued	Percent did not hunt	Percent unsuccessful hunters	Percent successful hunters	Males	Females	Unk.	Illegal	Total harvest
852	1986/87	0	--	--	--	--	--	--	--	--
	1987/88	20	40	66	33	3	1	--	--	4
	1988/89	20	50	90	10	1	0	--	--	1
	1989/90	20	90	0	100	1	1	--	--	2
	1990/91[a]	--	--	--	--	--	--	--	--	--
854	1986/87	0	--	--	--	--	--	--	--	0
	1987/88	8	50	25	75	1	2	--	--	3
	1988/89	8	50	0	100	3	1	--	--	4
	1989/90	10	60	75	25	1	0	--	--	1
	1990/91	10	60	100	0	0	0	--	--	0
855	1986/87	4	100	0	0	0	0	--	--	0
	1987/88	4	25	66	33	0	1	--	--	1
	1988/89	4	25	66	33	1	0	--	--	1
	1989/90	10	60	75	25	1	0	--	--	1
	1990/91	5	20	75	25	1	0	--	--	1
856	1986/87	0	--	--	--	--	--	--	--	--
	1987/88	2	0	50	50	0	1	--	--	1
	1988/89	2	50	0	100	0	1	--	--	1
	1989/90	3	66	100	0	0	0	--	--	0
	1990/91	3	33	50	50	1	0	--	--	1
857	1986/87	10	40	33	66	3	1	--	--	4
	1987/88	10	60	25	75	3	0	--	--	3
	1988/89	10	50	20	80	4	0	--	--	4
	1989/90	10	50	40	60	3	0	--	--	3
	1990/91	10	40	17	83	1	4	--	--	5

Table 8. (Continued).

Hunt No. /Area	Regulatory year	Permits issued	Percent did not hunt	Percent unsuccessful hunters	Percent successful hunters	Males	Females	Unk.	Illegal	Total harvest
858	1986/87	0	--	--	--	--	--	--	--	--
	1987/88	8	63	0	100	3	0	--	--	3
	1988/89	8	75	50	50	1	0	--	--	1
	1989/90	8	75	0	100	2	0	--	--	2
	1990/91	8	63	33	66	2	0	--	--	2
859	1986/87	0	--	--	--	--	--	--	--	--
	1987/88	16	63	66	33	2	0	--	--	2
	1988/89	16	63	17	83	2	3	--	--	5
	1989/90	16	25	8	92	8	3	--	--	11
	1990/91	16	38	50	50	3	2	--	--	5
860	1986/87	15	80	0	100	2	1	--	--	3
	1987/88	20	30	64	36	5	0	--	--	5
	1988/89	20	40	58	42	3	2	--	--	5
	1989/90	20	60	63	37	1	2	--	--	3
	1990/91	20	65	57	43	3	0	--	--	3
861	1986/87	0	--	--	--	--	--	--	--	--
	1987/88	18	50	66	33	2	1	--	--	3
	1988/89	18	50	89	11	0	1	--	--	1
	1989/90	18	50	11	89	5	3	--	--	8
	1990/91	18	39	18	82	8	1	--	--	9
862	1986/87	10	50	20	80	3	1	--	--	4
	1987/88	10	60	100	0	0	0	--	--	0
	1988/89	10	40	50	50	3	0	--	--	3
	1989/90	10	30	43	57	2	2	--	--	4
	1990/91	10	40	50	50	2	1	--	--	3

Table 8. (Continued).

Hunt No. /Area	Regulatory year	Permits issued	Percent did not hunt	Percent unsuccessful hunters	Percent successful hunters	Males	Females	Unk.	Illegal	Total harvest
863	1986/87	0	--	--	--	--	--	--	--	--
	1987/88	16	69	40	60	3	0	--	--	3
	1988/89	16	50	50	50	4	0	--	--	4
	1989/90	16	81	0	100	3	0	--	--	3
	1990/91[a]	0	--	--	--	--	--	--	--	--
864	1986/87	0	--	--	--	--	--	--	--	--
	1987/88	10	60	0	100	2	2	--	--	4
	1988/89	10	30	43	57	4	0	--	--	4
	1989/90	6	50	66	33	0	1	--	--	1
	1990/91[a]	0	--	--	--	--	--	--	--	--
865	1986/87[a]	0	--	--	--	--	--	--	--	--
	1987/88[a]	0	--	--	--	--	--	--	--	--
	1988/89[a]	0	--	--	--	--	--	--	--	--
	1989/90[a]	0	--	--	--	--	--	--	--	--
	1990/91[a]	0	--	--	--	--	--	--	--	--

[a] Subsistence season.

Table 9. Units 7 and 15 mountain goat harvest data by registration permit hunt, 1986-91.

Hunt No. /Area	Regulatory year	Permits issued	Did not hunt	Unsuccessful hunters	Successful hunters	Males	Females	Unk.	Illegal	Total harvest
831	1986/87	0	--	--	--	--	--	--	--	0
	1987/88	0	--	--	--	--	--	--	--	0
	1988/89	2	0	50	50	0	1	--	--	1
	1989/90	0	--	--	--	--	--	--	--	0
	1990/91	0	--	--	--	--	--	--	--	0
833	1986/87	18	39	64	36	4	0	--	--	4
	1987/88	0	--	--	--	--	--	--	--	0
	1988/89	29	34	68	32	4	2	--	--	6
	1989/90	0	--	--	--	--	--	--	--	0
	1990/91	0	--	--	--	--	--	--	--	0
836	1986/87	23	43	69	31	3	1	--	--	4
	1987/88	0	--	--	--	--	--	--	--	0
	1988/89	10	70	66	33	1	0	--	--	1
	1989/90	0	--	--	--	--	--	--	--	0
	1990/91	0	--	--	--	--	--	--	--	0
839	1986/87	0	--	--	--	--	--	--	--	0
	1987/88	0	--	--	--	--	--	--	--	0
	1988/89	0	--	--	--	--	--	--	--	0
	1989/90	0	--	--	--	--	--	--	--	0
	1990/91	91	47	79	21	9	4	--	--	13
840	1986/87	17	71	60	40	2	0	--	--	2
	1987/88	10	90	100	0	0	0	--	--	0
	1988/89	9	78	100	0	0	0	--	--	0
	1989/90	0	--	--	--	--	--	--	--	0
	1990/91	18	61	100	0	0	0	--	--	0

Table 9. (Continued).

Hunt No. /Area	Regulatory year	Permits issued	Did not hunt	Unsuccessful hunters	Successful hunters	Males	Females	Unk.	Illegal	Total harvest
842	1986/87	0	--	--	--	--	--	--	--	0
	1987/88	0	--	--	--	--	--	--	--	0
	1988/89	60	33	78	22	7	2	--	--	9
	1989/90	0	--	--	--	--	--	--	--	--
	1990/91	0	--	--	--	--	--	--	--	--
843	1986/87	0	--	--	--	--	--	--	--	--
	1987/88	0	--	--	--	--	--	--	--	--
	1988/89	1	100	0	0	0	0	--	--	0
	1989/90	0	--	--	--	--	--	--	--	--
	1990/91	0	--	--	--	--	--	--	--	--
844	1986/87	65	49	79	21	5	2	--	--	7
	1987/88	36	64	85	15	1	1	--	--	2
	1988/89	0	--	--	--	--	--	--	--	0
	1989/90[a]	--	--	89	11	3	1	--	--	4
	1990/91	0	--	--	--	--	--	--	--	0
845	1986/87	64	45	57	43	6	8	1	--	15
	1987/88	56	63	52	48	5	5	--	--	10
	1988/89	0	--	--	--	--	--	--	--	0
	1989/90[a]	--	--	75	25	2	1	--	--	3
	1990/91	34	41	65	35	6	1	--	--	7
846	1986/87	0	--	--	--	--	--	--	--	0
	1987/88	111	54	86	14	5	2	--	--	7
	1988/89	47	51	61	39	7	2	--	--	9
	1989/90[a]	--	--	69	31	9	3	1	--	13
	1990/91	0	--	--	--	--	--	--	--	0

Table 9. (Continued).

Hunt No. /Area	Regulatory year	Permits issued	Did not hunt	Unsuccessful hunters	Successful hunters	Males	Females	Unk.	Illegal	Total harvest
847	1986/87	0	--	--	--	--	--	--	--	0
	1987/88	23	48	83	17	2	0	--	--	2
	1988/89	8	38	40	60	2	1	--	--	3
	1989/90[a]	--	--	78	22	0	2	--	--	2
	1990/91	55	55	76	24	2	3	1	2	8
852	1986/87	17	41	40	60	5	1	--	--	6
	1987/88	0	--	--	--	--	--	--	--	0
	1988/89	8	38	20	80	2	1	1	--	4
	1989/90[a]	--	--	100	0	0	0	0	--	0
	1990/91	0	0	0	0	0	0	0	--	0
854	1986/87	14	36	22	78	5	2	--	--	7
	1987/88	0	--	--	--	--	--	--	--	--
	1988/89	0	--	--	--	--	--	--	--	--
	1989/90	0	--	--	--	--	--	--	--	--
	1990/91	14	50	57	43	2	1	--	--	3
855	1986/87	0	--	--	--	--	--	--	--	0
	1987/88	0	--	--	--	--	--	--	--	0
	1988/89	0	--	--	--	--	--	--	--	0
	1989/90	0	--	--	--	--	--	--	--	0
	1990/91	26	54	75	25	1	2	--	--	3
858	1986/87	33	61	38	62	5	3	--	--	8
	1987/88	7	43	0	100	3	1	--	--	4
	1988/89	14	50	29	71	2	3	--	--	5
	1989/90[a]	--	--	71	29	0	2	--	--	2
	1990/91	8	63	66	33	0	1	--	--	1

Table 9. (Continued).

Hunt No. /Area	Regulatory year	Permits issued	Did not hunt	Unsuccessful hunters	Successful hunters	Males	Females	Unk.	Illegal	Total harvest
859	1986/87	14	36	11	89	6	2	--	--	8
	1987/88	8	13	43	57	2	2	--	--	4
	1988/89	0	--	--	--	--	--	--	--	0
	1989/90	0	--	--	--	--	--	--	--	0
	1990/91	9	66	0	100	3	0	--	--	3
864	1986/87	24	38	66	33	3	2	--	--	5
	1987/88	23	30	100	0	0	0	--	--	0
	1988/89	0	--	--	--	--	--	--	--	0
	1989/90	0	--	--	--	--	--	--	--	0
	1990/91	0	--	--	--	--	--	--	--	0

[a] Original permits lost.

Table 10. Units 7 & 15 mountain goat harvest data by Tier II/Subsistence permit hunt, 1986-91.

Hunt No. /Area	Regulatory year	Permits issued	Did not hunt	Unsuccessful hunters	Successful hunters	Males	Females	Unk.	Illegal	Total harvest
852	1986/87[a]	0	--	--	--	--	--	--	--	0
	1987/88[a]	0	--	--	--	--	--	--	--	0
	1988/89[a]	0	--	--	--	--	--	--	--	0
	1989/90[c]									
	1990/91[d]									
863	1986/87[a]	0	--	--	--	--	--	--	--	0
	1987/88[a]	0	--	--	--	--	--	--	--	0
	1988/89[a]	0	--	--	--	--	--	--	--	0
	1989/90[c]									
	1990/91[d]									
864	1986/87[a]	0	--	--	--	--	--	--	--	0
	1987/88[a]	0	--	--	--	--	--	--	--	0
	1988/89[a]	0	--	--	--	--	--	--	--	0
	1989/90[c]	--	--	--	--	--	--	--	--	--
	1990/91[d]	--	--	--	--	--	--	--	--	--
865	1986/87[b]	15	60	50	50	1	2	--	--	3
	1987/88[b]	7	29	60	40	1	1	--	--	2
	1988/89[b]	7	57	100	0	0	0	--	--	0
	1989/90[c]	--	--	--	--	--	--	--	--	5
	1990/91[d]	--	--	--	--	--	--	--	--	--
875	1986/87	--	--	--	--	--	--	--	--	--
	1987/88	--	--	--	--	--	--	--	--	--
	1988/89	--	--	--	--	--	--	--	--	--
	1989/90[c]	--	--	--	--	--	--	--	--	3
	1990/91[d]	--	--	--	--	1	4	--	--	5

[a] Non exclusive subsistence registration hunt by residents of Port Graham/English Bay.
[b] Exclusive subsistence hunt by residents of Port Graham/English Bay.
[c] Data not available - all areas combined totaled 3 goats harvested.
[d] Tier II subsistence 865T, 875T. Data not available. Total harvest of 5 goats.

Table 11. Summary of mountain goat drawing permit season harvest for the Kenai Peninsula, 1984-90.

Year	Season Dates	No. Permits Issued	No. Hunters	Percent Success	Harvest			
					M	F	U	Total
1984	10 Aug. - 30 Sept.	355	169	38	50	14	1	65
1985	10 Aug. - 30 Sept.	16	11	45	2	3		5
1986	6 Sept. - 31 Oct.	130	60	58	21	14		35
1987	10 Aug. - 30 Sept.	340	160	42	49	17	1	67
1988	10 Aug. - 30 Sept.	329	156	38	43	17		60
1989	10 Aug. - 30 Sept.	324	146	47	46	22		68
1990	10 Aug. - 30 Sept.	280	151	36	36	18	1	55
Total					247	105	3	355

Table 12. Summary of mountain goat registration permit season harvest for the Kenai Peninsula, 1984-90.

Year	Season Dates	No. Permits Issued	No. Hunters	Percent Success	Harvest			
					M	F	U	Total
1984	15 Oct. - 30 Nov.	289	189	37	43	26	1	70
1985	1 - 31 Oct.	578	326	38	64	57	3	124
1986	6 Sept. - 31 Oct.	349	180	44	52	27	1	80
1987	15 Oct. - 31 Nov.	327	155	25	26	13		39
1988	15 Oct. - 31 Nov.	301	180	39	46	24	1	71
1989	15 Oct. - 31 Nov.	Unk.	127	25	18	13	1	32
1990	15 Oct. - 31 Nov.	255	125	29	23	12	3	38[a]
Total					272	172	10	454

[a] Includes 2 goats illegally taken during the registration hunt.

Table 13. Units 7 & 15 mountain goat hunter residency[b] and success, 1986-91.

Regulatory year	Successful				Unsuccessful				Total hunters
	Local[a] resident	Nonlocal resident	Nonresident	Total (%)	Local[a] resident	Nonlocal resident	Nonresident	Total (%)	
1986/87	Not available								
1987/88	20	44	3	67(42)	18	72	3	93(58)	160
1988/89	15	33	8	56(37)	19	71	4	94(63)	150
1989/90	17	46	5	68(47)	12	65	0	77(53)	145
1990/91	19	33	3	55(37)	17	78	0	95(63)	150

[a] Local means resident of GMU that hunted in their respective unit.
[b] Drawing permit hunts.

Table 14. Units 7 & 15 mountain goat hunter residency[b] and success, 1986-91.

Regulatory year	Successful				Unsuccessful				Total hunters
	Local[a] resident	Nonlocal resident	Nonresident	Total (%)	Local[a] resident	Nonlocal resident	Nonresident	Total (%)	
1986/87	Not available								
1987/88	18	16	5	39(25)	46	66	3	115(75)	154
1988/89	19	41	9	69(38)	33	77	1	111(62)	180
1989/90	10	21	0	31(27)	30	54	2	86(74)	117
1990/91	7	25	4	36(31)	7	73	1	81(69)	117

[a] Local means resident of Units 7 or 15
[b] Registration permit hunts.

Table 15. Units 7 & 15 mountain goat harvest[a] percent by transport method, 1986-91.

Regulatory year	Percent of harvest								
	Airplane	Horse	Boat	3- or 4-Wheeler	Snowmachine	ORV	Highway vehicle	Unknown	n
1986/87	Not Available								
1987/88	45	1	30	3	0	0	21	0	67
1988/89	44	5	24	7	0	2	19	0	59
1989/90	41	7	19	3	0	1	26	1	68
1990/91	42	4	29	2	0	2	18	4	55

[a] Drawing permit hunts.

Table 16. Units 7 & 15 mountain goat harvest[a] percent by transport method, 1986-91.

Regulatory year	Percent of harvest								
	Airplane	Horse	Boat	3- or 4-Wheeler	Snowmachine	ORV	Highway vehicle	Unknown	n
1986/87	Not Available								
1987/88	51	15	18	0	0	3	8	5	39
1988/89	44	6	18	1	0	0	25	6	71
1989/90	34	0	25	0	0	3	34	3	32
1990/91	22	8	33	0	0	3	31	3	36

[a] Registration permit hunts.

LOCATION

Game Management Unit: 8 (5,097 mi^2)

Geographical Description: Kodiak and Adjacent Islands

BACKGROUND

Mountain goats have occupied most suitable habitat since their introduction to Kodiak Island in 1952 and 1953. An increasing trend in annual aerial composition counts indicated the population was still growing in the most recently occupied habitat. Highest densities were in the northcentral Kodiak Island drainages of Ugak, Terror, Uganik and Kiliuda bays. A 1990 aerial survey indicated that goat numbers were increasing steadily in the Uyak and Zachar bay drainages of southcentral Kodiak Island. Hunting has been allowed by permit since 1968. Annual harvest ranged from 22 to 40 goats from 1986 to 1990. Hunting has been regulated by drawing permits since 1986. The road-accessible drainages near Kodiak city, where goats occur at low density, were closed to hunting to provide for viewing opportunity. Most southern Kodiak Island goat range remained closed to hunting through 1990 to facilitate colonization into suitable habitat.

MANAGEMENT DIRECTION

Management Objective

The Unit 8 mountain goat management objective is to maintain a prehunting population of at least 200 goats.

METHODS

We did composition counts annually with fixed-wing aircraft in August and early September. Count areas corresponded to the five permit hunt areas of northcentral Kodiak Island. We increased the survey area in 1990 to cover part of southern Kodiak Island where goats have steadily increased. We collected data on harvest and hunting effort from mandatory hunter reports and by examining horns of harvested goats.

RESULTS AND DISCUSSION

Population Status and Trend

Population Size: Staff estimated a mountain goat population of at least 550 in 1990 (Table 1). An aerial survey of approximately 70% of the known goat range resulted in

a total count of 494 goats. Previously, the most recent survey with comparable coverage was done in 1985 when 360 goats were counted.

Comparisons of 1985 and 1990 surveys indicated an increasing population trend. In the area open to hunting, staff counted 303 goats in 1990 compared to 249 goats in 1985. In the remaining area, staff counted 191 goats in 1990 compared to 111 goats in 1985. The Uyak and Zachar bay drainages of southwestern Kodiak Island contained the most rapidly increasing goat herds.

Population Composition: The kid:adult ratio ranged from 11-32 kids:100 adults with a mean of 24 (Table 1). Unusually low productivity in 1989, when we saw only 20 kids, was probably related to the severe 1988-89 winter with record low temperatures and heavy snow. Although mortality in goats was not observed, Sitka black-tailed deer experienced severe mortality that winter.

Distribution and Movement: Members of the public and other agency personnel occasionally sighted goats near known goat habitat. Goats were commonly seen on mountain peaks adjacent to the Kodiak Island road system. Goats now occur, in at least small numbers, in most suitable habitat on Kodiak Island.

Mortality

Harvest:

Season and Bag Limits. The open season for resident and nonresident hunters was 1 September to 31 October. The bag limit was one goat by drawing permit.

Board of Game Actions and Emergency Orders. In 1991 the Board adopted a department recommendation to open hunting by drawing permit in part of southern Kodiak Island where the goat population was still expanding. Two new permit hunts were created and the number of drawing permits was increased from 100 to 125.

In 1986 the Board opted to allow hunting by drawing permit only because of excessive harvests during 1984 and 1985 with registration permit hunts. A drawing permit hunt with 100 permits was in effect from 1986 through 1991.

Hunter Harvest. Annual harvests ranged from 22-40 goats (average = 29) during the 5-year period from 1986-1990 (Table 2). Annual harvests were relatively stable during this report period (Table 2). High participation and hunter success rates in 1986 resulted in an above average harvest of 40 goats.

The mean age of goats harvested (annually) ranged from 3.3-4.1 years for males and from 3.4-5.4 years for females (Table 3). The harvest of males exceeded females in all 5 permit hunts, with an overall mean of 58% males.

Hunter Residency and Success. Successful hunters were most often Unit 8 residents, followed by nonlocal Alaska residents, and nonresidents (Table 4). Annual hunter success ranged between 41-71% with a 5-year mean of 53%.

Permit Hunts. We issued 100 permits by lottery each year and 54% of the permittees reported hunting. Compliance with the permit hunt conditions by hunters was good. However, permittees who did not hunt frequently failed to return permit reports until receiving reminder letters.

Harvest Chronology. October harvests exceeded those in September every year except 1990 (Table 5). Weather patterns, which affect hunter success and influence when hunters go into the field, largely determined the harvest chronology.

Transportation Methods. Aircraft were the predominant transportation method used by hunters (Table 6).

Other Mortality: Documenting mortality from sources other than hunting is seldom possible because of the remote, rugged nature of goat habitat. Predation by brown bears undoubtedly occurs, but it is probably rare. The low production of kids in 1989 is suspected to have resulted from the unusually severe preceding winter, but it is unknown whether early postnatal mortality of kids or low initial productivity occurred. We estimate that wounding loss and illegal harvest contribute additional mortality equivalent to 10% of the reported harvest.

Habitat Assessment

Goat habitat on Kodiak Island is relatively secure because it is remote and has little immediate commercial value. The Terror Lake hydroelectric project, in goat habitat in northern Kodiak Island, is not detrimental (Smith, 1988).

The population is probably near habitat carrying capacity in northcentral Kodiak Island where goats first became established. In recently colonized areas of southern Kodiak Island, the population is below carrying capacity.

Winter severity varies considerably in the maritime environment where precipitation at lower elevations may occur as rain or snow. In studying goats on northern Kodiak Island, Hjeljord (1973) observed goats at higher elevations in March during a winter with snowcover at sea level, but goats were found at lower elevations during winters when lower slopes were partly snow-free.

Nonregulatory Management Problems/Needs

Although we suspect that present goat density is near carrying capacity in some areas, a conservative harvest regime is still employed. Research into the relationships between

winter severity and carrying capacity could provide managers with more precise estimates of allowable harvests on an annual basis.

CONCLUSIONS AND RECOMMENDATIONS

The goat population was stable in northcentral Kodiak Island, and continued to increase in recently colonized drainages of southern Kodiak. The policy of allowing goats to populate vacant habitat by keeping areas with low populations closed to hunting has been effective. The Board of Game opened much of the previously closed area of southern Kodiak Island to a limited permit hunt in 1991, after aerial surveys indicated goats were sufficiently abundant to sustain a harvest. Much of the area recently opened to hunting was difficult to access, and further liberalized hunting regulations will be justified if the goat population continues to expand.

The limited permit is effective in maintaining stable annual harvests, which appear to be conservative. I recommend no changes in seasons or bag limits. Management objectives for goats in Unit 8 should be modified to reflect changes in goat numbers and distribution. I recommend maintaining a prehunting population of 400-500 goats that will sustain an annual harvest composed of greater than 50% males.

LITERATURE CITED

Hjeljord, O. 1973. Mountain goat forage and habitat preference in Alaska. J. Wildl. Manage. 37(3): 353-362.

Smith, R. B. 1988. Unit 8 Mountain goat survey-inventory report. Pages 44-49 in S.O. Morgan, ed. Annual report of survey inventory activities. Part VII. Mountain Goat. Volume XVIII. Alaska Dep. Fish and Game. Fed. Aid Wildl. Res. Proj. W-22-6, Job 12.0. Juneau. 53pp.

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Table 1. Unit 8 aerial mountain goat composition counts and estimated population size, 1986-91.

Area	Regulatory year	Adults (%)	Kids (%)	Kids: 100 adults	Total goats observed	Goats/ hour	Estimated population size
All	1986/87	175 (82)	38 (18)	22	213	32.8	--
permit	1987/88	210 (83)	44 (17)	21	254	51.8	--
hunts	1988/89	176 (90)	20 (10)	11	196	61.3	435
	1989/90	221 (76)	71 (24)	32	292	88.5	450
	1990/91[a]	388 (79)	106 (21)	27	494	43.7	550[b]
871	1986/87	38 (84)	7 (16)	18	45	--	--
	1987/88	40 (82)	9 (18)	23	49	--	--
	1988/89	65 (87)	10 (13)	15	75	--	--
	1989/90	68 (81)	16 (19)	24	84	--	--
	1990/91	59 (77)	18 (23)	31	77	--	80-90
872	1986/87	40 (85)	7 (15)	18	47	--	--
	1987/88	37 (82)	8 (18)	22	45	--	--
	1988/89	26 (96)	1 (4)	4	27	--	--
	1989/90	29 (69)	13 (31)	45	42	--	--
	1990/91	36 (78)	10 (22)	28	46	--	50-60
873	1986/87	54 (78)	15 (22)	28	69	--	--
	1987/88	77 (80)	19 (20)	25	96	--	--
	1988/89	50 (94)	3 (6)	6	53	--	--
	1989/90	72 (71)	30 (29)	42	102	--	--
	1990/91	93 (78)	26 (22)	28	119	--	120-130
874	1986/87	30 (81)	7 (19)	23	37	--	--
	1987/88	35 (85)	6 (15)	17	41	--	--
	1988/89	32 (86)	5 (14)	16	37	--	--
	1989/90	27 (82)	6 (18)	22	33	--	--
	1990/91	28 (80)	7 (20)	25	35	--	40-60

Table 1. (cont'd)

Area	Regulatory year	Adults (%)	Kids (%)	Kids: 100 adults	Total goats observed	Goats/ hour	Estimated population size
876	1986/87	-- --	-- --	--	--	--	--
	1987/88	-- --	-- --	--	--	--	--
	1988/89	-- --	-- --	--	--	--	--
	1989/90	7 (78)	2 (22)	29	9	--	--
	1990/91	18 (69)	8 (31)	44	26	--	50-60

[a] Extensive survey covering most of known goat range.
[b] Population estimates extrapolated from annual composition counts and personal knowledge of area management biologist; considered a minimum estimate.

Table 2. Unit 8 mountain goat harvest data by permit hunt, 1986-91.

Hunt No. /Area	Regulatory year	Permits issued	Percent did not hunt	Percent unsuccessful hunters	Percent successful hunters	Males (%)	Females (%)	Unk.	Illegal	Total harvest
All	1986/87	100	36	29	71	23 (58)	17 (42)	0	0	40
permit	1987/88	100	46	59	41	13 (59)	9 (41)	0	0	22
hunts	1988/89	100	47	52	48	15 (60)	10 (40)	0	0	25
	1989/90	100	48	46	54	14 (52)	13 (48)	0	0	27
	1990/91	100	39	51	49	18 (62)	10 (33)	1	0	29
871	1986/87	20	35	46	54	6 (86)	1 (14)	--	--	7
	1987/88	20	50	70	30	1 (33)	2 (67)	--	--	3
	1988/89	20	50	80	20	2 (100)	0 (0)	--	--	2
	1989/90	20	35	62	38	3 (60)	2 (40)	--	--	5
	1990/91	20	35	69	31	1 (25)	3 (75)	--	--	4
872	1986/87	15	13	38	62	4 (50)	4 (50)	--	--	8
	1987/88	15	53	43	57	0 (0)	4 (100)	--	--	4
	1988/89	15	20	42	58	4 (57)	3 (43)	--	--	7
	1989/90	15	60	17	83	4 (80)	1 (20)	--	--	5
	1990/91	15	40	11	89	5 (63)	3 (37)	--	--	8
873	1986/87	20	55	11	89	4 (50)	4 (50)	--	--	8
	1987/88	20	50	50	50	4 (80)	1 (20)	--	--	5
	1988/89	20	45	64	36	1 (25)	3 (75)	--	--	4
	1989/90	20	40	25	75	4 (44)	5 (56)	--	--	9
	1990/91	20	30	79	21	2 (100)	0 (0)	1	--	3
874	1986/87	20	45	27	73	4 (50)	4 (50)	--	--	8
	1987/88	20	45	64	36	3 (75)	1 (25)	--	--	4
	1988/89	20	75	40	60	1 (33)	2 (66)	--	--	3
	1989/90	20	55	67	33	1 (33)	2 (66)	--	--	3
	1990/91	20	50	30	70	5 (71)	2 (29)	--	--	7

Table 2. (cont'd)

Hunt No. /Area	Regulatory year	Permits issued	Percent did not hunt	Percent unsuccessful hunters	Percent successful hunters	Males (%)	Females (%)	Unk.	Illegal	Total harvest
876	1986/87	25	60	10	90	5 (56)	4 (44)	--	--	9
	1987/88	25	36	62	38	5 (83)	1 (17)	--	--	6
	1988/89	25	44	22	78	7 (78)	2 (22)	--	--	9
	1989/90	25	60	50	50	2 (40)	3 (60)	--	--	5
	1990/91	25	48	46	54	5 (71)	2 (29)	--	--	7

Table 3. Unit 8 mountain goat harvest mean age data from horn rings, 1986-91.

Regulatory year	Males	(N)	Females	(N)
1986/87	3.9	(23)	4.1	(16)
1987/88	3.8	(13)	3.4	(9)
1988/89	4.1	(13)	5.0	(9)
1989/90	3.3	(14)	3.8	(11)
1990/91	4.0	(17)	5.4	(9)

Table 4. Unit 8 mountain goat hunter residence and success, 1986-91.

	Successful				Unsuccessful				
Regulatory year	Local[a] resident	Nonlocal resident	Nonresident	Total (%)	Local[a] resident	Nonlocal resident	Nonresident	Total (%)	Total hunters
1986/87	31	6	3	40 (71%)	16	-	0	16 (29%)	56
1987/88	10	9	3	22 (41%)	29	-	3	32 (59%)	54
1988/89	17	3	5	25 (48%)	16	11	0	27 (52%)	52
1989/90	16	9	2	27 (54%)	13	7	3	23 (46%)	50
1990/91	12	17	0	29 (49%)	15	15	0	30 (51%)	59

[a] Includes all Alaskan residents in 1986/87 and 1987/88; Unit 8 residents only in 3 remaining years.

Table 5. Unit 8 mountain goat harvest chronology percent by time period, 1986-91.

Area	Regulatory year	Harvest periods		n
		September	October	
All permit hunts	1986/87	48	52	40
	1987/88	32	68	22
	1988/89	48	52	25
	1989/90	37	63	27
	1990/91	63	41	29

Table 6. Unit 8 mountain goat harvest by transport method and hunter success, 1986-91.

Regulatory year	Successful hunters					Unsuccessful hunters					All hunters				
	Airplane No. (%)	Boat No. (%)	ORV No.(%)	Other No. (%)	Total reporting	Airplane No. (%)	Boat No. (%)	ORV No. (%)	Other No. (%)	Total reporting	Airplane No. (%)	Boat No. (%)	ORV No. (%)	Other No. (%)	Total reporting
1986/87	-- --	-- --	-- --	-- --	--	-- --	-- --	-- --	-- --	--	-- --	-- --	-- --	-- --	--
1987/88	-- --	-- --	-- --	-- --	--	-- --	-- --	-- --	-- --	--	39 (72)	12 (22)	1 (2)	2 (4)	54
1988/89	-- --	-- --	-- --	-- --	--	-- --	-- --	-- --	-- --	--	35 (73)	12 (25)	1 (2)	0 (0)	48
1989/90	-- --	-- --	-- --	-- --	--	-- --	-- --	-- --	-- --	--	31 (64)	10 (20)	7 (14)	1 (2)	49
1990/91	28 (100)	0 (0)	0 (0)	0 (0)	28	18 (62)	7 (24)	3 (10)	1 (4)	29	46 (81)	7 (12)	3 (5)	1 (2)	57

LOCATION

Game Management Unit: 11 (12,782 mi^2)

Geographical Description: Wrangell Mountains

BACKGROUND

Hunters have harvested mountain goats in Unit 11 for over 30 years, but little information is available on the number of animals hunters harvested before 1972 because harvest data was not collected. Although seasons and bag limits were liberal, harvests before 1972 were probably low because of minimal hunting pressure. When hunting pressure and harvests increased in the mid-1970s, season length and bag limit were reduced.

Little information is available about the population status of mountain goats before 1970. The MacColl Ridge trend count area was established in 1970 to obtain sex and age composition data and monitor population trends. Additional aerial survey data on mountain goats in other parts of Unit 11 were collected in conjunction with sheep counts.

MANAGEMENT DIRECTION

Management Objective

The Unit 11 mountain goat management objective is to maintain a prehunting season population of at least 500 goats.

METHODS

We conducted an aerial survey to determine sex and age composition and population trends of MacColl Ridge, north of the Chitina River in southeast Unit 11. We collected additional mountain goat population data periodically during aerial surveys of sheep trend count areas. Harvests and hunting pressure were controlled by registration permit. We monitored harvests by requiring registration at the Glennallen office, and check-out of all successful permittees in person at either the Glennallen, Palmer, or Anchorage offices.

RESULTS AND DISCUSSION

Population Status and Trend

The 1991 survey of MacColl Ridge resulted in a count of 54 goats, similar to the previous year's count of 55 (Table 1). The count was 12% higher than the 10-year (1982-91) average of 48 goats observed on MacColl Ridge. Because of the yearly fluctuations in survey results, it was difficult to detect a definite trend. When compared to both the last 5- and 10-year average count of 48 goats, the mountain goat population on MacColl Ridge apparently increased slightly.

Population Size: Approximately 700 mountain goats inhabited the southern Wrangell and Chugach mountains in Unit 11 (Table 2). This population estimate was obtained by combining the survey results from all the different count areas surveyed over the years in Unit 11 since 1973. If an individual count area were surveyed more than once, the highest count was used in the population estimate. Obviously, this assumes the highest count observed might closely reflect the actual number of mountain goats the area could support and that numbers had not declined appreciably.

Population Composition: The ratio of kids:adults observed on MacColl Ridge during 1991 was 20:100; kids comprised 17% of the goats observed (Table 1). The kid:adult ratio has declined during the past four years and was the lowest observed since 1983, though the actual number of kids counted has not changed appreciably since 1983. Fluctuations in the number of kids observed were probably attributable as much to annual survey conditions as fluctuations in productivity.

Distribution and Movements: By combining the results of aerial surveys over a number of years, we estimated that 400 mountain goats inhabit the Wrangell Mountains north of the Chitina River between the Cheshnina River and the Canadian border. Within this area the Kennicott, Hawkins, and Barnard glaciers, MacColl Ridge, and McCarthy Creek supported the largest number of goats. We counted close to 300 goats south of the Chitina River in the Chugach Mountains from the Copper River to the Canadian border.

Information on movements of mountain goats inhabiting Unit 11 was limited. Studies using radio collars on goats have not been conducted in the area. Major rutting and kidding areas were unknown. Field observations suggested seasonal altitudinal movements occur; with goats often using lower elevations during winter. East-west movements may also have occurred; mountain goats were observed traveling between the Kotsina and Kuskalana rivers, and between Kennicott Glacier and McCarthy Creek.

Mortality

Harvest:

Season and Bag Limit. The season for resident and nonresident hunters was 1 September to 30 November; the bag limit was one goat by registration permit only.

Board of Game Actions and Emergency Orders. In 1975 the Board shortened the mountain goat season by changing the opening date from 10 August to 1 September and reducing the bag limit from two goats to one. This was done to reduce the annual harvest, closing the goat season during the first 20 days of sheep season when the heaviest sheep hunting pressure occurred. By maintaining a 1 September opening, the Board still provided opportunity for hunters to take both sheep and goats (i.e., 1-20 September).

Beginning in 1980 goat hunting was by registration permit only. This action was necessary because much of Unit 11 was included in the recently established Wrangell-St. Elias National Park/Preserve. The elimination of hunting opportunity on lands designated as "national park" concentrated sport hunting pressure on goats located on lands designated as preserve. In 1986 the goat season was reduced by 31 days, closing on November 30. This action aligned closing dates with those in adjacent Unit 6.

Hunter Harvest. Hunters killed 17 mountain goats during the 1989 season, and 16 during 1990 (Table 3). Except for 1986 when the harvest increased to 30, the Unit 11 harvest has been relatively stable since 1981, averaging 15 mountain goats a year. Harvests were lower than those reported before 1980. From 1972 to 1974 (10 August opening date and a 2-goat bag limit), the average annual harvest was 49 goats. In 1975 the bag limit was reduced to one goat and the season opening delayed until 1 September. As a result, the reported average annual harvest from 1975 to 1979 declined to 23 goats.

The 1990 harvest was composed of 12 (75%) males and 4 (25%) females, similar to the 1989 take of 12 (70%) males and 5 (30%) females. During the last few years hunters have been more selective for males; this apparent selectivity may reflect an increase in the number of guided hunts. Between 1986 and 1990 males comprised 74% of the harvest compared to a 50:50 harvest sex ratio from 1980-85.

Permit Hunts. An unlimited number of registration permits were issued for the mountain goat hunt on a first-come, first-served basis. Permits were available only in Glennallen, but hunters reported hunt results at ADF&G offices in Palmer, Anchorage, and Glennallen. The season may be closed by emergency order if the reported harvest exceeds harvest guidelines.

Hunter Residency and Success. Sixty-six registration permits were issued in 1989, but only 50 were issued in 1990 (Table 3). The number of permittees who reported hunting

in 1990 was the lowest since 1982. The hunter success rate in 1990 was 60% and, although fluctuating somewhat between years, has been relatively high for Unit 11 goat hunters (Table 4). Successful hunters reported spending 2.1 days afield, compared with 2.8 days for unsuccessful hunters in 1990. The hunting effort reported by Unit 11 goat hunters has not changed much from year to year. Since 1986 nonresidents have taken about one-half (59%) of the harvest and experienced a higher success rate (71%) than residents (39%). Hunting by local residents declined over the past two years.

Harvest Chronology. During 1989 and 1990, 53% and 69% of the respective yearly harvests occurred during the season's first three weeks (Table 5). A similar pattern occured between 1986 and 1988. Before 1986, higher harvests were reported later in the season, especially in October before inclement winter weather. We attributed the harvest chronology change to an increased number of nonresident hunters seeking a combined sheep and goat hunt during 1-20 September. Goats killed later in the season were usually taken by local or nonlocal residents who were hunting only mountain goats.

Transport Methods. Transportation means used by goat hunters in Unit 11 have not changed much since 1986 (Table 6). Most hunters (63-85%) used aircraft; highway vehicles were the second-most popular method.

Other Mortality: Common forms of natural mortality among mountain goats include accidents and starvation during periods of deep snow or icing. Wolf predation was also observed in portions of Unit 11. Reports by trappers and local residents suggested wolf predation may be common; however, predation rates have not been determined.

Habitat Assessment

The Wrangell Mountains and the northern Chugach Mountains are part of the northernmost extent of mountain goat range in Alaska. Because favorable habitat is limited, goats tend to congregate in areas that best provide their habitat requirements. Goats occur in substantial numbers north of the Chitina River from east of the Lakina River to the Canadian border. The rest of the Wrangell Mountains west of the Lakina River is considered marginal goat habitat. Habitat in the Chugach Range south of the Chitina River may be more suitable for goats where they appear more evenly distributed.

CONCLUSIONS AND RECOMMENDATIONS

The number of mountain goats counted in the MacColl Ridge trend area was above the 5-year (1987-91) and 10-year (1982-91) averages. During the past four years kid production was stable and adequate to support the level of human harvests. Mountain goats are difficult to count because they inhabit rugged terrain. The vegetation on the MacColl Ridge trend count area also increases the difficulty of getting accurate counts. We do not know whether changes in the number of mountain goats observed on MacColl

Ridge reflect actual population fluctuations or are only incomplete counts. Movement patterns are also unknown. We complete counts at approximately the same time each year in an attempt to minimize the effect of movements on survey results and we feel that long-term trends in abundance can be recognized.

The mountain goat population north of the Chitina River is stable or increasing slightly. Trends south of the Chitina River are unknown, because all goat population data were collected during one year. Mountain goats are numerous only in limited areas where habitat conditions are favorable. Overall, goat densities in Unit 11 are much lower than in areas with more favorable habitat, e.g., the Kenai Peninsula.

Although harvests and hunting pressure during the 1970s were greater than during recent years, goats were hunted throughout their range in the unit. As a result, the overall harvest rates may not have been much higher than currently observed, as more areas were open for harvesting. Because of current restrictive National Park regulations, goat hunting is now concentrated in open areas around McCarthy, MacColl Ridge, and the Hawkins and Barnard glaciers. MacColl Ridge receives some of the heaviest hunting pressure in the unit, especially for guided hunts. During the past five years, 25 goats (i.e., 26% of the unit's harvest) came from MacColl Ridge. The average annual harvest was five goats, or 10% of the current observed population. Barnard and Hawkins glaciers are popular sheep hunting areas for trophy rams, and because combination hunts are popular, goats also receive heavy pressure. Guides are active in these areas; over the past five years (1986-1990), 19% and 12% of the total goat harvest was taken from Barnard and Hawkins glaciers, respectively. The average annual harvest rate over the past five years on these glaciers was slightly over 10% of the observed populations. The overall harvest rate, for mountain goats north of the Chitina River was 4% of the estimated population.

Because Unit 11 goats apparently sustain yearly harvest rates approaching 10% of the observed populations, current harvest rates are considered sustainable. Sustainable exploitation rates may be lower as actual population size is probably larger than the number of animals observed during surveys. Should recruitment in the MacColl Ridge area decline because of reduced productivity or increased predation, heavy harvests could result in a decline in the area's goat population. Harvests in areas other than the MacColl Ridge, Hawkins and Bernard glacier areas fluctuate yearly, and overharvesting is not as much of a concern. I recommend that the hunting season be closed by emergency order as soon as the combined harvests from MacColl Ridge and Hawkins and Barnard glaciers exceed 12 goats or 10% of the observed number of goats present. The total annual harvest from Unit 11 should not exceed 35 goats for more than one year; if it does, further reductions in season length should be implemented by emergency order the following year. If a permanent season reduction should be necessary, I recommend delaying the opening until 10 September. Delaying the opening date will more likely achieve the objective of reducing the harvest than shortening the season in November because most of the hunting pressure comes early. In addition to the yearly trend count

on MacColl Ridge, goats should be periodically surveyed in other heavily hunted areas; e.g., Hawkins and Barnard glaciers.

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Table 1. Unit 11 aerial mountain goat composition counts and estimated population size, 1987-91.

Area	Regulatory year	Adults (%)	Kids (%)	Unk.	Kids: 100 adults	Total goats observed	Goats /hour	Estimated population size[a]
MacColl Ridge	1987/88	36(77)	11(23)	--	30.5	47	--	47
	1988/89	29(69)	13(31)	--	44.8	42	--	42
	1989/90	31(76)	10(24)	--	32.2	41	--	41
	1990/91	43(78)	12(22)	--	27.9	55	--	55
	1991/92	45(83)	9(17)	--	20.0	54	--	54

[a] No extrapolated population estimates made.

Table 2. Unit 11 aerial mountain goat composition counts and estimated population size, 1973-84.

Count Area	Regulatory year	Adults (%)	Kids (%)	Kids: 100 adults	Total goats observed	Goats /hour	Estimated population size[a]
15	1981	103(79.2)	27(20.8)	26.2	130	34.2	n/a
16	1984	76(86.4)	12(13.6)	15.8	88	36.7	n/a
17	1983	12(66.7)	6(33.3)	50.0	18	7.2	n/a
18	1983	2(66.7)	1(33.3)	50.0	3	0.6	n/a
21	1981	55(84.6)	10(15.4)	18.2	65	n/a	n/a
22	1984	46(86.8)	7(13.2)	15.2	53	21.2	n/a
23E	1983	20(90.9)	2(9.1)	10.0	22	12.2	n/a
23W	1981	10(76.9)	3(23.1)	30.0	13	n/a	n/a
Total, all areas							
North of Chitina River							
	1981-84	324(82.7)	68(17.3)	21.0	392	n/a	n/a
South of Chitina River							
	1973	230(77.7)	66(22.3)	28.7	296	n/a	n/a

Table 3. Unit 11 mountain goat harvest data by permit hunt, 1986-91.

Hunt No. /Area	Regulatory year	Permits issued	Percent did not hunt	Percent unsuccessful hunters	Percent successful hunters	Males (%)	Females (%)	Unk.	Illegal	Total harvest
Unit 11	1986/87	97	55	32	68	25(83)	5(17)	0	0	30
	1987/88	64	50	41	59	14(74)	5(26)	0	0	19
	1988/89	69	49	57	43	9(60)	6(40)	0	0	15
	1989/90[a]	66	38	59	41	12(71)	5(29)	0	0	17
	1990/91[a]	50	46	41	59	12(75)	4(25)	0	0	16

[a] Guide required for nonresident.

Table 4. Unit 11 mountain goat hunter residency and success, 1986-91.

Regulatory year	Successful				Unsuccessful				Total hunters
	Local[a] resident	Nonlocal resident	Nonresident	Total (%)	Local[a] resident	Nonlocal resident	Nonresident	Total (%)	
1986/87	6	9	15	30(68)	1	8	5	14(32)	44
1987/88	2	4	13	19(59)	8	2	3	13(41)	32
1988/89	4	3	8	15(43)	4	8	8	20(57)	35
1989/90	1	6	10	17(42)	7	16	1	24(59)	41
1990/91	0	5	11	16(59)	4	5	2	11(41)	27

[a] Residents of Unit 11 or 13.

Table 5. Unit 11 mountain goat harvest percent by time period, 1986-91.

Regulatory year	Season dates	September 1-7	September 8-15	September 16-23	September 24-30	October 1-7	October 8-15	October 16-23	October 24-31	Other	n
1986/87	9/1-12/31	36.7	30.0	10.0	10.0	--	6.7	--	--	6.7	30
1987/88	9/1-11/30	47.4	21.1	21.1	10.5	--	--	--	--	0	19
1988/89	9/1-11/30	40.0	20.0	0	13.3	20.0	6.7	--	--	0	15
1989/90	9/1-11/30	17.6	17.6	17.6	17.6	5.9	5.9	17.6	--	0	17
1990/91	9/1-11/30	12.5	37.5	18.8	6.25	6.25	6.25	6.25	--	6.25	16

Table 6. Unit 11 mountain goat harvest percent by transport method, 1986-91.

Regulatory year	Percent of harvest: Airplane	Horse	Boat	3- or 4-Wheeler	Snowmachine	ORV	Highway vehicle	Unknown	n
1986/87	86.7	--	6.7	--	--	--	6.7	--	30
1987/88	79.0	10.5	--	5.3	--	--	5.3	--	19
1988/89	80.0	--	--	6.7	--	--	13.3	--	15
1989/90	82.4	--	--	--	--	--	17.6	--	17
1990/91	87.5	--	--	--	--	--	12.5	--	16

LOCATION

Game Management Units: Subunit 13D and Unit 14 (12,370 mi^2)

Geographical Description: Talkeetna Mountains and northwestern Chugach Mountains

BACKGROUND

The first comprehensive goat survey in Unit 14 was conducted in 1972 and periodic surveys have been conducted since. The first survey in Subunit 13D was conducted in 1959.

The mean annual harvest from the Talkeetna and northwestern Chugach mountains was 36 goats for 1986 through 1990. The lowest harvest occurred during 1987 when 29 animals were killed; the highest, was during 1986 when 50 animals were killed. More than 85% of the harvest has come from the Lake George area in Subunit 14C.

Seasons and bag limits have ranged from a liberal 10 August through 31 December, 2-goat limit in all of Units 14 and 13 during the mid 1960s to a restrictive drawing permit season during the late 1970s and early 1980s in Subunits 14B, 14C, and portions of 14A, with Subunit 13D and the remainder of 14A closed. Hunting in Unit 14 is currently under a registration permit season with northern Subunits 14A and 14B closed to mountain goat hunting. Subunit 13D was opened in 1987 under a drawing permit hunt after a 10-year closure. The season was limited to billies only during 1987 and 1988 but was liberalized to either sex in 1989.

MANAGEMENT DIRECTION

Management Objectives

The goat management objective for Unit 13 is to maintain a pre-hunting season population of at least 100 goats.

The goat management objective for Subunits 14A and 14B is to maintain a pre-hunting season population of at least 60 goats.

The goat management objective for Subunit 14C is to maintain a population of 500 goats that would sustain an annual harvest of 25 goats composed of at least 60% males.

METHODS

We monitored sex and age composition and trend of goat populations through aerial surveys during summer 1989 in Subunit 13D. We flew surveys during summers of 1989 and 1990 in Subunits 14A and 14C. No surveys were flown in Subunit 14B.

RESULTS AND DISCUSSION

Population Status and Trend

Aerial surveys were conducted throughout most goat range in the northwestern Chugach Mountains during 1989 (Tables 1-4). In Subunit 14C we observed 530 goats, while we saw 85 in Subunit 14A south of the Matanuska River, and 111 in Subunit 13D. During 1990 we only surveyed portions of Subunit 14A, however, we completed a survey of nearly all of Subunit 14C and saw 524 goats. Tables 1-4 show survey data from 1986-90. Goat populations in Subunit 13D appear stable and in Subunits 14A and 14C they are stable to increasing slightly. Variations in count conditions and movement may account for year to year deviations in numbers. Late evening surveys are considered best for observing goats. We saw the largest number of goats in Subunit 14C during 1989 (530) and 1990 (524) when we counted in the evening instead of as in 1988 (370) when counts were conducted in early morning-mid-day. We did not survey goat populations in the Talkeetna Mountains in Subunits 14A and 14B during the report period. Observations made incidental to other work indicate that about 40 mountain goats are in the subunit.

Population Size: Aerial survey data collected over the past several years indicate that at least 790 goats inhabit the Talkeetna and northwestern Chugach mountains. Estimates of goat population size by subunit are: Subunit 13D, 130-150; Subunit 14A, 75-100; Subunit 14B, 35-40; and Subunit 14C, 550-600. Although current population objectives are being met, careful monitoring should continue, particularly in Subunits 14A and 14B where past harvest appears high compared to population estimates.

Population Composition: Complete annual composition data are only available for Subunit 14C. Because of limited funding, a number of goat surveys in Subunits 14A, 14B, and 13D were either not conducted or were incidental to aerial sheep surveys. Tables 1-4 present composition data for 1986 through 1990 for these subunits. Kid recruitment appeared high in Subunit 14C.

Distribution and Movements: Goats are seldom found far from escape cover that includes broken, rocky, steep terrain. Goat distribution during summer has been documented from aerial surveys. During summer goats tend to be found feeding in early morning and late evening on open grassy slopes, often adjacent to glaciers or snowfields. During midday, they seek relief from the heat in dense shrub cover and under rocky outcrops.

Winter ranges often contain steep, timbered hillsides, however, little is known about precise winter distribution or kidding or rutting areas.

In Unit 13 mountain goats occur chiefly in Subunit 13D in the Chugach Mountains. Occasionally an animal is observed in the Talkeetna Mountains portion of Unit 13 and a small population occurs in the Chulitna Mountains near Cantwell. These goat populations are on the northernmost edge of mountain goat range and occupy poor habitat. Only Subunit 13D animals are hunted. The future of mountain goats in Unit 13 depends largely on winter weather conditions. During the early-1970s, when deep snowfall occurred, goat numbers were greatly reduced.

Most mountain goats in Unit 14 occur in the Chugach Mountains although small numbers are also found in the Talkeetna Mountains. The Talkeetna Mountains are the northern limit of mountain goat range and are probably marginal habitat. Given favorable weather conditions and low harvest rates, goats may increase somewhat in the Chugach Mountains portion of the unit. Goat habitat is marginal in the Talkeetna Mountains and will probably not support a large goat population.

Mortality

Harvest:

Season and Bag Limit. In Subunit 13D the open season for resident and nonresident hunters was 10 August-20 September during 1989 and 1990. The bag limit was one goat by drawing permit only. In Subunits 14A and 14C the 1989 and 1990 open seasons for residents and nonresidents was from 1 September-31 October, however, from 16 October-31 October goats could only be taken by bow and arrow. The bag limit was one goat by registration permit. In Subunit 14B the 1989 season was 1 September-15 October. No open season occurred during 1990. In the remainder of Unit 13 and Subunit 14A north of the Matanuska River no open seasons occurred in 1989 or 1990.

Board of Game Action and Emergency Orders. Beginning in 1989, the Board of Game changed the bag limit in Subunit 13D from males (billies) only to either sex. During 1990 the Subunit 14B mountain goat season was closed by emergency order and no permits were issued.

Hunter Harvest. A season in Subunit 13D was initiated in 1987 after having been closed since 1978; harvests have been low (Table 5). Those portions of Unit 14 open to goat hunting were changed from a drawing permit hunt to a registration permit hunt in 1984. This action resulted in a substantial increase in the Subunit 14C harvest (Table 5). Most of this increase occurred in the Lake George drainage because it supports a high density of goats and is easily accessible by aircraft. The Subunit 14C harvest has decreased substantially since the 1988 hunting season, a result of a 1-month season reduction (from 1 September-30 November to 1 September-31 October). The last two weeks of October

(16-31 October) were restricted to archery hunting and no goats were reported killed during that time (Table 5).

Permit Hunts. The number of goat registration permits issued for Unit 14 has fluctuated substantially over the past five years (Tables 6-8). The reduction in permits issued since 1986 was caused by a shorter season and an archery-only restriction during the last two weeks of the season. Subunit 13D was opened to hunting by drawing permit only (Table 8). Goat hunting within the subunit had been closed since 1978.

Hunter Residency and Success. Tables 9-13 summarize hunter residency and success. With the exception of the Lake George drainage in Subunit 14C, few nonresidents hunt the Talkeetna and northwestern Chugach mountains. In the Lake George area, during the 3 years before 1989, nonresidents comprised 41% of all successful goat hunters, including 62% in 1988 (Table 13). Legislation was passed in 1989 that required all nonresident goat hunters to be accompanied by a guide-outfitter or an Alaskan resident within the second degree of kindred. This requirement reduced the harvest by nonresidents in the Lake George area, however, the success rate for residents increased in 1990 compensating for the decrease in harvest by nonresidents.

Harvest Chronology. In the Lake George area of Subunit 14C (Hunt 869), harvest chronology varies highly between years with no discernable trend. Harvests in Subunits 13D, 14A, 14B, and the Twentymile River drainage in Subunit 14C were too small to evaluate chronology. Weather plays an important role in the timing of hunts, as do season dates for other big game species.

Transport Methods. Nearly all successful hunters used aircraft as the primary transport means to hunt goats in Unit 14 (except the Twentymile River drainage) and Subunit 13D during the 1989 and 1990 hunting seasons. In the Twentymile River drainage boats, ORVs or highway vehicles were used by all successful hunters (Tables 13-17).

Other Mortality: Mountain goat natural mortality is seldom documented in the Talkeetna and northwestern Chugach mountains. Although annual survey results varied substantially over the years, significant natural mortality was not observed.

CONCLUSIONS AND RECOMMENDATIONS

Surveys completed during this report period were conducted during evening hours when goats were out feeding and more easily observed. Because of this we made a more accurate assessment of the mountain goat population.

Monitoring of mountain goat populations should continue, however, because of the low harvest in Subunit 13D goats need surveying only every 2-3 years. In Subunit 14C,

because of budget limitations and the apparent stability of the goat population, surveys can be conducted biennially unless severe winter weather conditions occur.

Management goals need to be changed to reflect current management philosophy. I recommend that there be a minimum observable population of 50 goats before goat hunting is allowed in a hunt area, particularly in Subunits 14A and 14B. I also recommend that harvest quotas be based on survey results of observable goats and that the quota should be no more than 7%.

Current season and bag limits are appropriate, however, hunts in Unit 14 need close monitoring to prevent overharvesting.

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Table 1. Subunit 13D aerial mountain goat composition counts and estimated population size, 1986-91.

Regulatory year	Adults (%)	Kids (%)	Kids: 100 adults	Total goats observed	Goats /hour	Estimated population size[c]
1986/87[a]	109	25 (19)	23	134	6.4	150
1987/88[a]	97	19 (16)	20	116	13.3	150
1988/89[b]	--	-- (--)	--	--	--	150
1989/90	85	26 (23)	31	111	17.3	150
1990/91[b]	--	-- (--)	--	--	--	150

[a] Goats noted while doing sheep survey.
[b] Surveys not completed.
[c] Based upon 80-85% sightability (snow conditions)

Table 2. Subunit 14A aerial mountain goat composition counts and estimated population size, 1986-91.

Regulatory year	Adults (%)	Kids (%)	Kids: 100 adults	Total goats observed	Goats /hour	Estimated population size[c]
1986/87[a]	45	18 (29)	40	63	--	60
1987/88[a]	38	15 (28)	39	53	7.5	60
1988/89	--	-- (--)	--	--	--	60
1989/90	58	27 (32)	47	85		70
1990/91[b]	37	5 (12)	14	42	5.9	60

[a] Goats noted while doing sheep survey.
[b] Partial survey.
[c] Based upon 80-85% sightability (snow conditions)

Table 3. Subunit 14B aerial mountain goat composition counts and estimated population size, 1986-91.

Regulatory year	Adults (%)	Kids (%)	Kids: 100 adults	Total goats observed	Goats /hour	Estimated population size[b]
1986/87[a]	19	5 (21)	26	24	--	30
1987/88[a]	12	3 (25)	25	15	--	30
1988/89	--	--	--	--	--	30
1989/90	--	--	--	--	--	30
1990/91[b]	--	--	--	--	--	30

[a] Goats noted while doing sheep survey.
[b] Based upon 80-85% sightability (snow conditions).

Table 4. Subunit 14C aerial mountain goat composition counts and estimated population size, 1986-91[a].

Regulatory year	Adults (%)	Kids (%)	Kids: 100 adults	Total goats observed	Goats /hour	Estimated population size[b]
1986/87	385	130 (25)	34	515	76	500
1987/88	330	83 (20)	25	413	76	500
1988/89	296	74 (20)	25	370	73	450
1989/90	391	137 (26)	35	530	82	500
1990/91	411	113 (22)	27	524	81	550

[a] Data include all goats observed in Subunit 14C; S&I reports before 1984 included only goats in registration hunt areas.
[b] Based upon 80-85% sightability (snow conditions).

Table 5. Annual mountain goat harvest by subunit, 1986-91.

Regulatory year	Subunit				Total
	13D	14A[b]	14B[b]	14C[b]	
1986/87	--[a]	3	1	45	49
1987/88	2[c]	5	2	20	29
1988/89	2[c]	0	1	30	33
1989/90	4[d]	0	3	23	30
1990/91	5[d]	4	0[e]	28	37

[a] Subunit 13D was not open to goat hunting until 1987.
[b] Subunits 14A, 14B, and 14C by registration permit only.
[c] Subunit 13D by drawing permit only (billies only).
[d] Subunit 13D by drawing permit only (either sex).
[e] Subunit 14B closed to mountain goat hunting.

Table 6. Unit 14 mountain goat harvest data by permit hunt, 1986-91.

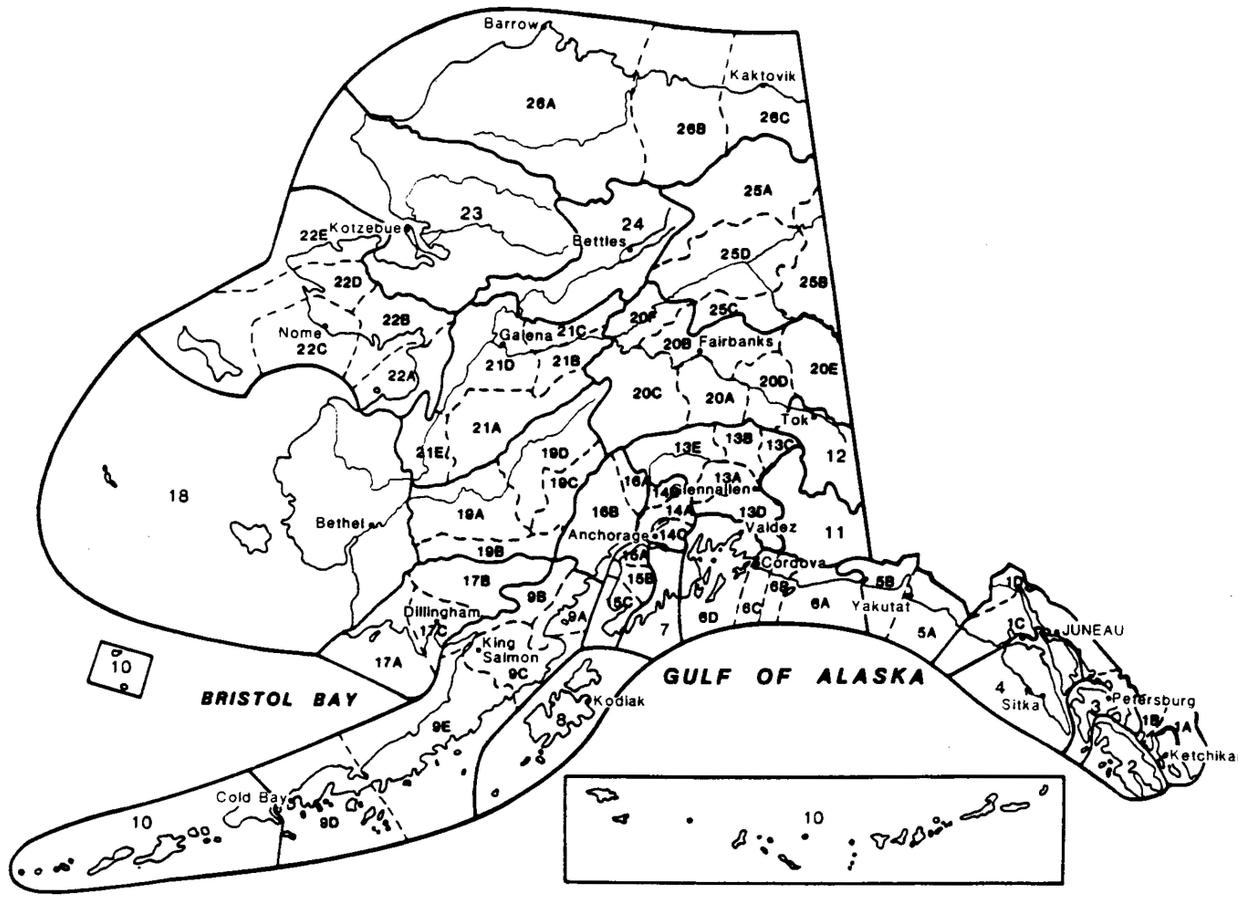
Hunt No. /Area	Regulatory year	Permits issued[a]	Percent did not hunt	Percent unsuccessful hunters	Percent successful hunters	Males (%)	Females (%)	Unk.	Total harvest
866	1986/87	63	43	91	9	3(100)	0(0)	--	3
Subunit	1987/88	35	74	44	56	--	--	5(100)	5
14A	1988/89	20	45	100	0	0	0	--	0
	1989/90	26	50	100	0	0	0	--	0
	1990/91	39	28	79	21	3(75)	1(25)	--	4
867	1986/87	9	78	50	50	1(100)	0(0)	--	1
Subunit	1987/88	11	55	60	40	2(100)	0(0)	--	2
14B	1988/89	6	50	66	33	1(100)	0(0)	--	1
	1989/90	10	50	75	25	3(100)	0(0)	--	3
	1990/91	--	--	--	--	--	--	--	--
868	1986/87	104	60	90	10	2(50)	2(50)	--	4
Subunit	1987/88	57	46	90	10	--	--	3(100)	3
14C	1988/89	47	49	63	37	5(56)	4(44)	--	9
Twentymile	1989/90	64	48	75	25	5(83)	1(17)	--	6
River	1990/91	69	36	97	3	1(100)	0(0)	--	1

[a] Include permittees who did not report.

Table 7. Unit 14 mountain goat harvest data by permit hunt, 1986-91.

Hunt No. /Area	Regulatory year	Permits issued	Percent did not hunt	Percent unsuccessful hunters	Percent successful hunters	Males (%)	Females (%)	Unk.	Total harvest
869	1986/87	130	41	43	57	25(61)	16(39)	--	41
Subunit	1987/88	96	47	67	33	--	--	17(100)	17
14C	1988/89	126	52	66	34	11(52)	10(48)	--	21
Lake	1989/90	109	38	69	31	12(71)	5(29)	--	17
George	1990/91	107	30	58	42	15(56)	12(44)	--	27
Totals for	1986/87	306	49	67	33	31(63)	18(37)	--	49
all Unit	1987/88	199	52	64	36	2(7)	--	25(93)	27
14 permit	1988/89	216	46	67	33	17(55)	14(45)	--	31
hunts	1989/90	209	43	26	26	20(77)	6(23)	--	26
	1990/91	215	32	59	41	19(59)	13(41)	--	32

Alaska's Game Management Units



WILDLIFE RESTORATION

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