Mountain Goat
Management Report
of survey-inventory activities
1 July 1999–30 June 2001

Carole Healy, Editor
Alaska Department of Fish and Game
Division of Wildlife Conservation
December 2002

ADF&G

Please note that population and harvest data in this report are estimates and may be refined at a later date.

If this report is used in its entirety, please reference as: Alaska Department of Fish and Game. 2002. Mountain Goat management report of survey-inventory activities 1 July 1999–30 June 2001. C. Healy, editor. Project 12.0. Juneau, Alaska.

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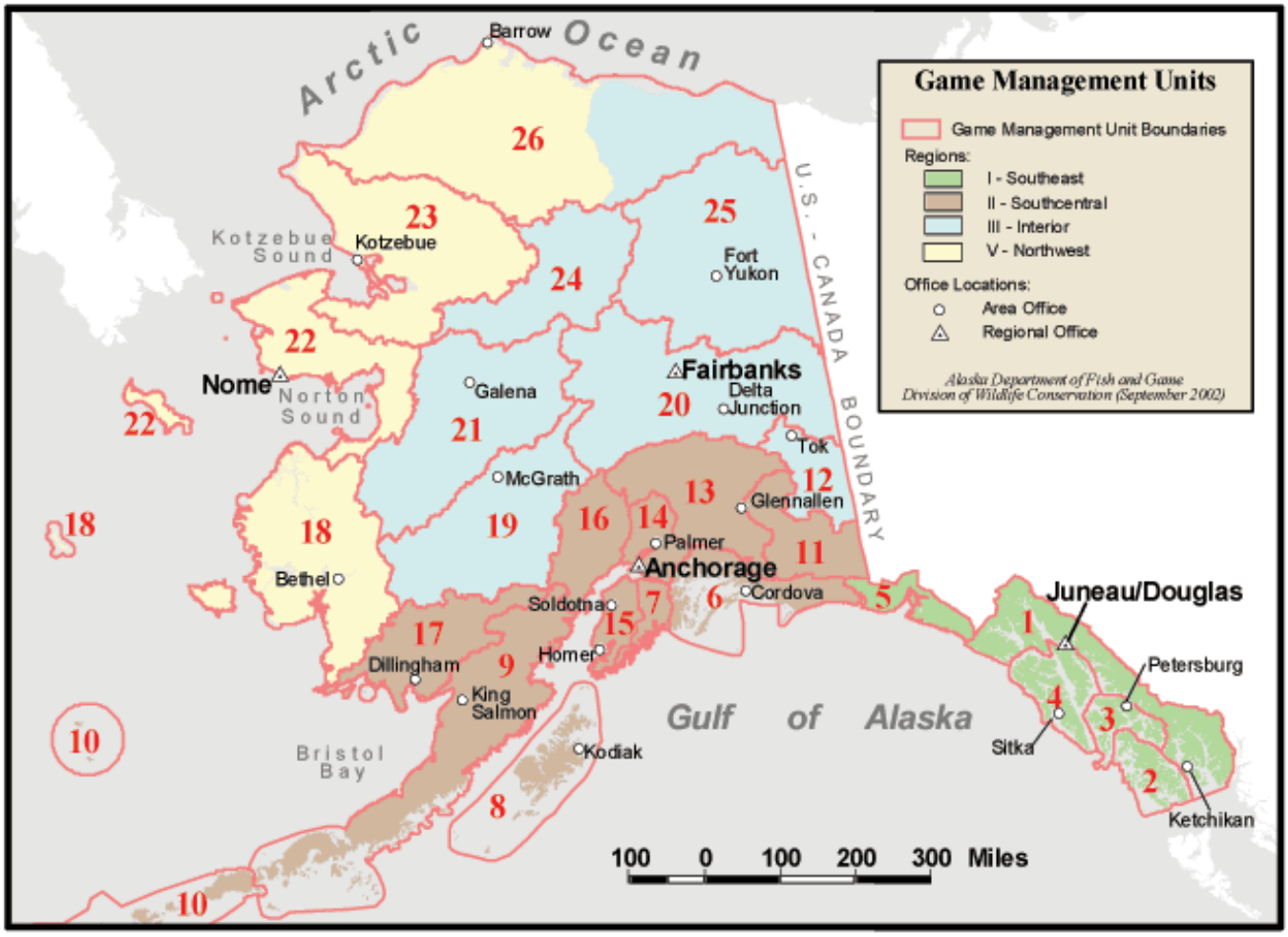
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Regions:
I - Southeast
II - Southcentral
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MOUNTAIN GOAT MANAGEMENT REPORT

From: 1 July 1999
To: 30 June 2001

LOCATION

GAME MANAGEMENT UNIT: 6 (10,140 mi^2)

GEOGRAPHIC DESCRIPTION: Prince William Sound and North Gulf Coast

BACKGROUND

Mountain goats are endemic to mountains on the mainland in Unit 6 and to Bainbridge, Culross and Knight Islands. Captain Cook in 1785 (Beaglehole 1966), Edmond Heller in 1908 (1910), Clarence Rhodes in 1938 (ADF&G files), and Fred Robards in 1952 (ADF&G files) documented their presence. Robards estimated 4350 goats between Cape Fairfield and Bering Glacier, which includes most of Unit 6.

Several events caused significant reductions in the mountain goat population during the last 60 years. Art Sheets, game biologist with ADF&G, reported evidence that military personnel stationed in Whittier reduced goat numbers in Port Wells in the 1940s. He reported a similar reduction in the Puget Bay area during the 1950s by military personnel stationed in Seward. Populations also may have suffered significant natural mortality during the severe winters of 1971 and 1975. Goat numbers remained low during the late 1970s and 1980s because of hunter harvest (Griese 1988*a*) and predation (Reynolds 1981, Griese 1988*b*). By 1987 the estimated population was approximately 3400. It declined to 3000 by 1994 but rebounded to approximately 4000 goats by 1999 as a result of conservative harvest strategies and mild winters.

Population surveys began with aerial composition flights in 1969. Methods were not standardized until 1986, when surveys were improved by establishing count areas that were systematically searched (Griese 1988*a*).

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

Management guidelines were clarified in 1993 when a tracking harvest strategy (Caughley 1977, Smith 1984) was fully implemented. The 3 elements essential for implementation of the strategy

were: 1) improved aerial survey methods for obtaining trend information, 2) registration permit hunts allowing careful monitoring of harvest distribution and magnitude, and 3) establishing a minimum population objective of 2400 goats for Unit 6. Implementation of the strategy provided the conceptual framework necessary to guide decisions about harvest. In response to declining populations in most of the unit, we reduced harvest and prohibited hunting of small groups of goats (<60) during the early and mid 1990s.

We have monitored harvest 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 35 goats in 1996–97.

MANAGEMENT DIRECTION

MANAGEMENT OBJECTIVES

- Maintain a minimum population of 2400 goats
- Achieve a minimum of 70% males in the harvest.

METHODS

We conducted aerial surveys to estimate mountain goat population size, trend, and composition in permit hunt areas (Fig. 1). Individual hunt areas were usually surveyed during August and September at 2–3-year intervals. Each area was divided into 1 or more sample units. Units were 5 to 70 mi^2 and encompassed alpine cover types above 1000 ft elevation. Large glaciers (>1mi^2) were excluded from sample units. However, the edges of glaciers were searched (up to 300 ft), and goats observed were included in the count. Where possible, sample units were separated by geographic barriers to minimize variability due to movement of goats among units. Boundaries were drawn on 1:63,360 scale, topographic maps.

Sample units were searched using a Piper Super Cub (PA-18) or Bellanca Scout aircraft on wheels with pilot and 1 observer onboard. The pilot maintained airspeed of 60 to 70 mph and stayed 300 to 500 ft from slopes or cliffs. Flights were made in the morning within 3 hours after sunrise or in the evening within 3 hours of sunset. Flight lines followed contours, starting at the tops of ridges and repeating passes downward in elevation, or starting at treeline and repeating passes upward in elevation. Width of the search area between passes was limited to no more than 500 ft elevation or 1/8 mile. Observations were generally made on the side of the aircraft toward steep topography. Searches were completed drainage by drainage to avoid duplicate counts and to insure systematic coverage.

The observer recorded start and stop times and calculated search effort (minutes/mi^2) for each survey. Number of kids and goats older than kids were recorded for each group. Goat observations and flight lines were plotted on sample unit maps. We also recorded environmental conditions during the survey to evaluate survey quality as excellent, good, or poor. We noted cloud cover, turbulence, wind speed, and light type and intensity. Excellent conditions were overcast skies, soft light, and no turbulence (Nichols 1980). Good conditions were combinations of partly cloudy to clear skies, direct light, and mild turbulence. Poor conditions were combinations of clear skies, bright light, and mild to severe turbulence.

We summarized most survey results by hunt area and unit. We also summarized data from Unit 6D into western and eastern portions. The line dividing Unit 6D into western and eastern portions was drawn from Hinchinbrook Entrance through Valdez Arm, Port Valdez, and Lowe River. Summaries included goats observed, number of goats older than kids, percent older goats, number of kids, percent kids, and kids:100 older goats. Size of the goat population was estimated by assuming 70%, 80% and 90% of goats were observed during surveys that were poor, good, or excellent quality, respectively. The population was estimated during years when surveys were not completed by considering most recent surveys, harvest, and probable productivity and survival.

Harvest was monitored through permit hunt reports that we required from all hunters. Hunters not reporting were sent up to 2 reminder letters. To minimize kill of females, hunters were given an information leaflet that presented methods of differentiating sexes of goats at a distance and explained benefits of selectively harvesting males. Hunters were not required to have horns checked by department staff to identify sex, with the exception of those taking goats in Unit 6C.

We also summarized data from Unit 6D into western and eastern portions. In addition to standard ADF&G harvest parameters, we calculated a weighted total harvest by multiplying the number of females taken by 2, and lost goats or unknowns by 1.5 (unless the lost goat was identified by sex by a guide). Weighted harvest rate was also determined for each unit by dividing weighted total harvest by the estimated population in permit hunt areas.

A maximum allowable harvest (MAH) for each year was established for each permit hunt. It was calculated as a percentage of goats observed during the most recent survey. The percent applied ranged from 2.2% to 5.5%, depending upon population trend, estimated mortality, and elapsed time since the last survey. For example, hunts with decreasing population trend, high mortality, and survey data several years old had an MAH of 2.2% to 3.0%. Permit hunts were closed by emergency order if weighted harvest reached MAH.

RESULTS AND DISCUSSION

POPULATION STATUS AND TREND

Population Size

We completed aerial surveys in all or part of 13 permit hunt areas during this reporting period. We counted 970 goats during 1999 and 1110 goats in 2000 (Table 1). Flights were a joint effort with USFS, Cordova and Glacier Ranger Districts, who helped fund aircraft charter and provided an observer. We estimated 4000 goats unit-wide in 1999–00 and 3640 goats in 2000–01.

Population size and trend varied among units over the past 5 years. Unit 6D (West) had the highest number of goats, but the population began declining during the reporting period (Table 1). Hunt area RG252 declined by 13% and RG249 by 45% since 1998. The goat population in Unit 6D (East) was relatively stable during the reporting period. Goats in Unit 6C peaked during 1997 when hunting resumed after a 10-year closure (Table 1). The population has since stabilized. Goat populations in Units 6A decreased by 8%, driven by declines in RG214 and RG215. Goats in Unit 6B also declined (by 20% since 1998), but part of the decline may be attributed to a survey in RG266 during which goats were lower than usual and concealed in heavy brush.

Survey data and estimates produced since 1989 indicate long-term trends of goat populations in Unit 6 (Fig. 2). Goat numbers in Unit 6A declined through 1994, but have since stabilized. Unit 6B population has been relatively stable since 1989. Unit 6C goats increased steadily because hunting was closed in 1989. This population more than tripled by 1997 and has since stabilized. Goats in Unit 6D (West) increased through 1992, decreased slightly during the next 2 years, then resumed increasing through 1998. The Unit 6D (East) goat population was stable between 1989 and 1994, then increased to an historic high by 1998 where it has remained.

Results of aerial goat surveys can be extremely variable (Ballard 1975, Fox 1977). We attempted to minimize variability by standardizing methods and by surveying mostly during excellent or good conditions.

Population Composition

The kid-to-older goat ratio and percent kids for all areas counted during 1999–00 were 16:100 and 14%, respectively (Table 1). These values for 2000–01 were 18:100 and 15%, respectively. Kids observed during goat surveys over the past 10 years averaged 18% (SD = 3%) in Unit 6. On the Kenai Peninsula (Del Frate 1996) and Kodiak Island (Smith & VanDaele 1987), values less than 20% and 17% kids, respectively, indicated poor productivity and declining populations.

MORTALITY

Harvest

Season and Bag Limit. The mountain goat season in Units 6A and 6B was 20 August to 31 January and in Unit 6D was 15 September to 31 January. Hunts in 6C were limited to 2 periods during 9–15 October and 13–19 November. The bag limit was 1 goat by registration permit only. Permit hunts were opened in all units.

Board of Game Actions and Emergency Orders. The Board of Game made no changes to mountain goat regulations during the reporting period.

Eight emergency orders were issued closing registration permit hunts when MAH was reached. During 1999–00, hunts RG226, RG249 (1 partial closure and 1 full closure), and RG52 were closed. During 2000–01, hunts RG226, RG245, RG249 and RG266 were closed. These were routine management actions.

Hunter Harvest. Unweighted and weighted harvest during 1999–01 was 67 and 73, respectively (Table 2). Harvest during 2000–01 was 68 and 83, respectively. The harvest included 45 males (69%) and 12 females (18%) during1999–01. In 2000–01, the sex composition was 47 males (73%) and 19 females (30%). There were 6 goats of unknown sex taken during the reporting period.

Sex composition of the harvest varied by unit. In Units 6A and 6B, most hunters were guided nonresidents who reported taking almost 100% billies (Table 2). Sex verification was not required for these units, but in general guides are motivated to take billies and report accurately. Sex verification is required for Unit 6C hunters (most of whom were locals and experienced goat hunters), who harvested 71 and 75% billies. Most hunters in Unit 6D were nonlocal residents who reported 63% and 70% billies during this period. The relatively low proportion of billies

taken in RG252 (1999) and RG266 (2000), occurred because air and boat charters dropped multiple hunters into primarily nanny/kid areas. Hunters were aware that nannies counted as 2 goats toward the harvest quota, sex verification was not required, hence additional nannies may have been taken and reported as billies.

MAH during 1999–00 and 2000–01 was 108 and 110, respectively (Table 2). Weighted harvest exceeded MAH in 7 of 16 hunts during this reporting period. In Unit 6A and 6B, weighted harvest rates ranged from 1.0 to 2.5 since 1996–97 (Fig. 3 and 4). The harvest in Unit 6C during the same period was 2.3-3.3 (Fig. 5). In Units 6D (East) and 6D (West), the harvest rates were 1.6—3.3 and 2.5—5.2, respectively, since 1996—97 (Figs 6 and 7). MAH in RG249 (1998-2000) and RG266 (2000—01) was exceeded because of high hunter effort, harvest of nannies, and easy access from Valdez (Table 2). Conservative MAH's and resulting low harvest overall were part of our tracking harvest strategy for hunted populations that were declining, and where kid survival was poor. Under these conditions hunter take was considered additive to other mortality factors (Hebert & Turnbull 1977, Adams & Bailey 1982). Most of our harvest rates were conservative compared to unweighted rates of 7% in Colorado (Adams & Bailey 1982), 5% in Alberta (Hall 1977), and 4% in Idaho (Kuck 1977).

Permit Hunts. Registration permits were first required in the entire unit in 1981–82. The number issued reached a peak of 796 in 1983–84 and then steadily declined. Number of permits issued reached an historic low of 148 in 1995–96, then increased to 311 by 2000–01 (Table 2).

Hunter Residency and Success. Most goat hunters during this reporting period were residents of Alaska but did not live in Unit 6 (Table 3). Hunter success during the reporting period averaged 51.5%, which was within the normal range during the last 5 years.

Harvest Chronology. September and October were the most productive months overall for goat harvest during the reporting period (Table 4). In Unit 6C the season is open for 1 week each during October and November.

Transport Methods. Airplanes were the most important means of hunter transport in Units 6A and 6B (Table 5). In Unit 6C highway vehicles were the primary mode of transportation. In Unit 6D boats and airplanes were primarily used. ORV's and highway vehicles were used following the opening of RG245 in 2000–01 with road access from Valdez.

Other Mortality

Predation by wolves was a source of natural mortality, particularly in Units 6A and 6B where wolf density was greatest. Pilots in Units 6A and 6B have occasionally reported wolf predation on goats. However, Carnes et al. (1996) found little evidence of significant wolf predation in Unit 6, during the early to mid 1990's. He reported that the wolf population probably peaked during the early to late 1980's and then declined during the following decade to a stable, relatively low density. Hence, wolf predation may have been a more important factor in the past than it is currently.

HABITAT

Old-growth forest provides important winter habitat for goats along the coast of Alaska (Schoen and Kirchoff 1982, Fox 1979, Fox et al. 1989). We recognize the potential for clear-cut logging

to negatively affect populations through removal of old-growth timber and subsequent improved human access. Logging roads can result in increased legal harvest, illegal harvest, and disturbance (Arnett & Irwin 1989, Fox et al. 1989).

Logging commenced on the western shore of Icy Bay in the mid 1960s. Clear-cutting and a road system progressed westward toward Cape Yakataga through the 1970s and 1980s. Logging began in the White River watershed during spring 1995 and has since proceeded westward toward Cape Yakataga. Clear-cutting in hunt area RG204 along the North Fork Yakataga River began during spring 2001 in the Porcupine Creek drainage on University of Alaska (UA) lands. RG204 has the largest population (200 goats) in Game Management Unit 6A.

UA and ADF&G have made some progress in eliminating goat winter habitat from logging in Unit 6A. However, actual evidence of goat use (hair, pellets or goats) must be observed in each individual cut unit before removing from the harvest schedule. This mandate precludes conservation of potential or previously used winter habitat during higher goat population cycles. Searching cut units is labor intensive and requires helicopter support, which UA provided during spring, 2001. ADF&G searched 18 cut units in RG204 and found winter goat use in two units. We did not search any cut units that require helicopter logging because the timber market will not support any logging in those units in the near future (Jeff Hermanns, UA Forester, pers. Comm.).

Historical trends of mountain goat populations in the area indicate the effect of removing winter habitat. The White River to Icy Bay hunt area (RG202), numbered approximately 400 goats in 1977, and has since steadily declined to 77 in 1998–99, representing an 80% decrease. There was excessive legal harvest and poaching in RG202 during the 1970s and early 1980's because of easy access by logging roads. There was little protection given to winter goat habitat, nor mitigation for the loss of goat habitat. Despite low wolf density (Carnes et al. 1996) and restricted hunter harvest, the goat population has remained low. Goat populations in adjacent unlogged hunt areas have been increasing, despite hunter harvest and continued wolf predation.

CONCLUSIONS AND RECOMMENDATIONS

We achieved our objective for maintaining a minimum population size of 2400 goats. Estimated number at the end of this reporting period was 3600. The population was stable to slightly declining since 1996, indicating that our harvest tracking strategy was successful. Weighted harvest rate of declining populations was restricted to <3.5%, and hunting was closed where goat numbers approached minimum acceptable levels. Weighted harvest rate in the future should not exceed 6%, unless kid survival improves. Hunt areas RG249 and RG266 will be closed earlier in anticipation of high nanny harvest, low kid survival, and easy access by hunters

We achieved our objective of 70% males in the harvest. However, hunter reports were possibly biased. Since the requirement that hunters have sex verified by ADF&G staff was suspended, hunters may have been reluctant to voluntarily report harvest of females. This bias was likely limited to Unit 6D.

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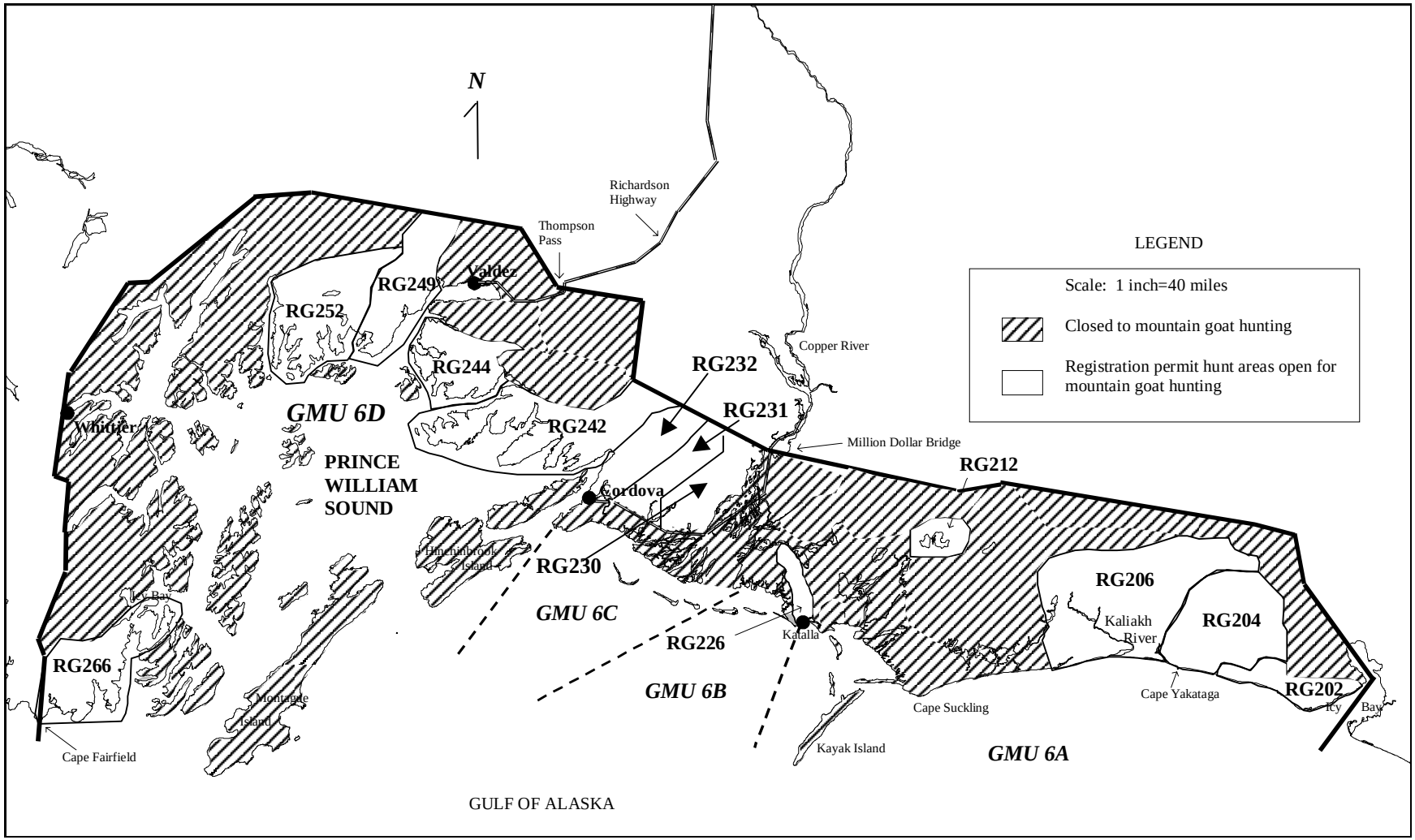

Figure 1 Unit 6 mountain goat registration permit hunts 1996–2000.

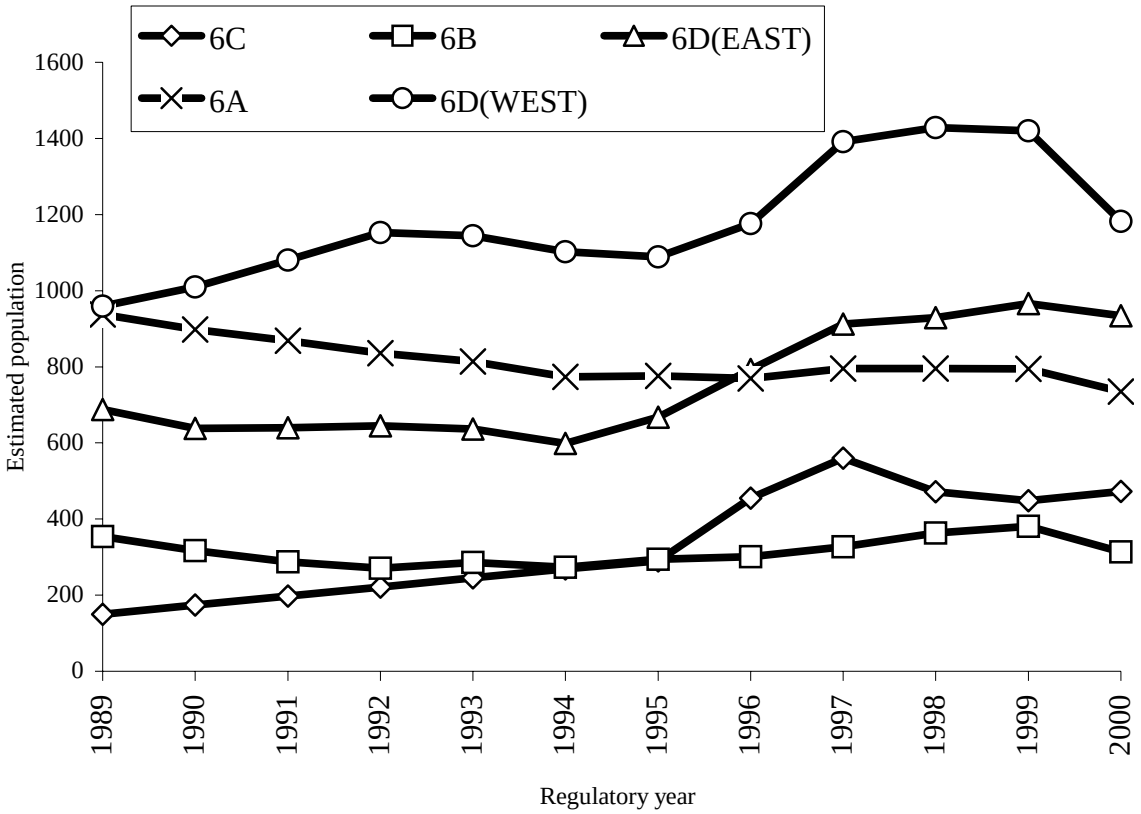

Figure 2 Unit 6 mountain goat estimated population size 1989–2000.

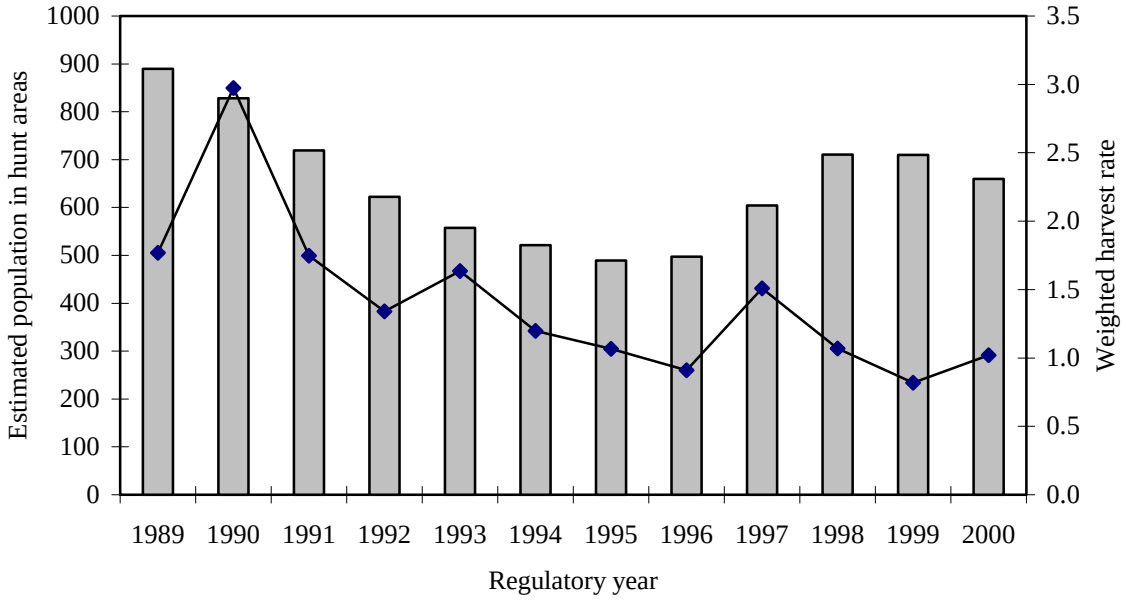

Figure 3 Estimated mountain goat populations and weighted harvest rate (nannies = 2 goats, lost goats = 1.5, billies = 1 goat) in permit hunt areas of Unit 6A, 1989–2000.

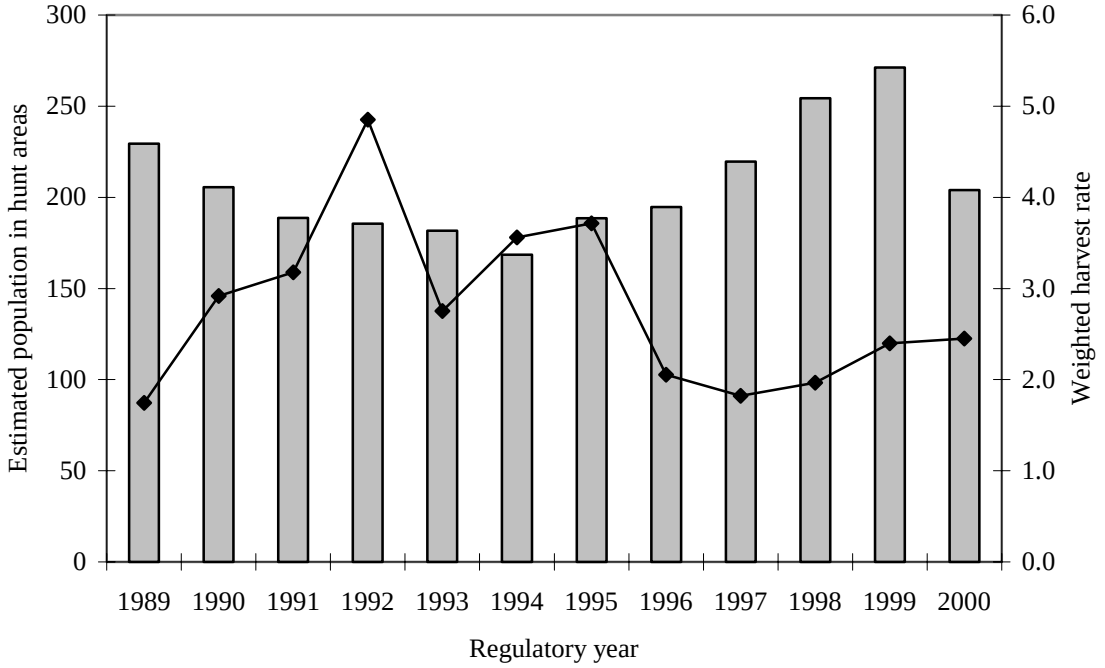

Figure 4 Estimated mountain goat populations and weighted harvest rate (nannies = 2 goats, lost goats = 1.5, billies = 1 goat) in permit hunt areas of Unit 6B, 1989–2000.

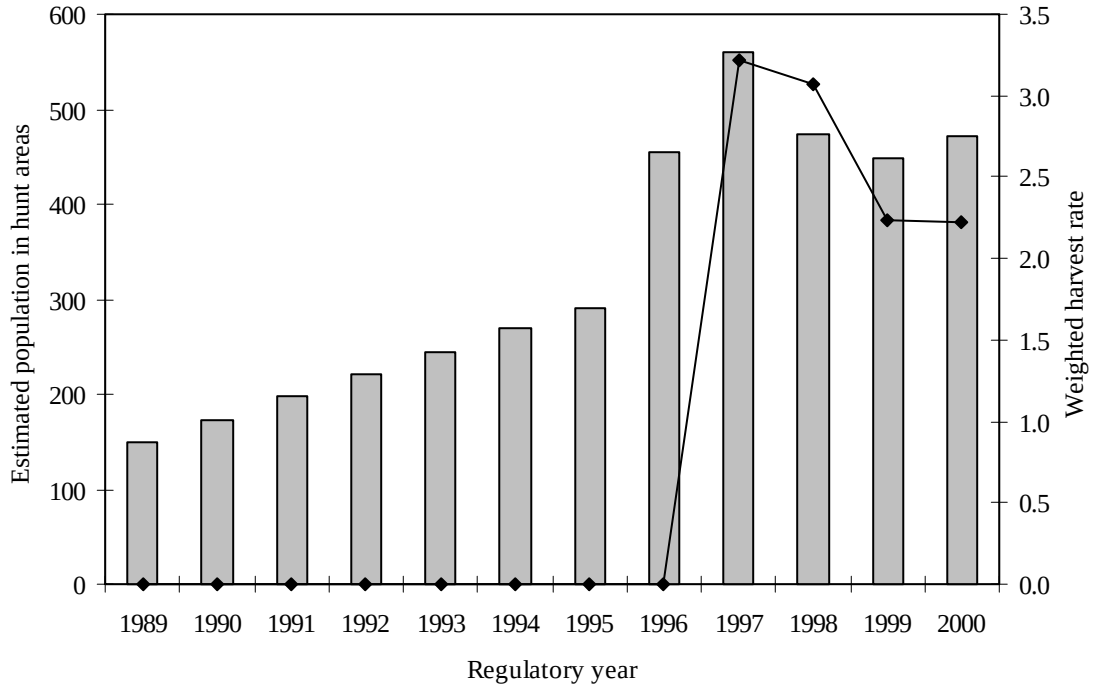

Figure 5. Estimated mountain goat populations and weighted harvest rate (nannies = 2 goats, lost goats = 1.5, billies = 1 goat) in permit hunt areas of Unit 6C, 1989–2000. Hunting resumed during 1997.

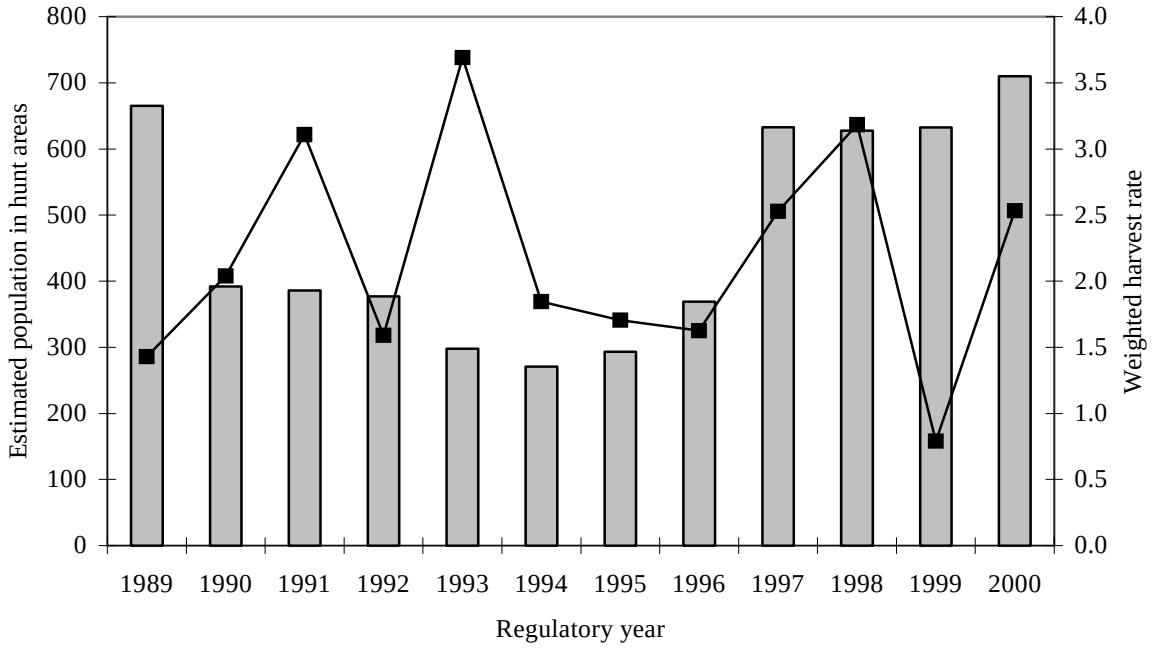

Figure 6. Estimated mountain goat populations and weighted harvest rate (nannies = 2 goats, lost goats = 1.5, billies = 1 goat) in permit hunt areas of Unit 6D (East), 1989–2000.

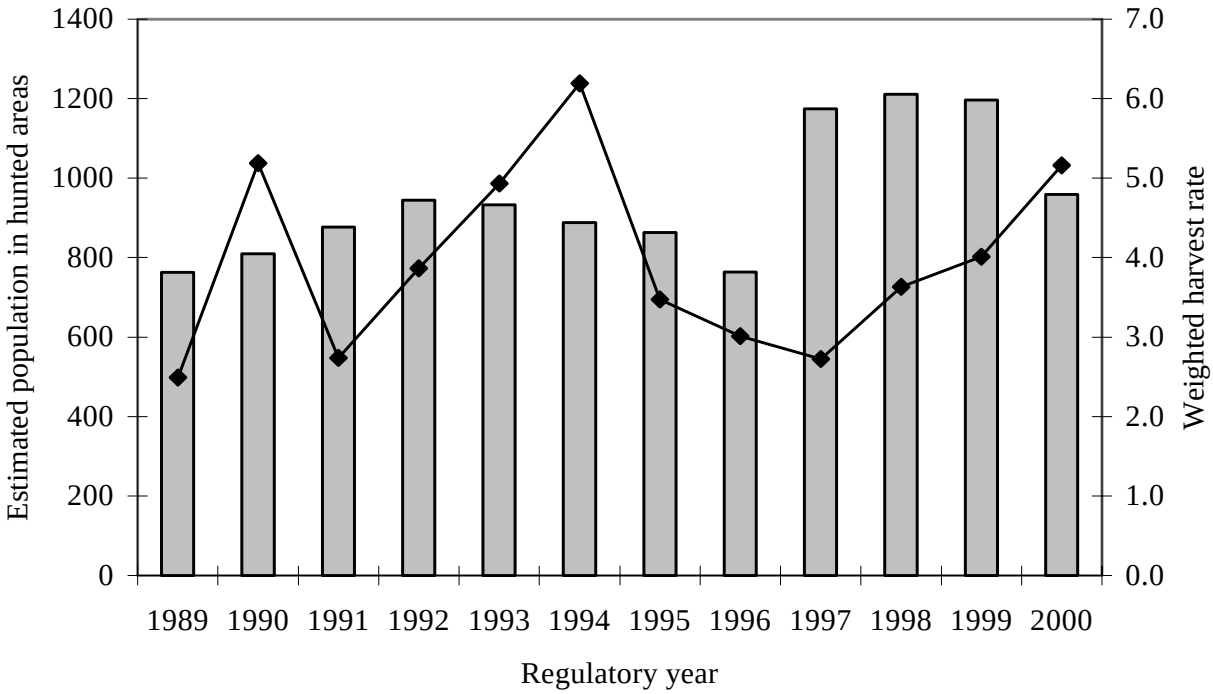

Figure 7. Estimated mountain goat populations and weighted harvest rate (nannies = 2 goats, lost goats = 1.5, billies = 1 goat) in permit hunt areas of Unit 6D (West), 1989–2000.

Table 1 Unit 6 summer/fall mountain goat composition counts and estimated population size, 1996–00.

Unit	Hunt nr. or area	Regulatory Year	Survey coverage	Older goats	(%)	Kids	(%)	Kids:100 older goats	Total goats observed	Estimated population size
6A	RG202	1996-1997	None	--	--	--	--	--	--	93
		1997-1998	None	--	--	--	--	--	--	93
		1998-1999	Full	62	(81)	15	(19)	24	24	92
		1999-2000	None	--	--	--	--	--	--	90
		2000-2001	None	--	--	--	--	--	--	90
	Brower Ridge	1996-1997	None	--	--	--	--	--	--	44
		1997-1998	None	--	--	--	--	--	--	43
		1998-1999	None	--	--	--	--	--	--	43
		1999-2000	None	--	--	--	--	--	--	43
		2000-2001	None	--	--	--	--	--	--	43
	RG204	1996-1997	None	--	--	--	--	--	--	170
		1997-1998	None	--	--	--	--	--	--	185
		1998-1999	Partial	138	(82)	25	(15)	18	169	189
		1999-2000	None	--	--	--	--	--	--	195
		2000-2001	None	--	--	--	--	--	--	195
	RG206	1996-1997	None	--	--	--	--	--	--	234
		1997-1998	Partial	103	(54)	19	(16)	18	191	226
		1998-1999	Partial	55	(29)	14	(20)	25	190	225
		1999-2000	None	--	--	--	--	--	--	225
		2000-2001	None	--	--	--	--	--	--	225

Table 1 Continued

Unit	Hunt nr. or area	Regulatory Year	Survey coverage	Older goats	(%)	Kids	(%)	Kids:100 older goats	Total goats observed	Estimated population size
6A	RG212	1996-1997	None	--	--	--	--	--	--	92
		1997-1998	Full	63	(73)	23	(27)	37	86	103
		1998-1999	None	--	--	--	--	--	--	100
		1999-2000	None	--	--	--	--	--	--	95
		2000-2001	Full	65	(87)	10	(13)	15	75	90
	RG214	1996-1997	None	--	--	--	--	--	--	27
		1997-1998	Partial	13	(56)	3	(19)	23	23	28
		1998-1999	None	--	--	--	--	--	--	20
		1999-2000	None	--	--	--	--	--	--	12
		2000-2001	Full	4	(100)	--	--	--	4	5
	RG215	1996-1997	None	--	--	--	--	--	--	92
		1997-1998	Full	65	(77)	19	(23)	29	84	101
		1998-1999	None	--	--	--	--	--	--	104
		1999-2000	None	--	--	--	--	--	--	106
		2000-2001	Full	39	(78)	11	(22)	28	50	60
	Suckling Hills	1996-1997	None	--	--	--	--	--	--	14
		1997-1998	Full	8	(62)	5	(38)	63	13	16
		1998-1999	None	--	--	--	--	--	--	20
		1999-2000	Partial	17	(81)	4	(19)	24	21	27
		2000-2001	None	--	--	--	--	--	--	26

Table 1 Continued

Unit	Hunt nr. or area	Regulatory Year	Survey coverage	Older goats	(%)	Kids	(%)	Kids:100 older goats	Total goats observed	Estimated population size
6A		1996-1997	Partial	--	--	--	--	--	--	769
TOTAL		1997-1998	Partial	252	(38)	69	(21)	27	670	795
		1998-1999	Partial	255	(38)	54	(17)	21	677	795
		1999-2000	Partial	17	(3)	4	(19)	24	674	794
		2000-2001	Partial	108	(17)	21	(16)	19	625	735
6B	RG226	1996-1997	Full	112	(82)	25	(18)	22	137	151
		1997-1998	None	--	--	--	--	--	--	158
		1998-1999	Full	135	(89)	16	(11)	12	151	181
		1999-2000	None	--	--	--	--	--	--	186
		2000-2001	Full	76	(80)	19	(20)	25	95	114
	RG220	1996-1997	None	--	--	--	--	--	--	44
		1997-1998	Full	44	(86)	7	(14)	16	51	61
		1998-1999	None	--	--	--	--	--	--	73
		1999-2000	Full	59	(83)	12	(17)	20	71	85
		2000-2001	None	--	--	--	--	--	--	90
	Goat Mt.	1996-2000	None	--	--	--	--	--	--	110
6B		1996-1997	Partial	112	(63)	25	(18)	22	177	195
TOTAL		1997-1998	Partial	44	(23)	7	(14)	16	195	220
		1998-1999	Partial	135	(64)	16	(11)	12	212	254
		1999-2000	Partial	59	(26)	12	(17)	20	226	271
		2000-2001	Partial	76	(45)	19	(20)	25	170	204
6C		1996-1997	Partial	118	(30)	34	(22)	29	389	455
TOTAL		1997-1998	Full	396	(83)	84	(18)	21	480	560
		1998-1999	Full	359	(91)	34	(9)	9	393	473
		1999-2000	Full	326	(84)	60	(16)	18	386	448
		2000-2001	Partial	123	(30)	13	(3)	11	416	472
6D	RG242	1996-1997	Full	248	(78)	72	(23)	29	320	369
		1997-1998	None	--	--	--	--	--	--	378
		1998-1999	Full	283	(85)	50	(15)	18	333	386
		1999-2000	None	--	--	--	--	--	--	406

		2000-2001	Full	331	(83)	66	(17)	20	397	465
	RG243	1996-1997	None	--	--	--	--	--	--	105
		1997-1998	None	--	--	--	--	--	--	126
		1998-1999	None	--	--	--	--	--	--	148
		1999-2000	Full	134	(87)	20	(13)	15	154	178
		2000-2001	None	--	--	--	--	--	--	171
	RG244	1996-1997	None	--	--	--	--	--	--	227
		1997-1998	Full	186	(83)	37	(17)	20	223	255
		1998-1999	None	--	--	--	--	--	--	242
		1999-2000	None	--	--	--	--	--	--	227
		2000-2001	Full	102	(84)	19	(16)	19	121	145
6D	RG245	1996-1997	None	--	--	--	--	--	--	65
		1997-1998	Partial	35	(40)	8	(19)	23	87	96
		1998-1999	None	--	--	--	--	--	--	97
		1999-2000	Partial	42	(46)	4	(9)	10	91	100
		2000-2001	None	--	--	--	--	--	--	100
	Heiden Canyon	1996–2000	None	--	--	--	--	--	--	55
6D (East) TOTAL East of Valdez Port, Narrows and Arm		1996-1997	Partial	248	(36)	72	(23)	29	697	793
		1997-1998	Partial	221	(28)	45	(17)	20	779	912
		1998-1999	Partial	283	(36)	50	(15)	18	795	929
		1999-2000	Partial	176	(21)	24	(3)	14	823	966
		2000-2001	Partial	433	(55)	85	(11)	20	784	934
6D	RG249	1996-1997	None	--	--	--	--	--	--	406
		1997-1998	Full	347	(76)	109	(24)	31	456	502
		1998-1999	None	--	--	--	--	--	--	502
		1999-2000	Partial	169	(40)	23	(12)	14	422	493
		2000-2001	Full	203	(88)	29	(13)	14	232	277

Table 1 Continued

Unit	Hunt nr. or area	Regulatory Year	Survey coverage	Older goats	(%)	Kids	(%)	Kids:100 older goats	Total goats observed	Estimated population size
6D	RG252	1996-1997	Full	161	(81)	38	(19)	24	199	239
		1997-1998	None	--	--	--	--	--	--	291
		1998-1999	Full	249	(87)	37	(13)	30	286	328
		1999-2000	None	--	--	--	--	--	--	307
		2000-2001	None	--	--	--	--	--	--	287
	RG266	1996-1997	None	--	--	--	--	--	--	358
		1997-1998	Full	264	(78)	76	(22)	29	340	382
		1998-1999	None	--	--	--	--	--	--	382
		1999-2000	None	--	--	--	--	--	--	396
		2000-2001	None	--	--	--	--	--	--	396
6D (West)	Remainder	1996-1997	Partial	23	(13)	9	(5)	39	176	174
Valdez, Sargent Icefield, Mt. Castner, Whittier, College Fiord		1997-1998	None	8	(5)	--	--	--	--	217
		1998-1999	None	--	--	--	--	--	--	217
		1999-2000	None	--	--	--	--	--	--	223
		2000-2001	None	--	--	--	--	--	--	223
6D (West)		1996-1997	Partial	184	(17)	47	(20)	26	1063	1176
TOTAL		1997-1998	Partial	619	(51)	185	(23)	30	1210	1392
		1998-1999	Partial	249	(20)	37	(13)	15	1253	1429
West of Valdez Port, Narrows and Arm		1999-2000	Partial	169	(14)	23	(12)	14	1190	1420
		2000-2001	Partial	203	(21)	29	(13)	14	954	1182

Table 1 Continued

Unit	Hunt nr. or area	Regulatory Year	Survey coverage	Older goats	(%)	Kids	(%)	Kids:100 older goats	Total goats observed	Estimated population size
6D		1996-1997	Partial	432	(25)	119	(22)	28	1760	1970
TOTAL		1997-1998	Partial	840	(42)	230	(21)	27	1988	2304
		1998-1999	Partial	532	(26)	87	(14)	16	2048	2358
		1999-2000	Partial	345	(17)	47	(12)	14	2013	2386
		2000-2001	Partial	636	(37)	114	(15)	18	1738	2116
UNIT 6		1996-1997		662	(79)	178	(21)	27	840	3495
TOTAL		1997-1998		1532	(80)	390	(20)	25	1922	3987
		1998-1999		1281	(87)	191	(13)	15	1472	3997
		1999-2000		747	(77)	123	(14)	16	970	4009
		2000-2001		943	(85)	167	(15)	18	1110	3638

Table 2 Unit 6 mountain goat harvest data by permit hunt, 1996–00.

Unit/ hunt no.	Regulatory year	Permits issued	Nr. did not hunt	Percent did not hunt	Nr. unsuccessful hunters	Percent unsuccessful hunters	Nr. successful hunters	Percent successful hunters	Males	(%)	Females	(%)	Unk.	Total harvest		Maximum allowable harvest [c]
														Unw [a]	W [b]	
6A/RG202	1996-1997	10	2	20	5	63	3	38	3	(100)	0	(0)	0	3	3	3
	1997-1998	13	10	77	1	33	2	67	2	(100)	0	(0)	0	2	2	3
	1998-1999	20	10	50	8	80	2	20	2	(100)	0	(0)	0	2	2	3
	1999-2000	12	10	83	1	50	1	50	1	(100)	0	(0)	0	1	1	3
	2000-2001	11	5	45	3	50	3	50	1	(100)	0	(0)	2	3	5	3
6A/RG204	1996-1997	6	2	33	2	50	2	50	2	(100)	0	(0)	0	2	2	4
	1997-1998	7	4	57	1	33	2	67	2	(100)	0	(0)	0	2	2	4
	1998-1999	8	3	38	3	60	2	40	1	(100)	0	(0)	1	2	3	4
	1999-2000	5	2	40	1	33	2	67	1	(100)	0	(0)	1	2	3	7
	2000-2001	13	9	69	2	50	2	50	2	(100)	0	(0)	0	2	2	7
6A/RG206	1996-1997	4	0	0	2	50	2	50	2	(100)	0	(0)	0	2	2	3
	1997-1998	7	3	43	0	0	4	100	4	(100)	0	(0)	0	4	4	4
	1998-1999	5	3	60	0	0	2	100	2	(100)	0	(0)	0	2	2	5
	1999-2000	7	4	57	1	33	2	67	1	(100)	0	(0)	0	1	1	5
	2000-2001	11	7	64	3	75	1	25	1	(100)	0	(0)	0	1	1	5
6A/RG212	1996-1997	None	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	1997-1998	None	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	1998-1999	10	6	60	2	50	2	50	2	(100)	0	(0)	0	2	2	4
	1999-2000	5	4	80	0	0	1	100	1	(100)	0	(0)	0	1	1	4
	2000-2001	0	0	-	0	-	0	-	0	-	0	-	0	0	0	3
6A/RG215	1996-1997	None	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	1997-1998	9	2	22	4	57	3	-	2	(67)	1	(33)	0	3	4	4
	1998-1999	None	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	1999-2000	None	-	-	-	-	-	-		-		-	-	-	-	-
	2000-2001	12	7	58	2	40	3	60	3	(100)	0	(0)	0	3	3	4

Table 2 Continued

Unit/ hunt no.	Regulatory year	Permits Issued	Nr. did not hunt	Percent did not hunt	Nr. unsucc hunters	Percent unsucc hunters	Nr. succ hunters	Percent succ hunters	Males	(%)	Females	(%)	Unk.	Total harvest Unw [a]	Total harvest W [b]	Maximum allowable harvest [c]
6A TOTAL	1996-1997	20	4	20	9	56	7	44	7	(100)	0	(0)	0	7	7	10
	1997-1998	36	19	53	6	35	11	65	10	(91)	1	(9)	0	11	12	15
	1998-1999	43	22	51	13	62	8	38	7	(100)	0	(0)	1	8	9	16
	1999-2000	29	20	69	3	33	6	67	4	(100)	0	(0)	1	5	6	19
	2000-2001	47	28	60	10	53	9	47	7	(100)	0	(0)	2	9	11	22
6B/RG220	1994-1999	None	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	2000-2001	9	8	89	0	0	1	100	1	(100)	0	(0)	0	1	1	4
6B/RG226	1996-1997	9	3	33	2	33	4	67	4	(100)	0	(0)	0	4	4	5
	1997-1998	11	5	45	2	33	4	67	4	(100)	0	(0)	0	4	4	5
	1998-1999	11	4	36	2	29	5	71	5	(100)	0	(0)	0	5	5	5
	1999-2000	12	5	42	1	14	6	86	5	(100)	0	(0)	1	6	7	7
	2000-2001	9	4	44	2	40	3	60	2	(67)	1	(33)	0	3	4	3
6B TOTAL	1996-1997	9	3	33	2	33	4	67	4	(100)	0	(0)	0	4	4	5
	1997-1998	11	5	45	2	33	4	67	4	(100)	0	(0)	0	4	4	5
	1998-1999	11	4	36	2	29	5	71	5	(100)	0	(0)	0	5	5	5
	1999-2000	12	4	33	1	13	6	75	5	(100)	0	(0)	1	6	7	7
	2000-2001	18	4	22	2	14	4	29	3	(75)	1	(25)	0	4	5	7
6C/RG230	1998-1999	7	0	0	2	29	5	71	3	(75)	1	(25)	1	5	7	6
	1999-2000	7	1	14	3	50	3	50	3	(100)	0	(0)	0	3	3	6
	2000-2001	8	2	25	3	50	3	50	2	(100)	0	(0)	1	3	4	6
6C/RG231	1997-1998	12	0	0	2	17	10	83	8	(80)	2	(20)	0	10	12	14
	1998-1999	8	1	13	2	29	5	71	4	(80)	1	(20)	0	5	6	8
	1999-2000	5	1	20	1	25	3	75	1	(33)	2	(67)	0	3	5	4
	2000-2001	4	0	0	0	0	4	100	2	(50)	2	(50)	0	4	6	5
6C/RG232	1997-1998	4	0	0	0	0	4	100	2	(50)	2	(50)	0	4	6	6
	1998-1999	6	1	17	4	80	1	20	0	(0)	1	(100)	0	1	2	6
	1999-2000	7	2	29	3	60	2	40	2	(100)	0	(0)	0	2	2	7
	2000-2001	9	2	22	6	86	1	14	1	(100)	0	(0)	0	1	1	7

Table 2 Continued

Unit/ hunt no.	Regulatory year	Permits issued	Nr. did not hunt	Percent did not hunt	Nr. unsucc hunters	Percent unsucc hunters	Nr. succ hunters	Percent succ hunters	Males	(%)	Females	(%)	Unk.	Total harvest Unw [a]	Total harvest W [b]	Maximum allowable harvest [c]
6C TOTAL																
	1997-1998	16	0	0	2	13	14	88	10	(71)	4	(29)	0	14	18	20
	1998-1999	21	2	10	8	42	11	58	7	(70)	3	(30)	1	11	15	20
	1999-2000	19	4	21	7	47	8	53	6	(75)	2	(25)	0	8	10	17
	2000-2001	21	4	19	9	53	8	47	5	(71)	2	(29)	1	8	11	18
6D/RG242	1996-1997	23	11	48	6	50	6	50	6	(100)	0	(0)	0	6	6	5
	1997-1998	27	17	63	1	10	9	90	8	(89)	1	(11)	0	9	10	11
	1998-1999	29	14	48	6	40	9	60	6	(67)	3	(33)	0	9	12	13
	1999-2000	20	14	70	6	100	0	0	0	-	0	-	0	0	0	11
	2000-2001	36	26	72	3	30	7	70	5	(71)	2	(29)	0	7	9	15
6D/RG244	1996-1997	25	18	72	7	100	0	0	0	-	0	-	0	0	0	4
	1997-1998	13	10	77	3	100	0	0	0	-	0	-	0	0	0	12
	1998-1999	15	8	53	5	71	2	29	1	(50)	1	(50)	0	2	3	12
	1999-2000	19	11	58	5	63	3	38	2	(67)	1	(33)	0	3	4	8
	2000-2001	13	10	77	2	67	1	33	1	(100)	0	(0)	0	1	1	4
6D/RG245	1994-1999	None	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	2000-2001	30	14	47	11	69	5	31	4	(80)	1	(20)	0	5	6	6
6D (EAST)	1996-1997	48	29	60	13	68	6	32	6	(100)	0	(0)	0	6	6	9
TOTAL	1997-1998	40	27	68	4	31	9	69	8	(89)	1	(11)	0	9	10	23
	1998-1999	44	22	50	11	50	11	50	7	(64)	4	(36)	0	11	15	25
	1999-2000	39	25	64	11	79	3	21	2	(67)	1	(33)	0	3	4	19
	2000-2001	79	50	63	16	55	13	45	10	(77)	3	(23)	0	13	16	25
6D/RG249	1996-1997	52	25	48	16	59	11	41	11	(100)	0	(0)	0	11	11	12
	1997-1998	66	29	44	16	43	21	57	20	(95)	1	(5)	0	21	22	25
	1998-1999	55	21	38	8	24	26	76	25	(96)	1	(4)	0	26	27	25
	1999-2000	51	18	35	9	27	24	73	20	(83)	4	(17)	0	24	28	21
	2000-2001	41	18	44	7	30	16	70	11	(73)	4	(27)	1	16	21	13

Table 2 Continued

Unit/ hunt no.	Regulatory year	Permits issued	Nr. did not hunt	Percent did not hunt	Nr. unsucc hunters	Percent unsucc hunters	Nr. succ hunters	Percent succ hunters	Males	(%)	Females	(%)	Unk.	Total harvest Unw [a]	Total harvest W [b]	Maximum allowable harvest [c]
6D/RG252	1996-1997	No	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	1997-1998	21	14	67	4	57	3	43	3	(100)	0	(0)	0	3	3	10
	1998-1999	32	23	72	4	44	5	56	4	(80)	1	(20)	0	5	6	10
	1999-2000	27	15	56	4	33	8	67	5	(63)	3	(38)	0	8	11	12
	2000-2001	55	38	69	11	65	6	35	5	(83)	1	(17)	0	6	7	12
6D/RG266	1996-1997	33	11	33	15	68	7	32	4	(57)	3	(43)	0	7	10	8
	1997-1998	52	36	69	11	69	5	31	3	(60)	2	(40)	0	5	7	16
	1998-1999	62	35	56	18	67	9	33	7	(78)	2	(22)	0	9	11	16
	1999-2000	45	27	60	13	72	5	28	3	(60)	2	(40)	0	5	7	13
	2000-2001	50	16	32	20	59	14	41	6	(43)	8	(57)	0	14	22	13
6D (WEST)	1996-1997	85	36	42	31	63	18	37	15	(83)	3	(17)	0	18	21	20
TOTAL	1997-1998	139	79	57	31	52	29	48	26	(90)	3	(10)	0	29	32	51
	1998-1999	149	79	53	30	43	40	57	36	(90)	4	(10)	0	40	44	51
	1999-2000	123	60	49	26	41	37	59	28	(76)	9	(24)	0	37	46	46
	2000-2001	146	72	49	38	51	36	49	22	(63)	13	(37)	1	36	50	38
6D TOTAL	1996-1997	133	65	49	44	65	24	35	21	(88)	3	(13)	0	24	27	29
	1997-1998	179	106	59	35	48	38	52	34	(89)	4	(11)	0	38	42	74
	1998-1999	193	101	52	41	45	51	55	43	(84)	8	(16)	0	51	59	76
	1999-2000	162	85	52	37	48	40	52	30	(63)	10	(21)	0	48	50	65
	2000-2001	225	122	54	54	52	49	48	32	(70)	16	(35)	1	47	66	63
UNIT 6	1996-1997	162	72	44	55	61	35	39	32	(91)	3	(9)	0	35	38	44
TOTAL	1997-1998	242	130	54	45	40	67	60	58	(87)	9	(13)	0	67	76	114
	1998-1999	268	129	48	64	46	75	54	62	(85)	11	(15)	2	75	88	117
	1999-2000	222	113	51	48	44	60	55	45	(69)	12	(18)	2	67	73	108
	2000-2001	311	158	51	75	49	70	46	47	(73)	19	(30)	4	68	93	110

[a] Unweighted harvest; males counted as 1, females counted as 1 and unknowns counted as 1.
[b] Weighted harvest; males counted as 1, females counted as 2 and unknowns counted as 2.

Table 3 Unit 6 mountain goat hunter residency and success, 1996–00.

		Successful					Unsuccessful					
Unit	Regulatory year	Local resident	Nonlocal resident	Nonresident	Total	(%)	Local resident	Nonlocal resident	Nonresident	Total	(%)	Total hunters
6A	1996-1997	0	0	7	7	(44)	0	2	7	9	(56)	16
	1997-1998	0	0	11	11	(61)	0	4	3	7	(39)	18
	1998-1999	1	0	7	8	(38)	8	1	4	13	(62)	21
	1999-2000	0	0	6	6	(67)	0	2	1	3	(33)	9
	2000-2001	1	2	6	9	(47)	1	5	4	10	(53)	19
6B	1996-1997	0	0	4	4	(67)	0	1	1	2	(33)	6
	1997-1998	0	1	3	4	(80)	0	1	0	1	(20)	5
	1998-1999	0	0	5	5	(71)	0	1	1	2	(29)	7
	1999-2000	0	0	6	6	(86)	0	1	0	1	(14)	7
	2000-2001	0	0	4	4	(67)	0	1	1	2	(33)	6
6C	1997-1998	13	1	0	14	(88)	2	0	0	2	(13)	16
	1998-1999	10	1	0	11	(58)	8	0	0	8	(42)	19
	1999-2000	6	1	1	8	(53)	7	0	0	7	(47)	15
	2000-2001	5	3	0	8	(47)	7	2	0	9	(53)	17
6D	1996-1997	7	14	3	24	(35)	9	27	8	44	(65)	68
	1997-1998	13	20	5	38	(52)	15	20	0	35	(48)	73
	1998-1999	8	32	9	51	(54)	10	24	7	43	(46)	94
	1999-2000	5	20	15	40	(52)	5	27	5	37	(48)	77
	2000-2001	7	24	18	49	(48)	13	35	6	54	(52)	103
Unit 6	1996-1997	7	14	14	35	(39)	9	30	16	55	(61)	90
Total	1997-1998	26	22	19	67	(60)	17	25	3	45	(40)	112
	1998-1999	19	33	21	75	(53)	26	26	12	64	(45)	141
	1999-2000	11	21	28	60	(55)	12	30	6	48	(44)	110
	2000-2001	13	29	28	70	(48)	21	43	11	75	(51)	147

Table 4 Unit 6 mountain goat harvest chronology percent by month, 1996–00.

Unit	Regulatory year	Harvest Periods						*n*
		August	September	October	November	December	January	
6A	1996-1997	29	71	0	0	0	0	7
	1997-1998	9	55	36	0	0	0	11
	1998-1999	0	63	38	0	0	0	8
	1999-2000	67	33	0	0	0	0	6
	2000-2001	33	0	44	0	11	11	9
6B	1996-1997	100	0	0	0	0	0	4
	1997-1998	50	25	25	0	0	0	4
	1998-1999	80	20	0	0	0	0	5
	1999-2000	83	17	0	0	0	0	6
	2000-2001	50	50	0	0	0	0	4
6C	1997-1998	0	0	93	7	0	0	14
	1998-1999	0	0	73	27	0	0	11
	1999-2000	0	0	75	25	0	0	8
	2000-2001	0	0	63	38	0	0	8
6D	1996-1997	54	33	13	0	0	0	24
	1997-1998	0	42	50	8	0	0	38
	1998-1999	0	35	57	2	2	4	51
	1999-2000	0	43	55	3	0	0	40
	2000-2001	0	35	51	14	0	0	49
Unit 6	1996-1997	54	37	9	0	0	0	35
Total	1997-1998	4	34	55	6	0	0	67
	1998-1999	5	32	53	5	1	3	75
	1999-2000	15	33	47	5	0	0	60
	2000-2001	7	27	49	14	1	1	70

Table 5 Unit 6 mountain goat harvest percent by transport method, 1996–00.

Subunit	Regulatory year	Airplane		Boat		3- or 4-wheeler		Snowmachine		ORV		Highway vehicle		Unknown		Total
		n	(%)	*n*	(%)	*n*	(%)	*n*	(%)	*n*	(%)	*n*	(%)	*n*	(%)	*n*
6A	1996-1997	7	(100)	0	(0)	0	(0)	0	(0)	0	(0)	0	(0)	0	(0)	7
	1997-1998	15	(88)	2	(12)	0	(0)	0	(0)	0	(0)	0	(0)	0	(0)	17
	1998-1999	13	(62)	0	(0)	2	(10)	1	(5)	4	(19)	0	(0)	1	(5)	21
	1999-2000	7	(78)	1	(11)	0	(0)	1	(11)	0	(0)	0	(0)	0	(0)	9
	2000-2001	10	(53)	3	(16)	3	(16)	0	(0)	0	(0)	3	(16)	0	(0)	19
6B	1996-1997	4	(100)	0	(0)	0	(0)	0	(0)	0	(0)	0	(0)	0	(0)	4
	1997-1998	6	(100)	0	(0)	0	(0)	0	(0)	0	(0)	0	(0)	0	(0)	6
	1998-1999	7	(100)	0	(0)	0	(0)	0	(0)	0	(0)	0	(0)	0	(0)	7
	1999-2000	7	(100)	0	(0)	0	(0)	0	(0)	0	(0)	0	(0)	0	(0)	7
	2000-2001	6	(100)	0	(0)	0	(0)	0	(0)	0	(0)	0	(0)	0	(0)	6
6C	1997-1998	1	(6)	1	(6)	2	(13)	0	(0)	0	(0)	11	(69)	1	(6)	16
	1998-1999	0	(0)	0	(0)	1	(5)	0	(0)	0	(0)	17	(89)	1	(5)	19
	1999-2000	0	(0)	3	(20)	4	(27)	0	(0)	1	(7)	7	(47)	0	(0)	15
	2000-2001	0	(0)	2	(12)	1	(6)	0	(0)	1	(6)	13	(76)	0	(0)	17

Table 5 Continued

Subunit	Regulatory year	Airplane		Boat		3- or 4-wheeler		Snowmachine		ORV		Highway vehicle		Unknown		Total
		n	(%)	*n*	(%)	*n*	(%)	*n*	(%)	*n*	(%)	*n*	(%)	*n*	(%)	*n*
6D	1996-1997	12	(50)	12	(50)	0	(0)	0	(0)	0	(0)	0	(0)	0	(0)	24
	1997-1998	22	(30)	47	(64)	0	(0)	0	(0)	1	(1)	0	(0)	3	(4)	73
	1998-1999	42	(46)	50	(54)	0	(0)	0	(0)	0	(0)	0	(0)	0	(0)	92
	1999-2000	43	(56)	33	(43)	0	(0)	0	(0)	0	(0)	0	(0)	1	(1)	77
	2000-2001	39	(38)	48	(47)	6	(6)	0	(0)	6	(6)	3	(3)	1	(1)	103
UNIT 6	1996-1997	23	(66)	12	(34)	0	(0)	0	(0)	0	(0)	0	(0)	0	(0)	35
TOTAL	1997-1998	44	(39)	50	(45)	2	(2)	0	(0)	1	(1)	11	(10)	4	(4)	112
	1998-1999	62	(45)	50	(36)	3	(2)	1	(1)	4	(3)	17	(12)	2	(1)	139
	1999-2000	57	(53)	37	(34)	4	(4)	1	(1)	1	(1)	7	(6)	1	(1)	108
	2000-2001	55	(38)	53	(37)	10	(7)	0	(0)	7	(5)	19	(13)	1	(1)	145

Alaska Department of Fish and Game
DIVISION OF WILDLIFE CONSERVATION
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MOUNTAIN GOAT MANAGEMENT REPORT

From: 1 July 1999
To: 30 June 2001

LOCATION

GAME MANAGEMENT UNIT: 7 and 15 (8397 mi^2)

GEOGRAPHIC DESCRIPTION: Kenai Peninsula

BACKGROUND

Mountain goats inhabit the entire length of the Kenai Mountains, the westernmost natural extension of the species' continental range. Goat populations are most abundant in the coastal mountains and least abundant along the drier western slopes and interior portions of the Kenai Mountains where they coexist with Dall sheep (*Ovis dalli*).

The Kenai Peninsula has been a popular mountain goat hunting area since statehood because of its proximity to Anchorage and good accessibility. By the late 1970s wildlife managers recognized that allowing long general seasons with bag limits of 2 goats and moderate to severe winters had led to local population declines. Consequently, permit hunts were implemented in 1978 to control harvest rates and to distribute hunters. Since 1982, goat harvest on the Kenai Peninsula has been managed by a combination of drawing and registration permit hunts. Holdermann (1989) provided a summary of the Kenai Peninsula mountain goat management system, which was reviewed by Del Frate and Spraker (1994).

Goats within the Kenai Fjords National Park (KFNP) were protected from hunting when the park was established in 1980. KFNP includes some private and state lands that may in the future support additional hunting opportunity. In addition to KFNP, most goat habitat on the Kenai Peninsula is within the Kenai National Wildlife Refuge, Chugach National Forest, or Kachemak Bay State Park and remains virtually unaffected by development (Del Frate and Spraker 1994).

Spruce bark beetles (*Dendroctonus rufipennis*) have infested and killed many older stands of spruce trees on the Kenai Peninsula. Markets for Alaska wood products and the need to reduce fire danger may facilitate extensive logging and could adversely affect goat populations through loss of winter habitat.

Backcountry recreation may be one of the fastest growing winter sports activities that may affect goats in the future. Technological advances in snowmachine design have made it easier for riders

to access more and steeper terrain that may be in or near adjacent mountain goat habitat. More snowmachine enthusiasts are accessing and exploring the backcountry with these bigger and better machines. Private and commercial backcountry ski tours are also on the increase. While most skiers restrict their activities to day-trips from the existing highways, alternative transportation is provided by the Alaska Railroad and by helicopter tours.

MANAGEMENT DIRECTION

MANAGEMENT OBJECTIVES

To maintain a population of 4000–4500 mountain goats with a harvest of predominantly (66% minimum) males.

METHODS

The Kenai Peninsula mountain goat range is divided into 35 count areas that correspond to hunt areas. Since the early 1970s ADF&G has routinely monitored goat populations in these areas by midsummer aerial surveys (Lentfer 1955, Nichols 1980). We fly surveys before hunting season in a Piper PA-18 Super Cub or Cessna 305 Birddog with an observer during early morning and evening hours in July, August and September. Cool temperatures, light wind and a high overcast cloud cover characterize optimum counting conditions. Flights follow drainage contours beginning at the sub alpine zone and progressing upward into the alpine zone by 150–200 m increments. We count and classify goats as kids (<4 months) or older goats and record data on standardized forms.

The size of the peninsula mountain goat population is first estimated by combining the most recent aerial count of each survey area. Assuming 70% to 90% (Nichols 1980) of goats present during aerial surveys are observed, the population was expressed as a range reflecting those sightability variations. Three goat population trend areas, each consisting of 2 or 3 contiguous count areas, were established in 3 separate geographic regions of the Kenai (Del Frate (1992). The use of these trend areas was discontinued in 1998 because we felt that a more systematic approach to surveying all hunt areas was more important than focusing our limited budget in one region.

Goat harvest on the Kenai Peninsula is managed through a system of permit hunts. Harvest quotas are set and adjusted based on the number of goats observed in each hunt area during the most recent survey. The number of drawing permits issued for each area is limited based on hunter success rates and biologist experience, attempting to meet but not exceed the quota. At the end of the drawing season, we determine if any areas have unfilled quotas and can be reopened to an unlimited registration permit hunt. The registration permits are valid for seven days. Areas are only opened to registration permit hunting if the remaining portion of the harvest quota is large enough that there is little chance of overharvest. Recently the Board of Game authorized the department to issue archery-only registration permits for areas where the quota had not been reached but the threat of overharvest was too great if opened to all weapon types. Emergency orders to close these registration hunts are issued when harvest goals are achieved.

Subsistence harvest is allowed in only two hunt areas under the State's subsistence program. We manage these hunts similar to the above general seasons. Tier II subsistence permits were

allocated to achieve the harvest goal. If the quota has not been reached then Tier I registration permits (Alaska residents only) are issued.

RESULTS AND DISCUSSION

POPULATION STATUS AND TREND

Population Size

We observed 2570 goats during the latest surveys of count areas on the Kenai Peninsula. This excluded the KFNP that contained an estimated 800–1000 goats. We estimated 3656 (90% observability) to 4671 goats (70% observability) inhabit the Kenai Peninsula. Goat populations have declined approximately 7% during this reporting period.

Population Composition

In 1999 we surveyed 6 count areas and tallied 491 goats with 17% kids (Table 1). In 2000 we counted 892 goats in 15 count areas with 15% kids. It appears that the population may continue to decline because of poor kid production.

MORTALITY

Harvest

Season and Bag Limit. The sport season has remained 10 August to 30 September by drawing permit since 1987 (Table 2). This was followed by a 15 October to 30 November registration permit hunt (Table 3). The Tier II subsistence hunt for hunt areas TG364 and TG365 was from 1 August to 30 September. The bag limit was 1 goat for all areas.

Board of Game Actions and Emergency Orders. During the March 1997 Board of Game meeting the board approved the department's plan to allow archery-only hunts during the late fall registration season. Archery hunts only take place in those areas where a harvestable surplus exists and a general all-weapon season is not practical. These hunts have become popular among hunters from across the state.

During March, 2001 the Board approved a change to both the drawing and registration season dates. The new season dates will be 10 August to 15 October and 1-30 November, respectively. This change will become effective in the fall of 2001. A separate proposal to protect nannies accompanied by kids also passed at this meeting.

Registration permit hunts are managed for the remainder of the harvestable quota not taken during the drawing or tier II seasons. When the quotas were reached, emergency orders were issued closing the respective hunt areas. In 1999, one emergency order was issued. On October 28, hunt areas RG331, RG333 and RG345 were closed (Table 5). In 2000, two emergency orders were issued. Hunt areas RG343 and RG347 were closed by emergency order October 20 2000. Hunt areas RG334 and RG365 were closed by emergency order November 1, 2000 (Table 8).

Hunter Harvest. Hunters harvested 84 goats on the Kenai Peninsula in 1999. Drawing permittees killed 69 goats (48 males, 21 females) throughout 27 hunt areas (Table 4). Permittees harvested 10 goats (5 males, 3 females and 2 of unspecified sex) from 7 hunt areas during the registration

permit hunt (Table 5). Subsistence hunters harvested 3 billy and 2 nanny goats in the 2 Tier II subsistence hunts (Table 6).

In 2000, Hunters harvested 111 goats on the Kenai Peninsula. Drawing permittees killed 82 goats (49 males, 33 females) throughout 27 hunt areas (Table 7). Permittees harvested 24 goats (13 males, 9 females and 2 of unspecified sex) from 9 hunt areas during the registration permit hunt (Table 8). Subsistence hunters harvested 5 billy goats in the Tier II hunts (Table 6).

Hunter Residency and Success. Success rates varied between hunt areas and hunt types as well as between years (Tables 9, 10 and 11). Goat distribution, weather, and hunter demographics contributed to these variations. Nonresident hunters composed less than 2% of total hunters in both 1999 and 2000 (Tables 12 & 13). However, nonresidents usually had high success rates because of guiding requirements. The overall success rate of nonresidents was 50% and 25% for 1999 and 2000, respectively. For the years 1992–2000 the average success rate for drawing permit hunters was 36.5%. For registration permit hunters the average success rate was 22.7%. The lower-than-normal success rate for registration permit hunters (9%) in 1999 was due to poor weather conditions throughout this season.

Harvest Chronology. Drawing permittees harvested a higher proportion of goats during the last part of September in 1999, and nearly equal proportions between the first and last parts of the season in 2000 (Table 14). The registration season was quota-based and hunt areas were closed as quotas were achieved. Consequently, harvest occurred shortly after registration hunting began. Many areas with easy access had high demand and closed within 5–7 days of the start of the registration period.

Transport Methods. Transportation methods varied between game management units because of accessibility. In 1999 successful hunters in Unit 7 used highway vehicles (42%), boats (24%), aircraft (24%) and 4-wheeler (7%) (Table 15). In Unit 15 successful hunters used aircraft (85%), or boats (15%), (Table 16). Other transportation methods were not reported.

In 2000 the transportation types used were similar to the previous year. Successful hunters in Unit 7 used highway vehicles (46%), boats (22%), aircraft (21%), and 4-wheelers (8%) (Table 15). In Unit 15 successful hunters used aircraft (67%) boats (30%) and horses (3%) (Table 16).

HABITAT

Spruce bark beetles have infested much of the Kenai Peninsula. The infestation affects primarily white spruce (*Picea glauca*) and Lutz spruce (*Picea* x *lutzii*) trees greater than 5” in diameter. In response, several agencies and landowners have begun salvage logging throughout the Kenai (Steve Albert ADF&G Habitat Division, pers. comm.). Several parcels of land are scheduled for logging that may include mountain goat winter habitat. ADF&G estimated that over 8500 acres of potential winter habitat were logged in 1996. More importantly, over 2500 acres have been scheduled for harvest in the 2 state subsistence hunt areas. (TG364 and TG365) in Unit 15C.

CONCLUSIONS AND RECOMMENDATIONS

We observed 2570 goats on the Kenai Peninsula, excluding KFNP. An estimated 800 to 1000 goats inhabited the KFNP. Excluding KFNP, we estimated between 2855 goats (assuming 90%

observability) and 3671 goats (assuming 70% observability) inhabited the Kenai Peninsula. At the higher observability and assuming 800 goats in KFNP, the population is slightly below objectives. At the lower observability and assuming 1000 goats in KFNP, the population is slightly above objectives. No change in management direction is recommended at this time. Reducing the harvest rate in areas with substantial declines should be sufficient to allow numbers to increase.

The system of mountain goat harvest management developed on the Kenai Peninsula may have application in other areas of the state. A comprehensive evaluation was reported at the Northern Wild Sheep and Goat Symposium in 1994 (Del Frate and Spraker 1994). We provided additional hunter opportunity with the addition of archery-only hunts in areas that would otherwise be closed during the registration season. We do not recommend any changes in goat harvest management on the Kenai Peninsula at this time.

Winter recreation continues to gain popularity on the Kenai Peninsula. The Chugach National Forest released an Environmental Assessment for commercial guided helicopter skiing (1999) and has coordinated landing permits to minimize impacts to mountain goats. Technological advancements in snowmachines have allowed backcountry users to encroach into winter goat habitat. It is unclear how these backcountry users affect goat distribution or behavior. We recommend that ADF&G coordinate with federal land managers to study the impacts of winter recreation on mountain goats.

Winter severity and access to winter habitat may limit mountain goat populations on the Kenai (Hjeljord 1973, Del Frate and Spraker 1994). Surveys following poor weather conditions (deep, persistent snow with warm periods causing the snow to crust) during 1992–93 support this hypothesis. Because hunter harvest is the primary mortality factor in prime-aged mountain goats (Smith 1986), we must be cautious to recognize declines and adjust harvest objectives to avoid larger declines.

Forestry practices on state and private land adjacent to winter mountain goat habitat could be detrimental to mountain goats. Removal of the overstory reduces the amount of thermal cover and forage availability on winter habitat. The department should delineate all winter habitat and work closely with landowners to ensure this habitat is protected.

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Table 1. Units 7 & 15 aerial mountain goat composition counts and estimated population size, 1996–2000.

Area	Regulatory year	Adults	Kids	Unk.	Kids: 100 adults	Total goats observed	Goats /hour	Estimated population size
DG331	1996–1997 [a]	--	--	--	--	--	--	--
	1997–1998 [a]	--	--	--	--	--	--	--
	1998–1999	41	8	--	20	49	--	49
	1999–2000 [a]	--	--	--	--	--	--	--
	2000–2001	35	4	--	11	39	--	39
DG332	1996–1997	17	7		41	24		24
	1997–1998 [a]	--	--	--	--	--	--	--
	1998–1999	57	16	--	28	73	--	73
	1999–2000 [a]	--	--	--	--	--	--	--
	2000–2001	50	9	--	18	59	--	59
DG333	1996–1997 [a]	--	--	--	--	--	--	--
	1997–1998	135	41	--	30	176	--	176
	1998–1999 [a]	--	--	--	--	--	--	--
	1999–2000 [a]	--	--	--	--	--	--	--
	2000–2001	78	10	--	13	88	--	88
DG334	1996–1997 [a]	--	--	--	--	--	--	--
	1997–1998	83	24	--	29	107	--	107
	1998–1999 [a]	--	--	--	--	--	--	--
	1999–2000 [a]	--	--	--	--	--	--	--
	2000–2001	84	17	--	20	101	--	101
DG335	1996–1997[a]	--	--	--	--	--	--	--
	1997–1998[b]	27	5	--	19	32	--	32
	1998–1999[a]	--	--	--	--	--	--	--
	1999–2000 [a]	--	--	--	--	--	--	--
	2000–2001	65	10	--	15	75	--	75

Table 1. Continued

Area	Regulatory year	Adults	Kids	Unk.	Kids: 100 adults	Total goats observed	Goats /hour	Estimated population size
DG336	1996–1997	132	46	--	35	178	--	178
	1997–1998 [a]	--	--	--	--	--	--	--
	1998–1999 [a]	--	--	--	--	--	--	--
	1999–2000	109	26	--	24	135	--	135--
	2000–2001 [a]	--	--	--	--	--	--	--
DG337	1996–1997	16	3	--	19	19	--	19
	1997–1998 [a]	--	--	--	--	--	--	--
	1998–1999 [a]	--	--	--	--	--	--	--
	1999–2000 [a]	--	--	--	--	--	--	--
	2000–2001	13	2	--	15	15	--	15
DG338	1996–1997	7	1	--	14	8	--	8
	1997–1998 [a]	--	--	--	--	--	--	--
	1998–1999 [a]	--	--	--	--	--	--	--
	1999–2000 [c]	21	8	--	38	29	--	29
	2000–2001 [a]	--	--	--	--	--	--	--
DG339	1996–1997 [a]	--	--	--	--	--	--	--
	1997–1998 [a]	--	--	--	--	--	--	--
	1998–1999 [a]	--	--	--	--	--	--	--
	1999–2000	154	20	--	13	174	--	174
	2000–2001 [a]	--	--	--	--	--	--	--
DG340	1996–1997	64	21	--	33	85	--	85
	1997–1998 [a]	--	--	--	--	--	--	--
	1998–1999 [a]	--	--	--	--	--	--	--
	1999–2000	31	6	--	19	37	--	37
	2000–2001	38	7	--	18	45	--	45

Table 1 Continued

Area	Regulatory year	Adults	Kids	Unk.	Kids: 100 adults	Total goats observed	Goats /hour	Estimated population size
DG341	1996–1997	36	17	--	47	53	--	53
	1997–1998 [a]	--	--	--	--	--	--	--
	1998–1999 [a]	--	--	--	--	--	--	--
	1999–2000 [a]	--	--	--	--	--	--	--
	2000–2001 [a]	--	--	--	--	--	--	--
DG342	1996–1997 [a]	--	--	--	--	--	--	--
	1997–1998 [b]	57	20	--	35	77	--	77
	1998–1999 [a]	--	--	--	--	--	--	--
	1999–2000 [a]	--	--	--	--	--	--	--
	2000–2001	84	15	--	18	99	--	99
DG343	1996–1997 [a]	--	--	--	--	--	--	--
	1997–1998 [a]	--	--	--	--	--	--	--
	1998–1999 [a]	--	--	--	--	--	--	--
	1999–2000 [a]	--	--	--	--	--	--	--
	2000–2001	86	18	--	21	104	--	104
DG344	1996–1997 [a]	--	--	--	--	--	--	--
	1997–1998 [a]	--	--	--	--	--	--	--
	1998–1999 [a]	--	--	--	--	--	--	--
	1999–2000 [a]	--	--	--	--	--	--	--
	2000–2001 [a]	--	--	--	--	--	--	--
DG345	1996–1997 [a]	--	--	--	--	--	--	--
	1997–1998 [a]	--	--	--	--	--	--	--
	1998–1999 [a]	--	--	--	--	--	--	--
	1999–2000 [a]	--	--	--	--	--	--	--
	2000–2001	85	23	--	27	108	--	108

Table 1. Continued

Area	Regulatory year	Adults	Kids	Unk.	Kids: 100 adults	Total goats observed	Goats /hour	Estimated population size
DG346	1996–1997	166	52	--	31	218	--	218
	1997–1998 [a]	--	--	--	--	--	--	--
	1998–1999 [a]	--	--	--	--	--	--	--
	1999–2000 [a]	--	--	--	--	--	--	--
	2000–2001 [a]	--	--	--	--	--	--	--
DG347	1996–1997 [a]	--	--	--	--	--	--	--
	1997–1998 [a]	--	--	--	--	--	--	--
	1998–1999 [a]	--	--	--	--	--	--	--
	1999–2000	68	23	34	--	91	--	91
	2000–2001	--	--	--	--	--	--	--
DG348	1996–1997 [a]	--	--	--	--	--	--	--
	1997–1998 [a]	--	--	--	--	--	--	--
	1998–1999 [a]	--	--	--	--	--	--	--
	1999–2000 [a]	--	--	--	--	--	--	--
	2000–2001 [a]	--	--	--	--	--	--	--
DG349	1996–1997 [a]	--	--	--	--	--	--	--
	1997–1998 [a]	--	--	--	--	--	--	--
	1998–1999 [a]	--	--	--	--	--	--	--
	1999–2000 [a]	--	--	--	--	--	--	--
	2000–2001 [a]	--	--	--	--	--	--	--
DG350	1996–1997 [a]	--	--	--	--	--	--	--
	1997–1998 [a]	--	--	--	--	--	--	--
	1998–1999 [a]	--	--	--	--	--	--	--
	1999–2000 [a]	--	--	--	--	--	--	--
	2000–2001 [a]	--	--	--	--	--	--	--

Table 1. Continued

Area	Regulatory year	Adults	Kids	Unk.	Kids: 100 adults	Total goats observed	Goats /hour	Estimated population size
DG351	1996–1997[a]	--	--	--	--	--	--	--
	1997–1998[c]	17	10	--	59	27	--	27
	1998–1999[a]	--	--	--	--	--	--	--
	1999–2000[a]	--	--	--	--	--	--	--
	2000–2001[a]	--	--	--	--	--	--	--
DG352	1996–1997[a]	--	--	--	--	--	--	--
	1997–1998[a]	--	--	--	--	--	--	--
	1998–1999	137	32	--	23	169	--	169
	1999–2000[a]	--	--	--	--	--	--	--
	2000–2001[a]	--	--	--	--	--	--	--
DG353	1996–1997	0	0	--	--	0	--	0
	1997–1998[a]	--	--	--	--	--	--	--
	1998–1999[a]	--	--	--	--	--	--	--
	1999–2000[a]	--	--	--	--	--	--	--
	2000–2001	0	0	--	0	0	--	0
DG354	1996–1997	35	8	--	23	43	--	43
	1997–1998[a]	--	--	--	--	--	--	--
	1998–1999[a]	--	--	--	--	--	--	--
	1999–2000[a]	--	--	--	--	--	--	--
	2000–2001[a]	--	--	--	--	--	--	--
DG355	1996–1997[a]	--	--	--	--	--	--	--
	1997–1998	21	6	--	29	27	--	27
	1998–1999[a]	--	--	--	--	--	--	--
	1999–2000[a]	--	--	--	--	--	--	--
	2000–2001[a]	--	--	--	--	--	--	--

Table 1. Continued

Area	Regulatory year	Adults	Kids	Unk.	Kids: 100 adults	Total goats observed	Goats /hour	Estimated population size
DG356	1996–1997 [a]	--	--	--	--	--	--	--
	1997–1998	35	17	--	49	52	--	52
	1998–1999	27	9	--	33	36	--	36
	1999–2000 [a]	--	--	--	--	--	--	--
	2000–2001 [a]	--	--	--	--	--	--	--
DG357	1996–1997 [a]	--	--	--	--	--	--	--
	1997–1998	37	11	--	30	48	--	48
	1998–1999 [a]	--	--	--	--	--	--	--
	1999–2000 [a]	--	--	--	--	--	--	--
	2000–2001 [a]	--	--	--	--	--	--	--
DG358	1996–1997	40	16	--	40	56	--	56
	1997–1998 [a]	--	--	--	--	--	--	--
	1998–1999 [a]	--	--	--	--	--	--	--
	1999–2000	--	--	--	--	--	--	--
	2000–2001	30	6	--	20	36	--	36
DG359	1996–1997 [a]	--	--	--	--	--	--	--
	1997–1998 [a]	--	--	--	--	--	--	--
	1998–1999	39	7	--	18	46	--	46
	1999–2000 [a]	--	--	--	--	--	--	--
	2000–2001 [a]	--	--	--	--	--	--	--
DG360	1996–1997[c]	35	14	--	40	49	--	49
	1997–1998 [a]	--	--	--	--	--	--	--
	1998–1999	96	26	--	27	122	--	122
	1999–2000 [a]	--	--	--	--	--	--	--
	2000–2001 [a]	--	--	--	--	--	--	--

Table 1. Continued

Area	Regulatory year	Adults	Kids	Unk.	Kids: 100 adults	Total goats observed	Goats /hour	Estimated population size
DG361	1996–1997 [a]	--	--	--	--	--	--	--
	1997–1998	48	13	--	27	61	--	61
	1998–1999 [a]	--	--	--	--	--	--	--
	1999–2000 [a]	--	--	--	--	--	--	--
	2000–2001	66	13	--	20	79	--	79
DG362	1996–1997 [a]	--	--	--	--	--	--	--
	1997–1998 [a]	--	--	--	--	--	--	--
	1998–1999	88	20	--	23	108	--	108
	1999–2000 [a]	--	--	--	--	--	--	--
	2000–2001 [a]	--	--	--	--	--	--	--
DG363	1996–1997 [a]	--	--	--	--	--	--	--
	1997–1998	150	51	--	34	201	--	201
	1998–1999 [a]	--	--	--	--	--	--	--
	1999–2000 [a]	--	--	--	--	--	--	--
	2000–2001 [a]	--	--	--	--	--	--	--
DG364	1996–1997 [a]	--	--	--	--	--	--	--
	1997–1998	45	7	--	16	52	--	52
	1998–1999 [a]	--	--	--	--	--	--	--
	1999–2000 [a]	--	--	--	--	--	--	--
	2000–2001	41	3	--	7	44	--	44
DG365	1996–1997 [a]	--	--	--	--	--	--	--
	1997–1998 [a]	--	--	--	--	--	--	--
	1998–1999	93	26	--	28	119	--	119
	1999–2000 [a]	--	--	--	--	--	--	--
	2000–2001 [a]	--	--	--	--	--	--	--

[a]No survey.
[b]Poor count.
[c]Partial count.

Table 2. Summary of mountain goat drawing permit season harvest for the Kenai Peninsula, 1984–2000.

Year	Season Dates	Permits Issued	Hunters	Percent Success	Harvest			Total
					M	F	U	
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
1991	10 Aug.–30 Sept.	320	172	36	44	17	1	62
1992	10 Aug.–30 Sept.	347	180	43	54	23	1	78
1993	10 Aug.–30 Sept.	420	215	47	58	42		100
1994	10 Aug.–30 Sept.	395	216	31	44	24		68
1995	10 Aug.–30 Sept.	381	192	39	46	27	1	74
1996	10 Aug.–30 Sept.	444	252	36	58	32		90
1997	10 Aug.–30 Sept.	385	208	38	56	22	1	79
1998	10 Aug.–30 Sept.	444	236	31	51	22		73
1999	10 Aug.–30 Sept.	437	229	30	48	21		69
2000	10 Aug.–30 Sept.	429	233	35	49	33		82
Total					755	368	7	113

Table 3. Summary of mountain goat registration permit season harvest for the Kenai Peninsula, 1984–2000.

Year	Season Dates	Permits Issued	Hunters	Percent Success	Harvest			Total
					M	F	U	
1984	15 Oct.–30 Nov.	289	189	37	43	26	1	70
1985	1 Oct.– 31 Oct.	578	326	38	64	57	3	124
1986	6 Sept.–31 Oct.	349	180	44	52	27	1	80
1987	15 Oct.–30 Nov.	327	155	25	26	13		39
1988	15 Oct.–30 Nov.	301	180	39	46	24	1	71
1989	15 Oct.–30 Nov.	Unk.	127	25	18	13	1	32
1990	15 Oct.–30 Nov.	255	125	29	23	12	3	38[a]
1991	15 Oct.–30 Nov.	416	212	28	42	17		59
1992	15 Oct.–30 Nov.	433	263	29	52	22	1	75
1993	15 Oct.–30 Nov.	481	281	25	45	25		70
1994	15 Oct.–30 Nov.	438	245	22	41	11	1	53
1995	15 Oct.–30 Nov.	427	231	28	39	24	1	64
1996	15 Oct.–30 Nov.	353	139	29	24	16	1	41
1997	15 Oct.–30 Nov.	321	192	24	30	16	0	46
1998	15 Oct.–30 Nov.	433	244	15	23	12	1	36
1999	15 Oct.–30 Nov.	277	116	9	5	3	2	10
2000	15 Oct.–30 Nov.	342	160	15	13	9	2	24
Total					586	327	19	932

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

Table 4. Kenai Peninsula mountain goat drawing permit hunt summary, 1999[a].

Hunt area	Permits issued	Number of hunters	Percent success	Harvest			
				Male	Female	Unknown	Total
DG331	3	3	0	0	0		0
DG332	4	3	33	0	1		1
DG333	25	15	20	3	0		3
DG334	8	6	67	3	1		4
DG335	3	3	33	0	1		1
DG336[b]	30	15	0	0	0		0
DG339	18	12	58	4	3		7
DG340	30	4	0	0	0		0
DG341	5	4	50	2	0		2
DG342	14	10	30	0	3		3
DG343	8	8	25	2	0		2
DG344	10	5	20	1	0		1
DG345[b]	40	19	16	2	1		3
DG346	40	22	41	5	4		9
DG347	20	12	42	5	0		5
DG351	4	4	25	1	0		1
DG352	25	14	50	6	1		7
DG354	8	3	0	0	0		0
DG355	4	2	50	1	0		1
DG356[b]	6	3	33	0	1		1
DG357	10	5	20	1	0		1
DG358	10	9	0	0	0		0
DG359	10	6	17	1	0		1
DG360[b]	30	14	21	1	2		3
DG361[b]	20	8	38	3	0		3
DG362[b]	22	12	17	1	1		2
DG363	30	8	100	6	2		8
Totals	437	229	30	48	21	0	69

[a]Season Dates: 10 August–30 September.
[b]One permit report was not returned.

Table 5. Kenai Peninsula mountain goat registration permit hunt summary, 1999[a].

Hunt area	Permits issued	Number of hunters	Percent success	Harvest			
				Male	Female	Unknown	Total
RG331[bc]	13	5	20	0	1		1
RG333[b]	162	77	6%	3	0	2	5
RG336	55	21	5%	0	1		1
RG340	4	2	0%	0	0		0
RG344[c]	5	2	0%	0	0		0
RG345[b]	30	8	38%	2	1		3
RG357[c]	8	1	0%	0	0		0
Totals	277	116	9%	5	3	2	10

[a]Season Dates: 15 October–30 November.
[b]Hunt areas RG331, RG333 and RG345 closed by emergency order October 28, 1999.
[c]Hunt areas RG331, RG344 and RG357 were Archery Only hunts.

Table 6. Kenai Peninsula subsistence harvest, 1986–2000.

Year	Season Dates	Permits Issued	Hunters	Percent Success	Harvest			
					M	F	U	Total
1986	6 Sep–31 Oct	15	6	50	1	2		3
1987	10 Aug–31 Oct	7	5	40	1	1		2
1988	10 Aug–31 Oct	7	3	0	0	0		0
1989[a]	1 Aug–31 Oct				0	0	3	3
1990[b]	28 Sep–18 Dec				1	4		5
1991[c]	1 Aug–30 Sep	94	42	31	13	0		13
1992[c]	1 Aug–30 Sep	94	53	45	19	5		24
1993	1 Aug–30 Sep	50	27	22	5	1		6
1994	1 Aug–30 Sep	105	66	41	21	6		27
1995	1 Aug– 30 Sep	50	23	30	4	3		7
1996	1 Aug–30 Sep	46	21	29	6	0		6
1997	1 Aug–30 Sep	46	31	29	6	3		9
1998	1 Aug–30 Sep	46	20	20	3	1		4
1999	1 Aug–30 Sep	46	21	24	3	2		5
2000	1 Aug–30 Sep	46	20	25	5	0		5
Total					88	28	3	123

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

Table 7. Kenai Peninsula mountain goat drawing permit hunt summary, 2000[a].

Hunt area	Permits issued	Number of hunters	Percent success	Harvest			
				Male	Female	Unknown	Total
DG331	3	2	0%	0	0		0
DG332	4	4	50	1	1		2
DG333	25	14	21%	2	1		3
DG334	10	9	33%	2	1		3
DG335	3	1	100%	1	0		1
DG336	30	11	0%	0	0		0
DG339	25	20	50%	5	5		10
DG340	20	5	20%	0	1		1
DG341	6	3	100%	2	1		3
DG342	12	10	50%	4	1		5
DG343	8	7	14%	1	0		1
DG344	12	8	38%	2	1		3
DG345	40	19	21%	2	2		4
DG346	30	18	39%	6	1		7
DG347	20	9	33%	3	0		3
DG351	5	1	0%	0	0		0
DG352	25	13	62%	4	4		8
DG354	8	3	0%	0	0		0
DG355	4	2	50%	0	1		1
DG356	5	2	50%	0	1		1
DG357	10	5	40%	2	0		2
DG358	12	4	50%	1	1		2
DG359	10	2	50%	1	0		1
DG360	30	17	35%	2	4		6
DG361	20	11	36%	1	3		4
DG362	22	17	41%	5	2		7
DG363	30	16	25%	2	2		4
Totals	429	233	35%	49	33	0	82

[a]Season Dates: 10 August–30 September.

Table 8. Kenai Peninsula mountain goat registration permit hunt summary, 2000[a].

Hunt area	Permits issued	Number of hunters	Percent success	Harvest			
				Male	Female	Unknown	Total
RG331[d]	19	7	29	1	0		1
RG334[c d]	48	24	8	2	0		2
RG335	54	26	4	1	0		1
RG336	65	26	0	0	0		0
RG343[b]	79	40	25	3	6	1	10
RG347[b]	33	18	39	5	2		7
RG354	18	8	0	0	0		0
RG363	15	1	0	0	0		0
RG365[c e]	11	10	20	1	1		2
Totals	342	160	15	13	9	2	24

[a] Season Dates: 15 October–30 November.
[b]Hunt areas RG343 and RG347 closed by emergency order October 20 2000.
[c]Hunt areas RG334 and RG365 closed by emergency order November 1, 2000.
[d] Hunt areas 331 and RG334 were Archery Only Hunts
[e]imited to residents of Alaska. Only a portion of the hunt area was opened.

Table 9. Units 7 & 15 mountain goat harvest data by drawing permit hunt, 1996–2000.

Hunt Area	Regulatory year	Permits issued	Percent did not hunt	Percent unsuccessful hunters	Percent successful hunters	Males	Females	Unk.	Illegal	Total harvest
DG331	1996–1997	3	0	50	50	2	0	--	--	2
	1997–1998	3	0	33	67	1	1	--	--	2
	1998–1999	3	0	0	100	2	1	--	--	3
	1999–2000	3	0	100	0	0	0	--	--	0
	2000–2001	3	33	100	0	0	0	--	--	0
DG332	1996–1997	0	--	--	--	--	--	--	--	--
1997–1998	0	--	--	--	--	--	--	--	--	
1998–1999	0	--	--	--	--	--	--	--	--	
	1999–2000	4	0	75	25	0	1	--	--	1
	2000–2001	4	0	50	50	1	1	--	--	2
DG333	1996–1997	15	33	90	10	0	1	--	--	1
1997–1998	20	45	91	9	1	0	--	--	1	
1998–1999	25	24	68	32	4	2	--	--	6	
	1999–2000	25	40	80	20	3	0	--	--	3
	2000–2001	25	44	79	21	2	1	--	--	3
DG334	1996–1997	8	13	29	71	4	1	--	--	5
1997–1998	8	25	0	100	4	2	--	--	6	
1998–1999	6	33	75	25	1	0	--	--	1	
	1999–2000	8	25	33	67	3	1	--	--	4
	2000–2001	10	10	67	33	2	1	--	--	3
DG335	1996–1997	8	38	80	20	0	1	--	--	1
1997–1998	10	20	50	50	2	2	--	--	4	
1998–1999	10	30	71	29	1	1	--	--	2	
	1999–2000	3	0	67	33	0	1	--	--	1
	2000–2001	3	67	0	100	1	0	--	--	1

Table 9. Continued

Hunt Area	Regulatory year	Permits issued	Percent did not hunt	Percent unsuccessful hunters	Percent successful hunters	Males	Females	Unk.	Illegal	Total harvest
DG336	1996–1997	25	36	80	20	1	2	--	--	3
1997–1998	25	36	81	19	2	1	--	--	3	
1998–1999	30	47	69	31	4	1	--	--	5	
	1999–2000	30	48	100	0	0	0	--	--	0
	2000–2001	30	62	100	0	0	0	--	--	0
DG337	1996–1997	--	--	--	--	--	--	--	--	--
1997–1998	--	--	--	--	--	--	--	--	--	
1998–1999	--	--	--	--	--	--	--	--	--	
	1999–2000	--	--	--	--	--	--	--	--	--
	2000–2001	--	--	--	--	--	--	--	--	--
DG338	1996–1997	--	--	--	--	--	--	--	--	--
1997–1998	--	--	--	--	--	--	--	--	--	
1998–1999	--	--	--	--	--	--	--	--	--	
	1999–2000	--	--	--	--	--	--	--	--	--
	2000–2001	--	--	--	--	--	--	--	--	--
DG339	1996–1997	18	22	50	50	4	3	--	--	7
1997–1998	15	0	67	33	4	1	--	--	5	
1998–1999	15	13	85	15	2	0	--	--	2	
	1999–2000	18	33	42	58	4	3	--	--	7
	2000–2001	25	20	50	50	5	5	--	--	10
DG340	1996–1997	25	52	100	0	0	0	--	--	0
1997–1998	25	56	91	9	1	0	--	--	1	
1998–1999	30	57	85	15	1	1	--	--	2	
	1999–2000	30	87	100	0	0	0	--	--	0
	2000–2001	20	74	80	20	0	1	--	--	1

Table 9. Continued

Hunt Area	Regulatory year	Permits issued	Percent did not hunt	Percent unsuccessful hunters	Percent successful hunters	Males	Females	Unk.	Illegal	Total harvest
DG341	1996–1997	6	0	33	66	1	1	--	--	2
1997–1998	6	0	17	83	1	4	--	--	5	
1998–1999	4	50	50	50	0	1	--	--	1	
	1999–2000	5	20	50	50	2	0	--	--	2
	2000–2001	6	50	0	100	2	1	--	--	3
DG342	1996–1997	14	21	73	27	3	0	--	--	3
1997–1998	14	21	64	36	2	2	--	--	4	
1998–1999	12	25	89	11	0	1	--	--	1	
	1999–2000	14	29	70	30	0	3	--	--	3
	2000–2001	12	17	50	50	4	1	--	--	5
DG343	1996–1997	8	13	71	29	1	1	--	--	2
1997–1998	8	12	29	71	4	1	--	--	5	
1998–1999	6	17	60	40	2	0	--	--	2	
	1999–2000	8	0	75	25	2	0	--	--	2
	2000–2001	8	13	86	14	1	0	--	--	1
DG344	1996–1997	16	56	57	43	2	1	--	--	3
1997–1998	16	56	71	29	2	0	--	--	2	
1998–1999	16	19	62	38	3	2	--	--	5	
	1999–2000	10	50	80	20	1	0	--	--	1
	2000–2001	12	33	63	37	2	1	--	--	3
DG345	1996–1997	35	51	71	29	4	1	--	--	5
1997–1998	42	52	75	25	4	1	--	--	5	
1998–1999	40	70	67	33	3	1	--	--	4	
	1999–2000	40	51	84	16	2	1	--	--	3
	2000–2001	40	53	79	21	2	2	--	--	2

Table 9. Continued

Hunt Area	Regulatory year	Permits issued	Percent did not hunt	Percent unsuccessful hunters	Percent successful hunters	Males	Females	Unk.	Illegal	Total harvest
DG346	1996–1997	35	57	79	21	2	1	--	--	3
1997–1998	42	48	73	27	6	0	--	--	6	
1998–1999	40	58	76	24	3	1	--	--	4	
	1999–2000	40	45	59	41	5	4	--	--	9
	2000–2001	30	38	61	39	6	1	--	--	7
DG347	1996–1997	20	30	54	46	2	4	--	--	6
1997–1998	20	40	42	58	3	4	--	--	7	
1998–1999	20	25	67	33	5	0	--	--	5	
	1999–2000	20	40	58	42	5	0	--	--	5
	2000–2001	20	55	67	33	3	0	--	--	3
DG351	1996–1997	--	--	--	--	--	--	--	--	--
1997–1998	8	100	0	0	0	0	--	--	0	
1998–1999	4	25	67	33	1	0	--	--	1	
	1999–2000	4	0	75	25	1	0	--	--	1
	2000–2001	5	80	100	0	0	0	--	--	0
DG352	1996–1997	25	40	60	40	5	1	--	--	6
1997–1998	25	56	64	36	1	3	--	--	4	
1998–1999	25	48	46	54	2	5	--	--	7	
	1999–2000	25	44	50	50	6	1	--	--	7
	2000–2001	25	48	39	61	4	4	--	--	8
DG354	1996–1997	20	50	78	22	2	0	--	--	2
1997–1998	10	60	50	50	2	0	--	--	2	
1998–1999	10	70	100	0	0	0	--	--	0	
	1999–2000	8	63	100	0	0	0	--	--	0
	2000–2001	8	63	100	0	0	0	--	--	0

Table 9. Continued

Hunt Area	Regulatory year	Permits issued	Percent did not hunt	Percent unsuccessful hunters	Percent successful hunters	Males	Females	Unk.	Illegal	Total harvest
DG355	1996–1997	4	75	0	100	1	0	--	--	1
1997–1998	4	75	100	0	0	0	--	--	0	
1998–1999	4	0	75	25	0	1	--	--	1	
	1999–2000	4	50	50	50	1	0	--	--	1
	2000–2001	4	50	50	50	0	1	--	--	1
DG356	1994–95	8	25	67	33	0	2	--	--	2
1997–1998	5	80	0	100	1	0	--	--	1	
1998–1999	6	17	100	0	0	0	--	--	0	
	1999–2000	6	40	67	33	0	1	--	--	1
	2000–2001	5	60	50	50	0	1	--	--	1
DG357	1996–1997	10	50	50	50	2	0	--	--	2
1997–1998	10	50	100	0	0	0	--	--	0	
1998–1999	10	40	67	33	2	0	--	--	2	
	1999–2000	10	50	80	20	1	0	--	--	1
	2000–2001	10	50	60	40	2	0	--	--	2
DG358	1996–1997	25	52	45	55	2	4	--	--	6
1997–1998	12	58	0	100	4	1	--	--	5	
1998–1999	10	80	50	50	1	0	--	--	1	
	1999–2000	10	10	100	0	0	0	--	--	0
	2000–2001	12	67	50	50	1	1	--	--	2
DG359	1996–1997	20	30	64	36	4	1	--	--	5
1997–1998	20	55	33	67	4	2	--	--	6	
1998–1999	16	44	100	0	0	0	--	--	0	
	1999–2000	10	40	83	17	1	0	--	--	1
	2000–2001	10	80	50	50	1	0	--	--	1

Table 9. Continued

Hunt Area	Regulatory year	Permits issued	Percent did not hunt	Percent unsuccessful hunters	Percent successful hunters	Males	Females	Unk.	Illegal	Total harvest
DG360	1996–1997	30	43	59	41	4	3	--	--	7
1997–1998	30	63	73	27	3	0	--	--	3	
1998–1999	30	60	67	33	2	2	--	--	4	
	1999–2000	31	53	79	21	1	2	--	--	3
	2000–2001	30	43	65	35	2	4	--	--	6
DG361	1996–1997	20	45	60	40	2	2	--	--	4
1997–1998	20	65	86	14	1	0	--	--	1	
1998–1999	20	70	83	17	1	0	--	--	1	
	1999–2000	20	63	57	43	3	0	--	--	3
	2000–2001	20	42	64	36	1	3	--	--	4
DG362	1996–1997	18	72	100	0	0	0	--	--	0
1997–1998	20	50	60	40	4	0	--	--	4	
1998–1999	22	50	66	44	4	0	--	--	4	
	1999–2000	22	43	83	17	1	1	--	--	2
	2000–2001	22	23	59	41	5	2	--	--	7
DG363	1996–1997	30	57	15	85	9	2	--	--	11
1997–1998	30	63	55	45	2	2	1	--	5	
1998–1999	30	47	44	56	7	2	--	--	9	
	1999–2000	30	73	0	100	6	2	--	--	8
	2000–2001	30	47	75	25	2	2	--	--	4

[a] Subsistence season.

Table 10. Units 7 & 15 mountain goat harvest data by registration permit hunt, 1996–2000.

Hunt Area	Regulatory year	Permits issued	Percent Did not hunt	Percent Unsuccessful hunters	Percent Successful hunters	Males	Females	Unk.	Illegal	Total harvest
RG331	1996–1997 [a]	0	--	--	--	--	--	--	--	0
1997–1998 [a]	0	--	--	--	--	--	--	--	0	
1998–1999 [a]	0	--	--	--	--	--	--	--	0	
	1999–2000 [c]	13	62	80	20	0	1	--	--	1
	2000–2001 [c]	19	63	71	29	1	0	--	--	1
RG333	1996–1997	58	76	86	14	2	0	--	--	2
1997–1998	67	28	87	13	4	2	--	--	6	
1998–1999	81	37	94	6	3	0	--	--	3	
	1999–2000	162	52	94	6	3	0	--	--	3
	2000–2001 [a]	0	--	--	--	--	--	--	--	0
RG334	1996–1997 [a]	0	--	--	--	--	--	--	--	0
1997–1998 [a]	0	--	--	--	--	--	--	--	0	
1998–1999 [b]	80	33	91	9	3	2	--	--	5	
	1999–2000 [a]	0	--	--	--	--	--	--	--	0
	2000–2001 [c]	48	50	92	8	2	0	--	--	2
RG335	1996–1997	52	62	90	10	1	1	--	--	2
1997–1998 [a]	0	--	--	--	--	--	--	--	0	
1998–1999 [a]	0	--	--	--	--	--	--	--	0	
	1999–2000 [a]	0	--	--	--	--	--	--	--	0
	2000–2001	54	52	96	4	1	0	--	--	1
RG336	1996–1997	37	70	100	0	0	0	--	--	0
1997–1998	40	65	93	7	1	0	--	--	1	
1998–1999	79	56	94	6	2	0	--	--	2	
	1999–2000	55	62	95	5	0	1	--	--	1
	2000–2001	65	60	100	0	0	0	--	--	0

Table 10. Continued

Hunt Area	Regulatory year	Permits issued	Percent Did not hunt	Percent Unsuccessful hunters	Percent Successful hunters	Males	Females	Unk.	Illegal	Total harvest
RG339	1996–1997[a]	0	--	--	--	--	--	--	--	0
1997–1998[b]	23	39	86	14	0	2	--	--	2	
1998–1999[b]	30	40	100	0	0	0	--	--	0	
	1999–2000[a]	0	--	--	--	--	--	--	--	0
	2000–2001[a]	0	--	--	--	--	--	--	--	0
RG340	1996–1997	8	88	100	0	0	0	--	--	0
1997–1998	11	55	40	60	3	0	--	--	3	
1998–1999	3	33	0	100	2	0	--	--	2	
	1999–2000	4	50	100	0	0	0	--	--	0
	2000–2001[a]	0	--	--	--	--	--	--	--	0
RG343	1996–1997[a]	0	--	--	--	--	--	--	--	0
1997–1998[a]	0	--	--	--	--	--	--	0		
1998–1999[a]	0	--	--	--	--	--	--	0		
	1999–2000[a]	0	--	--	--	--	--	--	--	0
	2000–2001	79	50	75	25	3	6	--	--	9
RG344	1996–1997[a]	0	--	--	--	--	--	--	--	0
1997–1998[d]	1	0	0	100	0	1	--	--	1	
1998–1999[a]	0	--	--	--	--	--	--	--	0	
	1999–2000[c]	5	60	100	0	0	0	--	--	0
	2000–2001[a]	0	--	--	--	--	--	--	--	0
RG345	1996–1997	19	53	56	44	2	1	1	--	4
1997–1998	7	14	33	67	3	1	--	--	4	
1998–1999	25	72	71	29	1	1	--	--	2	
	1999–2000	30	73	62	38	2	1	--	--	3
	2000–2001[a]	0	--	--	--	--	--	--	--	0

Table 10. Continued

Hunt Area	Regulatory year	Permits issued	Percent Did not hunt	Percent Unsuccessful hunters	Percent Successful hunters	Males	Females	Unk.	Illegal	Total harvest
RG346	1996–1997	88	60	66	34	8	4	--	--	12
1997–1998	58	40	69	31	8	3	--	--	11	
1998–1999	89	39	76	24	7	5	1	--	13	
	1999–2000 [a]	0	--	--	--	--	--	--	--	0
	2000–2001 [a]	0	--	--	--	--	--	--	--	0
RG347	1996–1997 [a]	0	--	--	--	--	--	--	--	0
1997–1998 [a]	0	--	--	--	--	--	--	--	0	
1998–1999 [a]	0	--	--	--	--	--	--	--	0	
	1999–2000 [a]	0	--	--	--	--	--	--	--	0
	2000–2001	33	45	71	39	5	2	--	--	7
RG352	1996–1997	7	57	66	33	1	0	--	--	1
1997–1998	8	38	40	60	1	2	--	--	3	
1998–1999 [a]	0	--	--	--	--	--	--	--	0	
	1999–2000 [a]	0	--	--	--	--	--	--	--	0
	2000–2001 [a]	0	--	--	--	--	--	--	--	0
RG354	1996–1997 [a]	--	--	--	--	--	--	--	--	--
1997–1998 [a]	0	--	--	--	--	--	--	--	0	
1998–1999	6	50	67	33	1	0	--	--	1	
	1999–2000 [a]	0	--	--	--	--	--	--	--	0
	2000–2001	18	56	100	0	0	0	--	--	0
RG355	1996–1997 [a]	0	--	--	--	--	--	--	--	0
1997–1998 [c]	2	0	100	0	0	0	--	--	0	
1998–1999 [a]	0	--	--	--	--	--	--	--	0	
	1999–2000 [a]	0	--	--	--	--	--	--	--	0
	2000–2001 [a]	0	--	--	--	--	--	--	--	0

Table 10. Continued

Hunt Area	Regulatory year	Permits issued	Percent Did not hunt	Percent Unsuccessful hunters	Percent Successful hunters	Males	Females	Unk.	Illegal	Total harvest
RG356	1996–1997[a]	0	--	--	--	--	--	--	--	0
1997–1998[c]	1	0	100	0	0	0	--	--	0	
1998–1999[a]	0	--	--	--	--	--	--	--	0	
	1999–2000[a]	0	--	--	--	--	--	--	--	0
	2000–2001[a]	0	--	--	--	--	--	--	--	0
RG357	1996–1997[a]	0	--	--	--	--	--	--	--	0
1997–1998[c]	1	100	0	0	0	0	--	--	0	
1998–1999[a]	0	--	--	--	--	--	--	--	0	
	1999–2000[c]	8	88	100	0	0	0	--	--	0
	2000–2001[a]	0	--	--	--	--	--	--	--	0
RG360	1996–1997[a]	--	--	--	--	--	--	--	--	--
1997–1998	22	55	90	10	1	0	--	--	1	
1998–1999[a]	0	--	--	--	--	--	--	--	0	
	1999–2000[a]	0	--	--	--	--	--	--	--	0
	2000–2001[a]	0	--	--	--	--	--	--	--	0
RG361	1996–1997	13	46	71	29	2	0	--	--	2
1997–1998	7	43	50	50	1	1	--	--	2	
1998–1999	22	50	91	9	1	0	--	--	1	
	1999–2000[a]	0	--	--	--	--	--	--	--	0
	2000–2001[a]	0	--	--	--	--	--	--	--	0
RG362	1996–1997	25	52	50	50	2	4	--	--	6
1997–1998	35	43	95	5	0	1	--	--	1	
1998–1999[a]	0	--	--	--	--	--	--	--	0	
	1999–2000[a]	0	--	--	--	--	--	--	--	0
	2000–2001[a]	0	--	--	--	--	--	--	--	0

Table 10. Continued

Hunt Area	Regulatory year	Permits issued	Percent Did not hunt	Percent Unsuccessful hunters	Percent Successful hunters	Males	Females	Unk.	Illegal	Total harvest
RG363	1996–1997	30	47	69	31	2	3	--	--	5
1997–1998	24	33	81	19	3	0	--	--	3	
1998–1999 [a]	0	--	--	--	--	--	--	--	0	
	1999–2000 [a]	0	--	--	--	--	--	--	--	0
	2000–2001	15	93	100	0	0	0	--	--	0
RG365	1996–1997	16	31	30	70	4	3	--	--	7
1997–1998	14	21	27	73	5	3	--	--	8	
1998–1999	18	50	22	78	3	4	--	--	7	
	1999–2000 [a]	0	--	--	--	--	--	--	--	0
	2000–2001	11	9	80	20	1	1	--	--	2

[a] No hunt held
[b] Hunt held but no permits issued
[c] Archery only registration hunt
[d] Permit issued by mistake for this hunt.

Table 11. Units 7 & 15 mountain goat harvest data by Tier II subsistence permit hunt, 1996–2000.

Hunt Area	Regulatory year	Permit issued	Did not hunt(%)	Unsuccessful hunters (%)	Successful hunters (%)	Males	Females	Unk.	Total Illegal	harvest
TG364	1996–1997	16	25	70	30	3	0	--	--	3
1997–1998	16	25	75	25	2	1	--	--	3	
1998–1999	16	56	71	29	1	1	--	--	2	
	1999–2000	16	57	100	0	0	0	--	--	0
	2000–2001	16	71	100	0	0	0	--	--	0
TG365	1996–1997	30	70	67	33	3	0	--	--	3
1997–1998	30	37	68	32	4	2	--	--	6	
1998–1999	30	57	85	15	2	0	--	--	2	
	1999–2000	30	43	71	29	3	2	--	--	5
	2000–2001	30	53	64	36	5	0	--	--	5

Table 12. Units 7 & 15 mountain goat hunter drawing permit hunt residency and success, 1992–2000.

	Successful				Unsuccessful				
Regulatory year	resident	Nonresident	Unspec.	Total (%)	resident	Nonresident	Unspec.	Total (%)	Total hunters
1992–93	75	1	3	76(42)	102	1	1	103(58)	179
1993–94	90	2	2	95(47)	107	1	2	109(53)	204
1994–95	63	5		68(31)	147	1		148(69)	216
1995–96	71	3		74(39)	116	2		118(60)	192
1996–1997	81	6	1	88(36)	152	1	1	154(64)	242
1997–1998	86	1		87(39)	132	2		134(61)	221
1998–1999	69	4		73(31)	163	0		163(69)	236
1999–2000	67	2		69(30)	154	6		160(70)	229
2000–2001	80	2		82(35)	149	2		151(65)	233

Table 13. Units 7 & 15 mountain goat hunter registration permit hunt residency and success, 1992–2000.

Regulatory year	Successful resident	Successful Nonresident	Successful Total (%)	Unsuccessful resident	Unsuccessful Nonresident	Unsuccessful Total (%)	Total hunters
1992–93	64	10	75(29)[a]	183	1	184(71)	258
1993–94	67	3	70(25)	211	0	211(75)	281
1994–95	47	6	53(21)	192	1	194(79)[b]	247
1995–96	59	5	64(28)	166	2	168(72)	232
1996–1997	35	5	41(30)[c]	92	4	96(70)	137
1997–1998	43	3	46(24)	140	4	144(76)	190
1998–1999	34	2	36(15)	204	4	208(85)	244
1999–2000	9	1	10(9)	105	1	106(91)	116
2000–2001	24	0	24(17)	120	0	120(83)[d]	144

[a]Four unspecified successful hunters.
[b]One unspecified unsuccessful.
[c]One unspecified successful hunter.
[d]Sixteen unspecified unsuccessful hunters.

Table 14. Units 7 & 15 mountain goat harvest chronology for 1990–2000.

Regulatory year	Harvest periods								Total[a] Harvest
	10–19 August	20–31 August	1–15 September	16–30 September	15–31 October	1–15 November	16–31 November	Unknown	
1992–93	13	14	16	34	71	0	3	31	182
1993–94	18	11	23	42	65	4	1	12	176
1994–95	17	11	21	18	50	0	1	30	148
1995–96	20	10	20	23	55	2	3	2	135
1996–1997	11	15	28	33	29	7	5	1	129
1997–1998	19	14	24	29	39	4	2	2	133
1998–1999	26	7	25	15	30	5	1	0	109
1999–2000	15	14	12	27	10	0	0	1	79
2000–2001	23	21	14	24	22	0	2	0	106

[a]Not including Tier II subsistence and unreported harvest.

Table 15. Unit 7 mountain goat harvest percent by transport method, 1992–2000. Drawing and Registration hunts are combined.

Regulatory year	Percent of harvest								
	Airplane	Horse	Boat	3- or 4-Wheeler	Snowmachine	ORV	Highway vehicle	Unknown	*n*
1992–93	19	2	27	2	0	2	44	5	105
1993–94	27	0	24	3	0	0	43	3	94
1994–95	23	1	34	3	0	0	38	1	77
1995–96	20	0	31	6	0	0	42	1	90
1996–1997	19	0	34	6	0	1	35	4	68
1997–1998	11	1	36	0	0	0	47	4	91
1998–1999	18	0	38	3	0	0	38	1	78
1999–2000	24	0	24	7	0	0	42	3	59
2000–2001	21	0	22	8	0	1	46	1	76

Table 16. Unit 15 mountain goat harvest percent by transport method, 1992–2000. Drawing and Registration hunts are combined.

Regulatory year	Percent of harvest								
	Airplane	Horse	Boat	3- or 4-Wheeler	Snowmachine	ORV	Highway vehicle	Unknown	*n*
1992–93	46	4	42	1	0	0	3	4	72
1993–94	39	8	41	0	0	1	6	4	71
1994–95	73	5	23	0	0	0	0	0	44
1995–96	42	6	46	2	0	2	0	2	48
1996–1997	54	2	41	0	0	0	0	3	61
1997–1998	59	2	36	0	0	0	0	2	42
1998–1999	52	3	45	0	0	0	0	0	31
1999–2000	85	0	15	0	0	0	0	0	20
2000–2001	67	3	30	0	0	0	0	0	30

Alaska Department of Fish and Game
DIVISION OF WILDLIFE CONSERVATION
PO BOX 25526
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MOUNTAIN GOAT MANAGEMENT REPORT

From: 1 July 1999
To: 30 June 2001

LOCATION

GAME MANAGEMENT UNIT: 8 (5,097 mi^2)

GEOGRAPHICAL DESCRIPTION: Kodiak and Adjacent Islands

BACKGROUND

The mountain goat population in Unit 8 originated from 11 females and 7 males, which were transplanted from the Kenai Peninsula to the Hidden Basin area during 1952 and 1953. Success was not realized until 1964 when 26 goats were observed in the Crown Mountain area. The first hunting season was authorized in 1968, and permits have been issued each year since then. Prior to 1986, permit allocation varied between drawing, registration, and tier II (subsistence) permits. Since then all hunting has been regulated by drawing, with the number of permits available, and open areas changing to reflect population trends and goat movements.

From the late 1960 through 1970s, goat populations were lightly harvested and most areas were closed to hunting to encourage colonization. Permits were allocated through the registration or drawing system with a harvest quota of up to 15 goats. During the 1980s, the population continued to increase from an estimated 150 to over 400 animals, and new pockets of goats were observed on the southern end of Kodiak Island. The permit allocation process switched from a drawing system to a registration system in 1984 and 1985, and a tier II area was also established in 1985. A number of Emergency Orders were issued during the fall of 1985 when harvest goals were reached. The change from a drawing permit to a registration permit hunt in 1985 resulted in numerous inexperienced goat hunters going afield. Smith (1986) reported high hunter densities, less selectivity, herd shooting, and wanton waste during the 1985 hunting season. In 1986, the drawing system was resurrected.

Throughout the 1990s, goat populations continued to grow and the management scheme remained conservative. Populations were closely monitored and permits were adjusted accordingly. Much of the southern portion of Kodiak Island, which had been closed to facilitate colonization, was open to limited hunting in 1991. A new hunt area (DG 478) close to the Kodiak road system opened to hunting in 1995. In

2001 hunt area boundaries were modified to include all of Kodiak and Uganik Islands, and a new hunt area was also created (479 North Road System). There are currently 9 permit hunting areas that encompass Kodiak Island. Based on data from comprehensive aerial surveys, we estimated that the goat population of Unit 8 in 2001 was 1,200 goats. They occupied all available habitat on the island, and there were confirmed reports of a goats as far south as Kaguyak Bay and Akalura Lake.

MANAGEMENT DIRECTION

MANAGEMENT OBJECTIVES

Maintain a pre-hunting population of 700–1,000 goats islandwide, distributed in a manner that has minimal long-term impact on goat habitat.

METHODS

We complete composition counts annually with fixed-wing aircraft in August and early September. During the surveys, priority is given to the permit hunt areas nearest the original transplant site, but if weather and funding permit we attempt to survey all goat habitat on Kodiak. We collect data on harvest and hunting effort from mandatory hunter reports and by examining goat horns brought in by successful hunters.

RESULTS AND DISCUSSION

POPULATION STATUS AND TREND

Population Size

Our survey of approximately 90% of the goat range in August and September 2001 yielded a minimum population of 1,114 goats. The population continued to increase in the Uyak, Deadman Bay, and Kodiak Road system areas, whereas the population is decreasing slightly in the Kizhuyak and Wild Creek drainages. The estimated island-wide population in 2001 was 1,200 goats, with most of the suitable habitat being utilized.

Population Composition

Within the permit hunt areas, the kid:adult ratio ranged from a high of 24:100 in 1998 to a low of 15:100 in 2001 (Table 1). Kid production declined in 2000 to a ratio of 15.2:100, from an average of 19.2 during the previous 5 years. This decline was precipitated by heavy snowfall that persisted and delayed vegetative development in higher elevations during the spring of 2000. We did not collect any data on the sex composition of the population during this reporting period.

Distribution and Movements

During the first 3 decades after their introduction to Kodiak, goats gradually occupied pristine habitats near their release area, primarily in the Kizhuyak, Terror, and Hidden Basin drainages. As population density increased, goats began to pioneer new areas. No radio telemetry or other movement studies have been conducted on Kodiak goats. Research in other areas suggest that for males, dispersal may be driven by competition for females, but dispersal of females may have been triggered by reduced food availability (Stevens 1983). During the past decade goats expanded beyond the newly discovered pockets of suitable

habitat, and moved into areas not normally considered prime goat range. Goats now occur, in at least small numbers, in most of the suitable habitat on Kodiak Island.

MORTALITY

Harvest

Season and Bag. Goat hunting season for resident and nonresident hunters was open from 1 September to 31 October. The bag limit was 1 goat by drawing permit. In 2000–2001, there were 8 permit hunt areas with a total of 161 permits issued. Regulations authorize the department to issue up to 250 drawing permits per season (5 AAC 85.040[4]).

Game Board Actions and Emergency Orders. There were no Board of Game actions or Emergency Orders during this reporting period. During the 2000–2001 season, the Department administratively increased the number of permits available in hunt area DG 477 from 20 to 25 to take advantage of the increased harvestable surplus in that area. The number of permits in 2 hunt areas decreased due to a decline in the number of goats observed in those hunt areas – DG 473 permits decreased from 30 to 15, and DG 474 permits decreased from 15 to 10.

In 2000, the Federal Subsistence Regional Advisory Committee received a proposal to consider Kodiak Island goats as a "customary and traditional" resource, and to open the entire refuge to subsistence goat hunting by registration permit. Acceptance of this proposal would have significant impacts on our current goat management system, and we intend to work closely with Refuge staff to analyze and address these concerns.

Hunter Harvest. Annual harvests during this reporting period ranged from 54 goats in 2000–2001 to 70 goats in 1998–1999, with a 5-yr average of 62.2 (Table 2). Annual harvest ranged from 2–19 goats for each of the 8 permit hunts. Males continued to comprise the majority of the goats harvested during each year from 1996/97 to 2000/01, with a 5-yr average of 68.7%.

Goat age (horn ring) data were provided by hunters on their report cards beginning in 1994–1995 as regulations mandating horn inspection were rescinded. To better understand horn growth of goats and to investigate if goats have different growth rates in newly colonized areas of Unit 8 versus well established areas, successful hunters were required to submit horns for measuring in the fall of 2000. The mean age of goats harvested from 1991/92 to 1995/96 was 4.4 yrs for males and 5.0 yrs for females. During the next 5-yr period, 1996/97 to 2000/01, mean ages were 4.9 yrs for males and 5.3 yrs for females (Table 3).

Permit Hunts. All goat hunting in the Unit is by drawing permit. During this reporting period there were 8 hunt areas (DG 471–478) and the number of permits issued ranged from 161–176. Hunters afield ranged from 91–111, with a 5-yr average of 68% of the permittees participating in the hunt (Table 2). 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.

Hunter Residency and Success. Local Unit 8 residents received most of the permits issued between 1996/97 to 2000/01 (57%), followed by nonlocal Alaska residents (36%), and nonresidents (7%) (Table 4). Annual

hunter success ranged 56–65% with a 5-year mean of 60%. Nonresidents were the most successful hunters (86%), followed by local residents (60%) and nonlocal (55%).

Harvest Chronology. During most years, October is the preferred month for Unit 8 goat hunters (Table 5). Weather patterns, which affect hunter success and influence when hunters go into the field, largely determined the chronology of harvest.

Transport Methods. Aircraft (61%) were the predominant transportation method used by hunters from 1996/97 to 2000/01 (Table 6). Boats were also important (19%), and off-road vehicles (12%) were becoming more popular as trails proliferated and machines became more powerful and reliable.

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 and golden eagles undoubtedly occurs, but it is probably rare. The low production of kids in some years is suspected to have been caused by severe winter weather conditions, but it is unknown whether early postnatal mortality of kids or low initial productivity occurred. The severe winter of 1998–1999 yielded reports of a few winter-killed goats in the Hidden Basin and Old Harbor areas. It has been estimated that wounding loss and illegal harvest contribute additional mortality equivalent to 10% of the reported harvest (Van Daele and Smith 1998).

HABITAT

Assessment

Goat habitat on Kodiak Island is relatively secure because it is remote and has little immediate commercial value. Construction and operation of the Terror Lake hydroelectric project, in goat habitat in northern Kodiak Island, has not been detrimental (Smith and Van Daele 1987).

There have been no detailed analyses of goat range or carrying capacity on Kodiak, but survey data suggest that the population is probably near the carrying capacity of the habitat in the north central part of the island where goats first became established. In recently colonized areas of southern Kodiak Island, the population still seemed to be below carrying capacity during this reporting period. Kodiak National Wildlife Refuge staff has expressed interest in better understanding goat habitat needs and impacts of goats on refuge habitats.

Winter severity is quite variable in the maritime environment where precipitation at lower elevations may occur as either rain or snow. In studying goats on northern Kodiak Island, Hjeljord (1973) observed goats were found at higher elevations in March during a winter with snow cover at sea level, but goats were found at lower elevations during winters when lower slopes were partly snow-free. Smith and Van Daele (1987) determined that winter distribution was strongly influenced by snow cover, with goats favoring southerly exposed slopes and cliff faces. The lack of a coniferous overstory at lower elevations may adversely impact goats on Kodiak during winters with high snowfall.

In recent years there has been a proliferation of winter recreation activities around Kodiak Island. Snowmachines are more abundant and efficient than ever before, and the sport of heliskiing is increasingly popular. Kodiak National Wildlife Refuge prohibits helicopter access on the refuge for recreational

purposes, and limits snowmachine access in some areas, however most of the recent activity is near Kodiak city and not within refuge boundaries. There have been no studies on the impacts of winter sports on Kodiak goats, however there is a potential for disturbance.

Nonregulatory Management Problems

Aircraft over flights of goats have occurred since goats were originally introduced to Kodiak. Fixed-winged aircraft seem to have little direct impact on the goats, but helicopters typically solicit flight responses from both individuals and groups. Increasing interest in Kodiak by the cruise ship industry may spawn an increase in aerial wildlife viewing, so we will need to stay abreast of the situation and work with aircraft operators to minimize disturbances to goats.

CONCLUSIONS AND RECOMMENDATIONS

The goat population was stable in northeastern Kodiak, decreasing in northcentral, and increasing in recently colonized drainages of southern Kodiak. Based on the 2001 comprehensive aerial survey of goat range in Unit 8, we estimated a total of 1,200 goats. Severe weather during the winter of 1998–1999 resulted in lower kid:adult ratios in all permit areas, and exacerbated population declines in some areas. During this reporting period goat harvest was relatively stable, and percent males in the harvest and hunter success remained above 60%.

The policy of allowing goats to populate vacant habitat by keeping areas with low populations closed to hunting has been effective as we have routinely surpassed our management objectives. Population trends are closely monitored by annual surveys and permits are adjusted accordingly within hunt areas. In the winter of 2000 the majority of the mountain goat hunt boundaries were expanded to encompass the entire island of Kodiak. Before acting on these changes, we discussed them with local air charter operators, the local Advisory Board, and the Kodiak National Wildlife Refuge. Portions of the population, which were previously protected, were hunted for the first time in the fall of 2001.

We have reached a pivotal point in goat management on Kodiak as the population now occupies most, if not all, suitable habitat, and populations in most areas continue to increase. We should consider shifting our emphasis from encouraging range expansion and increased densities, to limiting the population to a level that will provide sustained hunting opportunities while maintaining habitat quality. We must also consider the relationship between habitat, hunting and goat viewing opportunities on the Kodiak road system and develop socially and biologically acceptable ways of balancing these potentially conflicting factors.

To achieve these goals, we recommend the following management actions:

Explore regulatory innovations within the State system to satisfy the requests of residents of remote villages for increased goat hunting opportunities;

Evaluate current hunt area boundaries and permit allocations to assure that they adequately reflect the recent changes in goat density and distribution;

Revise hunter handouts with emphasis on sex identification, goat anatomy, and ways to avoid wounding and/or losing goats while hunting;

Develop a web page that will assist goat hunters in selecting hunt areas and in being better prepared for their hunt;

Work with hunters and non-consumptive users to explore methods of establishing areas where goats can regularly be seen from the Kodiak road system;

Work closely with staff from Kodiak National Wildlife Refuge to initiate research into goat habitat, and the impacts of goats on that habitat; and,

Work with the U.S. Coast Guard to develop a memorandum of agreement that will minimize low-level over flights of goats.

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Table 1. Unit 8 Aerial summer mountain goat composition counts and estimated population size within permit hunt areas, 1996/97–2001/02.

Hunt Area	Regulatory year	Adults (%)	Kids (%)	Kids: 100 adults	Total goats observed	Goats/ hour	Estimated population size
All	1996–1997	405 (85)	72 (15)	18	477	94.1	--
permit	1997–1998	495 (83)	101 (17)	20	596	129.0	--
hunt areas	1998–1999	482 (81)	115 (19)	24	597	81.6	--
	1999–2000	684 (84)	128 (16)	19	812	96.2	900
	2000–2001	511 (87)	78 (13)	15	589	--	--
	2001–2002	760 (86)	123 (14)	16	1114	64.7	1200
DG 471	1996–1997	113 (84)	21 (16)	19	134	--	--
Wild Creek -	1997–1998	154 (79)	40 (21)	26	194	--	--
Center Mtn.	1998–1999	167 (78)	48 (22)	29	215	--	--
	1999–2000	137 (86)	23 (14)	17	160	--	160-180
	2000–2001	134 (92)	12 (8)	9	146	--	--
	2001–2002	113 (86)	18 (14)	16	131	--	130
DG 472	1996–1997	37 (80)	9 (20)	24	46	--	--
Crown Mtn	1997–1998	46 (87)	7 (13)	15	53	--	--
	1998–1999	18 (95)	1 (5)	6	19	--	--
	1999–2000	21 (88)	3 (12)	14	24	--	20-50
	2000–2001	41 (84)	8 (16)	20	49	--	20-50
	2001–2002	21 (88)	3 (12)	14	24	--	20-50

Table 1. (continued).

Area	Regulatory year	Adults (%)	Kids (%)	Kids: 100 adults	Total goats observed	Goats/ hour	Estimated population size
DG 473	1996–1997	101 (89)	12 (11)	12	113	--	--
Hidden Basin -	1997–1998	97 (85)	17 (15)	18	114	--	--
Terror Lake	1998–1999	63 (81)	15 (19)	24	78	--	--
	1999–2000	28 (90)	3 (10)	11	31	--	40-80
	2000–2001	50 (88)	7 (12)	14	57	--	40-80
	2001–2002[b]	83 (90)	9 (10)	11	92	--	92
DG 474	1996–1997	36 (97)	1 (3)	3	37	--	--
Uganik River	1997–1998	65 (83)	13 (17)	20	78	--	--
	1998–1999	33 (85)	6 (15)	18	39	--	--
	1999–2000	44 (92)	4 (8)	9	48	--	40-60
	2000–2001[a]	51 (96)	2 (4)	4	53	--	40-60
	2001–2002[ab]	53 (88)	7 (12)	13	60	--	40-60
DG 475	1996–1997[a]	24 (71)	10 (29)	42	34	--	--
Zachar River	1997–1998[a]	23 (100)	0	0	23	--	--
	1998–1999	--	--	--	--	--	--
	1999–2000	257 (90)	30 (10)	12	287	--	300
	2000–2001[a]	32 (89)	4 (11)	11	36	--	300
	2001–2002[ab]	236 (85)	41 (15)	17	277	--	300

Table 1. (continued).

Area	Regulatory year	Adults (%)	Kids (%)	Kids: 100 adults	Total goats observed	Goats/ hour	Estimated population size
DG 476	1996–1997	--	--	--	--	--	--
Kiliuda Bay	1997–1998	--	--	--	--	--	--
	1998–1999	42 (84)	8 (16)	19	50	--	--
	1999–2000 [a]	11 (85)	2 (15)	18	13	--	50–60
	2000–2001	--	--	--	--	--	--
	2001–2002[ab]	52 (87)	8 (13)	15	60	--	100–110
DG 477	1996–1997	--	--	--	--	--	--
Southwest	1997–1998	--	--	--	--	--	--
Kodiak	1998–1999 [a]	50 (83)	10 (17)	20	60	--	--
	1999–2000 [a]	92 (83)	19 (17)	21	111	--	130–160
	2000–2001	--	--	--	--	--	--
	2001–2002[ab]	--	--	--	231	--	250
DG 478	1996–1997	66 (81)	15 (19)	23	81	--	81
South Road	1997–1998	110 (79)	24 (21)	22	134	--	134
System	1998–1999	109 (81)	26 (19)	23	135	--	135
	1999–2000	94 (80)	24 (20)	26	118	--	118
	2000–2001	118 (81)	28 (19)	24	146	--	146
	2001–2002[b]	129 (82)	28 (18)	22	157	--	157
DG 479	1999–2000 [a]	43 (86)	7 (14)	16	50	--	50–60
North Road	2000–2001[a]	68 (84)	13 (16)	20	81	--	81
System	2001–2002	59 (89)	7 (11)	12	66	--	60–80

a–partial survey
b–2001 hunt area boundary change

Table 2. Unit 8 mountain goat harvest data by permit hunt, 1996/97–2000/01.

Hunt Area	Regulatory year	Permits Issued	Percent did not hunt	Percent unsuccessful hunters	Percent successful hunters	Males (%)	Female (%)	Unknown	Illegal	Total harvest
All permit hunts	1996–1997	176	44	40	60	37 (62)	20 (34)	2	0	59
	1997–1998	168	35	40	60	47 (72)	17 (28)	1	0	65
	1998–1999	168	36	35	65	49 (70)	21 (30)	0	0	70
	1999–2000	176	35	44	56	44 (71)	18 (29)	0	1	63
	2000–2001	161	41	41	59	34 (63)	21 (37)	0	0	54
DG 471 Wild Creek	1996–1997	30	47	37	63	6 (60)	4 (40)	0	0	10
	1997–1998	30	34	63	37	6 (86)	1 (14)	0	0	7
	1998–1999	30	50	27	73	8 (73)	2 (27)	0	0	11
	1999–2000	30	64	61	39	1 (14)	6 (86)	0	1	8
	2000–2001	30	41	65	35	2 (33)	4 (67)	0	0	6
DG 472 Crown Mtn	1996–1997	10	20	37	63	2 (40)	2 (40)	1	0	5
	1997–1998	10	30	57	43	0 (--)	2 (67)	1	0	3
	1998–1999	10	50	40	60	1 (33)	2 (67)	0	0	3
	1999–2000	10	40	33	67	4 (100)	0 (--)	0	0	4
	2000–2001	10	40	67	33	2 (100)	0 (--)	0	0	2
DG 473 Hidden Basin	1996–1997	31	39	37	63	9 (75)	3 (25)	0	0	12
	1997–1998	30	13	27	73	14 (74)	5 (26)	0	0	19
	1998–1999	30	17	36	64	13 (81)	3 (19)	0	0	16
	1999–2000	30	47	50	50	5 (63)	3 (37)	0	0	8
	2000–2001	15	27	36	64	3 (43)	4 (57)	0	0	7
DG 474 W. Terror Lake	1996–1997	30	50	53	47	4 (57)	3 (43)	0	0	7
	1997–1998	15	53	14	86	6 (100)	0 (--)	0	0	6
	1998–1999	15	53	14	86	2 (33)	4 (67)	0	0	6
	1999–2000	15	53	57	43	3 (100)	0 (--)	0	0	3
	2000–2001	10	33	33	67	3 (75)	1 (25)	0	0	4

Table 2. (continued).

Hunt Area	Regulatory year	Permits Issued	Percent did not hunt	Percent unsuccessful hunters	Percent successful hunters	Males (%)	Female (%)	Unknown	Illegal	Total harvest
DG 475	1996–1997	35	60	50	50	1 (14)	6 (86)	0	0	7
Uyak	1997–1998	35	51	53	47	5 (63)	3 (37)	0	0	8
Bay	1998–1999	35	46	68	32	4 (67)	2 (33)	0	0	6
	1999–2000	36	24	38	62	12 (75)	4 (25)	0	0	16
	2000–2001	35	59	29	71	3 (30)	7 (70)	0	0	10
DG 476	1996–1997	20	35	38	62	8 (100)	0 (--)	0	0	8
Kiliuda	1997–1998	20	25	27	73	9 (82)	2 (18)	0	0	11
Bay	1998–1999	20	45	27	73	6 (75)	2 (25)	0	0	8
	1999–2000	20	40	33	67	8 (100)	0 (--)	0	0	8
	2000–2001	20	41	10	90	7 (78)	2 (22)	0	0	9
DG 477	1996–1997	12	50	17	83	3 (60)	2 (40)	0	0	5
Deadman	1997–1998	20	40	33	67	6 (75)	2 (25)	0	0	8
Bay	1998–1999	20	20	17	83	11 (73)	4 (27)	0	0	15
	1999–2000	20	30	50	50	6 (86)	1 (14)	0	0	7
	2000–2001	25	46	38	62	6 (75)	2 (25)	0	0	8
DG 478	1996–1997	8	13	29	71	3 (60)	2 (40)	0	0	5
Chiniak	1997–1998	8	33	50	50	1 (33)	2 (67)	0	0	3
Bay	1998–1999	8	13	29	71	4 (80)	1 (20)	0	0	5
	1999–2000	15	20	25	75	5 (56)	4 (44)	0	0	9
	2000–2001	16	7	43	57	8 (100)	0 (--)	0	0	8

Table 3. Unit 8 mountain goat harvest mean age data from horn rings, 1991/92–2000/01.

Regulatory Year	Males	(n)	Females	(n)
1991–1992 [a]	3.8	(17)	4.0	(15)
1992–1993 [a]	3.8	(21)	4.7	(14)
1993–1994 [a]	3.8	(31)	3.7	(16)
1994–1995 [b]	4.7	(21)	5.7	(19)
1995–1996 [b]	5.9	(18)	6.7	(7)
1996–1997 [b]	5.2	(17)	6.2	(9)
1997–1998 [b]	5.5	(42)	5.6	(12)
1998–1999 [b]	5.3	(40)	5.5	(14)
1999–2000 [b]	4.5	(36)	4.6	(14)
2000–2001 [a]	4.0	(24)	4.5	(15)

a–horn inspections required.
b–hunters report goat age with report card.

Table 4. Unit 8 mountain goat hunter residence and success, 1996/97–2000/01.

	Successful					Unsuccessful					
Regulatory year	Local resident	Nonlocal resident	Nonresident	Total	(%)	Local resident	Nonlocal resident	Nonresident	Total	(%)	Total hunters
1996–1997	36	18	5	59	(60)	21	16	2	39	(40)	98
1997–1998	41	21	3	65	(60)	24	20	0	44	(40)	109
1998–1999	35	26	9	70	(65)	23	12	2	37	(35)	107
1999–2000	36	21	5	62	(56)	25	22	1	48	(44)	110
2000–2001	30	14	10	54	(59)	24	13	--	37	(41)	91

Table 5. Unit 8 mountain goat harvest chronology percent by time period, 1996/97–2000/01.

		Harvest periods		
Area	Regulatory year	September	October	n
All permit hunts	1996–1997	46 %	54 %	59
	1997–1998	52 %	48 %	65
	1998–1999	37 %	63 %	70
	1999–2000	52 %	48 %	62
	2000–2001	39 %	61 %	54

Table 6. Unit 8 mountain goat hunter transport method (percent in parentheses), 1996/97–2000/01.

Regulatory year	Transportation method							Total
	Aircraft	Boat	3 or 4 Wheeler	ORV	Highway vehicle	Snow-machine	Unknown	
1996–1997	56 (57)	31 (32)	7 (7)	0 (--)	3 (3)	1 (1)	0 (--)	98
1997–1998	70 (64)	18 (17)	13 (12)	0 (--)	7 (6)	0 (--)	1 (1)	109
1998–1999	66 (62)	22 (21)	9 (8)	1 (1)	5 (5)	0 (--)	4 (3)	107
1999–2000	72 (65)	15 (14)	14 (13)	2 (2)	6 (5)	0 (--)	1 (1)	110
2000–2001	51 (56)	12 (13)	17 (19)	2 (2)	8 (9)	0 (--)	1 (1)	91

SPECIES

MANAGEMENT REPORT

Alaska Department of Fish and Game
DIVISION OF WILDLIFE CONSERVATION
PO BOX 25526
JUNEAU, AK 99802-5526

MOUNTAIN GOAT MANAGEMENT REPORT

From: 1 July 1999
To: 30 June 2001

LOCATION

GAME MANAGEMENT UNIT: 11 (13,300 mi^2)

GEOGRAPHIC DESCRIPTION: Wrangell Mountains

BACKGROUND

Hunters have harvested mountain goats in Unit 11 for at least 30 years. Harvest data for goats were not collected before 1972. Although seasons and bag limits were liberal, harvests before 1972 were probably low. The season length and bag limit were reduced in the mid-1970s because of an increase in hunting pressure and harvest. Mountain goat hunts in GMU 11 have been administered via a state registration hunt since 1980. A subsistence goat registration hunt for local residents in the park-only portion ("pure park") of the Wrangell St. Elias National Park and Preserve was established and is administered by the National Park Service.

The MacColl Ridge trend count area was established in 1970 to obtain sex and age composition data and to monitor population trends. Additional aerial survey data on mountain goats in other portions of Unit 11 have been collected only periodically in conjunction with sheep counts.

MANAGEMENT DIRECTION

MANAGEMENT OBJECTIVES

Maintain harvest of mountain goats to fewer than 10% of the estimated mountain goat population within the hunt area.

METHODS

Department personnel conduct aerial surveys to determine sex and age composition and population trends on MacColl Ridge. MacColl Ridge is located north of the Chitina River in the southeastern portion of Unit 11. Additional mountain goat data are collected periodically during aerial surveys of sheep trend count areas. Harvest and hunting pressure are controlled by registration permit.

RESULTS AND DISCUSSION

POPULATION STATUS AND TREND

Population Size

The 2001 MacColl Ridge survey resulted in a count of 64 goats (Table 1). This survey is down 14% from the record high surveys in both 1998 and 1999 when 74 goats were observed. The current count on MacColl Ridge is 23% above the long term count average of 52 animals.

Biologists estimate 700 mountain goats inhabit the southern Wrangell and Chugach Mountains in Unit 11. This population estimate was obtained by combining survey results from different count areas in Unit 11 between 1973 and 1984. If a count area was surveyed more than once, the highest count was used in the population estimate.

Population Composition

The ratio of kids:adults observed on MacColl Ridge during 2001 was 16:100; kids composed 14% of goats observed (Table 1). Kids observed declined 36% in 2001 – the lowest observed in eight years. Recruitment was especially high between 1995 and 1998, and again in 2000, averaging 14 kids observed per year compared to an average of 8 kids per year between 1991 and 1993.

Distribution and Movements

In the past, observers have tallied approximately 400 mountain goats during aerial surveys in the Wrangell Mountains, north of the Chitina River between the Cheshnina River and the Canadian border. The Kennicott, Hawkins, and Barnard Glaciers, MacColl Ridge, and McCarthy Creek supported the largest number of animals. Nearly 300 goats have been counted south of the Chitina River in that portion of the Chugach Mountains from the Copper River east to the Canadian border.

Information on movements is limited, and major rutting and kidding areas are unknown. Field observations indicate seasonal altitudinal movements; goats often use lower elevations during winter. East–west movements also occur; animals have been observed traveling between the Kotsina and Kuskalana Rivers and between Kennicott Glacier and McCarthy Creek.

MORTALITY

Harvest

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

Board of Game Actions and Emergency Orders. In 1980 the Board of Game established the Unit 11-goat hunt as a registration permit hunt only. This action was necessary because much of the unit was included in Wrangell–Saint Elias National Park/Preserve, concentrating sport hunting for goats on preserve lands. Only subsistence hunting by local rural residents was allowed on park lands. In 1986, the goat season was reduced by 31 days, aligning the closing date with adjacent Unit 6. Starting in 1989 guides were required for all nonresident mountain goat hunters.

Federal Subsistence Seasons and Bag Limits. In 1990 the federal government assumed management of subsistence hunting on federal lands. At that time, the Federal Subsistence Board determined there was no subsistence hunting of mountain goats occurring in Unit 11 and subsequently closed the "pure park" to subsistence mountain goat hunting by local rural residents. In 1999 The National Park Service determined there was a subsistence use of mountain goats by local rural residents in the Park. A season was established with open dates of 25 August to 31 December. Hunting was controlled by registration permit issued by the National Park Service to residents of designated subsistence communities. The bag limit was one goat, and a harvest quota of 45 mountain goats for both the State and Federal hunts combined was established.

Hunter Harvest. Hunters killed 12 mountain goats during the 1999 season and 6 in 2000 for the state registration hunt (RG 580). The average yearly take since 1980 was 16 goats (range = 6–30). The 2000 harvest was comprised of all males, while 9 (75%) billies and 3 (25%) nannies were reported in 1999. Males composed the majority of animals taken (Table 2) during this reporting period. High male harvest is attributable to the selection of larger trophy animals, especially by nonresidents on guided hunts. There were no mountain goats reported killed in the federal subsistence hunt during the 1999 season, and harvest in 2000 was 2 goats (1 male, 1 female).

Hunter Residency and Success. We issued 39 state registration hunt permits in 2000. This is the lowest number of permits issued since 1982, when only 29 were issued. Usually the number of permits issued for this hunt fluctuates between 50 and 70, with no trend evident in the hunting pressure. The highest number of permits ever issued for this hunt was 97 in 1986. The hunter success rate was 36% in 1999 and 33% in 2000. The hunter success rate declined during this reporting period (Table 2). Successful hunters reported spending 4.2 days in the field compared with 7.9 days for unsuccessful hunters in 2000. This represents a 40% increase in overall hunting effort this year. Usually the hunting effort reported by Unit 11 goat hunters changes little each year. One reason for the increase in effort and decline in harvest may be the weather, as poor weather persisted throughout the fall season. Nonresident hunters took 4 goats in 2000, accounting for 67% of the harvest compared with 33% of the harvest taken by non-local Alaskan residents and none taken by local rural residents (Table 3). Since 1986, nonresidents have taken 61% of goats harvested and have had a higher success rate (74%) than residents (36%).

Harvest Chronology. In both 1999 and 2000, 83% of the harvest occurred during the initial 3 weeks of the season (Table 4). During the last 10 years, the highest harvests have occurred early in the season. Before 1986 more goats were taken later in the season, especially in October. The change in harvest chronology is partially the result of an increase in nonresident hunters combining sheep and goat hunts during the first 20 days of September. Residents hunting only mountain goats usually take goats later in the season.

Transport Methods. Most successful goat hunters use aircraft. Highway vehicles are also a popular method of transportation. Transportation methods used by goat hunters in Unit 11 have changed little over the years (Table 5). Since the use of aircraft is prohibited for subsistence hunting in the Park, the most important method of transportation for federal subsistence hunters is riverboat, followed by fourwheelers.

Other Mortality

Wolf predation of goats has been observed in portions of the unit. Reports by trappers and local residents suggest wolf predation may be common; however, predation rates have not been determined.

HABITAT

Assessment

The Wrangell Mountains and northern portion of the Chugach Mountains are part of the northernmost extension of mountain goat range in Alaska. Goat habitat in these areas is limited. A substantial number of goats live north of the Chitina River, from east of the Lakina River to the Canadian border. The remainder of the Wrangell Mountains west of the Lakina River is marginal goat habitat. Goat habitat in the Chugach Range south of the Chitina River may be more suitable. Overall, mountain goat densities in Unit 11 are much lower than in areas with more favorable habitat such as the Kenai Peninsula.

CONCLUSIONS AND RECOMMENDATIONS

The number of mountain goats observed in the MacColl Ridge trend area during the last two years was down from the all-time high population levels observed two years ago. However, the current count remains well above the long term average and no population trends are evident. Kid production and/or survival has been lower in two of the last three years of this reporting period. Between 1994 and 1998 survey results indicated the highest kid production and/or survival ever observed on MacColl ridge.

Interpretation of annual survey data is difficult because we do not know if small annual changes in the number of mountain goats observed on MacColl Ridge reflect actual population fluctuations or survey variables. Mountain goats are among the most difficult big game species to count because of vegetation and rugged terrain in the trend count areas. Also, the behavioral response of mountain goats to approaching aircraft is to hide in caves, under ledges, and in dense vegetation. Counts are conducted at approximately the same time each year in an attempt to minimize the effect of movements on survey results.

Goats were hunted throughout their range during the 1970s, and hunting pressure was greater than in recent times. National Park Service and Federal Subsistence Board hunting regulations now restrict non-subsistence goat hunting to Preserve lands around McCarthy, MacColl Ridge, Hawkins and Barnard Glaciers. MacColl Ridge receives some of the heaviest hunting pressure in the unit, especially for guided hunts. However, during this report period harvests were not concentrated enough in any one area to result in localized overharvests.

The federal subsistence hunt in the Park-designated lands should not present a management problem for the state hunt because hunters participating in the state hunt are limited to Preserve lands. The impact of the new federal subsistence hunt is to allow hunting of mountain goats in portions of Unit 11 that have been protected for over ten years. Harvests are expected to be low under the federal hunt as the number of individuals eligible for subsistence permits is very limited. Hunt areas are, for the most part, very remote and federal regulations prohibiting the use of aircraft for subsistence hunting will greatly limit access.

Harvest rates on mountain goats in more popular hunting areas of Unit 11 are, on occasion, as high as 10% of the observed population. This rate of harvest is probably sustainable because observed counts represent a minimum population estimate. However, heavy harvests from MacColl Ridge and Bernard and Hawkins Glaciers during periods with low kid recruitment or increased predation could result in a decline in the goat population in those areas. In addition to the yearly trend count on MacColl Ridge, goats should be surveyed periodically in heavily hunted areas such as Hawkins and Barnard Glaciers. Harvest rates are currently not a concern in other areas in the unit.

I recommend closing the hunting season by emergency order as soon as the harvest from MacColl Ridge and Hawkins and Barnard Glaciers exceeds 10% of the observed goat population. Timely emergency closures will be difficult because most of the harvest takes place in only a few days early in the season. The annual harvest from Unit 11 should not exceed 35 goats for more than 1 year; if it does, we should implement regulations to reduce the harvest.

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Table 1 Unit 11 MacColl Ridge trend count area mountain goat composition counts and estimated population size, 1996-2001

Area	Regulatory Year	Adults (%)	Kids (%)	Unk.	Kids: 100 adults	Total goats observed	Estimated population size[a]
MacColl Ridge	1996–1997	47 (78)	13 (22)	0	28	60	60
	1997–1998	50 (76)	16 (24)	0	32	66	66
	1998–1999	59 (80)	15 (20)	0	25	74	74
	1999–2000	64 (86)	10 (14)	0	16	74	74
	2000–2001	46 (77)	14 (23)	0	30	60	60
	2001–2002	55 (86)	9 (14)	0	16	64	64

[a] Estimate considered to be total count as all goat habitat on ridge counted.

Table 2 Unit 11 mountain goat harvest data by permit hunt, 1996-2001

Hunt Nr. /Area	Regulatory Year	Permits issued	Percent did not hunt	Percent unsuccessful hunters	Percent Successful Hunters	Males (%)	Females (%)	Unk.	Illegal	Total harvest
RG580	1996–1997	68	35	31	34	16 (70)	7 (30)	0	0	23
RG580	1997–1998	53	48	17	35	14 (78)	4 (22)	0	0	18
RG580	1998–1999	48	37	26	37	12 (71)	5 (29)	0	0	17
RG580	1999–2000	54	37	40	23	9 (75)	3 (25)	0	0	12
RG580	2000–2001	39	54	31	15	6 (100)	0	0	0	6

Table 3 Unit 11 mountain goat hunter residency and success, 1996-2001

Regulatory year	Successful				Unsuccessful				Total hunters
	Local[a] resident	Nonlocal resident	Nonresident	Total (%)	Local[a] Resident	Nonlocal resident	Non-resident	Total (%)	
1996–1997	2	3	18	23 (52)	2	14	5	21 (48)	44
1997–1998	2	8	8	18 (67)	2	5	2	9 (33)	27
1998–1999	4	5	8	17 (59)	2	7	3	12 (41)	29
1999–2000	0	8	4	12 (36)	10	9	2	21 (64)	33
2000–2001	0	2	4	6 (33)	2	7	3	12 (67)	18

[a] "local resident" means resident of Unit 11, 13, or that portion of Unit 12 along the Nabesna Road.

Table 4 Unit 11 mountain goat harvest chronology percent by time period, 1996-2001

Regulatory year	September				October					
	1–7	8–15	16–23	24–30	1–7	8–15	16–23	24–31	1–30	*n*
1996–1997	22	30	13	9	17	9	--	--	--	23
1997–1998	61	17	11	5	5	--	--	--	--	18
1998–1999	44	12	19	12	12	--	--	--	--	16
19992000	8	42	33	8	--	--	--	8	--	12
2000–2001	33	33	17	17	--	--	--	--	--	6

Table 5 Unit 11 mountain goat harvest percent by transport method, 1996-2001

Regulatory year	Percent of harvest							
	Airplane	Boat	3- or 4-Wheeler	Snowmachine	ORV	Highway Vehicle	Unknown	*n*
1996–1997	92	4	4	--	--	--	--	23
1997–1998	78	5	5	--	--	11	--	18
1998–1999	100	--	--	--	--	--	--	17
1999–2000	100	--	--	--	--	--	--	12
2000–2001	100	--	--	--	--	--	--	6

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MOUNTAIN GOAT MANAGEMENT REPORT

From: 1 July 1999
To: 30 June 2001

LOCATION

GAME MANAGEMENT UNIT: Units 13D and 14 (12,370 mi2)

GEOGRAPHIC DESCRIPTION: Talkeetna Mountains and western Chugach Mountains

BACKGROUND

The first goat survey in Unit 13D was conducted in 1959. The first comprehensive goat survey in Unit 14 was completed in 1972. Periodic surveys have been conducted since then in both units.

During the last decade, the goat population in the western Chugach Mountains (Units 13D, 14A, and 14C) has increased slightly. The number of goats observed during aerial surveys in Unit 14C ranged from 326 to 530 between 1982 and 1989. During a complete count of Unit 14C in 1994, 619 goats were observed. The goat population in the Talkeetna Mountains (Unit 14A and 14B) remains chronically low.

Seasons and bag limits for goats in Units 14 and 13D have varied since statehood. Regulations for Units 13 and 14 were the most liberal during the mid-1960s, with a 144-day goat hunting season (10 August through 31 December) and a 2-goat bag limit. In 1967 the bag limit for Unit 14 was lowered to one goat; however, hunters in Unit 13D could harvest two goats until 1975. In the 1970s the hunting season in Unit 14 began in early August or September and ran until 15 November. In the early 1980s goat hunting in the western Chugach Mountains was at its most restricted stage, with only 50 or 100 drawing permits issued for Units 14B and 14C and portions of 14A. Since 1984 most mountain goat hunting in Unit 14 has been regulated by a registration permit season. In 1987 Unit 13D opened to goat hunting under a drawing permit hunt after a 10-year closure. The harvest was limited to billies during 1987 and 1988 but was liberalized to either sex in 1989. In Unit 14A north of the Matanuska River, goat hunting has been closed since 1986. The hunting season for goats in Unit 14B has been closed since 1990 (by emergency order in 1990 and 1991).

Most of Unit 14C has been closed to goat hunting since the early 1960s, except for 1969–1972 when all of 14C was open to hunting. First, the drainages from Potter to Girdwood (Rainbow Closed Area) were closed. In 1973, the then recently created Chugach State Park, encompassing

most of the mountains west of the Lake George and Twentymile River drainages, was closed to goat hunting. Historically, these closed areas have not included a substantial segment of the goat population in Unit 14C; however, more goats have been observed in the park in recent years and drawing permit hunts have been established in drainages with a harvestable surplus of goats.

Winter recreation activities in the Chugach Mountains (Unit 14C) have increased during this reporting period. Heli-skiing activities operate within mountain goat range and potential winter habitat. During 2000, 2001, and 2002, the Glacier Ranger District of the Chugach National Forest contracted the Alaska Department of Fish and Game, Division of Wildlife Conservation to conduct winter surveys for goats in areas potentially affected by heli-ski operations. The purpose of these surveys was to identify habitat areas repeatedly used by mountain goats during winter. The information gathered during these surveys have enabled biologists to designate "no-fly zones" in winter use areas for mountain goats, to help reduce potential impacts to the goat population.

MANAGEMENT DIRECTION

MANAGEMENT OBJECTIVES

Unit 13D (Chugach Mountains)

- Maintain a prehunting season population of at least 100 goats.

Units 14A and 14B (Talkeetna Mountains)

- Allow the population to reach an observable minimum of 50 goats before allowing harvest, at which time annual harvest should not exceed 5% of observable goats and should comprise at least 60% males.

Unit 14A (Chugach Mountains)

- Maintain a minimum observable population of 60 goats that will sustain an annual harvest of 7% of observable goats and at least 70% males.

Unit 14C (Chugach Mountains)

- Maintain a population of at least 500 goats that will sustain an annual harvest of 25 goats, comprising at least 60% males.

METHODS

We monitored goat sex and age composition and population trends through aerial surveys. We monitored harvests by requiring successful hunters to report harvests within five or ten days of a kill depending on hunt location. In addition, all hunters were required to return hunt reports, whether they successfully harvested a goat or not. Winter aerial surveys were conducted to determine areas repeatedly used by mountain goats in Unit 14C.

RESULTS AND DISCUSSION

POPULATION STATUS AND TREND

Population Size

Because of limited funding, we conducted few goat surveys in Units 14 and 13D (Tables 1–4). Partial surveys were conducted in Units 14A and 14B (Talkeetna Mountains) in 1998 and 1999. Partial surveys were also conducted in 1999 in Unit 14A (Chugach Mountains) and during 2001 in 13D. Partial surveys were conducted in 14C in 1998, 1999, 2000, and 2001.

Goat populations remain high in the western Chugach Mountains. Aerial survey data collected over the past several years indicate that at least 1000 goats inhabit the western Chugach and Talkeetna Mountains (Tables 1–4).

Variations in count conditions and goat movement may partially account for annual fluctuations in the numbers of goats observed. Goats were observed in greater numbers during late evening surveys, compared to surveys conducted during the early morning or mid-day.

Age Distribution

Goats observed were categorized as kids or adults. Kids comprised 23% of observed goats in Unit 13D (Table 1), 22% in Unit 14A (Chugach Mountains; Table 2), 12–18% in Unit 14A and 14B (Talkeetna Mountains; Table 3), and 13–23% in Unit 14C (Table 4).

Distribution and Movements

Throughout both summer and winter surveys, goats were seldom observed far from escape terrain, which includes broken, rocky, and steep terrain. Goat distribution during summer has been documented from aerial surveys. During summer, goats were found feeding in early morning and late evening on open grassy slopes, often adjacent to glaciers or snowfields. During midday goats seek relief from the heat in dense shrub cover, on ice fields or glaciers, and under rocky outcrops.

Winter distribution of goats in select areas of Unit 14C were surveyed. The survey included six areas between Girdwood and Portage, and north to Twentymile Glacier (Figure 1). Because of snow and ice, sightability of goats was low. Most goats, However, were observed in close proximity to escape terrain. Designated “no-fly zones”, to reduce the impact of heli-ski operations on goats during the winter months, were created based on the results of these surveys (Figure 1).

In Unit 13, mountain goats are primarily found in the Chugach Mountains of Unit 13D; however, occasionally goats are observed in the Talkeetna Mountains in Unit 13, and a small population inhabits the Chulitna Mountains near Cantwell, at the northernmost edge of their range. It is suspected that the number of mountain goats in Unit 13 is primarily regulated by winter weather and secondarily by predation. Greatly reduced goat numbers in Unit 13 have been attributed to deep snowfall.

Mountain goats in Unit 14 are found primarily in the Chugach Mountains, with only small numbers in the Talkeetna Mountains. The Talkeetna Mountains are the northern limit of

mountain goat range and may provide only marginal habitat and therefore may be unable to support a large goat population.

MORTALITY

Harvest

Seasons and Bag Limits. From 1997 to 2001, in Unit 13D the goat hunting season for residents and nonresidents was 10 August–20 September, and the bag limit was one goat of either sex by drawing permit. The taking of kids and nannies accompanied by kids was prohibited.

In Unit 14A (south of the Matanuska River) the hunting season for residents and nonresidents was 1 September–31 October and was one goat by permit only. From 1997 to 2000 there were two drawing hunts in Unit 14C, one in the East Fork of the Eklutna River drainage and the other in the Glacier and Winner creek drainages. In 2001, two additional drawing hunts in Unit 14C were added. These hunts included Bird Creek drainage, including Penguin Creek, and the upper Eagle River drainage, including Icicle Creek but excluding Raven Creek drainage. These hunts were open from the day after Labor Day to October 15, with a bag limit of one goat.

In Unit 14C, one goat by registration permit only could be taken from 1 September to 15 October, or one goat by registration permit and by archery only could be taken from 16 October to 31 October.

Board of Game Actions and Emergency Orders. In 2001 the Board of Game authorized two additional drawing permit hunts for goats in Unit 14C, one in Bird Creek drainage, including Penguin Creek, and the other in the upper Eagle River drainage, upstream from and including Icicle Creek, but excluding Raven Creek drainage. Because the harvest quota was attained early, Emergency Orders were issued for the Unit 14A goat hunt (RG866) closing it on 29 and 25 September in 2000 and 2001 respectively.

Hunter Harvest. A hunting season was initiated in Unit 13D in 1987 after having been closed since 1978. Harvests have been low, ranging from 4–10 goats per season, from 1997–2001 (Table 5). 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 Unit 14C harvest. Most of this increase was in the Lake George drainage, because the area supports a high density of goats and is easily accessible by aircraft. The last two weeks of October (16–31 October) were restricted to archery hunting (RG875); however, few archers participate in this late archery-only season (Table 6). Likewise, the Twentymile River goat registration hunt (RG878) is also archery only from October 16–31 (Table 6).

Permit Hunts. The number of goat registration and drawing permits issued for Unit 14 ranged from 199 to 251 during this reporting period (Table 6). The number of Unit 14C drawing permits issued is based on the number of goats observed during surveys. During this reporting period the number of Unit 14C drawing permits issued was increased from 8 to 21 permits (Table 6). Thirty-five drawing permits were issued for the eastern portion of Unit 13D each year (Table 7).

Hunter Residency and Success. The majority of goat hunters in Unit 13 are nonlocal residents (Table 8), whereas, the majority of goat hunters in Unit 14 are typically local residents (Table 9).

Success rates from 1997 to 2001 ranged from 20 to 59% in Unit 13D (Table 8) and 25 to 48% in Unit 14 (Table 9). In both units, nonresidents typically experienced higher rates of success than did resident hunters (Tables 8 and 9). Nonresidents are required to be accompanied by a registered guide to hunt goats in Alaska; guided hunters are typically more successful than unguided hunters.

Harvest Chronology. Season dates for Unit 14 registration hunts occur from 1 September–31 October. The percent of harvest occurring in September increased from 46% to 92% during the reporting period (Table 10). In September 2001, only 8% of the goats in Unit 14 were harvested in October. Harvests in Unit 13D were too small to evaluate chronologically; season dates were earlier than Unit 14, occurring from 10 August–20 September.

Weather plays an important role in the timing of hunts. Conditions often deteriorate rapidly during the last weeks of October. Season dates and suitable conditions for hunting other big game species also affect timing of goat hunts.

Transport Methods. In Unit 13D, the majority of successful hunters used airplanes (17–67%) and highway vehicles (17–60%; Table 11). In Unit 14A and the Lake George portion of Unit 14C, aircraft were the primary mode of transport for successful hunters (67–90% in 14A and 96–100% in 14C; Table 12). In the Twentymile River drainage of Unit 14C, airplanes, highway vehicles, and boats are the most common mode of transport, except in years with low water levels when boat access is difficult.

HABITAT

Assessment

Summer habitat quality and availability have not been assessed in Units 13D and 14. High reproductive productivity in the western Chugach goat population and increasing numbers of goats in Unit 14C suggest that goats may still be below carrying capacity in these areas. Winter weather, particularly deep snow and heavy icing, are believed to be the limiting factors in the western Chugach Mountains.

Winter surveys have provided some insight on winter habitat and goat distribution in the survey areas in Unit 14C. However, the data are limited. No direct winter habitat assessments have been conducted.

CONCLUSIONS AND RECOMMENDATIONS

All management objectives were met. We conducted aerial surveys primarily during evening hours when goats were feeding and more easily observed. Because of this, our estimates of the mountain goat population have improved since 1988. This may account, in part, for the substantial increase in the number of goats observed in Unit 14C since 1989. At least 16 goats were harvested in Unit 14C annually during this reporting period, and goat harvests averaged 72% males. With the exception of 1997, less than 7% of observed goats were harvested annually in Unit 14A, and harvests averaged 82% males. Goat season remains closed in the Talkeetna Mountains portion of Unit 14.

No complete surveys were conducted during this reporting period; however, because of the low harvest in Unit 13D and 14A, goats need to be surveyed only every 3 years. In Unit 14C, because of a relatively large harvest, budget limitations, and high goat population, surveys should continue to be conducted at least biennially, unless there is severe winter weather or increased hunting pressure.

The Talkeetna Mountains portions of Units 14A and 14B appear to be marginal goat habitat. Before hunting is allowed in these areas, there should be a minimum observable population of 50 goats and harvest should not exceed 5% of observed goats. Maximum allowable harvest should not exceed 7% of the number of goats observed during surveys in the Chugach Mountains.

Current season and bag limits are appropriate; however, goat populations in Unit 14 need to be monitored closely to prevent overharvesting.

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Table 1 Unit 13D aerial mountain goat composition counts, 1997–2001

Regulatory year	Adults (%)	Kids (%)	Kids: 100 adults	Goats Observed	Goats /hour
1997–1998[a]					
1998–1999[a]					
1999–2000[a]					
2000–2001[a]					
2001–2002[b]	92 (77)	28 (23)	30	120	11.8

[a]No surveys conducted.
[b]Partial survey (count areas 2, 3, and 5).

Table 2 Unit 14A, Chugach Mountains, aerial mountain goat composition counts, 1997–2001

Regulatory year	Adults (%)	Kids (%)	Kids: 100 adults	Total goats observed	Goats /hour
1997–1998[a]					
1998–1999	90 (78)	25 (22)	28	115	8.4
1999–2000[a]					
2000–2001[a]					
2001–2002[a]					

[a] No surveys conducted.

Table 3 Unit 14A and 14B, Talkeetna Mountains, aerial mountain goat composition counts, 1997–2001

Regulatory Year	Adults (%)	Kids (%)	Kids: 100 adults	Total Goats Observed	Goats /hour
1997–1998[a]					
1998–1999[b]	14 (82)	3 (18)	21	17	
1999–2000[c]	14 (88)	2 (12)	14	16	
2000–2001[a]					
2001–2002[a]					

[a] No surveys conducted.
[b] Partial survey (north side of Sheep River, part of Iron Creek, upper Kashwitna, and North Fork Kashwitna).
[c] Partial survey (goats counted incidental to sheep surveys).

Table 4 Unit 14C aerial mountain goat composition counts and estimated population size, 1997–2001[a]

Regulatory Year	Adults	(%)	Kids	(%)	Kids: 100 adults	Total goats observed	Goats /hour	Estimated population size[b]
1997–1998[c]	112	(77)	34	(23)	30	146		
1998–1999[c]	95	(77)	29	(23)	31	124		
1999–2000								
2000–2001[d]	687	(87)	88	(13)	15	687		
2001–2002[c]	204	(83)	42	(17)	21	246		

[a] Data include all goats observed in Unit 14C; S&I reports prior to 1984 included only goats in registration hunt areas.
[b] Based on 80–85% sightability (snow conditions).
[c] Partial survey (goats counted incidental to sheep surveys; Lake George and Twentymile River not counted).
[d.] Partial survey (goats counted incidental to sheep surveys; Complete survey of Lake George; Twentymile River not counted).

Table 5 Annual mountain goat harvest by unit, 1997–2001

Regulatory Year	Unit				Total
	13D[a]	14A[b]	14B[c]	14C[d]	
1997–1998	6	10		38	54
1998–1999	5	7		26	38
1999–2000	10	10		16	36
2000–2001	4	10		22	36
2001–2002	6	2		23	31

[a] Drawing permit only.
[b] Registration permit only.
[c] Closed to mountain goat hunting.
[d] Registration permit only (1994–1995); both registration and drawing permits (1997–1998 to 2001–2002).

Table 6 Unit 14 mountain goat harvest data by permit hunt, 1997–2001.

Area[a]	Regulatory Year	Permits Issued	Percent did not hunt[b]	Percent Unsuccessful Hunters	Percent Successful Hunters	Males (%)		Females (%)		Total harvest
	1997–1998	38	26	64	36	9	(90)	1	(10)	10
RG866	1998–1999	72	50	81	19	6	(86)	1	(14)	7
Unit 14A	1999–2000	71	52	71	29	8	(80)	2	(20)	10
	2000–2001	54	50	63	37	7	(70)	3	(30)	10
	2001–2002	30	63	73	27	0	(0)	3	(100)	3
	1997–1998	3	0	100	0	0	(0)	0	(0)	0
DG852	1998–1999	5	33	50	50	2	(100)	0	(0)	2
Unit 14C	1999–2000	5	0	60	40	0	(0)	2	(100)	2
East Eklutna	2000–2001	5	20	25	75	0	(0)	3	(100)	3
	2001–2002	5	0	60	40	2	(100)	0	(0)	2
DG854[c]	2001–2002	3	0	67	33	0	(0)	1	(100)	1
Unit 14C										
	1997–1998	5	0	0	100	1	(20)	4	(80)	5
DG856	1998–1999	8	38	80	20	0	(0)	1	(100)	1
Unit 14C	1999–2000	8	13	71	29	1	(50)	1	(50)	2
Glacier Ck.	2000–2001	8	0	87	13	1	(100)	0	(0)	1
	2001–2002	8	25	67	33	2	(100)	0	(0)	2
DG858[c]	2001–2002	5	20	75	25	1	(100)	0	(0)	1
Unit 14C										
	1997–1998	82	43	81	19	6	(67)	3	(33)	9
RG868	1998–1999	73	52	80	20	4	(57)	3	(43)	7
Unit 14C	1999–2000	71	52	80	20	7	(100)	0	(0)	7
Twentymile	2000–2001	63	62	87	13	1	(33)	2	(67)	3
River	2001–2002	49	76	92	8	1	(100)	0	(0)	1

Table 6 Continued

Area[a]	Regulatory Year	Permits Issued	Percent did not hunt[b]	Percent Unsuccessful Hunters	Percent Successful Hunters	Males (%)		Females (%)		Total harvest
	1997–1998	71	41	43	57	19	(79)	5	(21)	24
RG869	1998–1999	75	52	56	44	11	(69)	5	(31)	16
Unit 14C	1999–2000	40	48	76	24	3	(60)	2	(40)	5
Lake	2000–2001	82	52	62	38	14	(93)	1	(7)	15
George	2001–2002	61	54	46	54	12	(80)	3	(20)	15
RG878	1997–1998	0								
Unit 14C	1998–1999	1	100	0	0	0	(0)	0	(0)	0
Twentymile	1999–2000	2	50	100	0	0	(0)	0	(0)	0
River	2000–2001	2	50	100	0	0	(0)	0	(0)	0
(archery)	2001–2002	0								
RG879	1997–1998	0								
Unit 14C	1998–1999	1	100	0	0	0	(0)	0	(0)	0
Lake	1999–2000	0								
George	2000–2001	0								
(archery)	2001–2002	0								
Totals	1997–1998	161	40	61	39	26	(68)	12	(32)	38
for all	1998–1999	163	51	67	33	17	(65)	9	(35)	26
Unit 14C	1999–2000	152	55	76	23	11	(69)	5	(31)	16
	2000–2001	160	53	71	29	17	(77)	5	(23)	22
	2001–2002	131	56	62	38	18	(82)	4	(18)	22

Area[a]	Regulatory Year	Permits Issued	Percent did not hunt[b]	Percent Unsuccessful Hunters	Percent Successful Hunters	Males (%)		Females (%)		Total harvest
Totals	1997–1998	199	37	62	38	35	(73)	13	(27)	48
for all	1998–1999	235	51	72	28	23	(70)	10	(30)	33
Unit 14	1999–2000	223	54	75	25	19	(73)	7	(27)	26
	2000–2001	214	52	68	31	24	(75)	8	(25)	32
	2001–2002	161	57	64	36	18	(72)	7	(28)	25

[a] Previous hunt number in parentheses.
[b] Includes permittees who did not report.
[c] New hunt added in 2001–2002.

Table 7 Unit 13D mountain goat harvest data by permit hunt, 1997–2001

Area	Regulatory Year	Permits issued	Percent did not hunt[a]	Percent unsuccessful hunters	Percent successful hunters	Males (%)	Females (%)	Total harvest
DG718	1997–1998	10	20	75	25	1 (50)	1 (50)	2
Unit 13D	1998–1999	10	70	67	33	1 (100)	0 (0)	1
West	1999–2000	10	30	57	43	3 (100)	0 (0)	7
	2000–2001	10	10	89	11	1 (100)	0 (0)	1
	2001–2002	10	60	50	50	2 (100)	0 (0)	2
DG719	1997–1998	25	60	60	40	4 (100)	0 (0)	4
Unit 13D	1998–1999	25	48	69	31	3 (75)	1 (25)	4
East	1999–2000	25	60	30	70	7 (100)	0 (0)	7
	2000–2001	25	14	73	27	2 (67)	1 (33)	3
	2001–2002	25	28	78	22	3 (75)	1 (25)	4
Totals	1997–1998	35	49	67	33	5 (83)	1 (17)	6
For all	1998–1999	35	54	69	31	4 (80)	1 (20)	5
Unit 13D	1999–2000	35	51	41	59	10 (100)	0 (0)	10
	2000–2001	35	43	80	20	3 (75)	1 (25)	4
	2001–2002	35	37	72	27	5 (83)	1 (17)	6

[a] Includes permittees who did not report.

Table 8 Unit 13D mountain goat hunter residency and success, 1997–2001

		Successful				Unsuccessful				
Area	Regulatory year	Local Resident	Nonlocal resident	Nonresident	Total (%)[a]	Local resident	Nonlocal resident	Nonresident	Total (%)[a]	Total Hunters[a]
DG718	1997–1998	0	2	0	2 (25)	2	4	0	6 (75)	8
Unit 13D	1998–1999	0	1	0	1 (33)	0	2	0	2 (60)	3
West	1999–2000	0	3	0	3 (43)	0	4	0	4 (57)	7
	2000–2001	0	0	1	1 (50)	1	0	0	1 (50)	2
	2001–2002	0	1	1	2 (50)	0	2	0	2 (50)	4
DG719	1997–1998	3	0	1	4 (36)	0	5	1	6 (55)	11
Unit 13D	1998–1999	1	2	1	4 (31)	0	9	0	9 (69)	13
East	1999–2000	1	5	1	7 (70)	1	2	0	3 (30)	10
	2000–2001	0	3	0	3 (27)	1	6	1	8 (73)	11
	2001–2002	0	0	4	4 (22)	2	10	2	14 (78)	18
Totals	1997–1998	3	2	1	6 (33)	2	9	1	12 (67)	18
For all	1998–1999	1	3	1	5 (31)	0	11	0	11 (69)	16
Unit 13D	1999–2000	1	8	1	10 (59)	1	6	0	7 (41)	17
	2000–2001	0	3	1	4 (20)	2	6	1	16 (80)	20
	2001–2002	0	1	5	6 (27)	2	12	2	16 (73)	22

[a] Includes hunters with unspecified residency and/or hunters that did not submit a report.

Table 9 Unit 14 mountain goat hunter residency and success, 1997–2001

Area	Regulatory year	Successful				Unsuccessful				Total Hunters[a]
		Local resident	Nonlocal resident	Nonresident	Total (%)[a]	Local resident	Nonlocal resident	Nonresident	Total (%)[a]	
RG866	1997–1998	1	0	3	10 (36)	10	0	1	18 (64)	28
Unit 14A	1998–1999	3	0	4	7 (19)	24	1	4	29 (81)	36
	1999–2000	3	2	5	10 (29)	19	3	2	24 (71)	34
	2000–2001	2	1	7	10 (37)	16	1	0	17 (63)	27
	2001–2002	2	1	0	3 (27)	7	0	1	8 (73)	11
DG852	1997–1998	0	0	0	0 (0)	2	1	0	3 (100)	3
Unit 14C	1998–1999	2	0	0	2 (50)	2	0	0	2 (50)	4
East Eklutna	1999–2000	2	0	0	2 (40)	3	0	0	3 (60)	5
	2000–2001	3	0	0	3 (75)	1	0	0	1 (25)	4
	2001–2002	2	0	0	2 (40)	3	0	0	3 (60)	5
DG854 Unit 14C	2001–2002	1	0	0	1 (33)	2	0	0	2 (67)	3
DG856	1997–1998	5	0	0	5 (100)	0	0	0	0 (0)	5
Unit 14C	1998–1999	1	0	0	1 (20)	4	0	0	4 (80)	5
Glacier Ck.	1999–2000	2	0	0	2 (29)	5	0	0	5 (71)	7
	2000–2001	1	0	0	1 (13)	5	2	0	7 (87)	8
	2001–2002	2	0	0	2 (33)	3	1	0	4 (67)	7
DG858 Unit 14C	2001–2002	0	0	0	1 (25)	0	0	0	3 (75)	4
RG868	1997–1998	9	0	0	9 (19)	36	1	1	38 (81)	47
Unit 14C	1998–1999	6	1	0	7 (20)	25	1	0	28 (80)	35
Twentymile	1999–2000	7	0	0	7 (21)	27	0	0	27 (79)	34
River	2000–2001	3	0	0	3 (13)	21	0	0	21 (87)	24
	2001–2002	1	0	0	1 (8)	11	0	0	11 (92)	12

Area	Regulatory year	Successful				Unsuccessful				Total Hunters[a]
		Local resident	Nonlocal resident	Nonresident	Total (%)[a]	Local resident	Nonlocal resident	Nonresident	Total (%)[a]	
RG869	1997–1998	18	1	5	24 (57)	12	2	4	18 (43)	42
Unit 14C	1998–1999	7	1	7	16 (44)	15	1	2	20 (56)	36
Lake	1999–2000	3	1	1	5 (24)	11	0	4	16 (76)	21
George	2000–2001	4	0	11	15 (38)	23	0	1	24 (62)	39
	2001–2002	2	1	12	15 (54)	10	1	2	13 (13)	28
RG878	1997–1998	0	0	0	0 (0)	0	0	0	0 (0)	0
Twentymile	1998–1999	0	0	0	0 (0)	0	0	0	0 (0)	0
River	1999–2000	0	0	0	0 (0)	1	0	0	1 (100)	1
(archery)	2000–2001	0	0	0	0 (0)	1	0	0	1 (100)	1
	2001–2002	0	0	0	0 (0)	0	0	0	0 (0)	0
RG879	1997–1998	0	0	0	0 (0)	0	0	0	0 (0)	0
Lake	1998–1999	0	0	0	0 (0)	0	0	0	0 (0)	0
George	1999–2000	0	0	0	0 (0)	0	0	0	0 (0)	0
(archery)	2000–2001	0	0	0	0 (0)	0	0	0	0 (0)	0
	2001–2002	0	0	0	0 (0)	0	0	0	0 (0)	0
Totals	1997–1998	32	1	5	38 (39)	50	4	5	59 (61)	97
for all	1998–1999	16	2	7	26 (32)	46	2	2	54 (68)	80
Unit 14C	1999–2000	14	1	1	16 (23)	21	0	4	52 (76)	68
	2000–2001	11	0	11	22 (29)	51	2	1	54 (71)	76
	2001–2002	8	1	12	22 (37)	29	2	2	36 (61)	59
Totals	1997–1998	33	1	8	48 (38)	60	4	6	77 (62)	125
for all	1998–1999	19	2	11	33 (28)	70	3	6	83 (72)	116
Unit 14	1999–2000	17	3	6	25 (25)	40	3	2	76 (74)	102
	2000–2001	13	1	18	32 (31)	67	3	1	71 (69)	103
	2001–2002	10	2	12	25 (35)	36	2	3	44 (63)	70

[a] Includes hunters with unspecified residency.

Table 10 Unit 14 mountain goat harvest chronology percent by month, 1997–2001

Area	Regulatory year	Harvest period						
		August	September	October	November	December	Unknown (*n*)	*n*
Unit 14A	1997–1998	0	56	44	0	0	1	10
	1998–1999	0	57	43	0	0	0	7
	1999–2000	0	70	30	0	0	0	10
	2000–2001	0	100	0	0	0	0	10
	2001–2002	0	100	0	0	0	0	3
Unit 14C	1997–1998	0	44	57	0	0	1	38
	1998–1999	0	6	40	0	0	1	26
	1999–2000	0	63	37	0	0	0	16
	2000–2001	0	77	23	0	0	0	22
	2001–2002	0	91	9	0	0	0	22
Totals for all Unit 14	1997–1998	0	46	54	0	0	2	48
	1998–1999	0	59	41	0	0	1	33
	1999–2000	0	65	35	0	0	0	26
	2000–2001	0	84	16	0	0	0	32
	2001–2002	0	92	8	0	0	0	25

Table 11 Unit 13D successful mountain goat hunter transport methods, 1997–2001

Regulatory year	Percent of harvest							
	Airplane	Horse	Boat	3- or 4-wheeler	Snowmachine	ORV	Highway vehicle	*n*
1997–1998	17	17	33	0	0	0	33	6
1998–1999	40	0	0	0	0	0	60	5
1999–2000	60	0	10	10	0	0	20	10
2000–2001	50	25	0	0	0	0	25	4
2001–2002	67	17	0	0	0	0	17	6

Table 12 Unit 14 successful mountain goat hunter transport methods (registration hunts only), 1997–2001

Area[a]	Regulatory Year	Percent of harvest								*n*
		Airplane	Horse	Boat	3- or 4-wheeler	Snowmachine	ORV	Highway vehicle	Unknown	
RG866	1997–1998	90	0	0	10	0	0	0	0	10
Unit 14A	1998–1999	71	0	14	14	0	0	0	0	7
	1999–2000	80	0	0	20	0	0	0	0	10
	2000–2001	80	0	10	10	0	0	0	0	10
	2001–2002	67	0	0	33	0	0	0	0	3
RG868	1997–1998	44	0	44	0	0	0	0	11	9
Unit 14C	1998–1999	14	0	43	0	0	0	29	14	7
Twentymile	1999–2000	14	0	57	0	0	0	14	14	7
River	2000–2001	67	0	0	0	0	0	33	0	3
	2001–2002	0	0	0	0	0	0	0	100	1
RG869	1997–1998	96	0	0	0	0	0	0	4	24
Unit 14C	1998–1999	100	0	0	0	0	0	0	0	16
Lake	1999–2000	100	0	0	0	0	0	0	0	5
George	2000–2001	100	0	0	0	0	0	0	0	15
	2001–2002	100	0	0	0	0	0	0	0	15
Totals	1997–1998	82	12	0	0	0	0	0	6	33
for all	1998–1999	74	13	0	0	0	0	9	4	23
Unit 14C	1999–2000	50	0	33	0	0	0	8	8	12
	2000–2001	94	0	0	0	0	0	6	0	18
	2001–2002	94	0	0	0	0	0	0	6	16
Totals	1997–1998	84	0	9	2	0	0	0	5	43
for all	1998–1999	73	0	13	3	0	0	7	3	30
Unit 14	1999–2000	64	0	18	9	0	0	5	0	22
	2000–2001	88	0	4	4	0	0	4	0	28
	2001–2002	90	0	0	5	0	0	0	5	19

[a] Archery-only registration hunts 878 and 879 (Twentymile River and Lake George, formerly 881 and 882) had no successful hunters.

The Federal Aid in Wildlife Restoration Program consists of funds from a 10% to 11% manufacturer's excise tax collected from the sales of handguns, sporting rifles, shotguns, ammunition and archery equipment. The Federal Aid program allots funds back to states through a formula based on each state's geographic area and number of paid hunting license holders. Alaska receives a maximum 5% of revenues collected each year. The Alaska Department of Fish and Game uses federal aid funds to help restore, conserve and manage wild birds and mammals to benefit the public. These funds are also used to educate hunters to develop the skills, knowledge and attitudes for responsible hunting.

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