

Mountain Goat Management Report

**of survey-inventory activities
1 July 2003–30 June 2005**

**Patricia Harper, Editor
Alaska Department of Fish and Game
Division of Wildlife Conservation**



Photo by Kevin White, ADF&G

**Funded through
Federal Aid in Wildlife Restoration
Grants W-33-2 and W-33-3, Project 12.0
December 2006**

STATE OF ALASKA

Sarah Palin, Governor

DEPARTMENT OF FISH AND GAME

Denby Lloyd, Commissioner

DIVISION OF WILDLIFE CONSERVATION

Matthew H. Robus, Director

For a hard copy of this report please direct requests to our publications specialist:

Publications Specialist
ADF&G, Wildlife Conservation
P.O. Box 25526
Juneau, AK 99802-5526
(907) 465-4176

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

The Alaska Department of Fish and Game (ADF&G) administers all programs and activities free from discrimination based on race, color, national origin, age, sex, religion, marital status, pregnancy, parenthood, or disability. The department administers all programs and activities in compliance with Title VI of the Civil Rights Act of 1964, Section 504 of the Rehabilitation Act of 1973, Title II of the Americans with Disabilities Act of 1990, the Age Discrimination Act of 1975, and Title IX of the Education Amendments of 1972.

If you believe you have been discriminated against in any program, activity, or facility please write:

- ◆ ADF&G ADA Coordinator, PO Box 115526, Juneau, AK 99811-5526.

The department's ADA Coordinator can be reached via phone at the following numbers: (VOICE) 907-465-6077, (Statewide Telecommunication Device for the Deaf) 1-800-478-3648, (Juneau TDD) 907-465-3646, or (FAX) 907-465-6078.

- ◆ US Fish and Wildlife Service, 4040 N Fairfax Drive, Suite 300 Webb, Arlington, VA 22203, or;
- ◆ Office of Equal Opportunity, US Department of the Interior, Washington DC 20240

For information on alternative formats and questions on this publication, please contact the following:

- ◆ Publications Specialist, ADF&G/Division of Wildlife Conservation, PO Box 115526, Juneau, AK 99811-5526, or call 907-465-4176.

Cover Photo: A radiocollared billy on a ridge adjacent to the Meade Glacier in the Katzeihin River Valley, near Haines. October 2006. Photo by Kevin White, ADF&G.

**MOUNTAIN GOAT
Management Report
of survey-inventory activities
1 July 2003–30 June 2005**

**Patricia Harper, Editor
Alaska Department of Fish and Game
Division of Wildlife Conservation**

**Funded through
Federal Aid in Wildlife Restoration
Grants W-33-2 and W-33-3, Project 12.0
December 2006**

Any information taken from this report should be cited with credit given to authors and the Alaska Department of Fish and Game. Authors are identified at the end of each unit section.

If this report is used in its entirety, please reference as: Alaska Department of Fish and Game. 2006. Mountain goat management report of survey-inventory activities 1 July 2003–30 June 2005. P Harper, editor. Juneau, Alaska.

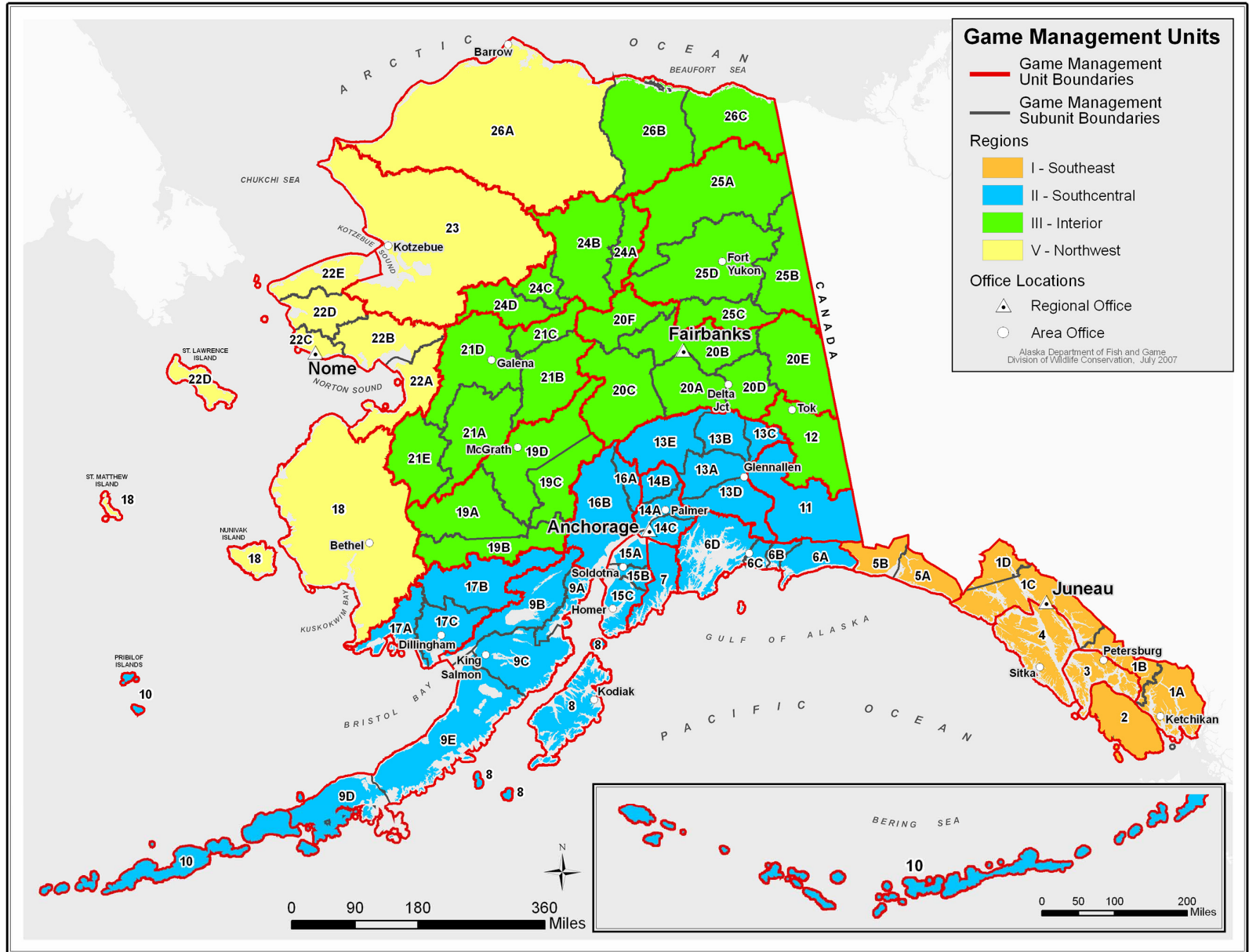
MOUNTAIN GOAT MANAGEMENT REPORT

From: 1 July 2003

To: 30 June 2005

TABLE OF CONTENTS

Unit Map	i
Subunit 1A – Ketchikan Area	1
Subunit 1B – Southeast Alaska Mainland from Cape Fanshaw to Lemesurier Point.....	17
Subunit 1C – Southeast Alaska Mainland from Cape Fanshaw to Eldred Rock	33
Subunit 1D – Southeast Alaska Mainland North of Eldred Rock, Excluding Sullivan Island and the Drainages of Berners Bay	44
Unit 4 – Admiralty, Baranof, Chichagof, and Adjacent Islands	59
Unit 5 – Cape Fairweather to Icy Bay, Eastern Gulf of Alaska Coast.....	69
Unit 6 – Prince William Sound and North Gulf of Alaska Coast	77
Units 7 and 15 – Kenai Peninsula	93
Unit 8 – Kodiak and Adjacent Islands	106
Unit 11 – Wrangell Mountains.....	123
Subunits 13D and Unit 14 – Talkeetna Mountains and Western Chugach Mountains.....	132



MOUNTAIN GOAT MANAGEMENT REPORT

From: 1 July 2003

To: 30 June 2005

LOCATION

GAME MANAGEMENT UNIT: 1A (5000 mi²)

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).

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. For the first time starting fall of 2006 this herd will be hunted by drawing permit. Twelve drawing permits have been issued and the season will run from 16 August–31 December.

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 (TCA) 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 mi². We generally initiate surveys during late August or September, and begin daily efforts from 0500–0800 or 1700–1900 hours.

We obtain harvest information through a mandatory hunt report that is part of a required registration permit (RG002). Information collected includes the areas and numbers of days hunted, hunter success, dates of hunts and kills, transport methods, and commercial services used. Successful Unit 1A hunters are also asked to voluntarily provide their goat horns to the Ketchikan Fish and Game office for aging. During the sealing process we obtain genetic samples, age the goat by counting growth annuli, and measure horn base circumferences and each annulus length. Genetic samples are shipped frozen to Steve Cote in Alberta, Canada who is looking at mountain goat genetic variability across North America. We also hope to use this genetic information to look at historical isolation of the Cleveland Peninsula goat population.

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 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 2003 we completed aerial surveys in the 5 following TCAs: 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-12 Mirror Lake (Table 1). We observed 479 goats in 6.6 hours of flying, or 73 goats/hour. The ratio of 39 kids per 100 adults was the highest in the past 10 years.

During fall 2004, because of poor flying weather, early snow in the alpine, and work schedule conflicts during the survey period, we counted only one TCA: K-6 Cleveland Peninsula (Table 2). We observed 16 goats in a 1 hour survey. Our observation rate of 15 goats per hour was similar to previous years.

Population Size

Results of aerial mountain goat surveys can be interpreted only 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/mi² to these areas, which resulted in a mainland estimate of 7,300–10,200 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

We do not have a hard population estimate for Unit 1A but numbers currently appear to be high and stable. A series of mild winters, moderate bear and wolf predation, and good habitat conditions have all contributed to healthy goat numbers in this unit.

Distribution and Movements

The most recent goat introduction near Ketchikan (Deer Mountain) appears to be doing very well. Radio collars placed on some of these goats during the translocation effort are no longer transmitting and no new goats have been captured to provide additional movement or distribution data. During the past few years we have received a number of observations of goats near Ketchikan either walking along the beaches or crossing roads at low elevation. This and aerial surveys indicate goats are moving and colonizing most of the suitable goat habitat in this area.

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 the divide between Carroll Creek and the south fork of Orchard Creek, south of Orchard Creek, Orchard Lake, Shrimp Bay, and Gedney Pass

1 Aug–31 Dec

1 goat by registration permit only

Unit 1A, remainder of Revillagigedo Island

Drawing permit only

Board of Game (BOG) Actions and Emergency Orders. There have been no BOG actions since fall 2002 (Porter 2004).

Hunter Harvest. One-hundred-forty six permits and 120 permits were issued for Unit 1A during 2003 and 2004, respectively. Seventy-two hunters killed 18 goats in 2003 and 51 hunters killed 22 goats during the 2004 season. The harvest during the past 2 years has been close to the 10-year average of 22 goats (range 9–36) (Table 3). However, the 51 hunters in 2004 represented the lowest number of hunters in the field on record, well below the 10-year average of 76 (range 51–114). There were likely several reasons for lack of hunter participation during the 2004 season, including poor weather conditions for flying into hunting areas and a slow but steady downturn in the economy that left many hunters with less disposable income.

Successful hunters spent an average of 2.7 days to kill a goat during the 2003 season, and 2 days to kill a goat during 2004 (range 1–6 days).

Permit Hunts. Goat hunting in Unit 1A has been regulated by registration permits for the past 21 years. For the first time drawing permits were issued for the area on Revillagigedo Island near Mahoney Peak. Twelve drawing permits will be available each fall and the season will be 15 August–31 December. The Cleveland Peninsula portion of Unit 1A remains closed to goat hunting (Porter 2004).

Hunter Residency and Success. Seven nonresidents hunted goats successfully in Unit 1A during 2003, while only one nonresident killed a goat during 2004 (Table 4). Fifty and 64% of the 2003 and 2004 harvests, respectively, were by hunters residing within the subunit. Alaska residents composed 65% of the 2003 harvest and 55% of the 2004 harvest. Overall hunter success during 2003 was 36%, and in 2004 was 48% (Table 4). Successful nonresident hunters spent more time than residents to kill a goat during both years. This likely represents more selectivity on the part of a nonresident hunter accompanied by a registered guide.

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 2003 the harvest was higher during September (44%) while hunters during the 2004 season were more successful in August (41%) (Table 5).

Transport Methods. Airplanes accounted for 100% and 50% of the transportation used by successful hunters during the past two seasons, respectively (Table 6). Airplanes accounted for 77% of the transportation used by Unit 1A hunters during the past 10 seasons (range 50–100%). The balance of hunters used boats to access hunting areas.

Horn Growth Rates. Because of the poor voluntary response by successful hunters we were not able to obtain a sufficient sample size of ages and growth annuli. We will consider submitting a proposal to the BOG in 2006 to require mandatory horn sealing.

Other Mortality

Several diseased goats were harvested by hunters on the mainland during this report period and tissue samples were submitted to the state wildlife veterinarian for testing. One was positive for contagious ecthyma (orf) and the other 2 samples, although they appeared similar, were infected with a less serious virus. This is the first confirmed case of the orf virus in the goat population from southern Southeast Alaska. We will make an effort this fall to alert hunters to look for and to report cases of infected goats during the 2006 season. Better goat hunter education is needed because the orf virus is potentially dangerous to humans.

CONCLUSIONS AND RECOMMENDATIONS

The 1991 Upper Mahoney Lake goat introduction appears to have been a success. The herd increased from the original 15 to at least 120 goats in fall 2004 and productivity remains high. Starting fall of 2006 there will be a limited drawing hunt in this area, near Ketchikan.

Mountain goat populations appear to be stable throughout most of Unit 1A. We will continue to monitor goat numbers on the Cleveland Peninsula, an area recently closed to hunting. Because of viability concerns on the Cleveland we will survey it annually during the next few years. Our objective for the remainder of the unit of maintaining goat densities greater than 20 goats per hour of survey time has been met consistently. We will continue to monitor disease outbreaks and educate hunters prior to handling goats during the hunting season. No additional regulation or management changes are recommended at this time.

LITERATURE CITED

- BALLARD, W. B. 1975. Mountain goat survey technique evaluation. Alaska Department of Fish and Game. Federal Aid in Wildlife Restoration. Final Report. Project W-17-7, Job 12.2R. Juneau, Alaska, USA. 152pp.
- FOSTER, B.R. 1982. Observability and habitat characteristics of the mountain goat (*Oreamnos americanus* Blainville, 1816) in west-central British Columbia. M.Sc. Thesis Univ. of B.C. 134 pp.
- PORTER, B. 2004. Unit 1A mountain goat management report. Pages 1–21 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.
- SMITH, C. A. 1983. Habitat use by mountain goats in Southeast Alaska. Progress Report. Federal Aid in Wildlife Restoration, Federal Aid in Wildlife Restoration Project. W-22-2, Job 12.4 R. Alaska Dept. Fish and Game. Juneau, Alaska. 14 pp.
- SMITH, C. A. 1984. Evaluation and management implications of long-term trends in coastal mountain goat populations in Southeast Alaska. Pages 395–424 in Proc. Fourth Bien. Symp. of North Wild Sheep and Goat Council. M. Hoefs, ed. Whitehorse, Canada.

- AND K.T. BOVEE. 1984. A mark-recapture census and density estimate for a coastal mountain goat population. Pages 487–498 *in* Proc. Fourth Bien. Symp. of North. Wild Sheep and Goat Council. M. Hoefs, ed. Whitehorse, Canada.
- AND L. NICHOLS, JR. 1984. Mountain goat transplants in Alaska: Restocking depleted herds and mitigating mining impacts. Pages 467–480 *in* Proc. Fourth Bien. Symp. of North. Wild Sheep and Goat Council. M. Hoefs, ed. Whitehorse, Canada.

PREPARED BY:

Boyd Porter
Wildlife Biologist III

SUBMITTED BY:

Dale Rabe
Management Coordinator

Please cite any information taken from this section, and reference as:

Porter, B. 2006. Unit 1A mountain goat management report. Pages 1–16 *in* P. Harper, editor. Mountain goat management report of survey and inventory activities 1 July 2003–30 June 2005. Alaska Department of Fish and Game. Project 12.0. Juneau, Alaska.

Table 1 Unit 1A mountain goat survey data, 1994–2004

Survey Dates	Nr Kids	Nr. Adults	Total Goats	Kids-100 Adults	Count Time (hrs.)	Goats/ Hour
Sept. 8–Oct. 1, 1994 ^a	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	27	12.0	58
Sept. 13–Sept. 21, 1998	102	450	552	23	10.4	53
Sept. 12–Sept. 27, 1999	56	377	423	15	7.8	54
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	26	7.7	69
Aug 5–Sept 22, 2003	134	345	479	39	6.6	73
Sept 10, 2004	7	9	16	78	1.1	15
Average ^b	101	402	490	25	9.0	55

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

^b Overall average does not include the single count during 2004

Table 2 Unit 1A mountain goat trend count area surveys, 1994–2004

Survey Area	Year	Adults	Kids	Total Goats	Survey Time (hrs)	Goats Observed/hr	Kids:100 adults	Sets of twins
K-4	2002	54	14	68	0.9	76	26	0
	2001	56	10	66	1.1	73	18	0
	2000	73	10	83	1.0	83	14	2
	1999	29	6	35	.9	39	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
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

Table 2 continued

Survey Area	Year	Adults	Kids	Total Goats	Survey Time (hrs)	Goats Observed/hr	Kids:100 adults	Sets of twins
K-6								
	2004	9	7	16	1.1	15	78	0
	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

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
K-9	2003	19	5	24	0.9	27	26	1
	2002	37	7	34	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
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
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

Table 2 continued

Survey Area	Year	Adults	Kids	Total Goats	Survey Time (hrs)	Goats Observed/hr	Kids:100 adults	Sets of twins
K-12A	2003	54	30	84	0.8	105	56	2
	2002	21	8	29	0.3	97	38	2
	2000	26	7	33	0.8	41	27	0
	1998	27	12	39	0.5	78	44	1
	1996	18	5	23	0.8	29	28	0
	1995	32	4	36	0.7	51	12	0
K-12B	2002	35	16	51	0.5	102	46	0
	2000	76	21	87	1.2	73	28	0
	1998	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

Table 2 continued

Survey Area	Year	Adults	Kids	Total Goats	Survey Time (hrs)	Goats Observed/hr	Kids:100 adults	Sets of twins
K-13	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	29	0
K-14	2002	42	35	9	1	42	26	0
	2000	61	11	72	1.2	60	18	0

Table 3 Unit 1A mountain goat harvest data by permit hunt, regulatory years 1994–2004

Hunt	Regulatory year	Permits issued	Did not hunt	Unsuccessful hunters	Successful hunters	Harvest						Total harvest
						Males	(%)	Females	(%)	Unk	(%)	
RG001												
	1994	215	135	55	18 ^b	11	(55)	9	(45)	0	(0)	20
	1995	201	112	54	23 ^c	14	(58)	10	(42)	0	(0)	24
	1996	171	91	48	22	14	(64)	8	(36)	0	(0)	22
	1997	177	82	64	31 ^d	17	(47)	19	(53)	0	(0)	36
	1998	205 ^a	91	65	33 ^e	20	(61)	13	(39)	0	(0)	33
	1999	174	94	56	9	5	(56)	4	(44)	0	(0)	9
	2000	154	86	31	24	14	(58)	10	(42)	0	(0)	24
	2001	132	80	25	22	17	(77)	5	(23)	0	(0)	22
	2002 ^f	123	71	36	16	8	(50)	8	(50)	0	(0)	16
	2003	146	74	72	18	10	(56)	8	(44)	0	(0)	18
	2004	120	69	51	22	16	(73)	6	(27)	0	(0)	22
	Average	165	(89)	51	22	13	(60)	9	(40)	0	(0)	22

^a Four permits not returned.

^b Two hunters killed 2 goats (18 hunters killed 20 goats).

^c One hunter killed 2 goats (23 hunters killed 24 goats).

^d Five hunters killed 2 goats (31 hunters killed 36 goats).

^e Four hunters killed 2 goats (29 hunters killed 33 goats).

^f Regulation changed; bag limit reduced to 1 goat per season.

Table 4 Unit 1A mountain goat hunter residency and success, regulatory years 1994–2004

Regulatory year	Successful					Unsuccessful					Total hunters
	Local ^a resident	Nonlocal resident	Nonresident	Total	(%)	Local ^a resident	Nonlocal resident	Nonresident	Total	(%)	
1994	15	3	2	20	(27)	45	9	1	55	(73)	75
1995	18	6	0	24	(31)	38	14	2	54	(69)	78
1996	14	8	0	22	(31)	30	15	3	48	(69)	70
1997	24	10	2	36	(41)	40	8	3	51	(59)	87
1998	21	8	4	33	(34)	51	10	4	65	(66)	98
1999	4	3	2	9	(14)	41	6	9	56	(86)	65
2000	9	7	11	27	(47)	24	4	3	31	(53)	58
2001	9	4	9	22	(50)	17	2	3	22	(50)	44
2002	6	3	7	16	(31)	20	7	8	35	(69)	51
2003	10	3	7	20	(36)	26	6	4	36	(64)	56
2004	14	7	1	22	(52)	19	1	0	20	(48)	42
Average	13	6	4	23	(35)	32	7	4	43	(65)	66

^a Local resident hunters reside in Unit 1A.

Table 5 Unit 1A goat harvest chronology percent by month, 1994 through 2004

Regulatory year	Aug	(%)	Sep	(%)	Oct	(%)	Nov	(%)	Dec	(%)	Unk	(%)	n
1994	1	(5)	13	(65)	6	(30)	0	(0)	0	(0)	0	(0)	20
1995	3	(13)	19	(79)	2	(8)	0	(0)	0	(0)	0	(0)	24
1996	5	(23)	15	(68)	2	(9)	0	(0)	0	(0)	0	(0)	22
1997	13	(36)	13	(36)	7	(20)	3	(8)	0	(0)	0	(0)	36
1998	8	(25)	12	(36)	11	(33)	1	(3)	1	(3)	0	(0)	33
1999	5	(56)	2	(22)	2	(22)	0	(0)	0	(0)	0	(0)	9
2000	4	(17)	7	(29)	9	(38)	1	(4)	3	(12)	0	(0)	24
2001	7	(32)	10	(45)	5	(23)	0	(0)	0	(0)	0	(0)	22
2002	3	(19)	8	(50)	3	(19)	2	(13)	0	(0)	0	(0)	16
2003	4	(22)	8	(44)	5	(28)	1	(6)	0	(0)	0	(0)	18
2004	9	(41)	6	(27)	7	(32)	0	(0)	0	(0)	0	(0)	22
Average	5	(25)	10	(46)	5	(24)	1	(3)	0	(1)	0	(0)	22

Table 6 Unit 1A mountain goat harvest percent by transport method, regulatory years 1994–2004

Regulatory year	Harvest percent by transport method								n
	Airplane	Air (%)	Boat	Boat (%)	Dog sled	Sled (%)	Unk	Unk.(%)	
1994	14	(70)	6	(30)	0	(0)	0	(0)	20
1995	21	(88)	3	(12)	0	(0)	0	(0)	24
1996	18	(82)	2	(9)	2	(9)	0	(0)	22
1997	30	(83)	6	(17)	0	(0)	0	(0)	36
1998	24	(73)	9	(27)	0	(0)	0	(0)	33
1999	7	(78)	2	(22)	0	(0)	0	(0)	9
2000	18	(75)	6	(25)	0	(0)	0	(0)	24
2001	16	(73)	6	(27)	0	(0)	0	(0)	22
2002	12	(75)	4	(25)	0	(0)	0	(0)	16
2003	18	(100)	0	(0)	0	(0)	0	(0)	18
2004	11	(50)	10	(45)	0	(0)	1	(5)	22
Average	17	(77)	5	(22)	0	(0)	0	(0)	22

MOUNTAIN GOAT MANAGEMENT REPORT

From: 1 July 2003

To: 30 June 2005

LOCATION

GAME MANAGEMENT UNIT: 1B (3000 mi²)

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 1986), 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 1982).

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 (Fox 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 ADF&G 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 subunit 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 effect 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.

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 2 to 1 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.

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 26 goats per year for the 10-year period ending in 2002. The overwhelming majority of the annual harvest occurs in RG004, that portion of the subunit 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, respectively. 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. In recent years, interagency efforts to limit the number of guided hunts late in the season, combined with a series of unusually mild winters and below average snowfall, have reduced the percentage of the harvest occurring during the late season.

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 subunit, 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 (male=1pt.; female=2 pts.) 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. The results of aerial surveys were subsequently used to establish harvest objectives for specific mountain goat populations within each registration hunt area. These objectives allowed for a 5-6% harvest quota based on the most recent aerial survey and population trend data. To avoid localized depletion of goats, the 5-6% harvest quota may be applied to small discrete areas within larger registration hunt areas.

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.

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. This area will remain closed to hunting until the goat population recovers sufficiently to provide harvest opportunity.

Population Size

Precise population estimates are not available for goats in the subunit. Using 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 and September 2003 surveys, kids composed 22% and 17%, respectively, of the goats classified. In August 2004 surveys, kids composed 21% of the goats classified. 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 typically use steep, broken terrain throughout the year (Schoen 1979).

MORTALITY

Harvest

Season and bag limit

Unit 1B, that portion
north of Bradfield Canal
and the north fork of the
Bradfield River

1 goat by registration
permit only

Resident and nonresident hunters

1 Aug–31 Dec
(General hunt only)

Season and bag limitResident and nonresident hunters

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 (EO). No Board of Game actions were taken regarding Unit 1B goats during the report period.

In fall 2004 an EO was issued for the early closure of the resident and nonresident mountain goat season (RG004) in that portion of Game Management Unit 1(B) located within the drainages of LeConte Bay and the Wilkes Range. This early season closure was the result of the goat harvest objective having been achieved in those drainages.

Hunter Harvest. The 2003 and 2004 Unit 1B harvest of 21 and 23 goats, respectively, were below our unit-wide management goal of 35 goats and below the mean harvest of 26 goats annually during the preceding 10-year period (Table 2). It should be noted, however, that the 2003 season closure in that portion of RG001 on the Cleveland Peninsula south of the divide between Yes Bay and Santa Anna Inlet, and the late season EO closure of LeConte Bay and Wilkes Range area in 2004 likely reduced the harvest during the report period. Hunter success was 30% in 2003 and 45% in 2004, slightly below and well above the management goal of 35 percent, respectively. In 2003 and 2004 males composed 81% and 70% 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 and made available video-tapes 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. After reaching a high of 23 guided hunts in 2001, the number of nonresident goat hunters in Unit 1B decreased in 2003 and 2004 to 16 and 14, respectively (Table3). The decline in guided hunters during the report period is attributable, at least in part, to the closure of the goat hunting season in that portion of RG-001 on the Cleveland Peninsula south of the divide between Yes Bay and Santa Anna Inlet in 2003. Guided hunters harvested 2 goats in 2003 and 9 in 2004.

While the number of guided nonresident goat hunters has increased steadily over the last decade, we have witnessed a declining trend in the number of local resident goat hunters taking to the field each year. A total of 26 local residents pursued goats in 2004. That is the lowest local resident participation since at least 1984, and is well below the 10-year average of 39 local resident hunters in Unit 1B.

In 2003 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. In 2004 two permits were issued for the harvest of a second goat, one person hunted, and no goats were harvested.

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 the previous report period, the harvest by nonresidents exceeded that of local residents for the first time. In 2003 the majority of goats were again harvested by local residents, however, in 2004 the majority of goats were harvested by nonresident and nonlocal residents, respectively. This represents the first time since 1985 that the nonlocal resident goat harvest in Unit 1B has exceeded that of local residents.

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 27% success, nonlocal residents 62% success, and guided nonresidents 37% 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. During the report period, the overall success rate for those permittees who hunted was 31% in 2003 and 45% in 2004. The hunter success rate in 2004 was the highest success rate since at least 1984.

From 1992 to 2003, the success rate for guided hunters in Unit 1B ranged from 38 to 100%, and averaged 54%. During this report period the guided hunter success rate was 13% in 2003 and 64% in 2004. Because of the guide requirement, nonresident hunters typically enjoy the highest success rate, however, during 2003 both local and nonlocal residents enjoyed higher success than did guided hunters.

Harvest in Particular Areas. Goat harvest occurred in 9 Unit 1B Wildlife Analysis Areas (WAAs) during this report period. In 2003 harvest occurred in 7 WAAs, with #1603, #1605, #1706, and #1602 providing 29, 19, 19 and 14%, respectively, of the subunit's total annual harvest. The remainder of the harvest was evenly distributed across the remaining 4 WAAs. In 2004, harvest occurred in 9 WAAs with #1707, #1602, and #1603 providing 22, 17 and 13%, respectively, of the total harvest. The remainder of the harvest was evenly distributed across the remaining 6 WAAs.

Harvest Chronology. Winter weather, particularly during the late season, can have a profound influence on harvest chronology. The greatest proportion of the 2003 harvest occurred in October, followed by identical harvests in August and September. The largest percentage of the 2004 harvest occurred in August and November, respectively (Table 4). Exceptionally mild winter weather and below average snowfall reduced late season hunter success in 2003.

Transport Methods. In recent years, the majority of successful hunters have reported using boats to access their hunt areas. In 2003, however, 62% of hunters reported using airplanes, while 38% reported using boats to access their hunting area. In 2004, 52% of hunters reported using boats, and 44% reported using airplanes to access their hunting area. During the report period, just 1 hunter reported using another transportation method (Table 5).

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 subunit 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 subunit. 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 subunit.

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.

Recent USFS moratoriums imposed on the number of brown bear big game guides and hunters in Units 1 and 4 have created increased interest in goat guiding regionwide. During the last several 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, particularly in Guide Use Area (GUA) 01-06. Area management staff has worked closely with USFS permitting authorities and local big game guides to stabilize the number of hunt authorizations in GUA 01-06. Of particular concern is the potential for localized overharvest and potential conflicts between guided nonresident hunters and federally qualified subsistence hunters. We will continue to closely monitor the goat harvest by guided nonresident hunters.

CONCLUSIONS AND RECOMMENDATIONS

We believe that unusually mild winter weather and below average snowfall were at least partially responsible for the below average harvest during the report period. The Board of Game’s closure of the goat hunting season on the Cleveland Peninsula south of the divide between Yes Bay and

Santa Anna Inlet in 2003, and the 2004 emergency closure of the goat season in the LeConte Bay and Wilkes Range drainages, also contributed to below average harvest. In 2004 a sharp decline in local resident participation in goat hunting probably contributed to below average harvest that year. We believe that the aforementioned factors, not a population decline, are largely responsible for the below average goat harvest during the report period.

Concern remains about the elevated number of guided goat hunts occurring in Unit 1B. The increasing percentage of goats harvested by guided nonresident hunters has given rise to concerns about our ability to maintain sufficient opportunity for subsistence hunters. Between 1992 and 2001, the number of guided hunts conducted in Unit 1B increased dramatically. After reaching a high of 23 in 2001, the number of guided hunts decreased in 2003 and 2004 to 16 and 14, respectively. We will continue to work with USFS permitting authorities to stabilize the number of guided goat hunts at a level that ensures sufficient opportunity exists for federally-qualified local residents.

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 late-season goat hunting in 2003 and 2004. 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.

Although outside the State of Alaska's jurisdiction, we feel that the 2-goat bag limit allowed under federal hunting regulations should to be reduced in at least that portion of the subunit located north of the Stikine River drainage. Such a regulatory change would ensure a more equitable distribution of the available goat harvest among federally-qualified hunters.

Strict implementation of harvest guideline levels based on the results of aerial surveys was largely responsible for the emergency order issue for the LeConte Bay and Wilkes Range drainages in 2004. Uncertainty about the sightability of goats during aerial surveys remains a primary concern with regard to establishing harvest guidelines for individual goat populations. Research is needed to develop reliable methods of inventorying Southeast Alaska goat populations.

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.

LITERATURE CITED

- ADAMS, L. G., AND J. A. BAILEY. 1982. Population dynamics of mountain goats in the Sawatch Range, Colorado. *Journal of Wildlife Management*. 46(4):1003–1009.
- BALLARD, W. B. 1975. Mountain goat survey technique evaluation. Alaska Department of Fish and Game. Federal Aid in Wildlife Restoration. Final Report. Project W-17-7, Job12.2R. Juneau, Alaska, USA. 152pp.

- DAILEY, T. V., N. T. HOBBS, AND T. N. WOODWARD. 1984. Experimental comparisons of diet selection by mountain goats and mountain sheep in Colorado. *Journal of Wildlife Management*. 10: 799–806.
- FOX, J.L. 1983. Constraints on winter habitat selection by the mountain goat (*Oreamnos americanus*) in Alaska. Ph.D. Thesis. University of Washington. 147 pp.
- FOX, J. L., C. A. SMITH, AND J. W. SCHOEN, 1989. Relation between mountain goats and their habitats in Southeastern Alaska. Gen. Tech. Rep. PNW-GTR-246. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. 25p.
- GEIST, V. 1971. Mountain sheep – a study in behavior and evolution. University of Chicago Press, Chicago, Ill. 383 pp.
- SMITH, C. 1982. Habitat use by mountain goats in Southeast Alaska. Alaska Department of Fish and Game. Federal Aid in Wildlife Restoration Progress Report. Project W-21-2, Job 12.4R. 22 pp.
- SMITH, C. 1986. Habitat use by mountain goats in southeast Alaska. Alaska Department of Fish and Game. Federal Aid in Wildlife Restoration Final Report. Project W-21-1, W-22-2 and W-22-3, Job 12.4R. 63pp.
- SCHOEN, J. 1979. Winter habitat use by mountain goats. Alaska Department of Fish and Game. P-R Progress Report. 52pp.
- SCHOEN J. W. AND M. D. KIRCHHOFF. 1982. Habitat use by mountain goats in Southeast Alaska. Alaska Department of Fish and Game. Final Report. Federal Aid in Wildlife Restoration. Project W-17-10, W-17-11, W-21-1, W-21-2, Job 12.4R. Juneau, Alaska, USA. 67pp.
- SURING, L. H. 1993. Habitat capability models for wildlife in Southeast Alaska. USDA Forest Service, Alaska Region, Juneau. n. s.

PREPARED BY:

Richard E. Lowell
Wildlife Biologist III

SUBMITTED BY:

Dale Rabe
Management Coordinator

Please cite any information taken from this section, and reference as:

Lowell, R. 2006. Unit 1B mountain goat management report. Pages 17-32 in P. Harper, editor. Mountain goat management report of survey and inventory activities 1 July 2003–30 June 2005. Alaska Department of Fish and Game. Project 12.0. Juneau, Alaska.

Table 1 Unit 1B summer aerial mountain goat composition counts, regulatory years 1994–2004

Regulatory year ^a	Adults	(%)	Kids	(%)	Unknown	Kids: 100 adults	Total goats observed	Goats /hour
1994 (Aug. 1994)	90	(74)	31	(26)	0	34	121	35
1995 (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
2003 (Aug. 2003)	132	(78)	37	(22)	0	28	169	56
(Sept. 2003)	84	(83)	17	(17)	0	20	101	53
2004 (Aug. 2004)	446	(79)	120	(21)	0	27	566	33

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

Table 2 Unit 1B mountain goat harvest data by permit hunt, regulatory years 1995 through 2004

Hunt	Year	Permits ^a issued	Nr hunted	(%) Did not hunt	Nr successful hunters	(%) successful hunters	Nr males	(%) males	Nr females	Total harvest
RG001	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
	2003		5		1	(20)	0	(0)	1	1
	2004		5		2	(40)	1	(50)	1	2
RG004	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
	2003	115	64	(44)	20	(31)	17	(85)	3	20
	2004	103	46	(55)	21	(46)	15	(71)	6	21

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	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
	2003		69		21	(30)	17	(81)	4	21
	2004		51		23	(45)	16	(70)	7	23

^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 1995 through 2004

Year	Successful					Unsuccessful					Total hunters
	Local ^a resident	Nonlocal resident	Nonresident	Total	(%)	Local ^a resident	Nonlocal resident	Nonresident	Total	(%)	
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
2003	11	8	2	21	(31)	26	7	14	47	(69)	68
2004	6	8	9	23	(45)	20	3	5	28	(55)	51

^a Residents of Petersburg, Wrangell, and Kake.

Table 4 Unit 1B mountain goat harvest chronology, percent by month, regulatory years 1995 through 2004

Year	Month										Total harvest
	August		September		October		November		December		
	n	(%)	n	(%)	n	(%)	n	(%)	n	(%)	
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
2003	6	(29)	6	(29)	8	(38)	1	(4)	0	0	21
2004	8	(35)	1	(4)	5	(22)	7	(30)	2	(9)	23

Table 5 Unit 1B mountain goat harvest, percent by transport methods, regulatory years 1995 through 2004

Percent of harvest							
Year	Airplane		Boat		Other		Total harvest
	N	(%)	n	(%)	n	(%)	
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
2003	13	(62)	8	(38)	0	(0)	21
2004	10	(44)	12	(52)	1	(4)	23

MOUNTAIN GOAT MANAGEMENT REPORT

From: 1 July 2003

To: 30 June 2005

LOCATION

GAME MANAGEMENT UNIT: 1C (7600 miles²)

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

There are four main issues of concern regarding mountain goat management in Unit 1C: guided hunting, commercial helicopter tourism, construction activity, and a resurgence of symptoms that are similar to contagious ecthyma (orf) in a few goats. 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 implementing 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 flightseeing 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 is an issue of concern.

Construction activities associated with the Kensington Mine as well as the road infrastructure associated with the mine and the Juneau Access project have raised some concerns about the disturbance of goats on low elevation winter habitats. Funding has recently been acquired by ADF&G from Kensington Mine and the Department of Transportation to begin a mountain goat radiocollaring project to investigate these concerns.

Contagious ecthyma (also referred to as orf) has again begun to show up in goats near Juneau. During the late 1970's through the early 1990's this viral infection was routinely discovered in goats and was thought to be at least partly responsible for a decline in local goat numbers. During the 1990's through 2003 only 1-2 cases were reported by hunters harvesting goats in the Tracy Arm area of Unit 1C. Since 2004 however, there have been five cases reported in the

Juneau area, three that led to the deaths of affected kid goats and two others in adult goats that were taken by hunters.

MANAGEMENT DIRECTION

MANAGEMENT OBJECTIVES

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

- Maintain goat densities so at least 30 goats per hour are seen during fall surveys;
- Use pamphlets, videos, and other educational materials to assure a male:female harvest of at least 2:1;
- Maintain goat viewing opportunities along the Juneau road system;
- Identify discrete geographic areas and manage within these areas;
- Maintain a guideline harvest not to exceed 6 points (billie = 1 pt., nannie = 2 pt.) per 100 goats observed;
- 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 2003 and 2004 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 when compared to historical data 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: Lions Head Mountain, Border Lake, and Dorothy Lake in the RG013 permit area, and Antler Lake in the RG012 permit area.

Although these surveys represent a small portion of Unit 1C, hunter effort and harvest information as well as anecdotal information from hunters, pilots, commercial guides, and ADF&G personnel suggest that goat populations are healthy throughout the unit.

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 2004 Board of Game meeting a proposal was adopted to open the archery only mountain goat hunt (RG014) in Unit 1C on August 1. This opening is a month earlier than previously allowed and will provide additional opportunity to harvest goats by taking advantage of the longer days and better weather during August. In 2003, an emergency order was issued to close that portion of the RG012 hunt area south of the Gilkey River, west of the Thiel Glacier and east of Berners Bay when the allowable goat harvest was reached. In 2004, an emergency order was issued closing that portion of the RG013 hunt area south of the Taku River and north and east of the Wright Glacier when the allowable goat harvest was reached.

Hunter Harvest. Ninety-one goats were taken during this report period, 44 in 2003 and 47 in 2004 (Table 2). This is just slightly less (6 goats) than the harvest from the previous report period, but still higher than the previous three report periods spanning 1995-2001. The increase in harvest over historical records is largely due to nonresident guided hunters (Table 4).

Males again made up a large part of the harvest (88%), which is the same percentage as 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 receive significant commercial guiding harvest. There was one area near Pt. Couverdon (2305 and 2306) on the west side of Lynn Canal where the harvest declined substantially, making this area unique. The harvest decreased on the west from 13 during the previous report period to three goats during 2003-2004. This is partly due the lack of any guided hunts during the current report period, but also is attributed to local hunters not exploiting the area as hard as in the past.

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 206 in the previous report period to a mean of 233 in 2003-2004 (Table 3). The mean annual number of hunters during this report period (n=99) increased slightly from 96 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 48% during this report period, which is slightly less than the 50% rate in the previous report period. Alaska resident hunters harvested nearly as many goats during this report period as nonresidents (43 versus 48 respectively), however their success rate was only 31% compared to 83% 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 (53%) increased slightly from the previous report period (52%). Successful hunters expended an average of 2.4 days per goat during the report period, slightly lower than the mean of 3.0 days per goat during 2001-2003 (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 52% of the take in 2003 and 62% in 2004. 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 76% 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 35% of hunters using a commercial service versus 39% during 2001-2003 (Table 6). Eighty percent of hunters who used commercial services used a guide, and 28% 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 and the other 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 heliskiing 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.

During the report period we accomplished part of our goal of dividing Unit 1C into goat aerial survey units that also serve as management units. By managing goats in these smaller units we will be able to track harvest and survey data for each of these discrete areas more easily. This will prevent hunters from concentrating their harvest in easily accessible areas and potentially compromising the health of goat herd in those areas.

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.

LITERATURE CITED

CHADWICK, D.H. 1983. A beast the color of winter. Sierra Club Books. San Francisco, Calif. 208 pp.

HOLROYD, J. C. 1967. Observations of rocky mountain goats on Mount Wardle, Kootenay National Park, British Columbia. Can. Field-Nat. 81:1-22.

PREPARED BY:

Neil L. Barten
Wildlife Biologist III

SUBMITTED BY:

Dale Rabe
Management Coordinator

Please cite any information taken from this section, and reference as:

Barten, N. 2006. Unit 1C mountain goat management report. Pages 33–43 in P. Harper, editor. Mountain goat management report of survey and inventory activities 1 July 2003–30 June 2006. Alaska Department of Fish and Game. Project 12.0. Juneau, Alaska.

Table 1 Unit 1C mountain goat composition counts south of the Taku River, regulatory years 1995 through 2004

Year	Number adults	Number kids	Total goats	Kids:100 adults	Percent kids	Goats per hour
1995			No survey			
1996 ¹	215	78	293	36	27	52
1997			No survey			
1998 ²	225	38	263	17	14	77
	71	19	90	27	21	39
1999 ³	54	12	66	22	18	33
2000 ⁴	57	3	60	5	5	47
2000	143	30	179	21	17	36
2001 ⁵	464	113	577	24	20	132
⁶	174	57	231	33	25	139
⁷	20	7	27	35	26	20
⁸	18	1	19	5	5	27
2002 ⁹	163	47	213	29	22	82
¹⁰	152	26	178	17	15	85
2003 ¹¹	52	12	64	23	19	213
¹²	98	14	112	14	13	170
2004			No survey			

¹ 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.

² 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).

³ Registration hunt area RG014.

⁴ 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.

⁵ Nov 27 survey between Tracy and Endicott Arms.

⁶ Nov 27 survey of area north of Tracy Arm.

⁷ Sep 1 survey of area between Whiting and Speel Rivers.

⁸ Sep 1 survey of area from Sharp Pt. to Bart Lake (poor conditions due to sun glare).

⁹ Oct 19 survey of area south of Endicott Arm and north of Port Houghton (3 yearlings in count).

¹⁰ Nov 3 survey of Chilkat Range.

¹¹ Oct 8 survey of Berners Bay, Lions Head Mountain.

¹² Oct 8 Survey of Berners Bay, Antler Lake.

Table 2 Unit 1C annual goat harvest, regulatory years 1995–2004

Year	Males	Females	Unknown	Total
1995	26	10	0	36
1996	24	8	2	34
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
2003	40	4	0	44
2004	40	7	0	47

Table 3 Unit 1C goat hunter effort and success, regulatory years 1995–2004

Year	Permits issued	<u>Successful hunters</u>			<u>Unsuccessful hunters</u>			<u>Total hunters</u>		
		Nr hunters	Total days	Avg. days	Nr hunters	Total days	Avg. days	Nr hunters	Total days	Avg. days
1995	146	36	117	3.3	48	134	2.8	84	251	3.0
1996	135	34	101	3.0	21	42	2.0	55	143	2.6
1997	164	46	118	2.6	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	2.4	76	211	2.8
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
2003	248	44	102	2.3	72	192	2.7	116	294	2.5
2004	217	47	113	2.4	35	89	2.5	82	202	2.5

Table 4 Unit 1C goat hunter success by community of residence, regulatory years 1995–2004

Year	Percent success	Successful hunters			Unsuccessful hunters		
		Unit resident	Other AK	Non resident	Unit resident	Other AK	Non resident
1995	43	12	4	20	36	10	2
1996	61	10	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
2003	38	19	4	21	55	12	5
2004	57	18	2	27	27	3	5

Table 5 Unit 1C transport methods used by successful goat hunters, regulatory years 1995–2004

Year	Airplane		Boat		Foot		Hwy. vehicle		Other	
	Total	(%)	Total	(%)	Total	(%)	Total	(%)	Total	(%)
1995	6	(17)	29	(81)	0	(0)	0	(0)	1	(2)
1996	4	(12)	26	(76)	0	(0)	3	(9)	1	(3)
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)
2003	6	(14)	36	(82)	1	(2)	1	(2)	0	(0)
2004	12	(26)	33	(70)	1	(2)	1	(2)	0	(0)

Table 6 Commercial services used by Unit 1C goat hunters, regulatory years 1995–2004¹

Year	Unit residents		Other AK residents		Nonresidents		Total use		Registered guide	Transporter	Other
	No	Yes	No	Yes	No	Yes	No	Yes			
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	23	59	31	23	7	1
2003	72	2	15	0	1	25	88	27	25	2	0
2004	34	11	5	0	1	31	40	42	30	12	0

¹ Not all hunters report commercial services used

Table 7 Unit 1C mountain goat harvest from all Wildlife Analysis Areas (WAAs), regulatory years 1995–2004

WAA	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	Total
2202	2										2
2203		1	3	1					1		6
2304											-
2305				1			1	2		1	5
2306							6	4	1	1	12
2307											-
2408	2		1		1		1		1		6
2409	3	1	2			1	1	3	2	1	14
2410		1	3				1		1		6
2411	1		3		1		1				6
2412											-
2413		1	2	3						2	8
2514			1	2			1		5	2	11
2515			1								1
2517						1	1	3	1		6
2518	4	2	4	2	2	6	5	2	5	5	37
2519	1			2	1				1	5	10
2722											-
2823											-
2824	15	17	15	19	20	18	26	11	15	16	172
2825	7	8	8	8	13	11	10	10	10	13	98
2926	1						2				3
2927		3	3			2	4	2	1	1	16
Unkn											-
TOTAL	36	34	46	38	38	39	60	37	44	47	419

MOUNTAIN GOAT MANAGEMENT REPORT

From: 1 July 2003

To: 30 June 2005

LOCATION

GAME MANAGEMENT UNIT: 1D (2700 mi²)

GEOGRAPHIC DESCRIPTION: The Southeast Alaska mainland north of the latitude of Eldred Rock, excluding Sullivan Island and the drainages of Berners Bay.

BACKGROUND

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

REGION 1 MANAGEMENT GOAL

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

MANAGEMENT OBJECTIVES

Population management objectives for Unit 1D are as follows:

- Continue working towards identifying discrete geographic areas for use as goat trend count and management areas;
- Maintain a guideline harvest within management areas not to exceed 6 points (male = 1 pt., female = 2 pt.) per 100 goats observed;
- Conduct aerial surveys to establish the minimum number of goats needed to provide harvest opportunities for the Skagway Pie management area;
- 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 2003 and 2004. Results from BLM surveys, though not directly comparable to ADF&G data due to different survey aircraft and methodology, are still useful. A single 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, 1b, and 1c). 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 sublethal 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, 1b, and 1c).

MORTALITY

Harvest

Season and bag limits

Unit 1D, that portion between
Taiya Inlet and River and the
White Pass and Yukon Railroad

Resident and nonresident hunters

No open season.

Season and bag limitsResident and nonresident hunters

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 Katzechin 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 (EO). No Board of Game actions were taken during the report period. In both 2003 and 2004 the lower portion of the Takshanuk Mountains (Mount Tukgahgo Saddle) in the RG023 hunt area was closed by emergency order when guideline harvest levels were reached. In 2004, the entire RG024 hunt area was closed to goat hunting by emergency orders (EO's). To accomplish this, three separate EO's were issued to close specific portions of RG024 after guideline harvest levels were reached in these areas.

Hunter Harvest. A total of 74 goats were harvested during the report period, 35 in 2003 and 39 in 2004 (Table 2). The 2003 harvest consisted of 27 males (77%) and 7 female and 1 goat of unknown sex, compared to the 2004 harvest of 32 males (82%) and 6 females and 1 goat of unknown sex. The harvest during 2003-2004 represents the highest mountain goat harvest recorded during a report period in Unit 1D (Table 2). The harvest can be largely explained by the increase in nonresident guided hunters, and their much higher success rate compared to resident hunters (Table 3).

Permit Hunts. Unit 1D mountain goat hunting is regulated under three registration permit hunts, administered by a common hunt report. The main reason for maintaining three 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 were issued during each year of the report period; the same as the eight year mean (1997-2004).(Table 3).

Hunter Residency and Success. Local residents continue to compose the majority of Unit 1D goat hunters, although nonresident hunters are increasing. In 2003 and 2004, residents of the subunit took 24 (69%) and 24 (62%) of harvested goats, respectively, while nonlocal residents took just 4 (11%) and 5 (13%) of the goats during the first and second years of the report period. The nonresident hunters numbered 23 during the report period, compared to 17 during 2001-2002, and 6–8 during the three previous report periods.

Thirty-nine percent of the goat hunters were successful during the report period (Table 4). However, while 74% of the nonresident hunters harvested goats, only 35% of the resident hunters were successful. This discrepancy is partly due to nonresidents requiring a guide who knows how to hunt goats, and partly due to resident hunters not being quite as serious about getting a goat as their nonresident counterparts.

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 37% of the goats were harvested in October, 27% in September, 20% in November, and 8% in each of December and August.

Transport Methods. Boats and highway vehicles continue to be the transport methods used most often by successful hunters, amounting to 41% and 36% 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. 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), since these 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=23) reported using commercial services, mainly registered guides. The guide industry has been increasing their mountain goat hunts in recent years, and likely will continue this trend.

Location of Harvest. Goat harvest by Wildlife Analysis Area (WAA) 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 at least every three years

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. Flightseeing 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 two 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.

LITERATURE CITED

COTE, S.D. 1996. Mountain goat responses to helicopter disturbance. *Wildlife Society Bulletin* 24(4):681-685.

HUNDERTMARK K. J., W. L. EBERHARDT, AND R. E. BALL. 1983. Winter habitat utilization by moose and mountain goats in the Chilkat Valley. Alaska Department of Fish and Game. Final report for the Haines-Klukwan Cooperative Resource Study. 44 pp.

PREPARED BY:

Ryan Scott
Wildlife Biologist II

SUBMITTED BY:

Dale Rabe
Management Coordinator

Please cite any information taken from this section, and reference as:

Scott, R. 2006. Unit 1D mountain goat management report. Pages 44–58 in P. Harper, editor. Mountain goat management report of survey and inventory activities 1 July 2003–30 June 2005. Alaska Department of Fish and Game. Project 12.0. Juneau, Alaska.

Table 1A Unit 1D mountain goat composition counts, Skagway closed area, regulatory years 1981–2004

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			
2003			No survey			
2004			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 1989–2004.

Year	Number adults	Number kids	Total goats	Kids:100 adults	(%) kids	Goats/hour
<u>Klukwah Mt. (K) and Ferebee Glacier/River (F) to Chilkoot Inlet</u>						
1989 (K)	26	9	35	35	(26)	60
1993				No survey		
1994 (K,F) ¹	111	21	132	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		
2001–2002				No survey		
2003	140	44	184	31	(24)	141
2004				No survey		
<u>Takshanuk Mtns. (E, W)</u>						
1989 (E,W)	40	16	56	40	(29)	34
1993 (W)	27	7	34	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		
2003–2004				No survey		
<u>North of the Klehini River and West of the Chilkat River</u>						
1989	23	6	29	26	(21)	70
1993				No survey		
1994	58	4	62	7	(6)	69
1995	55	9	64	16	(14)	116
1996–2003				No survey		
2004	34	8	42	24	(19)	84
<u>East of Ferebee Glacier/River (F), Chilkoot/Taiya Inlet</u>						
1989 (F,C)	39	17	56	44	(30)	40
1992 (F,C)	30	10	40	33	(25)	19
1993				No survey		
1994 (F,C)	119/130	21/33	140/163	18/25	(15/20)	46/59
1995–2004				No survey		
<u>Harding Mountain to upper West Cr., upper Norse R. and Chilkoot Pass</u>						
1995	64	9	73	14	(12)	50.5
1996–2004				No survey		
<u>Twin Dewey Peaks, Skagway Pass, Warm Pass</u>						
1995	20	6	26	30	(23)	20
1996–2004				No survey		

Year	Number adults	Number kids	Total goats	Kids:100 adults	(%) kids	Goats/hour
<u>Katzehin River north to Twin Dewey Peaks</u>						
1994	121	32	153	26	(21)	102
1995			No survey			
1996	103	26	129	25	(20)	105
1997	96	15	111	16	(14)	80
1998–1999			No survey			
2000	97	21	108	22	(19)	83
2001 ³	60	13	73	21	(18)	77
2002–2004			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 1988–2004

Year	Number adults	Number kids	Total goats	Kids:100 adults	(%) kids	Goats/hour
<u>Tsirku River (T) and Takhin Ridge (N,S)</u>						
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	158	22	(18)	48
1995–2001	No survey					
2002 (N,S)	79	17	96	22	(18)	87
2003 (T)	34	15	49	44	(31)	58
2003 (N,S)	104	27	131	26	(21)	95
2004 (T)	55	17	72	31	(24)	81
2004 (N,S)	97	23	120	24	(19)	114
<u>Remainder of Area West of Chilkat Inlet</u>						
1974	39	3	42	8	(7)	72
1975	20	9	29	45	(31)	--- ³
1993	No survey					
1994	184	32	216	17	(15)	49
1995–2004	No survey					
<u>East of Chilkoot Inlet-Katzehin River South</u>						
1993	No survey					
1994	32	10	42	31	(24)	98
1995–1996	No survey					
1997	5	2	7	40	(29)	N/A
1998–2004	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 1995–2004

Year	Males	Females	Unknown	Total
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
2003	27	7	1	35
2004	32	6	1	39

Table 3 Unit 1D mountain goat hunter effort and success, regulatory years 1995–2004

Year	Successful hunters				Unsuccessful hunters			Total hunters		
	Permits issued	Nr hunters	Total days	Avg. Nr days	Nr. hunters	Total Nr days	Avg. Nr days	Nr hunters	Total Nr days	Ave. Nr days
1995	169	22	36	1.6	81	226	2.8	103	262	2.5
1996	176	20	32	1.6	75	152	2.0	95	184	1.9
1997	149	27	46	1.7	60	125	2.1	87	171	2.0
1998	157	27	64	2.4	69	168	2.4	96	232	2.4
1999	170	25	40	1.6	60	175	2.9	85	215	2.5
2000	161	22	48	2.2	73	172	2.4	95	220	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
2003	170	35	76	2.2	69	223	3.2	104	299	2.9
2004	147	39	83	2.1	45	115	2.6	84	198	2.4

Table 4 Unit 1D goat hunter success by community of residence, regulatory years 1995–2004

Year	Percent success	<u>Successful hunters</u>			<u>Unsuccessful hunters</u>		
		Unit resident	Non-local	Non-resident	Unit resident	Non-local	Non-resident
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
2003	34	24	4	7	45	20	4
2004	46	24	5	10	39	4	2

Table 5 Unit 1D transport methods used by successful goat hunters, regulatory years 1995–2004

Year	Airplane		Boat		Foot		Hwy vehicle		Other ¹	
	Total	(%)	Total	(%)	Total	(%)	Total	(%)	Total	(%)
1995	1	(5)	8	(36)	0	(0)	11	(50)	2	(9)
1996	0	(0)	8	(40)	5	(25)	5	(25)	2	(10)
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	(36)	3	(14)	10	(45)	1	(5)
2001	0	(0)	15	(63)	2	(8)	4	(17)	3	(12)
2002	1	(4)	5	(23)	3	(14)	11	(50)	2	(9)
2003	0	(0)	15	(43)	0	(0)	12	(34)	8	(23)
2004	1	(3)	15	(38)	1	(3)	15	(38)	7	(18)

¹ Includes unknown transportation

Table 6 Unit 1D commercial services reported by goat hunters, regulatory years 1995–2004

Year	Unit residents		Other AK residents		Non-residents		Total use		Registered Guide	Trans-porter	Other
	No	Yes	No	Yes	No	Yes	No	Yes			
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
2003	69	0	24	0	1	10	94	10	10	0	0
2004	64	0	9	0	0	12	73	12	11	0	1

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 1995 through 2004

Regulatory year	WAA							<i>Total</i>
	4302	4303	4304	4405	4406	4407	4408	
1995	16	0	0	0	0	3	3	22
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
2003	11	1	0	11	0	10	2	35
2004	19	5	0	5	0	9	1	39

MOUNTAIN GOAT MANAGEMENT REPORT

From: 1 July 2003

To: 30 June 2005

LOCATION

GAME MANAGEMENT UNIT: Unit 4 (5800 mi²)

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

BACKGROUND

Mountain goat populations were established on Baranof Island (~1865 square miles) 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 March 2004, the Federal Subsistence Board (FSB) issued permits through the U.S. Forest Service to the Sitka Tribe of Alaska to allow the spring harvest of 3 goats. The goats will be used for obtaining goat hair for spinning and weaving ceremonial robes as a cultural/education project. The FSB authorized renewal permits good for 5 years.

In the mid 1950s goats were transplanted to Chichagof Island (~2218 square miles) (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 (~1693 square miles) 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 limited and difficult. Weather patterns and hunter access 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.

MANAGEMENT OBJECTIVES

- Maintain an island-wide population in excess of 1000 goats.
- Monitor sex composition of the harvest and manage for < 6 points per hundred goats using a weighted harvest point system (males = 1 point, females = 2 points).

In February 2002 discussions took place to examine goat management objectives as a regional strategy. At that time, Unit 4 biologists believed the maintenance of a population sufficient to provide an annual harvest of at least 60 goats, and maintenance of a population sufficient to provide an annual hunter success rate of at least 25%, achieved the best objectives for the unit. Overall hunter harvest was low and comprised mostly of resident hunters hunting for meat and the hide. Trophy horns were uncommon and few guided nonresidents were drawn to the area. The amount of predation by brown bears is unknown. It is not believed to be a significant factor island-wide, especially for wintering goats in forested areas when the majority of the bears would still be in hibernation. Although the ratio of young to females varies considerably during surveys of segments of the population, the overall combined ratio has consistently been above 20%.

Discussions since 2002 have looked at the consistency of methods used regionally to monitor the sex composition of the harvest towards managing the population. The system widely used equates to a maximum allowable harvest of 6% of an observed (surveyed) population (i.e., no more than 6 males, 3 females, or any combination of points not exceeding 6 per 100 goats).

There is a 5 year trend which shows increases in the number of guided nonresident hunters as well as an increasing trend in the use of aircraft as the primary transport method. Although harvest of males is encouraged, females averaged 46% of the total in the last three seasons. Adoption of the 6 point system will provide a better mechanism to manage hunter harvest if females are heavily targeted. This system will be implemented with the fall 2006 registration hunt.

METHODS

Unit 4 goat hunting is administered through a registration permit (RG150). Hunters obtain permits without charge, but successful hunters are required to report within five 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. Over the last 3 years 72% of successful hunters have brought their horns in for measurement.

Mid to late summer aerial surveys are conducted periodically island-wide or in selected trend count areas. Survey platforms have ranged from larger fixed-wing aircraft using multiple observers, smaller fixed-wing aircraft with a pilot and observer, and helicopters. The island has been divided into trend count areas that can be used when island-wide surveys are not possible due to budget constraints, aircraft availability, and poor weather conditions. During August 2004 an extensive survey of the island was conducted to estimate total goat numbers, number of kids,

and distribution islandwide. A follow-up survey was conducted in August 2005 with the primary purpose of looking at the expansion of goats on the southern one-third of the island.

RESULTS AND DISCUSSION

POPULATION STATUS AND TREND

Population Size

An extensive aerial survey of goat distribution on Baranof Island was conducted during August 2004, resulting in a tally of 1300 goats. The survey platform was a Hughes 500 helicopter and observations occurred during optimal conditions. However, this number should be viewed as a minimum number of goats inhabiting the island, as sightability data have not been established. Because observers believe that survey conditions were optimal, it is estimated that approximately 85% of all goats were seen. Under this assumption the goat population on the island may exceed 1500 animals. The previous extensive survey was conducted during September 1998; resulting in a tally of 1013 goats (the survey platform was a Cessna 185 fixed-wing aircraft using multiple observers). This number was viewed as a minimum number of goats inhabiting the island because sightability data had not been established. During those surveys, observers suspected that conditions were near optimal and resulted in at least 65% of all goats being seen. Under this assumption the goat population on the island may exceed 1350 animals (Whitman 2002). Between 1998 and 2005, only select portions (trend count areas) of Baranof Island were surveyed. For example, in August 2005, a Piper Super Cub was used as the survey platform and the priority of the surveys was to look at the southern one-third of the island (south of the Great Arm of Whale Bay) for expansion of the population. 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. Areas on the north one-third of Baranof Island (where it is estimated that 70% of the goat population resides) do show an extensive network of trails and dig-outs (dig-outs are areas of soft, damp ground where goats dig up the ground to lie on and cool off). A habitat assessment project related to determining the impact of goats on the alpine summer range has been discussed with the U.S. Forest Service as a potential cooperative agency effort.

A population estimate for Baranof Island was made in 1991 by E. L. Young, who estimated 1000 goats (cited by Faro 1994). Whitman (2002) estimated the population at 1350, and the latest estimate from the 2004 surveys is 1500 goats.

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%. Surveys conducted in 2004-05 produced combined results with an average of 22%. These data should be viewed cautiously because of differences in observers,

pilots, type of aircraft used, and timing of surveys. Hunters are encouraged to select males, so harvest sex ratios do not reflect population-wide sex ratios.

From 1976 to 2005, 1026 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. Generally, males are selected over females; however the 2003 harvest resulted in 32 females taken versus 29 males. 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 mean ages by sex of harvested goats were 4.4 years for males and 5.4 years for females.

Females likely live longer than males. Approximately 8% of harvested females were ≥ 10 years of age, whereas less than 2% of males were ≥ 10 years. The oldest female killed was 17 years and the oldest male was 13 years.

Distribution and Movements

Mountain goats inhabit all available summer range on Baranof Island north of Port Herbert and Snipe Bay. Goat densities in the various alpine areas are unknown, but recent surveys indicate that at least some goat habitats are densely occupied, especially areas north of Blue Lake and south/southeast of Rodman Creek. There are increasing goat observations south of Whale and Gut bays reported by the public and as populations increase those areas will support additional goats. Limitations in contiguous goat habitat exist south of Whale and Gut bays and will play a role in slowing the expansion of the population and the numbers of the goats in this area. 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 306 goats from the 1998–2005 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 very difficult.

Despite earlier indications that incremental horn growth may reflect winter severity (Whitman 2002), addition of horn growth data from the 1999–2005 seasons has led to the conclusion that there is no correlation between horn growth and winter severity.

MORTALITY

Harvest

Season and bag limit

1 goat by registration permit only

Resident and nonresident hunters

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. No board actions were taken and no emergency orders were issued during the period.

Hunter Harvest. During 2003, 2004, and 2005, 331, 352, and 313 registration permits were issued, respectively (Table 1). This resulted in 61 (2003), 47 (2004), and 53 (2005) goats being legally harvested. The percent of permittees who actually hunted was 54% in years 2003 and 2004 and dropped slightly to 53% during 2005. For those hunters going afield, the success rate was 34% (2003), 25% (2004), and 32% in 2005. Five-year averages for the period 2001–2005 were: permits issued, 328; hunters afield, 166; and reported goat harvest, 53. Hunters reported the sex of goats in the harvest as 48% male in 2003 and 57% in both 2004 and 2005 (Table 1). With the current population estimate for goats in Unit 4 at 1500 animals, documented harvest accounts for near 4% mortality 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 (79% of hunters were local residents during 2003 and 2004, a number that dropped slightly to 78% in 2005) (Table 2). The proportion of nonresident guided hunters was 13% in 2003 and dropped slightly to 12% in 2004. In 2005 the nonresident proportion rose to 16%. Although these percentages are still low, the trend is increasing.

Harvest Chronology. Weather and hunter access appear to be the primary factors controlling hunter effort and chronology of the goat harvest in Unit 4. Typically, few goats are harvested during November and December when frequent low-pressure systems bombard Southeast Alaska with rain and/or snow. More recently, however, hunters elect to hunt after early-season snows drive goats to lower elevations. During 2003, 21 goats (34%) were harvested during December, while only 7 (11%) were harvested in November and 17 (28%) taken in October (Table 3). During 2004 hunters took the largest monthly total during September when 9 (30%) goats were taken. December recorded 11 goats (23%) taken while October saw 11 goats (23%) harvested. The 2005 season saw a swing back to what has been a more traditional trend, with 19 (36%) goats harvested in August and 10 (19%) in September. Some of the early season effort in 2005 is attributable to increases in guided nonresident hunter effort.

Transport Methods. Boats continue to provide the majority of transportation for Unit 4 goat hunters. During 2003, 77% of the successful hunters used boats for primary access. In 2004 and 2005, successful hunters used boats for primary access 51% and 55%, respectively (Table 4). The use of airplanes for primary access showed increasing trends the last two years after a

sizeable increase in 2002 (30%). The use of airplanes in 2004 climbed to 34% and increased to 36% in 2005.

Other Mortality. No estimates of extent or causes of other goat mortality have been made. Brown bear-caused mortality occurs, but its significance is unknown. Aerial surveys have noted bears at elevations between 3000-4200 feet lying prone in the rocks above goats, waiting in apparent ambush. Baranof Island's abundant deer and goat populations found on summer alpine range would appear to provide a plentiful resource to opportunistic bears. Bald eagles have been observed hazing young goats and kids as they cross over narrow ridges, much like golden eagles do in other locations. 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, but in 2004 three sites were selected for an initial sampling effort. All three sites (within a few air miles of each other) were located in a trend count area known for a high density of goats. Elevations ranged from 2300-3400 feet and were selected based on observation of bands of goats in the area, trail networks, and dig-outs. Dig-outs are often near the melting fringe of snow banks or in saddles where deep snow melts out slowly during the early summer. Although each of the sites had a different composition of plant species, dwarf blueberry (*Vaccinium caespitosum*), fireweed (*Epilobium sp.*), and oatgrass (*Trisetum sp.*) were found to have been grazed at each location. Relatively high numbers of kids (22% of all counted goats) observed during late summer aerial surveys, some observations of twin kids and good body condition of harvested goats suggest that the habitat is in relatively good shape.

Enhancement

No habitat enhancement activities were conducted on goat range during this report period. Discussions with the U.S. Forest Service – Sitka Ranger District biologists have been initiated to examine the potential for a goat habitat assessment project.

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. Voluntary hunter effort to target males will need to be reviewed if the proportion of harvested females remains high. 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. Habitat assessment work may help to define an upper limit of goats without degradation to the habitat as part of a long term management strategy.

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.

LITERATURE CITED

BRANDBORG, S. M. 1955. Life history and management of the mountain goat in Idaho. Idaho Department of Fish and Game, Wildlife Bulletin No. 2. Boise.

BURRIS, O. E. AND D. E. MCKNIGHT. 1973. Game transplants in Alaska. Alaska Department Fish and Game. Technical Bulletin No. 4. Juneau. 57pp.

FARO, J. B. 1994. Mountain goat survey-inventory management report. Pages 33–38 *in* M.V. Hicks, editor. Annual report of survey-inventory activities. Alaska Department of Fish and Game. Federal Aid in Wildlife Restoration Project Report. Project W-24-1 and W-24-2. Job 12. Juneau. 144pp.

JOHNSON, L. J. 1981. Mountain goat survey-inventory progress report. Pages 59–62 *in* R.A. Hinman, ed. Annual report of survey-inventory activities. Part III. Bison, caribou, mountain goat, muskoxen, and sheep. Volume XI. Alaska Department of Fish and Game. Federal Aid in Wildlife Restoration Project Report. Project W-17-12. Job 12. Juneau. 116pp.

WHITMAN, J. S. 2002. Mountain goat survey-inventory management report. Pages 55–64 *in* C. Healy, editor. Mountain goat management report of survey and inventory activities 1 July 1999–30 June 2001. Alaska Department of Fish and Game. Federal Aid in Wildlife Restoration Project Report. Project W-27-3 and W-27-4. Project. 12.0 Juneau, Alaska.

PREPARED BY:

Phil Mooney
Wildlife Biologist III

SUBMITTED BY:

Dale Rabe
Management Coordinator

Please cite any information taken from this section, and reference as:

Mooney, P. 2006. Unit 4 mountain goat management report. Pages 59–68 *in* P. Harper, editor. Mountain goat management report of survey and inventory activities 1 July 2003–30 June 2005. Alaska Department of Fish and Game. Project 12.0. Juneau, Alaska.

Table 1 Unit 4 mountain goat harvest data for registration permit hunt RG150, regulatory years 1998–2005

Year	Permits issued	Did not report	Did not hunt	Unsuccessful 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
2003	331	1	152	117	61	29	32	0	0	61
2004	352	0	162	143	47	27	19	1	0	47
2005	313	5	141	114	52	30	20	2	0	52

Table 2 Unit 4 mountain goat hunter residency and success for registration permit hunt RG150, regulatory years 1998–2005

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
2003	46	3	12	61	94	11	12	117	178
2004	38	1	8	47	109	16	15	140	187
2005	30	4	18	52	90	4	7	101	153

^aResidents of Baranof Island

Table 3 Unit 4 mountain goat harvest chronology by month for registration permit hunt RG150, regulatory years 1998–2005

Year	Month					Total
	August	September	October	November	December	
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
2003	10	6	17	7	21	61
2004	14	9	10	3	11	47
2005	19	10	4	9	6	48*

*5 unaccounted/unspecified not included in this total

Table 4 Unit 4 mountain goat harvest by transport method used by successful hunters for registration permit hunt RG150, regulatory years 1998–2005

Year			Snow	Off-road	Vehicle	Walked	Total
	Airplane	Boat	machine	vehicle			
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
2003	11	47	0	0	2	1	61
2004	16	24	0	2	1	4	47
2005	19	29	0	0	1	2	51*

*2 unspecified

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 _____

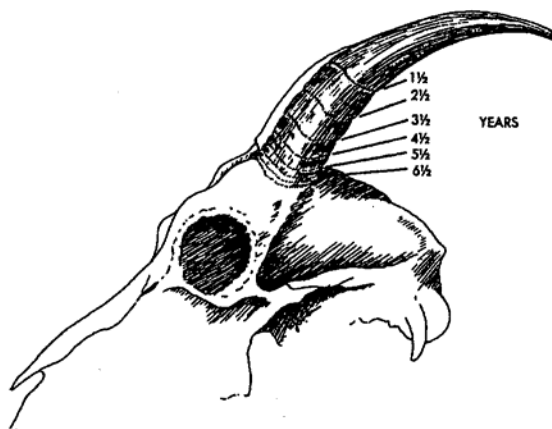
5.5-6.5 years _____

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 _____

MOUNTAIN GOAT MANAGEMENT REPORT

From: 1 July 2003

To: 30 June 2005

LOCATION

GAME MANAGEMENT UNIT: 5 (5800 mi²)

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

BACKGROUND

The Alaska Department of Fish and Game (ADF&G) first conducted aerial goat surveys in this unit in 1971. By 1973 Game Division biologists had documented a significant decline in goat numbers in the area, attributed primarily to severe winter weather. This was a common occurrence throughout Southeast Alaska during the early 1970s. 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. However, during the late 1990s an illegal guiding operation for mountain goats at Nunatak Bench appears to have precipitated a dramatic decline in goat numbers that prompted both ADF&G and the United States Forest Service (USFS) to close their respective hunting seasons in this area each year since 2000. At present this population remains at a low level and likely will not support a hunt for many years to come.

Nearly all Unit 5 hunting effort is concentrated in Unit 5A for several reasons. 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). The primary goat habitat open to hunting is at Icy Bay and is difficult to access. Also, private property at Icy Bay belongs to a Native corporation and is not open for hunting to the general public, though a commercial guide does have permission to operate there.

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 (males = 1 pt. and females = 2 pts.) 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 the report period, and accomplished this feat in 2003. We also surveyed the area from Harlequin Lake to the Fourth Glacier, but were forced to terminate that survey due to extremely high winds.

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 personnel conducted aerial surveys in the Nunatak Bench and Harlequin Lake areas 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

1 goat by registration
permit only

Resident and nonresident hunters

1 Aug–31 Dec
(General hunt only)

Board of Game Actions and Emergency Orders (EO). A proposal by ADF&G to officially define that area commonly known as Nunatak Bench was passed by the Board of Game in 2004. An emergency order was issued in fall 2003 to close goat hunting at Nunatak Bench when fall surveys revealed too few goats to warrant any harvest. Rather than continue to issue EO's for Nunatak Bench each year for the near future, ADF&G eliminated Nunatak Bench from the state registration permit (RG170) hunt area, thereby assuring a closure until further survey data warrants a reopening for goat hunting.

Federal Subsistence Board Actions. There were no federal subsistence board actions concerning mountain goats in Unit 5 during this report period.

Hunter Harvest. Only 5 goats (three males and two females) were harvested during the report period (3 in 2003 and 2 in 2004), and all were taken under state registration permits (Table 2). The percentage of male goats was 60% which is close to our previous 8-year mean of 64%. The sharp decrease in harvest during 2003 and 2004 is consistent with that seen during the previous report period (Table 4), and mirrors the decrease in hunter effort. The closure at Nunatak Bench is at least partly responsible for this trend. The Nunatak Bench hunt had consistently been the favorite by locals as well as guided hunters because of the ease of attaining goats from the cliffs above salt water. 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.

Permit Hunts. A total of 33 and 37 registration permits were issued during 2003 and 2004, respectively, nearly the same as the previous report period (Table 4). Hunting effort differed slightly between 2003 and 2004 with 10 and 14 people hunting, respectively. The mean of 12 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 was 30% during the first year of this report period, and dropped to a 10 year low of 14% during year two. This is a substantial decline from the previous report period when 41% of the hunters were successful (Table 3). Along with the lower success rate overall, Alaskan hunters didn't harvest any goats, while nonresidents harvested five, for a success rate of 45%.

Harvest Chronology. During the report period all three goats were taken in a one month period (October) in 2003, and in 2004 one goat was taken in October and the other in December. The Unit 5 goat harvest is usually spread throughout the season, with the greatest number of goats typically taken during September and October.

Transport Methods. In both years of the reporting period, boats represented 100% of the transportation method used by successful hunters. In a departure from previous transportation methods, nonresidents on guided hunts utilized boats rather than airplanes to get to the field (Table 5). Local residents continued to favor boats as their preferred mode of transportation. 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 6). The hunters using boats were all local Yakutat residents.

Other Mortality

The decline in goat numbers at Nunatak Bench suggests something not related to hunting is limiting goat numbers there. The past few winters have been relatively mild so mortality associated with severe weather doesn't seem likely. Predation or disease could certainly be a factor, but why this would suddenly crop up and almost specifically at Nunatak Bench doesn't make sense.

CONCLUSIONS AND RECOMMENDATIONS

Efforts to obtain mountain goat population information through aerial sex and age composition counts were a priority during this report period. These data, along with data collected since 1999, have 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.

PREPARED BY:

Neil L. Barten
Wildlife Biologist III

SUBMITTED BY:

Dale Rabe
Management Coordinator

Please cite any information taken from this section, and reference as:

Barten, N. L. 2006. Unit 5 mountain goat management report. Pages 69–76 in P. Harper, editor. Mountain goat management report of survey and inventory activities 1 July 2003–30 June 2005. Alaska Department of Fish and Game. Project 12.0. Juneau, Alaska.

Table 1 Unit 5 mountain goat composition counts, regulatory years 1986–2004¹

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	<u>No survey</u>					
	<u>Nunatak Bench</u>					
2000 ²	69	13	82	19	16	91
	40	6	46	15	13	52
2001 ³	37	11	48	30	23	20
	37	2	39	5	5	54
2002 ⁴	25	4	29	16	14	19
2003 ⁴	29	14	43	48	33	40
2004	<u>No Survey</u>					
	<u>East Harlequin Lake</u>					
2000	103	20	123	19	16	41
2001	119	31	150	26	21	52
2002	<u>No survey</u>					
2003	<u>No survey</u>					
2004	<u>No survey</u>					
	<u>West Harlequin Lake</u>					
2003 ⁴	63	21	84	33	25	126
2004	<u>No Survey</u>					

¹ Beginning in 2000, aerial survey data is listed for specific areas of Unit 5A.

² Both surveys conducted with a Hughes 500 helicopter

³ Survey # 1 (Hughes 500 helicopter), survey # 2 (Cessna 185)

⁴ Survey conducted with a Helio-Courier fixed wing aircraft

Table 2 Unit 5 annual goat harvest, regulatory years 1995–2004

Year	Males	Females	Unknown	Total
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
2003	2	1	0	3
2004	1	1	0	2

Table 3 Unit 5 goat hunter success by community of residence, regulatory years 1995–2004

Year	<u>Successful hunters</u>				<u>Unsuccessful hunters</u>		
	Percent success	Unit resident	Other AK	Non-resident	Unit resident	Other AK	Non-resident
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
2003	30	0	0	3	5	0	2
2004	14	0	0	2	0	8	4

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

Table 4 Unit 5 goat hunter effort and success, regulatory years 1995 through 2004

Year	Permits issued	<u>Successful hunters</u>			<u>Unsuccessful hunters</u>			<u>Total hunters</u>		
		Nr hunters	Total days	Avg nr days	Nr hunters	Total days	Avg nr days	Nr hunters	Total days	Avg nr days
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	2.2	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
2003	33	3	4	1.3	7	21	3.0	10	25	2.5
2004	37	2	11	5.5	12	62	5.2	14	73	5.2

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 1995–2004

Year	<u>Airplane</u>		<u>Boat</u>		<u>Snowmachine</u>		<u>Highway vehicle</u>		<u>Foot</u>	
	Total	%	Total	%	Total	%	Total	%	Total	%
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
2003	0	0	3	100	0	0	0	0	0	0
2004	0	0	2	100	0	0	0	0	0	0

Table 6 Unit 5 commercial services used by goat hunters, regulatory years 1995–2004

Year	<u>Unit residents</u>		<u>Other AK residents</u>		<u>Nonresidents</u>		<u>Total use</u>		Registered guide
	No	Yes	No	Yes	No	Yes	No	Yes	
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
2003	5	0	0	0	0	5	5	5	5
2004	0	0	3	5	0	6	3	11	5

MOUNTAIN GOAT MANAGEMENT REPORT

From: 1 July 2003

To: 30 June 2005

LOCATION

GAME MANAGEMENT UNIT: 6 (10,140 mi²)

GEOGRAPHIC DESCRIPTION: Prince William Sound and North Gulf Coast

BACKGROUND

Mountain goats are endemic to 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 1988a) and predation (Reynolds 1981, Griese 1988b). By 1987 the estimated population was 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, and has been relatively stable to increasing since then.

Aerial surveys to determine population size and composition began in 1969. Griese (1988a) 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 1 goat in 1976, and the first permit hunt was established in 1980. By 1986 the present system of registration permit hunts was in place.

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) a formalized 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 a historic high of 182 animals in 1983–1984 and declined to a historic low of 35 goats in 1996–1997.

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 (Crowley 2004). I summarized survey results by hunt area and unit. I also summarized data from Unit 6D into western and eastern portions. 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. 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. During years when surveys were not completed, we estimated the population by modeling most recent surveys, harvest, and probable productivity and survival (Crowley 2004).

We monitored harvest through permit hunt reports required from all hunters. Hunters who failed to report were sent up to 2 reminder letters. 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.

We established a maximum allowable harvest (MAH) for each year 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 on population trend, estimated mortality, and elapsed time since the last survey. 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 7 of 18 permit hunt areas during this reporting period (Table 1). This was fewer surveys than normally accomplished because of unseasonably hot and sunny conditions during August and September 2004. Flights were a cooperative effort with the U.S. Forest Service, Cordova Ranger District. I estimated 4100 goats unitwide during the reporting period.

Population size generally increased during the reporting period (Table 1). Unit 6D East had the highest number of goats, followed by Unit 6D West. Goat populations in Unit 6A were probably stable, although we lack survey data in the more remote hunt areas in eastern 6A.

Population Composition

The kid-to-older goat ratio and percent kids for all areas counted during RY 2003 were 28:100 and 22%, respectively (Table 1). These values for RY 2004 were 19:100 and 16%, respectively.

MORTALITY

Harvest

Season and Bag Limit. The mountain goat season in Units 6A and 6B was 20 August–31 January and in Unit 6D was 15 September–31 January. Hunts in 6C split into one-week periods during October and 8 November–31 January. The bag limit was one goat by registration permit only. Permit hunts were opened in all areas except for RG249, which remained closed during 2003–04.

Unweighted and weighted harvest during 2003/04 was 85 and 105, respectively (Table 2). Harvest during 2004/05 was 76 and 94, respectively. The harvest included 22% and 21% females during the reporting period.

The maximum allowable harvest was 124 during 2003/04 and 139 during 2004/05 (Table 2). Weighted harvest exceeded the maximum allowable harvest in 7 of the 32 hunts held during this reporting period. Overall, there were no significant events of overharvest that could affect populations.

Board of Game Actions and Emergency Orders. The Board of Game removed the Goat Mountain Closed area in Unit 6B during the spring 2005 meeting. The closed area was incorporated into hunt area RG220. The Board also prohibited the taking of nannies accompanied by kids.

Ten emergency orders were issued closing registration permit hunts when MAH was reached. During 2003/02, hunts RG215, RG226, RG244, RG245 and RG252 were closed. During 2004/05, hunts RG215, RG230, RG245, RG249 and RG266 were closed. These were routine management actions.

Permit Hunts. The number of registration permits issued was 306 in RY03 and 321 in RY04 (Table 2). The number issued has increased each year since 2001.

Hunter Residency and Success. Most successful goat hunters during this reporting period were nonresidents (Table 3). Hunter success during the reporting period averaged 55.5%, which was slightly higher than normal.

Harvest Chronology. September and October were the most productive months overall for goat harvest during the reporting period (Table 4). This pattern was normal.

Transport Methods. Transportation to hunt areas was similar to previous years. 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.

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.

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 4180. The population was increasing since 2001, 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%.

LITERATURE CITED:

- BALLARD, W. B. 1975. Mountain goat survey technique evaluation. Alaska Department of Fish and Game. Federal Aid in Wildlife Restoration. Final Report. Project W-17-7, Job12.2R. Juneau, Alaska. 25pp.
- BEAGLEHOLE, J. C., editor. 1966. The exploration of the Pacific: the journals of Captain Cook. London, England.
- CARNES, J. C., VAN BALLEMBERGHE, V., AND PEEK, J. M. 1996. Ecology of wolves on the Copper and Bering River Deltas, Alaska. Progress Report. University of Idaho, Moscow.
- CAUGHLEY, G. 1977. Analysis of vertebrate populations. John Wiley and Sons, New York, New York.
- Crowley, D. 2004. Unit 6 mountain goat management report. Pages 82–105 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.
- FOSTER, B. R. 1977. Historical patterns of mountain goat harvest in British Columbia. Pages 147–159 in W. Samuel, and W. G. MacGregor, editors. Proceedings of the 1st international mountain goat symposium. Province of British Columbia. Victoria, British Columbia, Canada.

- FOX, J. L. 1977. Summer mountain goat activity and habitat preference in coastal Alaska as a basis for the assessment of survey techniques. Pages 190–199 in W. Samuel and W. G. MacGregor, editors. Proceedings of the 1st international mountain goat symposium. Province of British Columbia. Victoria, British Columbia, Canada.
- GRIESE, H. J. 1988a. Unit 6 mountain goat. Pages 26–35 in S. O. Morgan, editor. Annual report of survey-inventory activities. Part VII. Volume XVIII. Alaska Department of Fish and Game. Federal Aid in Wildlife Restoration. Project W-22-6, Job 12.0. Juneau, Alaska. 53pp.
- . 1988b. Unit 6 wolf. Pages 17–19 in S. O. Morgan, editor. Annual report of survey-inventory activities. Part XV. Volume XVIII. Alaska Department of Fish and Game. Federal Aid in Wildlife Restoration. Project W-22-6, Job 14.0. Juneau, Alaska. 64pp.
- HELLER, E. 1910. Mammals of the 1908 Alexander Alaska expedition. University of California Publications in Zoology 5(11):321–360.
- NOWLIN, R. A. 1996. Unit 6 mountain goat. Pages 50–80 in M. V. Hicks, editor. Management report of survey-inventory activities. Alaska Department of Fish and Game. Federal Aid in Wildlife Restoration. Project W-24-2, Study 12.0. Juneau, Alaska. 152pp.
- NOWLIN, R. A. 1998. Unit 6 mountain goat. Pages 47–75 in M. V. Hicks, editor. Annual report of survey-inventory activities. Alaska Department of Fish and Game. Federal Aid in Wildlife Restoration. Project W-24-4 and W-24-5, Job 12.0. Juneau, Alaska. 148 pp.
- REYNOLDS, J. R. 1981. Unit 6 mountain goat survey-inventory progress report. Pages 203–211 in R. Hinman, editor. Mountain goat. Part II. Volume XXII. Alaska Department of Fish and Game. Federal Aid in Wildlife Restoration. Annual report of survey-inventory activities. Project W-19-1 and W-19-2, Jobs 3.0, 1.0 and 12.0. Juneau, Alaska. 223pp.
- SMITH, C. A. 1984. Evaluation and management implications of long-term trends in coastal mountain goat populations in southeast Alaska. Biennial Symposium of the Northern Wild Sheep and Goat Council 4:395–424.

PREPARED BY:

Dave Crowley
Wildlife Biologist III

SUBMITTED BY:

Gino Del Frate
Management Coordinator

Please cite any information taken from this section, and reference as:

Crowley, D. 2006. Unit 6 mountain goat management report. Pages 77-92 in P. Harper, editor. Mountain goat management report of survey and inventory activities 1 July 2003–30 June 2005. Alaska Department of Fish and Game. Project 12.0. Juneau, Alaska.

Table 1 Unit 6 summer/fall mountain goat composition counts and estimated population size, 1998–2004

Unit	Hunt nr or area	Year(s)	Survey coverage	Older goats	(%)	Kids (%)	Kids:100 older goats	Total goats observed	Estimated population size
6A	RG202	1998	Full	62	(81)	15	(19)	24	92
		1999–2004	None	--	--	--	--	--	90
	Brower	1998–2004	None	--	--	--	--	--	43
	RG204	1998	Partial	138	(82)	25	(15)	18	189
		1999–2004	None	--	--	--	--	--	195
	RG206	1998	Partial	55	(29)	14	(20)	25	225
		1999–2004	None	--	--	--	--	--	225
	RG212	2000	Full	65	(87)	10	(13)	15	90
		2001	None	--	--	--	--	--	90
		2002	Full	67	(84)	13	(16)	19	96
		2003–2004	None	--	--	--	--	--	96
	RG214	2000	Full	4	(100)	--	--	--	5
		2001	None	--	--	--	--	--	5
		2002	Partial	1	(50)	0	()	0	2
		2003–2004	None	--	--	--	--	--	2
	RG215	2000	Full	39	(78)	11	(22)	28	60
		2001	None	--	--	--	--	--	60
		2002	Full	44	(88)	6	(12)	14	60
		2003–2004	None	--	--	--	--	--	55
	Suckling Hills	1998	None	--	--	--	--	--	20
		1999	Partial	17	(81)	4	(19)	24	27
		2001–2004	None	--	--	--	--	--	29
	6A	2000	Partial	108	(17)	21	(16)	19	735
		2001	None	--	--	--	--	--	735
		2002	Partial	112	(18)	19	(15)	17	739
		2003	None	--	--	--	--	--	739
		2004	None	--	--	--	--	--	739

Table 1 continued

	Hunt nr.	Regulatory	Survey	Older				Kids:100 older	Total goats	Estimated population
Unit	or area	year	coverage	goats	(%) Kids	(%) Kids	(%) Kids	goats	observed	size
6B	RG226	2000	Full	76	(80) 19	(20)		25	95	114
		2001	None	--	-- --	--		--	--	144
		2002	Full	111	(79) 30	(21)		27	141	169
		2003	Full	126	(77) 38	(23)		30	164	197
		2004	None	--	-- --	--		--	--	
	RG220	1998	None	--	-- --	--		--	--	73
		1999	Full	59	(83) 12	(17)		20	71	85
		2000–2004	None	--	-- --	--		--	--	90
	Goat	1996–2004	None	--	-- --	--		--	--	110
	6B		2000	Partial	76	(80) 19	(20)		25	95
		2001	None	--	-- --	--		--	--	344
		2002	Partial	111	(79) 30	(21)		27	141	369
		2003	Partial	126	(77) 38	(23)		30	164	397
		2004	None	--	-- --	--		--	--	397
6C	RG230	2000–2001	None	--	-- --	--		--	--	174
		2002	Full	135	(83) 27	(17)		20	162	180
		2003	None	--	-- --	--		--	--	178
		2004	Partial	109	(86) 18	(14)		17	127	168
	RG231	2000	Full	123	(90) 13	(10)		11	136	163
		2001	None	--	-- --	--		--	--	168
		2002	Full	122	(84) 23	(16)		19	145	174
		2003–2004	None	--	-- --	--		--	--	174
	RG232	2000	None	--	-- --	--		--	--	165
		2001	Full	126	(80) 32	(20)		25	158	190
		2002	None	--	-- --	--		--	--	204
		2003	Full	152	(78) 42	(22)		28	194	233
		2004	None	--	-- --	--		--	--	252

Table 1 continued

								Kids:100	Total	Est.
Unit	Hunt nr. or area	Regulatory year	Survey coverage	Older goats	(%) Kids (%)	(%) Kids (%)	older goats	goats observed	Pop. size	
6C		2000	Partial	123	(29)	13	(3)	—	421	490
TOTAL		2001	Partial	126	(28)	32	(7)	25	443	532
		2002	Partial	257	(54)	50	(10)	19	477	558
		2003	Partial	152	(31)	42	(9)	28	487	584
		2004	Partial	109	(22)	18	(4)	17	495	594
6D	RG242	2000	Full	331	(83)	66	(17)	20	397	465
		2001	Partial	80	(18)	25	(24)	31	447	523
		2002	None	--	--	--	--	--	--	585
		2003	Full	437	(78)	121	(22)	28	558	648
		2004	None	--	--	--	--	--	--	669
	RG243	2000	None	--	--	--	--	--	--	171
		2001	Full	120	(85)	21	(15)	18	141	163
		2002–2004	None	--	--	--	--	--	--	171
	RG244	2000	Full	102	(84)	19	(16)	19	121	145
		2001	Partial	79	(42)	18	(19)	23	187	224
		2002	Partial	95	(44)	20	(17)	21	215	237
		2003–2004	None	--	--	--	--	--	--	251
	RG245	2000–2002	None	--	--	--	--	--	--	117
		2003	Partial	61	(53)	16	(21)	26	115	134
		2004	None	--	--	--	--	--	--	134
6D (East)	East of Valdez Port, Narrows and Arm	2000	Partial	433	(54)	85	(11)	20	518	951
		2001	Partial	279	(31)	64	(7)	23	343	1076
		2002	Partial	95	(10)	20	(2)	21	115	1159
		2003–2004	None	498	(47)	137	(13)	28	635	1278
6D	RG249	2000	Full	203	(88)	29	(13)	14	232	277
		2001	Partial	143	(53)	29	(17)	20	272	299
		2002	Partial	113	(48)	22	(16)	19	235	259
		2003	None	--	--	--	--	--	--	310
		2004	Full	279	(84)	55	(16)	20	334	367

Table 1 continued

Unit	Hunt nr. or area	Regulatory year	Survey coverage	Older goats	(%)	Kids (%)	Kids:100 older goats	Total goats observed	Est. Pop. size
	Heiden	1996–	None	--	--	--	--	--	55
6D	RG252	2000	None	--	--	--	--	--	287
		2001	Full	115	(80)	29	(20)	144	173
		2002	Full	178	(88)	25	(12)	203	244
		2003	None	--	--	--	--	--	260
		2004	Full	192	(83)	39	(17)	231	277
6D	RG266	2000–	None	--	--	--	--	--	326
		2002	Partial	165	(62)	43	(21)	268	301
		2003–	None	--	--	--	--	--	305
6D (West) Remainder Valdez, Sargent Mt. Castner, Whittier College Fiord		2000–	None	--	--	--	--	--	223
6D (West)		2000	Partial	203	(23)	29	(13)	232	1082
West of Valdez		2001	Partial	258	(31)	58	(18)	842	316
Port. Narrows and Arm		2002	Partial	456	(53)	90	(16)	857	546
		2003	None	258	(28)	58	(18)	316	1066
		2004	Partial	471	(48)	94	(17)	565	1144
6D		2000	Partial	636	(36)	114	(15)	750	2032
		2001	Partial	537	(29)	122	(19)	659	2050
		2002	Partial	551	(29)	110	(17)	661	2154
		2003	Partial	498	(24)	137	(22)	635	2313
		2004	Partial	471	(22)	94	(17)	565	2422
UNIT 6		2000	Partial	943	(31)	167	(15)	1110	3622
		2001	Partial	663	(21)	154	(19)	817	3711
		2002	Partial	1031	(31)	209	(17)	1240	3836
		2003	Partial	776	(22)	217	(22)	993	4050
		2004	Partial	580	(16)	112	(16)	692	4183

Table 2 Unit 6 mountain goat harvest data by permit hunt, 2000–2004

Unit/ hunt nr	R Y	Permits issued	Nr did not hunt	Percent did not hunt	Nr unsuccessful hunters	Percent unsuccessful hunters	Nr successful hunters	Percent successful hunters						Total harvest		Maximum allowable harvest ^c
									M	(%)	F	(%)	Unk.	Unw ^a	W ^b	
6A/RG202	2000	11	5	45	4	67	2	33	1	(100)	0	(0)	1	2	3	3
	2001	9	6	67	1	33	2	67	1	(100)	0	(0)	1	2	3	3
	2002	11	5	45	4	67	2	33	1	(100)	0	(0)	1	2	3	3
	2003	7	6	86	0	0	1	100	0	(0)	0	(0)	1	1	2	3
	2004	12	6	50	4	67	2	33	2	(100)	0	(0)	0	2	2	3
6A/RG204	2000	13	9	69	3	75	1	25	1	(100)	0	(0)	0	1	1	4
	2001	11	10	91	0	0	1	100	1	(100)	0	(0)	0	1	1	4
	2002	5	2	40	0	0	3	100	3	(100)	0	(0)	0	3	3	4
	2003	18	13	72	1	20	4	80	4	(100)	0	(0)	0	4	4	4
	2004	11	6	55	0	0	5	100	5	(100)	0	(0)	0	5	5	4
6A/RG206	2000	11	7	64	3	75	1	25	1	(100)	0	(0)	0	1	1	5
	2001	9	7	78	1	50	1	50	1	(100)	0	(0)	0	1	1	5
	2002	6	2	33	1	25	3	75	3	(100)	0	(0)	0	3	3	5
	2003	9	5	56	2	50	2	50	2	(100)	0	(0)	0	2	2	5
	2004	4	2	50	1	50	1	50	1	(100)	0	(0)	0	1	1	5
6A/RG212	2000	0	0	0	0	0	0	0	0	(0)	0	(0)	0	0	0	4
	2001	5	2	40	2	67	1	33	1	(100)	0	(0)	0	1	1	4
	2002	2	1	50	1	100	0	0	0	(0)	0	(0)	0	0	0	4
	2003	8	8	100	0	0	0	0	0	(0)	0	(0)	0	0	0	4
	2004	4	4	100	0	0	0	0	0	(0)	0	(0)	0	0	0	4
6A/RG215	2000	12	7	58	2	40	3	60	3	(100)	0	(0)	0	3	3	3
	2001	4	2	50	0	0	2	100	2	(100)	0	(0)	0	2	2	3
	2002	4	2	50	0	0	2	100	2	(100)	0	(0)	0	2	2	3
	2003	3	1	33	0	0	2	100	2	(100)	0	(0)	0	2	2	3
	2004	6	3	50	0	0	3	100	3	(100)	0	(0)	0	3	3	3
6A TOTAL	2000	47	28	60	12	63	7	37	6	(100)	0	(0)	1	7	8	19
	2001	38	27	71	4	36	7	64	6	(100)	0	(0)	1	7	8	19
	2002	28	12	43	6	38	10	63	9	(100)	0	(0)	1	10	11	19
	2003	45	33	73	3	25	9	75	8	(100)	0	(0)	1	9	10	19
	2004	37	21	57	5	31	11	69	11	(100)	0	(0)	0	11	11	19

Table 2 continued

Table 2 continued

Unit/ hunt nr	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 W ^b	Maximu allowable harvest ^c				
6B/RG220	2000	9	8	89	0	0	1	100	1	(100)	0	(0)	0	1	1	4
	2001	6	5	83	1	100	0	0	0	(0)	0	(0)	0	0	0	4
	2002	0	0	0	0	0	0	0	0	(0)	0	(0)	0	0	0	4
	2003	4	1	25	0	0	3	100	3	(100)	0	(0)	0	3	3	4
	2004	6	5	83	0	0	1	100	1	(100)	0	(0)	0	1	1	4
6B/RG226	2000	9	4	44	3	60	2	40	2	(100)	0	(0)	0	2	2	7
	2001	9	4	44	3	60	2	40	2	(100)	0	(0)	0	2	2	7
	2002	18	12	67	0	0	6	100	5	(83)	1	(17)	0	6	7	7
	2003	13	6	46	5	71	2	29	1	(50)	1	(50)	0	2	3	7
	2004	10	6	60	2	50	2	50	1	(50)	1	(50)	0	2	3	7
6B TOTAL	2000	18	12	67	3	50	3	50	3	(100)	0	(0)	0	3	3	11
	2001	15	9	60	4	67	2	33	2	(100)	0	(0)	0	2	2	11
	2002	18	12	67	0	0	6	100	5	(83)	1	(17)	0	6	7	11
	2003	17	7	41	5	50	5	50	4	(80)	1	(20)	0	5	6	11
	2004	16	11	69	2	40	3	60	2	(67)	1	(33)	0	3	4	11
6C/RG230	2000	8	2	25	3	50	3	50	2	(100)	0	(0)	1	3	4	6
	2001	8	4	50	3	75	1	25	1	(100)	0	(0)	0	1	1	6
	2002	10	2	20	4	50	4	50	4	(100)	0	(0)	0	4	4	6
	2003	23	6	26	11	65	6	35	4	(80)	1	(20)	1	6	8	6
	2004	15	5	33	4	40	6	60	4	(67)	2	(33)	0	6	8	6
6C/RG231	2000	4	0	0	0	0	4	100	2	(50)	2	(50)	0	4	6	4
	2001	7	0	0	2	29	5	71	4	(80)	1	(20)	0	5	6	4
	2002	8	2	25	2	33	4	67	4	(100)	0	(0)	0	4	4	4
	2003	15	4	27	4	36	7	64	3	(43)	4	(57)	0	7	11	4
	2004	10	3	30	5	71	2	29	1	(50)	1	(50)	0	2	3	6
6C/RG232	2000	9	2	22	6	86	1	14	1	(100)	0	(0)	0	1	1	7
	2001	7	3	43	4	100	0	0	0	(0)	0	(0)	0	0	0	8
	2002	14	3	21	5	45	6	55	6	(100)	0	(0)	0	6	6	8
	2003	25	12	48	6	46	7	54	6	(86)	1	(14)	0	7	8	8
	2004	22	12	55	9	90	1	10	1	(100)	0	(0)	0	1	1	8

Table 2 continued

Unit/ hunt nr	RY	Permit issued	Nr did not hunt	Percent did not hunt	Nr unsuccessful hunters	Percent unsuccessful hunters	Nr successful hunters	Percent successful hunters						Total harvest		Maximum allowable harvest ^c
									Males	(%)	Females	(%)	Unk.	Un	W ^b	
6C TOTAL	2000	21	4	19	9	53	8	47	5	(71)	2	(29)	1	8	11	17
	2001	22	7	32	9	60	6	40	5	(83)	1	(17)	0	6	7	18
	2002	32	7	22	11	44	14	56	14	(100)	0	(0)	0	14	14	18
	2003	63	22	35	21	51	20	49	13	(68)	6	(32)	1	20	27	18
	2004	47	20	43	18	67	9	33	6	(67)	3	(33)	0	9	12	20
6D/RG242	2000	36	26	72	3	30	7	70	5	(71)	2	(29)	0	7	9	17
	2001	42	30	71	9	75	3	25	3	(100)	0	(0)	0	3	3	19
	2002	59	30	51	15	52	14	48	12	(0)	2	(0)	0	14	16	19
	2003	73	34	47	23	59	16	41	15	(0)	1	(0)	0	16	17	31
	2004	62	23	37	18	46	21	54	13	(0)	5	(0)	3	21	28	28
6D/RG244	2000	13	10	77	0	0	3	100	3	(100)	0	(0)	0	3	3	12
	2001	28	12	43	8	50	8	50	6	(75)	2	(25)	0	8	10	9
	2002	32	23	72	5	56	4	44	3	(75)	1	(25)	0	4	5	11
	2003	27	13	48	5	36	9	64	6	(67)	3	(33)	0	9	12	15
	2004	26	17	65	8	89	1	11	1	(100)	0	(0)	0	1	1	15
6D/RG245	2000	30	14	47	11	69	5	31	4	(80)	1	(20)	0	5	6	0
	2001	24	11	46	8	62	5	38	5	(100)	0	(0)	0	5	5	6
	2002	31	10	32	17	81	4	19	4	(100)	0	(0)	0	4	4	6
	2003	19	12	63	2	29	5	71	1	(25)	3	(75)	1	5	9	6
	2004	40	25	63	15	100	4	27	2	(50)	2	(50)	0	2	6	6
6D (EAST) TOTAL	2000	79	50	63	11	38	18	62	12	(67)	6	(33)	0	18	24	29
	2001	94	53	56	22	54	19	46	14	(74)	5	(26)	0	19	24	34
	2002	122	63	52	27	46	32	54	19	(59)	13	(41)	0	32	45	36
	2003	119	59	50	16	27	44	73	27	(53)	24	(47)	1	52	77	54
	2004	128	65	51	29	46	34	54	19	(56)	15	(44)	4	38	55	51
6D/RG249	2000	41	18	44	7	30	16	70	11	(73)	4	(27)	1	16	21	20
	2001	29	19	66	2	20	8	80	8	(100)	0	(0)	0	8	8	12
	2002	19	5	26	4	29	10	71	6	(67)	3	(33)	1	10	14	12
	2003	0	0	0	0	0	0	0	0	(0)	0	(0)	0	0	0	0
	2004	21	11	52	1	10	9	90	6	(86)	1	(14)	2	9	11	11

Table 2 continued

Table 2 continued																
Unit/ hunt no.	RY	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		Maximu allowable harvest ^c		
												Unw ^a	W ^b			
6D/RG252	2000	55	38	69	11	65	6	35	5	(83)	1	(17)	0	6	7	10
	2001	24	18	75	0	0	6	100	3	(60)	2	(40)	1	6	9	7
	2002	33	14	42	10	53	9	47	5	(56)	4	(44)	0	9	13	10
	2003	28	13	46	3	20	12	80	9	(75)	3	(25)	0	12	15	11
	2004	48	34	71	7	50	7	50	7	(100)	0	(0)	0	7	7	12
6D/RG266	2000	50	16	32	20	59	14	41	6	(43)	8	(57)	0	14	22	17
	2001	39	20	51	9	47	10	53	6	(60)	4	(40)	0	10	14	15
	2002	22	14	64	5	63	3	38	2	(100)	0	(0)	1	3	4	9
	2003	34	23	68	6	55	5	45	4	(80)	1	(20)	0	5	6	13
	2004	24	12	50	1	8	11	92	8	(73)	3	(27)	0	11	14	17
6D (West)	2000	146	72	49	38	51	36	49	22	(63)	13	(37)	1	36	50	47
TOTAL	2001	92	57	62	11	31	24	69	17	(74)	6	(26)	1	24	31	34
	2002	74	33	45	19	46	22	54	13	(65)	7	(35)	2	22	30	31
	2003	62	36	58	9	35	17	65	13	(76)	4	(24)	0	17	21	24
	2004	93	57	61	9	25	27	75	21	(84)	4	(16)	2	27	32	40
6D TOTAL	2000	225	122	54	49	48	54	52	34	(64)	19	(36)	1	54	74	76
	2001	186	110	59	33	43	43	57	31	(74)	11	(26)	1	43	55	68
	2002	196	96	49	46	46	54	54	32	(62)	20	(38)	2	54	75	67
	2003	181	95	52	25	29	61	71	40	(59)	28	(41)	1	69	98	78
	2004	221	122	55	38	38	61	62	40	(68)	19	(32)	6	65	87	91
UNIT 6 TOTAL	2000	311	166	53	73	50	72	50	48	(70)	21	(30)	3	72	95	123
	2001	261	153	59	50	46	58	54	44	(79)	12	(21)	2	58	71	116
	2002	274	127	46	63	43	84	57	60	(74)	21	(26)	3	84	107	115
	2003	306	157	51	54	36	95	64	65	(65)	35	(35)	3	103	140	126
	2004	321	174	54	63	43	84	57	59	(72)	23	(28)	6	88	114	141

^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 1.5.

^c Three to 5% of population size.

Table 3 Unit 6 mountain goat hunter residency and success, 2000–2004

Unit	Regulatory year	Successful					Unsuccessful					Total hunters
		Local resident	Nonlocal resident	Nonresident	Total	(%)	Local resident	Nonlocal resident	Nonresident	Total	(%)	
6A	2000	1	2	6	9	(47)	1	5	4	10	(53)	19
	2001	2	0	5	7	(64)	1	0	3	4	(36)	11
	2002	0	1	9	10	(63)	1	5	0	6	(38)	16
	2003	0	1	10	11	(73)	1	3	0	4	(27)	15
	2004	0	0	11	11	(69)	2	3	0	5	(31)	16
6B	2000	0	0	4	4	(67)	0	1	1	2	(33)	6
	2001	0	0	2	2	(33)	0	1	3	4	(67)	6
	2002	0	0	2	2	(67)	0	0	1	1	(33)	3
	2003	0	2	5	7	(100)	0	0	0	0	(0)	7
	2004	0	1	2	3	(60)	0	1	1	2	(40)	5
6C	2000	5	3	0	8	(47)	7	2	0	9	(53)	17
	2001	5	1	0	6	(40)	9	0	0	9	(60)	15
	2002	14	0	0	14	(56)	11	0	0	11	(44)	25
	2003	18	2	0	20	(53)	17	1	0	18	(47)	38
	2004	8	1	0	9	(33)	18	0	0	18	(67)	27
6D	2000	7	24	18	49	(48)	13	35	6	54	(52)	103
	2001	6	17	17	40	(53)	11	22	3	36	(47)	76
	2002	8	19	18	45	(47)	12	28	11	51	(53)	96
	2003	3	23	21	47	(53)	10	19	13	42	(47)	89
	2004	3	22	28	53	(56)	8	23	10	41	(44)	94
Unit 6	2000	13	29	28	70	(48)	21	43	11	75	(52)	145
Total	2001	13	18	24	55	(51)	21	23	9	53	(49)	108
	2002	22	20	29	71	(51)	24	33	12	69	(49)	140
	2003	21	28	36	85	(57)	28	23	13	64	(43)	149
	2004	11	24	41	76	(54)	28	27	11	66	(46)	142

Table 4 Unit 6 mountain goat harvest chronology percent by month, 2000–2004

Unit	Regulatory year	Harvest Periods						n
		August	September	October	November	December	January	
6A	2000	33	0	44	0	11	11	9
	2001	57	0	29	0	0	14	7
	2002	0	60	30	0	10	0	10
	2003	27	36	36	0	0	0	11
	2004	9	73	18	0	0	0	11
6B	2000	50	50	0	0	0	0	4
	2001	50	50	0	0	0	0	2
	2002	50	0	50	0	0	0	2
	2003	14	86	0	0	0	0	7
	2004	0	100	0	0	0	0	3
6C	2000	0	0	63	38	0	0	8
	2001	0	0	67	33	0	0	6
	2002	0	0	50	29	7	14	14
	2003	0	0	65	5	0	30	20
	2004	0	0	56	0	11	33	9
6D	2000	0	35	51	14	0	0	49
	2001	0	45	40	10	3	3	40
	2002	0	60	22	11	4	2	45
	2003	0	43	50	7	0	0	46
	2004	0	60	32	0	4	4	53
Unit 6	2000	7	27	49	14	1	1	70
Total	2001	9	35	40	11	2	4	55
	2002	1	46	30	13	6	4	71
	2003	5	36	48	5	0	7	84
	2004	1	57	32	0	4	7	76

Table 5 Unit 6 mountain goat harvest percent by transport method, 2000–2004

Subunit	Regulatory year	Airplane <i>n</i> (%)	Boat <i>n</i> (%)	3- or 4-wheeler <i>n</i> (%)	Snowmachine <i>n</i> (%)	ORV <i>n</i> (%)	Highway vehicle <i>n</i> (%)	Unknown <i>n</i> (%)	Total <i>n</i>
6A	2000	5 (56)	1 (11)	2 (22)	0 (0)	0 (0)	1 (11)	0 (0)	9
	2001	5 (71)	0 (0)	2 (29)	0 (0)	0 (0)	0 (0)	0 (0)	7
	2002	8 (80)	0 (0)	0 (0)	0 (0)	0 (0)	2 (20)	0 (0)	10
	2003	11 (100)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	11
	2004	9 (82)	2 (18)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	11
6B	2000	4 (100)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	4
	2001	2 (100)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	2
	2002	2 (100)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	2
	2003	7 (100)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	7
	2004	3 (100)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	3
6C	2000	0 (0)	0 (0)	1 (13)	0 (0)	1 (13)	6 (75)	0 (0)	8
	2001	0 (0)	1 (17)	0 (0)	0 (0)	0 (0)	4 (67)	1 (17)	6
	2002	0 (0)	5 (36)	1 (7)	0 (0)	0 (0)	8 (57)	0 (0)	14
	2003	0 (0)	1 (5)	3 (15)	0 (0)	1 (5)	15 (75)	0 (0)	20
	2004	0 (0)	0 (0)	1 (11)	0 (0)	0 (0)	7 (78)	1 (11)	9
6D	2000	18 (35)	28 (55)	2 (4)	3 (6)	0 (0)	0 (0)	0 (0)	51
	2001	15 (37)	22 (54)	1 (2)	0 (0)	0 (0)	3 (7)	0 (0)	41
	2002	19 (40)	24 (51)	2 (4)	0 (0)	0 (0)	1 (2)	1 (2)	47
	2003	19 (40)	24 (51)	0 (0)	0 (0)	0 (0)	3 (6)	1 (2)	47
	2004	23 (43)	25 (47)	2 (4)	1 (2)	0 (0)	2 (4)	0 (0)	53
Unit 6	2000	27 (38)	29 (40)	5 (7)	3 (4)	1 (1)	7 (10)	0 (0)	72
Total	2001	22 (39)	23 (41)	3 (5)	0 (0)	0 (0)	7 (13)	1 (2)	56
	2002	29 (40)	29 (40)	3 (4)	0 (0)	0 (0)	11 (15)	1 (1)	73
	2003	37 (44)	25 (29)	3 (4)	0 (0)	1 (1)	18 (21)	1 (1)	85
	2004	35 (46)	27 (36)	3 (4)	1 (1)	0 (0)	9 (12)	1 (1)	76

MOUNTAIN GOAT MANAGEMENT REPORT

From: 1 July 2003
To: 30 June 2005

LOCATION

GAME MANAGEMENT UNITS: 7 and 15 (8397 mi²)

GEOGRAPHIC DESCRIPTION: Kenai Peninsula

BACKGROUND

Mountain goats inhabit the entire length of the Kenai Mountains, the westernmost extent of their range in Alaska. Goat populations are most abundant on 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 of 3500–4500 goats throughout the Kenai Peninsula; however, the population appears to be declining.

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. Hunting goats within the KFNP was abolished 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 with severe winters and other undetermined causes.

MANAGEMENT DIRECTION

MANAGEMENT OBJECTIVES

The management objectives are to monitor population trends, maintain a low proportion of nannies in the harvest, and restrict or liberalize hunting permits according to conservative assessments of minimum population size and population trends.

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 through midsummer aerial surveys (Lentfer 1955; Nichols 1980). Each area is surveyed once every 3–4 years depending on funding availability. Surveys distinguish kids (<4 months) from adults.

Goats are often difficult to see during surveys when they seek shade below tree line, so our count data is highly variable. We conservatively base harvest quotas on the minimum numbers of goats counted and long-term trends in the population size. At the end of each drawing season, hunt

areas that have unfilled quotas can be 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 points when calculating quotas, whereas billies count as 1. 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 is 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 only in 2 hunt areas south of Kachemak Bay.

This report has the most updated harvest information; therefore, some 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 14 count areas (Table 1). Several count areas showed a modest increase in goats tallied, but in most areas we counted fewer goats than when we surveyed 2–4 years earlier.

MORTALITY

Harvest

Season and Bag Limit. Since 2001, the drawing permit season has been 10 August–15 October, the registration permit season has been 1–30 November, and the Tier II season has been 1 August–15 October. The bag limit has been one goat per season since 1974.

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

Hunter Harvest. During the past 5 seasons, the annual average harvest was 64 goats during the drawing season and 17 during the registration season (Tables 2 and 3). The average annual subsistence harvest was 5 goats (Table 4). Individual statistics for each drawing and registration hunt are shown in Table 5.

Hunter Residency and Success. During the past 5 seasons, the vast majority of drawing season hunters were Alaska residents (Table 6). The 5-year average success rate was 33% for drawing hunts (Table 6).

Harvest Chronology. The harvest chronology for the drawing season was spread throughout the season and is a reflection of seasonal weather conditions (Table 7).

CONCLUSIONS AND RECOMMENDATIONS

Since the early 1990s, goat numbers appear to be declining throughout the Kenai Peninsula. The management strategy for goats on the Kenai will allot 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 guided heli-skiing in the Chugach National Forest (1999). The ADF&G hopes to remain involved with the heli-ski permit process of the U.S. Forest Service (Chugach Ranger District) in properly identifying areas of important wintering habitat for goats that should not be open to heli-ski operations.

LITERATURE CITED

CHUGACH NATIONAL FOREST. 1999. Environmental Assessment for commercially guided helicopter skiing on the Glacier and Seward Ranger Districts Chugach National Forest. 48 pp.

DEL FRATE, G. G. 2002. Units 7 & 15, Kenai Peninsula. Alaska Department of Fish and Game. Mountain goat management report of survey-inventory activities. 1 July–30 June 2001. C. Healy, editor. Project 12.0. Juneau, Alaska. Pages 99–133.

LENTFER, J. W. 1955. A two-year study of the Rocky Mountain goat in the Crazy Mountains, Montana. *Journal of Wildlife Management* 19(4):417–429.

NICHOLS, L. 1980. Aerial census and classification of mountain goats in Alaska. *Proceedings of the Biennial Symposium of the North American Wild Sheep and Goat Council* 2:523–589.

PREPARED BY:

Thomas McDonough
Wildlife Biologist II

SUBMITTED BY:

Gino Del Frate
Management Coordinator

Please cite any information taken from this section, and reference as:

McDonough, T. 2006. Units 7 & 15 mountain goat management report. Pages 93–105 in P. Harper, editor. Mountain goat management report of survey and inventory activities 1 July 2003–30 June 2005. Alaska Department of Fish and Game. Project 12.0. Juneau, Alaska.

Table 1 Mountain goat surveys for the Kenai Peninsula (Units 7 & 15), 2000–2004

Survey year	Area	Adults	Kids	Total goats	% kids
2004	335	19	3	22	14
	345	85	18	103	17
	340	38	6	44	14
	342	85	17	102	17
	343	37	6	43	14
	338	23	6	29	21
	334	80	23	103	22
	347	87	14	101	14
	337	11	3	14	21
	341	26	6	32	19
	364	49	9	58	16
2003	356	20	5	25	20
	358	34	5	39	13
	361	46	15	61	25
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

Table 1 continued

Survey year	Area	Adults	Kids	Total goats	% kids
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 2 Drawing permit harvest for mountain goats on the Kenai Peninsula (Units 7 & 15), 2000–2004

Year	Season Dates	Permits Issued	Hunters	Percent Success	Harvest			Total
					M	F	U	
2000	10 Aug–30 Sep	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
2003	10 Aug–15 Oct	379	195	31	37	20	3	60
2004	10 Aug–15 Oct	383	181	26	30	17		47

Table 3. Registration permit harvest for mountain goats on the Kenai Peninsula (Units 7 & 15), 2000–2004.

Year	Season Dates	Permits Issued	Hunters	Percent Success	Harvest			Total
					M	F	U	
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		25
2003	1–30 Nov	252	133	14	14	5		19
2004	1–30 Nov	182	73	8	2	4		6

Table 4. Tier II subsistence harvest for mountain goats on the Kenai Peninsula (Units 7 & 15), 2000–2004.

Year	Season Dates	Permits Issued	Hunters	Percent Success	Harvest			Total
					M	F	U	
2000	1 Aug–30 Sep	46	20	25	5	0		5
2001	1 Aug–15 Oct	42	15	27	3	1		4
2002	1 Aug–15 Oct	44	20	20	3	1		4
2003	1 Aug–15 Oct	44	16	44	4	3		7
2004	1 Aug–15 Oct	44	16	38	4	2		6

Table 5 Mountain goat harvest data for drawing and registration permits on the Kenai Peninsula (Units 7 & 15), 2000–2005

Drawing Hunts									Registration Hunts							
Area	Year	Billy	Nanny	Unk	Permits		# Hunted	% Success	Billy	Nanny	Unk	Total	Permits		# Hunted	% Success
					Total	issued							issued			
331	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							
	2003-04	0	0	0	0	3	0	0	No hunt							
	2004-05	1	1	0	2	3	3	67	No hunt							
332	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							
	2003-04	1	1	0	2	4	2	100	No hunt							
	2004-05	0	0	0	0	4	3	0	0	0	0	0	23	12	0	
333	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							
	2003-04	0	0	0	0	22	13	0	No hunt							
	2004-05	1	1	0	2	15	12	17	No hunt							
334	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	
	2003-04	3	2	0	5	10	8	63	No hunt							
	2004-05	3	1	0	4	15	13	31	No hunt							
335	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	
	2003-04	1	0	0	1	6	4	25	2	2	0	4	92	54	7	
	2004-05	0	0	0	0	6	4	0	No hunt							

Table 5 continued

Table 3 continued

Area	Year	Drawing Hunts							Registration Hunts						
		Billy	Nanny	Unk	Total	Permits issued	# Hunted	% Success	Billy	Nanny	Unk	Total	Permits issued	# Hunted	% Success
336	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
	2003-04	1	0	0	1	25	12	8	1	0	0	1	71	29	3
	2004-05	0	1	0	1	30	9	11	0	0	0	0	56	19	0
339	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
	2003-04	3	1	0	4	15	12	33	No hunt						
	2004-05	1	0	0	1	15	9	11	2	0	0	2	23	14	14
340	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						
	2003-04	0	0	0	0	20	6	0	No hunt						
	2004-05	1	0	0	1	20	4	25	0	0	0	0	0	0	0
341	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						
	2003-04	2	2	0	4	4	4	100	No hunt						
	2004-05	0	0	0	0	4	3	0	No hunt						
342	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
	2003-04	1	1	0	2	14	9	22	No hunt						
	2004-05	3	0	0	3	15	11	27	0	0	0	0	10	4	0

Table 5 continued

Table 3 continued

Area	Year	Drawing Hunts							Registration Hunts						
		Billy	Nanny	Unk	Total	Permits issued	# Hunted	% Success	Billy	Nanny	Unk	Total	Permits issued	# Hunted	% Success
343	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						
	2003-04	2	2	0	4	10	8	50	No hunt						
	2004-05	0	0	0	0	10	7	0	No hunt						
344	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
	2003-04	0	0	0	0	10	4	0	No hunt						
	2004-05	1	1	0	2	10	3	67	No hunt						
345	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
	2003-04	2	1	0	3	25	8	38	No hunt						
	2004-05	2	1	0	3	25	7	43	0	0	0	0	5	0	0
346	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						
	2003-04	4	3	2	9	40	27	33	11	3	0	14	80	48	29
	2004-05	5	3	0	8	40	18	44	0	4	0	4	54	24	17
347	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						
	2003-04	3	0	0	3	20	11	27	No hunt						
	2004-05	4	2	0	6	20	9	67	No hunt						

Table 5 continued

Area	Year	Drawing Hunts							Registration Hunts						
		Billy	Nanny	Unk	Total	Permits issued	# Hunted	% Success	Billy	Nanny	Unk	Total	Permits Issued	# Hunted	% Success
351	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							No hunt						
	2003-04	No hunt							No hunt						
	2004-05	No hunt							No hunt						
352	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
	2003-04	4	1	1	6	25	10	60	0	0	0	0	9	2	0
	2004-05	0	0	0	0	25	2	0	0	0	0	0	11	0	0
354	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						
	2003-04	0	0	0	0	8	1	0	No hunt						
	2004-05	0	0	0	0	8	2	0	No hunt						
355	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						
	2003-04	1	0	0	1	2	1	100	No hunt						
	2004-05	0	0	0	0	2	2	0	No hunt						
356	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						
	2003-04	0	0	0	0	5	1	0	No hunt						
	2004-05	0	1	0	1	5	1	100	No hunt						

Table 5 continued

Area	Year	Drawing Hunts							Registration Hunts						
		Billy	Nanny	Unk	Total	Permits issued	# Hunted	% Success	Billy	Nanny	Unk	Total	Permits issued	# Hunted	% Success
357	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						
	2003-04	0	0	0	0	5	4	0	No hunt						
	2004-05	0	0	0	0	5	2	0	No hunt						
358	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						
	2003-04	0	0	0	0	8	1	0	No hunt						
	2004-05	1	1	0	2	8	5	40	No hunt						
359	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						
	2003-04	0	1	0	1	10	5	20	No hunt						
	2004-05	0	0		0	10	6	0	No hunt						
360	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						
	2003-04	4	1	0	5	25	13	38	No hunt						
	2004-05	1	0	0	1	25	15	7	No hunt						
361	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						
	2003-04	0	1	0	1	15	9	11	No hunt						
	2004-05	1	1	0	2	15	8	25	No hunt						

Table 5 continued

Area	Year	Drawing Hunts							Registration Hunts						
		Billy	Nanny	Unk	Total	Permits issued	# Hunted	% Success	Billy	Nanny	Unk	Total	Permits issued	# Hunted	% Success
362	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						
	2003-04	1	1	0	2	18	10	20	No hunt						
	2004-05	1	0	0	1	18	10	10	No hunt						
363	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						
	2003-04	4	2	0	6	30	12	50	No hunt						
	2004-05	4	3	0	7	30	13	54	No hunt						
365	2000-01	5	0	0	5	30	14	36	1	1	0	2	11	10	20
	2001-02	2	1	0	3	30	9	33	2	1	0	3	5	5	60
	2002-03	3	1	0	4	30	16	25	2	2	0	4	12	5	80
	2003-04	3	3	0	6	30	12	50	No hunt						
	2004-05	3	2	0	5	30	10	50	No hunt						

Table 6 Residency and success for Kenai Peninsula mountain goat drawing permits (Units 7 & 15), 2000–2004

Regulatory year	Successful				Unsuccessful				Total hunters
	Resident	Nonresident	Unspec.	Total	Resident	Nonresident	Unspec.	Total	
2000–2001	80	2		82	149	2		151	233
2001–2002	60	3		63	141	2		143	206
2002–2003	64	4		68	121	2		123	191
2003–2004	57	3		60	135	1		136	196
2004–2005	45	2		47	133	1		134	181

Table 7 Harvest chronology (percent of harvest)^a for Kenai Peninsula mountain goat drawing permits (Units 7 & 15), 2000–2004

Regulatory year	Harvest periods				Nr Harvested
	August	September	October	Unk/other	
2000–2001 ^b	54	46	--	0	82
2001–2002	19	44	33	3	63
2002–2003	25	35	34	6	68
2003–2004	28	35	30	7	60
2004–2005	15	52	33	0	47

^a Total percentages may be greater or less than 100% due to rounding.

^bThe season ended in September.

MOUNTAIN GOAT MANAGEMENT REPORT

From: 1 July 2003

To: 30 June 2005

LOCATION

GAME MANAGEMENT UNIT: 8 (5097 mi²)

GEOGRAPHICAL DESCRIPTION: Kodiak and adjacent islands

BACKGROUND

The mountain goat population in Unit 8 originated from 11 females and 7 males 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; the number of permits available and open areas change 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 high hunter densities, less selectivity, herd shooting, and wanton waste during the 1985 hunting season. In 1986, the drawing system was resurrected.

Throughout the 1990s, goat populations continued to grow, and the management scheme remained conservative. Populations were closely monitored, and permits were adjusted accordingly. Much of the southern portion of 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 Board (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.

Currently 9 permit hunt areas are managed by drawing and registration permits. Goat harvest quotas are established for each permit hunt area annually. Harvest quota percentages in individual permit areas ranged from 5 to 20% during this report period. If harvest quota objectives are not met during the drawing permit season, registration permits are available. There was a concern of overharvest during the registration hunts, so restrictions to minimize such problems were implemented. Among the restrictions only Alaska residents were eligible to receive permits; permits were issued for a limited time prior to commencement of the hunt; they were issued only in the communities closest to the hunt areas; aircraft access was authorized only at state-maintained airports; and, for RG478 and RG479, weapons were limited to archery-only. A joint subcommittee of the Kodiak Fish and Game Advisory Committee and the Kodiak/Aleutians RAC meets annually to discuss management of the goat hunts. In March of 2005 the subcommittee agreed to ease restrictions on the registration hunts by expanding the times when permits may be issued and allowing aircraft access to saltwater areas.

Mountain goats currently occupy all available goat habitat on the island, and there have been confirmed reports of goats as far south as Kaguyak Bay and Akalura Lake. Based on data from comprehensive aerial surveys, we estimated that the goat population of Unit 8 in 2004 was 1560 goats.

MANAGEMENT DIRECTION

MANAGEMENT OBJECTIVES

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

METHODS

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

RESULTS AND DISCUSSION

POPULATION STATUS AND TREND

Population Size

Our survey of approximately 60% of the goat range in July and August 2003 yielded 781 goats. During August 2004 we surveyed about 35% of the goat range and classified 644 goats. The 2004 surveys showed increased goat numbers in the Crown Mountain, Hidden Basin–Terror Lake, South Road System and North Road System hunt areas. Goat movement is presumed to be responsible for some of these increases. Goat numbers in the Wild Creek hunt area decreased slightly. The estimated islandwide population in 2004 was 1560 goats, with most of the suitable habitat being used.

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 ($\bar{x} = 20.8$) (Table 1). The increasing trend coincides with a series of mild winters. 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 be a response to 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.

MORTALITY

Harvest

Season and Bag Limits. Goat hunting season for resident and nonresident hunters was open 20 August–25 October by drawing permit. In 2004–05, there were 9 permit hunt areas with a total of 338 permits issued (Table 2). The registration hunt (1 Nov–15 Dec) followed the drawing permit hunt starting in 2003–04 and was restricted to Alaska residents only (Table 3). In 2004–05 the 9 permit hunt areas were open to hunting with a total of 127 permits issued. The bag limit was 1 goat (either sex) for all areas.

Hunters estimated age (horn ring) data 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, hunters were required to submit horns for measuring from 2000 to 2002. The mandatory aging requirement was again rescinded in RY 2003–04, and age data were collected either from hunter reports or from hunters voluntarily bringing their goat horns into Alaska

Department of Fish and Game (ADF&G) for age determination. The mean age of goats harvested during 2000–2004 was 4.2 years for males and 4.9 years for females (Table 4).

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 mountain goat registration hunts were created for all of the 9 hunt areas to provide additional harvest opportunity. The drawing hunt season dates were changed from 1 September–31 October to 20 August–25 October to allow a week to tally goat harvest prior to the opening of the registration hunt.

We issued emergency orders to close registration permit hunts RG472 and RG479 on 31 October 2003, prior to the scheduled registration hunt opening. We issued no emergency orders during the 2004–05 registration permit hunt. Starting in the 2003–04 season, the department increased the number of permits available in hunt area DG471 from 35 to 40, in DG475 from 60 to 90, in DG477 from 40 to 60, in DG478 from 30 to 80, and in DG479 from 10 to 15 due to increasing goat populations in those areas.

Permit Hunts. Goat hunting in the unit was by drawing and registration permit during this report period. The number of drawing permits ranged from 337 to 338. Hunters afield ranged from 183 to 201, with a 5-year average of 60% of permittees participating in the hunt (Table 2). The number of registration permits issued ranged from 111 to 127. Hunters afield ranged from 54 to 62, with an average of 49% of permittees participating in the registration hunt (Table 3). Compliance with the permit hunt conditions by hunters was good; however, permittees who did not hunt frequently failed to return permit reports until they received reminder letters.

Hunter Residency and Success. Local (Unit 8) residents received most of the drawing permits issued between 2000–01 and 2004–05 (54%), followed by nonlocal Alaska residents (37%), and nonresidents (9%). Annual hunter success ranged 58–67% during that time period, with a 5-year mean of 63% (Table 5). Nonresidents were the most successful hunters (80%), followed by local (62%) and nonlocal (60%) residents.

Harvest Chronology. During most years, October is the preferred month for Unit 8 goat hunters (Table 6). Weather patterns, which affect hunter success and influence when hunters go into the field, largely determined the chronology of harvest.

Transport Methods. Aircraft (52%) were the predominant transportation method used by hunters from RY 2000 to RY 2004 (Table 7). Boats were also important (11%), and off-road vehicles (16%) are becoming more popular as the number of permits increases around the city of Kodiak.

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. We suspect the low production of kids in some years is caused by severe winter weather, 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 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 affect goats on Kodiak during winters with high snowfall.

In recent years winter recreation activities have proliferated around Kodiak Island. Snowmachines are more abundant and efficient, 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 overflights of goats have occurred since goats were originally introduced to Kodiak. Fixed-winged aircraft seem to have little direct impact on the goats, but helicopters typically solicit flight responses from both individuals and groups. In April of 2002, a memorandum of agreement involving ADF&G, the U.S Fish and Wildlife Service, and U.S. Coast Guard regarding flight operations over Kodiak was finalized. This agreement has spurred further cooperation between the Coast Guard and ADF&G to minimize mountain goat disturbances from helicopter flight operations.

CONCLUSIONS AND RECOMMENDATIONS

The goat population was stable in northcentral Kodiak and increasing on the northern and southern ends of the island. Based on the comprehensive aerial surveys of goat habitat in Unit 8, we estimated a total of 1560 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. From 2002 to present most 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 drawing permits and the addition of registration permits. The drawing permit hunter success remained above 58%. Registration permit hunter success averaged 36%. The lower success rate is possibly due to hunters obtaining multiple permits, harsh winter weather, archery-only hunt areas, and permit access restrictions.

The policy of allowing goats to populate vacant habitat by keeping areas with low populations closed to hunting has been effective; we have routinely surpassed our management objectives. Population trends are closely monitored by annual surveys, and permits are adjusted accordingly within hunt areas. In the winter of 2000 the majority of the mountain goat hunt boundaries were expanded to encompass the entire island of Kodiak. Before acting on these changes, we discussed them with local air charter operators, the local advisory board, and the Kodiak National Wildlife Refuge. Micro-herds 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 increased densities to limiting the population to a level that will provide sustained hunting opportunities while maintaining habitat quality. The 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 kill rates that will maintain habitat quality while preserving hunting opportunity.
- Revise hunter handouts and Web page with emphasis on sex identification, goat anatomy, and ways to avoid wounding and/or losing goats while hunting.
- Update our Kodiak mountain goat Web page that currently assists 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.

LITERATURE CITED

- HJELJORD, O. 1973. Mountain goat forage and habitat preference in Alaska. *Journal of Wildlife Management* 37(3):353–362.
- SMITH, R. B. AND L. J. VAN DAELE. 1987. Terror Lake hydroelectric project. Final report on mountain goat studies. Alaska Department of Fish and Game.
- _____, R. B. 1986. Unit 8 Mountain goat survey-inventory report. In: Townsend, B., editor. Annual report of survey inventory activities. Part VII. Mountain Goat. Volume XVII. Alaska Department of Fish and Game. Federal Aid in Wildlife Restoration Project W-22-5, Job 12.0. Juneau. p. 34–35.
- STEVENS, V. 1983. The dynamics of dispersal in an introduced mountain goat population [dissertation]. University of Washington, Seattle.
- VAN DAELE, L. J. AND R. B. SMITH. 1998. Unit 8 mountain goat management report of survey-inventory activities. In: Hicks, M. V., editor. Mountain goat management report 1 July 1995–30 June 1997. Alaska Department of Fish and Game, Federal Aid in Wildlife Restoration Grants W-24-4 and W-24-5, Study 12.0. Juneau. p. 111–122
- WILLIAMS, L. 2003. Patterns of harvest and use of mountain goats on Kodiak Island, GMU 8. Alaska Department of Fish and Game. Technical paper 276.

PREPARED BY:

Lawrence J. Van Daele
Wildlife Biologist III

John R. Crye
Wildlife Technician IV

SUBMITTED BY:

Gino Del Frate
Management Coordinator

Please cite any information taken from this section, and reference as:

Van Daele, L.J. 2006. Unit 8 mountain goat management report. Pages 106–122 in P. Harper, editor. Mountain goat management report of survey and inventory activities 1 July 2003–30 June 2005. 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, 1999–2000 through 2004–05

Hunt Area	Regulatory year	Adults (%)	Kids (%)	Kids: 100 adults	Total goats observed	Goats/hour	Estimated population size
All permit hunt areas	1999–2000	684 (84)	128 (16)	19	812	96.2	900
	2000–01	511 (87)	78 (13)	15	589	--	--
	2001–01	760 (86)	78 (13)	16	1114	64.7	1200
	2002–03	762 (79)	203 (21)	27	965	116.0	1400
	2003–04	633 (81)	148 (19)	23	781	78	1460
	2004–05	519 (81)	125 (19)	24	644	132	1560
DG/RG 471 Wild Creek	1999–2000	137 (86)	23 (14)	17	160	--	160–180
	2000–01	134 (92)	12 (8)	9	146	--	--
- Center Mtn	2001–02	113 (86)	18 (14)	16	131	--	130
	2002–03	130 (77)	39 (23)	30	169	--	170
	2003–04	160 (78)	44 (22)	28	204	219	210
	2004–05	158 (84)	31 (16)	20	189	195	200
DG/RG 472 Crown Mtn	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
	2003–04	21 (95)	1 (5)	5	22	--	30
	2004–05	--	--	--	--	--	50

Table 1 continued

Area	Regulatory year	Adults (%)	Kids (%)	Kids: 100 adults	Total goats observed	Goats/ hour	Estimated population size
DG/RG 473	1999–2000	28 (90)	3 (10)	11	31	--	40–80
Hidden Basin	2000–01	50 (88)	7 (12)	14	57	--	40–80
-							
Terror Lake	2001–02 ^b	83 (90)	9 (10)	11	92	--	80–100
	2002–03 ^a	60 (82)	13 (18)	22	73	--	80–100
	2003–04	44 (81)	10 (19)	23	54	74	100
	2004–05	81 (87)	12 (13)	15	93	48	60
DG/RG 474	1999–2000	44 (92)	4 (8)	9	48	--	40–60
Uganik River	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	76	140
	2003–04	102 (87)	15 (13)	15	117	--	120
	2004–05	--	--	--	--	--	120
DG/RG 475	1999–2000	257 (90)	30 (10)	12	287	--	300
Zachar River	2000–01 ^a	32 (89)	4 (11)	11	36	--	300
	2001–02 ^{ab}	236 (85)	41 (15)	17	277	--	300
	2002–03	--	--	--	--	--	300
	2003–04	--	--	--	--	--	300
	2004–05	--	--	--	--	--	300
DG/RG 476	1999–2000 ^a	11 (85)	2 (15)	18	13	--	50–60
Kiliuda Bay	2000–01	--	--	--	--	--	--
	2001–02 ^{ab}	52 (87)	8 (13)	15	60	--	100–110
	2002–03	95 (81)	23 (19)	24	118	--	120–140
	2003–04 ^a	74 (86)	12 (14)	16	86	--	120
	2004–05	--	--	--	--	--	120

Table 1 continued

Area	Regulatory year	Adults (%)	Kids (%)	Kids: 100 adults	Total goats observed	Goats/hour	Estimated population size
DG/RG 477	1999–2000 ^a	92 (83)	19 (17)	21	111	--	130–160
Southwest	2000–01	--	--	--	--	--	--
Kodiak	2001–02 ^{ab}	--	--	--	231 ^c	--	250
	2002–03 ^a	43 (75)	14 (25)	33	57	--	250
	2003–04	--	--	--	--	--	250
	2004–05	--	--	--	--	--	300
DG/RG 478	1999–2000	94 (80)	24 (20)	26	118	--	118
South Road	2000–01	118 (81)	28 (19)	24	146	--	146
System	2001–02 ^b	129 (82)	28 (18)	22	157	--	157
	2002–03	203 (78)	58 (22)	29	261	--	261
	2003–04	175 (79)	47 (21)	27	222	161	230
	2004–05	186 (76)	58 (24)	31	244	134	250
DG/RG 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
	2003–04 ^a	57 (75)	19 (25)	32	76	--	100
	2004–05	94 (80)	24 (20)	26	118	--	120

^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 drawing permit hunt, 2000–01 through 2004–05^a

Hunt Area	Regulatory Year	Permits Issued	Percent did not hunt	Percent unsuccessful hunters	Percent successful hunters	Males (%)	Female (%)	Unknown	Illegal	Total harvest
All	2000–01 ^a	161	41	41	59	34 (63)	21 (37)	0	0	54
DG	2001–02 ^a	195	36	42	58	50 (75)	17 (25)	2	1	70
permit	2002–03 ^a	230	39	33	67	61 (66)	32 (34)	0	1	94
hunts	2003–04 ^b	337	44	39	61	67 (60)	45 (40)	0	3	115
	2004–05 ^b	338	39	34	66	88 (67)	43 (33)	1	1	133
DG 471	2000–01 ^a	30	41	65	35	2 (33)	4 (67)	0	0	8
Wild	2001–02 ^a	35	48	59	41	7 (100)	0 (–)	0	0	7
Creek-	2002–03 ^a	35	40	33	67	9 (64)	5 (35)	0	0	14
Center	2003–04 ^b	40	49	53	47	7 (78)	2 (22)	0	0	9
Mountain	2004–05 ^b	40	42	45	55	6 (50)	6 (50)	0	0	12
DG 472	2000–01 ^a	10	40	67	33	2 (100)	0 (–)	0	0	2
Crown	2001–01 ^a	10	80	0	100	2 (100)	0 (–)	0	0	2
Mtn	2002–01 ^a	10	90	0	100	0 (–)	1 (100)	0	0	1
	2003–04 ^b	10	40	33	67	2 (50)	2 (50)	0	0	4
	2004–05 ^b	10	60	25	75	3 (100)	0 (–)	0	0	3
DG 473	2000–01 ^a	15	27	36	64	3 (43)	4 (57)	0	0	7
Hidden	2001–02 ^a	10	20	25	75	4 (67)	2 (33)	0	0	6
Basin-	2002–03 ^a	8	40	17	83	3 (60)	2 (40)	0	0	5
E. Terror	2003–04 ^b	8	57	67	33	1 (100)	0 (–)	0	0	1
Lake	2004–05 ^b	8	0	38	62	3 (60)	2 (40)	0	0	5
DG 474	2000–01 ^a	10	33	33	67	3 (75)	1 (25)	0	0	4
Uganik	2001–02 ^a	15	27	64	36	3 (100)	0 (–)	1	0	4
River	2002–03 ^a	15	36	22	78	3 (43)	4 (57)	0	0	7
	2003–04 ^b	14	14	33	67	7 (88)	1 (12)	0	1	9
	2004–05 ^b	15	33	30	70	6 (86)	1 (14)	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	2000–01 ^a	35	59	29	71	3 (30)	7 (70)	0	0	10
Zachar	2001–02 ^a	40	37	50	50	9 (82)	2 (18)	1	0	12
River	2002–03 ^a	60	43	47	53	13 (72)	5 (28)	0	0	18
	2003–04	90	70	50	50	8 (62)	5 (48)	0	0	13
	2004–05	90	51	49	51	17 (77)	5 (23)	0	0	22
DG 476	2000–01 ^a	20	41	10	90	7 (78)	2 (22)	0	0	9
Kiliuda	2001–02 ^a	20	58	25	75	4 (67)	2 (33)	0	0	6
Bay	2002–03 ^a	20	50	50	50	4 (80)	1 (20)	0	0	5
	2003–04 ^b	20	55	56	44	2 (50)	2 (50)	0	0	4
	2004–05 ^b	20	63	43	57	4 (100)	0 (–)	0	0	4
DG 477	2000–01 ^a	25	46	38	62	6 (75)	2 (25)	0	0	8
Deadman	2001–02 ^a	30	28	33	57	10 (91)	1 (9)	1	0	12
Bay	2002–03 ^a	40	44	23	77	11 (69)	5 (31)	0	1	17
	2003–04 ^b	60	36	27	73	19 (70)	8 (30)	0	0	27
	2004–05 ^b	60	52	14	86	20 (83)	4 (17)	0	0	24
DG 478	2000–01 ^a	16	7	43	57	8 (100)	0 (–)	0	0	8
South	2001–02 ^a	25	21	27	73	4 (29)	10 (71)	0	0	14
Road	2002–03 ^a	30	10	26	74	14 (70)	6 (30)	0	0	20
System	2003–04 ^b	80	27	36	64	17 (46)	20 (54)	0	2	39
	2004–05 ^b	80	14	29	71	24 (52)	22 (48)	1	1	48
DG 479	2001–02 ^a	10	0	22	78	7 (100)	0 (–)	0	0	7
North	2002–03 ^a	10	11	25	75	4 (67)	2 (33)	0	0	6
Road	2003–04 ^b	15	13	31	69	4 (44)	5 (56)	0	0	9
System	2004–05 ^b	15	13	38	62	5 (63)	3 (37)	0	0	8

^a Season Dates: 1 September–31 October ; ^b Season Dates: 20 August–25 October

Table 3 Unit 8 mountain goat harvest data by registration permit hunt, 2003–04 through 2004–05^a

Hunt Area	Regulatory year	Permits Issued	Percent did not hunt	Percent unsuccessful hunters	Percent successful hunters	Males (%)	Female (%)	Unknown	Illegal	Total harvest
All RG permit hunts	2003–04	111	51	54	48	17 (65)	9 (35)	0	0	26
	2004–05	127	51	74	26	11 (69)	5 (31)	0	0	16
RG471	2003–04	14	36	78	22	1 (50)	1 (50)	0	0	2
	2004–05	12	75	100	0	0	0	0	0	0
RG472	2003–04 ^a	0	0	0	0	0	0	0	0	0
	2004–05	6	67	50	50	1 (100)	0	0	0	1
RG473	2003–04	6	100	0	0	0	0	0	0	0
	2004–05	10	80	100	0	0	0	0	0	0
RG474	2003–04	0	0	0	0	0	0	0	0	0
	2004–05	1	100	0	0	0	0	0	0	0
RG475	2003–04	22	43	58	42	4 (80)	1 (20)	0	0	5
	2004–05	21	38	77	23	3 (100)	0	0	0	3
RG476	2003–04	18	72	40	60	0	3 (100)	0	0	3
	2004–05	15	67	80	20	1 (100)	0	0	0	1
RG477	2003–04	25	60	30	70	5 (71)	2 (29)	0	0	7
	2004–05	27	27	63	37	4 (57)	3 (43)	0	0	7
RG478	2003–04	26	31	50	50	7 (78)	2 (22)	0	0	9
	2004–05	22	59	100	0	0	0	0	0	0
RG479	2003–04 ^a	0	0	0	0	0	0	0	0	0
	2004–05	13	31	56	44	2 (50)	2 (50)	0	0	4

^a Season dates: 1 November–15 December^b Hunting areas RG472 and RG479 closed by emergency order 31 October 2003

Table 4 Unit 8 mountain goat harvest mean age data from horn rings,
1993–94 through 2004–05

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 ^b	3.9	(57)	5.0	(29)
2003–04 ^b	4.4	(52)	4.9	(31)
2004–05 ^b	4.5	(76)	4.9	(30)

^a Horn inspections required

^b Hunters report goat age with report card

Table 5 Residence and success of hunters participating in Unit 8 mountain goat drawing hunts, 2000–01 through 2004–05

Regulator y year	Successful					Unsuccessful					Total hunters
	Local resident	Nonlocal resident	Nonresident	Total	(%)	Local resident	Nonlocal resident	Nonresident	Total	(%)	
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
2003–04	58	44	11	113	(61)	33	31	8	72	(39)	185
2004–05	67	48	17	132	(66)	38	29	2	69	(34)	201

Table 6 Unit 8 mountain goat harvest chronology percent by time period, 2000–01 through 2004–05

Area	Regulatory year	Harvest periods					<u>n</u>
		Aug	Sep	Oct	Nov	Dec	
All permit hunts	2000–01		39	61			54
	2001–02		39	61			67
	2002–03		49	51			93
	2003–04 ^a	11	31	39	14	5	136
	2004–05	9	30	50	4	7	148

^a Drawing hunt season change and registration hunt established

Table 7 Unit 8 mountain goat hunter transport method (percent in parentheses), 2000–01 through 2004–05

Regulatory year	Transportation method							Total
	Aircraft	Boat	3 or 4 Wheeler	ORV	Highway vehicle	Snow- machine	Unknown	
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
2003–04	85 (47)	17 (10)	24 (13)	8 (4)	43 (24)	0 (--)	4 (2)	181
2004–05	96 (48)	15 (8)	26 (13)	4 (2)	56 (28)	0 (--)	3 (1)	200

MOUNTAIN GOAT MANAGEMENT REPORT

From: 1 July 2003

To: 30 June 2005

LOCATION

GAME MANAGEMENT UNIT: 11 (12,784 mi²)

GEOGRAPHIC DESCRIPTION: Wrangell Mountains

BACKGROUND

Hunters have harvested mountain goats in Unit 11 for at least 30 years. Harvest data for goats were not collected 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. Hunts have been administered via registration permits since 1980 on state, private, and preserve lands. A subsistence goat registration hunt for local residents in the Wrangell–St. Elias National Park and Preserve is administered by the National Park Service (NPS).

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, though only periodically in conjunction with sheep counts.

MANAGEMENT DIRECTION

MANAGEMENT OBJECTIVES

- Maintain an annual harvest of up to 10% of the estimated goat population.

METHODS

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

RESULTS AND DISCUSSION

POPULATION STATUS AND TREND

Population Size

The 2005 MacColl Ridge survey counted 59 goats (Table 1). The number is down 20% from the record high of 74 in both 1998 and 1999. The current count is slightly above the long-term average count 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. This estimate has not been updated because goat counts over much of the unit have not been repeated due to budget constraints. If MacColl Ridge is any indication, though, the current population is probably very similar to the early estimate.

Population Composition

Ten kids were observed on MacColl Ridge during 2005, and the resulting ratio of kids:adults was 20:100; kids composed 17% of goats observed (Table 1). The number of kids observed over the last 6 years has averaged 12 (Range = 9–14) per year. Recruitment has fluctuated yearly, but on average it is quite high and has been more than adequate to maintain the population and provide an annual harvest.

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 movement is limited, and major rutting and kidding areas are unknown. Field observations indicate seasonal altitudinal movements; goats often use lower elevations during the 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 state season for resident and nonresident hunters was 1 September–30 November; the bag limit was 1 goat by registration permit only (RG580). Hunters killed 10 goats during the 2003 season, and 6 in 2004. The average yearly take since 1980 has been 16 goats (range = 4–30). The 2003 harvest comprised 7 (70%) billies and 3 (30%) nannies, while 5 (83%) billies and 1 (17%) nanny were reported in 2004. Males composed 70% or more of the harvest during 4 of the last 5 years (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 federal harvest the last 3 years has been 3 billies a year (Table 2).

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–St. Elias National Park and Preserve, concentrating hunting pressure for goats on preserve lands. Only subsistence hunting by local rural residents was allowed on “hard park” lands due to NPS rules. 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 all federal lands. At that time, the Federal Subsistence Board determined no subsistence hunting of mountain goats was occurring in Unit 11 and subsequently closed the “hard park” to subsistence mountain goat hunting by local rural residents. In 1998 the NPS determined there was a subsistence use of mountain goats by local rural residents in the park. A 25 August–31 December season was established. Hunting was controlled by registration permit issued by the NPS to residents of designated rural subsistence communities. The bag limit was 1 goat, and a combined harvest quota of 45 mountain goats was set for the state and federal hunts.

Hunter Residency and Success. There were 56 state registration hunt (RG 580) permits issued and 39 federal (FG 110) permits in 2004. Since the registration hunt started in 1980, the number of state permits issued has averaged 60 (range = 29–90). The number of federal permits has increased from only 3 the first year of the hunt (1998) to 39 in 2004 (Table 2). The success rate was 11% for the state hunt and 8% for federal hunters. Successful state hunters reported spending 5.7 days in the field compared with 4.2 days for unsuccessful hunters in 2004. Usually the hunting effort reported by Unit 11 goat hunters changes little each year, averaging 3–5 days of hunting per hunter. Nonresident hunters took 2 goats in 2004, accounting for 33% of the harvest. Nonlocal Alaska residents took the other 67% and none were taken by local residents (Table 3). During the past 5 years, nonresidents have taken 54% of goats harvested.

Harvest Chronology. In 2003, 60% and in 2004, 67% of the state harvest occurred during the initial 3 weeks of the season (Table 4). This is similar to the harvest pattern over the last 10 years. 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, boats, and 4-wheelers 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, highway vehicles and walking.

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, but predation rates have not been determined.

HABITAT

Assessment

The Wrangell Mountains and northwestern 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 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 record highs observed in the late 1990s. However, the current count remains above the long-term average. Kid production and/or survival decreased slightly during the last year of this reporting period. Between 1994 and 1998, surveys indicated the highest kid production and/or survival ever observed on MacColl Ridge. Current kid production and/or survival are slightly lower than the peak, though still considered more than adequate to maintain the population and provide a yearly harvest.

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. MacColl Ridge is isolated for the most part, so movement is not considered a major problem. 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 past hunting pressure has been greater than in recent times. NPS and Federal Subsistence Board hunting regulations now restrict nonsubsistence goat hunting to the national preserve lands around McCarthy, MacColl Ridge, and Hawkins and Barnard Glaciers. MacColl Ridge receives some of the heaviest hunting pressure in the unit, especially for guided hunts, and accounts for the most goats taken. However, during this report period, harvests were not concentrated enough in any one area, including MacColl Ridge, to result in localized overharvests. One benefit to having the Unit 11 goat harvest concentrated on federal lands is the exclusive guide use system still employed there. One guide has a much better chance to minimize overhunting if no other guides are competing for the same animals.

The federal subsistence hunt in the hard park should not present a management problem for the state hunt because hunters participating in the state hunt are limited to preserve lands. The new federal subsistence hunt allows 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 because the number of individuals eligible for subsistence permits is very low. Hunt areas are, for the most part, very remote, and federal regulations prohibiting the use of aircraft for subsistence hunting greatly limit access.

Goat harvest rates 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 Barnard 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. To date, such a high harvest has not occurred, and there have been no emergency closures. Timely emergency closures will be difficult because most of the harvest takes place during a short period of time 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 recommend regulation changes to reduce the harvest.

PREPARED BY:

Robert W. Tobey
Wildlife Biologist III

SUBMITTED BY:

Gino Del Frate
Management Coordinator

Please cite any information taken from this section, and reference as:

Tobey, R.W. 2006. Unit 11 mountain goat management report. Pages 123–131 *in* P. Harper, editor. Mountain goat management report of survey and inventory activities 1 July 2003–30 June 2005. Alaska Department of Fish and Game. Project 12.0. Juneau, Alaska.

Table 1 Unit 11 MacColl Ridge trend count area mountain goat composition counts and estimated population size, 2000–2005

Area	Regulatory Year	Adults (%)	Kids (%)	Unk.	Kids: 100 adults	Total goats observed	Estimated population size ^a
MacColl Ridge	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
	2004–2005	37 (74)	13 (26)	0	35	50	50
	2005–2006	49 (83)	10 (17)	0	20	59	59

^a Estimate considered to be total count because all goat habitat on ridge counted.

Table 2 Unit 11 mountain goat harvest data by permit hunt, 2000–2005

Hunt nr /area	Regulatory year	Permits issued	Percent ^a did not hunt	Percent ^a unsuccessful hunters	Percent ^a successful Hunters	Males (%)	Females (%)	Unk.	Illegal	Total harvest
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
RG580	2003–2004	54	44	37	19	7 (70)	3 (30)	0	0	10
RG580	2004–2005	56	55	34	11	5 (83)	1 (17)	0	0	6
FG110	2000–2001	20	70	18	12	1 (50)	1 (50)	0	0	2
FG110	2001–2002	27	50	45	5	1 (100)	0	0	0	1
FG110	2002–2003	28	40	48	45	3 (100)	0	0	0	3
FG110	2003–2004	33	61	29	10	3 (100)	0	0	0	3
FG110	2004–2005	39	58	33	8	3 (100)	0	0	0	3

^a Percent of total permittees returning hunter reports

Table 3 Unit 11 RG580 mountain goat hunter residency and success, 2000–2005

Regulatory year	Successful				Unsuccessful				Total hunters
	Local ^a resident	Nonlocal resident	Nonresident	Total (%)	Local ^a resident	Nonlocal resident	Non-resident	Total (%)	
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
2003–2004	0	5	5	10 (33)	2	15	3	20 (67)	30
2004–2005	0	4	2	6 (25)	2	11	5	18 (75)	24

^a Local resident means resident of Unit 11, 13, or that portion of Unit 12 along the Nabesna Road.

Table 4 Unit 11 RG580 mountain goat harvest chronology percent^a by time period, 2000–2005

Regulatory year	September				October				1–30	<i>n</i>
	1–7	8–15	16–23	24–30	1–7	8–15	16–23	24–31		
2000–2001	33	33	17	17	--	--	--	--	--	6
2001–2002	9	45	27	9	--	--	--	9	--	11
2002–2003	50	--	50	--	--	--	--	--	--	4
2003–2004	20	20	20	20	10	--	10	--	--	10
2004–2005	17	50	--	--	--	--	33	--	--	6

^aTotals of the percentages for each year may be greater or less than 100% due to rounding

Table 5 Unit 11 RG580 mountain goat harvest percent by transport method, 2000–2005

Regulatory year	Percent of harvest							<i>n</i>
	Airplane	Boat	3- or 4-Wheeler	Snowmachine	ORV	Highway vehicle	Unknown	
2000–2001	100	--	--	--	--	--	--	6
2001–2002	82	--	--	--	--	18	--	11
2002–2003	50	25	--	--	--	25	--	4
2003–2004	90	--	10	--	--	--	--	10
2004–2005	67	33	--	--	--	--	--	6

MOUNTAIN GOAT MANAGEMENT REPORT

From: 1 July 2003

To: 30 June 2005

LOCATION

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

GEOGRAPHIC DESCRIPTION: Talkeetna Mountains and western Chugach Mountains

BACKGROUND

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

During the 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, but may be increasing slightly.

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 one goat; however, hunters in Subunit 13D could harvest two goats until 1975. In the 1970s the hunting season in Unit 14 began in early August or September and ran until Nov. 15. 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 these areas when possible.

Heli-ski guides in Subunit 13D operate in the Chugach Mountains just north of Valdez out of Thompson Pass as well as out of the Majestic Valley Lodge into the Upper Matanuska and Upper Nelchina glacier areas. This type of winter recreation relies on mountain goat terrain, as well as late winter conditions to be profitable. Heli-ski operations on state land do not require permitting, and thus there is no process by which to regulate these activities to avoid conflict with important mountain goat wintering or kidding areas. We recommend that future goat management in these areas take into consideration heli-ski operations in terms of identifying critical habitat areas and timing in order to avoid negative impacts on goats in the area.

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 five 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 Subunit 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 2000. Partial surveys were also conducted in 2002 and 2004 in Subunit 14A (Chugach Mountains) and in 2001 and 2003 in 13D. Partial surveys were conducted in 14C in 2000, 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 are typically 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), 22-25% 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 were surveyed in 2002. The survey included six 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 2000-2004, in Subunit 13D goat hunting for residents and nonresidents was 10 August–20 September, and the bag limit was one goat of either sex by drawing permit. The taking of kids, and nannies accompanied by kids, was prohibited.

In Subunit 14A (south of the Matanuska River) the hunting season for residents and nonresidents was 1 September–31 October and was one goat by permit only. In 2000 there were two 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, two 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 October, with a bag limit of one goat.

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

Harvests in Subunit 13D have been low, ranging from 4-11 goats per season in 2000-2004 (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 two 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 Oct. 16–31 (Table 6).

Board of Game Actions and Emergency Orders. In 2001 the Board of Game authorized two 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 153 to 182 during this reporting period (1 July 2003 – 30 June 2005; Table 6). The number of Subunit 14C drawing permits issued is based on the number of goats observed during surveys. During this reporting period 21 drawing permits were issued each year (Table 6). Thirty-five drawing permits were issued for the eastern portion of Subunit 13D each year (Table 7).

Hunter Residency and Success. The majority of successful and unsuccessful goat hunters in Unit 13 are nonlocal residents (Table 8). In Subunit 14A and the Lake George area of Subunit 14C there has been a shift from a majority of local resident hunters to a majority of nonresident hunters.

Success rates from 2000 to 2004 ranged from 20 to 61% in Subunit 13D (Table 8) and 31-48% in Unit 14 (Table 9). In both units, nonresidents typically experienced higher rates of success than

did resident hunters (Tables 8 and 9). Nonresidents are required to be accompanied by a registered guide to hunt goats in Alaska; guided hunters are typically more successful than unguided hunters.

Harvest Chronology. The percent of harvest occurring in September in Unit 14 ranged from 44% to 60% during the reporting period (Table 10). In 2003 and 2004, 37% and 27%, respectively, of the goats were harvested in October. Harvests in Subunit 13D were too small to evaluate chronologically; season dates of 10 August–20 September 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 have used airplanes (36-67%) or highway vehicles (17-60%; Table 11). In Subunit 14A and the Lake George portion of Subunit 14C, aircraft have been the primary mode of transport for successful hunters (25-88% in 14A and 63-94% in 14C; Table 12). In the Twentymile River drainage of Subunit 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 77% males. With the exception of 2000, less than 7% of observed goats have been harvested annually in Subunit 14A, and harvests have 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 three 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.

In 2004, all registration goat hunts in Subunit 14C were closed by emergency order. Hunting pressure in the subunit has increased dramatically since the Kenai Peninsula goat hunts were changed to early season drawing hunts followed by late season registration hunts. Specifically, hunting pressure in the Lake George area has become dominated by nonresident guided hunts, which are typically more successful. As a result, registration hunts in the area are being closed within several weeks of opening. In addition, there has also been increased participation in the 14A registration goat hunt. Due to the popularity of the 14C and 14A registration hunts, it has become exceedingly difficult to manage the number of participants and the harvest. It is most likely that the biologists for these subunits will recommend that these registration hunts are replaced with drawing hunts.

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.

PREPARED BY:

Jessy Coltrane
Wildlife Biologist II

REVIEWED BY:

Bruce Bartley
Acting Assistant Management Coordinator

Please cite any information taken from this section, and reference as:

Coltrane, J. 2006. Units 13D and 14 mountain goat management report. Pages 132–150 in P. Harper, editor. Mountain goat management report of survey and inventory activities 1 July 2003–30 June 2005. Alaska Department of Fish and Game. Project 12.0. Juneau, Alaska.

Table 1 Subunit 13D aerial mountain goat composition counts, 2000-2005

Regulatory year	Adults (%)	Kids (%)	Kids: 100 adults	Goats Observed	Goats /hour
2000-01 ^a					
2001-02 ^b	92 (77)	28 (23)	30	120	11.8
2002-03 ^a					
2003-04 ^c	37 (100)	0 (0)	0	37	
2004-05 ^a					

^aNo surveys conducted.^bPartial survey (count areas 2, 3, and 5).^cPartial surveys conducted incidental to sheep surveys (count areas 1-5).

Table 2 Subunit 14A, Chugach Mountains, aerial mountain goat composition counts, 2000-2005

Regulatory year	Adults (%)	Kids (%)	Kids: 100 adults	Total goats observed	Goats /hour
2000-01 ^a					
2001-02 ^a					
2002-03	106 (78)	29 (22)	27	135	
2003-04 ^a					
2004-05	118 (75)	40 (25)	34	158	

^a No surveys conducted.

Table 3 Subunit 14A and 14B, Talkeetna Mountains, aerial mountain goat composition counts, 2000-2005

Regulatory Year	Adults (%)	Kids (%)	Kids: 100 adults	Total Goats Observed	Goats /hour
2000-01 ^a	14 (88)	2 (12)	14	16	
2001-02 ^a					
2002-03 ^b					
2003-04 ^b					
2004-05 ^b					

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

Table 4 Subunit 14C aerial mountain goat composition counts and estimated population size, 2000-2005^a

Regulatory Year	Adults (%)	Kids (%)	Kids: 100 adults	Total goats observed	Goats /hour	Estimated population size
2000-01 ^b	599 (87)	88 (13)	15	687		
2001-02 ^c	204 (83)	42 (17)	21	246		
2002-03 ^c	127 (84)	25 (16)	20	152		
2003-04 ^c	86 (86)	14 (14)	16	100		
2004-05 ^d						

^a Data include all goats observed in Subunit 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).

^d No surveys conducted.

Table 5 Annual mountain goat harvest by unit, 2000-2005

Regulatory Year	Unit				Total
	13D ^a	14A ^b	14B ^c	14C ^d	
2000-01	4	10		22	36
2001-02	6	3		23	32
2002-03	5	8		25	38
2003-04	11	8		38	57
2004-05	10	8		22	40

^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, 2000-2005

Area ^a	Regulatory Year	Permits issued	Percent did not hunt ^b	Percent Unsuccessful Hunters	Percent Successful Hunters	Males (%)		Females (%)		Total Harvest ^c
RG866	2000-01	54	50	63	37	7	(70)	3	(30)	10
Subunit 14A	2001-02	30	63	73	27	0	(0)	3	(100)	3
	2002-03	38	65	38	62	7	(88)	1	(12)	8
	2003-04	75	67	68	32	6	(75)	2	(25)	8
	2004-05	48	58	60	40	6	(75)	2	(25)	8
DG852	2000-01	5	20	25	75	0	(0)	3	(100)	3
Subunit 14C	2001-02	5	0	60	40	2	(100)	0	(0)	2
East Eklutna	2002-03	5	20	100	0	0	(0)	0	(0)	0
	2003-04	5	0	40	60	1	(33)	2	(67)	3
	2004-05	5	20	75	25	1	(100)	0	(0)	1
DG854 ^c	2001-02	3	0	67	33	0	(0)	1	(100)	1
Subunit 14C	2002-03	3	33	100	0	0	(0)	0	(0)	0
Eagle River	2003-04	3	33	33	67	1	(50)	1	(50)	2
	2004-05	3	33	50	50	1	(100)	0	(50)	1
DG856	2000-01	8	0	87	13	1	(100)	0	(0)	1
Subunit 14C	2001-02	8	25	67	33	2	(100)	0	(0)	2
Glacier Ck.	2002-03	8	63	33	67	2	(100)	0	(0)	2
	2003-04	8	25	83	17	0	(0)	1	(100)	1
	2004-05	8	25	67	33	2	(100)	0	(0)	2
DG858 ^d	2001-02	5	20	75	25	1	(100)	0	(0)	1
Subunit 14C	2002-03	5	20	25	75	1	(33)	2	(67)	3
Bird Creek	2003-04	5	0	60	40	2	(100)	0	(0)	2
	2004-05	5	20	50	50	1	(50)	1	(50)	2

Area ^a	Regulatory Year	Permits issued	Percent did not hunt ^b	Percent Unsuccessful Hunters	Percent Successful Hunters	Males (%)		Females (%)		Total Harvest ^c
RG868	2000-01	63	62	87	13	1	(33)	2	(67)	3
Subunit 14C	2001-02	49	76	92	8	1	(100)	0	(0)	1
Twentymile	2002-03	70	74	83	17	3	(100)	0	(0)	3
River	2003-04	78	37	85	15	6	(100)	0	(0)	6
	2004-05	63	65	76	24	5	(100)	0	(0)	5
RG869	2000-01	82	52	62	38	14	(93)	1	(7)	15
Subunit 14C	2001-02	61	54	46	54	12	(80)	3	(20)	15
Lake	2002-03	98	71	39	61	14	(82)	2	(12)	17
George	2003-04	73	34	43	57	14	(64)	8	(36)	22
	2004-05	69	72	47	53	11	(100)	0	(0)	11
RG878	2000-01	2	50	100	0	0	(0)	0	(0)	0
Subunit 14C	2001-02	11	0	91	9	1	(100)	0	(0)	1
Twentymile	2002-03	3	100							
River	2003-04	5	20	75	25	1	(100)	0	(0)	1
(archery)	2004-05	0								
RG879	2000-01	0								
Subunit 14C	2001-02	0								
Lake	2002-03	8	75	100	0	0	(0)	0	(0)	0
George	2003-04	5	20	75	25	0	(0)	1	(100)	1
(archery)	2004-05	0								0
Totals	2000-01	160	53	71	29	17	(77)	5	(23)	22
for all	2001-02	142	56	62	38	19	(82)	4	(18)	23
Subunit 14C	2002-03	200	71	58	42	20	(80)	4	(16)	25
	2003-04	182	35	64	36	25	(66)	13	(34)	38
	2004-05	153	40	60	40	21	(95)	1	(5)	22

Area ^a	Regulatory Year	Permits issued	Percent did not hunt ^b	Percent Unsuccessful Hunters	Percent Successful Hunters	Males (%)		Females (%)		Total Harvest ^c
Totals	2000-01	214	52	68	31	24	(75)	8	(25)	32
for all	2001-02	172	57	64	36	19	(73)	7	(27)	26
Unit 14	2002-03	238	70	58	42	27	(81)	5	(15)	33
	2003-04	257	49	65	35	31	(67)	15	(33)	46
	2004-05	201	63	60	40	27	(90)	3	(10)	30

^a Previous hunt number in parentheses.

^b Includes permittees who did not report.

^c Includes animals of unknown sex.

^d New hunt added in 2001-02.

Table 7 Subunit 13D mountain goat harvest data by permit hunt, 2000-2005

Area	Regulatory Year	Permits issued	Percent did not hunt ^a	Percent unsuccessful hunters	Percent successful hunters	Males (%)	Females (%)	Total harvest
DG718	2000-01	10	10	89	11	1 (100)	0 (0)	1
Subunit 13D	2001-02	10	60	50	50	2 (100)	0 (0)	2
West	2002-03	10	70	67	33	0 (0)	1 (100)	1
	2003-04	10	50	40	60	2 (67)	1 (33)	3
	2004-05	10	30	57	43	1 (33)	2 (67)	3
DG719	2000-01	25	14	73	27	2 (67)	1 (33)	3
Subunit 13D	2001-02	25	28	78	22	3 (75)	1 (25)	4
East	2002-03	25	64	56	44	3 (75)	1 (25)	4
	2003-04	25	48	38	62	5 (63)	3 (38)	8
	2004-05	25	52	42	58	5 (71)	2 (29)	7
Totals	2000-01	35	43	80	20	3 (75)	1 (25)	4
for all	2001-02	35	37	72	27	5 (83)	1 (17)	6
Subunit 13D	2002-03	35	66	58	42	3 (60)	2 (40)	5
	2003-04	35	49	39	61	7 (64)	4 (36)	11
	2004-05	35	46	47	53	6 (60)	4 (40)	10

^a Includes permittees who did not report.

Table 8 Subunit 13D mountain goat hunter residency and success, 2000-2005

Area	Regulatory Year	Successful				Unsuccessful				Total Hunters ^a
		Local Resident	Nonlocal Resident	Nonresident	Total (%) ^a	Local resident	Nonlocal Resident	Nonresident	Total (%) ^a	
DG718	2000-01	0	0	1	1 (50)	1	0	0	1 (50)	2
Subunit 13D	2001-02	0	1	1	2 (50)	0	2	0	2 (50)	4
West	2002-03	0	0	1	1 (33)	2	0	0	2 (67)	3
	2003-04	0	2	1	3(60)	0	2	0	2 (40)	5
	2004-05	0	2	1	3 (43)	0	3	1	4 (57)	7
DG719	2000-01	0	3	0	3 (27)	1	6	1	8 (73)	11
Subunit 13D	2001-02	0	0	4	4 (22)	2	10	2	14 (78)	18
East	2002-03	0	2	2	4 (44)	0	5	1	6 (56)	10
	2003-04	0	3	2	8 (67)	1	3	0	4 (33)	12
	2004-05	0	5	2	7 (58)	1	4	0	5 (42)	12
Totals	2000-01	0	3	1	4 (20)	2	6	1	16 (80)	20
for all	2001-02	0	1	5	6 (27)	2	12	2	16 (73)	22
Subunit 13D	2002-03	0	2	3	5 (42)	2	5	1	8 (58)	13
	2003-04	0	5	3	11 (61)	1	5	1	7 (39)	18
	2004-05	0	7	3	10 (53)	1	7	1	9 (47)	19

^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, 2000-2005

Area	Regulatory year	Successful				Unsuccessful				Total Hunters ^a
		Local resident	Nonlocal resident	Non-resident	Total (%) ^a	Local resident	Nonlocal resident	Non-resident	Total (%) ^a	
RG866	2000-01	2	1	7	10 (37)	16	1	0	17 (63)	27
Subunit 14A	2001-02	2	1	0	3 (27)	7	0	1	8 (73)	11
	2002-03	1	2	5	8(62)	1	1	3	5 (38)	13
	2003-04	2	0	6	8 (32)	9	8	0	17 (68)	25
	2004-05	1	5	2	8(40)	7	4	1	12(60)	20
DG852	2000-01	3	0	0	3 (75)	1	0	0	1 (25)	4
Subunit 14C	2001-02	2	0	0	2 (40)	3	0	0	3 (60)	5
East Eklutna	2002-03	0	0	0	0 (0)	1	3	0	4 (100)	4
	2003-04	3	0	0	3 (75)	1	0	0	1 (25)	4
	2004-05	0	1	0	1(25)	2	1	0	3 (75)	4
DG854	2001-02	1	0	0	1 (33)	2	0	0	2 (67)	3
Subunit 14C	2002-03	0	0	0	0 (0)	2	0	0	2 (100)	2
Eagle River	2003-04	2	0	0	2 (100)	0	0	0	0 (0)	2
	2004-05	0	1	0	1 (50)	1	0	0	1 (50)	2
DG856	2000-01	1	0	0	1 (13)	5	2	0	7 (87)	8
Subunit 14C	2001-02	2	0	0	2 (33)	3	1	0	4 (67)	7
Glacier Ck.	2002-03	2	0	0	2 (67)	1	0	0	1 (33)	3
	2003-04	1	0	0	1 (17)	5	0	0	5 (83)	6
	2004-05	2	0	0	2 (33)	3	1	0	4 (67)	6
DG858	2001-02	0	0	0	1 (25)	0	0	0	3 (75)	4
Subunit 14C	2002-03	2	1	0	3 (75)	1	0	0	1 (25)	4
Bird Creek	2003-04	1	1	0	2 (40)	3	0	0	3 (60)	5
	2004-05	1	1	0	2 (50)	2	0	0	2 (50)	4

Area	Regulatory year	Successful				Unsuccessful				Total Hunters ^a
		Local resident	Nonlocal resident	Non- resident	Total (%) ^a	Local resident	Nonlocal resident	Non- resident	Total (%) ^a	
RG868	2000-01	3	0	0	3 (13)	21	0	0	21 (87)	24
Subunit 14C	2001-02	1	0	0	1 (8)	11	0	0	11 (92)	12
Twentymile	2002-03	3	0	0	3 (17)	15	0	0	15 (88)	18
River	2003-04	6	0	0	6 (15)	30	4	1	35 (85)	41
	2004-05	3	2	0	5(24)	11	5	0	16 (76)	21
RG869	2000-01	4	0	11	15 (38)	23	0	1	24 (62)	39
Subunit 14C	2001-02	2	1	12	15 (54)	10	1	2	13 (13)	28
Lake	2002-03	3	4	10	17 (61)	2	5	4	11 (39)	28
George	2003-04	4	5	12	21 (54)	6	8	3	17 (44)	39
	2004-05	1	2	8	11 (58)	0	4	4	8 (42)	19
RG878	2000-01	0	0	0	0 (0)	1	0	0	1 (100)	1
Subunit 14C	2001-02	1	0	0	1 (100)	0	0	0	0 (0)	1
Twentymile	2002-03	0	0	0	0 (0)	0	0	0	0 (0)	0
River	2003-04	1	0	0	1 (25)	3	0	0	3 (75)	4
(archery)	2004-05	0	0	0	0 (0)	0	0	0	0 (0)	0
RG879	2000-01	0	0	0	0 (0)	0	0	0	0 (0)	0
Subunit 14C	2001-02	0	0	0	0 (0)	0	0	0	0 (0)	0
Lake	2002-03	0	0	0	0 (0)	1	0	1	2 (100)	2
George	2003-04	0	1	0	1 (25)	1	1	1	3 (75)	4
(archery)	2004-05	0	0	0	0 (0)	0	0	0	0 (0)	0
Totals	2000-01	11	0	11	22 (29)	51	2	1	54 (71)	76
for all	2001-02	8	1	12	23 (38)	29	2	2	36 (60)	60
Subunit 14C	2002-03	10	5	10	25 (41)	21	15	5	36 (59)	61
	2003-04	18	7	12	38 (54)	19	9	4	32 (45)	71
	2004-05	7	7	8	22 (39)	19	11	4	34(61)	56

Area	Regulatory year	Successful				Unsuccessful				Total Hunters ^a
		Local resident	Nonlocal resident	Non- resident	Total (%) ^a	Local resident	Nonlocal resident	Non- resident	Total (%) ^a	
Totals	2000-01	13	1	18	32 (31)	67	3	1	71 (69)	103
for all	2001-02	10	2	12	26 (35)	36	2	3	44 (63)	71
Unit 14	2002-03	11	7	15	33 (41)	22	17	8	47 (59)	80
	2003-04	20	14	27	46 (48)	28	17	4	49 (51)	96
	2004-05	8	12	10	30 (39)	26	15	5	46 (61)	76

^a Includes hunters with unspecified residency.

Table 10 Unit 14 mountain goat harvest chronology percent by month, 2000-2005

Area	Regulatory year	Harvest period					Unknown (<i>n</i>)	<i>n</i>
		August	September	October	November	December		
Subunit 14A	2000-01	0	100	0	0	0	0	10
	2001-02	0	100	0	0	0	0	3
	2002-03	0	100	0	0	0	1	8
	2003-04	0	0	0	0	0	8	0
	2004-05	0	100	0	0	0	0	8
Subunit 14C	2000-01	0	77	23	0	0	0	22
	2001-02	0	91	9	0	0	1	23
	2002-03	4	84	8	0	0	0	25
	2003-04	0	54	46	0	0	3	35
	2004-05	5	53	42	0	0	3	22
Totals for all Unit 14	2000-01	0	84	16	0	0	0	32
	2001-02	0	92	8	0	0	1	26
	2002-03	3	91	6	0	0	1	32
	2003-04	0	57	43	0	0	1	35
	2004-05	3	60	27	0	0	3	30

Table 11 Subunit 13D successful mountain goat hunter transport methods, 2000-2005

Regulatory year	Percent of harvest						Highway vehicle	<i>n</i>
	Airplane	Horse	Boat	3- or 4-wheeler	Snowmachine	ORV		
2000-01	50	25	0	0	0	0	25	4
2001-02	67	17	0	0	0	0	17	6
2002-03	40	0	0	0	0	0	60	5
2003-04	36	9	0	0	0	0	55	11
2004-05	30	0	10	0	0	10	50	10

Table 12 Unit 14 successful mountain goat hunter transport methods (registration hunts only), 2000-2005

Area ^a	Regulatory Year	Percent of harvest								n
		Airplane	Horse	Boat	3- or 4-wheeler	Snowmachine	ORV	Highway vehicle	Unknown	
RG866	2000-01	80	0	10	10	0	0	0	0	10
Subunit 14A	2001-02	67	0	0	33	0	0	0	0	3
	2002-03	88	0	0	0	0	0	0	12	8
	2003-04	75	0	0	25	0	0	0	0	8
	2004-05	25	0	13	13	0	13	0	38	8
RG868	2000-01	67	0	0	0	0	0	33	0	3
Subunit 14C	2001-02	0	0	0	0	0	0	0	100	1
Twentymile	2002-03	0	0	33	0	0	0	67	0	3
River	2003-04	20	0	0	0	0	40	40	0	6
	2004-05	20	0	60	0	0	0	20	0	5
RG869	2000-01	100	0	0	0	0	0	0	0	15
Subunit 14C	2001-02	100	0	0	0	0	0	0	0	15
Lake	2002-03	100	0	0	0	0	0	0	0	17
George	2003-04	90	0	2	0	0	0	0	5	22
	2004-05	82	0	0	0	0	0	0	18	11
RG878	2003-04	0	0	0	0	0	0	0	100	1
Subunit 14C	2004-05	0	0	0	0	0	0	0	0	0
Twentymile River (archery)										
RG879	2003-04	100	0	0	0	0	0	0	0	1
Subunit 14C	2004-05									0
Lake George (archery)										

Area ^a	Regulatory Year	Percent of harvest								<i>n</i>
		Airplane	Horse	Boat	3- or 4-wheeler	Snowmachine	ORV	Highway vehicle	Unknown	
Totals	2000-01	94	0	0	0	0	0	6	0	18
for all	2001-02	94	0	0	0	0	0	0	6	16
Subunit 14C	2002-03	85	0	5	0	0	0	10	0	20
	2003-04	70	0	7	0	0	7	7	10	30
	2004-05	63	0	19	0	0	0	6	12	16
Totals	2000-01	88	0	4	4	0	0	4	0	28
for all	2001-02	90	0	0	5	0	0	0	5	19
Unit 14	2002-03	89	0	4	0	0	0	7	4	28
	2003-04	71	0	5	5	0	5	5	8	38
	2004-05	63	0	21	5	0	5	5	26	30

^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 2003-04.



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.



Photo by Kevin White, ADF&G