Species Management Report and Plan ADF&G/DWC/SMR&P–2018–39

Dall Sheep Management Report and Plan, Wrangell and St. Elias Mountains, Game Management Unit 11:

Report Period 1 July 2011–30 June 2016, and

Plan Period 1 July 2016–30 June 2021

Heidi L. Hatcher

2018

Alaska Department of Fish and Game Division of Wildlife Conservation

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Funding for survey and inventory project 6.0 was provided by Federal Aid in Wildlife Restoration grant program. Hunters are important founders of the modern wildlife conservation movement. They, along with trappers and sport shooters, provided funding for this publication through payment of federal taxes on firearms, ammunition, and archery equipment, and through state hunting license and tag fees.

Species management reports and plans provide information about species that are hunted or trapped and management actions, goals, recommendations for those species, and plans for data collection. Detailed information is prepared for each species every 5 years by the area management biologist for game management units in their areas, who also develops a plan for data collection and species management for the next 5 years. This type of report is not produced for species that are not managed for hunting or trapping or for areas where there is no current or anticipated activity. Unit reports are reviewed and approved for publication by regional management coordinators and are available to the public via the Alaska Department of Fish and Game's public website.

This species management report and plan was reviewed and approved for publication by Todd A. Rinaldi, Management Coordinator for Region IV for the Division of Wildlife Conservation.

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The document has been published only in electronic PDF format and should be cited as follows:

Hatcher, H. L. 2018. Dall sheep management report and plan, Wrangell and St. Elias Mountains, Game Management Unit 11: Report period 1 July 2011–30 June 2016, and plan period 1 July 2016–30 June 2021. Alaska Department of Fish and Game, Species Management Report and Plan ADF&G/DWC/SMR&P-2018-39, Juneau.

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Purpose of this Report

This report provides a record of survey and inventory management activities for Dall sheep (*Ovis dalli*) in Unit 11 for the previous 5 regulatory years and plans for survey and inventory management activities in the 5 years following the end of that period. A regulatory year (RY) begins 1 July and ends 30 June (e.g., RY11 = 1 July 2011–30 June 2012). This report is produced primarily to provide agency staff with data and analysis to help guide and record its own efforts but is also provided to the public to inform it of wildlife management activities. In 2016 the Alaska Department of Fish and Game's (ADF&G) Division of Wildlife Conservation (DWC) launched this 5-year report to more efficiently report on trends and describe potential changes in data collection activities over the next 5 years. It replaces the Dall sheep management reports of survey and inventory activities that were previously produced every 3 years.

I. RY11–RY15 Management Report

Management Area

Unit 11 (12,784 mi^2) consists of that area draining into the headwaters of the Copper River south of Suslota Creek and the area drained by all tributaries into the east bank of the Copper River between the confluence of Suslota Creek with the Slana River and Miles Glacier (Fig. 1). Most of Unit 11 is included in the Wrangell–St. Elias National Park and Preserve. Unit 11 includes portions of 3 of Alaska's 32 ecoregions: the Wrangell Mountains, the Chugach–St. Elias Mountains, and the Copper River Basin. Maps for Unit 11 boundaries and special management areas can be found on ADF&G's website: http://www.adfg.alaska.gov/index.cfm?adfg=maps.main.

Summary of Status, Trend, Management Activities, and History of Sheep in Unit 11

In December 1978, the boundaries established for the new Wrangell–St. Elias National Monument encompassed most of Unit 11. In 1980, monument status was changed to park and preserve with passage of the Alaska National Interest Lands Conservation Act (ANILCA).

Dall sheep are recognized as an integral part of the ecosystem throughout alpine and subalpine areas in Unit 11 and are managed to provide for a wide variety of human uses and values, including hunting, photography, viewing, and scientific research (ADF&G 2002). Due to the extent of National Park Service (NPS) land and the limited access available for resource users, the state has adopted a passive approach to sheep management in Unit 11. As a result, sheep management in Unit 11 is reflective of NPS policy, which largely strives to allow for natural ecosystem processes without human interference and thereby allow the sheep population to fluctuate as influenced by available habitat and predation rates.

The harvest of Dall sheep on park lands is limited to federal subsistence hunting by rural residents of designated communities in Units 11, 13, and a portion of 12. Federally qualified hunters may also hunt under federal subsistence regulations on preserve lands. State hunting

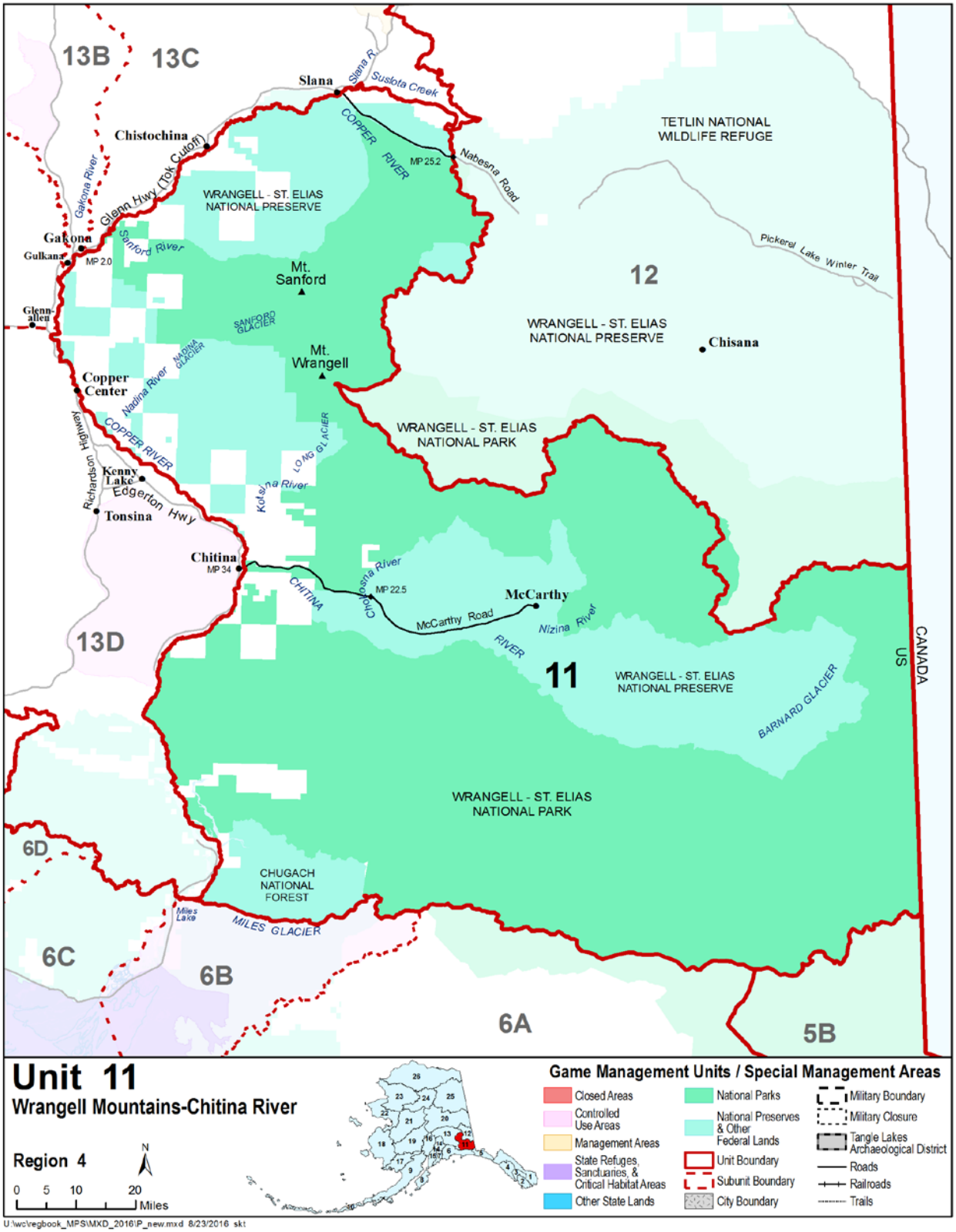

Figure 1. Map showing Unit 11 boundaries, Southcentral Alaska.

regulations provide opportunity for residents and nonresidents to hunt sheep on preserve lands, as well as state and private lands in Unit 11. In RY79, the Unit 11 bag limit changed from 1 ram with ¾-curl or larger horns to 1 ram with 7/8-curl or larger. In RY89 the bag limit was changed to 1 sheep for state subsistence hunters (defined as rural Alaska residents that have a customary and traditional use of a particular species of game in a particular area) and 1 ram with full curl or larger horns for other hunters (nonlocal resident and nonresident hunters). Late that year, rural subsistence priority for state hunters was struck down in a decision on the McDowell appeal. Subsequently, the state bag limit for all resident hunters became 1 sheep from RY90 through RY00. Due to declining sheep numbers, the regulation was changed to 1 ram in RY01, and then to 1 ram with ¾-curl or larger in RY03. The nonresident bag limit has remained full-curl or larger since RY89; guides are required.

Beginning in RY90, the Federal Subsistence Board (FSB) implemented a federal subsistence sheep season with a bag limit of 1 sheep. The bag limit for the federal subsistence hunt was changed to 1 ram in RY16. Federal regulations prohibit the use of aircraft for hunting on park lands. In RY98 the Federal Subsistence Board implemented an additional federal season for hunters over the age of 60 with a bag limit of 1 sheep. Except for hunters who participate in this federal Unit 11 Elder hunt (FS1104), state and federal sheep hunting in Unit 11 is reported under the state harvest ticket system. Sealing requirements were implemented for all sheep harvested under the state harvest ticket system starting in RY04.

Sheep numbers in the Wrangell Mountains prior to the 1950s are unavailable. While sheep surveys were done during the late 1950s and 1960s, they are generally not comparable to more recent surveys because early survey intensity and specific area boundaries are unknown. Specific count areas and techniques for aerial surveys were established in 1973, when sex and age composition surveys were flown over large portions of the Wrangell and Chugach mountains. These surveys still continue in selected areas. The northern portion of the Wrangell Mountains is known for relatively high densities of sheep, while the southern portion of the range typically has lower densities of sheep. Dall sheep harvests were not monitored prior to 1962. However, since then, harvest reports have provided managers with harvest numbers and trends.

Given the size of Unit 11, unitwide sheep population data are limited. NPS estimated 26,286 sheep ± 4,473 (95% CI) within the entire Wrangell–St. Elias National Park and Preserve in 1990, 27,796 sheep ± 6,448 (95% CI) in 1991, and 17,455 ± 3,883 sheep in 1993 (McDonald et al. 1991; Strickland et al. 1993). The NPS Central Alaska Network used distance sampling techniques (Schmidt et al. 2012) in 2010 and 2011 to survey the entire Wrangell Mountain range. A population estimate of 12,428 sheep was determined for Wrangell–St. Elias National Park and Preserve (NPS 2013).

Management Direction

Existing Wildlife Management Plans

- Management direction set out in sheep management plans for the Wrangell and Mentasta mountains and the Nelchina Basin (ADF&G 1976) has been modified through public comments, staff recommendations, and Board of Game actions over the years. A record

of these changes can be found in the division's previous species management reports. The plan portion of this report contains the current management plan for sheep in Unit 11.

GOALS

- Provide the greatest sustained-yield opportunity to participate in hunting sheep.

CODIFIED OBJECTIVES

Amounts Reasonably Necessary for Subsistence Uses

- The Alaska Board of Game made a positive finding for customary and traditional uses for Dall sheep in Unit 11. The unitwide amounts reasonably necessary for subsistence uses (ANS) is 60–75 sheep.

Intensive Management

Sheep are not designated as an intensive management species in the State of Alaska. Intensive management predation control programs implemented for moose or caribou may affect predation levels on sheep. The Alaska Board of Game has determined that the Mentasta caribou herd and the moose population for Unit 11 do not provide high levels of human consumptive use (negative finding), and, therefore, there is no intensive management program in Unit 11.

MANAGEMENT OBJECTIVES

- Maintain a sheep population that will sustain an annual harvest of 60 rams.

MANAGEMENT ACTIVITIES

Assessing population status and trends and monitoring harvest are integral components of management programs in Unit 11. Survey and inventory (S&I) management activities used to monitor sheep populations in Unit 11 are described below.

1. Population Status and Trend

ACTIVITY 1.1. Monitor sheep abundance and population composition.

Data Needs

Sheep abundance and composition data are necessary to determine population status in relation to management objectives. These data inform an index of annual productivity and sustainable harvest potential and provide insight into population trends and fluctuations that occur due to factors such as icing events, severe winters, or changes in habitat, including nutritional availability.

Methods

Aerial surveys using fixed-wing aircraft are conducted in established trend count areas (CAs) to determine sheep population trends and sex and age composition (Fig. 2; Appendix A). Surveys are generally conducted in July or early August. An experienced pilot /observer team flies geographic contours systematically within a CA at 70–80 mph searching for sheep and recording data. Goat observations are recorded when encountered during a sheep survey. Each sheep or group of sheep that is observed during the survey is circled to determine sex and age classification and number of animals present. Adult male sheep are recorded as rams, and young male sheep and ewes are recorded as ewe-like sheep. Lambs are differentiated from adults. A waypoint is recorded for each observation and a digital photograph may be taken to confirm sheep numbers and classification for that waypoint upon return to the office. In some years, surveys are not possible due to poor survey conditions (e.g., high winds or low visibility) or limited funding. Surveys are usually conducted every 2 years in CA 11 and 12 from the Dadina drainage to the Kuskulana drainage. Other CAs are surveyed every 5 to 10 years as weather and resources allow. Survey timing and CAs are coordinated with NPS to maximize resources.

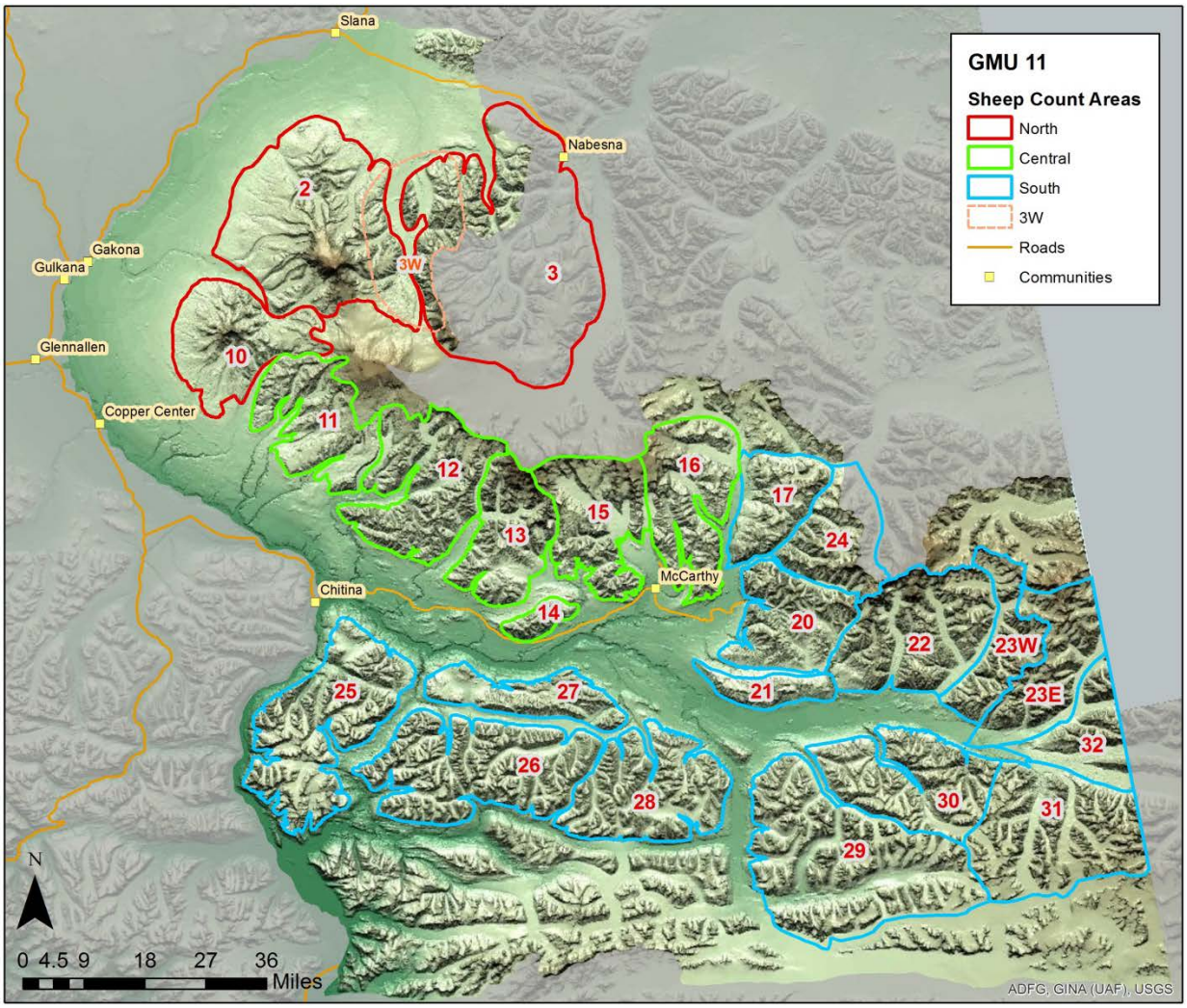

Figure 2. Map showing Unit 11, Alaska sheep trend count areas.

Results and Discussion

Northern Unit 11

Population information for the northern portion of the Wrangell Mountains in Unit 11 is collected from CAs 2, 3W, and 10; CAs 2 and 3W were surveyed in 2013 (Table 1). Counts have been conducted in CA 2 only in 2002 and 2013, and the 2013 survey was incomplete. Composition data showed that, biologically, there were sufficient rams to breed ewes in CA 2 in 2013 (54 rams:100 ewes), but the percent of rams that were full curl may have declined from the 20% observed in 2002 to 7% observed in 2013 (Valdez and Krausman 1999). The number of sheep observed in CA 3W in 2013 was 41% lower than the 565 sheep observed in 2007 and 34% lower than the 502 sheep observed in 2001. The percent of the population represented by lambs was 8% in 2013, which was below the 20% observed in 2007. CA 3W represents a popular any-ram hunting area for federal subsistence users; while the percent of rams that were legal for harvest had dropped from 46% in 2001 and 50% in 2007 to 11% in 2013, the ratio of rams:100 ewe-likes remained above adequate for biological ratios (46). Due to the location of the previous CA 3W, it is plausible that the declines observed in 2013 compared to previous surveys are reflective of sheep location during the survey (being just over the ridgetop, for example) rather than actual population trends. For this reason, CA 3W boundaries will be altered for future surveys (see the plan section of this document).

Central Unit 11

The central portion of the Wrangell Mountains in Unit 11 is represented in CAs 11 and 12, which are the most frequently surveyed CAs, as well as CAs 13, 14, 15, and 16. During this reporting period, CAs 11 and 12 were surveyed in 2011, 2013, and 2015 while CAs 13 and 14 were surveyed only in 2013 (Table 1). Sheep observations in CA 11 slowly declined after the late 1980s, when 400–560 sheep were observed, until 2002. Following that time, the population has remained fairly stable with an average of 177 sheep observed since 2002. The number of sheep observed in CA 11 during the current reporting period ranged from 124 to 207 with an average of 168 (Table 1). Rams:100 ewe-likes ranged 30–44 with an average of 35. During the current reporting period, an average of 16% of rams were full-curl or greater than full curl. Lambs represented an average of 17% of the flock.

Sheep numbers in adjoining CA 12 began to decline in the late 1990s, falling from a high of 601 sheep observed in 1996 to a low of 113 sheep observed in 2006. The counts appeared to stabilize from 2004 to 2009 when on average 166 sheep were observed annually. During the current reporting period, the number of sheep observed in CA 12 averaged 282 sheep, with observations ranging from 258 sheep to 322 sheep (Table 1). On average, lambs represented 17% of the observed flock, which was above the average from previous surveys of 14%. The ratio of rams to 100 ewe-likes ranged from 45 to 61 with an average of 51, which is similar to the overall average of 50 rams:100 ewes from all previous surveys.

CA 13 was surveyed in 2013 for the first time since 1999. While the total of 124 sheep observed in 2013 was lower than the 369 observed in 1999, it was not far from the 150 sheep observed during the only earlier survey of the area, in 1984. Of the rams observed, 14% were full-curl or greater than full-curl, which was identical to the 1999 survey. 82 rams:100 ewes were observed and 9% of the flock consisted of lambs.

Table 1. Unit 11 Dall sheep composition counts, Alaska, regulatory years[a] 2011–2015.

Trend count area	Regulatory year	Total rams	Full curl	(%)[b]	Ewes and ewe-likes	Lambs	(%)[c]	Lambs:100 ewe-likes	Rams: 100 ewe-likes	Total sheep observed
North										
CA2	2013[d]	43	3	(7)	79	12	(9)	15.2	54.4	134
CA3W	2013	96	11	(11)	207	27	(8)	13.0	46.4	330
Central										
CA11	2011	41	7	(17)	131	35	(17)	26.7	31.3	207
	2013	33	5	(15)	75	16	(13)	21.3	44.0	124
	2015	31	5	(16)	102	39	(23)	38.2	30.4	172
CA12	2011	68	13	(19)	152	47	(18)	30.9	44.7	267
	2013	88	19	(22)	144	26	(10)	18.1	61.1	258
	2015	79	24	(30)	168	75	(23)	44.6	47.0	322
CA13	2013	51	7	(14)	62	11	(9)	17.7	82.3	124
CA14	2013	25	0	(0)	64	5	(5)	7.8	39.1	94
South										
CA22	2011	71	20	(28)	124	51	(21)	41.1	57.3	246
	2013	58	15	(26)	142	34	(15)	23.9	40.8	234
CA23	2013	82	14	(17)	146	22	(9)	15.1	56.2	250

[a] A regulatory year begins 1 July and ends 30 June (e.g., regulatory year 2011 = 1 July 2011–30 June 2012).
[b] Percent full curl is calculated as a proportion of total rams.
[c] Percent lambs is calculated as a proportion of total sheep observed.
[d] Survey was incomplete.

The number of sheep observed in 2013 in CA 14 (94 sheep) was above the 10-year average from previous surveys (75 sheep; Schwanke 2011). None of the rams observed were full-curl or larger, which was also the case in 2003 and 2005. The total number of rams observed (25) was greater than in any previous survey, except the next most recent survey in 2006, when 31 rams were observed. The ram-to-ewe-likes ratio was 39 rams:100 ewe-likes and lambs made up only 5% of the population.

Southern Unit 11

Population information for the northwest portion of the Saint Elias Mountains that adjoins the southeast portion of the Wrangell Mountains is collected from CA 17, CA 21, CA 22, CA 23, CA 24, and CA 32 in the upper Chitina River drainage. Most recently, CA 22 was surveyed in 2011 and 2013 and CA 23 was surveyed in 2013.

In CA 22, total sheep numbers since the early 1980s have ranged from 197 to 304 (average = 252). Counts have stabilized since 2001 with an average of 237 sheep observed; on average 240 sheep were observed during the 2 surveys conducted in the current reporting period (Table 1). An average of 49 rams:100 ewe-likes were observed and an average of 27% of rams observed were full-curl or greater than full-curl. On average, lambs made up 18% of the flock.

Counts in CA 23 have fluctuated between 244 sheep and 375 sheep since the early 1980s, with an average of 309 sheep observed. During this reporting period, 250 sheep were observed in CA 23 with 56 rams:100 ewe-likes, 17% of rams full-curl or greater than full-curl, and 9% of the flock made up of lambs.

Recommendations for Activity 1.1

Modify as follows:

- Continue to collaborate with NPS to maximize resources and conduct surveys of established CAs.
- Rename the original CA3W as CA2.5 and designate a new CA3W that contributes to the overall footprint of CA3 (Fig. 3).
- Determine a schedule, based on hunting pressure and previous surveys, for CAs that are surveyed intermittently, or discontinue CAs that are not surveyed:

Survey annually or semi-annually:	Survey every 3 to 5 years:	Survey every 10 years:	Discontinue[a]:
CA3W	CA21	CA2	CA17
CA11	CA22	CA10	CA24
CA12	CA23	CA15	CA2.5
CA14	CA13	CA16	
		CA20	

[a] No flight has been conducted since the first survey in 1982.c

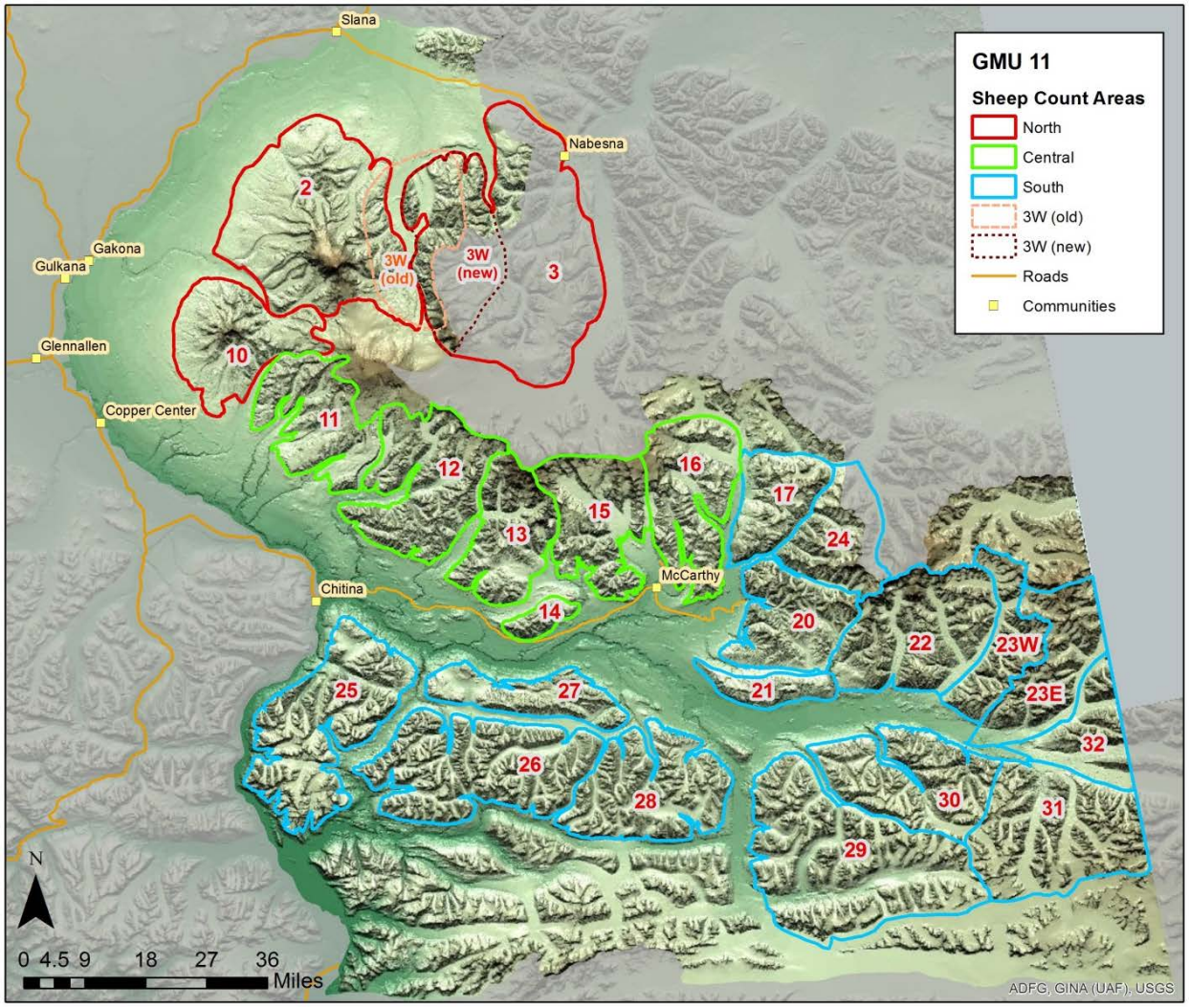

Figure 3. Map of Unit 11, Alaska sheep trend count areas, modified.

2. Mortality–Harvest Monitoring and Regulations

ACTIVITY 2.1. Monitor and evaluate sheep harvest through hunter harvest reports.

Data Needs

Monitoring and analyzing harvest data annually is important to understanding hunter effort and success in Unit 11, which is critical for sustained yield management.

Methods

Individuals who obtain a sheep harvest ticket from ADF&G are required to report on their ticket after successful harvest, or after the end of the season. Successful hunters must bring horns into an ADF&G office to be sealed, at which point detailed horn measurements are collected in addition to the standard hunt information collected on the harvest report form. Sheep horns are sealed with the placement of a metal stud with individual identification number in one horn. Unit

11 hunters participating in the federal elder hunt (FS1104) are required to report to NPS but are not required to have their horns sealed.

Seasons and Bag Limits

State Hunts	Bag Limit[a]	Resident Open Seasons	Nonresident Open Seasons
Unit 11			
Harvest ticket–youth hunt only	1 ram with full-curl horn or larger	Aug 1–Aug 5	Aug 1–Aug 5
Harvest ticket	1 ram with full-curl horn or larger	Aug 20–Sep 20	Aug 20–Sep 20

[a] As of RY16, nonresidents are allowed only 1 sheep harvest every 4 years.

Federal Hunts	Qualifying Hunters	Bag Limit	Open Seasons
Unit 11 north of Sanford River			
Harvest ticket	Residents of Unit 12, Chistochina, Chitina, Copper Center, Dot Lake, Gakona, Glennallen, Gulkana, Healy Lake, Kenny Lake, Mentasta Lake, Slana, McCarthy/South, Wrangell/South Park, Tazlina, Tonsina, McCarthy Road (mp 0-62), Nabesna Road (mp 0–46).	1 ram	Aug 10–Sep 20
FS1104 (60 years or older)		1 sheep	Aug 1–Oct 20
Unit 11 remainder			
Harvest ticket	Residents of Chistochina, Chitina, Copper Center, Gakona, Glennallen, Gulkana, Kenny Lake, Mentasta Lake, Slana, McCarthy/South, Wrangell/South Park, Tazlina, Tonsina, McCarthy Road (mp 0–62), Nabesna Road (mp 0–46), Tok Cutoff Road (mp 79–110).	1 ram	Aug 10–Sep 20
FS1104 (60 years or older)		1 sheep	Aug 1–Oct 20

Results and Discussion

Harvest by Hunters

Dall sheep harvest in Unit 11 during this reporting period ranged from 34 to 48 sheep with an average of 44 sheep harvested annually (Table 2). The number of hunters that reported hunting sheep in Unit 11 ranged from 119 to 141 with an average of 127 hunters annually (Table 3). On average, 56% of rams harvested annually were full-curl or greater during this reporting period. Annual average horn length of rams harvested in Unit 11 with full-curl or greater than full-curl horns (excluding double-broken rams) oscillated between 36.2 and 37.8 inches, with an overall average of 37 inches (Table 2). Annual average age of rams harvested was 7 years. Ewe harvest by federally qualified hunters ranged from zero ewes in 2011 and 2013 to 3 ewes in 2015, which is the highest ewe harvest since 2008.

Hunter Residency and Success

Sheep hunter residency and success in Unit 11 is presented in Table 3. The number of sheep hunters in Unit 11 peaked in the early 1990s, and steadily declined to a low of 119 hunters in RY13, but RY14 and RY15 showed a slight increase. During this reporting period, the average number of hunters per season was 127.

During the 1990s, local residents (residents of Units 11 or 13) were taking 22–43 sheep per year. Nonlocal residents took 54–100 sheep per year, and nonresidents took 20–42 per year during the same time period. During this reporting period, the average harvests by locals, nonlocal residents, and nonresidents were 15, 19, and 11 respectively. While down from the harvest in the 1990s, the harvests from local residents and nonresidents appear to have stabilized since RY00, while the harvest from nonlocal resident harvest appears to have stabilized since RY06. Nonresidents remain the most successful group of hunters in Unit 11, although nonresident success rates varied more during this reporting than did success rates for locals or nonlocal residents.

Hunter effort is summarized in Table 4. The average number of days hunted annually by successful hunters ranged from 3.4 to 5.0 days during this reporting period. The average number of days hunted annually by unsuccessful sheep hunters ranged from 5.3 to 7.0 days.

Harvest Chronology

Harvest chronology data for sheep taken in Unit 11 are presented in Table 5. Between RY95 and RY05, much of the harvest (average = 44%) occurred during the first week of the season. Since then, harvest chronology has been less predictable. During this reporting period, an average of 38% of harvest occurred during the first week of each season, with the remaining harvest generally spread between the second and fourth weeks of the season. In RY11, 23% of harvest occurred in the last week of the season.

Table 2. Unit 11 Dall sheep harvest, Alaska, regulatory years[a] 2011–2015.

Regulatory year	Rams	Rams ≥full curl (%)[a]	Average horn length of ≥ full-curl rams (inches)[b]	Rams ≥40 inches (%)[c]	Ewes	Total sheep
2011	48	28 (58)	37.3	6 (13)	0	48
2012	33	16 (48)	37.4	3 (9)	1	34
2013	45	31 (69)	36.2	5 (11)	0	45
2014	47	25 (53)	37.8	8 (17)	1	48
2015	44	22 (50)	36.3	5 (11)	3	47

[a] A regulatory year begins 1 July and ends 30 June (e.g., regulatory year 2011 = 1 July 2011–30 June 2012).
[b] Rams with both horns broken are not included.
[c] Percent of total number of rams harvested.

Table 3. Unit 11 Dall sheep hunter residency and success, Alaska, regulatory years[a] 2011–2015.

Regulatory	Local[b] residents		Nonlocal residents		Nonresidents		Total hunters	
year	Hunted	Successful (%)	Hunted	Successful (%)	Hunted	Successful (%)	Hunted	Successful (%)
2011	44	22 (50)	73	16 (22)	13	10 (77)	130	48 (37)
2012	28	9 (32)	79	18 (23)	13	7 (54)	120	34 (28)
2013	31	10 (32)	70	18 (26)	18	17 (94)	119	45 (38)
2014	33	17 (52)	72	18 (25)	18	13 (72)	123	48 (39)
2015	36	15 (42)	84	24 (29)	21	8 (38)	141	47 (33)

[a] A regulatory year begins 1 July and ends 30 June (e.g., regulatory year 2011 = 1 July 2011 – 30 June 2012).
[b] Local means residents of Units 11 or 13.

Table 4. Unit 11 reported Dall sheep hunting effort,[a] Alaska, regulatory years[b] 2011–2015.

Regulatory year	Successful hunters			Unsuccessful hunters			Total		
	No. hunters	Total days	Average days	No. hunters	Total days	Average days	No. hunters	Total days	Average days
2011	47	214	4.6	80	439	5.5	127	653	5.1
2012	34	117	3.4	86	468	5.4	120	585	4.9
2013	45	223	5.0	72	383	5.3	117	606	5.2
2014	48	201	4.2	74	429	5.8	122	630	5.2
2015	47	236	5.0	92	640	7.0	139	876	6.3

[a] Represents only reports that include hunter effort data.
[b] A regulatory year begins 1 July and ends 30 June (e.g., regulatory year 2011 = 1 July 2011–30 June 2012).

Table 5. Unit 11, Alaska reported[a] Dall sheep harvest chronology percent by harvest period for regulatory years[b] 2011–2015.

Regulatory year	Percent of reported annual harvest by period						
	8/10–8/16	8/17–8/23	8/24–8/30	8/31–9/6	9/7–9/13	9/14–9/20	*n*
2011	31	15	15	10	6	23	48
2012	41	24	0	18	3	15	34
2013	27	13	24	16	13	7	45
2014	43	15	21	4	9	9	47
2015	47	6	11	19	11	6	47

[a] Represents only reports that include date of kill.
[b] A regulatory year begins 1 July and ends 30 June (e.g., regulatory year 2011 = 1 July 2011–30 June 2012).

Transport Methods

Aircraft was the primary mode of transportation of successful hunters, with ATVs (3- or 4-wheelers) and boats being the next most popular transport methods (Table 6). An annual average of 17 successful hunters (38%) used aircraft, 12 (27%) used ATVs, and 8 (18%) used boats during RY11–RY15.

Table 6. Unit 11 Dall sheep reported harvest[a] by transport method, Alaska, regulatory years[b] 2011–2015.

	Harvest by transport method (%)							
Regulatory year	Airplane	Horse	Boat	ATV[c]	ORV[d]	Highway vehicle	Airboat	*n*
2011	19 (40)	0 (0)	11 (23)	13 (27)	3 (6)	2 (4)	0	48
2012	15 (44)	0 (0)	6 (18)	8 (24)	3 (9)	2 (6)	0	34
2013	21 (47)	0 (0)	8 (18)	8 (18)	2 (4)	6 (13)	0	45
2014	16 (33)	1 (2)	8 (17)	18 (38)	1 (2)	4 (8)	0	48
2015	14 (30)	0 (0)	6 (13)	14 (30)	1 (2)	12 (26)	0	47

[a] Represents only reports with transportation data.
[b] A regulatory year begins 1 July and ends 30 June (e.g., regulatory year 2011 = 1 July 2011–30 June 2012).
[c] ATV = 3- or 4-wheelers.
[d] ORV = off-road vehicles.

Other Mortality

Predation by wolves, wolverines, grizzly bears, coyotes, and golden eagles on Dall sheep has been documented in the Alaska Range (Scotton 1997; Arthur 2003) and has been observed in the Wrangell Mountains as well. Species-specific predation rates have not been estimated in Unit 11. Research initiated in RY16 may provide future information on ram mortality in the northern Wrangells.

Other sources of natural mortality common to sheep populations include accidents (e.g., falls), avalanches, and starvation due to deep snow, icing events, poor habitat, or density-dependent factors. Prior to 1993, snow depths were available only from 2 sites – Sanford River and Dadina Lake in the western Wrangell Mountains. In 1993, 3 other locations in the southern Wrangells were added: Lost Creek, Chokosna, and May Creek. All snow survey sites are located in low-lying areas which may not accurately represent snow depths in sheep habitat. During this reporting period, the winter snow depth index represented by average snow depths did not reach "severe" (30 inches) for any year. Measured snow depths exceeded 30 inches at Sanford River for one measurement in RY12 and one measurement in RY14. Measured snow depths exceeded 30 inches at Dadina Lake for 2 measurements in RY11 and 1 measurement in RY13. All other sites and dates showed snow depths below 30 inches.

Alaska Board of Game Actions and Emergency Orders

No Board of Game actions were taken for Unit 11 during this reporting period. The Federal Subsistence Board changed the bag limit for federally qualified subsistence users from 1 sheep to 1 ram beginning in RY16.

Recommendations for Activity 2.1.

Continue.

3. Habitat Assessment–Enhancement

No activities.

NONREGULATORY MANAGEMENT PROBLEMS OR NEEDS

Data Recording and Archiving

- State sheep harvest data are stored on ADF&Gs Wildlife Information Network (WinfoNet) server (http://winfonet.alaska.gov/index.cfm).
- Federal elder hunt sheep harvest data must be obtained from NPS and are stored electronically on the Glennallen office Shared Drive (O:\DWC\BGDIF\Sheep\Shpharvest\wrangellhv).
- Sheep survey data forms (Appendix A) are stored in the "Sheep" filing cabinet located in the Assistant Area Biologist office in Glennallen.
- Data are entered and stored electronically with survey waypoints, survey tracks, and PDF files of the scanned data sheets on the Glennallen Shared Drive (O:\DWC\BGDIF\Sheep\Shpcomp\wrangellcmp).
- All electronic files are backed up nightly to offsite storage maintained on State of Alaska (SOA) servers.
- A results report on each survey, including cost, conditions, dates flown, and count information, is written and transmitted to appropriate staff and supervisors in memo format.

Agreements

A data sharing agreement is in place to provide sheep (and other species) harvest data to Wrangell–St. Elias National Park and Preserve for RY90–RY20 (Appendix B). Sheep surveys are coordinated with NPS; as a result, total counts for individual CAs are received from or shared with NPS as needed.

Permitting

Not applicable.

Conclusions and Management Recommendations

Sheep surveys in Unit 11 indicate, based on data gathered during RY11–RY15 that populations are currently stable with an average of 43 rams harvested annually. Annual average age of rams harvested remains stable at 7 years. Rams with horns greater than full-curl average 37 inches in length, and on average 12% of the total number of rams harvested are 40 inches or greater in

horn length (not including rams with both horns broken). Sheep surveys should be conducted more frequently and in CAs with the greatest hunting pressure to confirm that population trends are stable. Due to the inconsistent manner of surveying CA3 historically and the overlap of CA3W with CA2, CA3W should be renamed CA2.5 and a new CA3W should be delineated as a portion of the greater CA3, allowing for more comparability and consistent tracking of survey completion in the future.

Since large amounts of sheep habitat in Unit 11are federally-protected and either restrict hunter access or are difficult for hunters to access, it is unlikely the population will fall below a level that would sustain a harvest of 60 rams. Therefore, the existing objective to maintain a population that could sustain that harvest is unnecessary. Since RY06, RY09 is the only year that 60 rams were harvested, although the population can likely sustain a harvest of 60 rams (74 full-curl rams were observed in CAs surveyed in RY13, which represented only a portion of Unit 11). Similarly, it would be arbitrary to set an objective of growing or maintaining a sheep population that would provide a consistent take of 60 rams annually as the size of the sheep population is largely driven by uncontrollable factors such as weather, habitat quality, and predation, rather than hunter harvest. Land status in Unit 11 provides limited hunter access to the totality of sheep in the unit; growing the sheep population in areas accessible to hunters is not realistic.

The protected nature of Wrangell–St. Elias National Park lands in Unit 11 allows for access to sheep habitat via fixed-wing aircraft for recreational purposes but not for hunting purposes. Coupled with the remoteness of these lands, there are pristine alpine areas available for flightseeing and backcountry exploring that provide spectacular opportunities to view and photograph sheep. Given these opportunities and public interest in nonconsumptive uses of sheep in Wrangell–St. Elias National Park, it would be reasonable to include an additional sheep management goal for Unit 11 to continue to provide opportunities for nonconsumptive uses. In order to achieve both the current management goal of providing the greatest sustained-yield opportunity to participate in hunting sheep and the goal of providing opportunities for nonconsumptive uses, it will be necessary to define the overall management goal for Unit 11 as protecting and maintaining the sheep population and its habitat in concert with other components of the ecosystem.

II. Project Review and RY16–RY20 Plan

Review of Management Direction

MANAGEMENT DIRECTION

The management direction for Unit 11 has been modified for the RY16–RY20 period to reflect meaningful and realistic goals and objectives that are appropriate in the context of current access, hunting pressure, and sheep populations in Unit 11. Changes for this period compared to the RY11–RY15 reporting period are noted below. All are consistent with statewide goals (ADF&G 2002) and fall within the frameworks of sustained yield and species conservation.

GOALS

The previous goal stated in the RY11–RY15 report:

- Provide the greatest sustained-yield opportunity to participate in hunting sheep.

is retained and 2 additional goals, based on statewide goals, have been added to the goals for Dall sheep management in Unit 11.

- Protect and maintain the sheep population and its habitat in concert with other components of the ecosystem.

- Provide an opportunity for nonconsumptive uses such as viewing and photographing sheep.

CODIFIED OBJECTIVES

Amounts Reasonably Necessary for Subsistence Uses

- Unit 11 has a positive customary and traditional use determination for Dall sheep. The unitwide amount reasonably necessary for subsistence is 60–75 sheep. This is expected to remain the same during RY16–RY20.

MANAGEMENT OBJECTIVES

RY11–RY15 Objective

- Maintain a sheep population that will sustain an annual harvest of 60 rams.

Revised objective:

- Maintain a sheep population with a ratio of ≥ 40 rams:100 ewe-likes in CAs surveyed pre-hunt.

Based on the current level of harvest in accessible areas and given that the actual ram:100 ewe ratio would be higher than the ram:100 ewe-like ratio observed, a minimum of 40 rams:100 ewe-likes should leave an adequate number of rams:100 ewes (≥33 rams:100 ewes) after the harvest to provide for successful breeding and lamb production (Valdez and Krausman 1999).

REVIEW OF MANAGEMENT ACTIVITIES

No new activities are planned for RY16–RY20, but changes will be made to how surveys will be conducted, as described below.

1. Population Status and Trend

ACTIVITY 1.1. Monitor sheep abundance and population composition.

Data Needs

No change from report.

Methods

Changes reflect the recommendations listed in the report (above). Surveys will be conducted on the following schedule, in collaboration with NPS:

Survey annually or semi-annually:	Survey every 3–5 years:	Survey every 10 years:	Discontinue[a]
CA3W	CA21	CA2	CA17
CA11	CA22	CA10	CA24
CA12	CA23	CA15	CA2.5
CA14	CA13	CA16	
		CA20	

[a] No flight has been conducted since the first survey in 1982.

2. Mortality–Harvest Monitoring

ACTIVITY 2.1. Monitor and evaluate sheep harvest through hunter harvest reports.

Data Needs

No change from report.

Methods

No change from report.

3. Habitat Assessment–Enhancement

No activities.

NONREGULATORY MANAGEMENT PROBLEMS OR NEEDS

No issues have been identified.

Data Recording and Archiving

No change from report.

Agreements

No change from report.

Permitting

No change from report.

Acknowledgments

Special thanks to Judy Putera with Wrangell–St. Elias National Park and Preserve for collaborating on sheep surveys in Unit 11, including CA2 in 2013.

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Appendix A. Sheep and goat survey data form for Unit 11, Alaska.

MOUNTAIN GOAT AND SHEEP SURVEY FORM

Area: Chugach / Talkeetna / Alaska Range / Other: _____ (circle one) Page_____ of _____

Date:_____ Count Area: _____

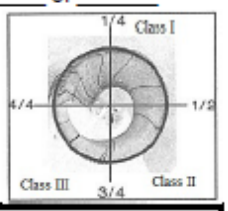
Pilot_____ Observer _____

Time Off:_____ Time Landing: _____ Total Flight Time: _____

Light: low / med / bright Cloud cover: clear / scat / broken / overcast

Snow cover (%) _____

Start Count Time: _____ End Count Time: _____ Total Count Time: _____



	Goats			Sheep							
					< Full Curl Rams						
Waypoint	Adults	Kids	Unid	Full Curl Rams	I	II	III	Unid Rams	Ewes	Lambs	Unid.
This page tot.											
Other pages											
Total											

Appendix B. Data sharing agreement for wildlife data with the National Park Service.

AGREEMENT FOR USE OF WILDLIFE DATA
BETWEEN
ALASKA DEPARTMENT OF FISH & GAME (ADF&G)
AND
WRANGELL-ST. ELIAS NATIONAL PARK AND PRESERVE

This agreement covers the following two files to be transferred to Wrangell-St. Elias National Park and Preserve: 1) harvest data files for bison, black bear, brown bear, caribou, moose, mountain goat, sheep, and wolves in Game Management Units 11 and 12 by UCU, including location of kill by major and minor subdivisions, method of take, date of kill, horn, skull, or antler morphometric data, and sex for the regulatory years 1990–1991 through 2014–2015; and 2) a .shp file delineating UCU boundaries. ADF&G will provide harvest data for species listed for regulatory years 2015–2016 through 2020–2021 upon request by Wrangell St Elias National Park.

This information is released to, and may be used by, Wrangell-St. Elias National Park and Preserve under the following conditions:

1. The information will be used to monitor harvest of bison, black bear, brown bear, caribou, moose, mountain goat, sheep, and wolf populations within the Park boundaries.
2. Harvest information will not be published, publically disseminated, or presented by the NPS or its contractors at the spatial resolution of latitude and longitude of a kill site or by watershed defined as a Uniform Coding Unit (UCU) in ADF&G data.
3. The information will not be released to others except to persons in a contractual relationship with Wrangell-St. Elias National Park and Preserve who will be performing work for or on behalf of Wrangell-St. Elias National Park and Preserve, on a need-to-know basis, in which case Wrangell-St. Elias National Park and Preserve will require the contractors to agree to and abide by the conditions in this document.
4. The NPS agrees that the harvest location data is protected from disclosure under state law and will make every effort to keep it confidential under federal law, and will notify ADF&G if there is a Freedom of Information Act request for the data.

Under the above conditions, ADF&G agrees to release the attached information, and Wrangell-St. Elias National Park and Preserve agrees to receive and use it.

SOF

Date April 4, 2016

Maria Gladziszewski, Deputy Director, Division of Wildlife Conservation, ADF&G

SOF

Date 4/7/2016

Eric Veach, Acting Superintendent, Wrangell-St. Elias National Park and Preserve


ALASKA
DEPARTMENT OF FISH AND GAME