Species Management Report ADF&G/DWC/SMR-2012-3

Mountain goat management report of survey-inventory activities, 1 July 2009–30 June 2011

Patricia Harper, editor

2012

Alaska Department of Fish and Game Division of Wildlife Conservation

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Alaska Department of Fish and Game
Division of Wildlife Conservation
P.O. Box 115526
Juneau, Alaska 99811-5526

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Species management reports provide information about species that are hunted or trapped and management actions, goals, and recommendations for those species. Detailed information is prepared for each species every two or three years, depending on the species, by the area management biologist for game management units in their areas. Reports are not produced for species that are not managed for hunting or trapping or for areas where there is no current or anticipated activity. The individual unit reports are compiled in this statewide report. Unit reports are reviewed and approved for publication by regional management coordinators.

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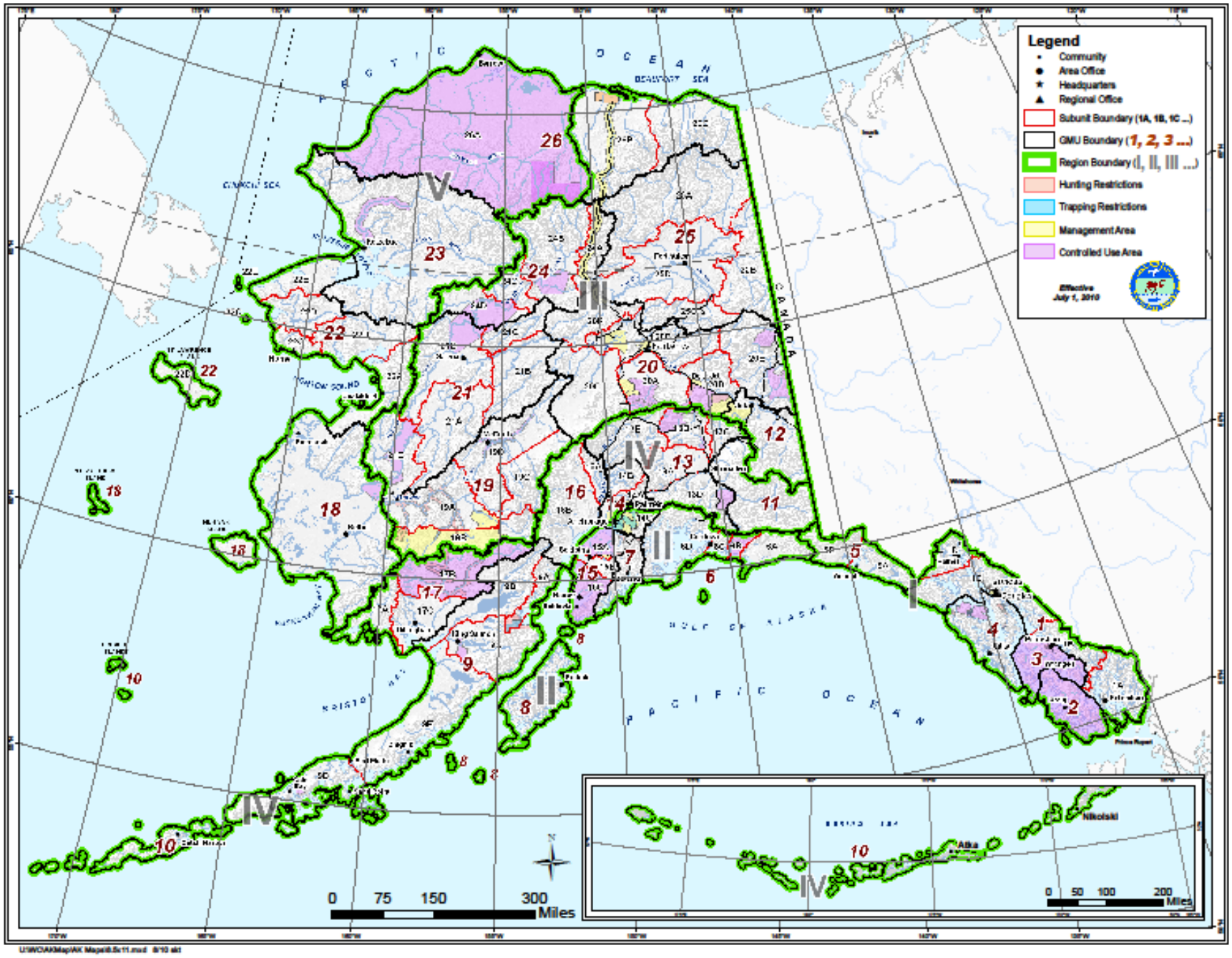
Cover Photo: An old billy stands on a hillside near Juneau, Alaska. ©2009 Mark O'Brien.

MOUNTAIN GOAT MANAGEMENT REPORT

From: 1 July 2009
To: 30 June 2011

TABLE OF CONTENTS


Legend
Community
Area Office
Headquarters
Regional Office
Subunit Boundary (1A, 1B, 1C ...)
GMU Boundary (1, 2, 3 ...)
Region Boundary (I, II, III ...)
Hunting Restrictions
Trapping Restrictions
Management Area
Controlled Use Area
Effective July 1, 2010
0 75 150 300 Miles
0 50 100 200 Miles
Nikolski
Atka
BERING SEA
PACIFIC OCEAN
GULF OF ALASKA
CANADA

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Division of Wildlife Conservation
PO BOX 115526
JUNEAU, AK 99811-5526

MOUNTAIN GOAT MANAGEMENT REPORT

From: 1 July 2009
To: 30 June 2011

LOCATION

GAME MANAGEMENT UNIT: 1A (5,000 mi^2)

GEOGRAPHIC DESCRIPTION: Ketchikan area including mainland areas draining into Behm and Portland Canals

BACKGROUND

Severe winter weather conditions during 1968–1975 resulted in up to 90% reductions in Unit 1A mountain goat (*Oreamnos americanus*) populations (Smith 1984). Subsequent moderating weather enabled populations to recover and we believe they are currently stable at moderate 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 goat introductions to Swan Lake (17 goats) in 1983 (Smith and Nichols 1984) and Deer Mountain (15 goats) in 1991 (Paul 2009).

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 3 to 6 of the unit's 14 established TCAs each fall as weather and work schedules allow. TCAs vary in size 23–200 mi^2. We generally initiate surveys during late July, August or September, and begin daily survey efforts during 0500–0800 or 1700–1900 hours. This report contains a summary of the 2009 and 2010 regulatory years.

We obtain hunt and harvest information through mandatory reporting associated with registration permit hunt RG001 and drawing permit hunt DG003 near Ketchikan. Information collected includes the general location 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 individual annulus length.

Guideline harvest levels are established for goats within each TCA. To accomplish this we use the number of goats observed within a TCA during annual fall surveys, then apply a guideline harvest of 6 harvest points per 100 adult goats observed. This is dependent on the survey conditions being good enough to consider the survey reliable. Points are weighted more heavily for females (2 points) than for males (1 point). A weighted point system is applied to the 3-year running average of the annual harvest to determine a guideline harvest level. For instance, if 6 points are allowed in a hunt area, then for any given 3-year period, the cumulative points for an area should not exceed 18. In this way, if 7 points are taken one year, and 8 the next, then the third year point allowance would be reduced to 3. Hunt areas that reach the harvest level 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 assume that some animals die during the winter and consequently fewer animals would be available for the following hunting season. Our management strategy of using 6 points per 100 goats on a 3-year running average and careful monitoring of environmental conditions throughout the unit assures that we keep hunter harvest and mortality associated with environmental factors at a level the population can withstand.

Data are summarized by regulatory year (RY), which begins 1 July and ends 30 June (e.g., RY09 = 1 July 2009 through 30 June 2010).

RESULTS AND DISCUSSION

POPULATION STATUS AND TREND

During fall 2009 we completed aerial surveys in 7 of the TCAs: K-5 Marten Arm to Portland, K-6 Cleveland Peninsula, K-7 Yes Bay to Bradfield, K-9 Chickamin River to 2722, K-12A Mirror Lake to Swan Lake, K-12B Swan Lake and K-13 Deer Mountain. During 2010 we completed surveys in 5 of the TCAs: K-3 Rudyerd to Smeaton, K-9 Chickamin River to 2722, K-12A Mirror Lake to Swan Lake, K-12B Swan Lake and K-13 Deer Mountain (Table 1). Compiling these surveys during the past two years we observed 1,177 goats in 16.9 hours of flying. The 80

goats/hour observation rate was slightly higher than in recent years. The ratio of 30 kids per 100 adults was within the range of 17–47 from the previous 8 years (Table 2).

Population Size

Although we have data from numerous goat surveys in recent years, the results of these types of aerial mountain goat surveys can be interpreted only as minimum population values (Ballard 1975), and not as a population estimate. However, because of our strategy of managing the goat harvest conservatively, we use these minimum counts as the basis of setting our guideline harvest levels. We developed population estimates for goats inhabiting Unit 1A using historical survey data (ADF&G unpublished report, 1990, Ketchikan) and the sightability correction factor developed by Smith and Bovee using radiocollared goats (1984). To derive our estimate, we first delineated the percentage of each Wildlife Analysis Area (WAA) that we believed contained suitable goat habitat. Then we applied our survey-derived estimate of 1.27 goats/mi^2 to these areas, which resulted in a mainland estimate of 3,000–4,000 goats. This estimate is based on using all goat habitat in the unit and an average goat density in good habitat calculated from previous aerial surveys. We believe this is the best overall estimate available for Unit 1A goat numbers. We estimate goat numbers in the DG003 drawing hunt area each fall to reference in establishing numbers of drawing permits. We do not attempt to estimate annual goat numbers in the remainder of Unit 1A, which is managed under registration permit (RG001).

We estimate that the Deer Mountain population within the DG003 hunt area currently numbers about 150 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. New sightings of goats as recently as 2010 outside the typical habitat in this area suggest goats are pushing out in search of additional habitat.

Population Composition

A series of mild winters, likely resulting in only moderate bear and wolf predation, and good habitat conditions, have all contributed to healthy goat numbers in this unit as a whole. However, repeated aerial surveys of Deer Mountain in RY09 yielded both low total goat numbers and low kid-to-adult ratios. The drawing permit allocation for RY10 was adjusted downward accordingly. However during fall 2010 observed goat numbers were back up and kids:100 adult ratios were in the expected range when compared to historical data. We will continue to keep a close watch on these survey numbers and issue permit numbers accordingly.

Distribution and Movements

We continue to be concerned about disturbance to goats in these drawing hunt areas located on Revilla Island because of the high number of daily over flights by both fixed wing and rotary aircraft. This area is directly in the flight path of tourist flights going and returning from Misty Fiords National Monument, a popular cruise ship passenger flight seeing destination.

The Cleveland Peninsula portion of Unit 1A remains closed to goat hunting (Porter 2004). We initiated a sightability study along the lower Cleveland in fall of 2009. Seven goats were fitted with GPS radio collars and are providing us with a good reference to develop a sightability correction factor for aerial surveys in this area and to help identify critical winter habitat.

Currently our estimate of goat numbers remains at about 50 animals for the entire Cleveland area and do not appear to be increasing at this time. This area produced world class trophy goats in the past; some of the top 10 Boone and Crocket record book goats were harvested from the Cleveland Peninsula.

Sealaska Native Corporation began cutting timber along the western slope of the Cleveland Peninsula near Jim Creek during summer 2010 and will continue building roads and harvesting old growth timber for several years. Once we recover GPS radio collars from goats in this timber harvest area we will have better insight toward determining how this winter habitat loss might affect Cleveland goats in the future. This timber harvest and removal of important goat winter habitat likely will have a negative impact on mountain goats especially near Ship and Black Bear Mountains. Because of this, we are likely to see fewer goats using this area after the current timber harvest.

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 goat by registration permit only	1 Aug–31 Dec
Unit 1A, remainder of Revillagigedo Island:	
1 goat by drawing permit DG003 only	15 Aug–31 Dec

Board of Game (BOG) Actions and Emergency Orders. During the 2010 BOG meeting in Ketchikan there was public interest in harvesting goats from a previously closed area north of Deer Mountain. Starting fall 2011 (RY11) we opened an additional drawing hunt near Neets Bay (DG005). DG003 was replaced by this Neets Bay hunt (DG005) and an additional nearby area was created south of the previous DG003 area (DG007) to move some of the hunting effort to this previously underutilized area. Hunting and harvest from these new drawing goat hunts will be discussed in the next management report.

Hunter Harvest. Registration permit hunt RG001: One hundred permits and 102 permits were issued for registration permit hunt RG001 in Unit 1A during RY09 and RY10, respectively (Table 3). Thirty-five hunters killed 22 goats in RY09 and 38 hunters killed 14 goats during RY10. The RY10 harvest was slightly below the past 8-year average of 19 goats and RY09 was slightly above the average (range 13–27). The RY10 harvest also included one of the highest percentage of female goats (Table 3). Total RG001 goat hunters in the field during RY09 was the lowest on record and RY10 was also at the lower end of the past 8-year trend (range 25–52; Table 4).

Drawing Permit Hunt DG003: Goat hunting in Unit 1A has historically been managed by registration permit for the past 27 years. To open a new area to hunting because of healthy numbers of goats, a drawing permit (DG003) was issued for the first time during RY06 for the area on Revillagigedo Island near Deer Mountain. Twelve drawing permits were available starting fall of 2006 with the season from 15 August–31 December. The number of drawing applicants has increased each year for this new drawing hunt and RY10 reached a high of 334 applications. Twelve goats and three goats were harvested during RY09 and RY10 respectively from the DG003 hunt during this report period (Table 5). Hunters obtaining DG003 permits are often first-time big game hunters or at least first-time goat hunters. We require all drawing permit winners to visit our office for a brief hunt orientation before going afield. We take that opportunity to educate them about the importance of harvesting male goats and about good alpine range estimation techniques. We also emphasize the importance of being respectful of other user groups in the area, especially during the early part of the fall hunting season when hikers and campers are using this same area for nonhunting recreation.

Hunter Residency and Success. Throughout Alaska, nonresident hunters must contract with a licensed Big Game Guide to hunt mountain goats or be accompanied by a second degree kindred relative. Two and 4 nonresidents hunted goats successfully in Unit 1A (RG001) during RY09 and RY10 respectively (Table 4). Seventy three percent and 43% of the RY09 and RY10 harvests, respectively, were by hunters residing within the subunit. Alaska residents were responsible for 91% of the RY09 harvest and 71% of the RY10 harvest (Table 4). Successful nonresident hunters spent more time than residents to kill a goat during both years. This likely represents more trophy selectivity by nonresident hunters accompanied by a registered guide.

Since RY96, approximately 50% of hunters on average who register for RG001 actually report hunting effort and about 28% of those hunters are successful each year (Table 3).

The first hunting season in this area was initiated by drawing permit DG003 during fall of 2006. Twelve drawing permits were issued during both RY06 and RY07, with the season running 16 August–31 December. Six goats were harvested during each of those seasons. During RY08 we issued 20 permits and 4 goats were harvested. During RY09 we issued 25 permits and hunters harvested 12 goats. For the RY10 season, after repeated low survey numbers and high female harvest the year before, we issued only 4 DG003 permits and hunters killed 3 goats (Table 5). Ninety-two and 97% of hunters with DG003 drawing permits actually hunted during RY09 and RY10, respectively.

Harvest Chronology. Typically, most of the registration permit goat harvest in the unit is split between August and September with a few animals taken during October, depending on weather

patterns. During RY09 and RY10, most of the harvest occurred August through October (Table 6). October is becoming more popular as more nonresident hunters hire licensed big game guides and wait until later in the season for the goats to acquire longer hair and better hide quality. The DG003 drawing goat hunting effort and success are more spread out over the fall season than that of the registration permit harvest, including some goats taken in November. The dispersed nature of this harvest chronology is due to hunters having better access to the hunt area; they are not limited by stormy boating weather or poor flying conditions as are hunters who pursue goats in most of the remainder of the unit. This drawing hunt area near Ketchikan is accessible via maintained hiking trails from paved roads originating from Ketchikan.

Transport Methods. Airplanes accounted for 55% and 71% of the transportation used by successful hunters in the registration hunt RG001 during the past two seasons, respectively (Table 7). Airplanes have accounted for 76% of the transportation used by Unit 1A hunters during the past 11 seasons (range 50–100%). The balance of goat hunters used boats to access hunting areas. There is no road access to (RG001) Unit 1A mountain goats.

Horn Growth Rates. We had greater success this report period getting hunters to submit their horns from harvested goats to ADF&G for measurement of growth annuli. Observed horn growth, especially during the first 3 years of life, appears to be highest in the two introduced populations of goats, including the Mahoney Mountain and Reid Mountain herds.

CONCLUSIONS AND RECOMMENDATIONS

Mountain goat populations appear to be stable throughout most of Unit 1A. We will continue to monitor goat numbers on the Cleveland Peninsula, a portion of Unit 1A west of Ketchikan that remains closed to hunting because of goat population viability concerns. We will continue the new sightability study on the Cleveland and make multiple aerial counts each year to monitor changes. Sealaska Native Corporation's timber harvest along the Cleveland will remove critical winter habitat important for goats and reduce carrying capacity for Cleveland goats in the near future.

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 the DG003 drawing hunt and determine the number of permits to offer based on recent survey counts.

We will continue to monitor disease outbreaks and educate hunters prior to their handling goats during the hunting season. Also, we will continue to educate hunters about the importance of harvesting male goats and how to identify male goats in the field.

The new drawing permit hunt (DG003) has been very popular, with about 50% hunter success each year. We remain concerned about air traffic disturbance, both fixed wing and helicopter, to goats in the drawing area. This herd is close to town and directly in the flight path of the high volume tourist flights going and coming back from Misty Fiords National Monument. We continue to monitor this situation.

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PREPARED BY:

Boyd Porter
Wildlife Biologist

SUBMITTED BY:

Neil Barten
Management Coordinator

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Table 1. Unit 1A mountain goat trend count area surveys, regulatory years 2000 through 2010.

Survey Area	Year	Adults	Kids	Total Goats	Survey Time (hrs)	Goats Observed/hr	Kids:100 Adults	Sets of Twins
K-3	2010	83	22	105	1.5	70	27	2
	2006	115	28	143	1.5	95	24	0
	2001	86	27	113	1.8	63	31	2
	2000	60	13	73	1.5	48	22	0
K-4	2002	54	14	68	0.9	76	26	0
	2000	73	10	83	1.0	83	14	2
K-5	2009	89	34	123	1.7	72	38	1
	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
K-6	2009	22	7	29	1.0	29	32	0
	2008	11	7	18	1.0	18	64	0
	2007	22	6	28	0.8	35	27	0
	2006	30	6	36	0.8	45	20	0
	2005	22	7	29	1.0	29	32	0

Table 1 continued.

Survey Area	Year	Adults	Kids	Total Goats	Survey Time (hrs)	Goats Observed/hr	Kids:100 Adults	Sets of Twins
K-6 cont.								
	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
K-7								
	2009	38	18	56	1.7	33	47	1
	2006	43	10	53	1.5	35	23	0
	2005	67	10	77	1.5	51	15	0
	2003	60	26	86	2.0	43	43	2
	2002	57	15	72	1.5	48	26	1
	2001	58	15	73	1.4	52	26	0
K-9	2010	85	22	107	2.0	54	26	0
	2009	41	11	52	1.7	31	27	0
	2007	64	12	76	1.5	51	19	4
	2003	19	5	24	0.9	27	26	1
	2002	37	7	44	1.3	34	19	0
	2001	29	6	35	1.0	34	21	2

Table 1 continued.

Survey Area	Year	Adults	Kids	Total Goats	Survey Time (hrs)	Goats Observed/hr	Kids:100 Adults	Sets of Twins
K-12A	2010	75	22	97	1.0	97	29	1
	2009	51	24	75	0.4	188	47	0
	2002	21	8	29	0.3	97	38	2
	2000	26	7	33	0.8	41	27	0
K-12B	2010	56	20	76	1.0	76	36	2
	2009	54	18	72	1.4	51	33	1
	2007	60	15	75	1.0	75	25	2
	2004	56	20	76	1.0	76	36	1
	2002	35	16	51	0.5	102	46	0
	2000	76	21	97	1.2	81	28	0
K-13	2010	97	35	132	1.0	132	36	0
	2009	80	5	85	1.0	85	6	0
	2008	61	27	88	1.0	88	44	1
	2007	106	31	137	1.0	137	29	2
	2006	60	16	76	0.8	95	27	0
	2005	95	14	109	1.0	109	15	0
	2003	67	19	86	0.5	172	28	1
	2002	46	18	64	0.8	80	39	0
	2001	64	23	87	0.5	174	36	5
	2000	35	14	49	0.4	123	40	0

Table 2. Unit 1A mountain goat survey data, regulatory years 2000 through 2010.

Survey Dates	Nr Kids	Nr. Adults	Total Goats	Kids:100 Adults	Count Time (hrs.)	Goats/ Hour
Aug. 23–Oct. 4, 2000	79	356	435	22	7.1	61
July 24–Oct 11, 2001	130	487	617	27	8.6	72
Aug 24–Oct 10, 2002	116	439	555	26	7.7	72
Aug 5–Sept 22, 2003	134	345	479	39	6.6	73
Sept 10, 2004	**7**	**9**	**16**	**78**	**1.1**	**15**
Aug 16–Aug 25, 2005	31	184	215	17	3.5	61
Aug 16–Oct 3, 2006	60	248	308	24	4.5	68
Aug 16–Oct. 5, 2007	78	295	373	26	4.8	78
Aug 10–Oct 2, 2008	34	72	106	47	2.0	53
Sept 25–Oct 7, 2009	153	507	660	30	10.4	79
July 28–Sept 15, 2010	121	396	517	31	6.5	80
Average[a]	95	330	426	22	6.0	71

[a] Overall average does not include the single trend area count during 2004.

Table 3. Unit 1A mountain goat harvest data by registration permit hunt, regulatory years 2000 through 2010.

Hunt	Regulatory Year	Permits issued	Did not hunt	Unsuccessful hunters	Successful hunters	Harvest						Total harvest
						Males	(%)	Females	(%)	Unk	(%)	
RG001												
	2000	154	100	31	23[a]	14	(58)	10	(42)	0	(0)	24
	2001	132	87	22	23	17	(74)	5	(22)	1	(4)	23
	2002[b]	123	72	35	16	8	(50)	8	(50)	0	(0)	16
	2003	138	85	35	18	10	(56)	8	(44)	0	(0)	18
	2004	121	79	20	22	16	(73)	6	(27)	0	(0)	22
	2005	106	54	25	27	13	(48)	12	(44)	2	(7)	27
	2006	101	56	31	14	11	(79)	3	(21)	0	(0)	14
	2007	98	56	29	13	10	(77)	3	(23)	0	(0)	13
	2008	118	74	25	19	16	(84)	3	(16)	0	(0)	19
	2009	100	56	13	22	16	(73)	6	(27)	0	(0)	22
	2010	102	54	24	14	8	(57)	6	(43)	0	(0)	14
	Average	118	70	26	19	13	(66)	6	(33)	0	(0)	19

[a] One hunter killed 2 goats (23 hunters killed 24 goats).
[b] Regulation changed; bag limit reduced to one goat per season.

Table 4 Unit 1A mountain goat hunter residency and success, regulatory years 2000 through 2010, hunt RG001.

	Successful					Unsuccessful					
Regulatory year	Local[a] resident	Nonlocal resident	Nonresident	Total	(%)	Local[a] resident	Nonlocal resident	Nonresident	Total	(%)	Total hunters
2000	8	5	10	23	(43)	24	4	3	31	(57)	54
2001	10	4	9	23	(51)	17	2	3	22	(49)	45
2002	6	3	7	16	(31)	20	7	8	35	(69)	51
2003	9	3	6	18	(34)	25	6	4	35	(66)	53
2004	14	7	1	22	(52)	19	1	0	20	(48)	42
2005	13	9	5	27	(52)	20	3	2	25	(48)	52
2006	4	2	8	14	(31)	22	3	6	31	(69)	45
2007	4	0	9	13	(31)	24	4	1	29	(69)	42
2008	7	4	8	19	(43)	15	3	7	25	(57)	44
2009	16	4	2	22	(79)	5	1	0	6	(21)	28
2010	6	4	4	14	(27)	18	2	3	23	(63)	37
Average	9	4	6	19	(43)	19	3	3	26	(56)	45

[a] Local resident hunters reside in Unit 1A.

Table 5. DG003 Deer Mountain area drawing permit hunt, regulatory years 2006–2010.

Regulatory year	Applications	Number permits issued	Harvest male	Harvest female	Hunted	Aerial survey count
2006[a]	202	12	4	2	11	109
2007	150	12	5	1	10	137
2008	252	20	3	1	13	88
2009	255	25	6	6	15	85
2010	334	4	2	1	4	132
Average	239	15	4	2	11	110

[a] First year drawing permits issued.

Table 6. Unit 1A goat harvest chronology percent by month, regulatory years 2000 through 2010, hunt RG001.

Regulatory year	Aug	(%)	Sep	(%)	Oct	(%)	Nov	(%)	Dec	(%)	Unk	(%)	n
2000	4	(17)	7	(29)	9	(38)	1	(4)	3	(12)	0	(0)	24
2001	7	(30)	10	(44)	5	(22)	0	(0)	0	(0)	1	(4)	23
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
2005	10	(37)	7	(26)	7	(26)	2	(7)	1	(4)	0	(0)	27
2006	3	(21)	3	(21)	7	(50)	0	(0)	0	(0)	1	(8)	14
2007	2	(15)	6	(46)	4	(31)	1	(8)	0	(0)	0	(0)	13
2008	3	(16)	11	(58)	5	(26)	0	(0)	0	(0)	0	(0)	19
2009	9	(41)	5	(23)	8	(0)	0	(0)	0	(0)	0	(0)	22
2010	6	(43)	6	(43)	2	(14)	0	(0)	0	(0)	0	(0)	14
Average	5	(27)	7	(37)	6	(26)	<1	(3)	<1	(1)	1	(1)	19

Table 7. Unit 1A mountain goat harvest percent by transport method, regulatory years 2000–2010.

Regulatory	Harvest percent by transport method						
year	Airplane	Air (%)	Boat	Boat (%)	Unk	Unk.(%)	n
2000	18	(75)	6	(25)	0	(0)	24
2001	16	(73)	6	(27)	1	(4)	23
2002	12	(75)	4	(25)	0	(0)	16
2003	18	(100)	0	(0)	0	(0)	18
2004	11	(50)	10	(45)	1	(5)	22
2005	22	(81)	5	(19)	0	(0)	27
2006	12	(86)	2	(14)	0	(0)	14
2007	10	(77)	2	(16)	1	(7)	13
2008	18	(95)	1	(5)	0	(0)	19
2009	12	(55)	10	(45)	0	(0)	22
2010	10	(71)	4	(39)	0	(0)	14
Average	14	(76)	5	(24)	<1	(1)	19

Alaska Department of Fish and Game
Division of Wildlife Conservation
PO BOX 115526
JUNEAU, AK 99811-5526

MOUNTAIN GOAT MANAGEMENT REPORT

From: 1 July 2009
To: 30 June 2011

LOCATION

GAME MANAGEMENT: Unit: 1B (3,000 mi^2)

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

BACKGROUND

HABITAT DESCRIPTION

Mountain goats in Southeast Alaska use alpine, subalpine and 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).

The Alaska Department of Fish and Game (ADF&G) does not have an estimate for the amount of suitable goat habitat in Unit 1B. About 850 square miles is 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 that include some logging roads. Clearcuts and pole stands are considered poor goat winter habitat and roads can make goats vulnerable to exploitation due to 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 derived from 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. After statehood in 1959, season dates varied and normally fell 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. RG001 (formerly 801), is that portion of Unit 1B south of the North Fork Bradfield River, while RG004 (formerly 804), is that portion of the subunit north of the North Fork Bradfield River.

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.

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 closure remains in effect today. In a separate action, the Board also reduced the bag limit under state regulations from 2 goats to 1 goat in that portion of Unit 1B south of the Bradfield Canal and the North Fork Bradfield River. However, federal subsistence regulations continue to allow rural residents of Units 1B and 3 to harvest a second goat, by federal permit, in that portion of Unit 1B located south of Le Conte Bay and north of the North Fork Bradfield River.

In fall 2006, the Board of Game adopted a department-sponsored proposal prohibiting the taking of nannies accompanied by kids in Units 1–5. Since 2006, no additional changes to goat hunting regulations in unit 1B have taken place.

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. The harvest has remained relatively stable, averaging 20 goats per year for the 10-year period through 2008. The overwhelming majority of the annual harvest occurs in RG004, that portion of the subunit north of the North Fork Bradfield River.

Historical hunter residency patterns

Petersburg and Wrangell residents have historically represented the largest group of hunters and traditionally harvested most of the goats taken in the unit each year. However, those trends have weakened in recent years. For the first time in 2001, and again in 2002, 2004, 2005 and 2008, the

harvest by nonresidents exceeded that of local residents (residents of Petersburg, Wrangell, or Kake). And in 2004 for first time since at least 1984, the number of goats harvested by nonlocal residents also exceeded the number taken by local residents.

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. Since then, 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. Despite increasing interest in taking a late season goat with prime pelage, it was not until 2009 that the number of goats taken in December once again surpassed that of any other month. Inclement winter weather frequently hampers late-season goat hunting effort and success by restricting boat travel and reducing goat sightability. Additionally, because of the early season closure within the drainages of Le Conte Bay and the Wilkes Range in 2004 and Horn Cliffs, Thunder Mountain, Le Conte Bay and Wilkes Range in 2005, late season hunting in these areas was not an option. In recent years, interagency efforts to limit the number of guided hunts during the late season have reduced the percentage of the harvest occurring during the late season. (See Nonregulatory management problems/needs below.)

Historical harvest locations

Since 1985 the largest percentages of the Unit 1B goat harvest have 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 saltwater access points. Hunters access goat habitat by hiking up from saltwater, boating on river drainages, or driving logging roads, or by using floatplanes to fly into a few usable subalpine and alpine lakes in the subunit. The few high elevation lakes suitable for landing aircraft are generally accessible only during the early season before lakes freeze over.

Goats can become increasingly accessible to hunters from saltwater later in the season when snow typically forces them to lower elevation winter range. In Unit 1B these areas include Horn Cliffs, 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:

- Conduct aerial surveys to establish the minimum number of goats needed to maintain harvest opportunities for the Le Conte Bay management area.

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

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

- Maintain a guideline harvest not to exceed 6 points per 100 goats observed (where male goats = 1 point, and female goats = 2 points) during at least 2 consecutive surveys in management areas.

METHODS

We flew aerial surveys within established trend count areas to obtain the number of goats and the percentage of kids in the population. We used the results of the aerial surveys to establish harvest objectives for specific mountain goat populations within each registration hunt area. These objectives allow for a harvest quota of 5–6 points per 100 goats observed based on the most recent aerial survey and population trend data. Male goats count as 1 point and females 2 points toward the allowable harvest quota. Once the harvest quota has been achieved for a specific goat population, emergency orders are issued closing the goat hunting season in that area. To avoid localized depletion of goats, the 5–6 point 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 are 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.

Harvest and other data were summarized by regulatory year (RY), which begins 1 July and ends 30 June (e.g., RY09 = 1 July 2009–30 June 2010).

RESULTS AND DISCUSSION

POPULATION STATUS AND TREND

Data are insufficient to determine precise goat population trends in Unit 1B. Although data specific to goats in Unit 1B are scarce, available information indicates that with the exception of the Cleveland Peninsula, most Unit 1B goat populations have remained relatively stable since RY00.

The portion of Game Management Units 1(A) and 1(B) on the Cleveland Peninsula south of the divide between Yes Bay and Santa Anna Inlet closed to hunting in RY02 will remain closed until such time as the goat population recovers sufficiently to provide harvest opportunity.

Population Size

Precise population estimates are not available for goats in the subunit. U.S. Forest Service (USFS) and ADF&G biologists estimated that Unit 1B could support approximately 1,219 goats based on the availability of suitable winter habitat indicated by a mountain goat habitat capability model (Suring 1993).

Population Composition

Table 1 shows the past 9 years of age composition data from aerial trend counts. Differences in sample size occur because of annual differences in survey coverage and because inclement

weather frequently makes complete surveys difficult. In the September 2009 surveys, 271 goats were observed and 22% of the goats classified were kids. In the September 2010 surveys, 607 goats were observed and 21% of the goats classified were kids. Annual differences in survey coverage and uncertainties about the sightability of goats during aerial surveys make it difficult to develop precise population estimates for the entire unit. Nonetheless, aerial surveys provide valuable information with which to establish harvest guidelines and monitor population trends within select portions of the broader unitwide goat population. Because not all of the 27 individual trend count areas in Unit 1B can be surveyed annually, survey efforts typically focus on trend count areas that receive the most hunting pressure.

Distribution and Movements

Until recently, quantitative data on goat movement patterns and winter diet were limited to data obtained from radiotelemetry studies conducted in Unit 1C (Schoen1979), Unit 1A, and the extreme southern portion of Unit 1B (Smith 1982). Radiotelemetry studies currently underway in subunits 1A, 1B, 1C, and 1D are beginning to provide valuable information on the seasonal movement patterns and survival rates of goats on the Unit 1 mainland (White 2006, White et al. 2007, White and Barten 2009, White and Pendleton 2010, White et al. 2010). 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 slopes or steep slopes with little snow cover and may 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 Alaska goats. Males move between major ridge complexes, whereas females remain on ridges where they were captured. Inter-ridge movement by males appears to be associated with the rut and contributes to relatively large winter home ranges. Inter-ridge movements by males may be important for preventing problems associated with inbreeding.

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

MORTALITY

Harvest

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

Board of Game Actions and Emergency Orders. The Board of Game took no actions affecting Unit 1B goat hunting, and no emergency orders were issued during this report period.

Hunter Harvest. The RY09 and RY10 Unit 1B harvests of 13 and 11 goats, respectively, were each well below the mean harvest of 19 goats annually during the preceding 10-year period (Table 2). The harvest of 13 goats in RY09 and 11 goats in RY10 were the third lowest and second lowest goat harvests, respectively, in Unit 1B since at least 1984. We do not believe the relatively low harvest during the report period is indicative of a significant population decline; rather it is primarily attributed to reduced hunter effort. It should be noted that the continued season closure in that portion of RG001 on the Cleveland Peninsula south of the divide between Yes Bay and Santa Anna Inlet likely limited the harvest to some degree. Hunter success was 25% in RY09 and 26% in RY10, improved from the previous report period, but still below the preceding 10-year average 33% success rate. In RY09 and RY10 males composed 92% and 64% of the harvest, respectively. The sex of harvested goats was obtained from registration hunt reports and was not verified by checking hunter kills. We distributed literature and made available videotapes designed to help hunters identify male goats in the field and encouraged them to select males.

In RY09 a total of 16 nonresidents hunted goats in Unit 1B (Table 3). Of those, 15 employed the services of a big game guide and 1 was accompanied by next-of-kin. In RY10, 11 nonresidents hunted goats, all of whom employed big game guides. The number of goats harvested by guided hunters during the report period was 8 in RY09 and 6 in RY10.

Since RY04, we have witnessed a general decline in the number of local resident goat hunters taking to the field each year (Table 3). Local participation in goat hunting increased from 20 in

RY08, to 33 in RY09 before declining to 26 in RY10. The 26 local residents who took to the field in Unit 1B represents the second lowest local resident participation since at least 1984 and was well below the preceding 10-year average of 35 local resident hunters annually in Unit 1B.

Federal subsistence regulations allow qualified local residents to take a second goat in that portion of Unit 1B located south of Le Conte Bay and north of the North Fork Bradfield River. During the report period, no federal permits were issued for the taking of a second goat in the unit.

Hunter Residency and Success. During both years of the report period the harvest by nonresidents exceeded that of local residents (Table 3).

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 12% success; nonlocal residents had 23% success, and guided nonresidents 52% success. Many local residents 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 25% in RY09 and 26% in RY10. From 1999 to 2008, the average success rate for guided hunters in Unit 1B was 49% and ranged from 13 to 71%. During this report period the success rate for guided nonresident hunters was 50% in RY09 and 55%, in RY10. Because of the guide requirement, nonresident hunters typically enjoy the highest success rate and this was the case during the report period.

Geographical locations of harvest. Goat harvest occurred in 7 Unit 1B Wildlife Analysis Areas (WAAs) during this report period. These include WAAs in the Stanton Peak (#1602), Thomas Bay (#1603 and #1604), Patterson River to Thunder Mountain (#1605), Horn Cliff and Le Conte Bay (#1706), Stikine River (#1707) and Berg Mountain (#1811) areas. In 2009 harvest occurred in 6 WAAs, with #1605 providing 46% of the harvest, WAAs #1603 and #1706 each with 15%, followed by #1604, #1707, and #1811 each with 8% of the unit's total annual harvest. In 2010, harvest occurred in 6 WAAs with #1706 providing 27% of the total harvest followed by #1602, #1603, and #1605 each with 18%, and #1604 and #1707 each with 9% of the unit's total annual harvest.

Harvest Chronology. Winter weather, particularly during the late season, can have a profound influence on harvest chronology. The greatest proportion of the RY09 harvest occurred in December, November, and October, in descending order. The largest percentage of the RY10 harvest occurred in November, followed by September, and then August (Table 4).

Transport Methods. In recent years, the majority of successful hunters have reported using boats to access their hunt areas, and this was also the case during the report period. In RY09, 85% of successful hunters reported using boats, and 15% reported using airplanes to access their hunting area. In RY10, 64% of hunters reported using boats, and 36% reported using airplanes. During the report period, no successful hunters 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.

Although the disease is believed to be rare, goats displaying symptoms of contagious ecthyma, commonly called "orf," have been occasionally reported in the Horn Cliffs area of 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.

HABITAT

Assessment

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

During the report period, the Federal Energy Regulatory Commission decided not to renew a preliminary permit granting Cascade Creek, LLC of Bellingham, Washington exclusive rights to pursue hydroelectric development at Thomas Bay. Because any such development would involve construction of hydroelectric facilities and infrastructure amid prime goat habitat at Swan Lake, the potential impacts of potential hydroelectric development on mountain goat populations in the Thomas Bay area remains a concern for Unit 1B goat managers.

Enhancement

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

NONREGULATORY MANAGEMENT PROBLEMS/NEEDS

As related in past management reports (Lowell 2008) the results of aerial goat surveys can be interpreted only 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 continues to be needed to develop reliable methods of inventorying Southeast Alaska goat populations.

A persistent management issue is the potential for localized overharvest and potential conflicts between guided nonresident hunters and federally qualified subsistence hunters. The USFS has been concerned about maintaining sufficient harvest opportunity for federally qualified subsistence hunters. In an effort to halt the steady increase in the number of goats harvested annually by guided nonresidents in the GUA 01-06 portion of Unit 1B, action was taken in a 2006 cooperative agreement to both reduce and stabilize the number of guided hunts occurring annually (see details in Lowell 2008).

To ensure adequate goat hunting opportunity for local residents, in 2006 the USFS also modified GUA 01-06 guide use permits to exclude guided goat hunts within the drainages of Horn Cliffs, Thunder Mountain, Le Conte Bay, and the Wilkes Range unless specifically authorized by USFS and ADF&G managers. As part of this arrangement guides were informed that their permits could be amended in-season to allow limited guide use activity in this area if it appeared the goat population was likely to be underutilized by resident hunters. This was the case late in the RY09 season when 2 permitted guides requested and were granted authority to conduct 2 late-season goat hunts within the drainages of Horn Cliffs, Thunder Mountain, Le Conte Bay and the Wilkes Range. During the late RY10 season 2 permitted guides were again given authority to conduct 2 late-season goat hunts each in the area. During the report period there were no guided big game hunts conducted in the GUA 01-07 portion of Unit 1B.

Wounding loss, including nonreporting of goats mortally struck by hunters but unrecovered due to inaccessible terrain, remains a management concern.

CONCLUSIONS AND RECOMMENDATIONS

Variation in fall and winter weather conditions can have a profound influence on the annual goat harvest in Southeast Alaska. Following record snowfall in RY06, and well above average snowfall in RY07–RY08, winter weather was more moderate during the report period and hunter success improved in Unit 1B.

The RY09 and RY10 Unit 1B harvest of 13 and 11 goats, respectively, were well below the mean harvest of 20 goats annually during the preceding 10-year period. The harvest of just 13 goats in RY09 and 11 goats in RY10 were the third lowest and second lowest, respectively, unitwide harvest totals since at least 1984. Since RY04, the number of hunters taking to the field in search of Unit 1B goats has fallen well below the preceding 10-year average of 71 hunters per year. From RY04 to RY10 the number of hunters taking to the field averaged just 48 hunters per year. The 32 hunters in RY08, and 43 hunters in RY10, were the lowest and second lowest number of goat hunters since at least 1984. While 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 fall 2003 has probably limited the Unit 1B harvest to some extent, declines in the overall number of hunters going afield is at least partially responsible for the the relatively low unitwide harvest in recent years. Uncertainty about the sightability of goats during aerial surveys remains a primary concern with regard to establishing harvest guidelines for individual goat populations. Research currently underway in Units 1A, 1B, 1C, and 1D may provide a reliable sightability correction factor for use in estimating the total number of goats present based on the number observed during aerial census flights.

Although outside the State of Alaska's jurisdiction, we believe the 2-goat bag limit allowed under federal hunting regulations should to be reduced, at least in that portion of the unit 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.

Wounding loss and nonreporting of goats mortally struck by hunters but not recovered due to inaccessible terrain remains a management concern. Because of the increased vulnerability of goats during the late season, and possible localized overharvest in areas easily accessible from saltwater, we will continue to monitor the harvest carefully, particularly within the drainages of

Horn Cliffs, Thunder Mountain, Le Conte Bay, and Wilkes Range. Based on aerial survey data and hunter reports, goat populations appear stable in most of Unit 1B. Unitwide, hunting pressure is generally low, and tends to be concentrated close to communities in areas with easy access.

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PREPARED BY:

Richard E. Lowell
Wildlife Biologist III

SUBMITTED BY:

Neil Barten
Management Coordinator

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Table 1. Unit 1B summer aerial mountain goat composition counts, regulatory years 2000 through 2010.

Regulatory year[a]		Adults	(%)	Kids	(%)	Unknown	Kids: 100 adults	Total goats observed	Goats /hour
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
2005	(Aug. 2005)	480	(78)	135	(22)	0	28	615	70
2006	(Oct. 2006)	343	(83)	68	(17)	0	20	411	62
2007		0	0	0	0	0	0	0	0
2008	(Oct. 2008)	117	(81)	27	(19)	0	23	144	60
2009	(Sept. 2009)	211	(78)	60	(22)	0	28	271	60
2010	(Sept. 2010)	477	(79)	130	(21)	0	27	607	95

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

Table 2. Unit 1B mountain goat harvest data by permit hunt, regulatory years 2000 through 2010.

Hunt	Regulatory Year	Permits [a] issued	Nr hunted	(%) Did not hunt	Nr successful hunters	(%) successful hunters	Nr males	(%) males	Nr females	Total harvest
RG001	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
	2005		0		0	(0)	0	(0)	0	0
	2006		1		0	(0)	0	(0)	0	0
	2007		0		0	(0)	0	(0)	0	0
	2008		0		0	(0)	0	(0)	0	0
	2009		1		1	(0)	0	(0)	0	0
	2010		0		0	(0)	0	(0)	0	0
RG004	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
	2005	92	47	(49)	27	(57)	20	(74)	7	27
	2006	100	52	(48)	16[b]	(31)	15	(88)	2	17
	2007	102	54	(57)	12	(22)	8	(67)	4	12
	2008	71	32	(55)	6	(19)	6	(100)	0	6
	2009	99	52	(53)	13	(25)	12	(92)	1	13
	2010	107	43[a]	(60)	11	(26)	7	(64)	4	11

Table 2 continued.

Hunt	Regulatory Year	Permits [a] issued	Nr hunted	(%) Did not hunt	Nr successful hunters	(%) successful hunters	Nr males	(%) males	Nr females	Total harvest
Combined	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
	2005		47		27	(57)	20	(74)	7	27
	2006		53		16[b]	(30)	15	(88)	2	17
	2007		54		12	(22)	8	(67)	4	12
	2008		32		6	(19)	6	(100)	0	6
	2009		53		13	(25)	12	(92)	1	13
	2010		43[c]		11	(26)	7	(64)	4	11

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

[b] One hunter killed 2 goats, second goat via federal subsistence permit.

[c] While the registration permit summary in WinfoNet shows that 44 people hunted, there are only 43 verifiable records.

Table 3. Unit 1B mountain goat hunter residency and success, regulatory years 2000 through 2010.

	Successful					Unsuccessful					
Year	Local[a] resident	Nonlocal resident	Nonresident	Total	(%)	Local[a] resident	Nonlocal resident	Nonresident	Total	(%)	Total hunters
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
2005	11	4	12	27	(57)	12	3	5	20	(43)	47
2006	9	2	5	16	(30)	20	7	10	37	(70)	53
2007	5	3	4	12	(22)	30	4	8	42	(78)	54
2008	1	0	5	6	(19)	19	5	2	26	(81)	32
2009	5	0	8	13	(25)	29	3	8	40	(75)	53
2010	2	3	6	11	(26)	24	3	5	32	(74)	43

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

Table 4. Unit 1B mountain goat harvest chronology, percent by month, regulatory years 2000 through 2010.

	Month										
	August		September		October		November		December		Total
Year	n	(%)	n	(%)	n	(%)	n	(%)	n	(%)	harvest
2000	4	(15)	6	(22)	3	(11)	6	(22)	8	(30)	27
2001	5	(21)	5	(21)	4	(17)	9	(38)	1	(4)	24
2002	4	(29)	2	(14)	5	(36)	1	(7)	2	(14)	14
2003	6	(29)	6	(29)	8	(38)	1	(5)	0	(0)	21
2004	8	(35)	1	(4)	5	(22)	7	(30)	2	(9)	23
2005	11	(41)	6	(22)	3	(11)	5	(19)	2	(7)	27
2006	3	(18)	5	(29)	3	(18)	4	(24)	2	(12)	17
2007	3	(25)	0	(0)	4	(33)	2	(17)	3	(25)	12
2008	0	(0)	1	(17)	0	(0)	5	(83)	0	(0)	6
2009	1	(8)	1	(8)	2	(15)	4	(31)	5	(38)	13
2010	2	(18)	3	(27)	1	(9)	4	(36)	1	(9)	11

Table 5. Unit 1B mountain goat harvest, percent by transport methods, regulatory years 2000 through 2010.

	Percent of harvest						
Year	Airplane		Boat		Other		Total harvest
	n	(%)	n	(%)	n	(%)	
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
2005	9	(33)	18	(67)	0	(0)	27
2006	4	(24)	13	(76)	0	(0)	17
2007	5	(42)	6	(50)	1	(8)	12
2008	1	(17)	5	(83)	0	(0)	6
2009	2	(15)	11	(85)	0	(0)	13
2010	4	(36)	7	(64)	0	(0)	11

Alaska Department of Fish and Game
Division of Wildlife Conservation
(907) 465-4190 PO BOX 115526
JUNEAU, AK 99811-5526

MOUNTAIN GOAT MANAGEMENT REPORT

From: 1 July 2009
To: 30 June 2011

LOCATION

GAME MANAGEMENT UNIT: 1C (7,600 mi^2)

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

BACKGROUND

There are three main concerns regarding mountain goat management in Unit 1C: guided hunting, commercial helicopter tourism, and construction activity. 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 interest from registered guides to hunt goats in this area remains high, and will likely require the Alaska Department of Fish and Game (ADF&G) to address the high nonresident harvest through changes in management strategies to keep the nonresident harvest within acceptable limits. ADF&G continues to work with the U.S. Forest Service in allocating an appropriate number of permits, and distributing hunting effort in the Tracy and Endicott Arm area.

Since their origin in the early 1980s, helicopter flightseeing tours have become the signature adventure for cruise ship tourists while visiting Juneau. A heli-skiing company is operating in the Juneau area during the winter months. The effects these overflights have on mountain goat populations are unknown, but negative influence of this industry on goats is an issue of concern. There is currently not a monitoring plan in place for the Juneau area. ADF&G work cooperatively with the U.S. Forest Service to address helicopter overflight complaints, and too accomplish aerial mountain goat surveys on and near the Juneau icefield.

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. Coeur Alaska and the Alaska Department of Transportation (DOT) continue to provide funding to study mountain goat ecology in the mine and proposed Juneau Access Road Corridor. Sweetheart Lake, located in the southern portion of Unit 1C, has been identified as a possible hydroelectric site. Department staff has discussed mountain goat data needs and possible research associated with the project.

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 ensure 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 (billy = 1 pt., nanny = 2 pt.) per 100 goats observed.
- Conduct aerial surveys at least every 3 years in areas of high harvest.

METHODS

We flew aerial surveys within established trend count areas to obtain the number of goats and the percentage of kids in the population. We used the results of the aerial surveys to establish harvest objectives for specific mountain goat populations within each registration hunt area. These objectives allow for a harvest quota of 6 points per 100 goats observed based on the most recent aerial survey and population trend data. Male goats (billies) count as 1 point and females (nannies) 2 points toward the allowable harvest quota. Once the harvest quota has been achieved for specific goat populations, emergency orders are issued closing the goat hunting season in that area. To avoid localized depletion of goats, the point based 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 are 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.

Harvest and other data were summarized by regulatory year (RY), which begins 1 July and ends 30 June (e.g., RY09 = 1 July 2009–30 June 2010).

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: Tracy Arm, Endicott Arm, and from Taku Glacier to Mount Bullard in the Mendenhall Valley. Tracy and Endicott Arm goat hunts are managed under registration hunt RG013; hunts in the area between Taku Glacier and Mount Bullard are managed under an archery only registration permit (RG014); only the RG014 hunt area is open in this are with the remaining lands being closed to mountain goat hunting. Additional surveys were flown in

conjunction with research being conducted in Lynn Canal, including portions of Unit 1C and Unit 1D. White and Barten (2009) documented decreased survival in mountain goats in the study area. They reported that decreased survival is most likely due to severe winter weather conditions during the report period. When assessing population health and determining guideline harvest levels for mountain goats, we also need to consider the survival rate of the population.

Although these surveys represent a small portion of Unit 1C, other indications such as hunter effort and harvest information and anecdotal information from hunters, pilots, commercial guides, and ADF&G personnel suggest that goat populations are generally 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. An Emergency Order was issued in 2010 to close the mountain goat hunting season between Eagle Glacier and Davies Creek in registration hunt RG012; this area is accessible from the Juneau road system.

At their November 2010 meeting the Alaska Board of Game established a drawing permit hunt in the area of McGinnis Creek in the Mendenhall Valley and Herbert Glacier. Applications for this hunt will be taken in 2011 with the first hunt occurring in fall 2012.

Hunter Harvest. Seventy one goats were taken during this report period, 30 in RY09 and 41 in RY10 (Table 2); this period's harvest level is slightly lower than the previous report period, and is below the mean annual harvest of 44.5 goats taken between RY99 and RY06. For all of Unit 1C 104 and 105 points were available in RY09 and RY10, respectively. In RY09, 33 points were taken, and 46 were taken in RY10. In-season management of goat hunts in Southeast Alaska is common. Once harvest point levels have been reached department staff uses emergency orders to close the season. Goat hunters in Unit 1C generally check with the department prior to going into the field to hunt to get the current status of the hunt.

Males again made up a large part of the harvest (90%), higher than the previous report period of 89%. 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 best interest to insure their hunters take billies.

Because we do not require hunters to present goats for sealing, there is a possibility that the reported harvest of male goats is inflated, as hunters are sometimes reluctant to admit to killing a nanny. Region I research staff has developed a mountain goat identification quiz handout to assist hunters in selecting male goats to harvest. The quiz has been made available at all area wildlife offices and the on department's website. Research staff conducts phone surveys of goat hunters in order to improve educational materials available to goat hunters. Several important attributes to goat hunting have been identified through the surveys; less experienced hunters take more female goats; take longer shots; and were less likely to use spotting scopes to determine goat gender (Jeff Jemison, personal communication). One of the primary focus of the department's mountain goat education material is to reduce the harvest of female mountain goats. Data collected by phone survey indicates 42% of hunters who harvested a female goat did so intentionally (ADF&G unpublished data). The mountain goat quiz is very popular with goat hunters and serves as an excellent opportunity to interact with hunters and develop relationships that will benefit both the department and hunters into the future.

As has been the case during the previous report periods, much of the harvest took place in 2 Wildlife Analysis Areas (WAA's) (Table 3). The WAAs representing Tracy and Endicott arms (2824 and 2825) account for 41% of the harvest for the period. WAA's 2824 and 2825 are combined for guideline harvest (points) purposes. Twenty nine to thirty points are available in this area; 12 points were taken in 2009 and 22 points in 2010. While the harvest is often high in this area, hunters typically take male goats; this can be attributed to the requirement that nonresidents must have a guide to hunt mountain goats. Both of these areas are accessible by boat and receive significant commercial guiding effort. The remaining harvest (42 goats) was taken in widely distributed WAAs; 2517 (bow hunt area), 2518 (upper Taku River), 2305 and 2306 (lower Chilkat Range), 2408 and 2409 (Berners Bay and lower Lynn Canal), and 2927 (Port Houghton). Sporadic harvest in most areas of the unit other than Tracy and Endicott arms is normal. Weather and access

drive mountain goat hunting, and these, combined with the challenges of hunting this species, limit the overall harvest in most areas.

Permit Hunts. Registration permit hunts RG012 (north Juneau road system), RG013 (south of Taku Inlet & northern Chilkat Range), and RG014 (bow hunt area), are combined under a single registration permit. The mean number of permits issued annually during this report period (208) is nearly the same as the previous reporting period (215) (Table 4). The mean annual number of hunters during this report period was 74, lower than the previous period (96). Roughly half the people who get registration permits actually hunt. Compliance with reporting requirements has been good, but we continue to resort to reminder letters and enforcement action to obtain information from some hunters.

Hunter Residency and Success. The average success rate of all hunters was 48% during this report period. Success rate decreased significantly from the previous report period (55%). Alaska resident hunters harvested fewer than half the number of goats taken by nonresident during the report period (Table 5). Nonresident hunter success rates were also much higher than resident hunters. Eighty-seven percent of nonresidents successfully harvested a goat compared to only 27% of resident hunters. This reflects the requirement that nonresidents hunt with a guide. Most guides are better equipped to hunt goats than the average local resident hunter. Successful hunters spent an average of 2.3 days afield per goat during the report period, the same as the previous report period (Table 4). Unsuccessful hunters spent an average of 2.8 days in the field.

Harvest Chronology. The November harvest continued to be the highest of the 4-month season, accounting for 56% of the take during the report period. October was the month with the second highest harvest followed by September and then August. The preponderance of late season kills reflects the availability of goats at lower elevations and hunter desire to take a fully-furred goat. In addition, the majority of the guided harvest, which accounts for more than half the goats harvested, takes place later in the season.

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 79% of successful hunters using them (Table 6). Other means of transportation included airplanes (5%), and highway vehicles (5%). Highway vehicles were used along the Juneau road system and airplanes are used to access high-elevation lakes.

Commercial Services. Commercial services use increased slightly from the previous report period, with 36% of hunters using a commercial service compared to 35% during RY07–RY08 (Table 7). The current level of commercial use is similar to previous report periods. Eighty-five percent of hunters who used commercial services used a guide, and 15% used commercial transportation to the field. This is not surprising since most huntable areas are accessible only by airplane or boat. Resident hunters most often used commercial services for transportation (almost entirely air charter), whereas nearly all nonresidents used a registered guide, which is required by law unless accompanied by a second degree blood relative who is a resident of Alaska.

Other Mortality

Severe winter weather continued in both years of the report period. Deep snow forced many goats to low elevations in close proximity to downtown Juneau. Several goat mortalities were documented along Juneau trails that are believed to have been caused by weather conditions. Three dead goats (2 adults & 1 kid) were recovered from the Flume Trail near Juneau and an adult male (estimated Age ~13 years) was euthanized on Thane Road after becoming incapacitated due to starvation. We examined the marrow of long bones associated with carcasses when available and all the marrow appeared red and gelatinous, consistent with an animal in a poor nutritional state. Contagious Ecthyma (CE), also known as ORF, was documented in the male goat euthanized on Thane Road; an additional male yearling with apparent CE was harvested near Juneau. Samples for disease surveillance were provided to the department's wildlife veterinarian. Little other data is 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. White and Barten (2009) visited several mortality sites along Lynn Canal but were unable to determine cause of death for most because carcasses had been scavenged.

HABITAT

Assessment

Unit 1C winter and summer goat range is extensive and goats appear to be occupying most of this range. (See Lowell 2008 for a detailed description of mountain goat habitat in mainland Southeast Alaska.) Helicopter traffic in or near goat habitat and its potential to drive goats away from preferred habitat remains a concern. While there are fewer requests for additional flights and landings, there are consistent requests to relocate landings and their associated flight routes. Goats disturbed and displaced from preferred habitat areas could suffer reduced fitness, which may ultimately play a role in population declines. Admittedly however, little is known about the effects of helicopter noise on goat populations.

Managers met with U.S. Forest Service personnel several times during the report period to discuss land use in the Tracy-Endicott Arm area focusing on guided mountain goat hunts. The USFS is reviewing the number of hunts allocated in the area and may initiate an official prospectus for the area in the future. As noted in the report, the majority of goats taken in Unit 1C come from these areas and any changes to the allocation of guided hunts will affect the management of goats in the area. Managers will continue to meet with service personnel and provide information and comments as needed.

CONCLUSIONS AND RECOMMENDATIONS

Aerial surveys were completed in several areas we considered most important due to hunting pressure, but inclement weather prevented additional surveys. Management objectives were met or surpassed in most areas, except for the need for aerial surveys. 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 herds in those areas.

Hunter effort increased but success remained nearly the same as the previous report period. In both years of the report period hunters predominantly killed male goats. Although the percentage of nannies in the kill was low, we should continue to emphasize directing hunting pressure away from females. We will continue to use harvest guidelines established for each permit hunt area, which should further encourage hunters to select males. We may soon implement a sealing requirement for goats. With the guideline harvest being approached in several areas in the past few years, sealing may be necessary to ensure accurate reporting of male and female goats.

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PREPARED BY: **SUBMITTED BY:**

Ryan Scott
Biologist III

Neil L. Barten
Management Coordinator

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Table 1. Unit 1C mountain goat aerial survey data, regulatory years 1995 through 2010.

Year	Number Adults	Number Kids	Total Goats	Kids:100 Adults	Percent Kids	Goats/Hr.	Location Description
1995				No Survey			
1996	215	78	293	36	27	52	East Chilkat Range
1997				No Survey			
1998	225	38	263	17	14	77	Eagle Glacier-Lace R.
1998	71	19	90	27	21	39	RG014 Hunt Area
1999	54	12	66	22	18	33	RG014 Hunt Area
2000	57	3	60	5	5	47	Lake Dorothy
2000	143	30	173	21	17	36	Chilkat Range
2001	464	113	577	24	20	132	Btw. Tracy & Endicott Arm
2001	174	57	231	33	25	139	North of Tracy Arm
2001	20	7	27	35	26	20	Btw. Whiting & Speel River
2001	18	1	19	6	5	27	Bart Lake
2002	163	47	210	29	22	82	Endicott Arm to Pt. Houghton
2002	152	26	178	17	15	85	Chilkat Range
2003	52	12	64	23	19	213	Lions Head Mt.
2003	98	14	112	14	13	170	Antler Lake
2004				No Survey			
2005	226	39	265	17	15	101	East Lynn Canal
2005	15	1	16	7	6	15	Border Lake
2006	203	33	236	16	14	16	Chilkat Range
2006	50	16	66	32	24	NA	Lemon Glacier
2006	45	4	49	9	8	NA	Herbert Glacier
2006	60	22	82	37	27	NA	Eagle Glacier
2007	15	0	15	0	0	14	Lake Dorothy
2007	196	36	232	18	16	80	Cape Fanshaw
2007	179	18	197	10	9	39	South of Endicott Arm
2008	8	4	12	50	33	10	Lake Dorothy
2008	121	43	164	36	26	44	Endicott Arm
2009	235	67	302	29	22	110	Taku Glacier to Bullard
2009	306	62	368	20	17	123	S. Tracy/ N. Endicott
2009	86	11	97	13	11	108	N. Tracy Arm
2010	56	10	66	18	15	29	N. Tracy Arm
2010	85	21	106	25	20	29	S. Tracy/ N. Endicott

Table 2. Unit 1C annual goat harvest, regulatory years 2001 through 2010.

Year	Males	Females	Unknown	Total
2001	51	8	1	60
2002	34	3	0	37
2003	40	4	0	44
2004	40	7	0	47
2005	39	10	0	49
2006	35	7	0	42
2007	36	4	0	40
2008	37	4	1	42
2009	28	2	0	30
2010	36	5	0	41

Table 3. Unit 1C mountain goat harvest from all Wildlife Analysis Areas (WAAs), regulatory years 2001 through 2010.

WAA	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	Total
2202											-
2203			1								1
2304						1					1
2305	1	2		1		1		1		1	7
2306	6	4	1	1		4	1		1	5	23
2307											-
2408	1		1		2			2			6
2409	1	3	2	1	2			2		1	12
2410	1		1								2
2411	1										1
2412											-
2413				2		3					5
2514	1		5	2	1	3		1	4		17
2515						1					1
2517	1	3	1		5		1	2	2	1	16
2518	5	2	5	5	4	2	2	1		3	29
2519			1	5	3						9
2722											-
2823					1				1		2
2824	26	11	15	16	17	13	14	15	12	13	152
2825	10	10	10	13	11	13	19	16	9	16	127
2926	2										2
2927	4	2	1	1	3	1	3	2	1	1	19
Unkn											-
TOTAL	60	37	44	47	49	42	40	42	30	41	432

Table 4. Unit 1C goat hunter effort and success, regulatory years 2001 through 2010.

		Successful hunters			Unsuccessful hunters			Total hunters		
Year	Permits issued	Nr hunters	Total days	Avg. days	Nr hunters	Total days	Avg. days	Nr hunters	Total days	Avg. days
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
2005	201	49	102	2.1	47	113	2.4	96	215	2.2
2006	191	42	103	2.5	30	80	2.7	72	183	2.5
2007	213	40	92	2.3	58	153	2.6	98	245	2.5
2008	216	42	98	2.3	51	106	2.1	93	204	2.2
2009	228	30	59	2.0	44	116	2.6	74	175	2.4
2010	187	41	108	2.6	33	103	3.1	74	211	2.9

Table 5. Unit 1C goat hunter success by community of residence, regulatory years 2001 through 2010.

		Successful hunters			Unsuccessful hunters		
Year	Percent success	Unit resident	Other AK	Non resident	Unit resident	Other AK	Non resident
2001	59	27	3	30	24	13	4
2002	41	12	5	20	38	13	3
2003	38	19	4	21	55	12	5
2004	57	18	2	27	27	3	5
2005	51	20	6	23	32	10	5
2006	58	13	5	24	21	5	4
2007	41	12	2	26	43	7	8
2008	45	14	0	28	40	8	3
2009	41	11	1	18	30	9	5
2010	55	8	6	27	27	4	2

Table 6 Unit 1C transport methods used by successful goat hunters, regulatory years 2001 through 2010.

Year	Airplane		Boat		Foot		Hwy. vehicle		Other	
	Total	(%)	Total	(%)	Total	(%)	Total	(%)	Total	(%)
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)
2005	8	(16)	38	(78)	0	(0)	3	(6)	0	(0)
2006	5	(12)	31	(74)	0	(0)	4	(9)	2	(5)
2007	3	(8)	36	(90)	0	(0)	1	(2)	0	(0)
2008	1	(2)	38	(91)	0	(0)	3	(7)	0	(0)
2009	1	(3)	24	(80)	0	(0)	5	(17)	0	(0)
2010	4	(10)	32	(78)	1	(2)	1	(2)	3	(8)

Table 7. Commercial services used by Unit 1C goat hunters, regulatory years 2001 through 2010.

Year	Unit residents		Other AK residents		Nonresidents		Total use		Registered guide	Transporter	Other
	No	Yes	No	Yes	No	Yes	No	Yes			
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
2005	43	8	10	6	2	26	55	40	26	12	2
2006	27	7	9	0	0	28	36	35	27	8	0
2007	51	4	8	1	2	32	61	37	29	8	0
2008	52	2	8	0	2	29	62	31	29	2	0
2009	40	1	9	1	1	22	50	24	22	2	0
2010	33	2	10	0	1	28	44	30	28	2	0

Table 3. Unit 1C mountain goat harvest from all Wildlife Analysis Areas (WAAs), regulatory years 2001 through 2010.

WAA	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	Total
2202											-
2203			1								1
2304						1					1
2305	1	2		1		1		1		1	7
2306	6	4	1	1		4	1		1	5	23
2307											-
2408	1		1		2			2			6
2409	1	3	2	1	2			2		1	12
2410	1		1								2
2411	1										1
2412											-
2413				2		3					5
2514	1		5	2	1	3		1	4		17
2515						1					1
2517	1	3	1		5		1	2	2	1	16
2518	5	2	5	5	4	2	2	1		3	29
2519			1	5	3						9
2722											-
2823					1				1		2
2824	26	11	15	16	17	13	14	15	12	13	152
2825	10	10	10	13	11	13	19	16	9	16	127
2926	2										2
2927	4	2	1	1	3	1	3	2	1	1	19
Unkn											-
TOTAL	60	37	44	47	49	42	40	42	30	41	432

Alaska Department of Fish and Game
Division of Wildlife Conservation
(907) 465-4190 PO BOX 115526
JUNEAU, AK 99811-5526

MOUNTAIN GOAT MANAGEMENT REPORT

From: 1 July 2009
To: 30 June 2011

LOCATION

GAME MANAGEMENT UNIT: 1D (2,700 mi^2)

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

BACKGROUND

Mountain goat hunting is very popular in Unit 1D. Unlike many areas of Alaska where goats are hunted as a trophy species, most goats harvested in Unit 1D are taken for food. Hunters are generally interested in taking the first goat that can be successfully harvested. This results in a female goat harvest higher than desired, but Unit 1D hunters still typically harvest more male than female goats, and have been responsive to department efforts encouraging male selection An extensive road system in the Haines area provides access to goat hunting areas and the majority of hunting in other areas of the unit occurs from boats. Mountain goat habitat ranges from alpine areas of densely forested mountains in coastally influenced areas to brushy benches in areas influenced more by interior Yukon, Canada climate conditions. In addition, there are isolated areas, such as Takhin Ridge, where movement of goats is restricted by rivers and developed roads (Haines Highway).

There are 3 separate registration permit hunts with separate hunt areas in Unit 1D (RG023-Takshanuk Mountains, RG024-Upper Chilkat River and Skagway area, and RG026-Takhinsha Mountains and northern Lynn Canal). Few hunters pursue goats in the early season (1 August), and effort significantly increases in mid-September when areas accessible by road are open to goat hunting. A significant number of hunters pursue goats late into the season (November and December) when goats have moved down slope to wintering areas in forested habitat along Lynn Canal.

In some areas of Unit 1D goat numbers persist at low levels offering limited opportunity to harvest. As in other Southeast, Alaska locations, the unit has been subdivided into smaller, unique geographical areas for management purposes. The intent of each management area is to provide an additional opportunity to hunt if other locations in a hunt area (e.g., RG023) are closed because the guideline harvest level has been obtained. Prior to the start of the mountain goat hunting season biologists review point allocations for each management area. Changes to the allowable points may be made based on survey and harvest information. Based on aerial survey data, mountain goat populations appear to be stable or increasing in the unit. Two areas in

particular indicate increasing goat numbers; the area between the Skagway and Taiya River (Skagway Pie), and the Takshanuk Mountains (RG023).

MANAGEMENT DIRECTION

REGION 1 MANAGEMENT GOAL

- Manage Southeast Alaska 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 during aerial surveys;
- 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

Alaska Department of Fish and Game (ADF&G) management staff conducted aerial surveys in locations identified for high hunter effort during the reporting period. Additional aerial surveys were conducted by research staff concurrent with a project assessing and monitoring mountain goats along the Juneau access road corridor and near the Kensington Mine conducted for the Alaska Department of Transportation (White and Barten 2009). These survey data are the result of intensive, replicate aerial surveys for four specific flight routes; 2 of these routes (Mt. Sinclair and Mt. Villard) are within the Unit 1D boundaries. A single registration permit (RG023) was used to administer hunts RG023, RG024, and RG026. Harvest parameters, including hunter success, effort, access, and transportation were determined for each hunt.

Harvest data were summarized by regulatory year (RY), which begins 1 July and ends 30 June (e.g. RY09 = 1 July 2009–30 June 2010).

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 unitwide 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. We do our best to approach each survey with similar weather conditions, timing,

and aircraft to eliminate as much variability as possible.

In fall 2005, department research staff began a project to monitor and assess mining development activities as they relate to mountain goats in the areas of the Kensington Mine on the north side of Berners Bay and the eastern shore of Lynn Canal (White and Barten 2009). Mine development is limited to Unit 1C; however, other development associated with the Juneau Access Road would start in Unit 1C at Echo Cove, continue through Berners Bay and up the east shoreline of Lynn Canal, and terminate at the Katzehin River Delta in Unit 1D. In anticipation of the mine and road, the department, with funding provided by the Alaska Department of Transportation and Coeur Alaska, captured and deployed radio/GPS collars on mountain goats in order to learn more about spatial and temporal habitat use in the development areas. During the report period a sample of collared goats were maintained in the study area. In addition, mountain goat reproduction, survival and sightability data gathered through aerial surveys for collared goats will provide invaluable information concerning mountain goat populations in the study area. In order to better estimate sightability during aerial surveys, monitor survival, and develop population estimates for survey areas, VHF radio collars will remain on goats in the study area once research activities have ended.

Information on Unit 1D mountain goat populations was gathered from aerial surveys during this report period, as well as during 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 compared over years (Tables 1a, 1b, and 1c). In areas that were not surveyed during this report period, we used hunter effort and success as well as previous survey information as indicators of population status.

Population Composition

We used aerial surveys to monitor population trends and composition (kid-to-adult ratios) in certain areas within the unit during this report period. We concentrated our effort in two of the most heavily hunted areas, Takhin Ridge (Table 1c) and Takshanuk Mountains (Table 1b), and included the Skagway Pie area (Table 1a), which was changed to an archery-only hunt during the 2008 Alaska Board of Game meeting. A growing helicopter skiing and summer tourist industry has increased concerns about potential lethal and sublethal effects of human activity 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 at this time.

Mortality

HARVEST

Season and bag limits	Resident and nonresident hunters
Unit 1D, that portion between Taiya Inlet and River and the White Pass and Yukon Railroad by bow and arrow only	15 Sep–15 Nov (General hunt only)
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 1 goat by registration permit only	15 Sep–15 Nov (General hunt only)
Unit 1D, that portion north of the Haines Highway and west of the Chilkat River, between the Ferebee River and Glacier and Taiya River and Inlet, and between the White Pass and Yukon Railroad and the Katzehin River 1 goat by registration permit only	1 Sep–30 Nov (General hunt only)
Remainder of Unit 1D 1 goat by registration permit only	1 Aug–31 Dec (General hunt only)

Board of Game action and Emergency Orders (EO). During the fall 2010 Alaska Board of Game (BOG) meeting a proposal was submitted by the Alaska Department of Fish and Game to align the season dates for mountain goat hunting in a portion of Unit 1D. Prior to this proposal the archery-only hunt located in the Skagway Pie was closed 2 weeks before the other RG024 goat hunts in the area. To alleviate the confusion during harvest, and because there were no conservation concerns with extending the archery-only hunt 2 weeks longer, the proposal was adopted by the board. The new archery season will be open September 15–November 30 in 2011.

In RY09 the Tukgahgo and Takshanuk Mountain portion of the RG023 hunt area was closed by Emergency Order (EO) when guideline harvest levels, based on harvest point allocation, were reached. Mountain goats in the area are more accessible than other locations due to the proximity to the Haines Highway. In addition, several areas of RG024 (Halutu Ridge, East Fork of Skagway River, and Taiya Inlet south of Kasidaya Creek) were closed by EO; Katzehin River south to Yeldagalga Creek in RG026 was also closed by EO. In total, 6 discreet areas were closed to goat hunting prior to the scheduled end of the season. These closures were spread out

through the duration of the season. In RY10, 5 discreet hunting areas were closed by EO when guideline harvest levels were reached. These areas included: Tukgahgo Mountain, Takshanuk Mountains, Halutu Ridge, East Fork north of the Skagway River, and Takhin Ridge.. Similarly, the closures during the RY10 hunt season were also spread throughout the season as was the case in RY09.

Hunter Harvest. A total of 69 goats were harvested during the report period, 31 in RY09 and 38 in RY10 (Table 2). The RY09 harvest consisted of 21 male (68%) and 10 female (32%) goats. In RY10, 24 male (63%) and 14 female (37%) goats were taken. The total harvest during RY09 and RY10 was the same as the last report period (69; Table 2). Harvest levels required the use of emergency orders (see Board of Game action and Emergency Orders above) to close the hunting season in several locations in Unit 1D once the allocated harvest points had been taken. For example, in the Takshanuk Mountains (RG023) in RY 09, only 8 goats were harvested before the area was closed by EO (10 points authorized); because the harvest included 3 female goats (male=1 point, female=2 points). In RY 10, 11 goats were taken before an EO was issued (10 points authorized) and in this case 5 female goats were harvested, putting the harvest 5 points over the allotted authorization. Taking female goats generally reduces the length of the hunting seasons; therefore hunters are encouraged to take males.

Unit 1D hunters continue to select more male goats vs. females which is important for successful management of local goat populations. The female portion of the harvest is higher in Unit 1D than some other units because more hunters take goats for food rather than for trophies (Jemison, unpublished data, ADF&G). Department staff has developed sex identification material and a quiz to assist hunters in selecting male goats, and will conduct follow-up interviews with successful goat hunters to assess the utility of these materials. Summary data from interviews will be provided in future management reports.

Permit Hunts. Unit 1D mountain goat hunting is regulated under 3 registration permit hunts administered by a common hunt report. The main reason for maintaining 3 hunts in the subunit is to allow different opening and closing dates while attempting to adjust for relative differences in hunting pressure. These 3 hunt areas are then divided into smaller management units that are assigned guideline harvest levels using point values (billies = 1 point, nannies=2 points) based on aerial survey information. This finer scale of management accomplishes 2 goals: 1) it protects goats in easily accessible areas from being overharvested, and 2) it provides hunters with the maximum amount of opportunity by closing only small accessible areas while allowing other portions of the unit to remain open. An average of 189 permits were issued per year during the 2 years of the report period, significantly higher than the previous 8-year mean of 159 permits/year Table 3.

Hunter Residency and Success. Local residents continue to be the majority of Unit 1D goat hunters. In RY09 and RY10, residents of the subunit took 23 (74%) and 26 (68%) of harvested goats, respectively, while nonlocal residents took 2 (6%) goats in RY09, and 6 (16%) in RY10 (Table 4). Unit 1D is a popular hunting destination for nonlocal Alaska residents because hunting areas are accessible by road. Eleven nonresident hunters participated in a Unit 1D goat hunt during each of the reporting periods, similar to the previous period. Nonresident hunters took 6 goats in each year of the reporting periods, 19% and 16% of the harvest during RY09 and RY10, respectively.

Thirty-two percent of all Unit 1D goat hunters were successful during the report period (Table 4). Fifty-five percent of nonresident hunters were successful compared to 33% of all Alaska resident hunters (unit residents and nonlocals). The higher rate of success for nonresident hunters is due to Alaska law requiring nonresidents to hunt with a licensed big game guide. Overall hunter success decreased, nonresident success increased, and resident success remained roughly the same as the previous report period.

Harvest Chronology. Goats can be hunted in Unit 1D from 1 August through 31 December, but seasons vary between the 3 hunt areas. Over the years, hunters have taken most goats from late September to early November. During this report period 46% of the goats were harvested in October, 28% in November, 19% in September, 6% in August, and 3% in December. Although the percentages listed above represent the harvest chronology for this reporting period, harvests by month vary year to year and are influenced by many factors, such as weather and snow conditions.

Transport Methods. Boats and highway vehicles continue to be the transport methods used most often by successful hunters, accounting for 46% and 36% respectively of transport during the report period (Table 5). A high percentage of successful hunters use highway vehicles because hunting areas are close to the Haines Highway and other developed roads. Boats are used in both fresh water and marine environments to access goat hunting areas. Several rivers provide good access to hunting areas, and mountain goat hunting opportunities adjacent to saltwater bodies are available along Lynn Canal and Taiya Inlet, where goats can be found during late fall and early winter.

Commercial Services. Because most Unit 1D goat hunters are local residents and have access to either a vehicle or boat to provide their own transportation there is little use of commercial services (Table 6). During the report period 19 nonresident hunters and no resident hunters reported using commercial services. The only 3 nonresident hunters not using commercial services took advantage of using a second degree level of kindred relative to serve as their guide. The number of guides offering mountain goat hunts has remained the same for a number of years. However, large tracts of state-managed land and the absence of a guide use area system on state lands mean there is potential for an increase in guide numbers in Unit 1D. We need to monitor any increases in guiding pressure to ensure guideline harvest levels are not exceeded when combined with harvests from other user groups (local and nonlocal Alaska residents).

Location of Harvest. Goat harvest by Wildlife Analysis Area (WAA) is provided in Table 7. Accessibility of mountain goat hunts 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.

Mountain Goat Research. In August of 2010, ADF&G and BLM staff radiocollared 23 goats to initiate a cooperative mountain goat research project in upper Lynn Canal (Takhin Ridge, Porcupine Mtn., Four Winds Mtn., Takshanuk Ridge, Chilkoot River, Ferebee River and the upper Nourse River). The intent of this 3-year study is to gather mountain goat distributional data

in order to characterize key seasonal habitats used by mountain goats in this area. Acquisition of these data is intended to supplement a data-based framework used to guide resource management decisions relative to regulation of summer and winter helicopter tourism and mountain goat management.

Since this project has only recently been initiated, the ability to provide representative conclusions from existing data is limited. Unfortunately, data are not yet available to discern whether goats in distinct localities exhibit a predisposition for particular wintering strategies, though this would be expected.

CONCLUSIONS AND RECOMMENDATIONS

Fine-scale mountain goat management continues to be necessary in Unit 1D as hunting pressure remains at a high level. 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 3 years in high use areas. Finally, permanent trend count areas with well-defined boundaries should be established to enhance comparable surveys from year to year.

Helicopter activities have increased annually in Unit 1D for the past 8 years. Our concerns grow over their immediate and long-term effects on mountain goats. Flightseeing is expected to continue to increase, as is the use of helicopters to access remote areas for hiking and mountaineering. Over the 2 years of this report period, staff spent increased time working on ways to address agency and public concerns about effects of these 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. During the latter part of the previous reporting period ADF&G was contacted by BLM about summer tourism-related commercial helicopter activities on federal land in Unit 1D. (The majority of winter helicopter activity occurs on state-managed land.) After review of aerial survey data a cooperative effort between ADF&G and BLM resulted in funding to deploy 23 GPS-equipped radiocollars on goats to compare model predictions to data collected from marked goats. These data would help ADF&G and other resource management agencies respond to proposed new activities in the area that may affect mountain goats.

Mountain goats continue to be an important source of game meat for unit residents and hunting effort from all demographics appears to be stable or slightly increasing. Efforts to reduce the female goat harvest should continue to help ensure the viability of this resource in Unit 1D.

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PREPARED BY:

Stephanie Sell
Wildlife Biologist II

SUBMITTED BY:

Neil Barten
Management Coordinator

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Table 1a. Unit 1D mountain goat composition counts, Skagway Pie area, regulatory years 1981 through 2010.

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[a]	11	5	16	45	31	20
1995[b]	21	7	28	33	25	N/A
1996-2000	No survey					
2001	32	7	39	22	25	93
2002-2007	No survey					
2008	99	19	118	19	16	59
2009[c]	No survey					
2010	No survey					

[a] Skagway Pass side only, goats/hour is for the entire survey that included a portion of hunt area RG023.
[b] Includes only the west side of closed area, adjacent to the Taiya River.
[c] First year open for goat harvest- archery only.

Table 1b. Unit 1D mountain goat composition counts, hunt areas RG023 and RG024, regulatory years 1989 through 2010.

Year	Number adults	Number kids	Total goats	Kids:100 adults	(%) Kids	Goats / hour
Klukwah Mt. (K) and Ferebee Glacier/River (F) to Chilkoot Inlet						
1989 (K)	26	9	35	35	(26)	60
1993	No survey					
1994 (K,F) [a]	111	21	132	19	(16)	45
1995 [b]	52	15	67	29	(22)	89
1996–1997	No survey					
1998	69	23	92	33	(25)	58
1999–2002	No survey					
2003	140	44	184	31	(24)	141
2004–2009	No survey					
2010 (K,F)	134	41	175	31	(23)	58
Takshanuk Mtns. (E, W)						
1989 (E,W)	40	16	56	40	(29)	34
1993 (W)	27	7	34	26	(21)	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
2002–2006	No survey					
2007 (E,W)	219	45	264	21	(17)	165
2008	No survey					
2009 (E,W)	168	37	205	22	(18)	205
2010 (E,W)	311	73	384	24	(19)	85
North of the Klehini River and West of the Chilkat River						
1989	23	6	29	26	(21)	70
1993	No survey					
1994	58	4	62	7	(6)	69
1995	55	9	64	16	(14)	116
1996–2003	No survey					
2004	34	8	42	24	(19)	84
2005–2010	No survey					

Table 1b continued.

East of Ferebee Glacier/River (F), Chilkoot/Taiya Inlet						
1989 (F,C)	39	17	56	44	(30)	40
1992 (F,C)	30	10	40	33	(25)	19
1993	No survey					
1994 (F,C)	119, 130	21, 33	140, 163	18, 25	(15, 20)	46, 59
1995–2009	No survey					
2010 (F,C)*	28	8	36	29	(22)	12
*Not a complete survey of western Taiya Inlet						
Harding Mountain to upper West Cr., upper Norse R., and Chilkoot Pass						
1995	64	9	73	14	(12)	50.5
1996–2009	No survey					
2010	30	3	33	10	(10)	43
Twin Dewey Peaks, Skagway Pass, Warm Pass						
1995	20	6	26	30	(23)	20
1996–2010	No survey					
Katzehin River north to Twin Dewey Peaks						
1994	121	32	153	26	(21)	102
1995	No survey					
Katzehin River north to Twin Dewey Peaks						
1994	121	32	153	26	(21)	102
1995	No survey					
1996	101	26	129	25	(20)	105
1997	96	15	111	16	(14)	80
1998–1999	No survey					
2000	97	21	118	22	(19)	83
2001[c]	60	13	73	22	(18)	77
2002–2009	No survey					
2010	66	19	85	29	(22)	28

[a] First survey listed conducted by the BLM in a PA-18 aircraft; this survey does not overlap with the ADF&G survey.
[b] Includes only the Chilkoot River side of the mountain range from Klukwah Mt. to Chilkoot Inlet.
[c] Partial survey from Kasidaya Creek north

Table 1c. Unit 1D mountain goat composition counts, hunt area RG026, regulatory years 1974 through 2010.

Year	Number adults	Number kids	Total goats	Kids:100 adults	(%) kids	Goats/hour
Tsirku River (T) and Takhin Ridge (N,S)						
1983 (T)	67	23	90	34	(26)	29
1985 (S)	41	13	54	32	(24)	69
1987 (N,S)	14	4	18	29	(22)	11
1989 (N,S)	111	33	144	30	(23)	126
1993 (N,S)	100	21	121	21	(17)	112
1994 (T,N,S)[a,b]	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
2005-2006	No survey					
2007 (N,S)	67	16	83	24	(19)	104
2008 (N,S)	84	19	103	23	(18)	103
2009 (N,S)	49	11	60	22	(18)	150
2010	No survey					
Remainder of Area West of Chilkat Inlet						
1974	39	3	42	8	(7)	72
1975	20	9	29	45	(31)	---[3]
1993	No survey					
1994	184	32	216	17	(15)	49
1995–2010	No survey					
East of Chilkoot Inlet-Katzehin River South						
1993	No survey					
1994	32	10	42	31	(24)	98
1995–1996	No survey					
1997	5	2	7	40	(29)	N/A
1998–2010	No survey					

[a] First survey listed conducted by the BLM in a PA-18 aircraft.
[b] Survey consisted of a significantly larger area than previous surveys represented.

Table 2. Unit 1D annual mountain goat harvest, regulatory years 2001 through 2010.

Year	Males	Females	Unknown	Total
2001	17	7	0	24
2002	15	6	1	22
2003	27	7	1	35
2004	32	6	1	39
2005	20	10	0	30
2006	20	11	0	31
2007	33	10	0	43
2008	16	10	0	26
2009	21	10	0	31
2010	24	14	0	38

Table 3. Unit 1D mountain goat hunter effort and success, regulatory years 2001 through 2010.

		Successful hunters			Unsuccessful hunters			Total hunters		
Year	Permits issued	No. hunters	Total days	Avg days	No. hunters	Total days	Avg days	No. hunters	Total days	Avg # days
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
2005	150	30	68	2.3	48	115	2.4	78	183	2.4
2006	165	31	52	1.7	57	145	2.5	88	197	2.2
2007	153	43	97	2.3	57	161	2.8	100	258	2.6
2008	168	26	53	2.0	59	184	3.1	85	237	2.8
2009	188	31	64	2.1	66	227	3.4	97	291	3.0
2010	190	38	80	2.1	78	231	3.0	116	311	2.7

Table 4. Unit 1D goat hunter success by community of residence, regulatory years 2001 through 2010.

		Successful hunters			Unsuccessful hunters		
Year	Percent success	Unit resident	Non-local	Non-resident	Unit resident	Non-local	Non-resident
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
2005	39	15	7	8	40	4	4
2006	35	20	7	4	42	7	8
2007	43	29	7	7	43	12	2
2008	31	18	1	7	49	7	3
2009	32	23	2	6	49	12	5
2010	33	26	6	6	58	15	5

Table 5. Unit 1D transport methods used by successful goat hunters, regulatory years 2001 through 2010.

Year	Airplane		Boat		Foot		Hwy vehicle		Other[a]	
	Total	(%)	Total	(%)	Total	(%)	Total	(%)	Total	(%)
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)
2005	1	(3)	12	(40)	3	(10)	9	(30)	5	(17)
2006	3	(10)	11	(35)	0	(0)	15	(48)	2	(7)
2007	1	(2)	22	(51)	0	(0)	14	(33)	6	(14)
2008	0	(0)	13	(50)	0	(0)	9	(35)	4	(15)
2009	0	(0)	19	(61)	1	(3)	7	(23)	4	(13)
2010	0	(0)	13	(34)	3	(8)	18	(47)	4	(11)

[a] Includes 3- and 4- wheelers and unknown transportation

Table 6. Unit 1D commercial services reported by goat hunters, regulatory years 2001 through 2010.

Year	Unit residents		Other AK residents		Non-residents		Total use		Regis-tered Guide	Trans-porter	Other
	No	Yes	No	Yes	No	Yes	No	Yes			
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
2005	69	0	24	0	1	10	94	10	10	0	0
2006	64	0	9	0	0	12	73	12	11	0	1
2007	71	1	19	0	1	8	91	9	8	1	0
2008	67	0	7	1	1	9	78	10	9	1	0
2009	72	0	14	0	0	11	86	11	11	0	0
2010	84	0	21	0	3	8	108	8	8	0	0

Table 7. Unit 1D Goat harvest by Wildlife Analysis Areas (WAA), regulatory years 2001 through 2010.

	WAA						
Regulatory year	4302	4303	4405	4406	4407	4408	*Total*
2001	12	0	1	0	9	2	24
2002	13	3	1	0	3	2	22
2003	11	1	11	0	10	2	35
2004	19	5	5	0	9	1	39
2005	13	3	5	0	8	1	30
2006	10	2	10	0	6	3	31
2007	22	1	5	0	12	3	43
2008	15	0	3	0	7	1	26
2009	13	1	6	0	9	2	31
2010	21	2	5	2	8	0	38

Alaska Department of Fish and Game
Division of Wildlife Conservation
(907) 465-4190 PO BOX 115526
JUNEAU, AK 99811-5526

MOUNTAIN GOAT MANAGEMENT REPORT

From: 1 July 2009
To: 30 June 2011

LOCATION

GAME MANAGEMENT UNIT: Unit 4 (5,800 mi^2)

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

BACKGROUND

Mountain goat populations were established on Baranof Island (~1,865 square miles) in 1923, when 18 animals were transplanted from Tracy Arm in Game Management Unit 1 (Paul 2009). Goats were not believed to have been indigenous to the island, although early written Russian history is confusing, with references to "white deer." Recently, tissue samples from goats in Unit 4 were analyzed and compared using DNA analysis. The genetic makeup of most goats is similar to that of goats in Tracy Arm. However, several of the goats had DNA that was different enough to indicate they originated from a relict population preceding the transplanted stock (Shafer 2011). Further DNA analysis has indeed established that there are two different genotypes on Baranof, and offered ideas as to what might have occurred to make this possible (Shafer 2011). Hunting was implemented in 1949 and seasons have continued through the present 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 and increased the number of permits to 5 in 2009.

In the mid-1950s goats were transplanted to Chichagof Island (~2,218 square miles; Paul 2009), 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 (~1,693 square miles) or any other island in the unit. The Baranof Island goat population appears to have declined somewhat during the period 2006–2009 due to winters with above-normal snowpack and cold, late spring conditions. Recent range expansions to areas on the southern part of the island that occurred prior to this period have contracted based on survey work.

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 important roles in regulating the harvest.

Research work involving the capture and radiocollaring of goats in the areas containing the hydroelectric projects at the Blue Lake dam and Takatz Lake began in the fall of 2010. Focus of the research will be to determine possible impacts of the development projects, characterize habitat selection and seasonal movement patterns, monitor reproductive success, analyze movement data, and better census the island population.

Harvest and other data in this report are tallied by regulatory year (RY), which begins 1 July and ends 30 June (e.g. RY09 = 1July 2009–30 June 2010).

MANAGEMENT DIRECTION

MANAGEMENT GOAL

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 1,000 goats.
- Monitor sex composition of the harvest and manage for 6 harvest points per 100 goats observed during aerial surveys, using a weighted harvest point system (males = 1 point, females = 2 points).

Harvest guidelines are developed considering population trend data, number of kids observed per 100 adults counted, nanny (female) to billy (male) harvest ratio, and age of harvested goats.

Management objectives in Unit 4 were revised in 2006 to be more consistent with the region wide protocols. The new objectives as mentioned above will conserve female goats through the point system.

A multi-year trend which showed slight increases in the number of guided nonresident hunters over the last 7 years continued in this reporting period after a brief downturn in RY07–RY08. The downturn in national economic conditions and decline in discretionary spending is believed to be the primary factor in that brief decline. Although harvest of males is encouraged, an average of 45% of the total harvest in the last 3 seasons was of females. Further use of the 6-point system will provide a better mechanism to manage hunter harvest if females are heavily targeted. The point system was implemented with the fall 2006 registration hunt and modified in RY10 to establish a point total where the female component was capped at a set number. The point system established allows significantly more males to be harvested, but if nannies are taken, the points available are reduced more quickly (counting directly against the maximum cap). For example, the RY10 hunt quota was established at 56 points or 18 females, whichever occurred first.

METHODS

Unit 4 goat hunting is administered through a registration permit (RG150). Hunters obtain permits without charge and successful hunters are required to report within 5 days of taking a goat. All other permittees are required to report by mid-January. Information from the reports includes the area and number of days hunted, kill date, sex of goat harvested, transportation used, and any use of commercial services. Since 1998 successful hunters have been encouraged to voluntarily bring in the horns from their goat for age and sex determination. Hunter participation

in the voluntary program dropped to 72% prior to the 2006 and 2007 seasons. Once the point system was put in place in 2006, the percentage of hunters bringing in horns climbed to 91%. However, because increase in harvest during late December increases the need to have an accurate and timely count of male and female goats throughout the season, horn measurement became a mandatory condition of the permit hunt beginning with the 2008 season.

Up to five federal permits for goats are issued through the Forest Service to the Sitka Tribe of Alaska each year. The permits are used by designated tribal hunters to harvest goats primarily for their hair to make cultural items, although the meat is shared with tribal members. During this reporting period, 2 male goats were harvested under a federal permit in May 2010. This goat harvest is included in the overall harvest for the island but is not reflected in the data tables (Tables 1–4) related to the state registration hunt, RG150.

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 to 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, or inclement weather conditions. During August 2004 an extensive survey of the island was conducted by helicopter under optimal conditions to estimate total goat numbers, number of kids, and distribution of goats across the entire island. 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. During RY05–RY08, only partial surveys were completed due to poor weather and aircraft availability. Nearly complete aerial surveys were accomplished in RY09-RY10 on the northern 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 1,300 goats and an estimated population of 1,530 goats (See Mooney 2008 for details on this and earlier surveys). Since the 2004 island-wide survey, only partial surveys have been completed due to budget, weather, or aircraft availability limitations. For example, in August 2005, a Piper Super Cub was used as the survey platform and the priority was to look at the southern one-third of the island (south of the Great Arm of Whale Bay) for expansion of the population. In RY07 and RY08, following record snowfall, poor weather prevented extensive surveys. In RY09, surveys via helicopter were accomplished for the northern third of the island on established trend count routes and tallied 348 goats. More importantly, the number of kids per 100 goats sighted dropped to 18%; approximately a 4% decline. In RY10 and RY11, surveys via helicopter were accomplished for the northern third of the island on established trend count routes and tallied 513 and 517 goats respectively. The number of kids per 100 goats sighted dropped to 16% in fall 2010 and increased to 18.4% in fall 2011. Additional survey effort could be expended in future years to determine sightability, or the survey count could function independently of sightability and the variation could be considered as a conservative population buffer.

Up until 2007, goat populations continued to expand both spatially and numerically on Baranof Island. Record winter snowpacks during the winters of 2006 through 2008, along with 3

consecutive late and cold springs, have reduced the goat population. During this report period the winter weather was more in the normal range, but population numbers have not recovered to 2006 levels. However, because of differences in observers, pilots, area surveyed, and type of aircraft used, it is difficult to infer goat abundance from the number of goats observed per hour of survey time.

Summer alpine range and winter range may be affected by proposed developments of hydroelectric projects in Sitka and Takatz Bay. A decision by the City and Borough of Sitka to raise the height of the Blue Lake dam will directly affect some wintering goats due to habitat loss. The project may provide hunters with improved boat launching at the dam and better access to goat winter range, affecting goat vulnerability. A second proposed hydroelectric development on the eastern side of the island at Takatz Bay could include a couple of dams and an overland transmission line route across the island to a tie-in with the Green Lake-Blue Lake transmission line. This development has the potential for direct impacts to the movement of goats on summer and winter range.

Areas on the northern one-third of Baranof Island (where an estimated 60–70% of the goat population resides) 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. We have discussed the potential for a cooperative agency habitat assessment project with the U.S. Forest Service to determine the impact of goats on the alpine summer range. As of this report date, funding for a project has not been secured.

E. L. Young estimated a Baranof Island population of 1,000 goats in 1991 (cited by Faro 1994). Whitman (2000) estimated the population at 1,350, and an estimate from the 2004 surveys was 1,529 goats (Mooney 2008). Survey and harvest data since then indicate a decline, with a current estimated population of 900–1,000 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 RY04–RY05 produced combined results with an average of 22% kids. Surveys conducted in 2010 saw a decline to 15.5% with a slight increase in 2011 to 18.4%. These data should be viewed cautiously because of differences in observers, pilots, type of aircraft used, and timing of surveys. Although kids and adults can be differentiated during aerial surveys, male and female goats cannot be differentiated using the aerial survey methodology. Therefore the sex ratio of goats on the landscape is unknown. Harvest data are available, but, since hunters are encouraged to select males, the harvest sex ratios do not reflect population-wide sex ratios.

From 1976 to 2010, hunters harvested 1,200 goats that have been classified by sex. With the exception of kids and yearlings, it is probable that hunters are not selecting against any age class of goat. Generally, males are selected over females but the percentage of females taken is high. The 2009 harvest resulted in 19 females taken and 12 males (Table 1). The mean ages by sex of harvested goats were 4.83 years for males and 4.45 years for females. In 2010, hunters harvested 16 males and 12 females. The mean ages by sex were 5.09 years for males and 6.95 years for females. The increasing ages for both males and females is worthy of note and could be indicative of missing younger age cohorts due to declining recruitment. This is in contrast to the previous report period (RY07–RY08), when the mean age of harvested males was 4.1 years, while for females it was 4.4 years.

In fall 2009 and 2010, 6 of 31 harvested females were ≥ 7.5 years of age; 4 of those were older than 9.5 years of age and one female was older than 10.5 years of age. During this same period, 4 of 28 males were 8.5 years of age or older. This is in contrast to the previous reporting period (RY07–RY08) when approximately 81% of all harvested females and 82% of all harvested males were between the ages of 1.5 and 5 years; in the current report period only 50% of the harvested females and 59% of the harvested males were between 1.5 and 5 years of age. The single reporting year of 2010 is particularly troublesome for the female harvest. In this case, 8 of 12 females harvested (66%) were 5.5-10.5 years of age.

With a goal of encouraging hunters to select billies over nannies, hunters are shown a series of close-up photographs of goats on Baranof Island at the Sitka office to help identify characteristics of the sexes in the field. This effort complements a region-wide brochure on the subject, issued in the summer of 2008, which is available to hunters in area offices and on the department's website.

Distribution and Movements

Mountain goats inhabit all available summer range on Baranof Island north of Port Herbert and Snipe Bay. Goat densities in various alpine areas are unknown, but recent surveys indicate that some goat habitats are densely occupied, especially areas north of Blue Lake and south/southeast of Rodman Creek. Until 2007 public reports and survey observations of goats south of Whale and Gut bays were increasing yearly. Contiguous goat habitat is limited south of Whale and Gut bays and that limitation plays a part in slowing the range expansion and population growth of goats in this area. Winter habitat is more difficult to define, but south-facing cliffs are generally preferred. The extreme winters of 2006 through 2008 most likely adversely affected goats in less than optimal habitat. Continuing island-wide surveys is an important priority for the next reporting period since management harvest guidelines are derived from population surveys and hunter harvest numbers.

Horn Growth Rates

In an effort to better understand growth characteristics of Unit 4 goats, hunters were requested to voluntarily submit horns for aging and measuring from 1998 through 2007. Beginning in 2008, hunters were required to submit horns. A total of 542 goats from the 1998–2010 seasons yielded data on horn growth and have been aged based on discreet annuli in horns (Brandborg 1955).

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. Also, after 6 years of age, growth annuli become so compressed that accurate measurements can be difficult.

Despite earlier indications that incremental horn growth might reflect winter severity (Whitman 2000), analysis of horn growth data from 1999 through 2010 suggests there is no correlation between horn growth and winter severity.

MORTALITY

Harvest

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

Regulations adopted by the Federal Subsistence Board (FSB) are identical to state regulations. Up to 5 permits per year are granted by the FSB to the Sitka Tribe of Alaska to harvest goats primarily for their hair to meet cultural needs. Male goats have been targeted for these hunts in the spring (May and early June) and only 2 goats were harvested during this reporting period.

Board of Game Actions and Emergency Orders. During the previous report period, the board adopted a proposal to prohibit the taking of a nanny with kids. No new proposals were adopted during this report period.

Hunter Harvest. During 2009 and 2010, 241 and 209 registration permits were issued, respectively (Table 1). Totals of 31 (2009) and 28 (2010) goats were legally harvested. Forty four percent of permittees actually hunted in 2009 and 43% hunted in 2010. For those hunters going afield, the success rate was 30% in 2009 and 31% in 2010. Five-year averages for the period 2006–2010 were as follows: 275 permits issued; 125 hunters afield; and 37 goats reported harvested. Hunters reported 39% male goats in the harvest in 2009 and 57% in 2010 (Table 1). With the current Unit 4 population estimate for goats at 900 animals, documented harvest during the report period accounts for less than 3.4% of the population 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. Seventy nine percent of hunters were local residents during 2009, a number that dropped to 74% in 2010 (Table 2). The proportion of nonresident guided hunters was 10% in 2009 and rose to 19% in 2010. Although these percentages of nonresidents are still low, the trend indicates a slight long-term increase.

Harvest Chronology. Weather and hunter access are the primary factors controlling hunter effort and chronology of the goat harvest in Unit 4. Historically, few goats were harvested during November and December, when frequent low-pressure systems bombard Southeast Alaska with rain and/or snow. In the last decade, however, hunters have elected to hunt after October-early November snows drive goats to lower elevations. The 2009 season saw the pattern swing back from this hunt harvest strategy to a later one with 7 (23%) goats harvested in November and 11 (35%) in December. During 2010, 9 goats (32%) were harvested during August, whereas 6 goats each (21%) were harvested in September, November, and December respectively (Table 3).

Transport Methods. Boats continue to be the main mode of transportation for Unit 4 goat hunters. During 2009, 68% of successful hunters used boats for primary access. In 2010,

successful hunters used boats for primary access 71% of the time (Table 4). The use of airplanes increased to 16 % in 2009, and decreased slightly to 15% in 2010.

Other Mortality

Quantitative estimates of extent or cause of other goat mortality is unknown. Brown bear-caused mortality occurs but its significance is unknown. During aerial surveys bears have been observed at elevations between 3,000 to 4,200 feet lying prone in the rocks above goats; these bears may have been waiting in apparent ambush. Baranof Island's deer and goat populations on summer alpine range appear to provide an opportunistic resource for bears. Bald eagles have been observed hazing young goats and kids as they cross over narrow ridges, similar to behavior exhibited by golden eagles in other locales. Winter starvation and accidental deaths due to falls, rockslides, and avalanches undoubtedly take some toll on the population.

HABITAT

Assessment

A preliminary 2004 sampling effort of three sites on Baranof found that dwarf blueberry (*Vaccinium caespitosum),* fireweed *(Epilobium sp.),* and oatgrass *(Trisetum sp.)* were grazed at each location (see Mooney 2008 for more details). An additional habitat study is planned for the summer of 2011 on southern Baranof Island.

Enhancement

No habitat enhancement activities were conducted on goat range during this report period. In cooperation with U.S. Forest Service Sitka Ranger District biologists, ADF&G continues to seek funding to develop projects for goat habitat assessment and enhancement work.

NONREGULATORY MANAGEMENT PROBLEMS/NEEDS

Efforts should continue to monitor timber extraction activities and additional road building associated with logging and hydroelectric projects. On Baranof Island, habitat degradation activities are currently of minor concern; however, the Blue Lake and Takatz Lake hydroelectric projects proposed by the City and Borough of Sitka may have some negative impacts to goats. Research work involving radiocollared goats is anticipated beginning fall of 2010 to address project impacts.

CONCLUSIONS AND RECOMMENDATIONS

The Unit 4 mountain goat population appears to be in a slight decline at this time. We recommend that current state regulations remain in effect concerning season dates and bag limits. The current registration permit hunt works well and hunters seem to readily accept the hunt conditions and obligations. If the trend of harvested females continues upward we may need to review whether encouraging hunters to voluntarily target males is sufficient to minimize female harvest. The new department brochure to help hunters with sex identification of goats will continue to be used. The mandatory horn measurement requirement as part of the registration permit for successful hunters is providing good information and filling in the voids from the earlier voluntary program. It also provides an opportunity for us to collect small tissue samples for DNA analysis with little additional work.

To help develop long-term management strategies, we need to explore ways to determine goat sightability during aerial survey efforts, or develop other methods. Knowing sightability factors

will allow a better estimation of goat population size on the island. Also, habitat assessment studies may help to identify the highest number of goats habitats can support without degradation, leading to finer-scale geographic harvest management.

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Prepared by:

Philip Mooney
Wildlife Biologist III

Submitted by:

Neil Barten
Management Coordinator

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Table 1. Unit 4 mountain goat harvest data for registration permit hunt RG150, RY06–RY10.

Year	Permits issued	Did not report	Did not hunt	Unsucess-ful hunters	Successful hunters	Males	Females	Sex unk.	Illegal	Total Harvest
2006	447	5	166	84	54	31	22	1	0	54
2007	500	4	158	131	38	26	12	0	1	39
2008	409	2	159	92	32	22	10	0	0	32
2009	346	3	133	74	31	12	19	0	0	31
2010	298	0	120	61	28	16*	12	0	0	28[a]

[a] Does not include 2 male goats taken under Sitka Tribe of Alaska permits.

Table 2. Unit 4 mountain goat hunter residency and success for registration permit hunt RG150, RY06–RY10.

Year	Successful				Unsuccessful				Total hunters
	Local[a] resident	Nonlocal resident	Nonres	Total	Local[a] resident	Nonlocal resident	Nonres	Total	
2006	32	2	20	54	80	6	25	111	165
2007	28	3	7	38	92	12	17	121	159
2008	18	3	11	32	70	11	10	91	123
2009	23	2	6	31	60	10	4	74	105
2010	19*	1	8	28	47	5	9	61	89

[a]Residents of Baranof Island; *does not include 2 residents with Sitka Tribe of Alaska permits.

Table 3. Unit 4 mountain goat harvest chronology by month for registration permit hunt RG150, RY06–RY10.

	Month					
Year	August	September	October	November	December	Total
2006	3	14	13	9	15	54
2007	13	4	4	8	10	39
2008	7	6	3	6	10	32
2009	4	4	5	7	11	31
2010	9	6	1	6	6	28[a]

[a] Does not include 2 male goats taken in May by Sitka Tribe of Alaska permits

Table 4. Unit 4 mountain goat harvest by transport method used by successful hunters for registration permit hunt RG150, RY04–RY10.

Year	Airplane	Boat	Snow machine	Off-road Vehicle[c]	Vehicle	Walked	Total
2004	16	24	0	2	1	4	47
2005	19	29	0	0	1	2	53[a]
2006	16	34	0	1	0	1	54[a]
2007	7	22	0	3	3	3	39
2008	4	22	0	2	3	1[b]	32
2009	5	21	0	3	2	0	31
2010	4	20	0	3	1	0	28[d]

[a] 2 goats taken in each of these years were unspecified by transport method
[b] Listed as "other" on report – but locations given as Hidden Falls (Taken by Hidden Fall Res) & Cross Mt (taken by Sitka Res)
[c] Off-road vehicle includes ¾ wheeler & off-road vehicle
[d] 2 goats taken by Sitka Tribe of Alaska permits are not included

Alaska Department of Fish and Game
Division of Wildlife Conservation
(907) 465-4190 PO BOX 115526
JUNEAU, AK 99811-5526

MOUNTAIN GOAT MANAGEMENT REPORT

From: 1 July 2009
To: 30 June 2011

LOCATION

GAME MANAGEMENT UNIT: 5 (5,800 mi^2)

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 Division of Game 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. During the 1980s Unit 5A surveys and anecdotal accounts from guides, pilots, and hunters 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. Beginning in the late 1990s a dramatic decline in Unit 5A goat numbers prompted both ADF&G and the United States Forest Service (USFS) to close their respective hunting seasons in this area beginning in 2000. ADF&G omitted "Nunatak Bench" from the legal hunt area of RG170, thereby closing it to goat hunting under state regulation. 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 associated national preserve remains open to hunting). The primary unit 5B goat habitat open to hunting is at Icy Bay and is difficult to access.

MANAGEMENT DIRECTION

MANAGEMENT OBJECTIVES

Unit 5 mountain goat management objectives identified by staff 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 ensure a male:female harvest of at least 2:1.
- Identify discrete geographic areas and manage within these areas.
- Maintain a guideline harvest not to exceed 6 points (males = 1 point and females = 2 points) per 100 goats observed.
- Conduct aerial surveys at least every 3 years in areas of high harvest.
- Continue to monitor the Nunatak Bench goat population through aerial surveys.

METHODS

We conducted several aerial surveys within the unit during this report period. Because of our concern with low goat numbers at Nunatak Bench and areas west of Harlequin Lake, we made it a priority to survey these areas. A complete survey was conducted at Nunatak Bench and the eastern Brabazon Range (East of Harlequin Lake); weather and staff availability precluded a complete survey of the western Brabazon Range (West of Harlequin Lake) (Table 1).

Unit 5 has both a state registration permit hunt and a federal subsistence regulations hunt for goats. The federal subsistence goat hunt is managed by the U. S. Forest Service under a federal subsistence registration permit. Season dates for the federal hunt are 1 August to 31 January. The state hunt opens 1 August and ends on 31 December. ADF&G receives information from all successful hunters and unsuccessful hunters in the state hunt, but information from federal permittees is often difficult to obtain because the reporting requirement is not strictly enforced. 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. We also gathered anecdotal information from hunters, ADF&G field personnel, and U.S. Forest Service (USFS) personnel stationed in Yakutat.

Harvest and other data were summarized by regulatory year (RY), which begins 1 July and ends 30 June (e.g., RY09 = 1 July 2009–30 June 2010).

RESULTS AND DISCUSSION

POPULATION STATUS AND TREND

Population Size

Table 1 shows the results from aerial surveys of the Nunatak Bench and Brabazon Range in Unit 5A. Based on this survey data, it appears the goat population at Nunatak Bench remains depressed in spite of the hunting closure that has been implemented each year since 2000. The area west of Harlequin Lake appears to be doing well with a fair number of goats observed and a good kid to adult ratio. The eastern Brabazon Range (east of Harlequin Lake) was not surveyed completely but the data collected suggests a continuing decline in goat numbers in the area. We will continue to monitor these areas through aerial surveys, and take management actions (hunt reinstatement, harvest quota reduction, hunt closure, etc.) based on the number of goats detected.

MORTALITY

Harvest

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

Board of Game Actions and Emergency Orders (EO). Emergency Orders were issued both in 2009 and 2010 closing the western Brabazon Range (west of Harlequin Lake) to goat hunting due to declining numbers of goats detected in aerial surveys (Table 1).

Federal Subsistence Board Actions and Emergency Orders (EO). During each year of the report period, the USFS issued an emergency order to close the Nunatak Bench to goat hunting prior to any harvest taking place. At present, the USFS continues to address our desire for no harvest in this area by using EOs and Special Action Requests to close the federal season.

Hunter Harvest. Two goats (1 male and 1 female) were harvested during the report period. Areas that were open to mountain goat hunting during the report period generally allowed 5–6 points to be taken (male=1 point and female=2 points). Both goats taken during the report period were harvested in unit 5A. The mountain goat harvest has been extremely low in Unit 5B and a harvest point quota has not been established in this unit. The department has spent a considerable amount of time encouraging mountain goat hunters to take male goats, and has provided several resources to hunters to assist in determining the sex of goats in the field. During the current report period few goats were taken and one of each sex was harvested, resulting in female goats representing 50% of the harvest. Considering the low harvest this percentage is not particularly concerning but it is curious that the female goat was taken by a guided nonresident hunter. For the previous 2 report periods the proportion of male goats was 100% and 86%, respectively; maintaining a high proportion of males in the harvest may assist in rebuilding herd numbers in areas with depressed populations. The low harvest in RY09 and RY10 is consistent with recent report periods (Table 2). The closure at Nunatak Bench is at least partly responsible for this low harvest as is the more recent closure of that area west of Harlequin Lake. 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.

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 the period RY99–RY08 the mean annual Unit 5 mountain goat harvest was 6 goats per year. An illegal guiding operation on Nunatak Bench boosted harvest numbers for several years, including RY99 when 19 goats were taken. With the removal of the illegal guide harvest numbers declined and are closer to the long-term mean annual harvest of 6 goats per year (RY90—RY08, excluding RY98—RY00).

Permit Hunts. Totals of 23 and 11 registration permits were issued during RY09 and RY10, respectively. The number of permits issued during the report period (34) was below the number of permits issued during the previous report period (50; Table 4). Hunting effort was minimal with only 6 and 2 people hunting during RY09 and RY10, respectively. The mean of 4 hunters per year during the report period is less than half the mean of the previous period (10). Often hunters will get a registration permit to hunt mountain goats in hopes of having an opportunity. Access to goat hunting areas in Unit 5 is difficult and expensive. This, combined with low numbers of goats in areas where at least boat access is possible, likely contributes to the lack of interest in goat hunting in the unit.

Hunter Residency and Success. The goat hunter success rate was 17% in RY09, and increased to 50% in RY10 (Table 3); caution should be used in interpreting these data because only 2 permit holders hunted in RY10. Success rates in Unit 5 have ranged from 14% to 50% since 2001 (Table 3). Goat hunting success in Unit 5 is extremely variable. There is no obvious reason for the variability; however, weather and access drive goat hunting activity in most locations and may also account for the variability in success rate. Resident and nonresident hunters split the harvest this period, with 1 goat for each demographic group (Table 3). Historically, nonresidents have taken the majority of goats in Unit 5. Nonresidents are not eligible for the federal hunt. Overall, 4 resident and 4 nonresident hunters indicated they hunted mountain goats in Unit 5 during the report period (Table 3).

Harvest Chronology. During the report period 1 goat was harvest in October and the other in November. The Unit 5 goat harvest is traditionally spread throughout the season, with the

greatest number of goats typically taken during October and November when goats may be found at lower elevations.

Transport Methods. Boats were used by both successful goat hunters during the report period (Table 5). Local residents continued to favor boats as their preferred mode of transportation. Local and nonlocal residents use commercial services in the form of charter aircraft to fly them into remote airstrips that provide access to hunting areas (Table 6). Nonresident hunters must have a guide to hunt mountain goats in Alaska (Table 6), and the few guides offering goat hunts in Unit 5 typically use aircraft to access hunting areas; however, during the current period all guided nonresident goat hunters were transported by boat.

Other Mortality

The decline in goat numbers at Nunatak Bench and areas southeast to Harlequin Lake, despite hunt closures, suggests something unrelated to hunting is limiting goat numbers in those areas. Winter severity may be an additive factor contributing to the continued decline, but numbers began to dip prior to the extreme winter of RY06—RY07. In cooperation with the U.S. Forest Service, the department is attempting to survey the area annually to determine current trends for the goat population in the area.

CONCLUSIONS AND RECOMMENDATIONS

Obtaining mountain goat population information through aerial sex and age composition counts was a priority during this report period. These data, along with data collected since 1999, have allowed us to get a decent understanding of goat population levels, as well as herd composition and distribution. Few of the Unit 5 mountain goat management objectives are quantifiable. The 2 that are, harvest point levels and goat per hour observations were achieved; however, goats per hour must be considered in the context of the overall number of goats observed, percentage of kids, and areas surveyed. We achieved other management objectives by providing hard-copy and Internet-based mountain goat sex identification resources for hunters, and conducting multiple surveys in areas with depressed mountain goat numbers. These efforts should continue, especially for hunting areas at Nunatak Bench and in the western Brabazon Range, where the population appears to be persistently low. Like many areas in Southeast, Alaska, the mountain goat habitat capability in Unit 5 in unknown. Future research should focus on the development of habitat capability models for Southeast, Alaska. The Nunatak Bench and areas west of Harlequin Lake will remain closed to hunting until aerial survey results suggest goat numbers have increased to near 80 on Nunatak Bench, and 100 in the area west of Harlequin Lake.

PREPARED BY:

Ryan Scott
Wildlife Biologist III

SUBMITTED BY:

Neil L. Barten
Management Coordinator

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Table 1. Unit 5 mountain goat serial survey data, regulatory years 1986 through 2010.

Year	Number Adults	Number Kids	Total Goats	Kids:100 Adults	Percent Kids	Goats/Hr.
1986	36	11	47	31	23	40
1987	196	53	249	27	21	60
1988	140	53	193	38	27	56
1989	64	29	93	45	31	47
1990-1999				No Survey		
			Nunatak Bench			
2000	69	13	82	19	16	91
2000	40	6	46	15	13	52
2001	37	11	48	30	23	20
2001	37	2	39	5	5	54
2002	25	4	29	16	14	19
2003	29	14	43	48	33	40
2004				No Survey		
2005			19			
2006				No Survey		
2006	26	7	33	27	21	48
2007	17	6	23	35	26	31
2008	35	9	4	6	21	25
2010	22	6	28	27	21	25
		East Harlequin Lake (Eastern Brabazon Range)				
2000	103	20	123	19	16	41
2001	119	31	150	26	21	52
2002-2006				No Survey		
2007[d]	55	5	60	9	8	103
2008[g]	164	25	189	15	13	145
2010	126	31	157	25	20	87
		West Harlequin Lake (Western Brabazon Range)				
2003	63	21	84	33	25	126
2004				No Survey		
2005[b]	122	28	150	23	19	75
2006[c]	103	13	116	13	11	82
2007[e]	57	9	66	16	14	33
2008[f]	38	14	52	37	27	29
2010[h]	10	2	12	-	-	-

[a]Beginning in 2000, aerial survey data is listed for specific area of Unit 5A and 5B.

[b]Survey of Chaix Hills, Unit 5B.

[c]Nunatak Fiord south to Miller Creek.

[d]Mt. Reaburn to Italio Lake.

[e]Crescent Mountain to W. Nunatak Glacier.

[f]Nunatak to Harlequin Lake.

[g]Harlequin Lake to Nunatak Glacier.

[h]Incomplete survey 2010.

Table 2. Unit 5 annual goat harvest, regulatory years 2001 through 2010.

Year	Males	Females	Unknown	Total
2001	5	0	0	5
2002	3	1	0	4
2003	2	1	0	3
2004	1	1	0	2
2005	6	0	0	6
2006	3	0	0	3
2007	2	1	0	3
2008	4	0	0	4
2009	0	1	0	1
2010	1	0	0	1

Table 3. Unit 5 goat hunter success by community of residence, regulatory years 2001 through 2010.

		Successful hunters			Unsuccessful hunters		
Year	Percent success	Unit resident	Other AK	Non-resident	Unit resident	Other AK	Non-resident
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
2005	55	0	0	6	1	4	0
2006	33	0	0	3	3	2	1
2007	30	1	0	2	3	0	4
2008	44	3	0	1	2	1	2
2009	17	0	0	1	1	1	3
2010	50	1	0	0	1	0	0

Table 4. Unit 5 goat hunter effort and success, regulatory years 2001 through 2010.

		Successful hunters			Unsuccessful hunters			Total hunters		
Year	Permits Issued	Nr hunters	Total days	Avg nr days	Nr hunters	Total days	Avg nr days	Nr hunters	Total days	Avg nr days
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
2005	29	6	17	2.8	5	15	3.0	11	32	2.9
2006	35	3	3	1.0	6	19	3.2	9	22	2.4
2007	27	3	5	1.7	7	29	4.1	10	34	3.4
2008	23	4	15	3.8	5	21	4.2	9	36	4.0
2009	23	1	1	1.0	5	19	3.8	6	20	3.3
2010	11	1	1	1.0	1	1	1.0	2	2	1.0

Table 5. Unit 5 transport methods used by successful goat hunters, regulatory years 2001 through 2010

	Airplane		Boat		Snowmachine		Highway vehicle		Foot	
Year	Total	%	Total	%	Total	%	Total	%	Total	%
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
2005	1	17	5	83	0	0	0	0	0	0
2006	0	0	2	67	0	0	0	0	1	33
2007	2	67	1	33	0	0	0	0	0	0
2008	0	0	4	100	0	0	0	0	0	0
2009	0	0	1	100	0	0	0	0	0	0
2010	0	0	1	100	0	0	0	0	0	0

Table 6. Unit 5 Commercial services used by goat hunters, regulatory years 2001 through 2010.

Year	Unit Residents		Other AK Residents		Nonresidents		Total Use	
	Yes	No	Yes	No	Yes	No	Yes	No
2001	3	0	2	0	0	5	5	5
2002	5	0	1	1	0	5	6	6
2003	5	0	0	0	0	5	5	5
2004	0	0	3	5	0	6	3	11
2005	1	0	0	4	0	6	1	10
2006	3	0	0	2	0	4	3	6
2007	4	0	0	0	0	6	4	6
2008	3	2	1	0	0	3	4	5
2009	0	1	0	1	4	0	4	2
2010	0	2	0	0	0	0	0	2

Alaska Department of Fish and Game
Division of Wildlife Conservation
907-465-4190 P.O. BOX 115526
JUNEAU, AK 99811-5526

MOUNTAIN GOAT MANAGEMENT REPORT

From: 1 July 2009
To: 30 June 2011

LOCATION

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

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 (Heller 1910), Clarence Rhodes in 1938 (Annual Game Commission Report, ADF&G files), and Fred Robards in 1952 (Annual Game Commission Report, ADF&G files) documented their presence. Robards estimated a population size of 4,350 goats between Cape Fairfield and Bering Glacier, which includes most of Unit 6. Coastal mountain goat populations were reduced by hunting pressure during much of the twentieth century, probably starting in the 1940s when Art Sheets (ADF&G biologist) reported military personnel stationed in Whittier reduced goat numbers in Port Wells. Goat numbers remained low during the late 1970s and 1980s because of hunter harvest (Griese 1988a) and predation (Reynolds 1981, Griese 1988b). Harvest management evolved and important lessons were learned 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. By 1987 the goat population had declined to 3,400 and continued downward to 3,000 by 1994, even with the implementation of more conservative management, such as reduced harvest and no hunting of small groups of goats (<60) (Nowlin 1996). Conservative harvest strategies finally allowed the population to rebound to approximately 4,000 goats by 1999. During the last decade the population has remained between 3,800 and 4,200, declining somewhat during winters of heavy snow and recovering after mild winters.

The Alaska Department of Fish and Game (ADF&G) began flying aerial surveys in 1969 to determine mountain goat population size and sex and age composition. Griese (1988a) improved and standardized methods in 1986 by establishing count areas that were systematically searched. Nowlin (1998) established a tracking harvest strategy (Caughley 1977, Smith 1984) to guide goat management decisions. The three important elements for implementation of the strategy were (1) improved aerial survey methods for obtaining trend information, (2) registration permit hunts

allowing careful monitoring of harvest distribution and magnitude, and (3) a formalized minimum population objective of 2,400 goats for Unit 6.

We have monitored harvest since 1972 using hunter reports. Both successful and unsuccessful hunters have been required to report, except during 1980 through 1985, when only successful hunters reported. Annual harvest reached a historic high of 182 animals in 1983–1984 and declined to a historic low of 35 goats in 1996–1997. During 2000–2009 the annual harvest averaged 72 goats, ranging from 50 to 85.

MANAGEMENT OBJECTIVES

- Maintain a minimum population of 2,400 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%, or 90% of goats were observed during a survey, if conditions 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 two 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 is also referred to as "goat units" taken per hunt area (Del Frate 1992). Harvest data were summarized by regulatory year (RY), which begins 1 July and ends June 30.

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 flew complete or partial aerial surveys in 8 of 15 open permit hunt areas during this reporting period (Table 1). Poor survey conditions during August and September hindered the effort. Based on these and surveys from previous years, the population was approximately 4,000 goats (Table 1). Unit 6D had the highest number of goats.

MORTALITY

Harvest

Seasons and Bag Limits. The mountain goat season in Units 6A and 6B was 20 August–31 January and in Unit 6D it was 15 September–31 January. Hunts in 6C were October 7–31 January. The bag limit was 1 goat by registration permit only, the taking of nannies accompanied by kids was prohibited. Permit hunts were opened in at least 1 of the 2 years, except for RG215 which was closed both years. RG231 and RG248 remained closed during RY10 because of possible overharvest during RY09.

Weighted mountain goat harvests during the reporting period (Table 2) were well below the maximum allowable harvests of 166 (RY09) and 155 (RY10). Allowable harvest was exceeded by 2 or more goat units in RG204, RG230, RG232, RG248, and RG252 during the reporting period, usually as a result of nanny harvest. The harvest included 20–22 % females overall, which was within the objective of 30% maximum females in the harvest. Female harvest was highest in Unit 6C and RG248 in 6D where most goats are taken by local resident hunters. Nonresident guided hunters were much more likely to take billies. No nannies were killed in Units 6A and 6B during the reporting period. Overall, there were no significant events of overharvest that could affect populations.

Board of Game Actions and Emergency Orders. Ten emergency orders were issued closing registration permit hunts when MAH was reached. During RY09, hunts RG215, RG230, RG231, RG232, RG245, RG248, RG249 and RG252 were closed early. During RY10, hunts RG215, RG231, RG232, RG248, RG249 and RG266 were closed. These were routine management actions.

Permit Hunts. Registration permits issued were similar to previous years (Table 2). RG243 was open for state harvest during RY10 for the first time since 1989.

Hunter Residency and Success. The numbers of successful resident and nonresident hunters were similar to previous years (Table 3). Total hunters were down during RY10.

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 primarily boats and airplanes were used.

CONCLUSIONS AND RECOMMENDATIONS

We achieved our objectives to maintain a minimum population size of 2,400 goats and achieve 70% or more males in the harvest. The estimated number of goats at the end of this reporting period was approximately 4,000. The population was probably stable during the reporting period, 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%.

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PREPARED BY:

Dave Crowley
Wildlife Biologist III

SUBMITTED BY:

Gino Del Frate
Management Coordinator

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Table 1. Unit 6 summer mountain goat composition counts and estimated population size, 2006–2010.

Unit	Hunt nr. or area	Regulatory year	Survey coverage	Older goats	(%)	Kids	(%)	Kids:100 older goats	Total goats observed	Estimated population size[a]
6A	RG202	2006–2010	None	--	--	--	--	--	--	90
	RG204	2006–2010	None	--	--	--	--	--	--	195
	RG206	2010	Partial	247	(77)	73	(23)	30	320	392
	RG208	2006–2010	None							29
	RG212	2006–2010	None	--	--	--	--	--	--	96
	RG214	2006–2010	None	--	--	--	--	--	--	2
	RG215	2008	Full	4		0	0	--	4	5
	Brower Ridge	2010	Full	60	(79)	16	(21)	27	76	91
6A TOTAL		2010	Partial	311	(77)	89	(23)	29	400	900
6B	RG220	2006–2010	None	--	--	--	--	--	--	200
	RG226	2008	Full	78	(88)	11	(12)	14	89	108
6B TOTAL		2008–2010	Partial	78	(88)	11	(12)	14	89	308
6C	RG230	2006–2010	None							168
	RG231	2010	Full	62	(76)	20	(24)	22	82	140
	RG232	2010	Partial	52	(82)	11	(18)	21	63	230
6C TOTAL		2008	Partial	98	(78)	28	(22)	29	126	571
		2010	Partial	114	(79)	31	(21)	27	145	538
6D	RG242	2008	Partial	325	(85)	56	(15)	17	381	615
	RG243	2010	Partial	9	82	2	18	22	11	102
	RG244	2006–2010	None	--	--	--	--	--	--	257
	RG245	2006–2010	None	--	--	--	--	--	--	134
	RG248	2006–2010	None	--	--	--	--	--	--	70
	Heiden	2006–2010	None	--	--	--	--	--	--	30
	RG249	2008	Full	200	(84)	37	(16)	19	237	270
	RG252	2010	Full	231	(75)	79	(25)	34	310	340
	RG266	2010	Partial	103	(83)	21	(17)	20	124	319
	Remainder	2006–2010	None	--	--	--	--	--	--	133
6D TOTAL		2008	Partial	525	(85)	93	(15)	18	618	2411
		2010	Partial	343	(77)	102	(23)	30	445	2228
UNIT 6 TOTAL		2006	--	--	--	--	--	--	--	4125
		2007	--	--	--	--	--	--	--	4074
		2008	--	--	--	--	--	--	--	3974
		2009	--	--	--	--	--	--	--	3964
		2010	--	--	--	--	--	--	--	3974

[a] Based on most current complete (full) survey(s).

Table 2. Unit 6 mountain goat harvest data by permit hunt, 2006–2010.

Unit/ hunt nr	RY	Permits issued	Nr did not hunt	Percent did not hunt	Nr unsuccessful hunters	Percent unsuccessful hunters	Nr successful hunters	Percent successful hunters	M	(%)	F	(%)	Unk.	Total harvest Unw [a]	Total harvest W [b]
6A/RG202	2006	15	10	67	3	60	2	40	1	(50)	1	(50)	0	2	3
	2007	9	8	89	1	100	0	0	0	(0)	0	(0)	0	0	0
	2008	30	15	50	10	67	5	33	4	(80)	1	(20)	0	5	6
	2009	14	11	79	0	0	3	100	3	(100)	0	(0)	0	3	3
	2010	16	12	75	2	50	2	50	2	(100)	0	(0)	0	2	2
6A/RG204	2006	12	9	75	0	0	3	100	3	(100)	0	(0)	0	3	3
	2007	14	11	79	0	0	3	100	3	(100)	0	(0)	0	3	3
	2008	13	10	77	1	33	2	67	2	(100)	0	(0)	0	2	2
	2009	15	7	47	1	13	7	88	7	(100)	0	(0)	0	7	7
	2010	16	7	44	1	11	8	89	8	(100)	0	(0)	0	8	8
6A/RG206	2006	7	6	86	0	0	1	100	0		0		1	1	2
	2007	12	6	50	2	33	4	67	3	(100)	0	(0)	1	4	5
	2008	4	3	75	0	0	1	100	1	(100)	0	(0)	0	1	1
	2009	7	2	29	2	40	3	60	2	(67)	1	(33)	0	3	4
	2010	5	2	40	1	33	2	67	1	(100)	0	(0)	1	2	3
6A/RG212	2006	4	4	100											
	2007	0													
	2008	0													
	2009	2	2	100											
	2010	3	3	100											
6A/RG215	2006	8	5	63	3	100	0	0	0		0		0	0	0
	2007	4	4	100	0	0	0	0	0	(0)	0	(0)	0	0	0
	2008	0													
	2009	0													
	2010	0													
6A TOTAL	2006	46	34	74	6	50	6	50	4	(80)	1	(20)	1	6	8
	2007	39	29	74	3	30	7	70	6	(100)	0	(0)	1	7	8
	2008	47	28	60	11	58	8	42	7	(88)	1	(13)	0	8	9
	2009	38	22	58	3	19	13	81	12	(92)	1	(8)	0	13	14
	2010	40	24	60	4	25	12	75	11	(100)	0	(0)	1	12	13

Table 2 continued.

Unit/ hunt nr	RY	Permits Issued	Nr did not	Percen did hunt	Nr unsuccessful hunters	Percent unsuccessful hunters	Nr successful hunters	Percent successful hunters	Male	(%)	Female	(%)	Unk.	Total harvest Unw [a]	Total harvest W [b]
6B/RG220	2006	20	9	45	7	64	4	36	3	(100)	0	(0)	1	4	5
	2007	11	7	64	2	50	2	50	2	(0)	0	(0)	0	2	2
	2008	18	14	78	3	75	1	25	1	(100)	0	(0)	0	1	1
	2009	37	23	62	11	79	3	21	2	(67)	1	(33)	0	3	4
	2010	15	7	47	7	88	1	13	0		0		1	1	2
6B/RG226	2006	23	15	65	1	13	7	88	7	(100)	0	(0)	0	7	7
	2007	9	6	67	1	33	2	67	2	(100)	0	(0)	0	2	2
	2008	6	2	33	4	100	0	0	0	(0)	0	(0)	0	0	0
	2009	8	7	88	1	100									
	2010	19	15	79	2	50	2	50	1	(50)	1	(50)	0	2	3
6B TOT	2006	43	24	56	8	42	11	58	10	(100)	0	(0)	1	11	12
	2007	20	13	65	3	43	4	57	4	(100)	0	(0)	0	4	4
	2008	24	16	67	7	88	1	13	1	(100)	0	(0)	0	1	1
	2009	45	30	67	12	80	3	20	2	(67)	1	(33)	0	3	4
	2010	34	22	65	9	75	3	25	1	(50)	1	(50)	1	3	5
6C/RG230	2006	37	19	51	12	67	6	33	4	(67)	2	(33)	0	6	8
	2007	42	17	40	17	68	8	32	8	(100)	0	(0)	0	8	8
	2008	40	10	25	22	73	8	27	8	(100)	0	(0)	0	8	8
	2009	21	8	38	7	54	6	46	4	(67)	2	(33)	0	6	8
	2010	23	7	30	10	63	6	38	4	(67)	2	(33)	0	6	8
6C/RG231	2006	17	7	41	5	50	5	50	4	(80)	1	(20)	0	5	6
	2007	16	5	31	5	45	6	55	3	(50)	3	(50)	0	6	9
	2008	31	8	26	17	74	6	26	2	(33)	4	(67)	0	6	10
	2009	16	10	63	1	17	5	83	3	(60)	2	(40)	0	5	7
	2010	0													
6C/RG232	2006	23	16	70	5	71	2	29	0	(0)	2	(100)	0	2	4
	2007	20	11	55	4	44	5	56	3	(60)	2	(40)	0	5	7
	2008	16	8	50	5	63	3	38	3	(100)	0	(0)	0	3	3
	2009	69	38	55	28	90	3	10	3	(100)	0	(0)	0	3	3
	2010	9	2	22	5	71	2	29	1	(50)	1	(50)	0	2	3

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	Male	(%)	Female	(%)	Unk.	Total harvest Unw [a]	Total harvest W [b]
6C TOTAL	2006	77	42	55	22	63	13	37	8	(62)	5	(38)	0	13	18
	2007	78	33	42	26	58	19	42	14	(74)	5	(26)	0	19	24
	2008	87	26	30	44	72	17	28	13	(76)	4	(24)	0	17	21
	2009	106	56	53	31	62	19	38	11	(58)	8	(42)	0	19	27
	2010	32	9	28	10	43	13	57	8	(62)	5	(38)	0	13	18
6D/RG242	2006	40	25	63	6	40	9	60	7	(78)	2	(22)	0	9	11
	2007	27	16	59	5	45	6	55	6	(100)	0	(0)	0	6	6
	2008	35	19	54	10	63	6	38	5	(100)	0	(0)	1	6	7
	2009	55	25	45	18	60	12	40	9	(82)	2	(18)	1	12	15
	2010	45	30	67	7	47	8	53	7	(88)	1	(13)	0	8	9
6D/RG243	2010	14	6	43	2	25	6	75	5	(83)	1	(17)	0	6	7
6D/RG244	2006	26	24	92	2	100	0	0	0		0		0	0	0
	2007	16	14	88	2	100	0	0	0	(0)	0	(0)	0	0	0
	2008	27	18	67	6	67	3	33	1	(33)	2	(67)	0	3	5
	2009	31	20	65	7	64	4	36	3	(75)	1	(25)	0	4	5
	2010	17	11	65	4	67	2	33	2	(100)	0	(0)	0	2	2
6D/RG245	2006	28	18	64	10	100	0	0	0		0		0	0	0
	2007	36	19	53	16	94	1	6	1	(100)	0	(0)	0	1	1
	2008	19	14	74	3	60	2	40	0	(0)	2	(100)	0	2	4
	2009	24	19	79	0	0	5	100	3	(60)	2	(40)	0	5	7
	2010	39	26	67	10	77	3	23	3	(100)	0	(0)	0	3	3
6D/RG248	2007	35	13	37	13	59	9	41	7	(78)	2	(22)	0	9	11
	2008	20	8	40	9	75	3	25	2	(67)	1	(33)	0	3	4
	2009	37	17	46	12	60	8	40	6	(75)	2	(25)	0	8	10
	2010	0													

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	(%)	Female	(%)	Unk	Total harvest Unw [a]	Total harvest W [b]
6D/RG249	2006	61	40	66	10	48	11	52	9	(82)	2	(18)	0	11	13
	2007	33	13	39	5	25	15	75	9	(64)	5	(36)	1	15	21
	2008	18	8	44	2	20	8	80	6	(75)	2	(25)	0	8	10
	2009	17	8	47	1	11	8	89	7	(88)	1	(13)	0	8	9
	2010	15	9	60	0	0	6	100	4	(67)	2	(33)	0	6	8
6D/RG252	2006	34	22	65	1	8	11	92	7	(64)	4	(36)	0	11	15
	2007	32	18	56	4	29	10	71	9	(90)	1	(10)	0	10	11
	2008	45	18	40	15	56	12	44	11	(100)	0	(0)	1	12	13
	2009	27	15	56	1	8	11	92	8	(73)	3	(27)	0	11	14
	2010	46	26	57	9	45	11	55	8	(73)	3	(27)	0	11	14
6D/RG266	2006	51	31	61	8	40	12	60	9	(75)	3	(25)	0	12	15
	2007	50	29	58	10	48	11	52	10	(91)	1	(9)	0	11	12
	2008	44	34	77	6	60	4	40	4	(100)	0	(0)	0	4	4
	2009	44	39	84	1	8	4	92	4	(100)	0	(0)	0	4	4
	2010	33	19	58	9	45	9	55	4	(73)	5	(27)	0	9	18
6D TOTAL	2006	263	171	65	47	51	45	49	33	(73)	12	(27)	0	45	57
	2007	229	122	53	55	51	52	49	42	(82)	9	(18)	1	52	62
	2008	208	119	57	51	57	38	43	29	(81)	7	(19)	2	38	46
	2009	235	141	60	41	44	53	56	40	(78)	11	(22)	2	53	65
	2010	209	127	61	35	43	47	57	38	(81)	9	(19)	0	47	56
UNIT 6 TOTAL	2006	429	271	63	83	53	75	47	55	(75)	18	(25)	2	75	94
	2007	366	197	54	87	51	82	49	66	(83)	14	(18)	2	82	97
	2008	366	189	52	113	64	64	36	50	(81)	12	(19)	2	64	77
	2009	424	249	59	87	50	88	50	65	(76)	21	(24)	2	88	110
	2010	315	182	58	63	47	70	53	55	(81)	13	(19)	2	70	84

[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; rounded to the next highest whole number

Table 3. Unit 6 mountain goat hunter residency and success, regulatory years 2006–2010.

		Successful					Unsuccessful					
Unit	Regulatory year	Local resident	Nonlocal resident	Nonresident	Total	(%)	Local resident	Nonlocal resident	Nonresident	Total	(%)	Total hunters
6A	2006	0	2	4	6	(55)	1	4	0	5	(45)	11
	2007	0	2	5	7	(70)	0	1	2	3	(30)	10
	2008	0	0	8	8	(42)	1	1	9	11	(58)	19
	2009	0	4	9	13	(81)	0	0	3	3	(19)	16
	2010	0	2	10	12	(75)	0	0	4	4	(25)	16
6B	2006	0	3	8	11	(58)	3	1	4	8	(42)	19
	2007	0	1	3	4	(57)	0	3	0	3	(43)	7
	2008	0	0	1	1	(13)	1	2	4	7	(88)	8
	2009	0	1	2	3	(21)	4	6	1	11	(79)	14
	2010	1	0	2	3	(25)	4	2	3	9	(75)	12
6C	2006	7	5	1	13	(37)	16	6	0	22	(63)	35
	2007	13	5	1	19	(42)	20	6	0	26	(58)	45
	2008	11	2	0	13	(22)	33	13	0	46	(78)	59
	2009	12	6	1	19	(39)	19	11	0	30	(61)	49
	2010	4	3	1	8	(44)	7	3	0	10	(56)	18
6D	2006	1	17	27	45	(49)	11	31	5	47	(51)	92
	2007	9	19	24	52	(49)	17	36	2	55	(51)	107
	2008	5	12	24	41	(45)	13	30	8	51	(55)	92
	2009	5	20	28	53	(58)	15	23	1	39	(42)	92
	2010	3	19	25	47	(57)	8	23	4	35	(43)	82
Unit 6 Total	2006	8	27	40	75	(48)	31	42	9	82	(52)	157
	2007	22	27	33	82	(49)	37	46	4	87	(51)	169
	2008	16	14	33	63	(35)	48	46	21	115	(65)	178
	2009	17	31	40	88	(51)	38	40	5	83	(49)	171
	2010	8	24	38	70	(55)	19	28	11	58	(45)	128

Table 4. Unit 6 mountain goat harvest chronology percent by month, regulatory years 2006–2010.

Unit	Regulatory year	Harvest Periods						n
		August	September	October	November	December	January	
6A	2006	17	66	17	0	0	0	6
	2007	29	57	14	0	0	0	7
	2008	38	25	38	0	0	0	8
	2009	15	31	23	23	8	0	13
	2010	33	33	17	17	0	0	12
6B	2006	36	64	0	0	0	0	11
	2007	25	50	25	0	0	0	4
	2008	100	0	0	0	0	0	1
	2009	33	0	67	0	0	0	3
	2010	0	67	0	0	0	33	3
6C	2006	36	64	0	0	0	0	11
	2007	0	0	53	5	16	26	19
	2008	0	0	31	31	15	23	13
	2009	0	0	67	6	0	28	18
	2010	0	0	88	13	0	0	8
6D	2006	0	66	32	0	2	0	44
	2007	0	37	55	4	2	2	51
	2008	0	45	47	0	3	5	38
	2009	0	49	45	6	0	0	53
	2010	0	71	18	9	2	0	44
Unit 6 Total	2006	7	54	26	12	1	0	74
	2007	4	31	49	4	5	7	81
	2008	7	32	42	7	5	8	60
	2009	3	34	48	8	1	6	87
	2010	6	55	25	11	2	1	67

Table 5. Unit 6 mountain goat harvest percent by transport method, regulatory years 2006–2010.

Subunit	Regulatory year	Airplane n	Airplane (%)	Boat n	Boat (%)	3- or 4-wheeler n	3- or 4-wheeler (%)	Snowmachine n	Snowmachine (%)	ORV n	ORV (%)	Highway vehicle n	Highway vehicle (%)	Unknown n	Unknown (%)	Total n
6A	2006	4	(67)	1	(17)	1	(17)	0	(0)	0	(0)	0	(0)	0	(0)	6
	2007	7	(100)	0	(0)	0	(0)	0	(0)	0	(0)	0	(0)	0	(0)	7
	2008	5	(63)	0	(0)	1	(13)	0	(0)	2	(25)	0	(0)	0	(0)	8
	2009	12	(92)	0	(0)	1	(8)	0	(0)	0	(0)	0	(0)	0	(0)	13
	2010	10	(83)	0	(0)	1	(8)	0	(0)	1	(8)	0	(0)	0	(0)	12
6B	2006	10	(91)	0	(0)	1	(9)	0	(0)	0	(0)	0	(0)	0	(0)	11
	2007	4	(100)	0	(0)	0	(0)	0	(0)	0	(0)	0	(0)	0	(0)	4
	2008	1	(100)	0	(0)	0	(0)	0	(0)	0	(0)	0	(0)	0	(0)	1
	2009	1	(33)	0	(0)	0	(0)	0	(0)	0	(0)	2	(67)	0	(0)	3
	2010	2	(67)	0	(0)	0	(0)	1	(33)	0	(0)	0	(0)	0	(0)	3
6C	2006	0	(0)	2	(15)	1	(8)	0	(0)	0	(0)	10	(77)	0	(0)	13
	2007	0	(0)	3	(17)	4	(22)	3	(17)	0	(0)	8	(44)		(0)	18
	2008	0	(0)	0	(0)	3	(23)	0	(0)	0	(0)	10	(77)	0	(0)	13
	2009	0	(0)	1	(5)	1	(5)	5	(26)	0	(0)	12	(63)	0	(0)	19
	2010	0	(0)	0	(0)	1	(13)	0	(0)	0	(0)	7	(88)	0	(0)	8
6D	2006	21	(47)	22	(49)	2	(4)	0	(0)	0	(0)	0	(0)	0	(0)	45
	2007	15	(28)	24	(45)	2	(4)	1	(2)	0	(0)	7	(13)	4	(8)	53
	2008	12	(32)	22	(58)	0	(0)	2	(5)	0	(0)	2	(5)	0	(0)	38
	2009	15	(28)	30	(57)	1	(2)	0	(0)	0	(0)	7	(13)	0	(0)	53
	2010	14	(30)	31	(66)	0	(0)	1	(2)	0	(0)	0	(0)	1	(2)	47
Unit 6 Total	2006	35	(47)	25	(33)	5	(7)	0	(0)	0	(0)	10	(13)	0	(0)	75
	2007	26	(32)	27	(33)	6	(7)	4	(5)	0	(0)	15	(18)	4	(5)	82
	2008	18	(30)	22	(37)	4	(7)	2	(3)	2	(3)	12	(20)	0	(0)	60
	2009	28	(32)	31	(35)	3	(3)	5	(6)	0	(0)	21	(24)	0	(0)	88
	2010	26	(37)	31	(44)	2	(3)	2	(3)	1	(1)	7	(10)	1	(1)	70

Alaska Department of Fish and Game
Division of Wildlife Conservation
907-465-4190 P.O. BOX 115526
JUNEAU, AK 99811-5526

MOUNTAIN GOAT MANAGEMENT REPORT

From: 1 July 2009
To: 30 June 2011

LOCATION

GAME MANAGEMENT UNIT: 7 and 15 (8,397 mi^2)

GEOGRAPHIC DESCRIPTION: Kenai Peninsula

BACKGROUND

Mountain goats inhabit most areas of the Kenai Mountains. Goat densities are highest along the coastal mountains and lowest in the interior portions of the Kenai Mountains, where they coexist with Dall sheep. 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.

Hunters that take a goat on the Kenai Peninsula are required to bring in the horns for measuring. The results of a goat horn study comparing growth on the Kenai Peninsula, a native population, with Kodiak, a relatively new population, showed that horn growth can be used as a measure of habitat quality (McDonough et al. 2006). Kenai goats showed lower horn growth than Kodiak goats, especially for females.

Management strategy for Kenai goats has changed. Due to a population decline from the early 1990s through 2006, we have taken a conservative approach to managing goat hunts based on recent information on sustainable harvest rates (Hamel et al. 2006). The protocol to determine the number of hunting permits to issue each year in each area considers past hunting success, population size and trends, the age of survey data, past harvest rates, the age structure of the harvest, the number of females taken each year and in successive years, ease of access, and other factors. Details of this strategy are outlined in McDonough and Selinger (2008).

MANAGEMENT DIRECTION

MANAGEMENT OBJECTIVES

To monitor population trends, maintain a low proportion of nannies in the harvest, and restrict or liberalize hunting permits and allowable harvest based on conservative assessments of minimum population size and population trends.

METHODS

The Kenai Peninsula mountain goat range, excluding KFNP, is divided into individual count areas that correspond to hunt areas. There are 28 areas that have had hunts at some point during the past 5 seasons (Table 1). Since the early 1970s, ADF&G has monitored goat populations in these areas through aerial surveys typically conducted July–September. Optimally, each area is surveyed once every 3 years. Surveys distinguish kids (<5 months old) from adults. To protect the female proportion of the population, each nanny harvested is counted as 2 goats and a male as 1 goat when determining permit allocations and sustainable harvest levels.

RESULTS AND DISCUSSION

POPULATION STATUS AND TREND

Population Size and Composition

The overall population decreased 30 to 50% from the early 1990s to around 2006 based on fall trend count results. Populations in areas 331, 332, 333, 335, 343, 355, and 356 decreased to levels that prompted managers to either close the hunts or greatly reduce the number of permits. However, some individual count areas have stable or increasing populations (Table 2).

MORTALITY

Harvest

Season and Bag Limit. For the past 2 decades, goat hunting on the Kenai Peninsula has been managed by a combination of drawing and registration permit hunts. Since 2001, the drawing permit season has been 10 August–15 October and the registration permit season has been 1–30 November. The majority of the harvest opportunity is provided through drawing permits. At the end of each drawing season, hunt areas can be opened to a registration permit hunt if the area can sustain additional harvest. The number of permits issued in the registration hunts is limited to reduce the chance of overharvest. The bag limit has been 1 goat per season since 1974.

Board of Game Actions. In March 2009, the Board changed the bag limit. If a nanny is taken by a hunter in Units 7 and 15, that hunter is prohibited from hunting any goats in Units 7 and 15 for 5 regulatory years. This changed was proposed by the Alaska Department of Fish and Game (department) in order to reduce the negative impact of nanny harvests and help hunters actively determine management actions.

Hunter Harvest. During the past 5 seasons, the annual average harvest was 53 goats during the drawing season and 13 goats during the registration season (Table 3). Individual statistics for each drawing and registration hunt are shown in Table 4.

Hunter Residency and Success. Each year for the past decade, less than 5% of the hunters for the drawing season were nonresidents. The 5-year average success rate was 36% for drawing hunts and 35% for registration hunts (Table 3).

Harvest Chronology The harvest chronology for the drawing season was spread throughout the season with the highest take in September and is a reflection of seasonal weather conditions (Table 5).

CONCLUSIONS AND RECOMMENDATIONS

Goat populations are very vulnerable to overharvest compared to other ungulates. The harvest of even a few females from small populations can be unsustainable (Hamel et al. 2006). The taking of female goats during the drawing season often prevents registration hunts from opening and may decrease future permit allocations. For many years, ADF&G has attempted to educate hunters on how to distinguish males from females. We now have an online quiz on the department's website that helps educate hunters determine the gender of goats. (http://www.adfg.alaska.gov/index.cfm?adfg=quiz.overview&quiz_id=3).

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PREPARED BY:

Thomas McDonough
Wildlife Biologist II

SUBMITTED BY:

Gino Del Frate
Management Coordinator

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Table 1. Number and description of hunt/count areas on the Kenai Peninsula.

Area number	Unit	Area description
331	7	Resurrection Creek West
332	7	Gilpatrick Mt.
333	7	Seattle Creek
334	7	Mills Creek
335	7	Placer River West
336	7	Spencer Glacier
339	7	Grant Lake
340	7	Kings River
341	7	Cecil Rhodes Mt.
342	7	Lost Lake
343	7	Victor Creek (Andy Simmons Mts.)
344	7	Nellie Juan Lake
345	7	Whidbey Bay
346	7	Resurrection Peninsula
347	7	West Seward
352	7&15C	Brown Mt.
354	15B	Skilak Glacier
355	15B	Twin Lakes
356	15B	Indian Creek
357	15C	Tustumena Glacier
358	15C	Fox River
359	15C	Bradley Lake
360	15C	Dixon Glacier
361	15C	Halibut Cove
362	15C	Sadie Cove
363	15C	Port Dick
364	15C	Seldovia
365	15C	English Bay

Table 2. Mountain goat survey counts for the Kenai Peninsula (Units 7 & 15), 2007–2011.

Survey Year	Area	Adults	Kids	Total Goats
2011	331	69	12	81
	332	25	2	27
	333	40	8	48
	336	27	8	35
	337	31	6	37
	340	26	6	32
	341	60	9	69
	343	27	7	34
	344	66	12	78
	353	5	1	6
	354	24	8	32
	357	55	10	65
	358	27	7	34
	359	34	14	48
2010	336	45	10	55
	339	54	4	58
	346	182	35	217
	355	7	2	9
	356	30	8	38
	359	51	7	58
	360	146	38	184
	361	84	15	99
	362	79	19	98
	364	62	12	74
	365	247	63	310
2009	334	71	19	90
	338	33	10	43
	339	36	6	42
	342	90	26	116
	345	148	27	175
	357	47	7	54
	363	170	37	207

Table 2. Continued.

Survey Year	Area	Adults	Kids	Total Goats
2008	335	30	5	35
	337	-	-	37
	338	27	6	33
	341	49	11	60
	343	23	5	28
	347	104	16	120
	352	104	27	131
	354	32	7	39
	356	32	6	38
	358	42	9	51
	364	60	16	76
2007	332	34	11	45
	333	42	10	52
	341	40	18	58
	344	59	18	77
	352	73	7	80
	354	11	5	16
	355	2	0	2
	358	24	8	32
	359	53	14	67
	360	110	30	140
	361	72	15	87
	362	84	27	111

Table 3. Harvest totals for mountain goat drawing and registration permits on the Kenai Peninsula (Units 7 and 15), 2007–2011.

Permit Type	Regulatory Year	Permits Issued	# Hunted	Harvest			% Success
				Males	Females	Total	
Drawing	2007	331	164	45	19	64	39
	2008	320	144	34	6	40	28
	2009	317	172	39	20	59	34
	2010	303	148	26	21	47	32
	2011	265	118	40	13	53	45
Registration	2007	90	38	7	5	12	32
	2008	58	26	8	2	10	38
	2009	131	55	17	4	21	38
	2010	42	28	6	2	8	29
	2011	95	38	11	3	14	37

Table 4. Mountain goat harvest for drawing and registration permits on the Kenai Peninsula (Units 7 & 15), regulatory years 2007–2011.

		Drawing Hunts						Registration Hunts					
Area	Regulatory Year	Billy	Nanny	Total	permits issued	# Hunted	% Success	Billy	Nanny	Total	permits issued	# Hunted	% Success
331	2007				0						0		
	2008				0						0		
	2009				0						0		
	2010				0						0		
	2011				0						0		
332	2007	0	2	2	4	4	50				0		
	2008				0						0		
	2009				0						0		
	2010				0						0		
	2011				0						0		
333	2007				0						0		
	2008	0	0	0	2	2	0				0		
	2009	0	0	0	2	2	0				0		
	2010	1	0	1	2	1	100				0		
	2011	0	0	0	2	1	0				0		
334	2007	5	1	6	15	13	46				0		
	2008	2	0	2	15	9	22				0		
	2009	0	2	2	15	12	17				0		
	2010	1	1	2	15	9	22				0		
	2011	7	1	8	15	13	62				0		
335	2007	0	0	0	3	3	0				0		
	2008				0						0		
	2009				0						0		
	2010				0						0		
	2011				0						0		

Table 4. Continued.

		Drawing Hunts						Registration Hunts					
Area	Regulatory Year	Billy	Nanny	Total	permits issued	# Hunted	% Success	Billy	Nanny	Total	permits issued	# Hunted	% Success
336	2007	3	1	4	30	10	40				0		
	2008	1	0	1	30	10	10				0		
	2009	3	1	4	30	14	29				0		
	2010	3	2	5	30	18	28				0		
	2011				0						0		
339	2007	4	1	5	10	9	56				0		
	2008	1	0	1	10	7	14				0		
	2009	0	2	2	6	6	33				0		
	2010	1	0	1	2	2	50				0		
	2011	0	0	0	2	0	0				0		
340	2007	2	0	2	20	9	22				0		
	2008	0	0	0	20	3	0				0		
	2009	0	0	0	20	4	0				0		
	2010	0	0	0	20	2	0				0		
	2011	2	0	2	20	4	50				0		
341	2007	1	0	1	2	2	50				0		
	2008	0	0	0	2	1	0				0		
	2009	1	1	2	2	2	100				0		
	2010	0	0	0	2	1	0				0		
	2011	1	0	1	2	2	50				0		
342	2007	3	0	3	15	5	60				0		
	2008	4	0	4	15	11	36				0		
	2009	2	0	2	15	11	18	2	3	5	12	11	45
	2010	1	3	4	15	14	29				0		
	2011	4	1	5	15	11	45				0		

Table 4. Continued.

		Drawing Hunts						Registration Hunts					
Area	Regulatory Year	Billy	Nanny	Total	permits issued	# Hunted	% Success	Billy	Nanny	Total	permits issued	# Hunted	% Success
343	2007	1	0	1	2	2	50				0		
	2008				0						0		
	2009				0						0		
	2010				0						0		
	2011				0						0		
344	2007	0	0	0	5	3	0	0	0	0	12	2	0
	2008	0	0	0	5	2	0				0		
	2009	2	0	2	10	4	50				0		
	2010	0	0	0	10	5	0				0		
	2011	1	0	1	10	2	50				0		
345	2007	2	0	2	25	11	18	1	0	1	11	4	25
	2008	4	0	4	25	8	50				0		
	2009	4	0	4	25	11	36	2	0	2	20	7	29
	2010	2	1	3	25	10	30	0	0	0	3	0	0
	2011	2	2	4	35	13	31				0		
346	2007	7	6	13	40	24	54				0		
	2008	5	3	8	40	24	33				0		
	2009	12	2	14	40	32	44				0		
	2010	6	3	9	40	21	43				0		
	2011	3	0	3	30	14	21	2	0	2	15	12	17
347	2007	3	1	4	20	14	29				0		
	2008	2	1	3	20	8	38				0		
	2009	1	3	4	20	13	31				0		
	2010	1	4	5	20	14	36				0		
	2011	0	2	2	20	6	33				0		

Table 4. Continued.

		Drawing Hunts						Registration Hunts					
Area	Regulatory Year	Billy	Nanny	Total	permits issued	# Hunted	% Success	Billy	Nanny	Total	permits issued	# Hunted	% Success
352	2007	0	6	6	30	15	40				0		
	2008	3	0	3	30	12	25	0	0	0	14	1	0
	2009	2	0	2	30	13	15	2	0	2	20	4	50
	2010	2	0	2	30	9	22	0	0	0	2	0	0
	2011	5	1	6	30	10	60						
354	2007	0	0	0	2	1	0				0		
	2008	0	0	0	2	1	0				0		
	2009	0	0	0	2	1	0				0		
	2010				0						0		
	2011				0						0		
355	2007				0						0		
	2008				0						0		
	2009				0						0		
	2010				0						0		
	2011				0						0		
356	2007				0						0		
	2008				0						0		
	2009				0						0		
	2010				0						0		
	2011				0						0		
357	2007	0	0	0	2	1	0				0		
	2008	0	0	0	2	0	0				0		
	2009				0						0		
	2010	1	0	1	2	1	100				0		
	2011	0	0	0	2	1	0				0		

Table 4. Continued.

		Drawing Hunts						Registration Hunts					
Area	Regulatory Year	Billy	Nanny	Total	permits issued	# Hunted	% Success	Billy	Nanny	Total	permits issued	# Hunted	% Success
358	2007	1	0	1	8	3	33				0		
	2008	1	0	1	4	1	100				0		
	2009	0	1	1	2	2	50				0		
	2010	0	0	0	2	0	0				0		
	2011	0	0	0	2	0	0				0		
359	2007	0	0	0	10	1	0	1	0	1	1	1	100
	2008	3	0	3	10	4	75				0		
	2009	1	0	1	10	3	33				0		
	2010	1	0	1	10	6	17				0		
	2011	1	0	1	5	4	25				0		
360	2007	3	1	4	25	11	36	1	3	4	7	4	100
	2008	3	1	4	25	16	25				0		
	2009	3	1	4	25	12	33				0		
	2010	3	2	5	25	14	36				0		
	2011	6	1	7	20	16	44				0		
361	2007	0	0	0	15	3	0	0	0	0	12	5	0
	2008	2	0	2	15	8	25				0		
	2009	1	5	6	15	9	67				0		
	2010	1	0	1	5	1	100				0		
	2011	1	1	2	10	4	50				0		
362	2007	5	0	5	18	8	63				0		
	2008	2	1	3	18	6	50				0		
	2009	2	2	4	18	9	44				0		
	2010	1	2	3	18	10	30				0		
	2011	4	3	7	15	10	70				0		

Table 4. Continued.

		Drawing Hunts						Registration Hunts					
Area	Year	Billy	Nanny	Total	permits issued	# Hunted	% Success	Billy	Nanny	Total	permits issued	# Hunted	% Success
363	2007	5	0	5	30	12	42				0		
	2008	1	0	1	30	11	9	0	0	0	20	8	0
	2009	5	0	5	30	12	42	0	0	0	20	3	0
	2010	1	3	4	30	10	40				0		
	2011	3	1	4	30	7	57	0	0	0	20	2	0
364[1]	2007				0			3	0	3	10	8	38
	2008				0			3	0	3	10	6	50
	2009				0			5	0	5	10	7	71
	2010				0			1	0	1	10	9	0
	2011				0			1	0	1	10	5	0
365[a]	2007				0			1	2	3	28	10	30
	2008				0			5	2	7	14	11	64
	2009				0			6	1	7	49	21	33
	2010				0			5	2	7	27	19	37
	2011				0			8	3	11	50	19	58

[a] Areas became registration only hunts in 2007.

Table 5. Harvest chronology (% of harvest) for mountain goat drawing permits on the Kenai Peninsula (Units 7 & 15), regulatory years 2007–2011.

Regulatory Year	August	September	October	Unspecified
2007	28	44	27	2
2008	25	45	25	5
2009	24	49	25	2
2010	26	53	21	0
2011	25	53	17	6

Alaska Department of Fish and Game
Division of Wildlife Conservation
907-465-4190 P.O. BOX 115526
JUNEAU, AK 99811-5526

MOUNTAIN GOAT MANAGEMENT REPORT

From: 1 July 2009
To: 30 June 2011

LOCATION

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

GEOGRAPHIC 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; managers change the number of permits available and the areas open for hunting to reflect management objectives, 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 1985 hunting season when harvest goals were reached. Smith (1986) reported numerous inexperienced goat hunters going afield during that year, resulting in high hunter densities, less selectivity, herd shooting, and wanton waste. 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 opened 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 determine 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 (the department; ADF&G) 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 forgo actions that would have created a subsistence goat hunt on refuge lands.

Eight 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% of the population, depending on the productivity of goats in each area, during this report period. If harvest quota objectives were not met during the drawing permit season, registration permits were available. With help from the goat working group, we established restrictions to minimize chances of overharvest and crowded hunting conditions during the registration hunts (Van Daele 2006).

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 west to Sturgeon Head. Current goat populations on the southern portion of the island are increasing and are above our management objective. In March of 2009 the Board of Game adopted a proposal to expand hunting opportunities in this area by creating a new registration hunt open to residents and nonresidents. Based on data from comprehensive aerial surveys, we estimated that the goat population of Unit 8 in 2010 was 2,320 goats.

MANAGEMENT DIRECTION

MANAGEMENT OBJECTIVES

Maintain a pre-hunting population of 700–1,000 goats island-wide, 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 and August. 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

Cooperative survey flights with the U.S. Fish and Wildlife Service in 2009 covered approximately 40% of the goat range, yielding a total count of 1,028 goats. In 2010, we surveyed about 40% of the goat range and classified 950 goats. Surveys indicate a stable goat population

on the northern and central portion of the island and an increasing population trend on the southern portion of the island. The estimated island-wide population in 2010 was at least 2,320 goats, with virtually all suitable habitat being used.

Population Composition

During this reporting period, the kid:adult ratio was 26:100 in regulatory year 2009 (RY09) and 18:100 in RY10 (previous 5-year average = 22; Table 1).A regulatory year runs from 1 July through 30 June (e.g., RY09 = 1 July 2009–30 June 2010).

Distribution and Movements

During the first three 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 male dispersal may be driven by competition for females, but female dispersal 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 habitats 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 the northern part of Kodiak Island. A registration hunt (1 November–15 December) following the drawing permit hunt was initiated in 2003–04 for Alaska residents only, with permits available during a limited time prior to the hunting season in the villages nearest the hunt area and floatplane access restricted to saltwater. The southern part of Kodiak is included in a registration hunt (RG480; 20 August–15 December) that is available to both residents and nonresidents, who can pick up permits throughout the season either from ADF&G offices or via the Internet. The bag limit was 1 goat (either sex) for all areas, but nannies with kids could not be legally harvested.

Game Board Actions and Emergency Orders. During its March 2011 meeting, the Board of Game adopted a proposal extending the period during which hunters could obtain a registration permit for hunts RG471, 472. 473. 474 and 476. Permits for those hunts continue to be available only in the communities nearest the hunt area, but they are now available throughout the open season.

Permit Hunts. During this reporting period all goat hunting in Unit 8 was by either drawing or registration permit. In 2009–10 there were 9 drawing permit hunt areas, and 493 permits were issued. In 2010–11 there were 7 drawing permit hunts and a total of 237 permits were issued (Table 2). There were also 9 registration permit hunt areas open in RY09, and a total of 376 permits were issued. In RY10, 8 registration hunt areas were open and a total of 627 permits were issued (Table 3).

Hunter Residency and Success. Annual hunter success declined from a previous 5-year average of 51.0%, to an average of 50% in RY09 and 37% in RY10 (Table 4). The number of drawing permits available was lower in RY10 due to the creation of registration hunt RG480, which combined drawing/registration hunt areas 475 and 477. The percentage of nonresidents participating in hunts has remained stable (previous 5-year average = 10.7%; RY09 = 10%; RY10 = 13%), while nonlocal resident participation has increased considerably (previous 5-year average = 45.7%; RY09 = 59%; RY10 = 51%) and the proportion of local residents has decreased (previous 5-year average = 43.6%; RY09 = 31%; RY10 = 36%).

Estimated age (horn ring) data was obtained from hunter report cards (1994–2000, 2004–2011) and from mandatory horn inspections by department staff (1993, 2001–2003). During this reporting period the mean age of males goats harvested was 4.6 years in RY09 and 5.0 years in RY10 (previous 5-year average = 4.6 years). For females the averages were 5.2 years in RY09 and 6.4 years in RY10 (previous 5-year average = 4.9 years; Table 5). The results of a comparative horn growth study between the Kenai Peninsula and Kodiak showed that initial growth may be a useful index of habitat quality (McDonough et al. 2006).

Harvest Chronology. In recent years, October has been 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 determine the chronology of harvest.

Transport Methods. Aircraft was the predominant transportation method used by hunters during this reporting period (48% in RY09; 43% in RY10), exhibiting a similar pattern to the previous 5 years ($\bar{x}$ = 44.0%; Table 7). Highway vehicles and off-road vehicles are the primary means of access for goat hunters for permit areas along the road system near Kodiak city (DG/RG 478 and 479).

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 that were found along beaches 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 enhanced access into goat habitat in northern Kodiak Island, but overall it 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 began a pilot study of goat range in 2011, with the intent of gaining a better understanding goat habitat needs and impacts of goats on Refuge habitats.

Winter severity is quite variable in maritime environments, 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 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.

When snow conditions allow, winter recreation activities are increasingly common around Kodiak Island. Snowmachines are more abundant and efficient, and the sport of heli-skiing is popular with a small group of residents. 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 the city of Kodiak 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

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, and department staff participates in annual presentations to air crews at the U.S. Coast Guard base in Kodiak.

Increased fuel costs, coupled with expanding goat numbers and range, are dramatically increasing the cost of conducting aerial surveys. U.S. Fish and Wildlife Service has assisted us in recent years by providing aircraft and observers, allowing continuation of historic survey techniques. We are concerned; however, that our limited survey opportunities may not be able to provide data sufficient and sensitive enough to accurately determine population levels throughout the southern part of Kodiak.

CONCLUSIONS AND RECOMMENDATIONS

The goat population was stable in northern and central Kodiak and increasing on the southern end of the island. Based on the representative aerial surveys of goat habitat in Unit 8, we estimated a total of about 2,300 goats during this reporting period. During the same time, goat harvest increased slightly due to the creation of registration hunt RG480, which combined 2 of the largest hunt areas on Kodiak and allowed Internet registration and nonresident participation. The drawing permit hunter success remained 44% or above. Registration permit hunter success

was lower (29% and 34%) due to hunters obtaining multiple permits, harsh weather during the hunting season, archery-only hunt areas, and permit access restrictions.

Kodiak Island is currently the most popular goat hunting destination in Alaska, accounting for 32% of the harvest in the state in RY10. With the increase in permit numbers and harvest there has been a demographic shift of goat hunters on Kodiak. In RY04, local hunters composed 52% of the hunters afield, compared to 36% in RY01, while numbers of resident nonlocal hunters afield increased considerably during the same time frame (33% in RY04; 51% in RY10). The increased nonlocal hunter participation was a result of liberalizing the registration hunt on the south end of the island and the elimination of drawing hunts in this area during the RY10 regulatory year.

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 many 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 has enhanced our ability to increase hunter opportunity and stabilize goat numbers, but we must consider other alternatives if these measures are insufficient. 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.

We also recommend changes to our management objectives to reflect this shift in philosophy. The new recommendations are as follows:

Management Goal:

➢ Maintain a population of 1,000 goats island-wide, distributed in a manner that will provide sustained hunting opportunities while maintaining habitat quality.

To achieve this goal, we recommend the following management actions:

- Develop sampling techniques that will allow population trend monitoring without relying on annual total counts of all goat habitat.

- Work with Kodiak National Wildlife Refuge staff to initiate a radiotelemetry study to investigate goat movements and critical winter ranges.

- Evaluate applicability of current goat hunt boundaries and develop harvest rates that will maintain habitat quality while preserving hunting opportunities.

- Work closely with Kodiak National Wildlife Refuge staff to initiate research of goat habitat and the impacts of goats on that habitat, and to jointly develop objective estimates of goat population levels that can sustain hunting opportunity while maintaining habitat quality, and modify population objectives if necessary.

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

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PREPARED BY:

Lawrence J. Van Daele
Wildlife Biologist III

John R. Crye
Wildlife Biologist I

SUBMITTED BY:

Gino Del Frate
Management Coordinator

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Table 1. Unit 8 aerial summer mountain goat composition counts and estimated population size within permit hunt areas, regulatory years 2004–2010.

Hunt Area	Regulatory Year	Adults (%)	Kids (%)	Kids: 100 adults	Total goats observed	Goats/ hour	Estimated population size
All	2004	519 (81)	125 (19)	24	644	132	1,560
permit	2005	1,367 (81)	319 (19)	23	1,686	85	1,900
hunt areas	2006	472 (82)	105 (18)	22	577	125	1,780
	2007	1,390 (83)	284 (17)	20	1,674	--	1,910
	2008	1,607 (81)	368 (19)	23	1,975	88	2,145
	2009	814 (79)	214 (21)	26	1,028	190	2,371
	2010	804 (85)	146 (15)	18	950	--	2,320
DG/RG 471	2004	158 (84)	31 (16)	20	189	195	200
Wild Creek	2005	145 (81)	35 (19)	24	180	168	190
Center Mtn	2006	103 (86)	17 (14)	17	120	--	140
	2007	137 (88)	18 (12)	13	155	--	175
	2008	72 (84)	14 (16)	19	86	--	110
	2009	114 (72)	44 (28)	39	158	--	160
	2010	102 (82)	23 (18)	23	125	--	125
DG/RG 472	2004	--	--	--	--	--	50
Crown Mtn	2005	21 (84)	4 (16)	19	25	--	30
	2006	31 (79)	8 (21)	26	39	--	40
	2007	--	--	--	--	--	40
	2008	30 (88)	4 (12)	13	34	--	40
	2009	37 (84)	7 (16)	19	44	--	50
	2010	--	--	--	--	--	50
DG/RG 473	2004	81 (87)	12 (13)	15	93	48	60
Hidden	2005	39 (80)	10 (20)	26	49	--	50
Basin	2006	30 (86)	5 (14)	17	35	--	60
Terror Lake	2007	45 (92)	4 (8)	9	49	49	60
	2008	51 (86)	8 (14)	16	59	59	60
	2009	49 (82)	11 (18)	22	60	--	75
	2010	--	--	--	--	--	75

Table 1 continued.

Area	Regulatory year	Adults (%)	Kids (%)	Kids: 100 adults	Total goats observed	Goats/ hour	Estimated population size
DG/RG 474	2004	--	--	--	--	--	120
Uganik River	2005 [a]	91 (81)	22 (19)	24	113	72	140
	2006	--	--	--	--	--	130
	2007	43 (81)	10 (19)	23	53	--	130
	2008	95 (82)	21 (18)	22	116	--	130
	2009	234 (86)	37 (14)	16	271	--	271
	2010	--	--	--	--	--	250
DG/RG 475	2004	--	--	--	--	--	300
Zachar River	2005	438 (81)	104 (19)	24	542	108	550
	2006	--	--	--	--	--	500
	2007	504 (84)	98 (16)	19	602	--	600
	2008	526 (85)	95 (15)	18	621	--	630
	2009	--	--	--	--	--	630
	2010 [a]	206 (87)	32 (13)	16	238	--	650
DG/RG 476	2004	95 (81)	23 (19)	24	118	--	130
Kiliuda Bay	2005	74 (86)	12 (14)	16	86	--	120
	2006	--	--	--	--	--	120
	2007	--	--	--	--	--	120
	2008	--	--	--	--	--	120
	2009	89 (86)	15 (14)	17	104	--	125
	2010	--	--	--	--	--	125
DG/RG 477	2004	--	--	--	--	--	300
Southwest	2005 [a]	302 (84)	59 (16)	20	361	97	400
Kodiak	2006	--	--	--	--	--	400
	2007	319 (80)	82 (20)	26	401	--	430
	2008	503 (79)	137 (21)	27	640	--	660
	2009	--	--	--	--	--	660
	2010 [a]	202 (90)	22 (10)	11	224	--	660

Table 1 continued.

Area	Regulatory year	Adults (%)	Kids (%)	Kids: 100 adults	Total goats observed	Goats/ hour	Estimated population size
DG/RG 478	2004	186 (76)	58 (24)	31	244	134	250
South Road	2005	174 (79)	46 (21)	26	220	144	230
System	2006	170 (77)	51 (23)	30	221	149	225
	2007	117 (80)	29 (20)	25	146	--	175
	2008	156 (76)	50 (24)	32	206	--	230
	2009	179 (73)	67 (27)	37	246	--	250
	2010	168 (81)	39 (19)	23	207	188	220
DG/RG 479	2004	94 (80)	24 (20)	26	118	--	120
North Road	2005	157 (80)	39 (20)	25	196	--	200
System	2006	138 (85)	24 (15)	17	162	--	165
	2007	130 (84)	25 (16)	19	155	--	170
	2008	92 (78)	26 (22)	28	118	--	145
	2009	112 (77)	33 (23)	29	145	--	150
	2010	126 (81)	30 (19)	24	156	208	165

[a] Partial survey

Table 2. Unit 8 mountain goat harvest data by drawing permit hunt, regulatory years 2004 through 2010.

Hunt Area	Regulatory Year	Permits Issued	Percent did not hunt	Percent unsuccessful hunters	Percent successful hunters	Males (%)	Female (%)	Unknown	Illegal	Total harvest
All drawing permit hunts	2004 [a]	338	39	34	66	88 (67)	43 (33)	1	1	133
	2005 [a]	340	38	33	67	84 (60)	55 (40)	0	0	139
	2006[b]	498	43	45	55	95 (62)	59 (38)	1	0	155
	2007 [a]	500	47	50	50	89 (68)	41 (32)	1	0	131
	2008[a]	499	46	52	48	80 (63)	46 (37)	2	1	129
	2009	493	54	36	64	92 (64)	51 (36)	1	1	145
	2010	237	49	56	44	33 (62)	20 (38)	0	0	53
DG 471 Wild Creek-Center Mountain	2004 [a]	40	42	45	55	6 (50)	6 (50)	0	0	12
	2005 [a]	40	58	45	65	6 (55)	5 (45)	0	0	11
	2006 [a]	40	38	52	48	7 (58)	5 (42)	0	0	12
	2007 [a]	39	28	64	36	4 (40)	6 (60)	0	0	10
	2008 [a]	40	45	73	27	5 (83)	1 (17)	0	0	6
	2009	40	58	65	35	5 (83)	1 (17)	0	0	6
	2010	30	45	81	19	1 (33)	2 (67)	0	0	3
DG 472 Crown Mtn	2004 [a]	10	60	25	75	3 (100)	0 (--)	0	0	3
	2005 [a]	12	58	20	80	2 (50)	2 (50)	0	0	4
	2006 [a]	10	60	25	75	3 (100)	0	0	0	3
	2007 [a]	10	70	0	100	3 (100)	0	0	0	3
	2008 [a]	10	20	50	50	3 (75)	1 (25)	0	0	4
	2009	10	80	0	100	2 (100)	0	0	0	2
	2010	11	73	0	100	1 (33)	2 (67)	0	0	3

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 473	2004	8	0	38	62	3 (60)	2 (40)	0	0	5
Hidden	2005	8	50	0	100	2 (50)	2 (50)	0	0	4
Basin-	2006	10	40	0	100	4 (67)	2 (33)	0	0	6
E. Terror	2007	10	40	17	83	4 (80)	1 (20)	0	0	5
Lake	2008	10	40	50	50	1 (33)	2 (67)	0	0	3
	2009	10	60	56	50	2 (100)	0 (0)	0	0	2
	2010	12	75	67	33	1 (100)	0 (0)	0	0	1
DG 474	2004	15	33	30	70	6 (86)	1 (14)	0	0	7
Uganik	2005	15	27	9	91	8 (80)	2 (20)	0	0	10
River	2006	20	40	25	75	8 (89)	1 (11)	0	0	9
	2007	21	48	36	64	5 (71)	2 (29)	0	0	7
	2008	20	40	42	58	3 (43)	4 (57)	0	0	7
	2009	20	20	38	62	9 (90)	1 (10)	0	0	10
	2010	30	67	50	50	4 (80)	1 (20)	0	0	5
DG 475[b]	2004	90	51	49	51	17 (77)	5 (23)	0	0	22
Zachar	2005	90	44	50	50	11 (46)	13 (54)	0	0	24
River	2006	179	47	59	41	21 (55)	17 (45)	0	0	38
	2007	180	57	54	46	25 (74)	9 (26)	1	0	35
	2008	180	58	64	36	22 (81)	5 (19)	0	0	27
	2009	180	65	39	61	23 (61)	15 (39)	0	0	38

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 476	2004	20	63	43	57	4 (100)	0 (--)	0	0	4
Kiliuda	2005	20	50	33	67	5 (83)	1 (17)	0	0	6
Bay	2006	20	50	60	40	1 (25)	3 (75)	0	0	4
	2007	20	30	57	43	5 (83)	1 (17)	0	0	6
	2008	20	65	0	100	5 (71)	2 (29)	0	0	7
	2009	20	52	22	78	5 (71)	2 (29)	0	0	7
	2010	30	59	77	23	1 (33)	2 (67)	0	0	3
DG 477[b]	2004	60	52	14	86	20 (83)	4 (17)	0	0	24
Deadman	2005	60	40	31	69	13 (52)	12 (48)	0	0	25
Bay	2006	110	46	44	56	21 (64)	12 (36)	0	0	33
	2007	110	54	38	62	23 (74)	8 (26)	0	0	31
	2008	110	46	42	58	20 (61)	13 (39)	1	0	34
	2009	110	59	31	69	16 (52)	15 (48)	0	1	32
DG 478	2004	80	14	29	71	24 (52)	22 (48)	1	1	48
South	2005	80	21	31	69	29 (69)	13 (31)	0	0	42
Road	2006	59	29	37	63	15 (58)	11 (42)	0	0	26
System	2007	60	32	42	58	14 (61)	9 (39)	0	0	23
	2008	59	25	50	50	13 (59)	9 (41)	0	1	23
	2009	60	35	30	70	18 (72)	7 (28)	1	0	26
	2010	75	42	40	60	15 (60)	10 (40)	0	0	25

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 479	2004	15	13	38	62	5 (63)	3 (37)	0	0	8
North	2005	15	0	13	87	8 (62)	5 (38)	0	0	13
Road	2006	50	34	30	70	15 (65)	8 (35)	1	0	24
System	2007	50	32	68	32	6(55)	5 (45)	0	0	11
	2008	50	30	47	53	8 (47)	9 (53)	1	0	18
	2009	50	31	35	65	12 (55)	10 (45)	0	0	22
	2010	49	31	62	38	10 (77)	3 (23)	0	0	13

[a] Season Dates: 1 September–31 October
[b] DG475 and DG477 were curtailed in 2010-11 and merged into RG480

Table 3. Unit 8 mountain goat harvest data by registration permit hunt, regulatory years 2004 through 2010.

Hunt Area	Regulatory year	Permits Issued	Percent did not hunt	Percent unsuccessful hunters	Percent successful hunters	Males (%)	Female (%)	Unknown	Illegal	Total harvest
All registration permit hunts	2004	127	51	74	26	11 (69)	5 (31)	0	0	16
	2005	175	66	83	17	6 (60)	4 (40)	0	0	10
	2006	133	66	62	38	9 (53)	8 (47)	0	0	17
	2007	178	60	75	25	12 (71)	5 (29)	0	0	17
	2008	212	61	69	30	19 (76)	6 (24)	0	0	25
	2009	376	58	71	29	28 (62)	17 (38)	1	1	47
	2010	627	55	66	34	66 (69)	29 (31)	0	0	95
RG471	2004	12	75	100	0	0	0	0	0	0
	2005	16	81	100	0	0	0	0	0	0
	2006	7	100	0	0	0	0	0	0	0
	2007	12	100	0	0	0	0	0	0	0
	2008	10	100	0	0	0	0	0	0	0
	2009	1	100	0	0	0	0	0	0	0
	2010	10	100	0	0	0	0	0	0	0
RG472	2004	6	67	50	50	1 (100)	0	0	0	1
	2005	8	100	0	0	0	0	0	0	0
	2006	3	0	0	0	0	0	0	0	0
	2007	5	80	100	0	0	0	0	0	0
	2008	7	100	0	0	0	0	0	0	0
	2009	1	100	0	0	0	0	0	0	0
	2010	11	100	0	0	0	0	0	0	0
RG473	2004	10	80	100	0	0	0	0	0	0
	2005	10	80	100	0	0	0	0	0	0
	2006 [b]	0	0	0	0	0	0	0	0	0
	2007	13	77	33	67	2 (100)	0	0	0	2
	2008	13	100	0	0	0	0	0	0	0
	2009	2	100	0	0	0	0	0	0	0
	2010	11	82	50	50	1 (100)	0	0	0	1

Table 3 continued.

Hunt Area	Regulatory year	Permits Issued	Percent did not hunt	Percent unsuccessful hunters	Percent successful hunters	Males (%)	Female (%)	Unknown	Illegal	Total harvest
RG474	2004	1	100	0	0	0	0	0	0	0
	2005	0	0	0	0	0	0	0	0	0
	2006	1	0	100	0	0	0	0	0	0
	2007	3	100	0	0	0	0	0	0	0
	2008	2	100	0	0	0	0	0	0	0
	2009	1	100	0	0	0	0	0	0	0
	2010	9	89	100	0	0	0	0	0	0
RG475[c]	2004	21	38	77	23	3 (100)	0	0	0	3
	2005	19	88	50	50	1 (100)	0	0	0	1
	2006	10	100	0	0	0	0	0	0	0
	2007	12	50	83	17	1 (100)	0	0	0	1
	2008	13	33	63	37	1 (33)	2 (67)	0	0	3
	2009	--	--	--	--	--	--	--		
RG476	2004	15	67	80	20	1 (100)	0	0	0	1
	2005	10	80	50	50	1 (100)	0	0	0	1
	2006	25	88	100	0	0	0	0	0	0
	2007	23	65	63	37	1 (33)	2 (67)	0	0	3
	2008	31	44	53	47	5 (71)	2 (29)	0	0	7
	2009	12	42	0	0	0	0	0	0	0
	2010	8	63	67	33	1 (100)	0	0	0	1
RG477[c]	2004	27	27	63	37	4 (57)	3 (43)	0	0	7
	2005	30	62	55	45	2 (40)	3 (60)	0	0	5
	2006	40	55	50	50	6 (67)	3 (33)	0	0	9
	2007	29	48	53	47	7 (100)	0	0	0	7
	2008	43	51	69	31	5 (83)	1 (17)	0	0	6
	2009	--	--	--	--	--	--	--		

Table 3 continued.

Hunt Area	Regulatory year	Permits Issued	Percent did not hunt	Percent unsuccessful hunters	Percent successful hunters	Males (%)	Female (%)	Unknown	Illegal	Total harvest
RG478	2004	22	59	100	0	0	0	0	0	0
	2005	42	60	94	6	0	1 (100)	0	0	1
	2006	47	51	65	45	3 (38)	5 (62)	0	0	8
	2007	44	56	89	11	0	2 (100)	0	0	2
	2008	47	63	81	19	2 (67)	1 (33)	0	0	3
	2009	54	54	68	32	5 (63)	3 (37)	1	0	9
	2010	60	62	74	26	3 (50)	3 (50)	0	0	6
RG479	2004	13	31	56	44	2 (50)	2 (50)	0	0	4
	2005	40	48	90	10	2 (100)	0	0	0	2
	2006 [b]	0	0	0	0	0	0	0	0	0
	2007	37	53	88	12	1 (50)	1 (50)	0	0	2
	2008	46	52	73	27	6 (100)	0	0	0	6
	2009	31	77	100	0	0	0	0	0	0
	2010	57	70	88	12	0	2 (100)	0	0	2
RG480	2009	274	57	68	32	23	14	0	1	38
	2010	461	49	63	37	61	24	0	0	85

[a] Hunting areas RG472 and RG479 closed by emergency order 31 October 2003
[b] Hunting areas RG473 and RG479 closed by emergency order 26 October 2006
[c] RG475 and RG477 were curtailed in 2009-10 and merged into RG480

Table 4. Residence and success of hunters participating in Unit 8 mountain goat drawing/registration hunts, regulatory years 2004 through 2010.

Regulatory year[a]	Successful					Unsuccessful					Total hunters
	Local resident	Nonlocal resident	Nonresident	Total	(%)	Local resident	Nonlocal resident	Nonresident	Total	(%)	
2004	79	52	17	148	(57)	76	35	2	113	(43)	261
2005	68	67	15	150	(57)	59	53	2	114	(43)	264
2006	58	74	39	171	(52)	59	89	9	157	(48)	328
2007	45	76	27	148	(45)	81	91	11	183	(55)	331
2008	46	71	34	151	(44)	81	100	13	194	(56)	345
2009	48	107	35	190	(50)	70	118	3	191	(50)	381
2010	46	67	35	148	(37)	96	137	17	250	(63)	398

[a] –Permits issued: 2004–05 - 465; 2005–06 - 515; 2006–07 - 631; 2007–08 - 678; 2008–09 - 711; 2009–10 - 869; 2010–11 - 864

Table 5. Unit 8 mountain goat harvest mean age data from horn rings, regulatory years 2004 through 2010.

Regulatory Year	Males	(n)	Females	(n)
2004	4.5	(76)	4.9	(30)
2005	4.6	(52)	5.7	(32)
2006	4.6	(68)	4.5	(38)
2007	4.6	(80)	4.4	(30)
2008	4.6	(68)	5.1	(33)
2009	4.6	(78)	5.2	(37)
2010	5.0	(43)	6.4	(13)

Table 6. Unit 8 mountain goat harvest chronology percent by time period, regulatory years 2004 through 2010.

		Harvest periods					
Area	Regulatory year	Aug	Sep	Oct	Nov	Dec	*n*
All	2004	9	30	50	4	7	148
permit	2005	12	34	48	3	3	147
hunts	2006	11	32	47	6	4	170
	2007	13	34	42	7	4	147
	2008	16	32	35	14	3	150
	2009	13	28	35	18	6	186
	2010	11	16	53	17	3	148

[a] Drawing hunt season changed and registration hunt established.

Table 7. Unit 8 mountain goat hunter transport method (percent in parentheses), regulatory years 2004 through 2010.

Regulatory year	Transportation method							Total
	Aircraft	Boat	3 or 4 Wheeler	ORV	Highway vehicle	Snow-machine	Unknown	
2004	97 (37)	54 (21)	32 (12)	4 (2)	66 (25)	0 (--)	8 (3)	261
2005	111 (42)	23 (9)	43 (16)	6 (2)	56 (21)	0 (--)	25 (10)	264
2006	176 (54)	34 (10)	31 (10)	6 (2)	67 (20)	0 (--)	14 (4)	328
2007	148 (45)	57 (17)	34 (10)	4 (1)	81 (25)	0 (--)	7 (2)	331
2008	144 (42)	73 (21)	22 (6)	4 (1)	93 (27)	1 ((<1)	9 (3)	346
2009	181 (48)	89 (23)	24 (6)	1 (<1)	79 (21)	0 (--)	7 (2)	381
2010	171 (43)	102 (26)	22 (6)	5 (<1)	91 (23)	0 (--)	7 (2)	398

Alaska Department of Fish and Game
Division of Wildlife Conservation
PO BOX 115526
JUNEAU, AK 99811-5526

MOUNTAIN GOAT MANAGEMENT REPORT

From: 1 July 2009
To: 30 June 2011

LOCATION

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

GEOGRAPHIC DESCRIPTION: Wrangell Mountains

BACKGROUND

The principal mountain goat habitat in Unit 11 can be found east of McCarthy in the glacial drainages along the Chitina River and in the Chugach Mountains south of the Chitina River. Harvest data for mountain goats in Unit 11 was first collected in 1972. Since regulatory year (RY) 1980 (RY80 = 1 July 1980 through 30 June 1981), an average of 14 mountain goats have been harvested annually in Unit 11.

The Wrangell Mountains and the eastern Chugach Mountains in Unit 11 were designated National Monument lands in 1978. Wrangell St. Elias National Park and Preserve (WRST) was established in 1980, leaving very little state and private land remaining within Unit 11. The National Park Service administers a subsistence goat registration hunt for local residents in WRST, and an average of 2 goats have been harvested annually since the establishment of this hunt in 1998. The majority of goats harvested in Unit 11 are taken under state harvest regulations in the preserve portion of the WRST.

MANAGEMENT DIRECTION

MANAGEMENT OBJECTIVES

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

METHODS

Department personnel conduct fix-winged composition counts annually to determine mountain goat sex and age composition, in addition to population trends. The McColl Ridge count area, located north of the Chitina River, was designated a dedicated mountain goat trend count area in 1970. Additional mountain goat population data are collected in conjunction with Unit 11 Dall sheep surveys. Data on harvest and hunting effort data are collected through mandatory hunter reports, and harvest is controlled by registration permit.

RESULTS AND DISCUSSION

POPULATION STATUS AND TREND

Population Size

A total of 66 goats were observed during the 2010 MacColl Ridge goat survey (Table 1). While no data are available for 2011, the 2010 survey results are similar to observations from recent years, and indicate no significant population trend. Additionally, count fluctuations between years may reflect the difficulty of surveying mountain goat populations.

An estimated 700 goats inhabit the southern Wrangell and Chugach Mountains in Unit 11. This estimate was obtained by combining results from surveys conducted between 1973 and 1984 in different Unit 11 count areas. 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. Although the MacColl Ridge trend count area has shown no indication of population decline, declines are suspected in some areas and the overall population may be below this estimate.

Population Composition

The 2009 and 2010 counts of 11 and 15 kids, respectively (Table 1), were lower than the record count of 20 in 2007, but consistent with the average of 13 since 2001. The ratio of 29 kids:100 adults in 2010 was slightly higher than the ratio of 23 kids:100 adults observed during the 2009 survey. While recruitment has fluctuated yearly, average recruitment has been more than adequate to maintain the overall population at a level sufficient to 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 mountain goat season in Unit 11 was 1 September–30 November for residents and nonresidents. The bag limit was 1 goat by registration permit only (RG580). The taking of nannies with kids was prohibited, and the taking of males encouraged. Nonresident goat hunters are required to hunt with a guide or a next-of-kin, resident hunter. The average harvest since RY01 has been 11 goats. Hunters killed 14 and 17 mountain goats in RY09 and RY10, respectively (Table 2). During RY09, the harvest comprised 12 billies (86%) and 2 nannies (14%), with 14 billies (82%) and 3 nannies (18%) harvested in RY10. Billies have

accounted for 77% of the harvest over the last 10 years, likely as a result of their trophy value to hunters.

Board of Game Actions and Emergency Orders. Starting in RY07 the southeast portion of the Chugach Mountains south of the Tiekel River and east of a line beginning at the confluence of the Tiekel and Tsina rivers in subunit 13D was added to the Unit 11 mountain goat registration hunt RG580 through Board of Game action. This area was underutilized under the subunit 13D drawing permit. Interest in this area has increased each year with 1 goat taken in RY07, 3 in RY08, 3 in RY09, and 7 in RY10.

Hunter Residency and Success. There were 63 state registration hunt (RG 580) permits issued in 2009 and 54 in 2010 (Table 2). The hunting effort reported by Unit 11 goat hunters has changed little each year, averaging 3–5 days of hunting per hunter. In RY10, successful hunters reported spending 4.1 days in the field, with unsuccessful hunters expending 1.8 days. Nonresident hunters harvested the majority of goats during this reporting period, 71% in RY09 and 65% in RY10 (Table 3), continuing a trend established in RY05. Greater success by nonresidents may be a result of the requirement to hunt with a guiding professional.

Harvest Chronology. During RY09 and RY10, 63% and 46% of the mountain goat harvest occurred during the first 3 weeks of the season. A high harvest in the first 3 weeks of September is consistent with recent chronology data for this hunt, and may be attributed to hunters combining sheep and goat hunts. If hunters were pursuing goats as their primary objective, more goats would likely be harvested later in the season and when goats are at lower elevations and easier to access.

Transport Methods. The predominate means of transportation for successful hunters during the reporting period was aircraft (Table 5). Other means of transportation reported include boat, highway vehicle, horse, and off-road vehicle. Transportation methods in Unit 11 have changed little over the years, with aircraft being the most often utilized means of transportation for successful hunters over the last 25 years.

Other Mortality

Little is known about predation on mountain goats in Unit 11. However, predation on goats by wolves has been reported anecdotally by local residents. Carnivore predation on mountain goats undoubtedly occurs, and may be common, though no rates of predation have 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

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 factor in observed fluctuations. Counts are conducted at approximately the same time each year in an attempt to minimize the effect of seasonal altitudinal movements on survey results. 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.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 of 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.

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 have not been a recent concern in other areas in the unit. The annual harvest from Unit 11 should not exceed 35 goats for more than 1 year; if it does, we should recommend regulation changes to reduce the harvest.

PREPARED BY: **SUBMITTED BY:**

Frank Robbins
Wildlife Biologist II

Lem Butler
Management Coordinator

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

Robbins, W.F. 2010. Unit 11 mountain goat management report. Pages 130–136 [*In*] P. Harper, editor, Mountain goat management report of survey and inventory activities 1 July 2009–30 June 2011. Alaska Department of Fish and Game, Species Management Report ADF&G/DWC/SMR 2012-3, Juneau, Alaska.

Table 1. Unit 11 MacColl Ridge trend count area mountain goat composition counts and estimated population size, calendar years 2007 through 2010.

Area	Calendar Year	Adults (%)	Kids (%)	Unk.	Kids: 100 adults	Total goats observed	Estimated population size[a]
MacColl Ridge	2007	49 (71)	20 (29)	0	41	69	69
	2008	57 (84)	11 (16)	0	19	68	68
	2009	48 (81)	11 (19)	0	23	59	59
	2010	51 (77)	15 (23)	0	29	66	66
	2011	No survey					

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

Table 2. Mountain goat harvest data by permit hunt, regulatory years 2006 through 2010.

Hunt	Regulatory year	Permits issued	Percent[a] did not hunt	Percent[a] unsuccessful hunters	Percent[a] successful Hunters	Males (%)	Females (%)	Unk.	Illegal	Total harvest
RG580	2006	35	49	34	17	6 (100)	0	0	0	6
RG580	2007	79	49	38	13	9 (90)	1 (10)	0	0	10
RG580	2008	86	53	29	18	10 (67)	5 (33)	0	0	15
RG580	2009	63	43	38	19	12 (86)	2 (14)	0	0	14
RG580	2010	54	44	29	27	14 (82)	3 (18)	0	0	17

[a] Percent of total permittees returning hunter reports.

Table 3. RG580 mountain goat hunter residency and success, regulatory years 2006 through 2010.

	Successful				Unsuccessful				
Regulatory year	Local[a] resident	Nonlocal resident	Nonresident	Total (%)	Local[a] resident	Nonlocal resident	Non-resident	Total (%)	Total hunters
2006	0	0	6	6 (33)	0	11	1	12 (67)	18
2007	0	4	6	10 (25)	1	21	8	30 (75)	40
2008	1	5	9	15 (38)	3	16	6	25 (62)	40
2009	1	3	10	14 (39)	0	17	5	22 (61)	36
2010	1	5	11	17 (57)	2	10	1	13 (43)	30

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

Table 4. RG580 mountain goat harvest chronology percent by time period, regulatory years 2006 through 2010.

Regulatory	September				October					
year	1–7	8–15	16–23	24–30	1–7	8–15	16–23	24–31	1–30	*n*
2006	0	50	17	--	--	--	33	--	--	6
2007	0	0	20	20	10	20	20	10	--	10
2008	13	13	20	7	47	--	--	--	--	15
2009	29	7	29	7	7	14	--	--	7	14
2010	34	6	6	12	18	18	--	6	--	17

Table 5. RG580 mountain goat harvest percent by transport method, regulatory years 2006 through 2010.

Regulatory year	Percent of harvest							
	Airplane	Boat	3- or 4-Wheeler	Snowmachine	ORV	Highway vehicle	Horse	*n*
2006	100	--	--	--	--	--	--	6
2007	50	50	--	--	--	--	--	10
2008	67	13	--	--	--	7	13	15
2009	72	21	--	--	--	7	--	14
2010	64	12	--	--	6	18	--	17

Alaska Department of Fish and Game
Division of Wildlife Conservation
907-465-4190 P.O. BOX 115526
JUNEAU, AK 99811-5526

MOUNTAIN GOAT MANAGEMENT REPORT

From: 1 July 2009
To: 30 June 2011

LOCATION

GAME MANAGEMENT UNIT: 13D

GEOGRAPHIC DESCRIPTION: Chugach Mountains

BACKGROUND

Mountain goat habitat in Unit 13 is found primarily in the glacial drainages of the central Chugach Mountains in Subunit 13D. Regulations for goats in Subunit 13D have varied over the years in efforts to maintain both the goat population and hunting opportunity. Seasons and bag limits were most liberal in the mid-1960s. In 1975 the bag limit for mountain goats in Subunit 13D was reduced from 2 goats to one, and two years later the area was closed to hunting. In regulatory year (RY) 1987 (RY87 = 1 July 1987 through 30 June 1988), Subunit 13D opened to a drawing permit hunt after a 10-year closure. The goat harvest was limited to billies for RY87 and RY88, but was expanded to either sex just prior to the RY89 season. Additional permit hunts have been added; two drawing permits are currently offered (DG718 and DG719), and the Board of Game added a portion of Subunit 13D to the hunt area for the Unit 11 registration permit hunt RG580, for hunts beginning in RY07. The mountain goat harvest in Subunit 13D is small but increasing.

MANAGEMENT DIRECTION

MANAGEMENT OBJECTIVES

- Maintain an annual harvest of up to 10% of the estimated goat population in Subunit 13D.

METHODS

Department personnel monitored age composition and population trends of goat populations in conjunction with sheep aerial surveys. Harvest and hunting effort data were collected through mandatory hunter reports, and harvest was controlled by draw or registration permit. Successful draw hunters were required to report their harvest within 10 days, while the mandatory reporting period for successful registration hunters was 5 days. Unsuccessful hunters participating in permit hunts were required to report within 15 days after the conclusion of the hunt.

RESULTS AND DISCUSSION

POPULATION STATUS AND TREND

Population Size

No dedicated goat surveys were flown in Subunit 13D during the period of this report. However, goat composition data was collected incidental to sheep surveys (Table 1). Due to infrequent or incomplete surveys, poor survey conditions, and challenges associated with conducting aerial wildlife surveys in montane habitats, it has been difficult to estimate the goat population for the central Chugach Mountains. An absence of consistent and comprehensive survey data makes detecting significant population trends additionally difficult. However, the information available suggests that the goat population in Subunit 13D remains small, and stable.

Age Distribution

Goats observed during aerial surveys were classified as kids or adults. Kids constituted 20% of the goats detected in 2009, and 18% in 2010 (Table 1). During the period of this report an average ratio of 33 kids:100 adults were observed.

Distribution and Movements

While the vast majority of mountain goats in Unit 13 are found in the central Chugach Mountains of Subunit 13D, goats are periodically observed in the Talkeetna Mountains in Subunit 13A, and a small number occur near Cantwell in the Chulitna Mountains. The terrain of the Talkeetna Mountains likely provides insufficient habitat overall to support a large goat population.

Mountain goats are distinctly adapted to rugged mountain habitats, featuring rocky broken terrain with steep cliffs. Topography of this type offers protection from predation, and goats are seldom observed far from areas that provide this escape terrain. Goat distribution during summer has been documented from aerial surveys. In summer, goats were found feeding in early mornings on grassy slopes adjacent to escape terrain. During midday goats seek relief from the heat in dense shrub cover, on ice fields or glaciers, and under rocky outcrops.

While seasonal differences in habitat use, including differences by sex, have been documented in mountain goats, seasonal habitat use is poorly understood in Subunit 13D. Though not well described within the subunit, lower elevation winter habitat is likely critical to the health of the goat population.

MORTALITY

Harvest

Seasons and Bag Limits. The bag limit was 1 goat for each of the drawing permit hunts (DG718 and DG719), with the taking of nannies with kids prohibited. The taking of billies was encouraged. Guides were required for all nonresident goat hunters. The majority of goat hunting in Subunit 13D occurs in these drawing hunts from 10 August through 20 September. Additional hunting occurs in a small portion of Subunit 13D in registration hunt (RG580) 1 September–30 November. There is no open goat season in the remainder of Unit 13.

Board of Game Actions and Emergency Orders. There were no Board of Game actions during this reporting period.

Permit Hunts. A total of thirty-five drawing permits were issued each year of the report period in Subunit 13D. For the registration hunt that covers Unit 11 and includes an area of 13D (RG580), a total of 63 permits were issued in RY09 and 54 in RY10. No information is available about how many of the permitted hunters intended to but did not hunt in Subunit 13D. Twelve of 20 RG580 hunters (60%) who reported hunting indicated they hunted in Subunit 13D.

A total of 20 goats were harvested under all hunts in Subunit 13D during the period, 11 in RY09 and 9 in RY10, including 19 billies (95%), and 1 nanny (5%). Five billies were harvested with DG718 permits, 4 in RY09 and 1 in RY10. Four billies and one nanny were harvested with DG719 permits, 3 billies and 1 nanny in RY09 and 1 billy in RY10. Ten billies were harvested with RG580 permits, 3 in RY09 and 7 and RY10; this Subunit 13D harvest represented 32% of the total RG580 harvest (31 goats) during this 2-year period (full harvest information for the RG580 hunt can be found in the Unit 11 goat species management report).

In RY07, a portion of the Subunit 13D drawing hunt DG719 was added to an existing registration hunt area (RG580) by Board of Game action. The area, which includes the region of Subunit 13D south of the Tiekel River and east of a line beginning at the confluence of the Tiekel and Tsina rivers, has become a popular hunting destination, and its addition to the registration hunt has contributed significantly to the goat harvest in Unit 13. One goat, a nanny, was harvested in the Subunit 13D addition to the RG580 hunt during the first season. Three billies were harvested in each of RY08 and RY09, and 7 billies were harvested there in RY10.

Hunter Residency and Success. Nonresidents harvested 60% of the goats during this reporting period, and no goats were harvested by local residents (Table 3). Nonlocal resident hunters harvested 100% of the goats in the DG719 hunt in RY09, while harvests in all other registration and drawing hunts in Subunit 13D were dominated by nonresidents. Greater success by nonresidents may be a result of the requirement for nonresidents to be accompanied by a guide.

Harvest Chronology. During both RY09 and RY10, 50% of the draw harvest occurred within the first 3 weeks of the season. In RY09, 33% of the registration hunt harvest occurred within the first 3 weeks of the season, decreasing to 14% during RY10. Harvest chronology is primarily influenced by the time periods for each individual hunt, as well as the number of permits allotted. Weather plays an important role in the timing of hunts, and field conditions often deteriorate rapidly during the last weeks of October. However, goats may be more accessible to hunters later in the season after moving to lower elevations. Season dates for hunting other big game species may also affect timing of goat hunts.

Transport Methods. During the reporting period in Subunit 13D, all successful draw hunters reporting used either airplanes or highway vehicles (Table 4). In comparison, successful registration hunters employed a variety of transportation methods, with boat and highway vehicles being the most popular (Table 4).

Other Mortality

While carnivore predation on goats undoubtedly occurs, it is suspected that the mountain goat populations in Unit 13 are regulated primarily by winter weather. Goat population declines have been documented in Unit 13 following deep snowfalls.

HABITAT

ASSESSMENT

The central Chugach Mountains are among the northernmost extension of mountain goat range in Alaska. Goat habitat is limited in Subunit 13D, and habitat quality and availability have not been assessed.

CONCLUSIONS AND RECOMMENDATIONS

An average of 10 goats were harvested annually during the period of this report, 95% of which were males. No comprehensive surveys were conducted in Subunit 13D during this reporting period, although goats were counted incidental to sheep surveys. Ideal sheep survey conditions are bright sun and limited cloud cover, whereas goats prefer cool overcast weather. Survey methods, therefore, may account for variation in the number of goats observed in different years. We recommend dedicated, comprehensive surveys be conducted for goats within Subunit 13D. Information available suggests that the goat population in Subunit 13D remains stable.

The harvest within the drawing hunt areas has been low and consistent over time, with an average of 5 goats taken during this reporting period. There are no concerns with sustainability of these hunts. The recent increase in hunter effort in Subunit 13D south of the Tiekel River does however warrant additional attention. With 7 goats taken in RY10, hunter success in this area is suspected to decline in the next couple of years as many of the mature billies have likely been harvested. We recommend that additional survey areas be added in this region in coming years.

Observations of goat populations suggest that both sexes use low-elevation areas extensively during the critical winter period. Understanding seasonal habitat selection is important in developing wildlife management strategies and devising protocols that may limit the effect of human disturbance on mountain goats. Commercial heli-ski guides operate in the central Chugach Mountains out of Thompson Pass. These operators do not require permitting on state land, and as a result, there is no regulation of heli-ski activities that may prevent disturbance of critical mountain goat wintering or kidding areas. We recommend identifying important seasonal mountain goat habitat to help mitigate any negative goat population effects. Additionally, we recommend that helicopters should not hover over, circle, or harass goats in any way. Pilots should use flight paths that avoid mountain goats and their habitat, and helicopters should not land within any area known to be goat wintering habitat.

PREPARED BY:

W. Frank Robbins
Wildlife Biologist II

REVIEWED BY:

Lem Butler
Management Coordinator

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

Robbins, W. F. 2012. Subunit 13D mountain goat management report. Pages 137–145 [*In*] P. Harper, editor. Mountain goat management report of survey and inventory activities 1 July 2009–30 June 2011, Alaska Department of Fish and Game, Species Management Report ADF&G/DWC/SMR 2012-3, Juneau, Alaska.

Table 1. Subunit 13D, Central Chugach aerial mountain goat composition counts, calendar years 2006 through 2010.

	Adults (%)		Kids (%)		Kids: 100 adults	Goats Observed
2006 [a]	115	(77)	35	(23)	30	150
2007 [b]	69	(78)	20	(22)	29	89
2008 [c]	106	(82)	23	(18)	22	129
2009 [d]	69	(80)	17	(20)	25	86
2010 [e]	64	(82)	14	(18)	22	78

[a] Partial surveys conducted incidental to sheep surveys (count areas 1–5, 9, and 11–13).
[b] Partial surveys conducted incidental to sheep surveys (count areas 1–4, and 16–18).
[c] Partial surveys conducted incidental to sheep surveys (count areas 1–2, 11–13, and 16–18).
[d] Partial surveys conducted incidental to sheep surveys (count areas 1–3, 5, and 16-17).
[e] Partial surveys conducted incidental to sheep surveys (count areas 1–3).

Table 2. Subunit 13D, Central Chugach mountain goat harvest data, regulatory years 2006 through 2010.

Area	Regulatory Year	Permits issued	Percent did not hunt	Percent unsuccessful hunters	Percent successful hunters	Males (%)	Females (%)	Total harvest
DG718	2006	10	40	83	17	2 (40)	3 (60)	5
Subunit 13D	2007	10	40	67	33	1 (50)	1 (50)	2
West	2008	10	90	100	0	0	0	0
	2009	10	50	20	80	4 (100)	0	4
	2010	10	90	0	100	1 (100)	0	1
DG719	2006	25	44	93	7	1 (100)	0	1
Subunit 13D	2007	25	44	69	31	3 (75)	1 (25)	4
East	2008	25	56	64	36	2 (50)	2 (50)	4
	2009	25	56	64	36	3 (75)	1 (25)	4
	2010	25	60	90	10	1 (100)	0	1
RG580	2007	n/a	n/a	67	33	0	1 (100)	1
Subunit 13D [a]	2008	n/a	n/a	50	50	3 (100)	0	3
	2009	n/a	n/a	67	33	3 (100)	0	3
	2010	n/a	n/a	42	58	7 (100)	0	7

[a] Permit numbers are for the entire hunt; harvest numbers; no information is available about how many hunters intended to but did not hunt in Subunit 13D; harvest data include only data from RG580 hunters who reported hunting in Subunit 13D.

Table 3. Subunit 13D, Central Chugach mountain goat hunter residency and success, regulatory years 2006 through 2010.

		Successful				Unsuccessful				
Area	Regulatory Year	Local Resident	Nonlocal Resident	Nonresident	Total (%)	Local resident	Nonlocal Resident	Nonresident	Total (%)	Total Hunters
DG718	2006	0	2	3	5 (83)	0	1	0	1 (17)	6
Subunit	2007	0	2	0	2 (33)	0	3	1	4 (67)	6
13D	2008	0	0	0	0	0	0	1	1 (100)	1
West	2009	0	1	3	4 (80)	0	1	0	1 (20)	5
	2010	0	0	1	1 (100)	0	0	0	0	1
DG719	2006	0	1	0	1 (7)	4	9	0	13 (93)	14
Subunit	2007	0	4	0	4 (31)	0	9	0	9 (69)	13
13D East	2008	0	1	3	4 (36)	0	7	0	7 (64)	11
	2009	0	4	0	4 (36)	0	7	0	7 (64)	11
	2010	0	0	1	1 (10)	1	8	0	9 (90)	10
RG580	2007	0	1	0	1 (33)	1	0	1	2 (67)	3
Subunit	2008	0	0	3	3 (50)	1	2	0	3 (50)	6
13D [a]	2009	0	1	2	3 (33)	0	6	0	6 (67)	9
	2010	0	2	5	7 (58)	0	5	0	5 (42)	12

[a] Includes data only from hunters who reported hunting in in the Subunit 13D portion of RG580; for additional data on hunt RG580, see the Unit 11 goat management report.

Table 4. Subunit 13D, Central Chugach successful mountain goat hunter transport methods, regulatory years 2006 through 2010.

Area	Regulatory year	Percent of harvest						
		Airplane	Horse	Boat	3- or 4-wheeler	Snowmachine	ORV	Highway vehicle
	2006	100	0	0	0	0	0	0
DG718	2007	100	0	0	0	0	0	0
Subunit	2008	0	0	0	0	0	0	0
13D	2009	75	0	0	0	0	0	25
West	2010	100	0	0	0	0	0	0
DG719	2006	0	0	0	0	0	0	100
Subunit	2007	0	0	0	0	0	0	100
13D East	2008	50	0	0	0	0	0	50
	2009	25	0	0	0	0	0	75
	2010	100	0	0	0	0	0	0
RG580	2007	0	0	100	0	0	0	0
Subunit	2008	0	0	67	0	0	0	33
13D [a]	2009	0	0	67	0	0	0	33
	2010	14	0	29	0	0	14	43

[a] Includes only hunter transportation reports for the Subunit 13D portion of RG580.

Alaska Department of Fish and Game
Division of Wildlife Conservation
907-465-4190 P.O. BOX 115526
JUNEAU, AK 99811-5526

MOUNTAIN GOAT MANAGEMENT REPORT

From: 1 July 2009
To: 30 June 2011

LOCATION

GAME MANAGEMENT UNIT: 14A and 14B (4,713 mi^2)

GEOGRAPHIC DESCRIPTION: The western Talkeetna Mountains and the subunit 14A portion of the western Chugach Mountains

BACKGROUND

Since the early 1990s, the goat population in the Chugach Mountain portion of Subunit 14A has increased from 111 goats observed in the 1992 survey to 220 goats observed in the 2010 survey. The goat population in the Talkeetna Mountain portion of Subunits 14A and 14B remains low, with an estimate of no more than 50 goats.

Seasons and bag limits for goats in Unit 14 have varied since statehood. Regulations for Units 14 were most liberal during the mid-1960s, with a 144-day hunting season (10 August–31 December) and a 2-goat bag limit, until regulatory year (RY) 1967 (RY1967 = 1 July 1967 through 30 June 1968) when the bag limit for Unit 14 was lowered to 1 goat. In the 1970s the hunting season in Unit 14 began in early August or September and ran until 15 November. From RY1984 to RY2007 most of the goat hunting opportunity in Unit 14 required a registration permit. The harvest was limited to billies during RY1987 and RY1988, but was liberalized to either sex in RY1989. Goat hunting has been closed in the Talkeetna Mountain portion of Subunit 14A since RY1986, but remains open in the Chugach Mountain portion of Subunit 14A. Goat hunting in Subunit 14B (the remainder of the Talkeetna Mountains) has been closed since RY1990.

Beginning in RY2002, participation in goat registration hunts in the Chugach Mountain portion of Unit 14 (Subunits 14A and 14C) increased dramatically. This increase occurred a year after goat hunting opportunity on the Kenai Peninsula was restricted by a drawing permit system during the 10 August to October 15 portion of the season. As a result, the only unrestricted hunting opportunities in the area during this portion of the season were the registration hunts in Unit 14. Hunter participation, specifically guided nonresident hunters, increased rapidly for the registration hunts. By RY2005, most registration hunts were closing within 2 weeks of opening due to harvest quotas being met at a rapid pace. In 2007, the Board of Game approved a proposal to limit hunter participation in the Subunit 14A by converting the registration permit hunts to drawing permit hunts, which were implemented in RY2008.

MANAGEMENT DIRECTION

MANAGEMENT OBJECTIVES

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.

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.

METHODS

We monitored age composition and population trends of goat populations through aerial minimum count surveys. We monitored harvests by requiring successful hunters to report harvests within 2 days of kill. In addition, all hunters were required to return hunt reports, whether they harvested a goat or not. Harvest data was reviewed for accuracy and updated if necessary.

Calculation of the number of permits that are issued each year is based on surveys of the goat population and the age composition of goats observed. The number of permits is also adjusted following a review of harvest statistics from previous years. Points are assigned based on the sex of the harvested animal; a female is counted as 2 goats toward the allowable harvest guideline, while a male is counted as one. Goats can be susceptible to overharvest, especially when the female component of the harvest is high (Hamel 2006). Hunters are encouraged to harvest only male goats.

RESULTS AND DISCUSSION

POPULATION STATUS AND TREND

Population Size

Surveys in the Chugach Mountain portion of Subunit 14A were conducted in conjunction with sheep surveys in 2009 and 2010 (Table 1). Based on these surveys, the goat population in the Chugach Mountain area appears to be stabilizing at a recent high of 200–225 goats.

No surveys were conducted in the Talkeetna Mountain portion of Subunits 14A and 14B during the reporting period. Due to the lack of survey data for goats in the Talkeetna Mountains, it is difficult to ascertain any population trends in these areas.

Age Distribution

Goats observed were categorized as kids or adults. Kids comprised 20–22 % of observed goats in Subunit 14A (Chugach Mountains) during this reporting period, which is similar to what has been observed since 2001 (Table 1).

Distribution and Movements

Throughout the summer surveys, goats were seldom observed far from escape terrain, which includes broken, rocky, and steep areas. 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.

MORTALITY

Harvest

Seasons and Bag Limits. The bag limit for Subunit 14A (Chugach Mountains) was 1 goat of either sex, with the taking of nannies accompanied by kids prohibited.

In the Chugach Mountain portion of Subunit 14A the RY2007 hunting season for residents and nonresidents was 1 September–31 October by registration permit only. In RY2008, this registration hunt (RG866) was replaced with a drawing permit hunt (DG866) to limit the number of hunters participating in the hunt. As a result, harvest has decreased; the harvest was 10 goats in RY2006, 8 goats in RY2007, 3 goats in RY2008, 2 goats in RY2009, and 2 goats in RY2010.

Board of Game Actions and Emergency Orders. There were no Board of Game actions or Emergency orders issued during this reporting period.

Permit Hunts. Twenty total registration and drawing permits were issued each year of this reporting period for goat hunting in the Chugach Mountain portion of Subunit 14A (Table 3). The number of drawing permits issued is based on the number of goats observed during surveys.

Hunter Residency and Success. The number of hunters has decreased since drawing permits replaced registration permits in RY2008, and nonresidents take a much smaller percentage of the harvest. Only 15 hunters hunted during this reporting period compared to the 56 hunters who participated during the last 2 years of the registration hunt. Similarly only 2 nonresidents (non-Alaska) hunted during this reporting period, one of whom was successful (25% of the goats harvested), compared to the 22 nonresidents who participated during the last 2 years of the registration hunt (39% of all hunters) who took 78% of the goats harvested. Success rates for all hunters during the reporting period were 25% in RY2009 and 29% in RY2010 (Table 4).

Harvest Chronology. Harvest chronology is primarily influenced by the time periods for each individual hunt, as well as the number of permits allotted. This is especially true as additional hunts are created and hunt periods are shortened. However, weather plays an important role in the timing of hunts, and field conditions often deteriorate rapidly during the last weeks of October. Regardless, the majority of goats are harvested within the first week of each hunt period. Season dates and suitable conditions for hunting other big game species also affect timing of goat hunts.

Transport Methods. Aircraft are the primary mode of transport for successful hunters in Subunit 14A, however one successful hunters used a 4-wheelers in RY2010 (Table 5).

HABITAT ASSESSMENT

Summer habitat quality and availability have not been assessed in Subunits 14A and 14B. High 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. No direct winter habitat assessments have been conducted.

CONCLUSIONS AND RECOMMENDATIONS

Population objectives in the Chugach portion of Subunit 14A were met; however, overall harvest rates were below objective, and the percentage of females harvest exceeded the objective in at least 1 year (Table 3). It is, however, important to note that because overall harvest was low, it takes only a harvest of 1 female goat to exceed the <30% female harvest objective. It is evident that the drawing hunt (DG866) reduced the goat harvest below the 7% sustainable harvest objective in Chugach Mountains area of Subunit 14A. Additional hunting opportunities should be offered to increase harvests to the objective; increasing the number of draw permits issued or reopening a short registration hunt following the draw hunt should provide the means to achieve this.

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. Goat season remains closed in the Talkeetna Mountains portion of Unit 14.

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PREPARED BY:

Olin Albertson
Wildlife Biologist III

REVIEWED BY:

Lem Butler
Management Coordinator

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Albertson, O. 2012. Subunits 14A and 14B mountain goat management report. Pages 146–152 [*In*] P. Harper, editor, Mountain goat management report of survey and inventory activities 1 July 2009–30 June 2011. Alaska Department of Fish and Game, Species Management Report 2012-3, Juneau, Alaska.

Table 1. Subunit 14A, Chugach Mountains, aerial mountain goat composition counts, regulatory years 2001 through 2010.

Regulatory year	Adults (%)		Kids (%)		Kids: 100 adults	Total goats observed	Goats /hour
2001[a]							
2002	106	(79)	29	(21)	27	135	9.7
2003[a]							
2004	118	(75)	40	(25)	34	158	15.8
2005[a]							
2006[b]	102	(78)	29	(22)	28	131	13.1
2007	118	(78)	33	(22)	28	151	7.5
2008	170	(79)	45	(21)	26	215	10.3
2009[c]	100	(80)	25	(20)	25	125	6.8
2010	173	(79)	47	(21)	27	220	9.6

[a] No surveys conducted.
[b] Poor survey conditions.
[c] Incomplete survey conducted.

Table 2. Annual mountain goat harvest by Subunit, regulatory years 2006 through 2010.

Regulatory	Subunit		
Year	14A	14B[c]	Total
2006[a]	10	0	10
2007[a]	8	0	8
2008[b]	3	0	3
2009[b]	2	0	2
2010[b]	2	0	2

[a] Registration permit only.
[b] Drawing permit only.
[c] Closed to mountain goat hunting.

Table 3. Subunit 14A mountain goat harvest data by permit hunt, regulatory years 2006 through 2010.

Area	Regulatory Year	Permits issued	Percent did not hunt	Percent Unsuccessful Hunters	Percent Successful Hunters	Males (%)		Females (%)		Total Harvest
RG866	2006	33	45	44	56	7	(70)	3	(30)	10
Subunit 14A	2007	56	46	73	27	7	(87)	1	(13)	8
DG866[a]	2008	12	58	40	60	2	(67)	1	(33)	3
Subunit 14A	2009[b]	20	55	75	25	2	(100)	0	(0)	2
	2010	20	65	71	29	1	(50)	1	(50)	2

[a] Replaced RG866 in starting in RY2008.
[b] Excludes an illegally harvested goat in Subunit 13D with a Subunit 14A DG866 permit.

Table 4. Subunit 14A mountain goat hunter residency and success, regulatory years 2006 through 2010.

		Successful				Unsuccessful				
Area	Regulatory year	Local resident	Nonlocal resident	Nonresident	Total (%)	Local resident	Nonlocal resident	Nonresident	Total (%)	Total Hunters[a]
RG866	2006	1	2	7	10 (56)	2	5	1	8 (44)	18
Subunit 14A	2007	1	0	7	8 (21)	15	8	7	30 (79)	38
DG866[b]	2008	1	1	1	3 (60)	2	0	0	2 (40)	5
Subunit 14A	2009[c]	1	0	1	2 (25)	5	0	1	6 (75)	8
	2010	1	1	0	2 (29)	1	4	0	5 (71)	7

[a] Includes hunters with unspecified residency or who failed to report.
[b] Replaced RG866 in starting in RY2008.
[c] Excludes an illegally harvested goat in Subunit 13D with a Subunit 14A DG866 permit.

Table 5. Subunit 14A successful mountain goat hunter transport methods, regulatory years 2006 through 2010.

		Percent of harvest								
Area	Regulatory Year	Airplane	Horse	Boat	3- or 4-wheeler	Snowmachine	ORV	Highway vehicle	Unknown	n
RG866	2006	56	0	0	0	0	0	0	44	9
Subunit 14A	2007	0	0	0	0	0	0	0	100	8
DG866	2008	100	0	0	0	0	0	0	0	3
Subunit 14A	2009[a]	50	0	0	50	0	0	0	0	2
	2010	100	0	0	0	0	0	0	0	2

[a] Excludes an illegally harvested goat in Subunit 13D with a Subunit 14A DG866 permit.

SPECIES

MANAGEMENT REPORT

Alaska Department of Fish and Game
Division of Wildlife Conservation
907-465-4190 P.O. BOX 115526
JUNEAU, AK 99811-5526

MOUNTAIN GOAT MANAGEMENT REPORT

From: 1 July 2009
To: 30 June 2011

LOCATION

GAME MANAGEMENT UNIT: 14C (1,961 mi^2)

GEOGRAPHIC DESCRIPTION: Chugach Mountains

BACKGROUND

The goat population in the western Chugach Mountains has increased slightly since last surveyed in the mid-1990s. In 1994, 619 goats were observed during a complete survey of Unit 14C, while in 2011, 764 goats were counted in the same area. Goats observed incidental to recent sheep surveys suggest a range expansion in parts of Unit 14C, and, overall, the population appears to be stable to increasing.

Seasons and bag limits for goats in Unit 14C have varied since statehood. Most of Unit14C was closed to goat hunting in the early 1960s, except for 1969–1972, when all of 14C was open to hunting. In 1973, the then recently created Chugach State Park, encompassing most of the mountains west of the Lake George and Twentymile River drainages, was closed to goat hunting. Historically, these closed areas have not included a substantial segment of the goat population in Unit 14C; however, more goats have been observed in the park in recent years, and drawing permit hunts have been established in drainages with a harvestable surplus of goats.

The Lake George Area is the most popular goat hunting area in Unit 14C and supports the largest numbers of goats in the unit. Most hunting in Lake George has been managed by registration permits; however, since 2002 there have been numerous changes to hunting regulations governing the Lake George area in attempts to reduce overharvest while maximizing hunting opportunity. Beginning in 2002, participation in goat registration hunts in Unit 14C, specifically the Lake George area, increased dramatically. This increase occurred a year after goat hunts on the Kenai Peninsula were moved to a later time frame, with drawing hunts 10 August–October 15 and a late season registration hunt 1–30 November. As a result, the only early season registration goat hunts available in the area were in Units 14A and 14C. Hunter participation, specifically by guided nonresident hunters, increased rapidly for these registration hunts. By 2005, most registration hunts in the Lake George Area closed within 2 weeks of opening due to harvest quotas being met at a rapid pace. In 2005 and 2006, harvest exceeded desired quotas in Unit 14C. As a result, in 2007 the Board of Game approved a department proposal to change the registration goat hunts in Unit 14C to drawing permit hunts, to be followed by late season registration permit hunts if the quotas were not made. The new hunts began in the 2008–2009 season. Then, in 2009 the Board of Game changed the drawing permit hunts in the Lake George

area to a drawing hunt for nonresident hunters and a registration hunt for residents. In 2011, the board converted the nonresident drawing permit hunt to a registration permit hunt with a separate quota from the resident registration permit hunt. This new harvest regime will begin in the fall of 2012.

Winter recreation activities in the Chugach Mountains (Unit 14C) continue to increase. The Chugach National Forest receives more permit requests every year for motorized winter activities that have the potential to impact wintering goats. One of the most prevalent winter activities is heli-skiing. Currently, Chugach Powder Guides, operating out of Girdwood, has a permit to conduct commercial heli-ski activities in the Chugach National Forest. During 2000–2002, 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.

Helicopter assisted winter and summer recreational activities have also increased in the Lake George area. In summer 2010, a dogsled tour operation was permitted to maintain a helicopter accessed dogsled camp from 1 May through 30 September on Colony Glacier. ADF&G biologists worked with the tour operator to establish a flight path that would reduce potential impacts of helicopter overflights on goats. Continued expansion of sled dog tours as well as other summer activities may lead to significant impacts on goats in the area. In addition to the dogsled activity in the Lake George area, a heli-skiing company has been operating in the area since at least 2009. Unfortunately, because helicopter overflights and landings are considered general use on state land, there is no mechanism to control such operations. ADF&G biologists are currently working with DNR staff to ascertain a way to regulate helicopter activity in the Lake George area, due to the sensitivity of goats to aircraft disturbance, especially during the winter and spring.

MANAGEMENT DIRECTION

MANAGEMENT OBJECTIVES

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

METHODS

When possible, we monitored sex and age composition and population trends of goat populations through aerial surveys. We monitored harvests by requiring successful hunters to report harvests within 5 or 10 days of kill, depending on hunt location. In addition, all hunters were required to return hunt reports, whether they harvested a goat or not.

RESULTS AND DISCUSSION

POPULATION STATUS AND TREND

Population Size

A comprehensive survey of mountain goat hunt areas was conducted in Unit 14C in 2011. Survey conditions were excellent, and a total of 763 goats were counted (Table 1).

In addition to survey numbers, goats observed during sheep surveys suggest that goats in Unit 14C may be expanding their range throughout Chugach State Park. Overall, the goat population in Unit 14C appears stable to increasing.

Age Distribution

Goats observed were categorized as kids or adults. Kids comprised 17% of observed goats in Unit 14C in 2011 (Table 1).

Distribution and Movements

Throughout the summer surveys, goats were seldom observed far from escape terrain, which includes broken, rocky, and steep areas. 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.

No dedicated study has been conducted to assess goat movements or habitat use in Unit 14C.

MORTALITY

Harvest

Seasons and Bag Limits. Bag limit for 14C was 1 goat of either sex, with the taking of kids and nannies accompanied by kids prohibited. Goat harvest in Unit 14C is managed by both registration and drawing permit hunts for residents and nonresidents. During regulatory year 2009 (RY09; 1 July 2009–30 June 2010), there were 4 drawing hunts within Chugach State Park in Unit 14C: 1 in the East Fork of the Eklutna River drainage, 1 in the Glacier and Winner creek drainages, 1 in Bird Creek drainage, including Penguin Creek, and 1 in 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. The Lake George and Twentymile drainage areas supported goat hunting by registration and drawing permits only from 15 August–15 October, and 1–15 November, with a bag limit of 1 goat.

Board of Game Actions and Emergency Orders. In 2009, the Board of Game authorized the department to replace 3 drawing hunts in the Lake George and Twentymile areas with registration permit hunts for residents only and drawing hunts for nonresidents only in the same areas. In addition, the board authorized holding short late-season registration hunts if warranted, and maintaining an early-season, archery-only registration hunt for residents and nonresidents in Unit 14C. Separate harvest quotas were established for resident and nonresident registration hunts.

In 2011, the Board of Game authorized the department to replace the nonresident drawing hunts in Lake George and Twentymile areas with registration permit hunts for nonresidents only, with a separate quota for resident hunters. If harvest quotas for the Lake George and Twentymile areas (Subunit 14C) have not been met by the end of the draw period, a late season registration hunt may be held from 1–15 November in both or either areas.

Permit Hunts. The number of goat registration and drawing permits issued for Unit 14C ranged from 216 to 232 during this reporting period (Table 2). The number of drawing permits issued in Unit 14C is based on the number of goats observed during surveys. There were 7 drawing permit hunts in RY09 and 6 drawing permit hunts in RY10, with 72 and 22 total permits issued in those years, respectively. In addition, there were 4 registration permit hunts in RY09 and 6 in RY10.

Hunter Residency and Success. The majority of the successful hunters in Unit 14C were local and nonlocal residents (Table 3).

Overall success rates during the reporting period ranged from 32% to 38%. Nonresidents typically experienced higher rates of success than did resident hunters (Table 3). 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. Harvest chronology is primarily influenced by the time periods for each individual hunt, as well as the number of permits allotted. This is especially true as additional hunts are created and hunt periods are shortened. However, weather plays an important role in the timing of hunts, and field conditions often deteriorate rapidly during the last weeks of October. Regardless, the majority of goats are harvested within the first week of each hunt period. Season dates and suitable conditions for hunting other big game species also affect timing of goat hunts.

Transport Methods. In the Lake George portion of Unit 14C, aircraft was the primary mode of transport for successful hunters (Table 4). In the Twentymile River drainage of Subunit 14C, the common modes of transport are airplanes, highway vehicles, and boats, except in years when boat access is difficult due to low water levels (Table 4).

HABITAT

ASSESSMENT

Summer habitat quality and availability have not been assessed in Unit 14C. High 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 Unit 14C. However, data are limited. No direct winter habitat assessments have been conducted.

CONCLUSIONS AND RECOMMENDATIONS

All management objectives were met. At least 26 goats were harvested in Unit 14C annually during this reporting period, and goat harvests exceeded 67% males annually.

The goat population in Unit 14C appears to be stable to increasing; however, because of a relatively large harvest and increasing recreational activity in the winter through the kidding period in early summer, dedicated, comprehensive surveys should be conducted at least biennially. The maximum allowable harvest should not exceed 7% of the number of goats observed during surveys in the Chugach Mountains.

Increased unregulated helicopter-based recreational activity is occurring during winter and during the kidding period in the Lake George Area, which is one of the most popular goat hunting areas in the state. Aircraft overflights can alter both goat and sheep behavior and incite negative physiological responses, which may ultimately lead to reduced survivorship (MacArthur et al. 1979, 1982; Foster and Rahs 1983; Bleich et al. 1994; Cóte 1996; Krausman et al. 1998; Frid 2000a, b; Frid 2002; USDA Forest Service 2003).

Adult female mountain goats have heightened sensitivity to disturbances during kidding and post-kidding periods (Penner 1988). Compared to other ungulates, mountain goats have a low recruitment rate (Baily 1991, Festa-Bianchet et al. 1994), and reproductive success and survivorship of goat populations is closely tied to the health of mountain goat nursery groups. Since females are highly sensitive to disturbance, the Northern Wild Sheep and Goat Council recommends that helicopter activities be prohibited in areas inhabited by nursery groups during spring and early summer (Hurley 2004).

There are no data to indicate that habituation of mountain goats or Dall sheep will occur over time with cumulative exposure to helicopter activity (Frid 2003, Hurley 2004). Contrarily, repeated exposure to adverse stimuli, such as helicopter overflights, may increase vigilance and flight-initiation distance and result in increased stress on mountain ungulates (Frid and Dill 2002). Therefore, it is recommended that helicopter activity be no closer than 1,500 meters from any mountain goat locations (Hurley 2004).

In light of this information, we recommend that the Lake George Area be considered as a Special Use Area in order to regulate commercial helicopter activity, especially during winter through early summer (November 1 – June 15). If such activity continues unregulated, it may have significant negative impacts on the goat population in the Lake George Area. We recommend dedicated winter surveys for goats in the Lake George Area to obtain better information on winter goat distribution. Such information could be useful in restricting aircraft activity in areas subject to high disturbance.

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PREPARED BY:

Jessy Coltrane
Wildlife Biologist II

REVIEWED BY:

Gino Del Frate
Management Coordinator

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Table 1. Unit 14C aerial mountain goat composition counts and estimated population size, regulatory years 2006–2010.

Regulatory Year	Adults (%)		Kids (%)		Kids: 100 adults	Total goats observed	Goats /hour
2006[a]	121	(79)	33	(21)	27	154	
2007[b]							
2008[b]							
2009[b]							
2010[b]							
2011[c]	636	(83)	127	(17)	20	763	

[a] Complete survey of Twentymile River. Additional goats counted incidental to sheep surveys.
[b] No surveys conducted.
[c] Complete survey of Unit 14C goat hunt areas.

Table 2. Unit 14C mountain goat harvest data by permit hunt, regulatory years 2006–2010.

Area	Regulatory Year	Permits issued	Percent did not hunt[a]	Percent Unsuccessful Hunters	Percent Successful Hunters	Males (%)		Females (%)		Total Harvest[b]
	2006	3	0	33	67	1	(50)	1	(50)	2
DG852	2007	3	33	50	50	1	(100)	0	(0)	1
East Eklutna	2008	3	0	67	33	1	(100)	0	(0)	1
	2009	3	67	100	0	0	(0)	0	(0)	0
	2010	3	0	33	67	2	(100)	0	(0)	2
	2006	3	67	0	100	1	(100)	0	(0)	1
DG854	2007	3	0	0	100	3	(100)	0	(0)	3
Eagle River	2008	3	0	0	100	3	(100)	0	(0)	3
	2009	3	33	0	100	1	(50)	1	(50)	2
	2010	3	33	50	50	1	(100)	0	(0)	1
	2006	4	0	100	0	0	(0)	0	(0)	0
DG856	2007	4	50	100	0	0	(0)	0	(0)	0
Glacier Ck.	2008	4	0	100	0	0	(0)	0	(0)	0
	2009	3	33	100	0	0	(0)	0	(0)	0
	2010	3	67	100	0	0	(0)	0	(0)	0
DG858	2006	3	67	100	0	0	(0)	0	(0)	0
Bird Ck.	2007	3	0	67	33	0	(0)	1	(100)	1
	2008	3	0	67	33	1	(100)	0	(0)	1
	2009	3	0	67	33	0	(0)	1	(100)	1
	2010	3	100	0	0	0	(0)	0	(0)	0

Area	Regulatory Year	Permits issued	Percent did not hunt[a]	Percent Unsuccessful Hunters	Percent Successful Hunters	Males (%)		Females (%)		Total Harvest[b]
RG868[c]	2006	48	52	91	9	2	(100)	0	(0)	2
Twentymile	2007	76	46	80	20	6	(100)	0	(0)	6
River	2008	60	62	100	0	0	(100)	0	(0)	0
	2009									
	2010	78	64	75	25	4	(57)	3	(43)	7
	2006	73	53	44	56	14	(74)	5	(26)	19
RG869[c]	2007	76	51	46	54	15	(75)	5	(25)	20
Lake	2008	44	50	64	36	6	(75)	2	(25)	8
George	2009	117	70	74	26	4	(44)	5	(56)	9
	2010	79	71	57	43	9	(90)	1	(10)	10
RG878	2006	5	60	100	0	0	(0)	0	(0)	0
Twentymile	2007	4	100			0	(0)	0	(0)	0
River	2008	13	69	100	0	0	(0)	0	(0)	0
(archery)	2009	7	43	75	25	1	(100)	0	(0)	1
	2010	7	71	100	0	0	(0)	0	(0)	0
RG879	2006	0	0	0	0	0	(0)	0	(0)	0
Lake	2007	4	100			0	(0)	0	(0)	0
George	2008	10	80	50	50	1	(100)	0	(0)	1
(archery)	2009	8	62	100	0	0	(0)	0	(0)	0
	2010	2	100	0	0	0	(0)	0	(0)	0
DG859[d]										
Lake	2008	20	70	50	50	3	(100)	0	(0)	3
George	2009	20	60	63	37	3	(100)	0	(0)	3

Area	Regulatory Year	Permits issued	Percent did not hunt[a]	Percent Unsuccessful Hunters	Percent Successful Hunters	Males (%)		Females (%)		Total Harvest[b]
DG869[c,d]	2008	20	50	50	50	5	(100)	0	(0)	5
Lake	2009	20	35	46	54	6	(86)	1	(14)	7
George	2010[e]	8	63	0	100	3	(100)	0	(0)	3
DG868[d,e]	2008	12	42	67	33	2	(100)	0	(0)	2
Twentymile	2009	20	35	69	31	3	(75)	1	(25)	4
River	2010[e]	2	100	0	0	0	(0)	0	(0)	0
RG864 Lake George	2010	28	75	57	43	3	(100)	0	(0)	3

[a] Includes permittees who did not report.
[b] Includes animals of unknown sex.
[c] Resident hunt only beginning in regulatory year 2010.
[d] New hunt, regulatory year 2008.
[d] Nonresident hunt only beginning regulatory year 2010.

Table 3. Unit 14C mountain goat hunter residency and success, regulatory years 2006–2010.

		Successful				Unsuccessful				
Area	Regulatory Year	Local resident	Nonlocal resident	Nonresident	Total (%)	Local resident	Nonlocal resident	Nonresident	Total (%)	Total Hunters[a]
DG852	2006	2	0	0	2 (67)	1	0	0	1 (33)	3
East Eklutna	2007	0	1	0	1 (50)	0	1	0	1 (50)	2
	2008	0	1	0	1 (33)	0	2	0	2 (67)	3
	2009	0	0	0	0 (0)	0	1	0	1 (100)	1
	2010	1	1	0	2 (67)	1	0	0	1 (33)	3
DG854	2006	0	1	0	1 (100)	0	0	0	0 (0)	1
Eagle River	2007	1	1	1	3 (100)	0	0	0	0 (0)	3
	2008	2	0	1	3 (100)	0	0	0	0 (0)	3
	2009	2	0	0	2 (100)	0	0	0	0 (0)	2
	2010	1	0	0	1 (50)	0	1	0	1 (50)	2
DG856	2006	0	0	0	0 (0)	4	0	0	4 (100)	4
Glacier Ck.	2007	0	0	0	0 (0)	2	0	0	2 (100)	2
	2008	0	0	0	0 (0)	3	1	0	4 (100)	4
	2009	0	0	0	0 (0)	1	1	0	2 (100)	2
	2010	0	0	0	0 (0)	1	0	0	1 (100)	1
DG858	2006	0	0	0	0 (0)	1	0	0	1 (100)	1
Bird Ck.	2007	1	0	0	1 (33)	1	1	0	2 (67)	3
	2008	0	0	1	1 (33)	2	0	0	2 (67)	3
	2009	1	0	0	1 (33)	0	2	0	2 (67)	3
	2010	0	0	0	0 (0)	0	0	0	0 (0)	0
RG868[c]	2006	2	0	0	2 (9)	21	0	0	21 (91)	23
Twentymile	2007	4	2	0	6 (20)	16	8	0	24 (80)	30
River	2008	0	0	0	0 (0)	17	6	0	23 (100)	23
	2009									
	2010	7	0	0	7 (25)	14	7	0	21 (75)	28

Area	Regulatory Year	Successful				Unsuccessful				Total Hunters[a]
		Local resident	Nonlocal resident	Nonresident	Total (%)	Local resident	Nonlocal resident	Nonresident	Total (%)	
RG869[c]	2006	8	1	10	19 (56)	10	0	5	15 (44)	34
Lake	2007	4	0	16	20 (54)	9	5	3	17 (460	37
George	2008	4	3	1	8 (36)	0	14	0	14 (64)	22
	2009	6	2	1	9 (26)	10	16	0	26 (74)	35
	2010	3	7	0	10 (43)	10	3	0	13 (57)	23
RG878	2006	0	0	0	0 (0)	2	0	0	2 (100)	2
Twentymile	2007	0	0	0	0	0	0	0	0	0
River	2008	0	0	0	0 (0)	2	2	0	4 (100)	4
(archery)	2009	0	0	1	1 (25)	2	1	0	3 (75)	4
	2010	0	0	0	0 (0)	2	0	0	2 (100)	2
RG879	2006	0	0	0	0 (0)	0	0	0	0 (0)	0
Lake	2007	0	0	0	0	0	0	0	0	0
George	2008	0	0	1	1 (50)	0	1	0	1 (50)	2
(archery)	2009	0	0	0	0 (0)	1	1	1	3 (100)	3
	2010	0	0	0	0 (0)	0	0	0	0 (0)	0
DG859[d]										
Lake	2008	0	0	3	3 (50)	0	2	1	3 (50)	6
George	2009	3	0	0	3 (38)	1	4	0	5 (62)	8
DG869[d]	2008	2	1	2	5 (50)	2	3	0	5 (50)	10
Lake	2009	1	4	2	7 (58)	3	3	0	6 (42)	13
George	2010	0	0	3	3 (100)	0	0	0	0 (0)	3
DG868[d]	2008	1	1	0	2 (29)	4	1	0	5 (71)	7
Twentymile	2009	2	2	0	4 (31)	8	1	0	9 (69)	13
River	2010	0	0	0	0 (0)	0	0	0	0 (0)	0

Area	Regulatory Year	Successful				Unsuccessful				Total Hunters[a]
		Local resident	Nonlocal resident	Nonresident	Total (%)	Local resident	Nonlocal resident	Nonresident	Total (%)	
Lake George RG 864	2010	0	2	1	3 (43)	0	4	0	4 (57)	7
Totals for all Unit 14C	2006	12	2	10	24 (35)	39	0	5	44 (65)	68
	2007	10	4	17	31 (40)	28	15	3	46 (60)	77
	2008	9	6	9	24 (28)	30	32	1	63 (72)	87
	2009	15	8	4	27 (32)	26	30	1	57 (68)	84
	2010	12	10	4	26 (38)	28	15	0	43 (62)	69

[a] Includes hunters with unspecified residency or who failed to report.

Table 4. Unit 14C successful mountain goat hunter transport methods, regulatory years 2006–2010.

		Percent of harvest								
Area	Regulatory Year	Airplane	Horse	Boat	3- or 4-wheeler	Snowmachine	ORV	Highway vehicle	Unknown	n
RG868	2006	50	0	50	0	0	0	0	0	2
Twentymile	2007	0	0	17	0	0	0	83	0	6
River	2008	0	0	0	0	0	0	0	0	0
	2009	0	0	0	0	0	0	0	0	0
	2010	29	0	0	0	0	0	57	14	7
RG869	2006	89	0	5	0	0	0	0	5	19
Lake	2007	100	0	0	0	0	0	0	0	20
George	2008	100	0	0	0	0	0	0	0	8
	2009	78	0	0	0	0	0	22	0	9
	2010	100	0	0	0	0	0	0	0	10
RG878	2006	0	0	0	0	0	0	0	0	0
Twentymile	2007	0	0	0	0	0	0	0	0	0
River	2008	0	0	0	0	0	0	0	0	0
	2009	100	0	0	0	0	0	0	0	1
	2010	0	0	0	0	0	0	0	0	0
RG879	2006	0	0	0	0	0	0	0	0	0
Lake	2007	0	0	0	0	0	0	0	0	0
George	2008	100	0	0	0	0	0	0	0	1
	2009	0	0	0	0	0	0	0	0	0
	2010	0	0	0	0	0	0	0	0	0
DG859[d]										
Lake	2008	67	0	33	0	0	0	0	0	3
George	2009	100	0	0	0	0	0	0	0	3

Area	Regulatory Year	Percent of harvest								n
		Airplane	Horse	Boat	3- or 4-wheeler	Snowmachine	ORV	Highway vehicle	Unknown	
DG869[d]										
Lake	2008	60	0	40	0	0	0	0	0	5
George	2009	100	0	0	0	0	0	0	0	7
	2010	100	0	0	0	0	0	0	0	3
DG868[d]	2008	100	0	0	0	0	0	0	0	2
Twentymile	2009	25	0	0	0	0	0	75	0	4
River	2010	0	0	0	0	0	0	0	0	0
RG 864 Lake George	2010	0	0	0	0	0	0	0	100	3


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