Mountain Goat
Management Report
of Survey-Inventory Activities
1 July 2001–30 June 2003

Cathy Brown, editor
Alaska Department of Fish and Game
Division of Wildlife Conservation
December 2004

Photo by Neil Barten, ADF&G

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

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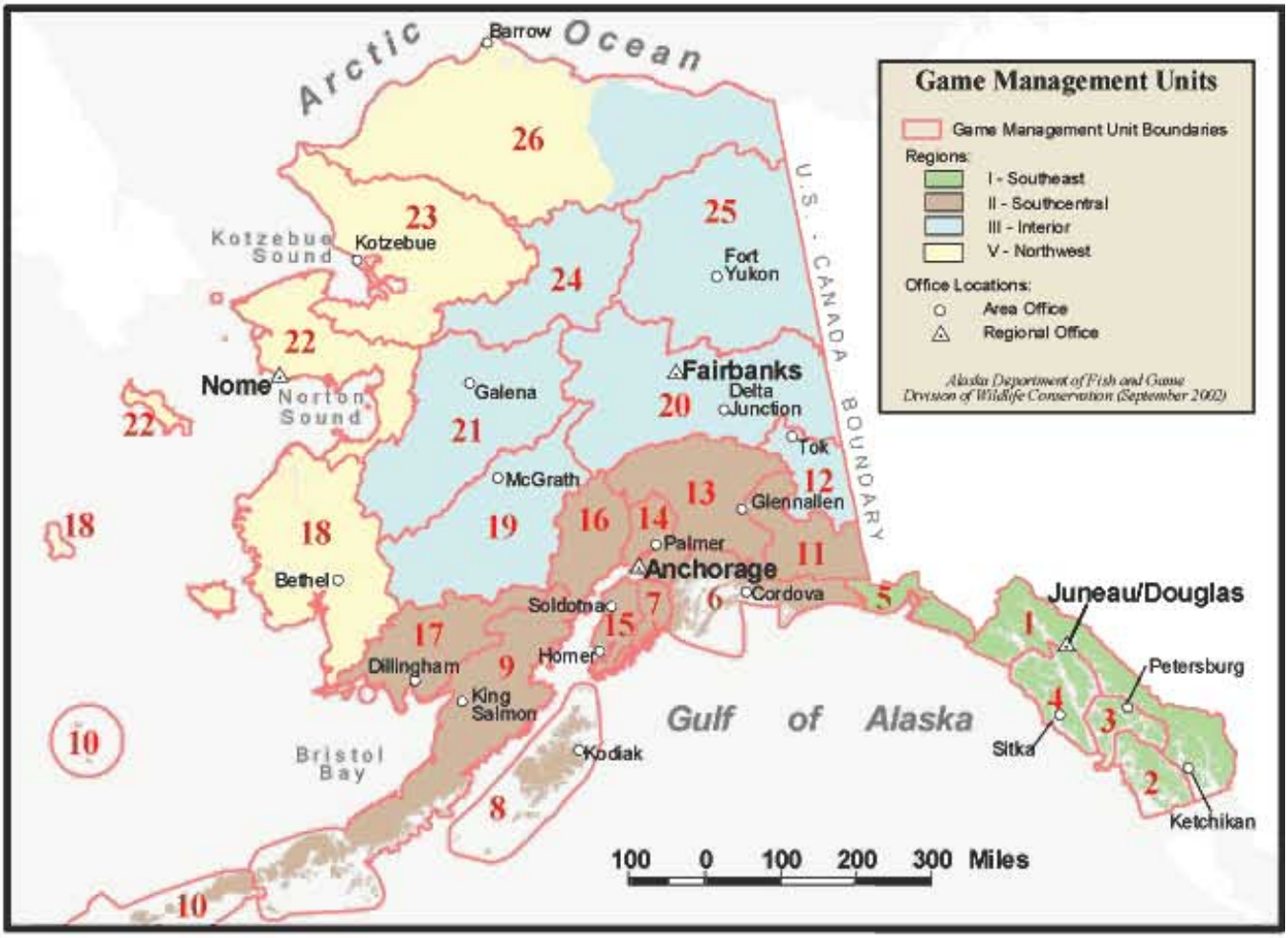
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WILDLIFE MANAGEMENT REPORT

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

MOUNTAIN GOAT MANAGEMENT REPORT

From: 1 July 2001
To: 30 June 2003[a]

LOCATION

GAME MANAGEMENT UNIT: 1A (5000 mi^2)
GEOGRAPHIC DESCRIPTION: Ketchikan area including mainland areas draining into Behm and Portland Canals.

BACKGROUND

Severe winter weather conditions during 1968–1975 resulted in up to 90% reductions in Unit 1A mountain goat (*Oreamnos americanus*) populations (Smith 1984). Subsequent moderating weather enabled populations to recover and we believe they are currently stable at moderate to high levels throughout most of the unit.

Steep glacial valleys and peaks in Unit 1A provide important escape terrain for goats from predating wolves and bears. Alpine vegetation consists of heath fields and provides goats with nutritious forb-sedge meadows. At lower elevations dense stands of old-growth forest provide necessary cover, and shrubs and evergreen forbs provide goats with important foods during critical winter months.

Although goats historically inhabited only the subunit's mainland, they now occur on Revillagigedo (Revilla) Island as a result of introductions to Swan Lake (17 goats) in 1983 (Smith and Nichols 1984) and Upper Mahoney Lake (15 goats) in 1991 (ADF&G unpublished data, Ketchikan). These areas were selected as introduction sites because they appeared to have suitable escape terrain and adequate winter habitat. The Swan Lake population has increased substantially and we believe it now numbers roughly 120–160 goats. This increase resulted in a hunting season in the eastern part of Revilla Island beginning in fall 1993. The Revilla Island harvest has remained low since its inception. Rugged terrain, poor access and frequent inclement weather are believed to be responsible for the continued low harvest.

We estimate that the Upper Mahoney Lake population currently numbers about 100–140 goats. These goats have expanded their range and are currently using most of the suitable goat habitat in this area. This herd is somewhat geographically isolated because access to adjoining suitable habitat would require a substantial move across more than 10 miles of open, low elevation habitat. Recent sightings of goats outside the typical habitat in this area suggest goats are pushing out in search of new territory. At present there is no hunting season for the Mahoney herd; however, ADF&G plans to submit proposals to the state Board of Game (BOG) in November 2004 to allow a limited drawing hunt. ADF&G has concerns about the increasing fixed-wing

[a] 'This unit report also includes data collected outside the reporting period at the discretion of the reporting biologist.

aircraft and helicopter traffic near this introduced herd. The potential threat from aircraft disturbance was noted prior to the transplant. We will continue to educate the Ketchikan public, particularly the local air carriers, about disturbance-related stress and its potential effect on goats. Frid (1997) found that although some habituation to disturbance such as aircraft likely occurs in most situations, there is no evidence suggesting habituation occurs enough to eliminate potential impacts of intense, chronic disturbance on reproductive success. Recruitment in this herd has been steady with high kid counts during the past 4 years (2000–2003) ranging from 28–40 kids per 100 adults. A total of 5 sets of twins were observed during the 2001 count.

Hunter harvests from Unit 1A averaged roughly 45 goats each season during 1972–1988. The average annual harvest dropped to about 25 during the past 9 seasons as a result of 1989 legislation requiring nonresident goat hunters to hire a registered guide. Cyclic and unpredictable weather severity, healthy predator populations, and density-related over-foraging of habitat are believed to be more influential than hunting in modifying this unit's goat populations.

To monitor population changes caused by winter weather, over-foraging, and predation, the department completes aerial surveys of established trend count areas (TCAs) annually or biannually during late summer and fall. Typically in Unit 1A that means about half of the 14 TCAs are counted during any given year. Although we believe survey results generally reflect population trends, we have found that weather conditions immediately prior to and during surveys can greatly influence our ability to observe goats and to accurately estimate herd size. Nichols (1980) found when properly done, fixed wing counts made under good conditions (i.e., overcast skies, soft light, no turbulence) in early to midsummer, included about 90 percent of the goats found from ground or helicopter surveys. Results were lower and more inconsistent when made on clear, sunny days because of glare and because some goats were hidden from observers. Some observers believe that helicopter and ground counts provide the optimal estimate of actual numbers. However, the cost and logistics of such measures make them impractical in most areas of Alaska.

Goat sightability is an important factor in estimating the actual number present, or in determining trends based on goats observed during aerial surveys. For example, in Southeast Alaska and British Columbia, where goats spend considerable time in forested habitats (Schoen and Kirchhoff 1982, Fox 1983, Smith 1983, Herbert and Turnbull 1977, Foster 1982), goat sightability is generally low. Foster (1982) reported an average sightability of only 42% for ground surveys in west central British Columbia. From fixed-wing aircraft even when aided by telemetry, Smith (1983) averaged only 30% sightability in coastal Southeast Alaska. Smith (1983) also compared fixed-wing aircraft surveys with helicopter counts of the same area with similar results. This same study estimated the density of goats in Unit 1A at 1.0–2.3 goats/km^2.

MANAGEMENT DIRECTION

Management Objectives

1. Maintain goat population densities that provide greater than 20 goats per hour of survey time during fall surveys, and when not achieved, determine probable causes.

2. Survey goats often in established trend count areas throughout Unit 1A.

3. Monitor sex composition of the harvest and manage for < 6 points per 100 goats using a weighted harvest point system (males = 1 point, females = 2 points).

METHODS

We attempt to survey at least 6 of the unit's 14 established TCAs each fall as weather and work schedules allow. TCAs vary in size from 23–200 mi^2. We generally initiate surveys during late August or September, and begin daily efforts from 0500–0800 or 1700–1900 hours. We use a PA-18 Supercub on floats with a pilot and one observer flown at an altitude of 200–300 feet above the ground. Both the pilot and observer search for goats and the observer records observations on a 1:63,360 topographic map. We classify goats as either adults or kids, and make no effort to ascertain sex or distinguish other age groups. We also record the number of sets of twin kids associated with female goats.

We obtain harvest information through a mandatory hunt report that is part of a required registration permit. Information collected includes the areas and numbers of days hunted, hunter success, dates of hunts and kills, transport methods, and commercial services used.

A weighted point system is applied to the 3-year running average of the annual harvest to determine a guideline harvest level. Points are weighted more heavily for females (2 points) than for males (1 point). Using the number of goats observed during annual fall surveys, we apply a harvest cap (6 harvest points per 100 adult goats observed during years with average weather) using a 3-year running average. Hunt areas that reach the harvest cap are closed by emergency order. Smith (1983**)** stressed the need to monitor both short- and long-term environmental fluctuations and subsequent variations in population parameters to assist in making management decisions. Average annual recruitment for Alaska goat populations is estimated to be approximately 4 to 6 percent per year. If we sustain a severe winter we would assume that some animals die during the winter and consequently less animals would be available for the following hunting season. Using the 6 points per 100 goats on a 3-year running average, and carefully monitoring environmental conditions throughout the unit ensures we are not over harvesting goats.

RESULTS AND DISCUSSION

POPULATION STATUS AND TREND

During fall 2001 we completed aerial surveys in the 7 following TCAs: K-3 Rudyerd Bay to Smeaton Arm, K-4 Wilson Arm to Boca De Quadra, K-5 Marten Arm to Portland Canal, K-6 Cleveland Peninsula, K-7 Yes Bay/Reflection Lake, K-9 Chickamin River to 2722, and K-13 Mahoney Mountain. (Table 1). We observed 517 goats in about 9 hours of flying, or 60 goats/hour. The ratio of 27 kids per 100 adults was similar to the 10-year average.

During fall 2002 with exceptionally good flying weather during the survey period we completed aerial surveys in the following 9 TCAs: K-4 Wilson Arm to Boca de Quadra, K-5 Marten Arm to Portland Canal, K-6 Cleveland Peninsula, K-7 Yes Bay to Bradfield Canal, K-9 Chickamin River to 2722, K-12A Mirror Lake to Swan Lake, K-12B Swan Lake/Mt. Reid, K13 Deer Mountain to Mahoney Peak, and K-14 South end of Boca de Quadra to Portland Canal (Table 1). We observed 553 goats in about 8 survey hours. Our observation rate of 72 goats per hour was up from the previous year, and the highest enumeration rate since 1990. However, this rate is

slightly below the long-term 20-year average of 79 goats per hour. The 2002 ratio of 35 kids per 100 adults was higher than the 10-year average ($\bar{x}$ =28:100).

The Deer Mountain, the second of 2 areas where goats were introduced, continues to grow and recruitment looks good with 87 total goats observed in 2001, including 23 kids and 5 sets of twins. The 2001 survey resulted in an encounter rate of 174 goats per hour. The 2003 survey count of 86 total goats, including 19 kids, shows a stable goat population in this new area (Table 2). The 2003 encounter rate was similar at 172 goats per hour of flying. The 2002 count was lower (85 goats/hour) but survey conditions during this flight were not as good. We believe goat populations elsewhere in the subunit remained relatively stable during this report period.

Population Size

Results of aerial mountain goat surveys can only be interpreted as minimum population values (Ballard 1975). We developed population estimates for goats inhabiting Unit 1A using survey data (ADF&G Unpublished report, 1990, Ketchikan) and the sightability correction factor developed by Smith and Bovee (1984). To derive our estimate, we first delineated the percentage of each Wildlife Analysis Area (WAA) that we believed contained suitable goat habitat. We then applied our survey-derived estimate of 1.27 goats/mi^2 to these areas, which resulted in a mainland estimate of 7300–10,200 goats (ADF&G unpublished report, 1990, Ketchikan). In the absence of any new information, we believe this is the best estimate available for Unit 1A goat numbers.

Population Composition

The 2001 and 2002 surveys resulted in an overall productivity estimate for Unit 1A of 27 and 30 kids/100 adults, respectively. The ratios are not directly comparable to overall productivity in Unit 1A because different areas were surveyed each year. Observed productivity varied among TCAs from 17–46 kids per 100 adults during this report period with a 10-year annual average of 28 kids per 100 adults (Table 1).

Distribution and Movements

Radio collars from the previous introductions to Unit 1A are no longer transmitting and no new goats have been captured to provide additional movement or distribution data. Two female goats from the original introduction site near Mahoney Peak were still carrying radio collars and ear tags during observations in 2000 and 2001 and appear to be in good health, considering both nannies are now between 15 and 18 years of age. One of the female goats was accompanied by a young of the year kid. Unfortunately, the tag numbers have worn off making them unreadable and hence unidentifiable.

Mortality

Season and Bag Limit	Resident and nonresident hunters
Unit 1(A), Revillagigedo Island, except that portion west of Carroll Inlet and Creek, west of	1 Aug–31 Dec

the divide between Carroll Creek and the south fork of Orchard Creek, south of Orchard Creek, Orchard Lake, Shrimp Bay, and Gedney Pass	
1 goat by registration permit only	
Unit 1A, remainder of Revillagigedo Island	No open season
Remainder of Unit 1(A)	

Board of Game Actions and Emergency Orders. During fall 2001 we issued an emergency order closure for goat hunting on the Cleveland Peninsula, including subunits 1A and 1B south of a line between Sunny Bay and Yes Bay. Goats in this area are distributed over a large area and occur in very small, isolated groups. The nature of the landscape makes migration of goats from other areas highly unlikely. Goats on the Cleveland Peninsula have historically occurred at low densities, and harvest during the past several years has reduced numbers even lower. Wildlife biologists conducted several aerial surveys of this area during September and October 2001. Low counts during these surveys and data from the past 4 years raise concerns about the health and viability of this goat population. Between 1995 and 2000 hunters harvested a total of 15 goats from this area, including 6 females. Biologists believe that continuing the general hunting season in this area is not warranted due to the low number of goats, and the harvest of any additional goats could be detrimental to the population. Smith and Raedeke (1982) described the vulnerability of this isolated goat population on the Cleveland Peninsula, the fragmented habitat, and the potential for periodic local extinction. This portion of Unit 1A remains closed to hunting after a BOG action in 2002.

During the fall 2002 the BOG reduced the bag limit for goats in Unit 1A from 2 goats to 1 per season. This change to a 1-goat bag limit makes Unit 1A consistent with all other game management units in the state.

Hunter Harvest. (Table 3) One-hundred-thirty-two permits and 123 permits were issued for Unit 1A during 2001 and 2002, respectively. Of these, 52 permittees actually hunted during 2001 and 52 hunted during 2002. Fifty-two hunters killed 22 goats in 2001 and 52 hunters killed 16 goats during the 2002 seasons. The harvest during the past 2 years has been well within the 10-year average of 25 goats (range 9–51).

Successful hunters spent an average of 3.4 days to kill a goat during the 2001 season (range 1–6) and 3.2 days to kill a goat during the 2002 (range 1–11 days).

Permit Hunts. Goat hunting in Unit 1A has been regulated by registration permits for the past 21 years. During 1982–1993, a second permit was available for hunters who killed a goat and returned their first hunt report. Just prior to the 1994 season this was changed so that hunters could harvest up to 2 goats during a single hunt in most of the subunit. The regulation was changed in 2002 to reduce the bag limit from 2 goats per season to 1, making this area consistent with all other management units in the state.

Hunter Residency and Success. Eight nonresidents hunted goats successfully in Unit 1A during 2001, and seven nonresidents killed goats during 2002 (Table 4). Forty-one and 38% of the 2001 and 2002 harvests, respectively, were by hunters residing within the subunit. Alaska residents composed 59% of the 2001 harvest and 51% of the 2002 harvest. Overall hunter success during 2001 was 42%, and in 2002 was 31% (Table 4). Successful nonresident hunters spent more time than residents to kill a goat during both years.

Fifty-two hunters actually went afield during each of the 2001 and 2002 seasons. This was the lowest number of hunters in the field on record and was well below the long term average of 86 (range 52-126). There were likely several reasons to explain the lack of hunter participation during the 2001 season including poor weather conditions for flying into hunting areas and a slow but steady downturn in the economy leaving many hunters with less disposable income.

Harvest Chronology. During average years the majority of the goat harvest is split between August and September with a few taken during October depending on weather patterns. During 2001 the harvest was evenly distributed over the prime three months while hunters during the 2002 season were more successful in September and October (Table 5).

Transport Methods Airplanes accounted for 78% and 75% of the transportation used by successful hunters during the past two seasons (Table 6). Airplanes accounted for 78% of the transportation used by Unit 1A hunters during the past 5 seasons (range 73-83%). Many alpine lakes in this area make it possible for hunters to land floatplanes and begin their hunt above timberline near goat habitat. The balance of hunters used boats to access hunting areas.

Other Mortality

Cyclic and unpredictable weather and healthy predator populations, including black and brown bears and wolves, are believed to be more influential than hunting in modifying the subunit's goat populations. Bears kill young or very old goats during a portion of the year, while wolves are capable of preying on all age classes of animals during the entire year. When deep snows displace goats from alpine and sub-alpine habitats, they are more vulnerable to predation as they seek refuge at lower elevations in old-growth forest where food and escape habitat is much more limited. Deer numbers are low throughout most of Unit 1A, leaving goats as alternative prey for wolves. Avalanches and snow slides also account for some goat mortality during years of heavy snowfall. No evidence of orf or other disease was observed by staff or by hunters during this report period.

CONCLUSIONS AND RECOMMENDATIONS

As a result of state legislation that took effect in 1989, all nonresident goat hunters are required to be accompanied by a registered guide or by an Alaska resident over 19 years of age who is

within the second degree of kindred. This law has markedly reduced nonresident participation in the unit's goat hunting. However, at least 3 registered guides have established use areas within the unit, and we anticipate increased nonresident hunter participation. A total of 15 nonresidents hunted goats in Unit 1A during the 2002 season and 7 of those were successful. This is the highest nonresident hunter participation since the inception of the guide requirement in 1989.

The 1991 Upper Mahoney Lake goat introduction appears to have been a success. Productivity remains high and the herd has increased from the original 15 to at least 87 goats in fall 2001. We have established a trend count area in the vicinity of Deer Mountain/Upper Mahoney Lake (K-13), which we will periodically survey along with the other TCAs in the unit. We anticipate going to the BOG in fall 2004 with a proposal to open the season in this area to a limited number of drawing permits.

Mountain goat populations appear to be stable throughout most of Unit 1A. Several areas we will be watching closely are the Cleveland Peninsula and Yes Bay. These 2 adjacent areas south of the Bradfield Canal will be surveyed annually during the next few years. Recent low counts around Yes Bay/Reflection Lake on the northern Cleveland Peninsula are probably the result of predation and overbrowsing of winter habitat rather than hunter harvest. High productivity observed during recent surveys suggests that the population in the Yes Bay area may be slowly rebounding. Our objective of maintaining goat densities greater than 20 goats per hour of survey time has consistently been met.

In February 2002, Region I Division of Wildlife Conservation wildlife managers met in Ketchikan to review existing goat management objectives. As a result of that meeting, revised objectives will be put in place for the region.

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Table 1 Unit 1A mountain goat survey data, 1968–2002

Survey dates[a]	Nr Kids	Nr. Adults	*Total Goats*	Kids-100 Adults	Count Time (hrs.)	Goats/ hour
Aug. 20–Sept. 18, 1968	162	553	715	29	4.9	146
Sept. 1–Sept. 16, 1971	111	357	468	31	3.9	120
Aug. 16–Sept. 16, 1973	35	149	184	23	2.5	74
Aug. 27–Sept. 21, 1974	14	50	64	28	1.8	35
Aug. 12–Sept. 11, 1975	84	270	354	31	7.6	46
Sept. 1–Sept. 11, 1976	73	283	356	26	8.0	44
Aug. 31–Sept. 6, 1977	165	354	519	47	6.3	82
Sept. 5–Sept. 9, 1978	126	404	530	31	5.2	102
Sept. 18–Sept. 21, 1979	62	238	300	26	3.8	79
Aug. 20–Sept. 12, 1980	215	617	832	35	9.6	87
Aug. 26–Sept. 21, 1981	153	461	614	33	6.0	102
Aug. 29–Sept. 18, 1982	167	515	682	32	6.9	99
Aug. 30–Sept. 23, 1983	177	658	835	27	7.5	111
Sept. 5–Sept. 24, 1984	174	666	840	26	7.1	118
Sept. 9–Sept. 26, 1985	75	311	386	24	3.3	117
Sept. 12–Sept. 15, 1986	64	359	423	18	4.0	106
Sept. 23–Oct. 8, 1987	39	182	221	21	2.0	110
Sept. 3–Sept. 19, 1988	104	304	408	34	4.4	93
Sept. 10–Sept. 13, 1989	124	415	539	30	5.5	98
Sept. 6–Oct. 3, 1990	193	603	796	32	9.3	85
Aug. 30–Sept. 5, 1993	47	163	210	29	6.8	31
Sept. 8–Oct. 1, 1994[b]	81	414	495	19	8.8	56
Aug. 28–Sept. 4, 1995	55	290	345	19	8.7	40
Sept. 3–Sept. 30, 1996	112	309	421	36	10.6	40
Sept. 9–Sept. 29, 1997	147	551	698	37	12.0	46
Sept. 13–Sept. 21, 1998	102	450	552	40	10.4	53

Survey dates[a]	Nr Kids	Nr. Adults	*Total Goats*	Kids-100 Adults	Count Time (hrs.)	Goats/ hour
Sept. 12–Sept. 27, 1999	56	377	423	15	7.8	44
Aug. 23–Oct. 4, 2000	79	356	435	22	7.1	61
July 24–Oct 11, 2001	130	487	517	27	8.6	60
Aug 24–Oct 10, 2002	116	439	533	35	7.7	72
Average	108	374	468	27	8.0	72

[a]Most comparable data is from 1975–2002.

[b]Includes a 48-minute survey of the Deer Mountain/Upper Mahoney Lake introduced population on September 8. Fourteen adults and 4 kids were observed

Table 2 Unit 1A mountain goat trend count area surveys, 1980–2002

Survey area	Year	Adults	Kids	Total goats	Survey time (hrs)	Goats observed/hr	Kids: 100 adults	Sets of twins
K-3								
	2001	86	27	113	1.8			
	2000	60	13	73	1.5	48	22	0
	1999	114	13	127	1.5	85	9	0
	1995	105	28	133	2.0	66	26	0
	1982	26	10	36	0.5	72	38	3
	1980	42	11	53	1.5	35	26	0
K-4								
	2002	54	14	68	0.9	76	26	0
	2001	56	10	66	1.1	66	18	0
	2000	73	10	83	1.0	83	14	2
	1999	29	6	35	.9	38	21	0
	1998	65	17	82	1.2	68	26	1
	1997	78	24	102	1.1	93	31	1
	1994	49	10	59	1.1	54	20	0
	1993	21	6	27	0.6	45	28	0
	1990	71	26	97	0.9	108	37	3
	1989	59	19	78	0.9	87	32	1
	1988	17	4	21	0.7	30	24	0
	1987	69	17	86	0.8	107	25	0
	1985	24	3	27	0.9	30	13	0
	1984	76	22	98	0.9	109	29	2
	1983	88	26	114	1.1	104	30	5

Table 2 continued

Survey area	Year	Adults	Kids	Total goats	Survey time (hrs)	Goats observed/hr	Kids: 100 adults	Sets of twins
	1982	64	23	87	1.0	87	36	0
	1981	68	27	95	0.8	119	40	4
	1980	35	18	53	0.7	76	51	1
K-5								
	2003	101	40	141	1.9	74	40	3
	2002	150	26	176	1.5	117	17	2
	2001	182	45	227	1.9	119	25	1
	2000	14	3	17	1.0	17	21	0
	1999	149	16	165	1.3	127	11	2
	1998	158	36	194	2.0	97	23	3
	1997	283	71	354	1.9	186	25	2
	1994	189	40	229	2.5	92	21	1
	1990	153	46	199	2.0	99	30	2
	1989	59	19	78	0.9	87	32	1
	1988	93	29	122	1.3	94	31	0
	1986	148	24	172	1.2	143	16	1
	1985	99	21	120	1.0	120	21	0
	1984	153	46	199	1.5	133	30	1
	1983	173	47	220	2.0	110	27	2
	1982	118	48	166	1.6	104	41	5
	1981	145	47	192	1.8	107	32	5
	1980	116	35	151	2.1	72	30	4

Table 2 continued

Survey area	Year	Adults	Kids	Total goats	Survey time (hrs)	Goats observed/hr	Kids: 100 adults	Sets of twins
K-6								
	2003	10	7	17	1.0	17	70	0
	2001	8	2	10	1.0	10	25	0
	2000	14	3	17	1.0	17	21	0
	1997	18	7	25	1.7	15	39	0
	1996	18	6	24	1.5	16	33	0
K-7								
	2003	60	26	76	2.0	38	43	2
	2002	57	15	72	1.5	48	26	1
	2001	58	15	73	1.4	52	26	0
	1999	46	12	58	1.9	31	26	0
	1998	43	6	49	2.0	25	14	0
	1997	49	12	61	2.3	26	24	0
	1996	65	25	90	2.5	36	38	1
	1995	22	2	24	2.2	11	9	0
	1994	82	12	94	2.6	36	15	0
	1993a	68	18	86	2.5	34	26	0
	1990	166	62	228	2.0	114	37	2
	1984	117	30	147	1.8	82	26	0
	1983	131	37	168	1.8	93	28	1
	1980	128	36	164	1.8	91	28	2

Table 2 continued

Survey area	Year	Adults	Kids	Total goats	Survey time (hrs)	Goats observed/hr	Kids: 100 adults	Sets of twins
K-8								
	1999	17	4	21	1.9	11	24	0
	1997	46	15	61	2.2	28	33	0
	1982b	52	13	65	0.7	89	25	0
K-9								
	2003	19	5	24	0.9	27	26	1
	2002	37	7	44	1.3	35	19	0
	2001	29	6	35	1.0	34	21	2
	1999	29	3	32	1.5	21	10	0
	1998	17	4	21	1.9	11	24	0
	1996	44	12	56	1.7	33	27	0
	1995	47	6	53	1.7	31	13	0
	1993a	48	20	68	2.2	31	42	1
	1990	81	22	103	1.5	69	27	1
	1989	94	33	127	1.4	91	35	2
	1988	119	46	165	1.3	127	39	1
	1986	106	21	127	1.4	91	20	0
	1985	92	24	116	1.1	105	26	1
	1984	138	19	157	1.4	112	14	0
	1983	146	37	183	1.6	114	25	0
	1982	104	25	129	1.3	99	24	0
	1981	100	39	139	1.8	77	39	4
	1980	158	66	224	1.8	124	42	4

Table 2 continued

Survey area	Year	Adults	Kids	Total goats	Survey time (hrs)	Goats observed/hr	Kids: 100 adults	Sets of twins
K-10								
	1998	20	3	23	1.1	21	15	0
	1996	52	14	66	1.2	55	27	0
	1994	63	10	73	1.4	52	16	0
	1993a	21	3	24	1.2	20	14	0
	1990	86	22	108	0.9	120	26	2
	1989	66	13	79	1.1	72	20	0
	1988	70	23	93	0.9	103	33	0
	1987	92	18	100	1.0	100	20	0
	1986	75	12	87	1.1	79	16	0
	1985	120	30	150	1.1	136	25	2
	1984	150	47	197	1.2	164	31	2
	1983	88	26	114	1.0	114	30	5
	1982	99	26	125	1.2	104	26	2
	1981	119	33	152	1.2	127	28	1
	1980	116	42	158	1.5	105	36	4
K-11								
	1997	6	0	6	0.3	20	0	0
	1996	12	2	14	0.3	47	17	0
	1995	20	2	22	0.3	73	10	1
	1994	17	5	22	0.4	55	29	1
	1993a	5	0	5	0.2	25	0	0
	1990	15	2	17	0.3	57	13	0
	1989	21	4	25	0.4	62	19	0

Table 2 continued

Survey area	Year	Adults	Kids	Total goats	Survey time (hrs)	Goats observed/hr	Kids: 100 adults	Sets of twins
	1987	21	4	25	0.3	83	19	0
	1986	30	7	37	0.3	123	23	0
	1984	32	10	42	0.4	105	31	1
	1982	20	8	28	0.2	140	40	0
	1981	29	7	36	0.3	120	24	0
	1980	22	7	29	0.3	97	32	1
K-12A								
	2003	54	30	84	0.8	112	56	2
	2002	21	8	29	0.3	97	38	2
	2000	26	7	37	0.8	32	19	0
	1998	27	12	39	0.5	78	44	1
	1996	18	5	23	0.8	31	28	0
	1995	32	4	36	0.7	51	12	0
	1992	27	7	34	0.4	79	26	0
K-12B								
	2002	35	16	51	0.5	102	46	0
	2000	76	21	87	1.2	41	28	0
	1998b	62	12	74	1.3	57	19	0
	1996	74	35	109	1.6	68	47	6
	1995	64	13	77	1.8	43	20	1
	1992	35	15	50	1.5	33	43	3
	1991	18	7	25	--	--	39	--
	1990	20	9	29	1.1	26	45	2
	1988	29	14	43	1.2	36	33	2

Table 2 continued

Survey area	Year	Adults	Kids	Total goats	Survey time (hrs)	Goats observed/hr	Kids: 100 adults	Sets of twins
K-13e								
	2003	67	19	86	0.5	172	28	1
	2002	46	18	64	0.8	85	39	0
	2001	64	23	87	0.5	174	36	5
	2000	35	14	49	0.4	136	40	0
	1999	22	5	27	0.3	82	23	0
	1998	46	13	59	0.8	79	28	1
	1997	35	13	48	1.1	44	37	1
	1996	26	13	39	1.0	39	50	0
	1994	14	4	18	0.8	23	28	0
K-14								
	2000	72	61	11	1.2	60	18	0
	2001							
	2002	42	35	9	1	42	26	0

[a] Extended hot weather suspected of keeping goats in low-elevation shade.
[b] Incomplete survey.
[c] Swan Lake introduced population.
[d] Surveys were done using a Bell 206 Jet Ranger helicopter.
[e] Upper Mahoney Lake introduced population.

Table 3 Unit 1A mountain goat harvest data by permit hunt, regulatory years 1985–2002

Hunt	Regulatory year	Permits issued[a]	Did not hunt	Unsuccessful hunters	Successful hunters	Harvest						Total harvest
						Males	(%)	Females	(%)	Unk	(%)	
RG001	1985–1986	261	122	88	51	29	(57)	22	(43)	0	(0)	51
	1986–1987	244	122	71	51	16	(31)	33	(65)	2	(4)	51
	1987–1988	195	107	61	27	14	(52)	3	(48)	0	(0)	27
	1988–1989	202	78	78	33	14	(42)	19	(58)	0	(0)	33
	1989–1990	182[b]	87	66	23	14	(16)	9	(39)	0	(0)	23
	1990–1991	208[c]	91	76	20	14	(70)	6	(30)	0	(0)	20
	1991–1992	245[d]	127	80	16	10	(63)	5	(31)	1	(6)	16
	1992–1993	246	120	76	23	17	(74)	6	(26)	0	(0)	23
	1993–1994	299	197	52	33	20	(61)	13	(39)	0	(0)	33
	1994–1995[c]	215	135	55	20[f]	11	(55)	9	(45)	0	(0)	20
	1995–1996	201	112	54	24[g]	14	(58)	10	(42)	0	(0)	24
	1996–1997	171	91	48	22	14	(64)	8	(36)	0	(0)	22
	1997–1998	177	82	51	36[h]	17	(47)	19	(53)	0	(0)	36
	1998–1999	205[b]	91	65	33[i]	20	(61)	13	(39)	0	(0)	33
	1999–2000	174	94	56	9	5	(56)	4	(44)	0	(0)	9
	2000–2001	154	86	31	24[f]	14	(58)	10	(42)	0	(0)	24
	2001–2002	132	80	25	25	17	(77)	5	(23)	0	(0)	22
	2002–2003	123	71	36	16[j]	8	(50)	8	(50)	0	(0)	16
	Average	191	105	50	25	15	(49)	9	(33)	0	0	25

[a]Total permits issued does not include the Unit 1B portion of the hunt and exceeds the total for "did not hunt," "unsuccessful hunters," and "successful hunters" categories.

[b] One permit not returned.

[c] Three permits not returned.

[d] Four permits not returned.

[e] Regulation changed; hunters could take 2 goats during a single hunt.

[f] Two hunters killed 2 goats (18 hunters killed 20 goats).

[g] One hunter killed 2 goats (23 hunters killed 24 goats).

[h] Five hunters killed 2 goats (31 hunters killed 36 goats).

[i] Four hunters killed 2 goats (29 hunters killed 33 goats).

[j.] Regulation changed; bag limit reduced to 1 goat per season.

Table 4 Unit 1A mountain goat hunter residency and success, regulatory years 1985–2002

	Successful					Unsuccessful					
Regulatory year	Local[a] resident	Nonlocal resident	Nonresident	Total	(%)	Local[a] resident	Nonlocal resident	Nonresident	Total	(%)	Total hunters
1985–1986		30	21	51	(37)		67	21	88	(63)	139
1986–1987		39	12	51	(42)		48	23	71	(58)	122
1987–1988	15	0	12	27	(31)	44	3	14	61	(69)	88
1988–1989	19	0	14	33	(33)	35	0	31	66	(67)	99
1989–1990	18	4	1	23	(26)	49	16	1	66	(74)	89
1990–1991	17	3	0	20	(20)	75	6	0	81	(80)	101
1991–1992	15	1	0	16	(17)	73	7	0	80	(83)	96
1992–1993	17	5	1	23	(23)	67	8	1	76	(77)	99
1993–1994	29	4	0	33	(39)	50	2	0	52	(61)	85
1994–1995	15	3	2	20	(27)	45	9	1	55	(73)	75
1995–1996	18	6	0	24	(31)	38	14	2	54	(69)	78
1996–1997	14	8	0	22	(31)	30	15	3	48	(69)	70
1997–1998	24	10	2	36	(41)	40	8	3	51	(59)	87
1998–1999	21	8	4	33	(34)	51	10	4	65	(66)	98
1999–2000	4	3	2	9	(14)	41	6	9	56	(86)	65
2000–2001	9	7	11	27	(49)	24	4	3	31	(51)	58
2001–2002	9	4	9	22	(50)	17	2	3	22	(50)	44
2002–2003	6	3	7	16	(31)	20	7	8	35	(69)	51
Average	16	8	5	27	(23)	44	13	7	59	(55)	86

[a] Local and nonlocal residents combined during 1985 and 1986. Local resident hunters reside in Unit 1A.

Table 5 Unit 1A goat harvest chronology percent by month, 1985 through 2002

Regulatory year	Aug	(%)	*Sep*	(%)	Oct	(%)	Nov	(%)	Dec	(%)	Unk	(%)	n
1985–1986	7	(14)	25	(49)	15	(29)	0	(0)	4	(8)	0	(0)	51
1986–1987	8	(16)	30	(59)	4	(8)	1	(2)	8	(16)	0	(0)	51
1987–1988	9	(33)	8	(30)	6	(22)	3	(11)	1	(4)	0	(0)	27
1988–1989	8	(24)	19	(58)	5	(15)	1	(3)	0	(0)	0	(0)	33
1989–1990	4	(17)	7	(31)	4	(17)	3	(13)	5	(22)	0	(0)	23
1990–1991	9	(45)	8	(40)	2	(10)	1	(5)	0	(0)	0	(0)	20
1991–1992	5	(31)	3	(19)	4	(25)	1	(6)	3	(19)	0	(0)	16
1992–1993	7	(31)	6	(26)	6	(26)	4	(17)	0	(0)	0	(0)	23
1993–1994	5	(15)	15	(46)	9	(27)	0	(0)	4	(12)	0	(0)	33
1994–1995	1	(5)	13	(65)	6	(30)	0	(0)	0	(0)	0	(0)	20
1995–1996	3	(13)	19	(79)	2	(8)	0	(0)	0	(0)	0	(0)	24
1996–1997	5	(23)	15	(68)	2	(9)	0	(0)	0	(0)	0	(0)	22
1997–1998	13	(36)	13	(36)	7	(20)	3	(8)	0	(0)	0	(0)	36
1998–1999	8	(25)	12	(36)	11	(33)	1	(3)	1	(3)	0	(0)	33
1999–2000	5	(56)	2	(22)	2	(22)	0	(0)	0	(0)	0	(0)	9
2000–2001	4	(17)	7	(29)	9	(38)	1	(4)	3	(12)	0	(0)	24
2001–2002	7	(32)	10	(45)	5	(23)	0	(0)	0	(0)	0	(0)	22
2002–2003	3	(19)	8	(50)	3	(19)	2	(13)	0	(0)	0	(0)	16
Average	6	9	12	33	6	17	1	3	2	5	0	0	27

Table 6 Unit 1A mountain goat harvest percent by transport method, regulatory years 1985–2002

Regulatory year	Harvest percent by transport method								
	Airplane	Air (%)	Boat	Boat (%)	Dog sled	Sled (%)	Unk	Unk.(%)	n
1985–1986	46	(90)	5	(10)	0	(0)	0	(0)	51
1986–1987	42	(82)	9	(18)	0	(0)	0	(0)	51
1987–1988	17	(63)	10	(37)	0	(0)	0	(0)	27
1988–1989	28	(85)	5	(15)	0	(0)	0	(0)	33
1989–1990	11	(48)	12	(52)	0	(0)	0	(0)	23
1990–1991	12	(60)	8	(40)	0	(0)	0	(0)	20
1991–1992	8	(50)	8	(50)	0	(0)	0	(0)	16
1992–1993	20	(87)	3	(13)	0	(0)	0	(0)	23
1993–1994	23	(70)	10	(30)	0	(0)	0	(0)	33
1994–1995	14	(70)	6	(30)	0	(0)	0	(0)	20
1995–1996	21	(88)	3	(12)	0	(0)	0	(0)	24
1996–1997	18	(82)	2	(9)	2	(9)	0	(0)	22
1997–1998	30	(83)	6	(17)	0	(0)	0	(0)	36
1998–1999	24	(73)	9	(27)	0	(0)	0	(0)	33
1999–2000	7	(78)	2	(22)	0	(0)	0	(0)	9
2000–2001	18	(75)	6	(25)	0	(0)	0	(0)	24
2001–2002	16	(73)	6	(27)	0	(0)	0	(0)	22
2002–2003	12	(75)	4	(25)	0	(0)	0	(0)	16
Average	20	(66)	6	(23)	0	(0)	0	(0)	27

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MOUNTAIN GOAT MANAGEMENT REPORT

From: 1 July 2001
To: 30 June 2003

LOCATION

GAME MANAGEMENT UNIT: 1B (3000 mi^2)

GEOGRAPHIC DESCRIPTION: Southeast Alaska mainland, Cape Fanshaw to Lemesurier Point.

BACKGROUND

HABITAT DESCRIPTION

Mountain goats in Southeast Alaska use alpine, subalpine and some heavily forested habitats (Fox 1983, Schoen and Kirchhoff 1982, Smith 1985), typically in proximity to steep escape terrain that provides security from predators. Considered generalist feeders (Dailey et al. 1984), goats take advantage of a wide variety of plant types for food (Geist 1971, Adams and Bailey 1983).

ADF&G does not have an estimate for the amount of suitable goat habitat in Unit 1B. About 850 square miles is comprised of forest habitat, some of which serves as important goat winter range, particularly during periods of severe winter weather.

In spring, goats occupy avalanche chutes and low elevation south-facing slopes where they forage on alder, rhizomes, and new shoots of ferns. As snow melts in the summer, goats move to high elevation alpine and subalpine habitats where they feed on newly exposed and highly nutritious sedges and forbs (Fox et al. 1989).

During winter goats in the colder mainland areas of Southeast Alaska occupy steep or windswept slopes with little snow cover, while those in the warmer coastal areas typically descend to forest habitats during periods of heavy snowfall. Winter is a period of severe nutritional deprivation and food scarcity for mountain goats (Fox et al. 1989). Forage availability and selection are influenced to a large extent by snowpack depth and density. During winter, goats feed on conifers, mosses, and lichens, and to lesser degree shrubs, forbs, ferns, and grasses (Smith, 1986). As a result of high annual precipitation, the majority of goat winter range in Southeast Alaska is limited to forested habitats. During periods of severe winter weather and heavy snowfall goats may even descend to forested coastal shorelines.

The largest threats to mountain goat habitat are development activities associated with logging, mining, and hydroelectric power (Schoen et al. 1989). To date, an estimated 14,000 acres of forested habitat in the subunit have been logged and are now clearcuts in various stages of seral

habitats and include some logging roads. Clearcuts and pole stands are considered poor goat winter habitat and roads can make goats vulnerable to exploitation by increased human access.

HUMAN–USE HISTORY

Mountain goats are indigenous to Unit 1B and are distributed throughout appropriate habitat. They have traditionally been hunted for food and trophies. Information about goats in the subunit is limited to aerial surveys, harvest records, anecdotal public reports, and observations by our staff.

REGULATION HISTORY

Prior to 1975, all Unit 1 subunits were managed under the same goat season and bag limit. Since statehood, season dates varied between 1 August and 31 January, and the resident and nonresident bag limit was 2 goats. Since 1973, the Unit 1B goat season has remained 1 August to 31 December. In the late 1960s and early 1970s, a succession of severe winters greatly reduced the goat population in the unit. Since 1975, the subunit has been managed separately from the remainder of Unit 1 and the bag limit has fluctuated from 1 to 2 goats.

Since 1980, a registration permit has been required to hunt goats in Unit 1B. From 1991 to the present the subunit has been divided into 2 separate registration hunts. In RG-001 (formerly 801), that portion of Unit 1B south of the North Fork Bradfield River, there is a 2-goat bag limit. In RG004 (formerly 804), that portion of the unit north of the North Fork Bradfield River, there is a one-goat bag limit.

Due to concerns about a population decline, from 1987 to 1989 the Muddy River, Horn Cliffs, and Le Conte Bay areas were managed via a separate registration hunt (807). In 1987 and 1988, the bag limit was restricted to 1 male goat. From 1989 to 1991, the bag limit was changed to 1 goat of either sex; however, the taking of kids or nannies with kids was prohibited. Although the separate registration hunt for the Horn Cliffs area was abolished in 1991, the regulation prohibiting the taking of kids or nannies with kids remained in affect for that portion of Unit 1B north of the North Fork Bradfield River until 1994.

In July 1989 a law was enacted requiring all nonresident goat hunters to employ the services of a big game guide. Since then, the percentage of goats taken by guided nonresidents has increased annually, with significant increases during the mid to late 1990s.

In 1997, the Federal Subsistence Board made a determination that all rural residents of Units 1B and 3 qualify as subsistence users of goats. In that portion of Unit 1B between LeConte Bay and the North Fork of the Bradfield River, federal regulations require a state permit for the taking of the first goat and a federal registration permit for the taking of a second goat.

Although Board of Game action was not required, prior to the fall 2000 hunting season the ADF&G shortened the reporting period for successful goat hunters to 5 days regionwide, under discretionary permit hunt requirements.

Historical harvest patterns

From 1973 to 2000, the Unit 1B harvest averaged 30 goats per year, ranging from a low of 15 goats in 1975 to a high of 50 goats in 1990. In recent years the harvest has remained relatively stable, averaging 27 goats per year for the 10-year period ending in 2000. The overwhelming majority of the annual harvest occurs in RG004, that portion of the unit north of the North Fork of the Bradfield River.

HARVEST CHRONOLOGY

Annual differences in fall and winter weather conditions and the number of guided hunts can have a profound influence on harvest chronology in the subunit. Between 1985 and 1998, most goat harvest during the 5-month season occurred during September and August. In recent years, however, we have seen an increase in the percentage of the annual harvest taken during the late season. This appears to be the result of an increasing desire on the part of hunters to harvest goats with prime winter pelage, and/or take advantage of easy hunting opportunities. In 2000, the proportion of the annual harvest taken in December surpassed that of any other month for the first time.

Historical harvest locations

Since 1985 the largest percentage of the Unit 1B goat harvest has occurred in Le Conte Bay, Stikine River, and Thomas Bay.

Hunters have limited access to most goat habitat in the unit, so hunting pressure tends to be focused near access points. Hunters access goat habitat by hiking up from saltwater, river drainages, or logging roads, or by using floatplanes to fly into the few usable subalpine and alpine lakes in the subunit. The few high elevation lakes suitable for landing aircraft are generally only accessible during the early season before lakes freeze over.

Goats can become increasingly accessible to hunters from saltwater later in the season when snow forces them to lower elevation winter range. In Unit 1B these areas include Le Conte and Thomas bays, and the Patterson River. Because of increased accessibility and vulnerability to harvest in some areas we monitor the late season harvest closely.

MANAGEMENT DIRECTION

MANAGEMENT OBJECTIVES:

Prior to 2002 our preliminary management goals were to maintain population levels to accommodate an annual harvest of 35 goats and a 35% hunter success rate. In January of 2002 Region I Division of Wildlife Conservation wildlife managers met in Ketchikan to review existing goat management objectives. As a result of that meeting, revised objectives were adopted for Unit 1B. These include:

- Conduct aerial surveys to establish the minimum number of goats needed to maintain harvest opportunities for the LeConte Bay management area.
- Conduct aerial surveys to establish the minimum number of goats needed to maintain harvest opportunities for the Thomas Bay management area.
- Conduct aerial surveys to establish the minimum number of goats needed to maintain harvest opportunities for the Cleveland Peninsula management area.

- Maintain a guideline harvest not to exceed 6 points per 100 goats observed during at least 2 consecutive surveys in management areas.

METHODS

Aerial surveys were flown within established trend count areas to obtain the number of goats and the percentage of kids in the population. We monitored hunter harvest through a registration permit system. All permit holders were required to report, and those hunting reported the location and duration of their hunts and/or kills, transportation used, and date and sex of kill. We also recorded anecdotal information from hunters and guides.

RESULTS AND DISCUSSION

POPULATION STATUS AND TREND

Data are insufficient to determine precise goat population trends in Unit 1B. Quantitative information on goat movement patterns and winter diet are limited to a radio telemetry study conducted in Unit 1A and the extreme southern portion of Unit 1B (Smith 1982). Although data are scarce, available information indicates Unit 1B goat populations have remained stable with the exception of the late 1960s and early 1970s when severe winters reduced the herd.

Population Size

Precise population estimates are not available for goats in the subunit. Based on a mountain goat habitat capability model (Suring 1993), U.S. Forest Service (USFS) and ADF&G biologists estimated that Unit 1B could support approximately 1219 goats based on the availability of suitable winter habitat.

Population Composition

Table 1 shows the past 9 years of age composition data from aerial trend counts. Differences in sample size occur because inclement weather frequently makes complete surveys difficult. In the August 2001 and August 2002 surveys, kids composed 27% of the goats classified in both years. Annual differences in survey coverage, and uncertainties about the sightability of goats during aerial surveys, make it difficult to estimate abundance.

Distribution and Movements

Southeast Alaska mountain goats occur on most mainland ridge complexes. Goat distribution information in the subunit is limited to observations made during aerial surveys, observations by staff, and anecdotal reports from the public. Although widely distributed across the subunit, in some areas goats are notably absent or present in small numbers despite the availability of apparently suitable habitat.

Goats typically occupy subalpine and alpine habitats from spring until fall. Depth and duration of snow cover can significantly influence winter movements of goats. In winter goats use windblown or steep slopes with little snow cover, or descend to low elevation forested areas during deep snow periods.

There appear to be sex-linked differences in movements and home range size (Smith 1982) in Southeast goats. Males moved between major ridge complexes, whereas females remained on

ridges where they were captured. Inter-ridge movement by males appears to be associated with the rut and contributed to relatively large winter home ranges. Inter-ridge movements by males may be important for preventing problems associated with inbreeding.

During spring goats generally moved to lower elevation, south-facing rock cliffs, brush, and forest habitats, presumably to take advantage of new green vegetation. Throughout the summer, goats dispersed to a variety of habitat types with an increase in elevation and greater use of northerly exposures. During fall goats moved down in elevation but still used north-facing exposures and inhabited forest, alpine, subalpine, and cliff habitats. Throughout winter goats used a wide range of elevations, concentrating at mid-elevations and southern exposures on alpine and rock-cliff habitats with less forested habitat. However, goats substantially use steep, broken terrain throughout the year (Schoen 1979).

MORTALITY

Harvest

Season and bag limit	Resident and nonresident hunters
Unit 1B, that portion north of Bradfield Canal and the north fork of the Bradfield River	1 Aug–31 Dec (General hunt only)
1 goat by registration permit only	
Units 1(A) and 1(B), that portion on the Cleveland Peninsula south of the divide between Yes Bay and Santa Anna Inlet	No open season
Remainder of Unit 1B	1 Aug–31 Dec (General hunt only)
1 goat by registration permit only	

Board of Game Actions and Emergency Orders. Due to conservation concerns, in fall 2002 the BOG closed the resident and nonresident mountain goat season (RG001) in that portion of Game Management Unit 1(A) and 1(B) on the Cleveland Peninsula south of the divide between Yes Bay and Santa Anna Inlet. In a separate action, the Board also reduced the bag limit from two to one goat in that portion of Unit 1B south of the Bradfield Canal and the north fork of the Bradfield River. However, federal subsistence regulations continue to allow rural residents of Unit's 1B and 3 to harvest a second goat, by federal permit, in that portion of Unit 1B located south of LeConte Bay and north of the North Fork of the Bradfield River.

Two emergency orders were issued during the report period. In 2001 an EO was issued for the early closure of the resident and nonresident mountain goat season (RG001) in that portion of

Game Management Unit 1(A) and 1(B) on the Cleveland Peninsula south of the divide between Yes Bay and Santa Anna Inlet. This emergency order was later reissued extending the season closure to the 2002 season.

Hunter Harvest. The 2001 and 2002 Unit 1B harvests of 24 and 14 goats, respectively, were below our management goal of 35 goats (Table 2). The harvest of 14 goats in 2002 represents the lowest documented harvest in Unit 1B since at least 1973. Hunter success was 35% in 2001 and 19% in 2002, at and well below the management goal of 35 percent, respectively. In 2001 and 2002 males composed 79% and 64% of the harvest, respectively. The sex of harvested goats was obtained from registration hunt reports and was not verified by checking hunter kills. We distributed literature designed to help hunters identify male goats in the field and encouraged them to select males.

In recent years, interest in Southeast Alaska goat hunting by nonresident hunters has increased, and because of the guide requirement, we are seeing an associated increase in harvest by guided nonresident hunters. The number of guided hunts increased in Unit 1B from 9 in 1992 to a high of 22 each in 2000 and 2001. The number of goats harvested by guided hunters during this period was 13 in 2001 and 8 in 2002. The 13 goats taken in Unit 1B by guided nonresident hunters during 2001 represents the highest nonresident harvest to date. During this report period, no federal subsistence permits were issued to harvest a second goat south of LeConte Bay and north of the North Fork of the Bradfield River.

Hunter Residency and Success. Petersburg and Wrangell residents continue to represent the largest group of hunters and have traditionally harvested the majority of goats taken in the subunit (Table 3). However, during this report period, the harvest by nonresidents exceeded that of residents for the first time. Local residents traditionally represent the largest group of unsuccessful hunters, and this remained the case during this report period.

During this report period, local residents had 14% success, nonlocal residents, 31% success, and guided nonresidents, 53% success. Although guided nonresident hunters typically enjoy the highest rate of success, different success rates between local residents and nonlocal residents are due primarily to lack of effort by many locals rather than differences in hunting skills between the groups. Many local hunters hunt primarily from the beach during the late season, hoping for an easy opportunity to harvest a goat. The overall success rate for those permittees who hunted was 35% in 2001 and 19% in 2002. The low harvest and success rate in 2002 probably resulted from exceptionally mild winter weather and record low snowfall, which allowed goats to stay at higher elevations where they were less vulnerable to late-season hunters.

From 1992 to 2000, the success rate for guided hunters in Unit 1B ranged from 38 to 100%, and averaged 56%. During this report period the guided hunter success rate was 57% in 2001 and 47%, in 2002. Because of the guide requirement, nonresident hunters typically enjoy the highest success rate.

Harvest in Particular Areas. Goat harvest occurred in 13 Unit 1B Wildlife Analysis Areas (WAAs) during this report period. In 2001 harvest occurred in 9 WAAs, with #1602 and #1706 providing 25 and 16%, respectively, of the subunit's total annual harvest. The remainder of the

harvest was evenly distributed across the remaining 6 WAAs. In 2002, harvest occurred in 5 WAAs with #1706 accounting for 36% of the total kill. The remainder of the harvest was evenly distributed across the remaining 4 WAAs.

Harvest Chronology. Winter weather, particularly during the late season, can have a profound influence on harvest chronology. The greatest proportion of the 2001 harvest occurred in November, followed by identical harvests in August and September. The highest percentage of the 2002 harvest occurred in October and August, respectively (Table 4). Exceptionally mild winter weather and record low snowfall reduced late season hunter success in 2002.

Prior to 1998, the highest proportion of the harvest traditionally occurred in September and August. In recent years there appears to have been a shift from early to late season effort. Although this may reflect recent winter weather conditions, it may also be attributable to an increasing hunter desire to either harvest goats with prime winter pelage, or to take advantage of easy hunting opportunities. Many Unit 1B goat guides have increased the number of late season hunts available to clients.

Transport Methods. In 2001 and 2002, 50 and 71%, respectively, of successful hunters accessed their hunting area by boat; the remainder used airplanes, with just 1 hunter using another transportation method (Table 5). The increased percentage of hunters using boats to access hunting areas may reflect a shift toward late season hunts when subalpine lakes are frozen and inaccessible by airplane.

Other Mortality

Although we received no reports of goat mortality unrelated to hunting, other sources of mortality can include predation by wolves, bears, and bald eagles, malnutrition, disease, and injury or death as a result of mishaps and avalanches.

Periodic outbreaks of contagious ecthyma, commonly called “orf,” have been documented in Unit 1B. Orf is a virus that causes blisters and scabs to form on the body of infected animals, primarily affecting the head, mainly the lips, mouth, nose, eyelids, and ears. The virus is spread by direct contact with scabs on infected animals, but can also be contracted through direct contact with scabs that have fallen to the ground. The disease can be fatal but no mortalities were documented in the unit as a result of the disease during this report period. Goats displaying symptoms of orf have been occasionally reported in the Horn Cliffs area in the past.

HABITAT

Assessment

Timber harvest and the resulting destruction of winter range continue to pose the most serious threat to goat habitat in the unit. Roads associated with logging increase hunter access and can make goats increasingly vulnerable to harvest. Department staff routinely review, and comment on, proposed timber sales in an attempt to minimize the effects of logging on important goat winter range.

Enhancement

No habitat enhancement projects for goats have been attempted in the unit.

NONREGULATORY MANAGEMENT PROBLEMS/NEEDS

Currently the results of aerial goat surveys can only be interpreted as minimum population estimates. Annual goat surveys performed only once in a trend count area may not accurately reflect population and composition trends (Ballard 1975). Variables that influence survey results are numerous and for the most part unquantifiable. Uncertainty about the sightability of goats during aerial surveys remains a primary concern. Research is needed to develop reliable methods of inventorying Southeast Alaska goat populations.

During the last two years we have witnessed a significant increase in the number of USFS guide use and service day requests for goat hunting on the 1B mainland. Recent USFS moratoriums imposed on the number of brown bear big game guides and hunters in Units 1 and 4 may have resulted in increased interest in goat guiding.

In June 2001 a meeting was held between USFS permitting authorities, ADF&G, and Unit 1B goat guides to discuss recent increases in both the number of guides and the number of hunt requests for Guide Use Area 01-06. Of particular concern was the potential for localized overharvest and crowding. Guides provided information on the number of clients booked for fall 2001 and the anticipated timing and planned location of scheduled hunts. We will continue to monitor the goat harvest by guided hunters closely.

CONCLUSIONS AND RECOMMENDATIONS

During this report period the goat harvest was below the management objective of 35 goats annually and below the average annual harvest of 27 goats annually during the preceding 10-year period. Hunter success during 2001 and 2002 was at and well below, respectively, the management objective of 35%. We believe that unusually mild winter weather was at least partially responsible for the low harvest in 2002, and that the harvest reduction is not indicative of a population decline.

Concern remains about the steady increase in the number of guides, the total number of guided hunts, and the number of goats killed by guided nonresident hunters. Between 1992 and 1999 the number of guided hunts in Unit 1B averaged 11 annually. In 2000 and 2001 this number increased to 22, the highest number of guided goat hunts ever in Unit 1B. Because of the high profitability of goat guiding, many guides restricted from brown bear hunts in the unit are turning toward goat hunts as an alternative source of income. Additionally, guides seeking to increase their income have begun booking goat hunts later in the year after seasons for other species have closed or are no longer productive.

In recent years the subunit has experienced a shift from early to late season goat harvests. This trend was alleviated somewhat during this report period, primarily because winter weather conditions were not conducive to goat hunting in 2001 and 2002. Because of the increased vulnerability of goats during the late season, and concerns about localized overharvest in areas easily accessible from saltwater, we will continue to monitor the harvest carefully, particularly during the late season.

Based on aerial survey data and hunter reports, goat populations appear stable to increasing in most of Unit 1B. Unit-wide, hunting pressure is generally low, and tends to be concentrated in

areas with easy access. Given recent increases in guided and late season hunts, we will continue to monitor the goat population and harvest closely.

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Table 1 Unit 1B summer aerial mountain goat composition counts, regulatory years 1991–2002

Regulatory year[a]	Adults	(%)	Kids	(%)	Unknown	Kids: 100 adults	Total goats observed	Goats /hour
1991	67	(83)	14	(17)	0	21	81	35
1992	117	(70)	50	(30)	0	43	167	72
1994 (Aug. 1994)	90	(74)	31	(26)	0	34	121	35
1994 (June 1995)	339	(94)	21	(6)	0	6	360	32
1996 (Sept. 1996)	59	(74)	21	(26)	0	36	80	52
1997 (Sept. 1997)	144	(87)	21	(13)	0	15	165	73
1998	0	(0)	0	(0)	0	0	0	0
1999 (Sept. 1999)	65	(79)	17	(21)	0	26	82	29
2000 (Sept. 2000)	14	(82)	3	(18)	0	21	17	17
2001 (Aug. 2001)	66	(73)	25	(27)	0	38	91	106
2002 (Aug. 2002)	89	(73)	33	(27)	0	37	122	81

[a] Different portions of the unit are flown in different years; data not directly comparable.

Table 2 Unit 1B mountain goat harvest data by permit hunt, regulatory years 1993 through 2002

Hunt	Year	Permits [a] issued	Nr hunted	(%) Did not hunt	Nr successful hunters	(%) successful hunters	Nr males	(%) males	Nr females	Total harvest
RG001	1993		18		11	(61)	5	(45)	6	11
	1994		6		6	(100)	1	(17)	5	6
	1995		11		6	(54)	3	(50)	3	6
	1996		10		1	(10)	0	(0)	1	1
	1997		8		5	(63)	5	(100)	0	5
	1998		15		4	(27)	3	(75)	1	4
	1999		15		2	(13)	2	(100)	0	2
	2000		13		4	(31)	4	(100)	0	4
	2001		4		3	(75)	3	(100)	0	3
	2002		5		0	(0)	0	(0)	0	0
RG004	1993	147	66	(55)	25	(38)	19	(76)	6	25
	1994	144	80	(44)	28	(35)	19	(68)	9	28
	1995	125	59	(52)	22	(40)	20	(90)	2	22
	1996	147	60	(59)	21	(35)	15	(71)	6	21
	1997	156	70	(55)	28	(40)	21	(75)	7	28
	1998	119	45	(62)	16	(36)	13	(81)	3	16
	1999	139	60	(57)	22	(37)	14	(64)	8	22
	2000	127	63	(50)	23	(37)	14	(61)	9	23
	2001	130	64	(51)	21	(33)	16	(76)	5	21
	2002	135	67	(50)	14	(21)	9	(64)	5	14

Table 2 continued

Hunt	Year	Permits [a] issued	Nr hunted	(%) Did not hunt	Nr successful hunters	(%) successful hunters	Nr males	(%) males	Nr females	Total harvest
Combined	1993		84		36	(43)	24	(67)	12	36
	1994		86		34	(40)	20	(59)	14	34
	1995		70		28	(40)	23	(82)	5	28
	1996		80		22	(31)	15	(68)	7	22
	1997		78		33	(42)	26	(79)	7	33
	1998		60		20	(33)	16	(80)	4	20
	1999		75		24	(32)	16	(67)	8	24
	2000		76		27	(36)	18	(67)	9	27
	2001		68		24	(35)	19	(79)	5	24
	2002		72		14	(19)	9	(64)	5	14

[a] Number of permits issued for 1B in hunt number RG001 is unknown because this hunt includes part of Unit 1A.

Table 3 Unit 1B mountain goat hunter residency and success, regulatory years 1993 through 2002

	Successful					Unsuccessful					
Year	Local[a] resident	Nonlocal resident	Nonresident	Total	(%)	Local[a] resident	Nonlocal resident	Nonresident	Total	(%)	Total hunters
1993	18	16	2	36	(44)	32	13	1	46	(56)	82
1994	21	7	6	34	(40)	35	5	10	50	(60)	84
1995	10	9	9	28	(42)	27	8	3	38	(58)	66
1996	8	7	7	22	(32)	27	12	6	45	(67)	67
1997	20	8	5	33	(42)	30	10	5	45	(58)	78
1998	9	5	6	20	(33)	31	7	2	40	(67)	60
1999	15	1	8	24	(33)	32	14	4	50	(67)	75
2000	12	6	9	27	(36)	26	11	12	49	(64)	76
2001	7	4	13	24	(35)	32	2	10	44	(65)	68
2002	5	1	8	14	(19)	40	9	9	58	(81)	72

[a] Residents of Petersburg, Wrangell, and Kake.

Table 4 Unit 1B mountain goat harvest chronology, percent by month, regulatory years 1993 through 2002

	Month										
	August		September		October		November		December		Total
Year	*n*	(%)	*n*	(%)	*n*	(%)	*n*	(%)	*n*	(%)	harvest
1993	9	(25)	15	(41)	9	(25)	1	(3)	2	(6)	36
1994	11	(32)	8	(24)	8	(24)	2	(6)	5	(15)	34
1995	7	(25)	12	(43)	5	(18)	2	(7)	2	(7)	28
1996	10	(45)	6	(27)	3	(13)	2	(9)	1	(6)	22
1997	16	(49)	5	(15)	5	(15)	4	(12)	3	(9)	33
1998	6	(30)	1	(5)	5	(25)	5	(25)	3	(15)	20
1999	7	(29)	4	(17)	2	(8)	5	(21)	6	(25)	24
2000	4	(15)	6	(22)	3	(11)	6	(22)	8	(30)	27
2001	5	(21)	5	(21)	4	(17)	9	(37)	1	(4)	24
2002	4	(29)	2	(14)	5	(36)	1	(7)	2	(14)	14

Table 5 Unit 1B mountain goat harvest, percent by transport methods, regulatory years 1993 through 2002

	Percent of harvest						
Year	Airplane		Boat		Other		Total harvest
	n	(%)	n	(%)	n	(%)	
1993	20	(56)	16	(44)	0	(0)	36
1994	22	(65)	12	(35)	0	(0)	34
1995	21	(75)	7	(25)	0	(0)	28
1996	12	(54)	9	(40)	1	(6)	22
1997	11	(33)	22	(67)	0	(0)	33
1998	9	(45)	11	(55)	0	(0)	20
1999	8	(33)	16	(67)	0	(0)	24
2000	7	(26)	19	(70)	1	(4)	27
2001	11	(46)	12	(50)	1	(4)	24
2002	4	(29)	10	(71)	0	(0)	14

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MOUNTAIN GOAT MANAGEMENT REPORT

From: 1 July 2001
To: 30 June 2003

LOCATION

GAME MANAGEMENT UNIT: 1C (7600 miles^2)

GEOGRAPHIC DESCRIPTION: The Southeast Alaska mainland and the islands of Lynn Canal and Stephens Passage lying between Cape Fanshaw and the latitude of Eldred Rock, including Sullivan Island and the drainages of Berners Bay.

BACKGROUND

Mountain goats arrived in Southeast Alaska from southern refugia sometime after the retreat of Pleistocene glaciation (Chadwick, 1983). Because mountain goats utilize alpine and subalpine zones in the summer and the upper reaches of coniferous forests in the winter, the coastal mountains of British Columbia and Alaska have promoted range expansion rather than acted as a barrier. Mountain goats now inhabit most of the coastal range of Southeast Alaska where steep forested slopes broken by rock outcrops are common.

Mountain goat populations throughout much of the unit declined during the 1970s and early 1980s from historically much higher numbers. This was partly due to the hunting pressure exerted on the most easily accessible areas. However, in addition to hunting pressure, severe winter weather conditions and an outbreak of contagious ecthyma (orf) further reduced goat numbers, resulting in unit-wide declines. Low goat numbers near the Juneau road system prompted the Board of Game (BOG) to close the area between the Taku Glacier and Eagle Glacier/River prior to the 1984 season. This was followed by a closure of the area south of the Endicott River on the west side of Lynn Canal in 1986. To boost goat numbers near Juneau, mountain goats from the Whiting River were reintroduced to Mount Juneau during the summer of 1989. All of these goats, individually marked prior to release, apparently left the area by 1992. In spite of this, goats reestablished themselves in the vicinity of Juneau, and are now routinely seen on nearly all local mainland mountains. This resurgence resulted in the BOG adopting a proposal in 1998 to allow an archery-only goat hunt between Pt. Salisbury and the Taku Glacier. The goat populations in other areas in Unit 1C have also rebounded, including the area on the west side of Lynn Canal, resulting in the BOG reopening that area in 1996.

There are two main issues of concern regarding mountain goat management in Unit 1C – guided hunting and commercial helicopter tourism. Although goats are distributed throughout the Unit 1C mainland, hunting efforts are usually concentrated in areas where access is relatively easy.

Because of this, guided hunts in Tracy and Endicott arms have become a major factor in the Unit 1C goat harvest. This is one of few areas in the world where hunters can stay in comfort aboard large boats and make day hunts for goats along steep cliffs lining fiords. This use predominates late in the season, when snow often forces goats to lower elevations. The competition by guides for goat hunts in this area is increasing each year, and will eventually force ADF&G to deal with this high nonresident harvest by shortening the season, changing to a drawing hunt, or some other system to keep the nonresident harvest within acceptable limits. At present, a short-term solution to this problem has been reached through limits on commercial service permitting by the U.S. Forest Service.

Since their origin in the early 1980s, helicopter flight-seeing tours have become the signature adventure for cruise ship tourists while visiting Juneau. The number of helicopter landings on the Juneau icefields has risen from just a few thousand during the early years of operation to nearly 19,000 in the late 1990s. The effects these overflights have on mountain goat populations are unknown, but concerns about negative influences of this industry on goats are becoming widespread.

MANAGEMENT DIRECTION

MANAGEMENT OBJECTIVES

Population management objectives identified by staff for Unit 1C are as follows:

1. Maintain goat densities so at least 30 goats per hour are seen during fall surveys;
2. Use pamphlets, videos, and other educational materials to assure a male:female harvest of at least 2:1;
3. Maintain goat viewing opportunities along the Juneau road system;
4. Identify discrete geographic areas and manage within these areas;
5. Maintain a guideline harvest not to exceed 6 points per 100 goats observed;
6. Conduct aerial surveys at least every 3 years in areas of high harvest.

METHODS

Harvest data were obtained from registration permit hunt reports for the 2001 and 2002 fall hunts. Population surveys were conducted in a small portion of Unit 1C during the report period.

RESULTS AND DISCUSSION

POPULATION STATUS AND TREND

Population Size

Information on Unit 1C mountain goat populations was gathered from aerial surveys. Mountain goat populations seem to be at medium to high densities over most of the range, based on the number of goats seen per hour, as well as the general numbers seen during aerial surveys (Table 1). Aerial population surveys were conducted in the following locations during this report period: (RG012 hunt area) between Endicott and Tracy Arms; north of Tracy Arm to Sweetheart Lakes; between the Whiting and Speel Rivers; from Sharp Pt. to Bart Lake; from Endicott Arm, south to Port Houghton; (RG013 hunt area) from Mt. Golub south to Pt. Couverdon. Sighting rates and

overall goat numbers were the highest ever recorded for much of the area south of the Taku River. The ratio of kids to adults was within the range of previous surveys in all but the Bart Lake area, which was considerably lower (Table 1).

In areas that were not surveyed during this report period, we used hunter effort and success as well as previous survey information as an indicator of population status. The goat population on the mountains adjacent to Juneau appears to be increasing, and sightings are becoming routine above town, as well as on Mt. Roberts and up the Sheep Creek valley.

MORTALITY

Harvest

Season and bag limits	Resident and nonresident hunters
Unit 1(C), that portion draining into Lynn Canal and Stephens Passage between Antler River and Eagle Glacier and River, and all drainages of the Chilkat Range south of the south bank of the Endicott River	1 Oct–30 Nov
1 goat by registration permit only	
Unit 1C, that portion draining into Stephens Passage between Eagle Glacier and River and Point Salisbury	No open season.
Unit 1(C), that portion draining into Stephens Passage and Taku Inlet between Point Salisbury and Taku Glacier	1 Oct–30 Nov (General hunt only)
1 goat by registration permit by bow and arrow only	
Remainder of Unit 1C	1 Aug–30 Nov
1 goat by registration permit only	

Board of Game Actions and Emergency Orders. During the fall 2002 Board of Game meeting, ADF&G submitted proposals to begin the goat hunting season in RG014 (the archery only area), and in the area west of Lynn Canal and south of the Endicott River on 1 September rather than 1 October. Both proposals passed and will take effect in RY2003. The season and bag limits listed above do not reflect these changes, as they will not take place until RY 2003. There were no emergency orders issued in the unit during this report period.

Hunter Harvest. A total of 97 goats were taken during this report period, 60 in 2001 and 37 in 2002 (Table 2). This was an increase of 20 goats from the previous report period, due mostly to the increase in nonresident guided hunters (Table 6). Males again made up a large part of the harvest (88%), which is slightly higher than the 82% male harvest during the previous report period. The predominantly male harvest resulted from guided hunts within the area. Registered guides are adept at differentiating male from female goats, and guided hunters prefer a male goat because of its trophy status. Also, guides are aware that females are counted more heavily than males against harvest guidelines, and that it is in their interest to restrict their hunters to taking billies. Because we do not require hunters to present goats for sealing, the reported harvest of male goats may be inflated, as hunters are sometimes reluctant to admit to killing a nanny.

As has been the case during the previous report periods, much of the harvest took place in 3 wildlife analysis areas (WAA's) (Table 7). One of these (2518) is in the upper Taku River, and access to the area is by floatplane to an alpine lake. The other two areas (2824 and 2825) are in Tracy and Endicott arms. Both of these areas are accessible by boat and bear the brunt of Unit 1C commercial guiding harvest. An additional area that received hunting pressure and subsequent harvest during this report period was the Pt. Couverdon area on the west side of Lynn Canal WAA's (2305 and 2306). Although this area was reopened in 1996 after a 10-year closed period, only one goat was harvested here during 1996–2000, while 13 were taken during this report period. This sharp increase in harvest is not related to goat numbers, but rather to hunters figuring out ways to hunt this area. Their success is largely attributable to the logging road system near Homeshore that allows easy access to the southern end of the Chilkat Mountain range. A commercial guide who targeted the area in RY2001 and harvested 3 goats also used this road system.

Permit Hunts. Registration permit hunts RG012, RG013, and RG014 are incorporated under a single permit. The number of permits issued increased from a mean of 185 in the previous report period, to a mean of 206 in 2001–2002 (Table 3). The mean annual number of hunters during this report period (n=96) increased from 77 during the previous report period. Compliance with reporting requirements has been good, but we continue to resort to reminder letters and certified reminder letters to attain information from some hunters.

Hunter Residency and Success. The success rate of all hunters averaged 50% during this report period, which is the same as the previous report period. Although Alaska resident hunters harvested nearly as many goats during this report period as nonresidents (47 versus 50 respectively), their success rate was only 35% compared to 88% for nonresident hunters (Table 4). This is a reflection of nonresidents being required by statute to hunt with a guide, and the fact that most guides are better equipped to hunt goats than the average local resident hunter. The percentage of goats taken by nonresidents (52%) increased slightly from the previous report period (50%). Successful hunters expended an average of 3.0 days per goat during the report period, slightly higher than the mean of 2.8 days per goat during 1999–2000 (Table 3). Unsuccessful hunters expended an average of 2.6 days in the field.

Harvest Chronology. The November harvest continued to be the highest of the 4-month season, accounting for 58% of the take in 2001 and 65% in 2002. The preponderance of late season kills reflects the availability of goats at lower elevations and hunter desire to take an animal in winter pelage. In addition, the majority of the commercial harvest takes place during this time period.

Transport Methods. Boats have historically been the primary means of transportation for successful goat hunters in the unit. This trend continued during the report period, with 89% of successful hunters using them (Table 5). Other means of transportation included airplanes, highway vehicles, and 4-wheelers. Highway vehicles were used along the Juneau road system and 4-wheelers were used on logging roads near Pt. Couverdon and Homeshore.

Commercial Services. The use of commercial services decreased from the previous report period, with 39% of hunters using a commercial service versus 51% during 1999–2000. Seventy-seven percent of hunters who used commercial services used a guide, and 22% used commercial transportation to the field. This is not surprising since most huntable areas are only accessible by airplane or boat. The commercial service used most often by resident hunters was transportation (almost entirely air charter), whereas all nonresidents used a registered guide as required by law.

Other Mortality

There is little data available concerning natural mortality. Holroyd (1967) cited several instances of goats killed in falls, rockslides, and avalanches. Wounding loss may be responsible for additional deaths, but we have not gathered data related to this cause. During the spring of 2002, two goat kids were found dead with apparent cases of orf. One of the kids was found up Nugget Creek while the 2nd one was found along the trail up Sheep Creek.

HABITAT

Assessment

Unit 1C winter and summer goat range is extensive and goats appear to be occupying most of this range. Helicopter traffic in or near goat habitat is probably the biggest concern at this time. There is a steady increase in demand for both summer flightseeing tours as well as winter heli-skiing opportunities. Little is known about the effects of helicopter noise on goat populations. Goats may be displaced from preferred habitat areas because of these disturbances that could ultimately play a role in population declines due to reduced fitness.

CONCLUSIONS AND RECOMMENDATIONS

Aerial surveys were completed in the areas we considered most important due to hunting pressure. Management objectives were met or surpassed in all but one small portion of the areas, and record numbers of goats were recorded in the Tracy Arm area. As weather and funding permit, aerial surveys should be continued to determine population trends throughout the unit, especially in areas that receive the brunt of the hunting pressure. If possible, these areas should be surveyed on a 3- to 4-year cycle and more often if anecdotal information suggests the populations have declined. We intend to define discrete trend count areas throughout the unit, which will provide data that is more comparable year to year.

Hunter effort and success was lower than the preceding report period, again mostly due to fewer guided hunters. In both years of the report period hunters predominantly killed male goats. Although the percentage of nannies in the kill was low, continued emphasis should be placed on directing hunting pressure away from females. Harvest guidelines established for each permit hunt area will continue to be used and should further encourage hunters to select males.

The Chilkat Range south of the Endicott River reopened in fall 1998, but received little hunting pressure and no goats were harvested there during 1999–2000. However, during this report period, 13 goats were taken in this area, most of which were accessed from the logging road system near Homeshore. A guide who targeted the area because of the easy access via ATV's took three of the goats. This is an area that warrants close attention to prevent overharvest due to easy access.

In February 2002 Region I Division of Wildlife Conservation wildlife managers met in Ketchikan to review existing goat management objectives. Based on discussion that took place at that meeting, we drafted new management objectives for mountain goats. Our emphasis was on adopting objectives that were measureable and made good biological sense. This report includes those new objectives.

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Table 1 Unit 1C mountain goat composition counts south of the Taku River, regulatory years 1986 through 2002

Year	Number adults	Number kids	Total goats	Kids:100 adults	Percent kids	Goats per hour
1986	192	55	247	29	22	42
1987			No survey			
1988	81	26	107	32	24	26
1989	514	169	683	33	25	51
1990–92			No survey			
1993[1]	171	4	175	2	2	17
	62	15	77	25	19	77
1994	370	79	449	21	18	82
1995			No survey			
1996[2]	215	78	293	36	27	52
1997			No survey			
1998[3]	225	38	263	20	14	77
	71	19	90	27	21	39
1999[4]	54	12	66	22	18	33
2000[5]	57	3	60	5	5	47
	143	30	179	48	17	36
2001[6]	464	113	577	24	20	132
[7]	174	57	231	33	25	139
[8]	20	7	27	35	26	20
[9]	18	1	19	5	5	27
2002[10]	163	47	213	29	22	82
[11]	152	26	178	17	15	85

[1] The first survey was conducted from a boat in early May at Tracy and Endicott arms. The second survey, conducted from a PA-18 aircraft in October, was done in the Kensington Mine area.

[2] Survey included all goat habitat in the Chilkat Range outside of Glacier Bay National Park, from Sullivan Is. to the southern end of the Chilkat Mts.

[3] The first survey was from Eagle River and Glacier to the Lace River. The second survey was from Pt. Salisbury to the Taku Glacier (RG014 bow and arrow only hunt area).

[4] Registration hunt area RG014.

[5] The first survey was conducted at Lake Dorothy south of the Taku River. The second survey was conducted in the Chilkat Range over the course of 2 days.

[6] Nov. 27 survey between Tracy and Endicott Arms.

[7] Nov. 27 survey of area north of Tracy Arm.

[8] Sep. 1 survey of area between Whiting and Speel Rivers.

[9] Sep. 1 survey of area from Sharp Pt. to Bart Lake (poor conditions due to sun glare).

[10] Oct. 19 survey of area south of Endicott Arm and north of Port Houghton (3 yearlings in count).

[11] Nov. 3 survey of Chilkat Range.

Table 2 Unit 1C annual goat harvest, regulatory years 1990–2002

Year	Males	Females	Unknown	Total
1990	19	10	1	30
1991	14	8	0	22
1992	27	12	0	39
1993	35	12	0	47
1994	36	6	0	42
1995	25	7	0	32
1996	24	8	3	35[1]
1997	30	14	2	46
1998	30	6	2	38
1999	28	10	0	38
2000	35	3	1	39
2001	51	8	1	60
2002	34	3	0	37

[1] Three of these goats were taken illegally.

Table 3 Unit 1C goat hunter effort and success, regulatory years 1990–2002

		Successful hunters			Unsuccessful hunters			Total hunters		
Year	Permits issued	Nr hunters	Total days	Avg. days	Nr hunters	Total days	Avg. days	Nr hunters	Total days	Avg. days
1990	140	30	82	2.7	25	57	2.5	55	139	2.7
1991	145	22	48	2.2	41	114	2.8	63	162	2.6
1992	151	39	124	3.2	35	74	2.1	74	198	2.7
1993	157	47	135	2.9	50	136	2.7	97	271	2.8
1994	168	42	114	2.7	41	132	3.2	83	246	3.0
1995	146	32	111	3.5	44	134	3.0	76	245	3.2
1996	135	35	101	2.9	21	42	2.0	56	143	2.6
1997	164	46	118	2.7	35	70	2.0	81	188	2.3
1998	153	38	85	2.2	29	88	3.0	67	173	2.6
1999	190	38	97	2.6	40	104	2.6	78	201	2.6
2000	180	39	122	3.1	37	89	2.5	76	211	2.9
2001	198	60	182	3.0	41	114	2.8	101	296	2.9
2002	213	37	108	2.9	54	137	2.5	91	245	2.7

Table 4 Unit 1C goat hunter success by community of residence, regulatory years 1990–2002

		Successful hunters			Unsuccessful hunters		
Year	Percent success	Unit resident	Other AK	Non resident	Unit resident	Other AK	Non resident
1990	55	16	4	10	20	4	1
1991	35	14	3	5	34	4	3
1992	53	22	5	12	27	8	0
1993	48	22	4	21	40	7	3
1994	51	16	3	23	29	7	5
1995	43	12	2	18	36	5	2
1996	63	11	4	20	18	4	0
1997	57	22	4	20	30	4	1
1998	57	17	2	19	24	3	2
1999	49	17	3	18	29	8	3
2000	51	16	2	21	24	9	4
2001	59	27	3	30	24	13	4
2002	40	12	5	20	38	13	3

Table 5 Unit 1C transport methods used by successful goat hunters, regulatory years 1990–2002

Year	Airplane		Boat		Foot		Hwy. vehicle		Other	
	Total	(%)	Total	(%)	Total	(%)	Total	(%)	Total	(%)
1990	2	(7)	26	(87)	2	(7)	0	(0)	0	(0)
1991	3	(14)	19	(86)	0	(0)	0	(0)	0	(0)
1992	7	(18)	32	(82)	0	(0)	0	(0)	0	(0)
1993	7	(17	35	(85)	1	(2)	4	(10)	0	(0)
1994	9	(21)	31	(74)	0	(0)	2	(5)	0	(0)
1995	6	(19)	25	(78)	0	(0)	0	(0)	1	(3)
1996	4	(12)	26	(79)	0	(0)	3	(9)	0	(0)
1997	10	(22)	34	(74)	1	(2)	1	(2)	0	(0)
1998	6	(16)	32	(84)	0	(0)	0	(0)	0	(0)
1999	5	(13)	32	(84)	0	(0)	0	(0)	1	(3)
2000	5	(13)	34	(87)	0	(0)	0	(0)	0	(0)
2001	5	(8)	55	(92)	0	(0)	0	(0)	0	(0)
2002	1	(3)	31	(84)	0	(0)	2	(5)	3	(8)

Table 6 Commercial services used by Unit 1C goat hunters, regulatory years 1991–2002[a]

Year	Unit residents		Other AK residents		Nonresidents		Total use		Registered guide	Transporter	Other
	No	Yes	No	Yes	No	Yes	No	Yes			
1991	21	3	1	1	0	7	22	11	5	6	0
1992	38	4	6	2	2	10	46	16	7	9	0
1993	36	14	4	4	2	21	42	39	21	17	1
1994	38	4	7	1	1	27	46	33	28	4	0
1995	35	7	9	1	0	20	44	28	20	8	0
1996	20	3	5	2	0	19	25	24	20	4	0
1997	37	9	5	3	0	21	42	33	21	12	0
1998	28	5	5	0	0	21	33	26	21	4	1
1999	28	9	6	2	0	21	34	32	24	7	0
2000	25	11	8	2	0	25	33	38	25	13	0
2001	41	10	16	0	1	33	58	43	34	9	0
2002	44	5	15	3	0	12	59	31	23	7	1

[a] Not all hunters report commercial services used

Table 7 Unit 1C mountain goat harvest from all Wildlife Analysis Areas (WAAs), regulatory years 1990–2002

WAA	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	Total
2202			1			2								3
2203		2		1			1	3	1					8
2304														-
2305									1			1	2	4
2306												6	4	-10
2307														-
2408	1					2		1		1		1		6
2409			1			3	1	2			1	1	3	12
2410				2	1		1	3				1		8
2411					1	1		3		1		1		7
2412	1	1	1											3
2413							1	2	3					6
2514	2							1	2			1		6
2515								1						1
2517											1	1	3	5
2518	3	3	5	6	1	4	2	4	2	2	6	5	2	45
2519					1	1			2	1				5
2722														-
2823	3		1	3	4									11
2824	2	7	6	4	13	5	7	5	9	10	18	26	11	203
2825	9	3	8	0	7	7	8	8	8	3	11	10	10	112
2926			3	7	2	1						2		15
2927			1	4	2		3	3			2	4	2	21
Unkn	9	6	2	0	0	0	0	0	0	0	0			17
TOTAL	30	22	39	27	22	36	34	46	39	38	39	60	37	508

Alaska Department of Fish and Game
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MOUNTAIN GOAT MANAGEMENT REPORT

From: 1 July 2001
To: 30 June 2003

LOCATION

GAME MANAGEMENT UNIT: 1D (2700 mi^2)
GEOGRAPHIC DESCRIPTION: The Southeast Alaska mainland north of the latitude of Eldred Rock, excluding Sullivan Island and the drainages of Berners Bay.

BACKGROUND

Hundertmark et. al. (1983) examined winter habitat use by mountain goats in the Chilkat Valley. They suggested that the increased access afforded by timber and mineral development would elevate hunting pressure and illegal harvest. This added pressure on goats was considered detrimental to goat populations, as is habitat loss resulting from logging and mining.

There are three separate registration permit hunts with separate hunt areas in Unit 1D (RG023, RG024, and RG026). There is also an area referred to as the Skagway Pie that has been closed to goat hunting since 1985 because of conservation concerns. It is bounded by the Taiya River on the west, the Yukon and White Pass Railroad on the east, and the Canadian border. Periodic aerial composition counts of the Pie conducted between 1983 and present indicate this population has not rebounded to a huntable level. However, the mountain goat populations appear to be fairly healthy in the remainder of the subunit based on our aerial survey information.

MANAGEMENT DIRECTION

Following staff recommendations made at a mountain goat management meeting in February 2002, a regional management goal and unit management objectives were formulated. This has resulted in procedures for more effectively measuring whether objectives are being fulfilled, as well as providing for a wider range of uses by the public.

Region 1 Management Goal
Manage Southeast goat populations to provide for sustained annual use by hunters and wildlife viewers.

Management Objectives
Population management objectives identified by staff for Unit 1D goats are as follows:
1. Identify discrete geographic areas for use as goat trend count areas;
2. Maintain a guideline harvest not to exceed 6 points per 100 goats observed during at least 2 consecutive surveys in management areas;

3. Conduct aerial surveys to establish the minimum number of goats needed to provide harvest opportunities for the Skagway management area;
4. Maintain goat-viewing opportunities along the Haines and Skagway road systems.

METHODS

Both ADF&G and Bureau of Land Management (BLM) personnel conducted aerial surveys within the subunit during 2001 and 2002. Results from BLM surveys, though not directly comparable to ADF&G data due to different survey aircraft and methodology, are still useful. A common registration permit was used to administer hunts RG023, RG024, and RG026. Harvest parameters, including hunter effort and success rates, were determined for each hunt.

RESULTS AND DISCUSSION

POPULATION STATUS AND TREND

Population Size

Given that we survey only a portion of Unit 1D in any one year, it is difficult to evaluate the population on a unit wide basis. We generally use available time and money to target areas of greatest concern due to human use and/or disturbance. Survey results vary to some degree from year to year for most areas (Tables 1a, b, and c). Some of these variations are undoubtedly due to the intensity and scope of the surveys, but can also be affected by survey conditions and survey timing. The degree to which any one survey is influenced by these variables is unknown.
We augment ADF&G survey results with BLM data to provide a more comprehensive evaluation of the Unit 1D goat population. Information on Unit 1D mountain goat populations was gathered from aerial surveys during this report period, as well as other report periods in previous years. Mountain goat populations seem to be at medium to high densities in those areas we routinely survey, based on the number of goats seen per hour as well as the general numbers seen during aerial surveys (Table 1). In areas that were not surveyed during this report period, we used hunter effort and success as well as previous survey information as an indicator of population status.

Population Composition

We used aerial surveys to monitor population trends and kid-to-adult ratios in certain areas within the unit during this report period. We concentrated our effort in the most heavily hunted areas (Taiya Inlet and Takshanuk Mountains) and one location where a hydroelectric project may be initiated. A growing helicopter skiing industry has also increased concerns about potential lethal and sub-lethal effects on mountain goats in the unit. Based on the overall number of goats, percent of kids, and number of goats seen per hour of survey time, the goat population appears healthy overall (Tables 1a, b, and c).

MORTALITY

Harvest

Season and bag limits	Resident and nonresident hunters
Unit 1D, that portion between Taiya Inlet and River and the White Pass and Yukon Railroad	No open season.

Unit 1D, that portion north and east of the Chilkat River, south of the Canadian border, and south and west of the Ferebee River and Glacier	15 Sep–15 Nov (General hunt only)
1 goat by registration permit only	
Unit 1D, that portion north of the Haines Highway and west of the Chilkat River, between the Ferebee River and Glacier and Taiya River and Inlet, and between the White Pass and Yukon Railroad and the Katzehin River	1 Sep–30 Nov (General hunt only)
1 goat by registration permit only	
Remainder of Unit 1D	1 Aug–31 Dec (General hunt only)
1 goat by registration permit only	

Board of Game action and Emergency Orders. A proposal from the public was presented at the 2002 Board of Game meeting to open the season along the Haines Highway earlier. Neither ADF&G nor the local advisory committee supported this proposal. This area is accessible and frequently closes early through emergency closures, and there are other areas in the unit which open earlier in the season. The BOG did not adopt this proposal. An emergency order was issued in 2001 to close the area east of the Haines Highway and west of the Ferrebee River, in the RGO23 area.

Hunter Harvest. A total of 46 goats were harvested during the report period, 24 in 2001 and 22 in 2002 (Table 2). The 2001 harvest consisted of 17 males and 7 females, compared to the 2002 harvest of 15 males and 6 females. The 2002 harvest was lower than the average annual harvest of 24 for the preceding six years and 25 for the last 11 years. However, the 2001 harvest was close to or equal to those averages (Table 2).

Permit Hunts. Unit 1D mountain goat hunting is regulated under 3 registration permit hunts, administered by a common hunt report. The main reason for maintaining 3 hunts in the subunit is to allow different opening and closing dates while attempting to adjust for relative differences in hunting pressure. Smaller areas within the hunt areas are assigned point values (billies = 1 point, nannies=2 points.) based on aerial survey information, giving a finer scale of management when necessary. An average of 159 permits was issued during 2001–2002, compared to a mean of 166 during 1999–2000, and a mean of 163 since 1990 (Table 3).

Hunter Residency and Success. A mean of 25% of goat hunters were successful during the report period (Table 4). This is slightly lower than the 26% mean for 1999–2000, and lower than the mean of 30% during 1990–94, but meets the management objective of 25% hunter success. Local residents continue to compose the majority of Unit 1D goat hunters. In 2001 and 2002, residents of the subunit took 15 (63%) and 16 (73%) of harvested goats, respectively. In 2001 nonlocal Alaska residents took 5 of the 24 goats harvested, which compares closely to 2 of 22 in 2002. Only 17 nonresidents hunted goats in Unit 1D during the report period, harvesting 8 goats.

Harvest Chronology. Goats can be hunted in Unit 1D from 1 August through 31 December, but seasons vary between the three hunt areas. Over the years, most goats have been harvested from late September to early November. During this report period 35% of the goats were harvested in November, 33% in October, 13% in September, and 13% in December.

Transport Methods. Boats and highway vehicles continue to be the transport methods used most often by successful hunters, amounting to 43% and 33% respectively during the report period (Table 5). The higher percentage of successful hunters using boats may be related to heavy snows forcing goats down to low elevations along the water, leaving them available to hunters on the water. Frequently, nannies descend lower on the cliffs than billies, increasing the chance for a higher-than-desired female harvest. The high number of nannies taken on the east side of Taiya Inlet resulted in two emergency closures this report period. Some hunters, especially Klukwan residents, walk to their hunting area along the Haines Highway.

Commercial Services. Because most Unit 1D goat hunters are local residents, there is little use of commercial services (Table 6). Most hunters have access to either a highway vehicle or a boat and thus provide their own transportation. During the report period only nonresident hunters (n=17) reported using commercial services.

Location of Harvest. Goat harvest by Wildlife Analysis Area is provided in Table 7. Accessibility of mountain goat haunts is likely the most important factor in determining vulnerability of goats to hunters. The Takshanuk Mountains, which are skirted by the Haines Highway, have consistently borne much of the goat harvest in the unit. Also, the east side of Taiya Inlet that is readily accessible by boat can also experience a high level of harvest depending on weather conditions. By establishing point values that discourage the taking of females, we are able to more precisely manage areas that are used intensively.

CONCLUSIONS AND RECOMMENDATIONS

Finer-scale mountain goat management continues to be necessary in Unit 1D as hunting pressure increases. We will continue to use a single permit and report for the 3 hunts in the subunit. Careful population and harvest monitoring is necessary, and emergency closures may be required to avoid excessive harvest. Composition surveys should be conducted annually in high use areas. The Skagway closed area should be surveyed when possible to assess the possibility of reopening the area to hunting, and if opened would probably be managed with a drawing permit. Finally, permanent trend count areas with well-defined boundaries should be established to enhance comparable surveys from year to year.

As predicted in the last management report, helicopter activities in Unit 1D have increased, as have our concerns about their immediate and long-term effects on mountain goats. There are currently two heli-skiing companies based in Haines, and the area is gaining some renown among aficionados of remote skiing. Flight-seeing is expected to expand, and as a corollary, the practice of using helicopters to access remote areas for hiking and mountaineering is also expected to increase. Over the 2 years of this report period, staff spent increasing time working on ways in which to address agency and public concerns about effects of these increasing activities on goats in the area. Cote's (1996) research concerning mountain goat responses to helicopter activity indicates that we should investigate ways of monitoring these various uses of goat habitat. By sharing information with the BLM, our management of goats in this area will continue to become more effective.

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Table 1a Unit 1D mountain goat composition counts, Skagway closed area, regulatory years 1981–2002

Year	Number adults	Number kids	Total goats	Kids:100 adults	(%) kids	Goats/hour
1981	73	22	95	30	23	60
1983	26	5	31	19	16	56
1984	27	13	40	48	33	36
1985	29	3	32	10	9	25
1986	13	5	18	38	28	28
1987	7	0	7	0	0	55
1988				No survey		
1989	17	6	23	35	26	35
1990				No survey		
1991				No survey		
1992	1	0	1	0	0	3
1993				No survey		
1994[1]	11	5	16	45	31	20
1995[2]	21	7	28	33	25	N/A
1996	No survey					
1997				No survey		
1998	No survey					
1999	No survey					
2000	No survey					
2001	32	7	39	22	25	93
2002				No survey		

[1] Skagway Pass side only, goats/hour is for the entire survey that included a portion of hunt area RG023.

[2] Includes only the west side of closed area, adjacent to the Taiya River.

Table 1b Unit 1D mountain goat composition counts, hunt areas RG023 and RG024, regulatory years 1990–2002.

Year	Number adults	Number kids	Total goats	Kids:100 adults	(%) kids	Goats/hour
Klukwah Mt. (K) and Ferebee Glacier/River (F) to Chilkoot Inlet						
1989 (K)	26	9	35	35	(26)	60
1993	*No survey*					
1994 (K,F)[1]	111	21	131	19	(16)	45
1995[2]	52	15	67	29	(22)	89
1996–1997	*No survey*					
1998	69	23	92	33	(25)	58
1999–2000	*No survey*					
Takshanuk Mtns. (E, W)						
1989 (E,W)	40	16	56	40	(29)	34
1993 (W)	27	7	35	26	(20)	59
1994 (E,W)	48	5	53	10	(9)	17
1995	19	4	23	21	(17)	N/A
1996–1997	*NO SURVEY*					
1998	*22*	*6*	*28*	*27*	*(21)*	*20*
1999–2000	*NO SURVEY*					
2001	*150*	*39*	*189*	*26*	*(21)*	*122*
2002	No survey					
North of the Klehini River and West of the Chilkat River						
1989	23	6	29	26	(21)	70
1993	No survey					
1994	58	4	62	7	(6)	69
1995	55	9	64	16	(14)	116
1996–2002	No survey					
East of Ferebee Glacier/River (F), Chilkoot/Taiya Inlet						
1989 (F,C)	39	17	56	44	(30)	40
1992 (F,C)	30	10	40	33	(33)	19
1993	No survey					
1994 (F,C)	119/130	21/33	140/163	18/25	(15/20)	46/59
1995–2002	No survey					
Harding Mountain to upper West Cr., upper Norse R. and Chilkoot Pass						
1995	64	9	73	14	12	50.5
1996–2002	No survey					
Twin Dewey Peaks, Skagway Pass, Warm Pass						
1995	20	6	26	30	(23)	20
1996–2002	No survey					
Katzehin River north to Twin Dewey Peaks						
1994	121	32	153	26	21	102
1995	No survey					
1996	103	26	129	25	20	105
1997	96	15	111	16	14	80

Table 1b continued

Year	Number adults	Number kids	Total goats	Kids:100 adults	(%) kids	Goats/hour
1998–1999	No survey					
2000	97	21	108	22	19	83
2001[3]	60	13	73	21	18	77
2002	No survey					

[1] First survey listed conducted by the BLM in a PA-18 aircraft; this survey does not overlap with the ADF&G survey.

[2] Includes only the Chilkoot River side of the mountain range from Klukwah Mt. to Chilkoot Inlet.

[3] Partial survey from Kasidaya Creek north.

Table 1C Unit 1D mountain goat composition counts, hunt area RG026, regulatory years 1988–2002

Year	Number adults	Number kids	Total goats	Kids:100 adults	(%) kids	Goats/hour
Tsirku River (T) and Takhin Ridge (N,S)						
1983 (T)	67	23	90	34	(26)	29
1985 (S)	41	13	54	32	(24)	69
1987 (N,S)	14	4	18	29	(22)	11
1989 (N,S)	111	33	144	30	(23)	126
1993 (N,S)	100	21	121	21	(17)	112
1994 (T,N,S)[1,2]	129	29	156	22	(19)	48
1995–01	No survey					
2002 (N,S)	79	17	96	22	(18)	87
Remainder of Area West of Chilkat Inlet						
1974	39	3	42	8	7	72
1975	20	9	29	45	31	---[3]
1993				No survey		
1994	184	32	213	17	15	49
1995–2002				No survey		
East of Chilkoot Inlet-Katzehin River South						
1993				No survey		
1994	32	10	42	31	24	98
1995–1996				No survey		
1997	5	2	7	40	29	N/A
1998–2002				No survey		

[1] First survey listed conducted by the BLM in a PA-18 aircraft.

[2] Survey consisted of a significantly larger area than previous surveys represented.

[3] Survey time not available.

Table 2 Unit 1D annual mountain goat harvest, regulatory years 1988–2002

Year	Males	Females	Unknown	Total
1990	18	12	1	31
1991	18	5	2	25
1992	9	11	3	23
1993	15	8	2	25
1994	12	12	1	25
1995	14	8	0	22
1996	12	8	0	20
1997	15	12	0	27
1998	20	6	1	27
1999	10	15	0	25
2000	13	9	0	22
2001	17	7	0	24
2002	15	6	1	22

Table 3 Unit 1D mountain goat hunter effort and success, regulatory years 1990–2002

		Successful hunters			Unsuccessful hunters			Total hunters		
Year	Permits issued	No. hunters	Total days	Ave. No. days	Nr. hunters	Total No. days	Av. No. days	No. hunters	Total No. days	Ave. No. days
1990	193	31	56	1.8	71	116	1.6	102	172	1.7
1991	154	25	36	1.5	48	115	2.5	73	151	2.2
1992	130	23	35	1.5	47	115	2.4	70	150	2.1
1993	182	25	54	2.2	67	158	2.5	92	212	2.4
1994	171	25	64	2.6	79	168	2.3	104	232	2.4
1995	169	22	36	1.7	81	226	2.9	103	262	2.7
1996	176	20	32	1.6	75	152	2.2	95	184	2.1
1997	149	27	46	1.7	60	125	2.4	87	171	2.2
1998	157	27	64	2.6	69	168	2.6	96	230	2.6
1999	170	25	40	1.6	60	175	2.9	85	215	2.7
2000	161	22	48	2.2	73	172	2.4	96	222	2.3
2001	157	24	53	2.2	77	189	2.5	101	242	2.4
2002	160	22	52	2.4	65	218	3.4	87	270	3.1

Table 4 Unit 1D goat hunter success by community of residence, regulatory years 1990–2002

		Successful hunters			Unsuccessful hunters		
Year	Percent success	Unit resident	Other AK	Non-resident	Unit resident	Other AK	Non-resident
1990	30	20	9	2	60	11	0
1991	34	21	4	0	32	16	0
1992	33	21	2	0	38	8	1
1993	27	17	6	2	51	16	0
1994	24	15	9	1	54	25	0
1995	21	13	7	2	61	20	0
1996	21	14	3	3	51	21	3
1997	31	15	11	1	45	14	1
1998	28	24	2	1	58	8	3
1999	29	22	3	0	38	22	0
2000	23	17	3	2	54	16	4
2001	24	15	5	4	54	19	4
2002	25	16	2	4	43	17	5

Table 5 Unit 1D transport methods used by successful goat hunters, regulatory years 1990–2002

	Airplane		Boat		Foot		Hwy vehicle		Other[1]	
Year	Total	(%)	Total	(%)	Total	(%)	Total	(%)	Total	(%)
1990	0	(0)	17	(55)	5	(16)	7	(23)	2	(6)
1991	0	(0)	13	(57)	1	(4)	9	(39)	0	(0)
1992	0	(0)	9	(41)	7	(32)	5	(23)	1	(5)
1993	3	(12)	12	(48)	0	(0)	8	(32)	2	(8)
1994	0	(0)	15	(60)	3	(12)	7	(28)	0	(0)
1995	1	(5)	8	(36)	0	(0)	11	(50)	2	(9)
1996	0	(0)	8	(44)	5	(28)	5	(28)	0	(0)
1997	0	(0)	7	(26)	5	(19)	13	(48)	2	(7)
1998	0	(0)	12	(46)	5	(19)	7	(27)	2	(8)
1999	0	(0)	18	(72)	3	(12)	3	(12)	1	(4)
2000	0	(0)	8	(26)	3	(14)	10	(45)	1	(5)
2001	0	(0)	15	(63)	2	(8)	4	(17)	3	(12)
2002	1	(5)	5	(24)	3	(14)	11	(52)	1	(5)

[1] Includes unknown transportation

Table 6 Unit 1D commercial services reported by goat hunters, regulatory years 1991–2002

Year	Unit residents		Other AK residents		Non-residents		Total use		Registered guide	Transporter	Other
	No	Yes	No	Yes	No	Yes	No	Yes			
1991[1]	18	2	7	0	0	0	25	2	0	0	2
1992	48	0	9	0	0	0	57	0	0	0	0
1993	57	2	14	0	2	0	73	2	0	1	1
1994	64	0	28	1	0	1	92	2	1	1	0
1995	67	0	22	3	0	2	89	5	2	3	0
1996	56	0	19	1	0	4	75	5	4	1	0
1997	51	0	20	3	0	3	71	6	3	1	2
1998	77	0	10	0	0	4	87	4	4	0	0
1999[2]	56	2	21	1	0	0	77	3	1	1	1
2000[3]	69	0	19	0	1	4	89	4	4	0	0
2001	69	0	24	0	0	8	93	8	8	0	0
2002	58	0	19	0	0	9	77	9	9	0	0

[1] Only 37% of hunters reported whether they used, or did not use, commercial services in 1991.
[2] Six percent of hunters did not report whether they used commercial services in 1999.
[3] Three percent of hunters did not report whether they used commercial services in 2000.

Table 7 Unit 1D Goat harvest by Wildlife Analysis Areas (WAA), regulatory years 1990 through 2002

	WAA							
Regulatory year	4302	4303	4304	4405	4406	4407	4408	*Total*
1990	16	2	0	5	0	7	1	32
1991	13	2	0	3	0	4	3	25
1992	13	1	0	5	0	3	1	23
1993	11	5	0	4	1	1	3	25
1994	13	1	0	6	0	4	1	25
1995	14	0	0	0	0	3	1	18
1996	8	0	0	0	4	5	3	20
1997	16	5	0	1	0	5	0	27
1998	17	2	0	0	0	5	3	27
1999	7	0	0	2	0	12	4	25
2000	10	2	0	1	0	9	0	22
2001	12	0	0	1	0	9	2	24
2002	13	3	0	1	0	3	2	22

Alaska Department of Fish and Game
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MOUNTAIN GOAT MANAGEMENT REPORT

From: 1 July 2001
To: 30 June 2003

LOCATION

GAME MANAGEMENT UNIT: Unit 4 (5800 mi^2)

GEOGRAPHIC DESCRIPTION: Admiralty, Baranof, Chichagof, and adjacent islands.

BACKGROUND

Mountain goat populations were established on Baranof Island in 1923 when 18 animals were transplanted from Tracy Arm in Game Management Unit 1 (Burris and McKnight 1973). Goats were not believed to have been indigenous to the island, although early written Russian history is confusing with references to "white deer." Hunting was initiated in 1949 on descendants of the 1923 introduction, and seasons have continued to this time. In 1976 a registration permit system was initiated. Since that time the harvest has ranged from 28 to 75 goats per year.

In the mid 1950s goats were transplanted to Chichagof Island (Burris and McKnight 1973), but populations did not become established. The last report of a goat on Chichagof was in 1978 (Johnson 1981). Mountain goat populations do not exist on Admiralty or any other island in the unit. Baranof Island goats appear to be increasing and dispersing, with recent expansions of animals to the southern part of the island.

The effects of severe winters on goat populations are poorly understood. Consistent goat surveys are needed to better understand the effects of varying snow accumulations. Throughout most goat habitat on Baranof Island, hunter access is difficult. Weather patterns during open goat seasons play an important role in regulating the harvest.

MANAGEMENT DIRECTION

MANAGEMENT GOALS

Manage Baranof Island goat populations to provide for maximum sustained annual use by hunters and wildlife viewers. Maintain an islandwide population in excess of 1000 goats.

MANAGEMENT OBJECTIVES

Maintain a population sufficient to provide an annual harvest of at least 60 goats; and maintain a mountain goat population sufficient to provide an annual hunter success rate of at least 25%.

METHODS

Unit 4 goat hunting is administered through a registration permit system (Hunt RG150). Hunters obtain permits without charge, but successful hunters are required to report within 10 days of taking a goat. All other permittees are required to report by mid January. Information from the reports includes area hunted, number of days hunted, kill date, sex of goat harvested, transportation used, and any use of commercial services. Successful hunters are also encouraged to bring in the horns from their goat for age determination.

Late summer aerial surveys are conducted periodically in selected areas. During September 1998 an extensive survey designed to determine goat distribution was conducted islandwide.

A total of 189 goat horns voluntarily submitted by successful hunters were examined during 1998–2002. Information from 2003 has not been summarized. Incremental growth measurements, age, and width between horn bases were recorded on standardized forms (Appendix A), in an attempt to determine growth rates and characteristics of Baranof Island goats as they relate to varying winter severity.

RESULTS AND DISCUSSION

POPULATION STATUS AND TREND

Population Size

The last extensive aerial survey of goat habitat on Baranof Island was conducted during September 1998, resulting in a tally of 1013 goats. This number should be viewed as a minimum number of goats inhabiting the island, as sightability data have not been established. Observers suspected that conditions were near optimal, resulting in at least 65% of all goats being seen. Under this assumption the goat population on the island may exceed 1350 animals (Whitman 2002). Since that time, only select portions of Baranof Island have been surveyed. Additional survey effort should be expended in future years to determine sightability, leading to more precise population estimates.

Currently it appears that goat populations continue to expand both spatially and numerically on Baranof Island. However, because of differences in observers, pilots, area surveyed, and type of aircraft used, it is impossible to infer goat abundance from the number of goats observed per hour of survey time.

Summer alpine range is not currently threatened by destructive resource extraction activities (logging and mining with accompanying roads), and winter range appears to be secure for the immediate future. The only recent population estimate for Baranof Island was made in 1991 by E. L. Young, who estimated 1000 goats (cited by Faro 1994), and the population has undoubtedly increased since that time.

Population Composition

Kid percentages in the observed segment of the goat population have varied widely, from a low of 10 to a high of 41%. These data should be viewed cautiously because of differences in observers, pilots, type of aircraft used, and timing of surveys. Hunters generally select males, so harvest sex ratios do not reflect population-wide sex ratios (Whitman 2002).

From 1976 to 2002, 909 harvested goats have been aged based on discreet annuli in horns (Brandborg 1955). With the exception of kids and yearlings, I suspect that hunters are not selecting against any age class of goat. It is clear that billies are selected over nannies. With this in mind, I assume that within a particular sex, hunter harvest generally gives some indication of the proportion of goats in the population. The long-term median age of billies taken by hunters from Unit 4 is 2 years old, while median age of nannies is 3 years. The mean ages of harvested billies is 4.36 years and of harvested nannies, 5.42 years.

Nannies likely live longer than billies. Approximately 8% of harvested nannies were $\geq$ 10 years of age, whereas less than 2% of billies were $\geq$ 10 years. The oldest nanny killed was 17 years and the oldest billy was 13 years.

Distribution and Movements

Mountain goats inhabit all available summer range on Baranof Island north of Gut and Whale bays. Goat densities in the various alpine areas are unknown, but I suspect that at least some goat habitats are densely occupied. There are occasional goat observations south of Whale and Gut bays reported by the public, and as populations increase those areas will support additional goats. Winter habitat is more difficult to define, but south-facing cliffs are generally preferred.

Horn Growth Rates

In an effort to better understand growth characteristics of Unit 4 goats, hunters were asked to voluntarily submit horns for aging and measuring. A total of 189 goats from the 1998–2002 seasons yielded data on horn growth.

It is probable that horn growth reflects body growth patterns. Because no annuli are discernable until a goat reaches 1.5 years of age, and this “annulus” encompasses 2 growth years (0–0.5 and 0.5–1.5), the data cannot be used for analyses of single-year growth. Likewise, growth from the year of death cannot be reliably used, as growth may not be completed during that particular year. Additionally, after 6 years of age, growth annuli are so small that accurate measurements are impossible.

Despite earlier indications that incremental horn growth may reflect winter severity (Whitman 2002), addition of horn growth data from the 1999–2002 seasons has led to the conclusion that there is no correlation between horn growth and winter severity.

MORTALITY

Harvest

Season and bag limit	Resident and nonresident hunters
1 goat by registration permit only	1 Aug–31 Dec
	(General hunt only)

Regulations adopted by the Federal Subsistence Board are identical to state regulations.

Board of Game Actions and Emergency Orders. Although Board of Game action was not required, prior to the fall 2000 hunting season we shortened the reporting period for successful goat hunters to 5 days regionwide, under discretionary permit hunt requirements. No board actions were taken and no emergency orders were issued during the period.

Hunter Harvest. During 2001 and 2002, 322 registration permits were issued each of those years (Table 1). This resulted in 54 (2001) and 49 (2002) goats being legally harvested. The percent of permittees who actually hunted was 46% and 45%, respectively, during the 2 years. For those hunters going afield, the success rate was 36% in 2001 and 34% in 2002. Five-year averages for the period 1998–2002 were: permits issued, 316; hunters afield, 144; and reported goat harvest, 52. Hunters reported sex of goats in the harvest as 61% males in 2001 and 73% in 2002 (Table 1). With the current population estimate for goats in Unit 4 at 1367 animals, documented harvest accounts for a mortality of less than 4% annually.

Permit Hunts. All goat hunting in Unit 4 is conducted under a registration permit system.

Hunter Residency and Success. Baranof Island residents continue to be the primary users of Unit 4 goats (>80% of hunters were local residents during 2001 and 2002, Table 2). The proportion of nonresident, guided hunters increased to 14% in 2001 but fell to 7% in 2002, although numbers are still low.

Harvest Chronology. Weather appears to be the primary factor controlling hunter effort and chronology of the goat harvest in Unit 4. Typically, few goats are harvested during November and December when consecutive low-pressure systems bombard Southeast Alaska with rain and/or snow. However, this trend appears to be changing, with more hunters electing to hunt after early-season snows drive goats to lower elevations. During 2001, 9 goats (17%) were harvested during December, while 17 (31%) were harvested in November and 12 (22%) taken in August (Table 3). During 2002 hunters took the largest monthly total during October, when 21 goats (43%) were reported harvested.

Transport Methods. Boats continue to provide the majority of transportation for Unit 4 goat hunters. During 2001 and 2002, successful hunters used boats for primary access 80% and 65%, respectively (Table 4).

Other Mortality. No estimates of extent or causes of other goat mortality have been made. It is likely that bear-caused mortality occurs, but its significance is unknown. Winter

starvation and accidental deaths due to falls, rockslides, and avalanches undoubtedly take some toll on the population.

HABITAT

Assessment

No data are available regarding habitat quality. Relatively high numbers of kids observed during late summer composition surveys and good body condition of harvested goats suggests that habitat is in relatively good shape.

Enhancement

No habitat enhancement activities were conducted on goat range during this report period; there are no plans for future assessment or enhancement of goat habitat.

NONREGULATORY MANAGEMENT PROBLEMS/NEEDS

Efforts should continue to monitor timber extraction activities and additional road building associated with logging. On Baranof Island, habitat degradation activities appear to be minor.

CONCLUSIONS AND RECOMMENDATIONS

Unit 4 mountain goat populations appear to be secure at this time. I recommend that current state regulations remain in effect concerning season dates and bag limits. The current system of registration permit hunting appears to be working well and causes little additional effort on the part of hunters. I commend hunters for their willingness to voluntarily submit horn sets for evaluation. Future assessment work should be explored in an effort to determine goat sightability during aerial survey efforts. These data will allow a better estimation of goat population size on the island.

Effort continues at the regional level to review existing goat management objectives. As a result of that effort, revised objectives may be put into place for the region.

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Table 1 Unit 4 mountain goat harvest data for registration permit hunt RG150, regulatory years 1998–2002

Year	Permits issued	Did not report	Did not hunt	Unsucess-ful hunters	Successful hunters	Males	Females	Sex unk.	Illegal	Total Harvest
1998	326	1	167	95	63	36	27	0	0	63
1999	300	0	181	83	36	22	14	0	0	36
2000	312	2	160	90	60	31	29	0	0	60
2001	322	2	171	95	54	33	21	0	0	54
2002	322	0	178	95	49	36	12	1	0	49

Table 2 Unit 4 mountain goat hunter residency and success for registration permit hunt RG150, regulatory years 1998–2002

Year	Successful				Unsuccessful				Total hunters
	Local[a] resident	Nonlocal resident	Nonres	Total	Local[a] resident	Nonlocal resident	Nonres	Total	
1998	48	8	7	63	77	16	2	95	158
1999	22	5	9	36	70	8	5	83	119
2000	47	1	12	60	76	8	6	90	150
2001	45	0	9	54	74	9	12	95	149
2002	39	4	6	49	82	9	4	95	144

[a]Residents of Baranof Island.

Table 3 Unit 4 mountain goat harvest chronology by month for registration permit hunt RG150, regulatory years 1998–2002

	Month					
Year	August	September	October	November	December	Total
1998	11	12	18	13	9	63
1999	8	8	4	11	5	36
2000	9	10	12	10	19	60
2001	12	9	7	17	9	54
2002	7	5	21	11	5	49

Table 4 Unit 4 mountain goat harvest by transport method used by successful hunters for registration permit hunt RG150, regulatory years 1998–2002

Year			Snow	Off-road			
	Airplane	Boat	machine	vehicle	Vehicle	Walked	Total
1998	8	50	0	1	3	1	63
1999	4	28	0	0	3	1	36
2000	9	46	0	0	1	4	60
2001	7	41	0	0	3	3	54
2002	15	32	0	0	1	1	49

Appendix A

MOUNTAIN GOAT HORN STUDY

NAME _____

DATE OF KILL _____

LOCATION OF HARVEST _____

_____

AGE OF GOAT _____ CERTAINTY? A B C

SEX OF GOAT _____

(all measurements to nearest 1/16 inch)

LENGTH OF LEFT HORN _____ BROOMED? Y N

BASAL CIRCUMFERENCE OF LEFT HORN _____

LENGTH OF RIGHT HORN _____ BROOMED? Y N

BASAL CIRCUMFERENCE OF RIGHT HORN _____

ANNULUS LENGTHS (Use longer horn)

0-1.5 years _____

1.5-2.5 years _____

2.5-3.5 years _____

3.5-4.5 years _____

4.5-5.5 years _____

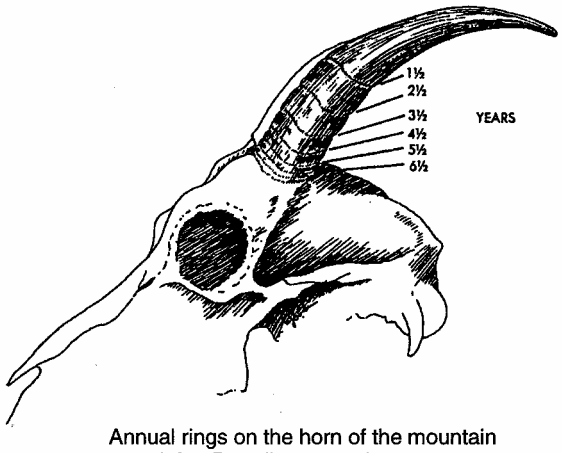
5.5-6.5 years _____

6.5-7.5 years _____

7.5-8.5 years _____

8.5-9.5 years _____

9.5-10.5 years _____



Annual rings on the horn of the mountain goat (after Brandborg 1955)

WIDTH BETWEEN HORN AND BASES _____

MEASUREMENTS RECORDED BY _____ DATE _____

Alaska Department of Fish and Game
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MOUNTAIN GOAT MANAGEMENT REPORT

From: 1 July 2001
To: 30 June 2003

LOCATION

GAME MANAGEMENT UNIT: 5 (5800 mi^2)

GEOGRAPHIC DESCRIPTION: Cape Fairweather to Icy Bay, eastern Gulf of Alaska coast.

BACKGROUND

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

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

The Alaska Department of Fish and Game first conducted aerial goat surveys in this Unit in 1971. In that year, 283 goats (33 kids:100 adults) were enumerated between Gateway Knob and Harlequin Lake in the Brabazon Mountains. By 1973 Game Division biologists had documented a significant decline in goat numbers in the area, attributed primarily to severe winter weather. Unit 5A surveys and anecdotal accounts from guides, pilots, and hunters during the 1980s indicated that goat numbers were higher than recorded in the early 1970s. In the 1990s no aerial surveys were conducted, but anecdotal information from hunters and guides suggested goats were relatively abundant throughout the area.

Nearly all Unit 5 hunting effort is concentrated in Unit 5A for several reasons. First, much of Unit 5B is in Wrangell St. Elias National Park and closed to hunting for mountain goats (the national preserve remains open to hunting), and secondly, the primary goat habitat open to hunting is at Icy Bay and is difficult to access. Private property there belongs to a Native corporation and is not open for hunting to the general public.

There is a state registration permit hunt and a federal hunt for goats in this unit. Season dates for the federal hunt extend to the end of January, whereas the state hunt ends at the end of December. ADF&G receives information from all successful hunters, but information from

unsuccessful federal permittees is often difficult to attain, as the U.S. Fish and Wildlife Service, the data manager, is not adamant about reporting requirements.

MANAGEMENT DIRECTION

MANAGEMENT OBJECTIVES

Unit 5 mountain goat management objectives identified by staff are as follows:
1. Maintain goat densities so at least 30 goats per hour are seen during fall surveys;
2. Use pamphlets, videos, and other educational materials to assure a male: female harvest of at least 2:1;
3. Identify discrete geographic areas and manage within these areas;
4. Maintain a guideline harvest not to exceed 6 points per 100 goats observed;
5. Conduct aerial surveys at least every 3 years in areas of high harvest;
6. Continue to monitor the Nunatak Bench goat population through aerial surveys.

METHODS

Several aerial surveys were conducted within the unit during this report period. Because of our concern with low goat numbers at Nunatak Bench, we made it a priority to survey this area during 2001 and 2002. We also surveyed the area from Nunatak Fiord, south to Harlequin Lake. In addition to our surveys, the USFS shared data on a survey they conducted that included the area from Harlequin Lake, east to the Alsek River, effectively giving us full coverage of all Unit 5A mountain goat habitat.

Hunters were required to obtain registration permits from ADF&G offices, which helped in-season monitoring of hunter effort and success. Information collected from registration reports included the number of days hunted, method of transportation used, hunt dates, commercial services used, and sex and date of kill. Anecdotal information was gathered from hunters, ADF&G field personnel, and U.S. Forest Service (USFS) personnel stationed in Yakutat.

RESULTS AND DISCUSSION

POPULATION STATUS AND TREND

Population Size

ADF&G and USFS personnel conducted aerial surveys throughout much of Unit 5A during this report period (Table 1). Based on this survey data, it appears the goat population at Nunatak Bench is continuing to decline in spite of the hunting closure that has been implemented during the past two years. We will continue to monitor this population over the foreseeable future to keep abreast of its status. The remainder of Unit 5A appears to have healthy goat populations when comparing the goats seen per hour of surveying with historical surveys.

MORTALITY

Harvest

Season and bag limits	Resident and nonresident hunters
1 goat by registration permit only	1 Aug–31 Dec (General hunt only)

Board of Game Actions and Emergency Orders. The portion of Unit 5A that constitutes Nunatak Bench was closed to goat hunting by emergency order during both years of the report period, prior to any animals being harvested.

Federal Subsistence Board Actions. The Federal Subsistence Board adopted a regulation in 2001 that assures Yakutat residents at least 2 goats out of the allowable harvest (set by ADF&G) within 3 management areas in Unit 5A.

Hunter Harvest. Only 9 goats were harvested during the report period (5 in 2001 and 4 in 2002) and all taken under state registration permits. The sharp decrease in harvest during 2001 and 2002 is likely due to a decline in hunter effort (Table 4), and this is due to the absence of a season at Nunatak Bench. The Nunatak Bench hunt has consistently been the favorite by locals as well as guided hunters because of the ease of attaining goats from the cliffs above salt water. Total hunters dropped by one-third in only three years, from 33 hunters in 1998 to only 10 hunters in 2001. Only one female was harvested during the report period, which results in 89% of the harvest being male goats. This 2-year average male harvest is significantly higher than the 61% male harvest over the previous 11 years (Table 2). There were no goats harvested in unit 5B during the report period.

Goat hunting has never attracted a lot of outside attention in Yakutat, probably due to the cost and logistical difficulty of hunting goats there. During 1990–97 the average harvest of goats in Unit 5 was only 8. The harvest in 1998–1999 of 16 and 19 goats respectively was due in large part to an illegal guiding operation, and should be looked at as an anomaly. After this poaching problem was taken care of, the harvest of 10 goats in 2000 was again closer to the long term annual harvest.

The reduction in kill from the early 1980s appears to be related more to decreased effort than reduced success rate or a decline in goat numbers (Table 3). During 2001–2002 the number of hunters decreased by 25 from the previous report period (Table 4), representing a 47% decline in hunter effort.

Permit Hunts. A total of 25 and 43 registration permits were issued during 2001 and 2002, respectively, 21 fewer than the previous report period (Table 4). Hunting effort differed slightly between 2001 and 2002 with 10 and 12 people hunting, respectively. The mean of 11 hunters per year during the report period is significantly lower than the RY 1999–2000 mean of 24, and noticeably lower than 1990–1996, when an average of 18 people hunted each year. The registration permit strategy remains a viable method for effectively managing goat hunting in this unit.

Hunter Residency and Success. Goat hunter success averaged 41% during the 2 years of this report period, substantially lower than the previous 2-year mean of 62%, but similar to the 42% success rate during 1997–1998 (Table 3). Only 3 of the 9 successful hunters were Yakutat residents, while 1 was a nonlocal Alaskan. Nonresidents on the other hand, accounted for 5 of the goats harvested.

The number of Yakutat residents who hunted during the 2001–2002 period was 8, while nonlocal Alaska residents and nonresidents accounted for 4 and 10 of the other hunters respectively. Several events in Unit 5 will result in a change in hunting effort that favors local residents.

Harvest Chronology. The Unit 5 goat harvest is usually spread throughout the season, with the greatest number of goats typically taken during September and October. However, the 2000–2001 harvest was concentrated in November and December when 6 of the 9 goats were taken.

Transport Methods. Transport methods for successful hunters were nearly evenly split with 4 using an airplane and 5 using a boat during the report period. Those hunters using aircraft for access were nonresidents on guided hunts (Table 5). The hunters using boats however, were all local Yakutat residents.

Other Mortality

The illegal guiding activity that predominated the previous report period did not seem to be a factor in 2000–2001. Other types of mortality probably are predation and winter weather, but we have no data to indicate the level of this mortality.

CONCLUSIONS AND RECOMMENDATIONS

Efforts to obtain mountain goat population information through aerial sex and age composition counts were a priority during this report period. This data along with that collected during 2000–2001, has allowed us to get a decent grasp on goat population levels, as well as herd composition and distribution. These efforts should continue, especially at Nunatak Bench, where the population appears to be floundering.

In February 2002 Region I Division of Wildlife Conservation wildlife managers met in Ketchikan to review existing goat management objectives. These have been incorporated into this document.

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Table 1 Unit 5 mountain goat composition counts, regulatory years 1986–2002

Year	Number adults	Number kids	Total goats	Kids:100 adults	Percent kids	Goats/ hour
1986	36	11	47	31	23	40
1987	196	53	249	27	21	60
1988	140	53	193	38	27	56
1989	64	29	93	45	31	47
1990–1999			No surveys			
			Nunatak Bench			
2000[1]	69	13	82	19	16	91
	40	6	46	15	13	52
2001[2]	37	11	48	30	23	20
	37	2	39	5	5	54
2002[3]	25	4	29	16	14	19
			East Harlequin Lake			
2000	103	20	123	19	16	41
2001	119	31	150	26	21	52
2002			No survey			

1. Both surveys conducted with a Hughes 500 helicopter.

2. Survey # 1 (Hughes 500 helicopter), survey # 2 (Cessna 185).

3. Survey conducted with a Helio-Courier fixed wing aircraft.

Table 2 Unit 5 annual goat harvest, regulatory years 1990–2002

Year	Males	Females	Unknown	Total
1990	11	2	0	13
1991	4	4	0	8
1992	2	2	0	4
1993	4	2	0	6
1994	6	6	0	12
1995	4	2	0	6
1996	5	2	0	7
1997	3	2	0	5
1998	9	6	1	16
1999	10	6	3	19
2000	7	2	1	10
2001	5	0	0	5
2002	3	1	0	4

Table 3 Unit 5 goat hunter success by community of residence, regulatory years 1990–2002

		Successful hunters			Unsuccessful hunters		
Year	Percent success	Unit resident	Other AK	Non-resident	Unit resident	Other AK	Non-resident
1990	43	3	4	6	3	11	3
1991	47	2	5	1	1	2	6
1992	31	2	2	0	1	2	6
1993	50	0	0	6	3	0	3
1994	71	8	3	1	2	1	2
1995	29	2	0	4	10	2	3
1996	39	3	1	3	4	4	3
1997	29	4	1	0	6	4	2
1998	48	5	4	7	8	4	5
1999[1]	73	8	3	5	2	3	2
2000	48	0	6	4	3	3	5
2001	50	2	0	3	1	2	2
2002	33	1	1	2	4	1	3

[1] Three goats were taken illegally by hunters of unknown residency.

Table 4 Unit 5 goat hunter effort and success, regulatory years 1990 through 2002

		Successful hunters			Unsuccessful hunters			Total hunters		
Year	Permits issued	Nr hunters	Total days	Avg nr days	Nr hunters	Total days	Avg nr days	Nr hunters	Total days	Avg nr days
1990	46	13	42	3.2	17	80	4.7	30	122	4.1
1991	42	8	22	2.8	9	16	2.7	17	38	2.7
1992	35	4	8	2.0	9	29	3.2	13	37	2.8
1993	39	6	12	2.0	6	25	4.2	12	37	3.1
1994	41	12	28	2.3	5	12	2.4	17	40	2.4
1995	57	6	19	3.2	14	47	3.4	20	66	3.3
1996	51	7	17	2.4	11	48	4.4	18	65	3.6
1997	53	5	8	1.6	12	26	2.6	17	34	2.3
1998	56	16	55	3.4	17	59	3.5	33	114	3.5
1999	44	19	31	1.6	7[1]	15	3.0	26	46	1.9
2000	45	10	31	3.1	11	16	1.5	21	47	2.2
2001	25	5	10	2.0	5	13	2.6	10	23	2.3
2002	43	4	10	2.5	8	22	2.8	12	32	2.7

[1] Days per hunt data only available for 5 of these hunters.

Table 5 Unit 5 transport methods used by successful goat hunters, regulatory years 1990–2002

	Airplane		Boat		Snowmachine		Highway vehicle		Foot	
Year	Total	%	Total	%	Total	%	Total	%	Total	%
1990	11	85	0	0	2	15	0	0	0	0
1991	4	50	4	50	0	0	0	0	0	0
1992	2	50	2	50	0	0	0	0	0	0
1993	4	66	1	17	0	0	0	0	1	17
1994	0	0	9	75	3	25	0	0	0	0
1995	6	100	0	0	0	0	0	0	0	0
1996	3	43	4	57	0	0	0	0	0	0
1997	0	0	5	100	0	0	0	0	0	0
1998	6	40	9	60	0	0	0	0	0	0
1999	3	16	16	84	0	0	0	0	0	0
2000	3	30	7	70	0	0	0	0	0	0
2001	3	60	2	40	0	0	0	0	0	0
2002	1	25	3	75	0	0	0	0	0	0

Table 6 Unit 5 commercial services used by goat hunters, regulatory years 1990–2002

	Unit residents		Other AK residents		Nonresidents		Total use		Registered
Year	No	Yes	No	Yes	No	Yes	No	Yes	guide
1990	0	0	0	0	0	6	0	6	6
1991	2	1	2	4	0	6	4	11	6
1992	3	0	1	1	1	7	5	8	6
1993	0	0	0	0	0	6	0	6	6
1994	8	0	0	1	0	3	8	4	4
1995	11	1	2	0	0	7	13	8	7
1996	4	0	1	3	0	5	5	8	6
1997	7	2	4	1	0	2	11	5	2
1998	12	0	4	3	0	12	16	15	2
1999	11	0	5	0	0	7	16	7	7
2000	3	0	3	6	0	8	6	14	8
2001	3	0	2	0	0	5	5	5	5
2002	5	0	1	1	0	5	6	6	5

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MOUNTAIN GOAT MANAGEMENT REPORT

From: 1 July 2001

To: 30 June 2003

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.

Mountain goat populations in Unit 6 have fluctuated widely over the last 60 years. Art Sheets (ADF&G biologist) reported 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. In response to declining populations and low recruitment, Nowlin (1996) reduced harvest and prohibited hunting of small groups of goats (<60) during the early and mid 1990s. The population rebounded to approximately 4000 goats by 1999 as a result of conservative harvest and mild winters.

Aerial surveys to determine population size and composition began in 1969. Griese (1988*a*) improved and standardized methods in 1986 by establishing count areas that were systematically searched.

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 1–2 goats were in effect from statehood through 1975. The bag limit was reduced to one goat in 1976, and the first permit hunt was established in 1980. By 1986 the present system of registration permit hunts was in place. Unit 6C represents the necessity of goat management based on small units. Because of road access from Cordova, goats in Unit 6C had declined substantially despite efforts to reduce harvest in the single, large hunt area. Goat hunting was closed in 1989 when the population declined to 130 goats. The population had more

than tripled by 1997 when hunting resumed under 3 registration hunt areas, and the trend has been stable to increasing under conservative harvest quotas.

Nowlin (1998) established a tracking harvest strategy (Caughley 1977, Smith 1984) to guide goat management decisions. The 3 elements for implementation of the strategy were: 1) improved aerial survey methods for obtaining trend information, 2) registration permit hunts allowing careful monitoring of harvest distribution and magnitude, and 3) formalizing a minimum population objective of 2400 goats for Unit 6.

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 1983–1984 and declined to an historic low of 35 goats in 1996–1997.

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 one or more sample units. Units were 5 to 70 mi^2 and encompassed alpine cover types above 1000 feet elevation. Large glaciers (>1mi^2) were excluded from sample units. However, the edges of glaciers were searched (up to 300 feet), 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 one observer onboard. The pilot maintained airspeed of 60 to 70 mph and stayed 300 to 500 feet 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 feet 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 ensure 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 12 of 18 permit hunt areas during this reporting period (Table 1). Flights were a joint effort with USFS, Cordova Ranger District, which helped fund aircraft charter and provided an observer. We estimated 3600 goats unitwide during the reporting period.

Population size and trend varied among units over the past five years. Unit 6D (east) had the highest number of goats, and the population was increasing during the reporting period (Table 1). In Unit 6D (west) goat numbers declined, driven primarily by declines in hunt area RG252 (by 25%) and RG249 (by 64%) since 1998. Goats in Unit 6C increased following a stable period during the mid 1990s. Goat populations in Units 6A were stable. Goats in Unit 6B increased during the reporting period (Table 1).

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. Goats in Unit 6D (west) generally increased through 1998 and then declined considerably. Goats were stable in Unit 6D (east) between 1989 and 1994, then increased through the reporting period.

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 2001–2002 were 23:100 and 19%, respectively (Table 1). These values for 2002–2003 were 20:100 and 17%, respectively. 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 Aug–31 Jan and in Unit 6D 15 Sep 15–31 Jan. Hunts in 6C were limited to 2 periods of 1 week each during October and November during 2001–2002. This was increased to 1 week during October and 9 Nov–31 Jan during 2002–2003. The bag limit was 1 goat by registration permit only. Permit hunts were opened in all areas.

Unweighted and weighted harvest during 2001–2002 was 55 and 66, respectively (Table 2). Harvest during 2002–2003 was 71 and 84, respectively. The harvest included 44 males (83%) and9 females during 2001–2002. In 2002–2003, the sex composition was 58 males (85%) and 10 females. Five goats of unknown sex were 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 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 83 and 100% billies. Most hunters in Unit 6D were nonlocal residents and nonresidents who reported 79% and 77% billies during this period. Most hunters in Unit 6D were aware that nannies counted as 2 goats toward the harvest quota and sex verification was not required; hence additional nannies may have been taken and reported as billies.

The maximum allowable harvest was 99 during 2001–2002 and 108 during 2002–2003 (Table 2). Weighted harvest exceeded the maximum allowable harvest in 5 of 16 hunts during this reporting period. In Unit 6A and 6B, weighted harvest rates ranged from 1.0 to 2.5 percent since 1998–99 (Fig. 3 and 4). The harvest in Unit 6C during the same period was 1.3-3.3 percent (Fig. 5). In Units 6D (east) and 6D (west), the harvest rates were 0.6-2.3 and 3.3-5.6 percent, respectively, since 1998–1999 (Figs 6 and 7). The maximum allowable harvest in RG249 (2002–2003), and RG252 was exceeded because of high hunter effort, harvest of nannies, and easy access from Valdez (Table 2). Conservative quotas and the 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).

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

Ten emergency orders were issued closing registration permit hunts when MAH was reached. During 2001–2002, hunts RG215, RG244, RG245, RG249 and RG252 and RG266 were closed. During 2002–2003, hunts RG215, RG249 RG252 and RG266 were closed. These were routine management actions.

Permit Hunts. Registration permits were first required in the entire unit in 1981–1982. The number issued reached a peak of 796 in 1983–1984 and then steadily declined. The number of permits issued reached an historic low of 148 in 1995–1996, increased to 311 by 2000–2001, and has since stabilized (Table 2).

Hunter Residency and Success. Most successful goat hunters during this reporting period were nonresidents (Table 3). Hunter success during the reporting period averaged 50%, 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).

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. ORVs and highway vehicles were used following the opening of RG245 in 2000–2001 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 1990s. He reported the wolf population probably peaked during the early to late 1980s and then declined during the following decade to a stable, relatively low density. Wolves have recently expanded into hunt area RG242 in Unit 6D (East).

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 clearcut 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. Clearcutting 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 proceeded westward and north of Cape Yakataga. Logging began in hunt area RG204 along the Yakataga River valley during spring 2001 and has since progressed to the Duktoth River. Under an agreement between the University of Alaska and ADF&G, cut units with winter goat habitat can be removed from the harvest schedule. However, actual evidence of goat use (hair, pellets or goats) must be observed. This precludes conservation of potential or previously used winter habitat during higher goat population cycles. ADF&G searched 18 cut units in RG204 during spring, 2001, (with helicopter support from UA) and found winter goat use in 2 units. Winter goat habitat probably occurs more often in cut units requiring helicopter logging because terrain is typically steeper and higher in elevation. We did not search any helicopter units because timber economics will not

support helicopter logging in the foreseeable future (Jeff Hermanns, UA Forester, personal communication.).

CONCLUSIONS AND RECOMMENDATIONS

We achieved our objective for maintaining a minimum population size of 2400 goats and of 70% or more males in the harvest. The estimated number at the end of this reporting period was 3680. The population was stable since 2000, indicating 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%. Hunt area RG249 was not opened during the 2003–2004 season and will be closed earlier in future years in anticipation of high nanny harvest, low kid survival, and easy access by hunters.

ADF&G will continue to work cooperatively with UA to assess and protect winter goat habitat near Cape Yakataga. A joint project will begin during spring 2004 to produce and ground truth a model to better predict winter goat habitat along the coast of Unit 6.

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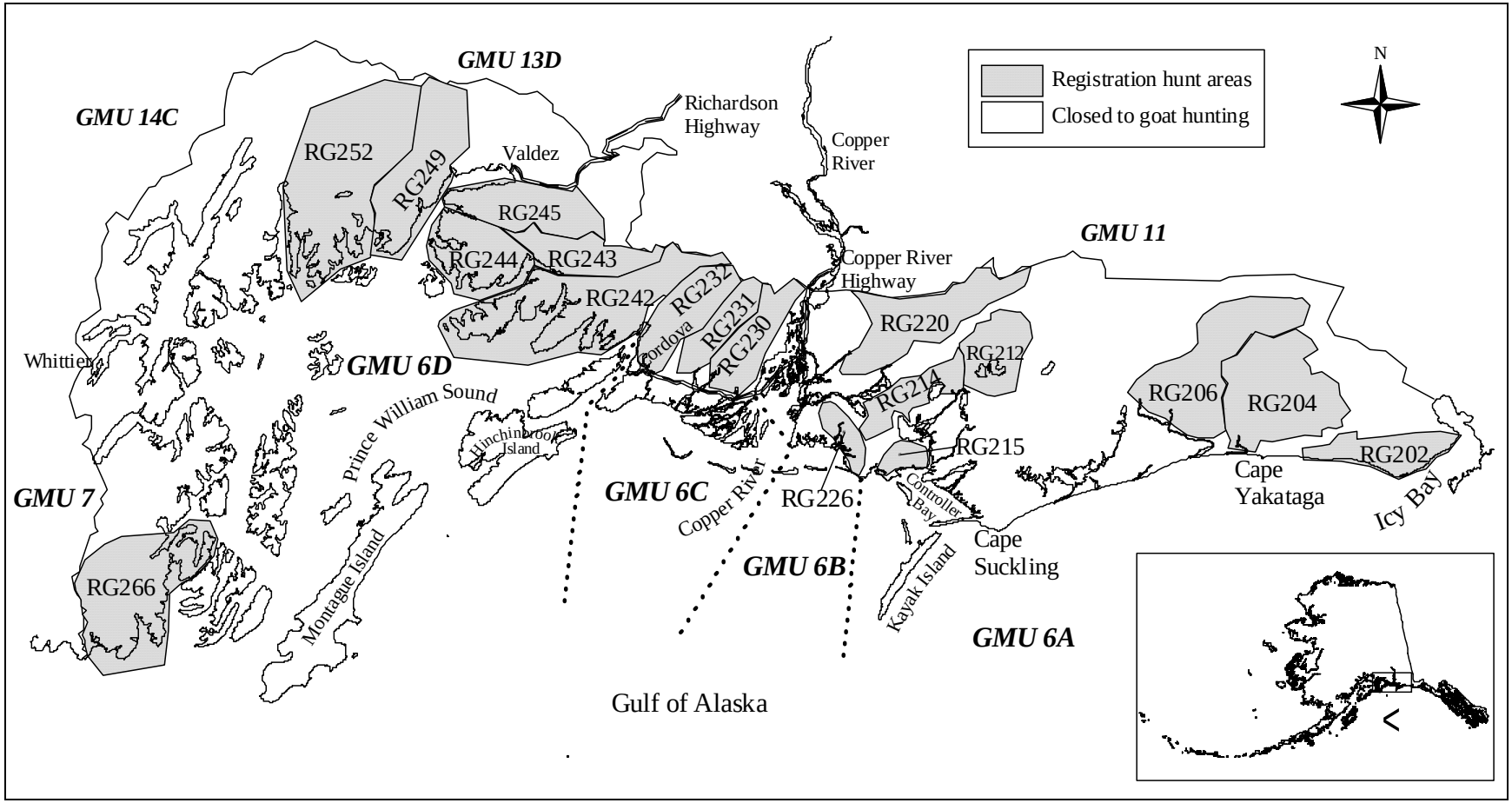

Figure 1 Unit 6 mountain goat registration permit hunts 1998–2003.

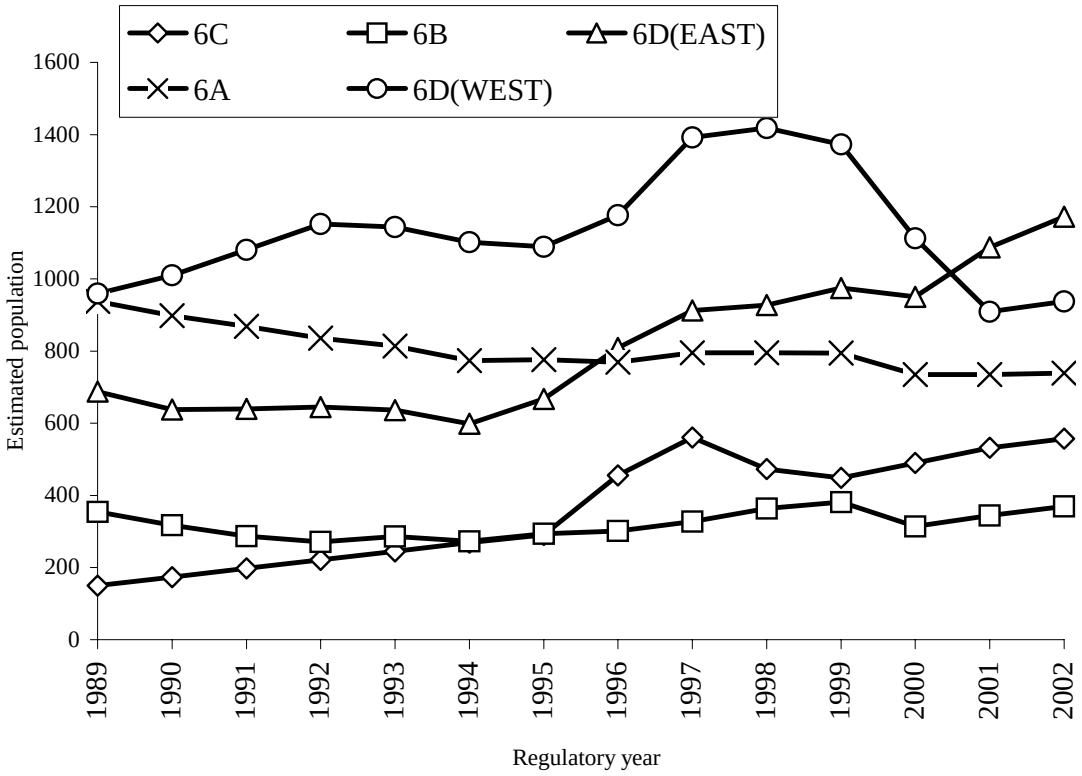

Figure 2 Unit 6 mountain goat estimated population size 1989–2002.

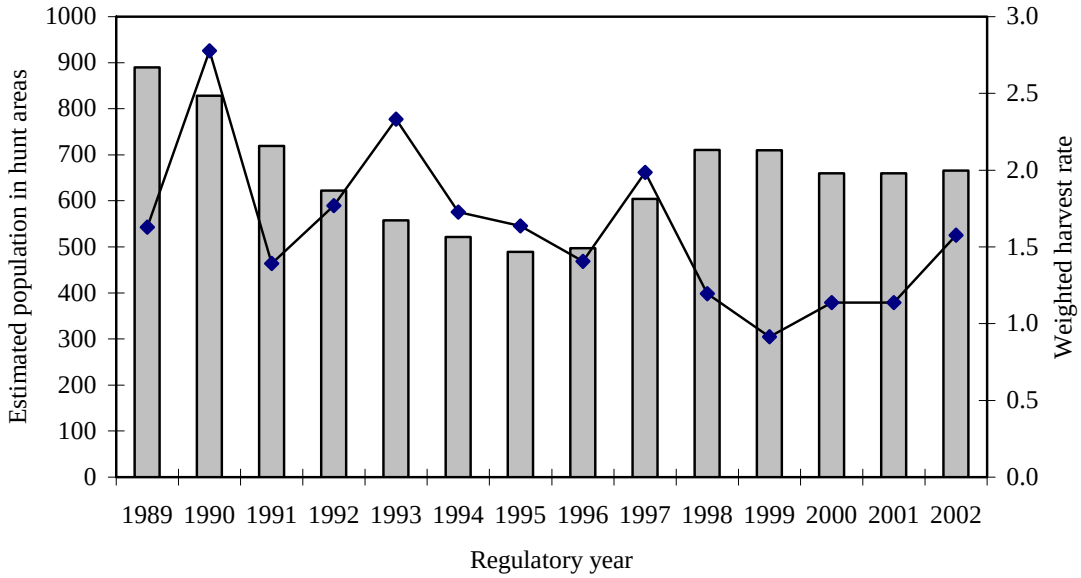

Figure 3 Estimated mountain goat populations and weighted harvest rate (nannies = 2 goats, lost goats = 1.5, billies = 1 goat) in permit hunt areas of Unit 6A, 1989–2002.

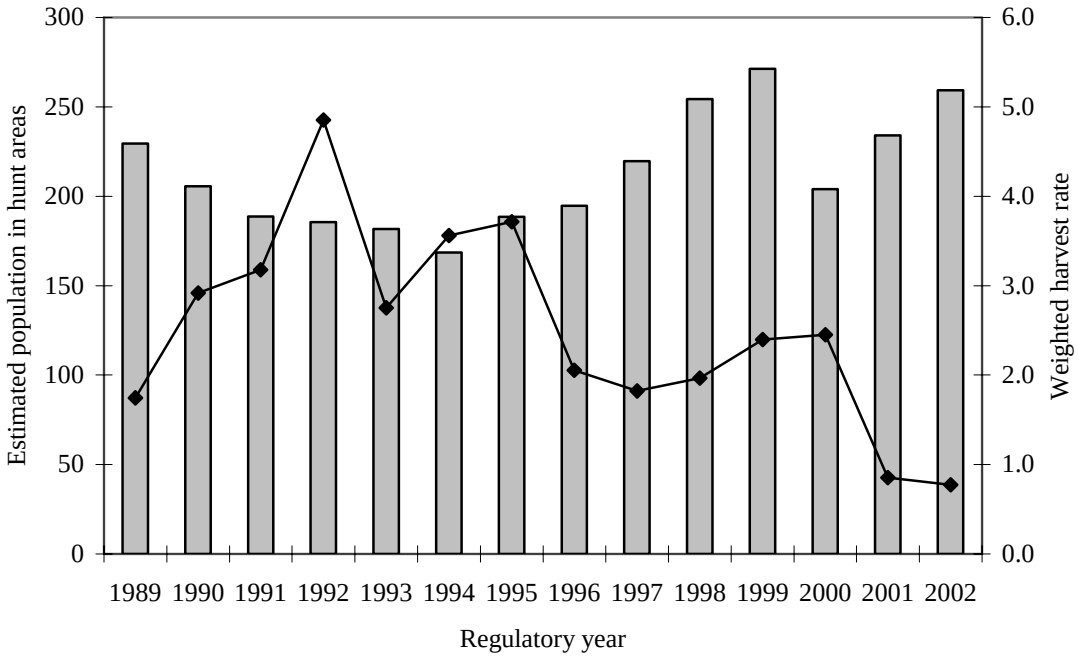

Figure 4 Estimated mountain goat populations and weighted harvest rate (nannies = 2 goats, lost goats = 1.5, billies = 1 goat) in permit hunt areas of Unit 6B, 1989–2002.

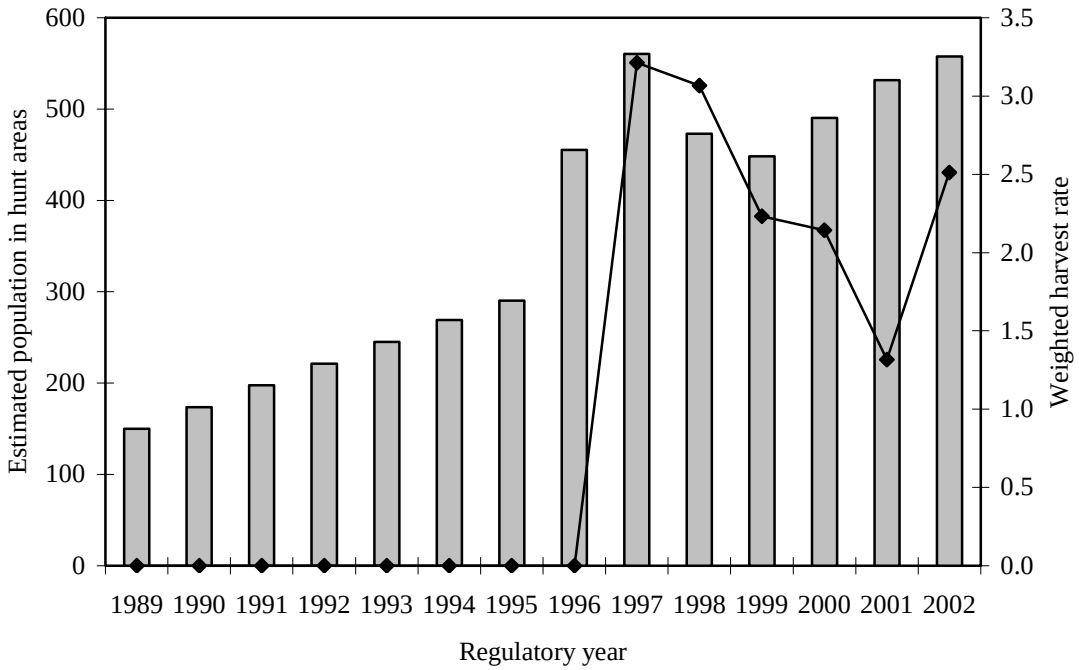

Figure 5. Estimated mountain goat populations and weighted harvest rate (nannies = 2 goats, lost goats = 1.5, billies = 1 goat) in permit hunt areas of Unit 6C, 1989–2002. Hunting resumed during 1997.

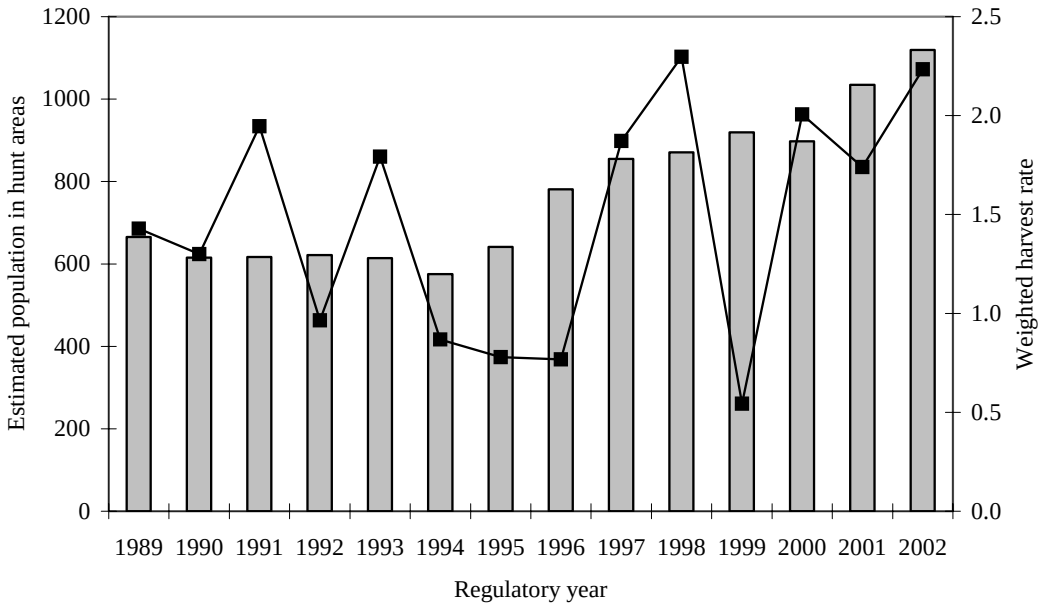

Figure 6. Estimated mountain goat populations and weighted harvest rate (nannies = 2 goats, lost goats = 1.5, billies = 1 goat) in permit hunt areas of Unit 6D (East), 1989–2002.

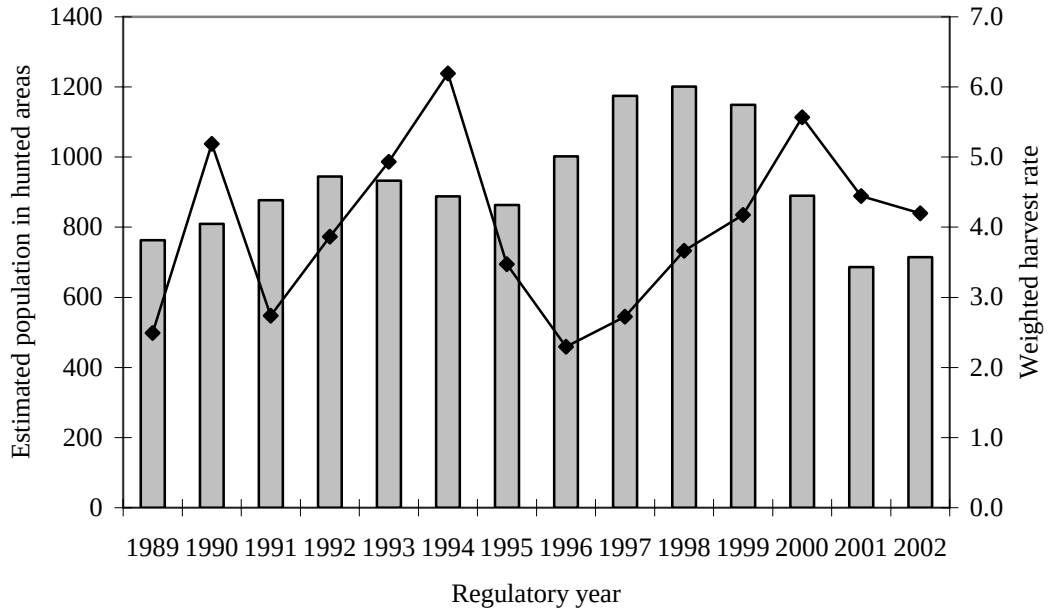

Figure 7. Estimated mountain goat populations and weighted harvest rate (nannies = 2 goats, lost goats = 1.5, billies = 1 goat) in permit hunt areas of Unit 6D (West), 1989–2002.

Table 1 Unit 6 summer/fall mountain goat composition counts and estimated population size, 1998–2003.

Unit	Hunt nr. or area	Regulatory Year	Survey coverage	Older goats	(%)	Kids	(%)	Kids:100 older goats	Total goats observed	Estimated population size
6A	RG202	1998–1999	Full	62	(81)	15	(19)	24	24	92
		1999–2003	None	--	--	--	--	--	--	90
	Brower Ridge	1998–2003	None	--	--	--	--	--	--	43
	RG204	1998–1999	Partial	138	(82)	25	(15)	18	169	189
	RG206	1998–1999	Partial	55	(29)	14	(20)	25	190	225
		1999–2003	None	--	--	--	--	--	--	225
	RG212	1998–2000	None	--	--	--	--	--	--	100
		2000–2001	Full	65	(87)	10	(13)	15	75	90
		2001–2002	None	--	--	--	--	--	--	90
		2002–2003	Full	67	(84)	13	(16)	19	80	96
	RG214	1998–2000	None	--	--	--	--	--	--	20
		2000–2001	Full	4	(100)	--	--	--	4	5
		2001–2002	None	--	--	--	--	--	--	5
		2002–2003	Partial	1	(50)	0	()	0	2	2
	RG215	1998–2000	None	--	--	--	--	--	--	85
		2000–2001	Full	39	(78)	11	(22)	28	50	60
		2001–2002	None	--	--	--	--	--	--	60
		2002–2003	Full	44	(88)	6	(12)	14	50	60
	Suckling Hills	1998–1999	None	--	--	--	--	--	--	20
		1999–2000	Partial	17	(81)	4	(19)	24	21	27
		2001–2003	None	--	--	--	--	--	--	26
6A		1998–1999	Partial	255	(38)	54	(17)	21	677	795
TOTAL		1999–2000	Partial	17	(3)	4	(19)	24	674	794
		2000–2001	Partial	108	(17)	21	(16)	19	625	735
		2001–2002	None	--	--	--	--	--	--	735
		2002–2003	Partial	112	(18)	19	(15)	17	628	739

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
6B	RG226	1998–1999	Full	135	(89)	16	(11)	12	151	181
		1999–2000	None	--	--	--	--	--	--	186
		2000–2001	Full	76	(80)	19	(20)	25	95	114
		2001–2002	None	--	--	--	--	--	--	144
		2002–2003	Full	111	(79)	30	(21)	27	141	169
	RG220	1998–1999	None	--	--	--	--	--	--	73
		1999–2000	Full	59	(83)	12	(17)	20	71	85
		2000–2001	None	--	--	--	--	--	--	90
		2001–2002	None	--	--	--	--	--	--	90
		2002–2003	None	--	--	--	--	--	--	90
	Goat Mt.	1996–2003	None	--	--	--	--	--	--	110
6B		1998–1999	Partial	135	(43)	16	(11)	12	311	363
TOTAL		1999–2000	Partial	59	(18)	12	(17)	20	326	381
		2000–2001	Partial	76	(28)	19	(20)	25	270	314
		2001–2002	None	0	()	0	()	0	295	344
		2002–2003	Partial	111	(35)	30	(21)	27	316	369
6C	RG230	1998–1999	Full	99	(87)	15	(13)	15	114	138
		1999–2000	Full	99	(79)	27	(21)	27	126	151
		2000–2001	None	--	--	--	--	--	--	162
		2001–2002	None	--	--	--	--	--	--	174
		2002–2003	Full	135	(83)	27	(17)	20	162	180
	RG231	1998–1999	Full	121	(94)	8	(6)	7	129	155
		1999–2000	Full	99	(90)	11	(10)	11	110	132
		2000–2001	Full	123	(90)	13	(10)	11	136	163
		2001–2002	None	--	--	--	--	--	--	168
		2002–2003	Full	122	(84)	23	(16)	19	145	174

Table 1 Continued

Unit	Hunt nr. or area	Regulatory Year	Survey coverage	Older goats	(%)	Kids	(%)	Kids:100 der goats	Total goats observed	Estimated opulation size
	RG232	1998–1999	Full	139	(93)	11	(7)	8	150	180
		1999–2000	Full	128	(85)	22	(15)	17	150	165
		2000–2001	None	--	--	--	--	--	--	165
		2001–2002	Full	126	(80)	32	(20)	25	158	190
		2002–2003	None	--	--	--	--	--	--	204
6C TOTAL		1998–1999	Full	359	(91)	34	(9)	9	393	473
		1999–2000	Full	326	(84)	60	(16)	18	386	448
		2000–2001	Partial	123	(29)	13	(3)	11	421	490
		2001–2002	Partial	126	(28)	32	(7)	25	443	532
		2002–2003	Partial	257	(54)	50	(10)	19	477	558
6D	RG242	1998–1999	Full	283	(85)	50	(15)	18	333	386
		1999–2000	None	--	--	--	--	--	--	420
		2000–2001	Full	331	(83)	66	(17)	20	397	465
		2001–2002	Partial	80	(18)	25	(24)	31	447	523
		2002–2003	None	--	--	--	--	--	--	585
	RG243	1998–1999	None	--	--	--	--	--	--	148
		1999–2000	Full	134	(87)	20	(13)	15	154	178
		2000–2001	None	--	--	--	--	--	--	171
		2001–2002	Full	120	(85)	21	(15)	18	141	163
		2002–2003	None	--	--	--	--	--	--	166
	RG244	1998–1999	None	--	--	--	--	--	--	235
		1999–2000	None	--	--	--	--	--	--	213
		2000–2001	Full	102	(84)	19	(16)	19	121	145
		2001–2002	Partial	79	(42)	18	(19)	23	187	224
		2002–2003	Partial	95	(44)	20	(17)	21	215	237
	RG245	1998–1999	None	--	--	--	--	--	--	102
		1999–2000	Partial	42	(42)	4	(9)	10	99	109
		2000–2001	None	--	--	--	--	--	--	117
		2001–2002	None	--	--	--	--	--	--	124
		2002–2003	None	--	--	--	--	--	--	132
Heiden Canyon		1996–2000	None	--	--	--	--	--	--	55

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 (East)		1998–1999	Partial	283	(36)	50	(15)	18	792	927
TOTAL		1999–2000	Partial	176	(21)	24	(3)	14	825	974
East of Valdez Port, Narrows and Arm		2000–2001	Partial	433	(54)	85	(11)	20	799	951
		2001–2002	Partial	279	(30)	64	(7)	23	915	1087
		2002–2003	Partial	95	(9)	20	(2)	21	1006	1172
6D	RG249	1998–1999	None	--	--	--	--	--	--	502
		1999–2000	Partial	169	(40)	23	(12)	14	422	493
		2000–2001	Full	203	(88)	29	(13)	14	232	277
		2001–2002	Partial	143	(75)	29	(17)	20	191	210
		2002–2003	Partial	113	(71)	22	(16)	19	160	176
6D	RG252	1998–1999	Full	249	(87)	37	(13)	15	286	328
		1999–2000	None	--	--	--	--	--	--	307
		2000–2001	None	--	--	--	--	--	--	287
		2001–2002	Full	115	(80)	29	(20)	25	144	173
		2002–2003	Full	178	(88)	25	(12)	14	203	244
	RG266	1998–1999	None	--	--	--	--	--	--	372
		1999–2000	None	--	--	--	--	--	--	349
		2000–2001	None	--	--	--	--	--	--	326
		2001–2002	None	--	--	--	--	--	--	303
		2002–2003	Partial	165	(63)	43	(21)	26	263	295
6D (West)	Remainder	1998–1999	None	--	--	--	--	--	--	217
Valdez, Sargent Icefield, Mt. Castner, Whittier, College Fiord		1999–2003	None	--	--	--	--	--	--	223
6D (West)		1998–1999	Partial	249	(20)	37	(13)	15	1244	1419
TOTAL		1999–2000	Partial	169	(15)	23	(12)	14	1148	1373
West of Valdez Port, Narrows and Arm		2000–2001	Partial	203	(23)	29	(13)	14	892	1113
		2001–2002	Partial	258	(33)	58	(18)	22	781	909
		2002–2003	Partial	456	(57)	90	(16)	20	802	938

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		1998–1999	Partial	555	(27)	96	(15)	17	2079	2324
TOTAL		1999–2000	Partial	353	(17)	47	(12)	13	2050	2390
		2000–2001	Partial	636	(36)	114	(15)	18	1774	2114
		2001–2002	Partial	537	(30)	122	(19)	23	1770	2047
		2002–2003	Partial	551	(30)	110	(17)	20	1849	2126
UNIT 6		1998–1999	Partial	1304	(42)	200	(13)	15	3092	3956
TOTAL		1999–2000	Partial	755	(27)	123	(14)	16	2783	4014
		2000–2001	Partial	943	(36)	167	(15)	18	2594	3653
		2001–2002	Partial	663	(25)	154	(19)	23	2638	3657
		2002–2003	Partial	1031	(38)	209	(17)	20	2683	3683

Table 2 Unit 6 mountain goat harvest data by permit hunt, 1998–2003.

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 Unw [a]	Total harvest W [b]	Maximum allowable harvest [c]
6A/RG202	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
	2001–2002	9	6	67	1	33	2	67	1	(100)	0	(0)	1	2	3	3
	2002–2003	11	5	45	4	67	2	33	1	(100)	0	(0)	1	2	3	3
6A/RG204	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
	2001–2002	11	10	91	0	0	1	100	1	(100)	0	(0)	0	1	1	7
	2002–2003	5	2	40	0	0	3	100	3	(100)	0	(0)	0	3	3	7
6A/RG206	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
	2001–2002	9	7	78	1	50	1	50	1	(100)	0	(0)	0	1	1	5
	2002–2003	6	2	33	1	25	3	75	3	(100)	0	(0)	0	3	3	5
6A/RG212	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
	2001–2002	5	2	40	2	67	1	33	1	(100)	0	(0)	0	1	1	4
	2002–2003	2	1	50	1	100	0	0	0	-	0	-	0	0	0	4
6A/RG215	1998–1999	None	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	1999–2000	None	-	-	-	-	-	-		-		-	-	-	-	-
	2000–2001	12	7	58	2	40	3	60	3	(100)	0	(0)	0	3	3	4
	2001–2002	4	2	50	0	0	2	100	2	(100)	0	(0)	0	2	2	2
	2002–2003	4	2	50	0	0	2	100	2	(100)	0	(0)	0	2	2	2
6A TOTAL	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
	2001–2002	38	27	71	4	36	7	64	6	(100)	0	(0)	1	7	8	21
	2002–2003	28	12	43	6	38	10	63	9	(100)	0	(0)	1	10	11	21

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]
6B/RG220	1994–1999	None	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	2000–2001	9	8	89	0	0	1	100	1	(100)	0	(0)	0	1	1	4
	2001–2002	6	5	83	1	100	0	0	0	-	0	-	0	0	0	4
	2002–2003	0	-	-	-	-	-	-	-	-	-	-	-	-	-	4
6B/RG226	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
	2001–2002	9	4	44	3	60	2	40	2	(100)	0	(0)	0	2	2	3
	2002–2003	15	12	80	1	33	2	67	2	(100)	0	(0)	0	2	2	7
6B TOTAL	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
	2001–2002	15	4	27	4	36	2	18	2	(100)	0	(0)	0	2	2	7
	2002–2003	15	4	27	1	9	2	18	2	(100)	0	(0)	0	2	2	11
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
	2001–2002	8	4	50	3	75	1	25	1	(100)	0	(0)	0	1	1	6
	2002–2003	10	2	20	4	50	4	50	4	(100)	0	(0)	0	4	4	9
6C/RG231	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
	2001–2002	7	0	0	2	29	5	71	4	(80)	1	(20)	0	5	6	5
	2002–2003	8	2	25	2	33	4	67	4	(100)	0	(0)	0	4	4	9
6C/RG232	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
	2001–2002	7	3	43	4	100	0	0	0	-	0	-	0	0	0	8
	2002–2003	14	3	21	5	45	6	55	6	(100)	0	(0)	0	6	6	10

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	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
	2001–2002	22	7	32	9	60	6	40	5	(83)	1	(17)	0	6	7	19
	2002–2003	32	7	22	11	44	14	56	14	(100)	0	(0)	0	14	14	28
6D/RG242	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
	2001–2002	42	30	71	9	75	3	25	3	(100)	0	(0)	0	3	3	17
	2002–2003	59	30	51	14	48	14	48	12	(86)	2	(14)	0	14	16	17
6D/RG244	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
	2001–2002	28	12	43	8	50	8	50	6	(75)	2	(25)	0	8	10	5
	2002–2003	32	23	72	4	44	4	44	3	(75)	1	(25)	0	4	5	7
6D/RG245	1994–1999	None	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	2000–2001	30	14	47	11	69	5	31	4	(80)	1	(20)	0	5	6	6
	2001–2002	24	11	46	8	62	5	38	5	(100)	0	(0)	0	5	5	6
	2002–2003	31	10	32	15	71	5	24	5	(100)	0	(0)	0	5	5	7
6D (EAST)	1998–1999	44	22	50	11	50	11	50	7	(64)	4	(36)	0	11	15	25
TOTAL	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
	2001–2002	94	53	56	25	61	16	39	14	(88)	2	(13)	0	16	18	28
	2002–2003	122	63	52	33	56	23	39	20	(87)	3	(13)	0	23	26	31
6D/RG249	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
	2001–2002	29	19	66	2	20	8	80	8	(100)	0	(0)	0	8	8	9
	2002–2003	19	5	26	4	29	10	71	6	(67)	3	(33)	1	10	14	5

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	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
	2001–2002	24	18	75	0	0	6	100	3	(60)	2	(40)	1	6	9	6
	2002–2003	33	14	42	10	53	9	47	5	(56)	4	(44)	0	9	13	9
6D/RG266	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
	2001–2002	39	20	51	9	47	10	53	6	(60)	4	(40)	0	10	14	11
	2002–2003	22	14	64	4	50	3	38	2	(100)	0	(0)	1	3	4	5
6D (WEST)	1998–1999	149	79	53	30	43	40	57	36	(90)	4	(10)	0	40	44	51
TOTAL	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
	2001–2002	92	57	62	11	31	24	69	17	(74)	6	(26)	1	24	31	24
	2002–2003	74	33	45	18	44	22	54	13	(65)	7	(35)	2	22	31	17
6D TOTAL	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
	2001–2002	186	110	59	36	47	40	53	31	(79)	8	(21)	1	40	49	52
	2002–2003	196	96	49	51	51	45	45	33	(77)	10	(23)	2	45	57	48
UNIT 6	1998–1999	268	129	48	64	46	75	54	62	(85)	11	(15)	2	75	88	117
TOTAL	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
	2001–2002	261	148	57	53	47	55	49	44	(83)	9	(17)	2	55	66	99
	2002–2003	271	119	44	69	45	71	47	58	(85)	10	(15)	3	71	84	108

[a] Unweighted harvest; each male, female, and unknown 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, 1998–2003.

		Successful					Unsuccessful					
Unit	Regulatory year	Local resident	Nonlocal resident	Nonresident	Total	(%)	Local resident	Nonlocal resident	Nonresident	Total	(%)	Total hunters
6A	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
	2001–2002	2	0	5	7	(64)	1	0	3	4	(36)	11
	2002–2003	0	1	9	10	(63)	1	5	0	6	(38)	16
6B	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
	2001–2002	0	0	2	2	(33)	0	1	3	4	(67)	6
	2002–2003	0	0	2	2	(67)	0	0	1	1	(33)	3
6C	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
	2001–2002	5	1	0	6	(40)	9	0	0	9	(60)	15
	2002–2003	14	0	0	14	(56)	11	0	0	11	(44)	25
6D	1998–1999	9	33	9	53	(55)	10	24	7	43	(45)	96
	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
	2001–2002	6	17	17	40	(53)	11	22	3	36	(47)	76
	2002–2003	8	19	18	45	(47)	12	28	11	51	(53)	96
Unit 6 Total	1998–1999	20	34	21	77	(55)	26	26	12	64	(45)	141
	1999–2000	11	21	28	60	(55)	12	30	6	48	(44)	108
	2000–2001	13	29	28	70	(48)	21	43	11	75	(52)	145
	2001–2002	13	18	24	55	(51)	21	23	9	53	(49)	108
	2002–2003	22	20	29	71	(51)	24	33	12	69	(49)	140

Table 4 Unit 6 mountain goat harvest chronology percent by month, 1998–2003.

Unit	Regulatory year	Harvest Periods						*n*
		August	September	October	November	December	January	
6A	1998–1999	0	63	38	0	0	0	
	1999–2000	67	33	0	0	0	0	
	2000–2001	33	0	44	0	11	11	8
	2001–2002	57	0	29	0	0	14	7
	2002–2003	0	60	30	0	10	0	10
6B	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
	2001–2002	50	50	0	0	0	0	2
	2002–2003	50	0	50	0	0	0	2
6C	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
	2001–2002	0	0	67	33	0	0	6
	2002–2003	0	0	50	29	7	14	14
6D	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
	2001–2002	0	45	40	10	3	3	40
	2002–2003	0	60	22	11	4	2	45
Unit 6	1998–1999	5	32	53	5	1	3	75
Total	1999–2000	15	33	47	5	0	0	60
	2000–2001	7	27	49	14	1	1	70
	2001–2002	9	35	40	11	2	4	55
	2002–2003	1	46	30	13	6	4	71

Table 5 Unit 6 mountain goat harvest percent by transport method, 1998–2003.

Subunit	Regulatory year	Airplane		Boat		3- or 4-wheeler		Snowmachine		ORV		Highway vehicle		Unknown		Total
		n	(%)	*n*	(%)	*n*	(%)	*n*	(%)	*n*	(%)	*n*	(%)	*n*	(%)	*n*
6A	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
	2001–2002	8	(73)	0	(0)	3	(27)	0	(0)	0	(0)	0	(0)	0	(0)	11
	2002–2003	12	(75)	1	(6)	0	(0)	0	(0)	0	(0)	3	(19)	0	(0)	16
6B	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
	2001–2002	6	(100)	0	(0)	0	(0)	0	(0)	0	(0)	0	(0)	0	(0)	6
	2002–2003	3	(100)	0	(0)	0	(0)	0	(0)	0	(0)	0	(0)	0	(0)	3
6C	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
	2001–2002	0	(0)	3	(20)	0	(0)	0	(0)	0	(0)	11	(73)	1	(7)	15
	2002–2003	0	(0)	8	(32)	4	(16)	1	(4)	1	(4)	11	(44)	0	(0)	25
6D	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
	2001–2002	24	(32)	43	(57)	2	(3)	0	(0)	0	(0)	7	(9)	0	(0)	76
	2002–2003	28	(29)	52	(54)	5	(5)	2	(2)	0	(0)	7	(7)	2	(2)	96
UNIT 6 TOTAL	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
	2001–2002	38	(35)	46	(43)	5	(5)	0	(0)	0	(0)	18	(17)	1	(1)	108
	2002–2003	43	(31)	61	(44)	9	(6)	3	(2)	1	(1)	21	(15)	2	(1)	140

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MOUNTAIN GOAT MANAGEMENT REPORT

From: 1 July 2001
To: 30 June 2003

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 extent of their range on mainland Alaska. Goat populations are most abundant in the coastal mountains and least abundant along the interior portions of the Kenai Mountains where they coexist with Dall sheep (*Ovis dalli*). Del Frate (2002) stated a probable population range between 3500–4500 goats throughout the Kenai Peninsula.

Nearly all the goat habitat on the Kenai Peninsula is within the Kenai Fjords National Park (KFNP), the Kenai National Wildlife Refuge, Chugach National Forest, or Kachemak Bay State Park. Goats within the KFNP were protected from hunting when the park was established in 1980. For the past 2 decades, goat hunting on the Kenai Peninsula has been managed by a combination of drawing and registration permit hunts. Populations have fluctuated due to weather conditions and predation pressure.

MANAGEMENT DIRECTION

MANAGEMENT OBJECTIVES

To maintain a healthy proportion of kids in each goat area, maintain a low proportion of nannies in the harvest (below 50%), and restrict hunting quotas according to conservative assessments of minimum population size.

METHODS

The Kenai Peninsula mountain goat range, excluding KFNP, is divided into 32 count areas that correspond to hunt areas. Since the early 1970s ADF&G has monitored goat populations in these areas by midsummer aerial surveys (Lentfer 1955, Nichols 1980). Each area is surveyed once every 3 to 4 years. Surveys distinguish kids (<4 months) from adults.

Goat harvest on the Kenai Peninsula is managed through a system of permit hunts. Due to the secretive nature of mountain goats, our survey data is highly variable and we conservatively base harvest quotas on minimum numbers of goats counted. At the end of each drawing season, hunt areas that have unfilled quotas are opened to a registration permit hunt if the remaining portion of the harvest quota is large enough to not risk quickly exceeding the quota. To protect the

female proportion of the population, nannies are counted as 2 goat units when calculating quotas, whereas billies count as one. The registration permits are valid for 7 days. Archery-only registration permits are issued for areas where the quota has not been reached but the threat of exceeding the quota was too great if opened to all weapon types. When harvest goals have been achieved, registration permits are no longer issued. A Tier II subsistence harvest is allowed in only 2 hunt areas south of Kachemak Bay.

All of the harvest data is now kept at ADF&G's Web-based database called WinfoNet. This report reflects updated data in all tables using data from WinfoNet; therefore data may differ slightly from past reports.

RESULTS AND DISCUSSION

POPULATION STATUS AND TREND

Population Size and Composition

During the reporting period, surveys were conducted in 21 count areas (Table 1). Several count areas showed a modest increase in goats tallied, but most areas counted fewer goats since they were surveyed 2–4 years previously. Overall, updated surveys counted 9% fewer goats across all areas from the last time these count areas were surveyed. This decrease may be a reflection of a small population decline and/or is an artifact of the wide margin or error when counting this furtive species.

MORTALITY

Harvest

Season and Bag Limit. During the March 2001 Board of Game meeting, the season dates for all 3 permit hunts changed starting in 2001–2002. The drawing season changed from Aug. 10–Sept. 30 to Aug. 10–Oct. 15; the registration season changed from Oct. 15–30 to Nov. 1–30; the subsistence season changed from Aug. 1–Sept. 1 to Aug. 1–Oct. 15. The bag limit has been 1 goat since 1974.

The average harvest for the past 2 decades is 64 goats for the drawing season and 44 goats during the registration season. The reporting period (1 July 2001–30 June 2003) showed the average drawing season harvest (66) near the 20-year average, and goats taken during the registration season (19) are below the average (Tables 2 and 3). The average subsistence harvest during the reporting period (4) was below the 10-year average of 10 goats per year (Table 4). Individual statistics for each drawing and registration hunt are shown in Table 5.

Board of Game Actions. There were no other board changes to goat management during the reporting period.

Hunter Residency and Success. In the past 5 seasons, the vast majority of drawing season hunters (123-163) and registration season hunters (91-208) were Alaska residents (Tables 6 and 7). The 5-year average success rate was 33% for drawing hunts (Table 6) and 13% for registration hunts (Table 7).

Harvest Chronology. The harvest chronology reflects the extension of the drawing season into October. The harvest chronology was spread throughout the season and is a reflection of seasonal weather conditions (Table 8).

Transport Methods. Averaged over the past 5 seasons, successful hunters primarily used airplanes (30%), boats (32%), and highway vehicles (30%) as the primary transport methods (Table 9).

CONCLUSIONS AND RECOMMENDATIONS

Goat numbers appear to be stable on the Kenai Peninsula with some areas showing a small decline. The management strategy allots the majority of the harvest opportunity to drawing permits. Registration hunts will open only when there is a substantial goat quota available after the drawing season.

A developing industry that may affect goat populations is commercial guided helicopter skiing in the Chugach National Forest (1999). We are assessing the possible impacts of heli-ski operations on winter goat distributions and recommending areas that should not be open for this activity, based on traditional wintering habitat for goats.

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Table 1. Mountain goat surveys for the Kenai Peninsula (Units 7 & 15), 1998–2002

SURVEY YEAR	AREA	ADULTS	KIDS	TOTAL GOATS	% KIDS
2002	331	21	5	26	19
	332	37	15	52	29
	333	24	7	31	23
	352	118	45	163	28
	354	23	5	28	18
	355	11	3	14	21
	357	16	5	21	24
	359	43	10	53	19
	360	54	15	69	22
	362	70	22	92	24
2001	336	109	26	135	19
	337	18	0	18	0
	338	24	5	29	17
	339	71	8	79	10
	341	30	9	39	23
	344	45	10	55	18
	346	252	51	303	17
	351	14	7	21	33
	353	0	0	0	0
	363	135	24	159	15
	365	147	51	198	26
2000	331	35	4	39	10
	332	50	9	59	15
	333	78	10	88	11
	334	84	17	101	17
	335	65	10	75	13
	337	13	2	15	13
	340	38	7	45	16
	342	84	15	99	15
	343	86	18	104	17
	345	85	23	108	21
	353	0	0	0	0
	358	30	6	36	17
	361	66	13	79	16
	364	41	3	44	7

Table 1. Continued

SURVEY YEAR	AREA	ADULTS	KIDS	TOTAL GOATS	% KIDS
1999	336	77	18	95	19
	338	21	8	29	28
	339	154	20	174	11
	340	31	6	37	16
	347	94	30	124	24
1998	331	41	8	49	16
	332	57	16	73	22
	352	137	32	169	19
	356	27	9	36	25
	359	39	7	46	15
	360	96	26	122	21
	362	88	20	108	19
	365	93	26	119	22

All data has been updated from the ADF&G online database: WildlifeInfoNet

Table 2. Drawing permit harvest for mountain goats on the Kenai Peninsula (Units 7 & 15), 1981–2002

Year	Season Dates	Permits Issued	Hunters	Percent Success	Harvest			
					M	F	U	Total
1981	10 Aug–30 Nov	185	93	33	25	6		31
1982	10 Aug–30 Sept	320	162	44	51	20		71
1983	10 Aug–30 Sept	320	unk	unk	46	20		66
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	61	57	21	14		35
1987	10 Aug–30 Sept	347	160	43	49	19	1	69
1988	10 Aug–30 Sept	329	156	38	43	17		60
1989	10 Aug–30 Sept	324	145	47	46	22		68
1990	10 Aug–30 Sept	364	160	37	14	4	41	59
1991	10 Aug–30 Sept	320	257	30	55	21	1	77
1992	10 Aug–30 Sept	347	183	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	414	231	34	48	30	1	79
1997	10 Aug–30 Sept	448	221	39	59	27	1	87
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
2001	10 Aug–15 Oct	394	206	31	40	23		63
2002	10 Aug–15 Oct	386	191	36	41	26	1	68

All data has been updated from the ADF&G online database: WildlifeInfoNet

Table 3. Registration permit harvest for mountain goats on the Kenai Peninsula (Units 7 & 15), 1981–2002

Year	Season Dates	Permits Issued	Hunters	Percent Success	Harvest			Total
					M	F	U	
1981	15 Oct–30 Nov	0	0	0	0	0		0
1982	15 Oct–30 Nov	172	96	19	6	11	1	18
1983	15 Oct–30 Nov	unk	unk	unk	21	14		35
1984	15 Oct–30 Nov	288	189	37	43	26	1	70
1985	1 Oct– 31 Oct	578	326	38	64	57	3	124
1986	6 Sept–31 Oct	366	188	44	53	29	1	83
1987	15 Oct–30 Nov	320	150	25	25	12		37
1988	15 Oct–30 Nov	308	183	39	46	24	1	71
1989	15 Oct–30 Nov	382	127	25	18	13	1	32
1990	15 Oct–30 Nov	270	124	32	24	14	2	40
1991	15 Oct–30 Nov	341	178	31	40	16		56
1992	15 Oct–30 Nov	431	263	29	52	22	1	75
1993	15 Oct–30 Nov	481	279	25	45	24		69
1994	15 Oct–30 Nov	439	247	21	41	11	1	53
1995	15 Oct–30 Nov	428	221	29	39	24	1	64
1996	15 Oct–30 Nov	353	137	30	24	16	1	41
1997	15 Oct–30 Nov	321	192	24	30	16	0	46
1998	15 Oct–30 Nov	433	244	15	22	12	2	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
2001	1–30 Nov	181	103	12	8	3	1	12
2002	1–30 Nov	329	188	13	16	9	0	25

All data has been updated from the ADF&G online database: WildlifeInfoNet

Table 4. Tier II subsistence harvest for mountain goats on the Kenai Peninsula (Units 7 & 15), 1991–2002

Year	Season Dates	Permits Issued	Hunters	Percent Success	Harvest			
					M	F	U	Total
1991	1 Aug–30 Sep	94	42	31	13	0		13
1992	1 Aug–30 Sep	94	48	50	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	105	23	30	4	3		7
1996	1 Aug–30 Sep	76	32	53	15	2		17
1997	1 Aug–30 Sep	46	28	32	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
2001	1 Aug–15 Oct	42	15	37	3	1		4
2002	1 Aug–15 Oct	44	20	20	3	1		4

All data has been updated from the ADF&G online database: WildlifeInfoNet

Table 5. Mountain goat harvest data for drawing and registration permits on the Kenai Peninsula (Units 7 & 15), 1998–2002

		Drawing Hunts							Registration Hunts						
Area	Reg. Year	Billy	Nanny	Unk	Total	permits issued	Nr Hunted	% Success	Billy	Nanny	Unk	Total	permits issued	Nr Hunted	% Success
331	1998–99	2	1	0	3	3	3	100	No hunt						
	1999–00	0	0	0	0	3	3	0	0	1	0	1	13	5	20
	2000–01	0	0	0	0	3	2	0	1	0	1	2	19	7	29
	2001–02	0	2	0	2	3	2	100	No hunt						
	2002–03	1	1	0	2	3	3	67	No hunt						
332	1998–99	No hunt							No hunt						
	1999–00	0	1	0	1	4	4	25	No hunt						
	2000–01	1	1	0	2	4	4	50	No hunt						
	2001–02	0	0	0	0	4	2	0	1	0	0	1	8	5	20
	2002–03	3	0	0	3	4	4	75	No hunt						
333	1998–99	4	2	0	6	25	19	32	3	0	0	3	81	51	6
	1999–00	3	0	0	3	25	15	20	3	0	2	5	162	77	6
	2000–01	2	1	0	3	25	14	21	No hunt						
	2001–02	1	1	0	2	22	14	14	No hunt						
	2002–03	1	0	0	1	22	12	8	No hunt						
334	1998–99	1	0	0	1	6	4	25	2	2	1	5	80	54	9
	1999–00	3	1	0	4	8	6	67	No hunt						
	2000–01	2	1	0	3	10	9	33	2	0	0	2	48	24	8
	2001–02	1	1	0	2	10	6	33	0	0	0	0	33	20	0
	2002–03	0	1	0	1	10	8	13	1	3	0	4	49	31	13
335	1998–99	1	1	0	2	10	7	29	No hunt						
	1999–00	0	1	0	1	3	3	33	No hunt						
	2000–01	1	0	0	1	3	1	100	1	0	0	1	54	26	4
	2001–02	1	0	0	1	5	4	25	No hunt						
	2002–03	0	0	0	0	6	2	0	4	1	0	5	78	44	11

Table 5. Continued

		Drawing Hunts							Registration Hunts						
Area	Reg. Year	Billy	Nanny	Unk	Total	permits issued	Nr Hunted	% Success	Billy	Nanny	Unk	Total	permits issued	Nr Hunted	% Success
336	1998–99	4	1	0	5	30	16	31	2	0	0	2	79	35	6
	1999–00	0	0	0	0	30	15	0	0	1	0	1	55	21	5
	2000–01	0	0	0	0	30	11	0	0	0	0	0	65	26	0
	2001–02	1	1	0	2	25	10	20	0	0	0	0	19	8	0
	2002–03	0	1	0	1	25	11	9	4	1	0	5	76	47	11
339	1998–99	2	0	0	2	15	13	15	0	0	0	0	30	18	0
	1999–00	4	3	0	7	18	12	58	No hunt						
	2000–01	5	5	0	10	25	20	50	No hunt						
	2001–02	5	3	0	8	20	16	50	No hunt						
	2002–03	1	0	0	1	15	9	11	1	1	0	2	51	33	6
340	1998–99	1	1	0	2	30	13	15	2	0	0	2	3	2	100
	1999–00	0	0	0	0	30	4	0	0	0	0	0	4	2	0
	2000–01	0	1	0	1	20	5	20	No hunt						
	2001–02	0	0	0	0	20	4	0	1	0	0	1	4	2	50
	2002–03	0	1	1	2	20	7	29	No hunt						
341	1998–99	0	1	0	1	4	2	50	No hunt						
	1999–00	2	0	0	2	5	4	50	No hunt						
	2000–01	2	1	0	3	6	3	100	No hunt						
	2001–02	1	2	0	3	6	4	75	No hunt						
	2002–03	1	0	0	1	4	3	33	No hunt						
342	1998–99	0	1	0	1	12	9	11	No hunt						
	1999–00	0	3	0	3	14	10	30	No hunt						
	2000–01	4	1	0	5	12	10	50	No hunt						
	2001–02	2	0	0	2	12	7	29	0	0	0	0	3	3	0
	2002–03	1	2	0	3	14	8	38	0	0	0	0	20	13	0

Table 5. Continued

		Drawing Hunts							Registration Hunts						
Area	Reg. Year	Billy	Nanny	Unk	Total	permits issued	Nr Hunted	% Success	Billy	Nanny	Unk	Total	permits issued	Nr Hunted	% Success
343	1998–99	2	0	0	2	6	5	40	No hunt						
	1999–00	2	0	0	2	8	8	25	No hunt						
	2000–01	1	0	0	1	8	7	14	3	6	1	10	79	40	25
	2001–02	2	0	0	2	8	5	40	1	1	1	3	34	22	14
	2002–03	2	3	0	5	10	9	56	No hunt						
344	1998–99	3	2	0	5	16	13	38	No hunt						
	1999–00	1	0	0	1	10	5	20	0	0	0	0	5	2	0
	2000–01	2	1	0	3	12	8	38	No hunt						
	2001–02	0	0	0	0	10	1	0	0	0	0	0	5	1	0
	2002–03	1	0	0	1	10	4	25	1	0	0	1	17	6	17
345	1998–99	3	1	0	4	40	12	33	1	1	0	2	25	7	29
	1999–00	2	1	0	3	40	19	16	2	1	0	3	30	8	38
	2000–01	2	2	0	4	40	19	21	No hunt						
	2001–02	2	0	0	2	30	14	14	0	0	0	0	5	0	0
	2002–03	3	0	0	3	25	6	50	1	0	0	1	13	4	25
346	1998–99	3	1	0	4	40	17	24	7	5	1	13	89	54	24
	1999–00	5	4	0	9	40	22	41	No hunt						
	2000–01	6	1	0	7	30	18	39	No hunt						
	2001–02	4	2	0	6	30	19	32	2	1	0	3	52	29	10
	2002–03	9	5	0	14	40	31	45	No hunt						
347	1998–99	5	0	0	5	20	15	33	No hunt						
	1999–00	5	0	0	5	20	12	42	No hunt						
	2000–01	3	0	0	3	20	9	33	5	2	0	7	33	18	39
	2001–02	2	2	0	4	20	12	33	No hunt						
	2002–03	2	1	0	3	20	11	27	No hunt						

Table 5. Continued

		Drawing Hunts							Registration Hunts						
Area	Reg. Year	Billy	Nanny	Unk	Total	permits issued	Nr Hunted	% Success	Billy	Nanny	Unk	Total	permits issued	Nr Hunted	% Success
351	1998–99	1	0	0	1	4	3	33	No hunt						
	1999–00	1	0	0	1	4	4	25	No hunt						
	2000–01	0	0	0	0	5	1	0	No hunt						
	2001–02	0	0	0	0	5	3	0	No hunt						
	2002–03	No hunt													
352	1998–99	2	5	0	7	25	13	54	No hunt						
	1999–00	6	1	0	7	25	14	50	No hunt						
	2000–01	4	4	0	8	25	13	62	No hunt						
	2001–02	3	5	0	8	25	15	53	No hunt						
	2002–03	1	1	0	2	25	4	50	2	1	0	3	13	5	60
354	1998–99	0	0	0	0	10	3	0	1	0	0	1	6	3	33
	1999–00	0	0	0	0	8	3	0	No hunt						
	2000–01	0	0	0	0	8	3	0	0	0	0	0	18	8	0
	2001–02	1	0	0	1	8	2	50	No hunt						
	2002–03	1	0	0	1	8	1	100	No hunt						
355	1998–99	0	1	0	1	4	4	25	No hunt						
	1999–00	1	0	0	1	4	2	50	No hunt						
	2000–01	0	1	0	1	4	2	50	No hunt						
	2001–02	0	0	0	0	4	3	0	No hunt						
	2002–03	1	0	0	1	4	2	50	No hunt						
356	1998–99	0	0	0	0	6	5	0	No hunt						
	1999–00	0	1	0	1	6	3	33	No hunt						
	2000–01	0	1	0	1	5	2	50	No hunt						
	2001–02	1	0	0	1	5	1	100	No hunt						
	2002–03	1	1	0	2	5	3	67	No hunt						

Table 5. Continued

		Drawing Hunts							Registration Hunts						
Area	Reg. Year	Billy	Nanny	Unk	Total	permits issued	Nr Hunted	% Success	Billy	Nanny	Unk	Total	permits issued	Nr Hunted	% Success
357	1998–99	2	0	0	2	10	6	33	No hunt						
	1999–00	1	0	0	1	10	5	20	0	0	0	0	8	1	0
	2000–01	2	0	0	2	10	5	40	No hunt						
	2001–02	1	0	0	1	10	6	17	No hunt						
	2002–03	0	1	0	1	10	4	25	No hunt						
358	1998–99	1	0	0	1	10	2	50	No hunt						
	1999–00	0	0	0	0	10	9	0	No hunt						
	2000–01	1	1	0	2	12	4	50	No hunt						
	2001–02	0	3	0	3	12	8	38	No hunt						
	2002–03	1	1	0	2	8	3	67	No hunt						
359	1998–99	0	0	0	0	16	9	0	No hunt						
	1999–00	1	0	0	1	10	6	17	No hunt						
	2000–01	1	0	0	1	10	2	50	No hunt						
	2001–02	0	0	0	0	10	3	0	No hunt						
	2002–03	1	0	0	1	10	4	25	No hunt						
360	1998–99	2	2	0	4	30	12	33	No hunt						
	1999–00	1	2	0	3	30	14	21	No hunt						
	2000–01	2	4	0	6	30	17	35	No hunt						
	2001–02	2	0	0	2	25	10	20	1	0	0	1	7	5	20
	2002–03	5	1	0	6	25	13	46	No hunt						
361	1998–99	1	0	0	1	20	6	17	1	0	0	1	22	11	9
	1999–00	3	0	0	3	20	7	43	No hunt						
	2000–01	1	3	0	4	20	11	36	No hunt						
	2001–02	1	1	0	2	15	6	33	No hunt						
	2002–03	2	1	0	3	15	7	43	No hunt						

Table 5. Continued

		Drawing Hunts							Registration Hunts						
Area	Reg. Year	Billy	Nanny	Unk	Total	permits issued	Nr Hunted	% Success	Billy	Nanny	Unk	Total	permits issued	Nr Hunted	% Success
362	1998–99	4	0	0	4	22	9	44	No hunt						
	1999–00	1	1	0	2	22	12	17	No hunt						
	2000–01	5	2	0	7	22	17	41	No hunt						
	2001–02	5	0	0	5	20	14	36	No hunt						
	2002–03	2	1	0	3	18	9	33	No hunt						
363	1998–99	7	2	0	9	30	16	56	No hunt						
	1999–00	6	2	0	8	30	8	100	No hunt						
	2000–01	2	2	0	4	30	16	25	0	0	0	0	15	1	0
	2001–02	4	0	0	4	30	15	27	0	0	0	0	6	3	0
	2002–03	1	4	0	5	30	13	38	No hunt						
365	1998–99								3	4	0	7	18	9	78
	1999–00								No hunt						
	2000–01								1	1	0	2	11	10	20
	2001–02								2	1	0	3	5	5	60
	2002–03								2	2	0	4	12	5	80

All data has been updated from the ADF&G online database: WildlifeInfoNet

Table 6. Residency and success for mountain goat drawing permits on the Kenai Peninsula (Units 7 & 15), 1998–2002

	Successful				Unsuccessful				
Regulatory year	resident	Nonresident	Unspec.	Total (%)	resident	Nonresident	Unspec.	Total	Total hunters
1998–1999	69	4		73(31)	163	0		163	236
1999–2000	67	2		69(30)	154	6		160	229
2000–2001	80	2		82(35)	149	2		151	233
2001–2002	60	3		63(31)	141	2		143	206
2002–2003	64	4		68(36)	121	2		123	191

All data has been updated from the ADF&G online database: WildlifeInfoNet

Table 7. Residency and success for mountain goat registration permits on the Kenai Peninsula (Units 7 & 15), 1998–2002

	Successful				Unsuccessful				
Regulatory year	resident	Nonresident	Unspec.	Total (%)	resident	Nonresident	Unspec.	Total	Total hunters
1998–1999	34	2		36(15)	204	4		208	244
1999–2000	9	1		10 (9)	105	1		106	116
2000–2001	23	1		24(15)	120	0	16	136	160
2001–2002	12	0		12(12)	90	1		91	103
2002–2003	22	2	1	25(13)	161	0	2	163	188

All data has been updated from the ADF&G online database: WildlifeInfoNet

Table 8. Harvest chronology (% of harvest) for mountain goat drawing permits on the Kenai Peninsula (Units 7 & 15), 1998–2002

Regulatory year	Harvest periods: August	September	October	Unk/other	Harvest
1998–1999	45	55	--	0	73
1999–2000	42	58	--	1	69
2000–2001	54	46	--	0	82
2001–2002	19	44	33	3	63
2002–2003	25	35	34	6	68

All data has been updated from the ADF&G online database: WildlifeInfoNet

Table 9. Transport method (%) for mountain goat drawing and registration permits on the Kenai Peninsula (Units 7 & 15) 1998–2002

Regulatory year	Percent of harvest: Airplane	Horse	Boat	3- or 4-Wheeler	Snowmachine	ORV	Highway vehicle	Unk/other	Harvest
1998–1999	27	1	40	3	0	1	27	2	113
1999–2000	39	0	24	5	0	0	30	2	84
2000–2001	32	1	28	5	0	1	32	1	111
2001–2002	28	4	30	3	1	3	29	3	79
2002–2003	26	2	37	1	0	0	30	4	97

All data has been updated from the ADF&G online database: WildlifeInfoNet

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MOUNTAIN GOAT MANAGEMENT REPORT

From: 1 July 2001
To: 30 June 2003

LOCATION

GAME MANAGEMENT UNIT: 8 (5097 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 relocated from the Kenai Peninsula to the Hidden Basin area during 1952 and 1953. In 1964, 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 with the number of permits available and open areas changing to reflect population trends and goat movements.

From the late 1960s 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 more than 400 animals, and new pockets of goats were observed on the southern end of the island. The permit allocation process switched from a drawing system to a registration system in 1984 and 1985. A Tier II (subsistence) 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 higher 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 the island, which had been closed to facilitate colonization, was open to limited hunting in 1991. A new hunt area (DG478) 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 (DG479 North Road System).

In 2000 the Federal Subsistence Regional Advisory Council (RAC) received a proposal to consider Kodiak Island goats as a “customary and traditional” resource, and to open Kodiak National Wildlife Refuge to subsistence goat hunting by registration permit. In 2002 a joint Kodiak Fish and Game Advisory

Committee-Kodiak/Aleutians RAC working group was formed to explore ways to satisfy the rural residents concerns while retaining state management. To investigate historic harvest patterns of Kodiak mountain goats, the U.S. Fish and Wildlife Service contracted the Division of Subsistence within the Alaska Department of Fish and Game to investigate and submit a report to the Federal Subsistence RAC (Williams 2003). In March 2003 the Board of Game approved a proposal submitted by the work group that increased the maximum number of drawing permits from 250 to 500 and established registration hunts after the drawing hunts if an allowable surplus of goats existed. This prompted the Federal Subsistence Board to forego actions that would have created a subsistence goat hunt on refuge lands.

There are currently 9 permit hunt areas which encompass Kodiak Island. Based on data from comprehensive aerial surveys, we estimated that the goat population of Unit 8 in 2002 was 1400 goats. They occupied all available habitat on the island, and there were confirmed reports of goats as far south as Kaguyak Bay and Akalura Lake.

MANAGEMENT DIRECTION

MANAGEMENT OBJECTIVES

Maintain a prehunting population of 700–1000 goats islandwide, distributed in a manner that has minimal long-term impact on their habitat.

METHODS

We completed composition counts annually with fixed-wing aircraft in August and early September. During the surveys, priority was given to the permit hunt areas nearest the original transplant site, but if weather and funding permitted, we attempted to survey all goat habitat on Kodiak. We collected 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 islandwide survey of approximately 85% of the goat range in August 2001 yielded a minimum population size of 1114 goats. During July and August 2002 we surveyed about 65% of the goat range and classified 965 goats. The 2002 surveys showed increased goat numbers in the Wild Creek, Crown Mountain, Uganik River, Kiluida and South Road System hunt area. Goat movement is presumed to be responsible for some of these increases. Hidden Basin-Terror Lake and the North Road System hunt areas slightly decreased. The estimated islandwide population in 2002 was 1400 goats, with most of the suitable habitat being utilized.

Population Composition

During the past 5 years, the kid:adult ratio ranged from a high of 27:100 in 2002 to a low of 15:100 in 2000 (average 18.6) (Table 1). The increase in 2002 was coincident with a mild winter that enhanced alpine

vegetation in the summer. We did not collect 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 radiotelemetry or other movement studies have been conducted on Kodiak goats. Research in other areas suggests 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, at least in small numbers, in most of the suitable habitat on Kodiak Island. Research on fall movements will be needed in the future when hunting seasons are extended into the month of December.

MORTALITY

Harvest:

Season and Bag Limits. Goat hunting season for resident and nonresident hunters was open 1 Sep–31 Oct. The bag limit was 1 goat by drawing permit. In 2002–03, there were 9 permit hunt areas with a total of 230 permits issued. Regulations authorized the department to issue up to 250 drawing permits per season. Annual harvests during this reporting period ranged from 70 goats in 2001–02 to 94 goats in 2002–03, with a 5-year average of 70.2 (Table 2). Annual harvest ranged from 1–20 goats for each of the 9 permit hunts. Males continued to compose the majority of the goats harvested each year with a 5-year average of 69%.

Age (horn ring) data were estimated by hunters on their report cards beginning in 1994–95 as regulations mandating horn inspection were rescinded. To better understand horn growth, and to investigate whether goats have different growth rates in newly colonized areas of Unit 8 versus well established areas, successful hunters were again required to submit horns for measuring from 2000–2002. The mean age of goats harvested 1998–2003 was 4.4 years for males and 5.0 years for females (Table 3). Analysis of these data suggests hunters usually overestimate the age of their goats.

Game Board Actions and Emergency Orders. During its March 2003 meeting, the Board of Game adopted a proposal from the Kodiak Advisory Committee and the Kodiak-Aleutians Regional Advisory Committee to increase the maximum number of goat drawing permits from 250 to 500. Within the same proposal registration hunts were created for all 9 hunt areas to provide additional harvest opportunity. No emergency orders occurred during this reporting period. During the 2002–03 season ADF&G increased the number of permits available in hunt area DG475 from 40 to 60, in DG477 from 30 to 40 and in DG478 from 25 to 30 to take advantage of the increased harvestable surplus.

Permit Hunts. All goat hunting in the unit was by drawing permit during this reporting period. The number of permits issued ranged from 195–230. Hunters afield ranged from 91 to 111, with a 5-year 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 1998–2003 (57%), followed by nonlocal Alaska residents (38%), and nonresidents (5%) (Table 4). Annual hunter success ranged 56–67% with a 5-year mean of 58%. Guided nonresidents were the most successful hunters (84%), followed by local (60%) and nonlocal (53%) residents.

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 (60%) were the predominant transportation method used by hunters (Table 6). Boats were also important (15%), 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 1998–99 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 the population is probably near the carrying capacity of the habitat in the northcentral 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 across Kodiak Island. Snowmachines are more abundant and efficient than ever before, and the sport of heli-skiing 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 flying over goats has 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. In April of 2002, a memorandum of agreement between the Alaska Department of Fish and Game, and U.S. Fish and Wildlife Service, and U.S. Coast Guard regarding flight operations over Kodiak was finalized. This agreement spurred further cooperation between the Coast Guard and the department to minimize mountain goat disturbances from helicopter flight operations.

CONCLUSIONS AND RECOMMENDATIONS

The goat population was stable in northcentral Kodiak and increasing in the northern and southern portions of Kodiak. Based on comprehensive aerial surveys of goat habitat in Unit 8, we estimated a total of 1400 goats. Severe weather during the winter of 1998–99 resulted in lower kid:adult ratios in all permit areas and exacerbated population declines in some areas. In 2002 all areas surveyed showed substantial kid:adult ratio increases. During this reporting period, goat harvest continued to increase due to an increase in the number of permits and hunter success that remained above 58%.

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 committee, and the Kodiak National Wildlife Refuge. Micro-herds, 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 are shifting our emphasis from encouraging range expansion and increasing densities to limiting the population to a level that will provide sustained hunting opportunities while maintaining habitat quality. Addition of late season registration hunts will enhance our ability to increase hunter opportunity and stabilize goat numbers. 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:

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

- Evaluate goat populations within hunt areas and formulate harvest rates that will maintain habitat quality while preserving hunting opportunity;

- 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 nonconsumptive 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.

- Develop ways to track herd movements from late summer to winter.

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Van Daele, L.J. and Crye, J.R.. 2004. Unit 8 mountain goat management report. Pages 122–137 *in* C. Brown, editor. Mountain goat management report of survey and inventory activities 1 July 2001–30 June 2003. Alaska Department of Fish and Game. Project 12.0. Juneau, Alaska.

Table 1. Unit 8 Aerial summer mountain goat composition counts and estimated population size within permit hunt areas, 1997/98–2002/03.

Hunt Area	Regulatory year	Adults (%)	Kids (%)	Kids: 100 adults	Total goats observed	Goats/ hour	Estimated population size
All	1997–98	495 (83)	101 (17)	20	596	129.0	--
permit	1998–99	482 (81)	115 (19)	24	597	81.6	--
hunt areas	1999–2000	684 (84)	128 (16)	19	812	96.2	900
	2000–01	511 (87)	78 (13)	15	589	--	--
	2001–02	760 (86)	123 (14)	16	1114 [c]	64.7	1200
	2002–03	762 (79)	203 (21)	27	965	116.0	1400
DG 471	1997–98	154 (79)	40 (21)	26	194	--	--
Wild Creek -	1998–99	167 (78)	48 (22)	29	215	--	--
Center Mtn.	1999–2000	137 (86)	23 (14)	17	160	--	160-180
	2000–01	134 (92)	12 (8)	9	146	--	--
	2001–02	113 (86)	18 (14)	16	131	--	130
	2002–03	130 (77)	39 (23)	30	169	--	170
DG 472	1997–98	46 (87)	7 (13)	15	53	--	--
Crown Mtn	1998–99	18 (95)	1 (5)	6	19	--	--
	1999–2000	21 (88)	3 (12)	14	24	--	20-50
	2000–01	41 (84)	8 (16)	20	49	--	20-50
	2001–02	21 (88)	3 (12)	14	24	--	20-50
	2002–03	50 (76)	16 (24)	31	67	--	70

Table 1 continued

Area	Regulatory year	Adults (%)	Kids (%)	Kids: 100 adults	Total goats observed	Goats/ hour	Estimated population size
DG 473	1997–98	97 (85)	17 (15)	18	114	--	--
Hidden Basin -	1998–99	63 (81)	15 (19)	24	78	--	--
Terror Lake	1999–2000	28 (90)	3 (10)	11	31	--	40–80
	2000–01	50 (88)	7 (12)	14	57	--	40–80
	2001–02[b]	83 (90)	9 (10)	11	92	--	80–100
	2002–03[a]	60 (82)	13 (18)	22	73	--	80–100
DG 474	1997–98	65 (83)	13 (17)	20	78	--	--
Uganik River	1998–99	33 (85)	6 (15)	18	39	--	--
	1999–2000	44 (92)	4 (8)	9	48	--	40–60
	2000–01[a]	51 (96)	2 (4)	4	53	--	40–60
	2001–02[ab]	53 (88)	7 (12)	13	60	--	40–60
	2002–03[a]	110 (84)	21 (16)	19	131	--	140
DG 475	1997–98[a]	23 (100)	0	0	23	--	--
Zachar River	1998–99	--	--	--	--	--	--
	1999–2000	257 (90)	30 (10)	12	287	--	300
	2000–01[a]	32 (89)	4 (11)	11	36	--	300
	2001–02[ab]	236 (85)	41 (15)	17	277	--	300
	2002–03	--	--	--	--	--	300

Table 1 continued

Area	Regulatory year	Adults (%)	Kids (%)	Kids: 100 adults	Total goats observed	Goats/ hour	Estimated population size
DG 476	1997–98	--	--	--	--	--	--
Kiliuda Bay	1998–99	42 (84)	8 (16)	19	50	--	--
	1999–2000[a]	11 (85)	2 (15)	18	13	--	50–60
	2000–01	--	--	--	--	--	--
	2001–02[ab]	52 (87)	8 (13)	15	60	--	100–110
	2002–03	95 (81)	23 (19)	24	118	--	120–140
DG 477	1997–98	--	--	--	--	--	--
Southwest	1998–99[a]	50 (83)	10 (17)	20	60	--	--
Kodiak	1999–2000[a]	92 (83)	19 (17)	21	111	--	130–160
	2000–01	--	--	--	--	--	--
	2001–02[ab]	--	--	--	231[c]	--	250
	2002–03[a]	43 (75)	14 (25)	33	57	--	250
DG 478	1997–98	110 (79)	24 (21)	22	134	--	134
South Road	1998–99	109 (81)	26 (19)	23	135	--	135
System	1999–2000	94 (80)	24 (20)	26	118	--	118
	2000–01	118 (81)	28 (19)	24	146	--	146
	2001–02[b]	129 (82)	28 (18)	22	157	--	157
	2002–03	203 (78)	58 (22)	29	261	--	261
DG 479	1999–2000[a]	43 (86)	7 (14)	16	50	--	50–60
North Road	2000–01[a]	68 (84)	13 (16)	20	81	--	81
System	2001–02	59 (89)	7 (11)	12	66	--	60–80
	2002–03	70 (79)	19 (21)	27	89	--	90–100

a - partial survey
b – 2001 hunt area boundary change
c – includes goats not differentiated by age.

Table 2. Unit 8 mountain goat harvest data by permit hunt, 1998/99–2002/03.

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	1998–99	168	36	35	65	49 (70)	21 (30)	0	0	70
	1999–2000	176	35	44	56	44 (71)	18 (29)	0	1	63
	2000–01	161	41	41	59	34 (63)	21 (37)	0	0	54
	2001–02	195	36	42	58	50 (75)	17 (25)	2	1	70
	2002–03	230	39	33	67	61 (66)	32 (34)	0	1	94
DG 471 Wild Creek-Center Mountain	1998–99	30	50	27	73	8 (73)	2 (27)	0	0	7
	1999–2000	30	64	61	39	1 (14)	6 (86)	0	1	11
	2000–01	30	41	65	35	2 (33)	4 (67)	0	0	8
	2001–02	35	48	59	41	7 (100)	0 (--)	0	0	7
	2002–03	35	40	33	67	9 (64)	5 (35)	0	0	14
DG 472 Crown Mtn	1998–99	10	50	40	60	1 (33)	2 (67)	0	0	3
	1999–2000	10	40	33	67	4 (100)	0 (--)	0	0	4
	2000–01	10	40	67	33	2 (100)	0 (--)	0	0	2
	2001–01	10	80	0	100	2 (100)	0 (--)	0	0	2
	2002–03	10	90	0	100	0 (--)	1 (100)	0	0	1
DG 473 Hidden Basin- E. Terror Lake	1998–99	30	17	36	64	13 (81)	3 (19)	0	0	16
	1999–2000	30	47	50	50	5 (63)	3 (37)	0	0	8
	2000–01	15	27	36	64	3 (43)	4 (57)	0	0	7
	2001–02	10	20	25	75	4 (67)	2 (33)	0	0	6
	2002–03	8	40	17	83	3 (60)	2 (40)	0	0	5
DG 474 Uganik River	1998–99	15	53	14	86	2 (33)	4 (67)	0	0	6
	1999–2000	15	53	57	43	3 (100)	0 (--)	0	0	3
	2000–01	10	33	33	67	3 (75)	1 (25)	0	0	4
	2001–02	15	27	64	36	3 (100)	0 (--)	1	0	4
	2002–03	15	36	22	78	3 (43)	4 (57)	0	0	7

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 Zachar River	1998–99	35	46	68	32	4 (67)	2 (33)	0	0	6
	1999–2000	36	24	38	62	12 (75)	4 (25)	0	0	16
	2000–01	35	59	29	71	3 (30)	7 (70)	0	0	10
	2001–02	40	37	50	50	9 (82)	2 (18)	1	0	12
	2002–03	60	43	47	53	13 (72)	5 (28)	0	0	18
DG 476 Kiliuda Bay	1998–99	20	45	27	73	6 (75)	2 (25)	0	0	8
	1999–2000	20	40	33	67	8 (100)	0 (--)	0	0	8
	2000–01	20	41	10	90	7 (78)	2 (22)	0	0	9
	2001–02	20	58	25	75	4 (67)	2 (33)	0	0	6
	2002–03	20	50	50	50	4 (80)	1 (20)	0	0	5
DG 477 Deadman Bay	1998–99	20	20	17	83	11 (73)	4 (27)	0	0	15
	1999–2000	20	30	50	50	6 (86)	1 (14)	0	0	7
	2000–01	25	46	38	62	6 (75)	2 (25)	0	0	8
	2001–02	30	28	33	57	10 (91)	1 (9)	1	0	12
	2002–03	40	44	23	77	11 (69)	5 (31)	0	1	17
DG 478 South Road System	1998–99	8	13	29	71	4 (80)	1 (20)	0	0	5
	1999–2000	15	20	25	75	5 (56)	4 (44)	0	0	9
	2000–01	16	7	43	57	8 (100)	0 (--)	0	0	8
	2001–02	25	21	27	73	4 (29)	10 (71)	0	0	14
	2002–03	30	10	26	74	14 (70)	6 (30)	0	0	20
DG 479 North Road System	2001–02	10	0	22	78	7 (100)	0 (--)	0	0	7
	2002–03	10	11	25	75	4 (67)	2 (33)	0	0	6

Table 3. Unit 8 mountain goat harvest mean age data from horn rings, 1993/94–2002/03.

Regulatory Year	Males	(n)	Females	(n)
1993–94 [a]	3.8	(31)	3.7	(16)
1994–95 [b]	4.7	(21)	5.7	(19)
1995–96 [b]	5.9	(18)	6.7	(7)
1996–97 [b]	5.2	(17)	6.2	(9)
1997–98 [b]	5.5	(42)	5.6	(12)
1998–99 [b]	5.3	(40)	5.5	(14)
1999–2000 [b]	4.5	(36)	4.6	(14)
2000–01 [a]	4.0	(24)	4.5	(15)
2001–02 [a]	4.1	(52)	5.3	(15)
2002–03 [a]	3.9	(57)	5.0	(29)

[a] Horn inspections required.
[b] Hunters report goat age with report card.

Table 4. Unit 8 mountain goat hunter residence and success, 1998/99–2002/03.

	Successful					Unsuccessful					
Regulatory year	Local resident	Nonlocal resident	Nonresident	Total	(%)	Local resident	Nonlocal resident	Nonresident	Total	(%)	Total hunters
1998–99	35	26	9	70	(65)	23	12	2	37	(35)	107
1999–2000	36	21	5	62	(56)	25	22	1	48	(44)	110
2000–01	30	14	10	54	(59)	24	13	--	37	(41)	91
2001–02	37	25	7	69	(58)	28	21	1	50	(42)	119
2002–03	56	31	6	93	(67)	28	15	2	45	(33)	138

Table 5. Unit 8 mountain goat harvest chronology percent by time period, 1998/99–2002/03.

Area	Regulatory year	Harvest periods		
		September	October	n
All permit hunts	1998–99	37 %	63 %	70
	1999–2000	52 %	48 %	62
	2000–01	39 %	61 %	54
	2001–02	39 %	61 %	67
	2002–03	49 %	51 %	93

Table 6. Unit 8 mountain goat hunter transport method (percent in parentheses), 1998/99–2002/03.

Regulatory year	Transportation method							Total
	Aircraft	Boat	3 or 4 Wheeler	ORV	Highway vehicle	Snow-machine	Unknown	
1998–99	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
2000–01	51 (56)	12 (13)	17 (19)	2 (2)	8 (9)	0 (--)	1 (1)	91
2001–02	67 (58)	18 (15)	13 (11)	2 (2)	16 (14)	0 (--)	0 (--)	116
2002–03	78 (59)	18 (13)	12 (9)	4 (3)	15 (11)	0 (--)	6 (5)	133

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MOUNTAIN GOAT MANAGEMENT REPORT

From: 1 July 2001
To: 30 June 2003[a]

LOCATION

GAME MANAGEMENT UNIT: 11 (12,784 mi^2)

GEOGRAPHIC DESCRIPTION: Wrangell Mountains

BACKGROUND

Hunters have harvested mountain goats in Unit 11 for at least 30 years. Harvest data were not collected until 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 "pure park" portion of the Wrangell St. Elias National Park and Preserve 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.

[a] This unit report also includes data collected outside the reporting period at the discretion of the reporting biologist.

RESULTS AND DISCUSSION

POPULATION STATUS AND TREND

Population Size

The 2003 MacColl Ridge survey resulted in a count of 61 goats (Table 1). The number is down 18% from the record high of 74 in both 1998 and 1999. The current count is 7% more than the long- term average of 57.

An estimated 700 goats inhabit the southern Wrangell and Chugach Mountains in Unit 11. This 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 2003 was 27:100; kids composed 21% of goats observed (Table 1). The number of kids observed increased 44% over the 2001 count, which was the lowest observed in 8 years. Recruitment has been quite high since 1994, averaging 13 kids per year over this 10-year period, compared to 10 kids per year average in prior surveys.

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 season for resident and nonresident hunters was 1 September to 30 November; the bag limit was 1 goat by registration permit only. Hunters killed 11 goats during the 2001 season and 4 in 2002 in the state registration hunt (RG 580). The average yearly take since 1980 was 16 goats (range = 4-30). The 2001 harvest comprised four (36%) billies and seven (64%) nannies, while three (75%) billies and one (25%) nanny were reported in 2002. Males composed the majority of animals taken during 4 of the 5 years of this reporting period (Table 2). High male harvest is attributable to the selection of larger trophy animals, especially by nonresidents on guided hunts. No mountain goats were reported killed in the federal subsistence hunt during the 1998 and 1999 seasons. The harvest in 2000 was two (1 male, 1 female), and in 2001 was 1 male.

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 and Preserve, concentrating sport hunting for goats on preserve lands. Only subsistence hunting by local rural residents was allowed on “hard 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 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 1998 the National Park Service determined there was a subsistence use of mountain goats by local rural residents in the park. A 25 August to 31 December season was established. 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 set.

Hunter Residency and Success. There were 50 state registration hunt permits issued in 2002. Over the years the number of permits issued has averaged 60 (range = 29-90). The trend has been toward reduced hunting effort and success in recent years (Table 2). The success rate was 35% in 2001 and 14% in 2002. Successful hunters reported spending 4.8 days in the field compared with 5.4 days for unsuccessful hunters in 2002. Usually the hunting effort reported by Unit 11 goat hunters changes little each year, averaging between 3 and 5 days of hunting per hunter. Nonresident hunters took 3 goats in 2002, accounting for 75% of the harvest. Nonlocal Alaska residents took the other 25% and none was taken by local residents (Table 3). Since 1990, guided nonresidents have taken 62% of goats harvested.

Harvest Chronology. In 2001, 81% and in 2002, 100% 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. The high harvests in the first 3 weeks of September are attributed to hunters combining sheep and goat hunts.

Transport Methods. The majority of successful goat hunters used aircraft. Highway vehicles and boats also were reported as methods of transportation. Transportation methods 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 4-wheelers.

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 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 4 years was down from the all-time highs observed in the late 1990s. However, the current count remains above the long-term average. Kid production and/or survival increased the last 2 years of this reporting period. Between 1994 and 1998 surveys 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 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 nonsubsistence goat hunting to the national 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 the 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 more than a decade. 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 greatly limits access.

Harvest rates on 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 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 one 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, 1998–2003

Area	Regulatory Year	Adults (%)	Kids (%)	Unk.	Kids: 100 adults	Total goats observed	Estimated population size[a]
MacColl Ridge	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
	2002–2003	42 (78)	12 (22)	0	29	54	54
	2003–2004	48 (79)	13 (21)	0	27	61	61

[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, 1998–2003

Hunt Nr. /Area	Regulatory Year	Permits issued	Percent did not hunt	Percent unsuccessful hunters	Percent Successful Hunters	Males (%)	Females (%)	Unk.	Illegal	Total harvest
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
RG580	2001–2002	54	40	37	20	4 (36)	7 (64)	0	0	11
RG580	2002–2003	50	44	48	8	3 (75)	1 (25)	0	0	4

Table 3 Unit 11 mountain goat hunter residency and success, 1998–2003

Regulatory year	Successful				Unsuccessful				Total hunters
	Local[a] resident	Nonlocal resident	Nonresident	Total (%)	Local[a] Resident	Nonlocal resident	Non-resident	Total (%)	
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
2001–2002	2	3	6	11 (35)	4	12	4	20 (65)	31
2002–2003	0	1	3	4 (14)	3	18	3	24 (86)	28

[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, 1998–2003

Regulatory year	September				October					
	1–7	8–15	16–23	24–30	1–7	8–15	16–23	24–31	1–30	*n*
1998–1999	44	12	19	12	12	--	--	--	--	16
1999–2000	8	42	33	8	--	--	--	8	--	12
2000–2001	33	33	17	17	--	--	--	--	--	6
2001–2002	9	45	27	9	--	--	--	9	--	11
2002–2003	50	0	50	--	--	--	--	--	--	4

Table 5 Unit 11 mountain goat harvest percent by transport method, 1998–2003

Regulatory year	Percent of harvest							
	Airplane	Boat	3- or 4-Wheeler	Snowmachine	ORV	Highway Vehicle	Unknown	*n*
1998–1999	100	--	--	--	--	--	--	17
1999–2000	100	--	--	--	--	--	--	12
2000–2001	100	--	--	--	--	--	--	6
2001–2002	82	--	--	--	--	18	--	11
2002–2003	50	25	--	--	--	25	--	4

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MOUNTAIN GOAT MANAGEMENT REPORT

From: 1 July 2001
To: 30 June 2003

LOCATION

GAME MANAGEMENT UNIT: Units 13D and 14 (12,370 mi^2)

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 1990s, the goat population in the western Chugach Mountains (Units 13D, 14A, and 14C) 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. Since 1999, partial surveys have been conducted incidental to sheep surveys in Unit 14C. The incidental counts in Unit 14C in 2001, 2002, and 2003 indicate a potential decline in goat numbers. However, it is possible the apparent decline is due in part to varying survey conditions. 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 hunting season (10 August–31 December) and a 2-goat bag limit. In 1967 the bag limit for Unit 14 was lowered to 1 goat; however, hunters in Subunit 13D could harvest 2 goats until 1975. In the 1970s the hunting season in Unit 14 began in early August or September and ran until 15 Nov. In the early 1980s goat hunting in the western Chugach Mountains was at its most restricted, with only 50 or 100 drawing permits issued. Since 1984 most hunting in Unit 14 has been by registration permit. In 1987 Subunit 13D opened to 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 Subunit 14A north of the Matanuska River goat hunting has been closed since 1986. The season for goats in Subunit 14B has been closed since 1990 (by emergency order in 1990 and 1991).

Most of Subunit 14C was closed to goat hunting in 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 recently created Chugach State Park, encompassing most of the mountains west of the Lake George and Twentymile River drainages, was closed. Historically, these closed areas have not included a substantial segment of the goat population in Subunit 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 (Subunit 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 to conduct winter surveys for goats in areas potentially affected by heli-ski operations. The purpose was to identify habitat repeatedly used by mountain goats during winter. The information gathered during these surveys enabled biologists to designate "no-fly zones" in winter use areas for mountain goats to help reduce potential impacts to the goat population. Additional surveys will be conducted in the spring of 2004.

MANAGEMENT DIRECTION

MANAGEMENT OBJECTIVES

Subunit 13D (Chugach Mountains)

- Maintain a pre-hunting population of at least 100 goats.

Subunits 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.

Subunit 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.

Subunit 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 sex and age composition and population trends of goat populations through aerial surveys. We monitored harvests by requiring successful hunters to report harvests within 5 or 10 days of kill, depending on hunt location. In addition, all hunters were required to return hunt reports, whether they 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 Subunits 14A and 14B (Talkeetna Mountains) in 1999. Partial surveys were also conducted in 2002 in Subunit 14A (Chugach Mountains) and in 2001 in 13D. Partial surveys were conducted in 14C in 2001, 2002, and 2003.

Goat numbers appear to be relatively high in the western Chugach Mountains. However, partial surveys indicate goat numbers may be declining in Subunit 14C (Table 4). Very few surveys

were conducted in the Chugach during this reporting period, and goat surveys were done only incidental to sheep surveys. Harvest areas surrounding Lake George and Twentymile in Subunit 14C were not surveyed at all within this reporting period. Therefore, it is difficult to estimate the goat population for the Western Chugach.

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 midday.

Age Distribution

Goats observed were categorized as kids or adults. Kids composed 0–23% of observed goats in Subunit 13D (Table 1), 22% in Subunit 14A (Chugach Mountains; Table 2), 12% in Subunits 14A and 14B (Talkeetna Mountains; Table 3), and 13–17% in Subunit 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 Subunit 14C was surveyed in 2002. The survey included 6 areas between Girdwood and Portage, and north to Twentymile Glacier. Due to snow and ice, sightability of goats was low. However, most goats were observed near escape terrain. As a result of these surveys, designated "no-fly zones" were created to reduce the impact of heli-ski operations on goats during the winter months.

In Unit 13, goats are found primarily in the Chugach Mountains of Subunit 13D; however, occasionally goats are observed in the Talkeetna Mountains in Subunit 13A, 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 regulated primarily by winter weather and secondarily by predation. Greatly reduced goat numbers in Unit 13 have been attributed to deep snowfall. The Talkeetna Mountains provide only marginal habitat, and therefore, may be unable to support a large goat population.

MORTALITY

Harvest

Seasons and Bag Limits. From 1999 to 2003, in Subunit 13D goat hunting for residents and nonresidents was 10 Aug–10 Sep, 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 Subunit 14A (south of the Matanuska River) the hunting season for residents and nonresidents was 1 Sep–31 Oct and was one goat by permit only. From 1999 to 2000 there were 2 drawing hunts in Subunit 14C, one in the East Fork of the Eklutna River drainage and the other in the

Glacier and Winner creek drainages. In 2001, 2 additional drawing hunts in Subunit 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 15 Oct, with a bag limit of one goat.

In Subunit 14C, one goat by registration permit only could be taken from 1 Sep–15 Oct, or one goat by archery-only registration 16–31 Oct.

Harvests in Subunit 13D have been low, ranging from 4–11 goats per season in 1999–2003 (Table 5). Changing from a drawing permit hunt to a registration permit hunt in 1984 resulted in a substantial increase in the Subunit 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 2 weeks of October were restricted to archery hunting (RG879); however, few archers participate in this late archery-only season (Table 6). Likewise, the Twentymile River goat registration hunt (RG878) is also archery only 16–31 Oct (Table 6).

Board of Game Actions and Emergency Orders. In 2001 the Board of Game authorized 2 additional drawing permit hunts for goats in Subunit 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.

Permit Hunts. The number of goat registration and drawing permits issued for Unit 14 ranged from 161 to 257 during this reporting period (Table 6). The number of Subunit 14C drawing permits issued is based on the number of goats observed during surveys. During this reporting period the number of drawing permits was 21 (Table 6). Twenty-five drawing permits were issued for the eastern portion of Subunit 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 1999 to 2003 ranged from 20 to 61% in Subunit 13D (Table 8) and 26–46% 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. The percent of harvest occurring in September in Unit 14 ranged from 44% to 92% during the reporting period (Table 10). In 2001 only 8% and in 2002 only 6% of the goats were harvested in October. Harvests in Subunit 13D were too small to evaluate chronologically; season dates of 10 Aug–20 Sep were earlier than Unit 14.

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 Subunit 13D, the majority of successful hunters used airplanes (36–67%) and highway vehicles (17–60%; Table 11). In Subunit 14A and the Lake George portion of Subunit 14C, aircraft were the primary mode of transport for successful hunters (67–88% in 14A

and 14–100% 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 suggests 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 Subunit 14C. However, the data are limited. No direct winter habitat assessments have been conducted.

CONCLUSIONS AND RECOMMENDATIONS

All management objectives were met. At least 16 goats were harvested in Subunit 14C annually during this reporting period, and goat harvests averaged 75% males. With the exception of 1999 and 2000, less than 7% of observed goats were harvested annually in Unit 14A, and harvests averaged 63% males. Goat season remains closed in the Talkeetna Mountains portion of Unit 14.

No complete surveys were conducted during this reporting period, and all goats were counted incidental to sheep surveys. Sheep surveys typically are conducted in the morning hours, whereas goat surveys are optimally conducted during evening hours. Survey methods, therefore, may account for variation in goat numbers among years. Because of the low harvest in Subunits 13D and 14A, goats need to be surveyed only every 3 years; however, fewer incomplete surveys have been conducted within this reporting period. In Subunit 14C, because of a relatively large harvest, budget limitations, and high goat population, surveys should be conducted at least biennially, unless there is severe winter weather or increased hunting pressure. No complete surveys of goats were conducted in Subunit 14C during the reporting period. Since 2001, goat numbers in 14C appear to be declining. We recommend dedicated, comprehensive surveys be conducted for goats within Subunit 14C. Due to budget constraints, it is unlikely comprehensive surveys will be conducted in the near future. As a result, quotas for registration hunts will be reduced in the coming years to avoid overharvest.

The Talkeetna Mountains portions of Subunits 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.

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Table 1 Unit 13D aerial mountain goat composition counts, 1999–2003

Regulatory year	Adults (%)	Kids (%)	Kids: 100 adults	Goats Observed	Goats /hour
1999–2000[a]					
2000–2001[a]					
2001–2002[b]	92 (77)	28 (23)	30	120	11.8
2002–2003[a]					
2003–2004[c]	37 (100)	0 (0)	0	37	

[a]No surveys conducted.
[b]Partial survey (count areas 2, 3, and 5).
[c]Partial surveys conducted incidental to sheep surveys (count areas 1-5).

Table 2 Unit 14A, Chugach Mountains, aerial mountain goat composition counts, 1999–2003

Regulatory year	Adults (%)	Kids (%)	Kids: 100 adults	Total goats observed	Goats /hour
1999–2000[a]					
2000–2001[a]					
2001–2002[a]					
2002–2003	106 (78)	29 (22)	27	135	
2003–2004[a]					

[a] No surveys conducted.

Table 3 Unit 14A and 14B, Talkeetna Mountains, aerial mountain goat composition counts, 1999–2003

Regulatory Year	Adults (%)	Kids (%)	Kids: 100 adults	Total Goats Observed	Goats /hour
1999–00[a]	14 (88)	2 (12)	14	16	
2000–01[b]					
2001–02[b]					
2002–03[b]					
2003–04[b]					

[a] Partial survey (goats counted incidental to sheep surveys).
[b] No surveys conducted.

Table 4 Unit 14C aerial mountain goat composition counts and estimated population size, 1999–2003[a]

Regulatory Year	Adults (%)	Kids (%)	Kids: 100 adults	Total goats observed	Goats /hour	Estimated population size
1999–2000						
2000–2001[b]	599 (87)	88 (13)	15	687		
2001–2002[c]	204 (83)	42 (17)	21	246		
2002–2003[c]	127 (84)	25 (16)	20	152		
2003–2004[c]	86 (86)	14 (14)	16	100		

[a] Data include all goats observed in Unit 14C; S&I reports prior to 1984 included only goats in registration hunt areas.
[b] Partial survey (goats counted incidental to sheep surveys; complete survey of Lake George; Twentymile River not counted).
[c] Partial survey (goats counted incidental to sheep surveys; Lake George and Twentymile River not counted).

Table 5 Annual mountain goat harvest by unit, 1999–2003

Regulatory Year	Unit				Total
	13D[a]	14A[b]	14B[c]	14C[d]	
1999–2000	10	10		16	36
2000–2001	4	10		22	36
2001–2002	6	3		23	32
2002–2003	5	8		25	38
2003–2004	11	8		38	57

[a] Drawing permit only.
[b] Registration permit only.
[c] Closed to mountain goat hunting.
[d] Both registration and drawing permits.

Table 6 Unit 14 mountain goat harvest data by permit hunt, 1999–2003.

Area[a]	Regulatory Year	Permits issued	Percent did not hunt[b]	Percent Unsuccessful Hunters	Percent Successful Hunters	Males (%)		Females (%)		Total Harvest[c]
	1999–2000	71	52	71	29	8	(80)	2	(20)	10
RG866	2000–2001	54	50	63	37	7	(70)	3	(30)	10
Unit 14A	2001–2002	30	63	73	27	0	(0)	3	(100)	3
	2002–2003	38	65	38	62	7	(88)	1	(12)	8
	2003–2004	75	67	68	32	6	(75)	2	(25)	8
	1999–2000	5	0	60	40	0	(0)	2	(100)	2
DG852	2000–2001	5	20	25	75	0	(0)	3	(100)	3
Unit 14C	2001–2002	5	0	60	40	2	(100)	0	(0)	2
East Eklutna	2000–2003	5	20	100	0	0	(0)	0	(0)	0
	2003–2004	5	0	40	60	1	(33)	2	(67)	3
DG854[c]	2001–2002	3	0	67	33	0	(0)	1	(100)	1
Unit 14C	2002–2003	3	33	100	0	0	(0)	0	(0)	0
	2003–2004	3	33	33	67	1	(50)	1	(50)	2
	1999–2000	8	13	71	29	1	(50)	1	(50)	2
DG856	2000–2001	8	0	87	13	1	(100)	0	(0)	1
Unit 14C	2001–2002	8	25	67	33	2	(100)	0	(0)	2
Glacier Ck.	2002–2003	8	63	33	67	2	(100)	0	(0)	2
	2003–2004	8	25	83	17	0	(0)	1	(100)	1
DG858[d]	2001–2002	5	20	75	25	1	(100)	0	(0)	1
Unit 14C	2002–2003	5	20	25	75	1	(33)	2	(67)	3
	2003–2004	5	0	60	40	2	(100)	0	(0)	2

Table 6 continued

Area[a]	Regulatory Year	Permits issued	Percent did not hunt[b]	Percent Unsuccessful Hunters	Percent Successful Hunters	Males (%)	Females (%)	Total Harvest[c]
RG868	1999–2000	71	52	80	20	7 (100)	0 (0)	7
Unit 14C	2000–2001	63	62	87	13	1 (33)	2 (67)	3
Twentymile	2001–2002	49	76	92	8	1 (100)	0 (0)	1
River	2002–2003	70	74	83	17	3 (100)	0 (0)	3
	2003–2004	78	37	85	15	6 (100)	0 (0)	6
	1999–2000	40	48	76	24	3 (60)	2 (40)	5
RG869	2000–2001	82	52	62	38	14 (93)	1 (7)	15
Unit 14C	2001–2002	61	54	46	54	12 (80)	3 (20)	15
Lake	2002–2003	98	71	39	61	14 (82)	2 (12)	17
George	2003–2004	73	34	43	57	14 (64)	8 (36)	22
RG878	1999–2000	2	50	100	0	0 (0)	0 (0)	0
Unit 14C	2000–2001	2	50	100	0	0 (0)	0 (0)	0
Twentymile	2001–2002	11	0	92	5	1 (100)	0 (0)	1
River	2002–2003	3	100					
(archery)	2003–2004	5	20	75	25	1 (100)	0 (0)	1
RG879	1999–2000	0						
Unit 14C	2000–2001	0						
Lake	2001–2002	0						
George	2002–2003	8	75	100	0	0 (0)	0 (0)	0
(archery)	2003–2004	5	20	75	25	0 (0)	1 (100)	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[c]
Totals	1999–2000	152	55	76	23	11	(69)	5	(31)	16
for all	2000–2001	160	53	71	29	17	(77)	5	(23)	22
Unit 14C	2001–2002	131	56	62	38	19	(82)	4	(18)	23
	2002–2003	200	71	58	42	20	(80)	4	(16)	25
	2003–2004	182	35	64	36	25	(66)	13	(34)	38
	1999–2000	223	54	75	25	19	(73)	7	(27)	26
Totals	2000–2001	214	52	68	31	24	(75)	8	(25)	32
For all	2001–2002	161	57	64	36	19	(73)	7	(27)	26
Unit 14	2002–2003	238	70	58	42	27	(81)	5	(15)	33
	2003–2004	257	49	65	35	31	(67)	15	(33)	46

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

Table 7 Unit 13D mountain goat harvest data by permit hunt, 1999–2003

Area	Regulatory Year	Permits issued	Percent did not hunt[a]	Percent unsuccessful hunters	Percent successful hunters	Males (%)	Females (%)	Total harvest
DG718	1999–2000	10	30	57	43	3 (100)	0 (0)	3
Unit 13D	2000–2001	10	10	89	11	1 (100)	0 (0)	1
West	2001–2002	10	60	50	50	2 (100)	0 (0)	2
	2002–2003	10	70	67	33	0 (0)	1 (100)	1
	2003–2004	10	50	40	60	2 (67)	1 (33)	3
DG719	1999–2000	25	60	30	70	7 (100)	0 (0)	7
Unit 13D	2000–2001	25	14	73	27	2 (67)	1 (33)	3
East	2001–2002	25	28	78	22	3 (75)	1 (25)	4
	2002–2003	25	64	56	44	3 (75)	1 (25)	4
	2003–2004	25	48	38	62	5 (63)	3 (38)	8
Totals	1999–2000	35	51	41	59	10 (100)	0 (0)	10
For all	2000–2001	35	43	80	20	3 (75)	1 (25)	4
Unit 13D	2001–2002	35	37	72	27	5 (83)	1 (17)	6
	2002–2003	35	66	58	42	3 (60)	2 (40)	5
	2003–2004	35	49	39	61	7 (64)	4 (36)	11

[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	1999–2000	0	3	0	3 (43)	0	4	0	4 (57)	7
Unit 13D	2000–2001	0	0	1	1 (50)	1	0	0	1 (50)	2
West	2001–2002	0	1	1	2 (50)	0	2	0	2 (50)	4
	2002–2003	0	0	1	1 (33)	2	0	0	2 (67)	3
	2003–2004	0	2	1	3(60)	0	2	0	2 (40)	5
DG719	1999–2000	1	5	1	7 (70)	1	2	0	3 (30)	10
Unit 13D	2000–2001	0	3	0	3 (27)	1	6	1	8 (73)	11
East	2001–2002	0	0	4	4 (22)	2	10	2	14 (78)	18
	2002–2003	0	2	2	4 (44)	0	5	1	6 (56)	10
	2003–2004	0	3	2	8 (67)	1	3	0	4 (33)	12
Totals	1999–2000	1	8	1	10 (59)	1	6	0	7 (41)	17
For all	2000–2001	0	3	1	4 (20)	2	6	1	16 (80)	20
Unit 13D	2001–2002	0	1	5	6 (27)	2	12	2	16 (73)	22
	2002–2003	0	2	3	5 (42)	2	5	1	8 (58)	13
	2003–2004	0	5	3	11 (61)	1	5	1	7 (39)	18

[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	1999–2000	3	2	5	10 (29)	19	3	2	24 (71)	34
Unit 14A	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
	2002–2003	1	2	5	8(62)	1	1	3	5 (38)	13
	2003–2004	2	0	6	8 (32)	9	8	0	17 (68)	25
DG852	1999–2000	2	0	0	2 (40)	3	0	0	3 (60)	5
Unit 14C	2000–2001	3	0	0	3 (75)	1	0	0	1 (25)	4
East Eklutna	2001–2002	2	0	0	2 (40)	3	0	0	3 (60)	5
	2002–2003	0	0	0	0 (0)	1	3	0	4 (100)	4
	2003–2004	3	0	0	3 (75)	1	0	0	1 (25)	4
DG854	2001–2002	1	0	0	1 (33)	2	0	0	2 (67)	3
Unit 14C	2002–2003	0	0	0	0 (0)	2	0	0	2 (100)	2
	2003–2004	2	0	0	2 (100)	0	0	0	0 (0)	2
DG856	1999–2000	2	0	0	2 (29)	5	0	0	5 (71)	7
Unit 14C	2000–2001	1	0	0	1 (13)	5	2	0	7 (87)	8
Glacier Ck.	2001–2002	2	0	0	2 (33)	3	1	0	4 (67)	7
	2002–2003	2	0	0	2 (67)	1	0	0	1 (33)	3
	2003–2004	1	0	0	1 (17)	5	0	0	5 (83)	6
DG858	2001–2002	0	0	0	1 (25)	0	0	0	3 (75)	4
Unit 14C	2002–2003	2	1	0	3 (75)	1	0	0	1 (25)	4
	2003–2004	1	1	0	2 (40)	3	0	0	3 (60)	5

Table 9 continued

		Successful				Unsuccessful				
Area	Regulatory year	Local resident	Nonlocal resident	Nonresident	Total (%)[a]	Local resident	Nonlocal resident	Nonresident	Total (%)[a]	Total Hunters[a]
RG868	1999–2000	7	0	0	7 (21)	27	0	0	27 (79)	34
Unit 14C	2000–2001	3	0	0	3 (13)	21	0	0	21 (87)	24
Twentymile	2001–2002	1	0	0	1 (8)	11	0	0	11 (92)	12
River	2002–2003	3	0	0	3 (17)	15	0	0	15 (88)	17
	2003–2004	6	0	0	6 (15)	30	4	1	35 (85)	41
RG869	1999–2000	3	1	1	5 (24)	11	0	4	16 (76)	21
Unit 14C	2000–2001	4	0	11	15 (38)	23	0	1	24 (62)	39
Lake	2001–2002	2	1	12	15 (54)	10	1	2	13 (13)	28
George	2002–2003	3	4	10	17 (61)	2	5	4	11 (39)	28
	2003–2004	4	5	12	21 (54)	6	8	3	17 (44)	39
RG878	1999–2000	0	0	0	0 (0)	1	0	0	1 (100)	1
Twentymile	2000–2001	0	0	0	0 (0)	1	0	0	1 (100)	1
River	2001–2002	1	0	0	1 (100)	0	0	0	0 (0)	1
(archery)	2002–2003	0	0	0	0 (0)	0	0	0	0 (0)	0
	2003–2004	1	0	0	1 (25)	3	0	0	0 (75)	4
RG879	1999–2000	0	0	0	0 (0)	0	0	0	0 (0)	0
Lake	2000–2001	0	0	0	0 (0)	0	0	0	0 (0)	0
George	2001–2002	0	0	0	0 (0)	0	0	0	0 (0)	0
(archery)	2002–2003	0	0	0	0 (0)	1	0	1	2 (100)	2
	2003–2004	0	1	0	1 (25)	1	1	1	3 (75)	4

Table 9 continued

		Successful				Unsuccessful				
Area	Regulatory year	Local resident	Nonlocal resident	Nonresident	Total (%)[a]	Local resident	Nonlocal resident	Nonresident	Total (%)[a]	Total Hunters[a]
Totals for all 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	23 (38)	29	2	2	36 (60)	60
	2002–2003	10	5	10	25 (41)	21	15	5	36 (59)	61
	2003–2004	18	7	12	38 (54)	19	9	4	32 (45)	71
Totals for all Unit 14	1999–2000	17	3	6	26 (25)	40	3	2	76 (74)	103
	2000–2001	13	1	18	32 (31)	67	3	1	71 (69)	103
	2001–2002	10	2	12	26 (35)	36	2	3	44 (63)	71
	2002–2003	11	7	15	33 (41)	22	17	8	47 (59)	80
	2003–2004	20	14	27	46 (48)	28	17	4	49 (51)	96

[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	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
	2002–2003	0	100	0	0	0	1	8
	2003–2004	0	0	0	0	0	8	8
Unit 14C	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	1	23
	2002–2003	4	84	8	0	0	0	25
	2003–2004	0	54	46	0	0	3	38
Totals for all Unit 14	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	1	26
	2002–2003	3	88	6	0	0	1	33
	2003–2004	0	44	37	0	0	11	46

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*
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
2002–2003	40	0	0	0	0	0	60	5
2003–2004	36	9	0	0	0	0	55	11

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	1999–2000	80	0	0	20	0	0	0	0	10
Unit 14A	2000–2001	80	0	10	10	0	0	0	0	10
	2001–2002	67	0	0	33	0	0	0	0	3
	2002–2003	88	0	0	0	0	0	0	12	8
	2003–2004	75	0	0	25	0	0	0	0	8
RG868	1999–2000	14	0	57	0	0	0	14	14	7
Unit 14C	2000–2001	67	0	0	0	0	0	33	0	3
Twentymile	2001–2002	0	0	0	0	0	0	0	100	1
River	2002–2003	0	0	33	0	0	0	67	0	3
	2003–2004	20	0	0	0	0	40	40	0	6
RG869	1999–2000	100	0	0	0	0	0	0	0	5
Unit 14C	2000–2001	100	0	0	0	0	0	0	0	15
Lake	2001–2002	100	0	0	0	0	0	0	0	15
George	2002–2003	100	0	0	0	0	0	0	0	17
	2003–2004	90	0	2	0	0	0	0	5	22
RG878 Unit 14C Twentymile River	2003–2004	0	0	0	0	0	0	0	100	1
RG879 Unit 14C Lake George	2003–2004	100	0	0	0	0	0	0	0	1

Table 12 continued

Area[a]	Regulatory Year	Percent of harvest: Airplane	Horse	Boat	3- or 4-wheeler	Snowmachine	ORV	Highway vehicle	Unknown	*n*
	1999–2000	50	0	33	0	0	0	8	8	12
Totals	2000–2001	94	0	0	0	0	0	6	0	18
for all	2001–2002	94	0	0	0	0	0	0	6	16
Unit 14C	2002–2003	85	0	5	0	0	0	10	0	20
	2003–2004	70	0	7	0	0	7	7	10	30
Totals	1999–2000	64	0	18	9	0	0	5	0	22
for all	2000–2001	88	0	4	4	0	0	4	0	28
Unit 14	2001–2002	90	0	0	5	0	0	0	5	19
	2002–2003	89	0	4	0	0	0	7	4	28
	2003–2004	71	0	5	5	0	5	5	8	38

[a] Archery-only registration hunts 878 and 879 (Twentymile River and Lake George, formerly 881 and 882) had no successful hunters in all years except 2003–2004.

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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