Sheep Management Report and Plan, Game Management Unit 13D, Chugach Range:

Report Period 1 July 2011–30 June 2016, and

Plan Period 1 July 2016–30 June 2021

W. Frank Robbins

2020

Alaska Department of Fish and Game Division of Wildlife Conservation

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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.

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Species management reports and plans are available via the Alaska Department of Fish and Game's public website (www.adfg.alaska.gov) or by contacting Alaska Department of Fish and Game's Division of Wildlife Conservation, PO Box 115526, Juneau, Alaska 99811-5526; phone: (907) 465-4190; email: dfg.dwc.publications@alaska.gov. The report may also be accessed through most libraries, via interlibrary loan from the Alaska State Library or the Alaska Resources Library and Information Services (www.arlis.org).

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Cover Photo: ©2016 ADF&G. Photo by Jeff Mondragon. Dall sheep rams rest in the alpine.

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Purpose of this Report

This report provides a record of survey and inventory management activities for Dall sheep in Unit13D 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., RY10 = 1 July 2010–30 June 2011). 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 them of wildlife management activities. In 2016 the Alaska Department of Fish and Game's 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

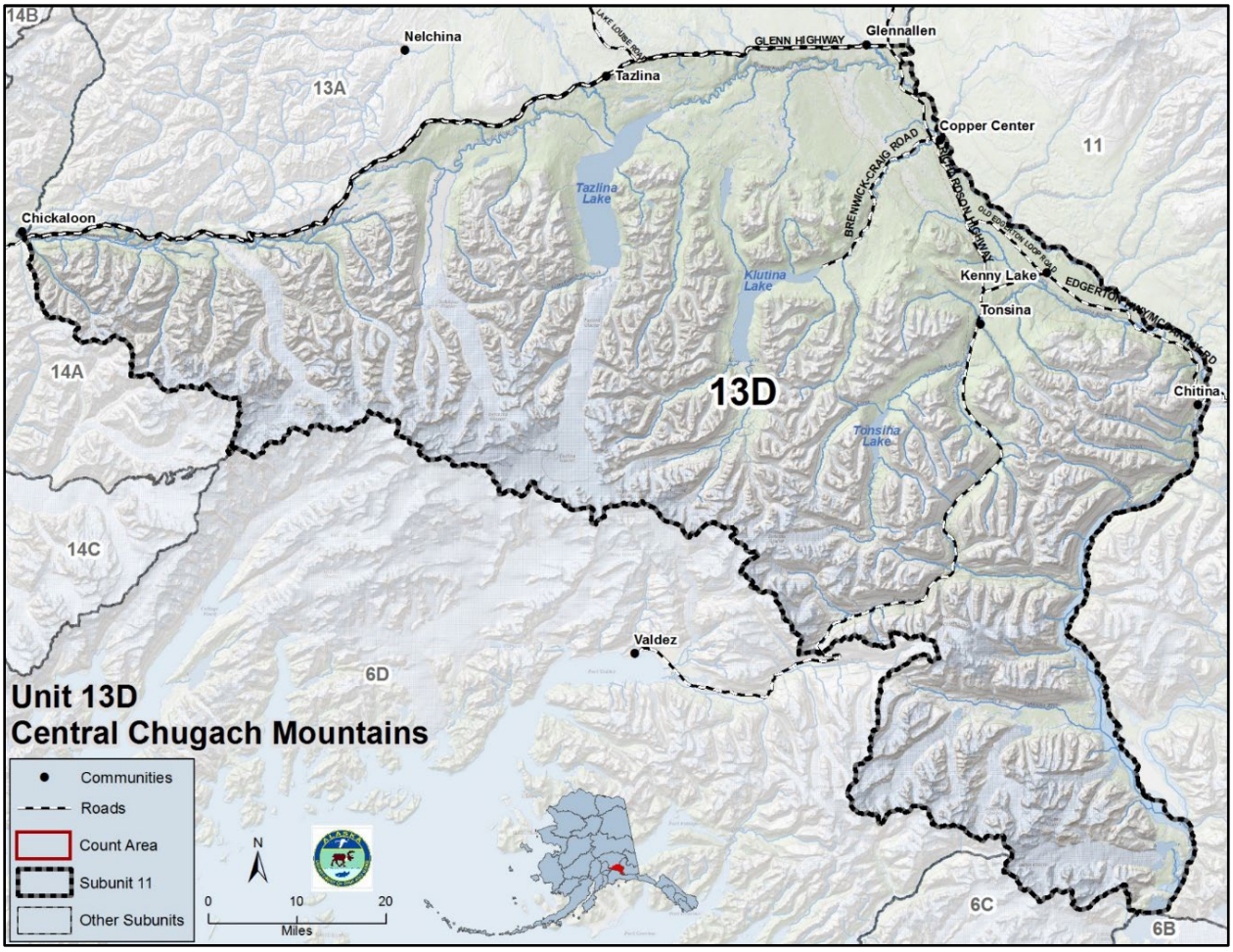
This report addresses the central Chugach Mountains of Game Management Unit 13D between Coal Creek drainage and the Copper River (Fig. 1).

Additional maps for Unit 13 boundaries and special management areas can be found at: http://www.adfg.alaska.gov/index.cfm?adfg=maps.main.

Summary of Status, Trend, Management Activities, and History of Sheep in the Chugach Mountains of Unit 13D Central .

The central Chugach Mountains have been a popular sheep hunting destination since the early 1900s. There is limited sheep population or harvest information available prior to the 1970s. During the early 1970s, the Chugach Range in Unit 13D averaged 152 hunters per year. In 1975, a 644 mi^2 portion of Unit 13D (east of the Richardson highway and north of the lower Tiekel River) was changed to a walk-in only hunt area and was designated as the Tonsina Controlled Use Area (TCUA). This restriction was implemented by the Board of Game (BOG) to reduce harvest pressure and allow more rams to mature to trophy size. Ground access to the remainder of sheep habitat in Unit 13D is limited by distance, rough terrain, and river crossings. Aircraft has consistently been the most common method of transportation for the majority of sheep hunters in the central Chugach Mountains.

In 1978, Presidential Proclamation 4625 designated the eastern Chugach Mountains and the Wrangell Mountains in Unit 11 to be a National Monument, effectively closing the area to hunting for all but federally qualified subsistence hunters. At the time, area managers with ADF&G worried that the change would lead to increased hunting pressure in adjacent areas such as Unit 13D, and management discussions included the potential for permit hunts for the entire Chugach range to moderate displaced hunting pressure. In 1980, Wrangell–St. Elias National Park and Preserve (WRST) was established. Federal park lands retained the federally qualified subsistence restrictions, while WRST reopened federal preserve areas to all hunters.



Source: ©ADF&G 2019

Figure 1. Relief Map showing the Central Chugach Mountains, Unit 13D, Southcentral Alaska.

Despite concerns about the displacement of sheep hunters, sheep harvests remained relatively consistent in Unit 13D until 1986, when the number of hunters increased. This increase was likely due to a combination of factors such as the aircraft access restrictions implemented in the WRST portions of Units 11 and 12 in 1985. These restrictions stopped federal subsistence hunters from using aircraft to access hunt areas and may have shifted hunter effort to Unit 13D. In the fall of 1988, the state's exclusive guide use area system was invalidated by the Owsichek Supreme Court decision. This was perhaps the most important change in regulation that impacted sheep hunting patterns in the central Chugach Range. For the next 20 years an unlimited number of guides had the ability to accommodate sheep hunting clients in Unit 13D.

Throughout the 1960s and 1970s, the sheep bag limit for all of Unit 13 was one ¾-curl ram, similar to the rest of Southcentral Alaska. In 1979, it was changed to ⅞-curl. In 1989, the Unit 13 bag limit was changed to full curl. Although the total number of sheep hunters and harvest in Unit 13D remained relatively stable through the 1990s, hunting patterns, such as the chronology of harvest and hunter residency, changed markedly.

In 1976, a record number of 1,028 sheep were counted in the 5 count areas established west of the Tazlina glacier in Unit 13D. While sheep counts in this area were intermittent in the subsequent years, numbers of sheep observed in the 1980s were somewhat lower than totals documented in the 1970s. During the 1980s sheep numbers appeared more stable in the count areas east of the Tazlina Glacier. By the mid-2000s, sheep numbers appeared to decline in major portions of the central Chugach Mountains. Due to concerns of heavy hunting pressure and low sheep numbers, the general season in the central Chugach Mountains west of the Richardson highway was changed to drawing permit in 2008. The regulatory changes included the establishment of a drawing hunt structure in the central Chugach Mountains, liberalization of bag limits in some areas to include any-ram hunts, and the allocation of harvest opportunity between residents and nonresidents. Despite changes to the hunt structure, sheep numbers have remained lower than the totals observed in the 1980s and 1990s, particularly in the portion of the central Chugach Mountains east of the Tazlina Glacier.

Management Direction

Existing Wildlife Management Plans

- Direction in the Nelchina Basin and Tonsina Management Plans (ADF&G 1976) have been modified by BOG regulatory actions over the years. A record of these changes can be found in the division's management report series. The plan portion of this report contains the current management plan for sheep in Unit 13D.
- DWC Strategic Plan (ADF&G 2002).

Goals

- Provide the opportunity to harvest a trophy Dall sheep under uncrowded conditions in the Central Chugach Mountains.

Codified Objectives

Amounts Reasonably Necessary for Subsistence Harvest

- Unit 13 has a negative Customary and Traditional Use Determination finding for Dall sheep.

Intensive Management

Sheep are not designated as an intensive management species in the state of Alaska. Intensive management predator control programs implemented for moose or caribou may affect predation levels on sheep. The BOG has determined that the Nelchina caribou herd and the Unit 13 moose population provide for high levels of human consumptive use (positive findings). There is currently an Intensive Management (IM) program for moose in Unit 13. However, the predator control area does not include Unit 13D and associated Chugach sheep range.

MANAGEMENT OBJECTIVES

- Provide a quality hunting experience as well as the opportunity to take a trophy-class ram in the central Chugach Mountains of Unit 13D.

MANAGEMENT ACTIVITIES

1. Population Status and Trend

ACTIVITY 1.1. Monitor sheep abundance and population composition.

Data Needs

Management objectives are based on principles of sustainable harvest. Sheep abundance and composition data are necessary to determine population status in relation to management objectives. This data provides information about annual productivity and insight into population trends and fluctuations.

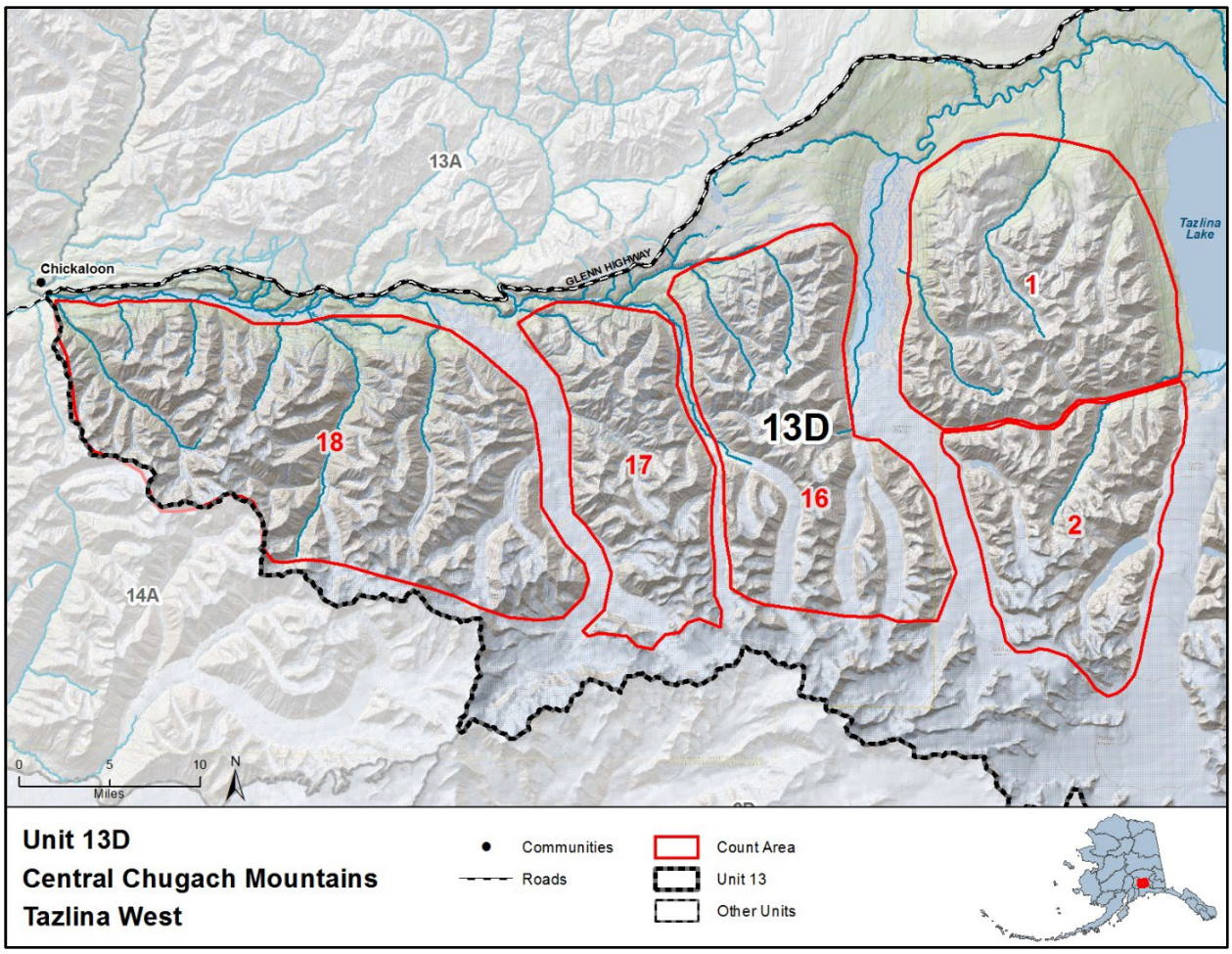
Methods

Aerial surveys using fixed-wing aircraft are conducted in established trend count areas (CAs) to determine sheep population trends as wells as sex and age composition (Figs. 2, 3, and 4; Appendix A). Surveys are generally conducted in July or early August when snow has melted in the mountains. An experienced pilot/observer team flies geographic contours systematically within a CA at 70–80 mph searching for sheep and recording data. Mountain goat observations are also recorded when encountered during sheep surveys. 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. Rams are classified as full curl or greater, or less than full curl. Young rams that can be easily differentiated from ewes are classified along with ewes as "ewe-likes." A waypoint is recorded for each observation and a digital photograph may be taken to confirm sheep numbers and classification for that waypoint. 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.

Results and Discussion

TAZLINA-WEST

Trend count areas (CAs) 1, 2, 16, 17, and 18 cover western Unit 13D (Coal Creek drainage to the Tazlina Glacier; Fig. 3). The highest count of sheep in this area was 1,028 in 1976. Subsequent surveys have fluctuated between 300 and 700 observed sheep. The most noticeable trend in this area has been in CAs 16 and 17, between the Matanuska and Nelchina glaciers. While observers in 1976 documented 475 sheep in this area, numbers declined to 278 in 2002, then to 91 in 2007. The population appeared to rebound during this reporting period for CAs 16 and 17 with 161 observed in 2011, and 171 observed in 2013. However, the total number of sheep observed in CAs 16 and 17 was back down to 89 in 2014 (Table 1). For all 5 CAs, 491sheep were observed in 2012, decreasing to 290 sheep in 2014. The highest numbers observed were in the Coal Creek drainage on the border of Unit 14A. Tracks indicate that sheep do pass between GMU 13D and 14A, creating some difficulty in monitoring population trends.

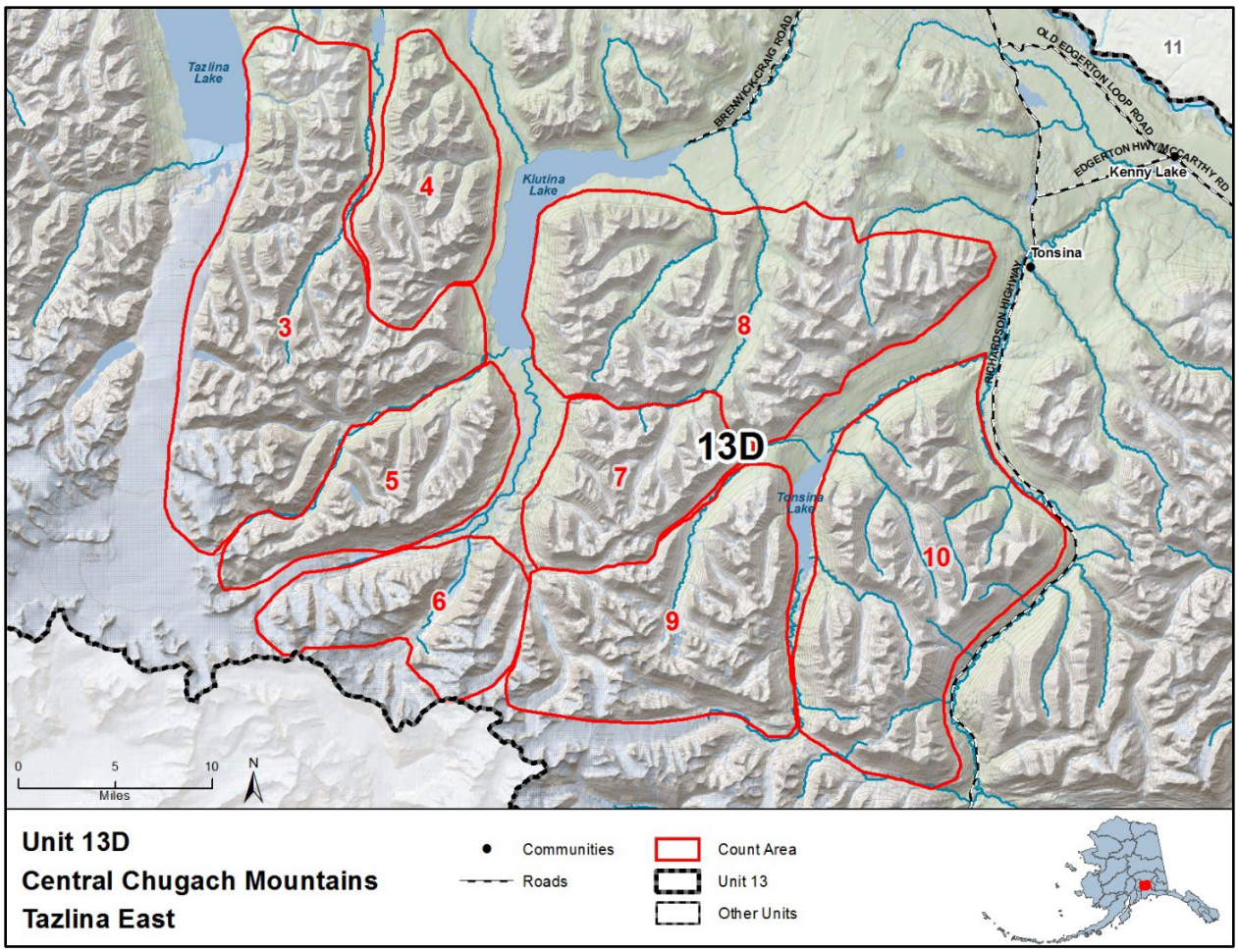


Source: ©ADF&G 2019

Figure 2. Relief map showing sheep trend count areas in the Tazlina-West portion of the Central Chugach range, Unit 13D, Alaska.

TAZLINA-EAST

Count areas 3, 4, 5, 6, 7, 8, 9, and 10 cover east central Unit 13D (Tazlina Glacier to the Richardson Highway; Fig. 4). Based on periodic surveys in this area, the highest sheep numbers likely occurred in 1997 when 479 sheep were observed in CAs 3, 4, and 5 (between Tazlina and Klutina lakes). Counts in these 3 CAs fluctuated widely, slowly declining to 319 in 2009, increasing to 451 in 2010, and dropping to 297 in 2012 and 230 in 2014. Periodic surveys from CAs 7 and 9 (between Klutina and Tonsina lakes) suggest these areas had up to 400 additional sheep during the 1990s. In 2012, a total of 189 sheep were observed in CAs 7 and 9 combined, with 140 total sheep counted in 2014 (Table 2). Count areas 6 and 10 were originally established with the other Tazlina-East CAs but, due to the low sheep densities in these areas, have not been surveyed since 1976.

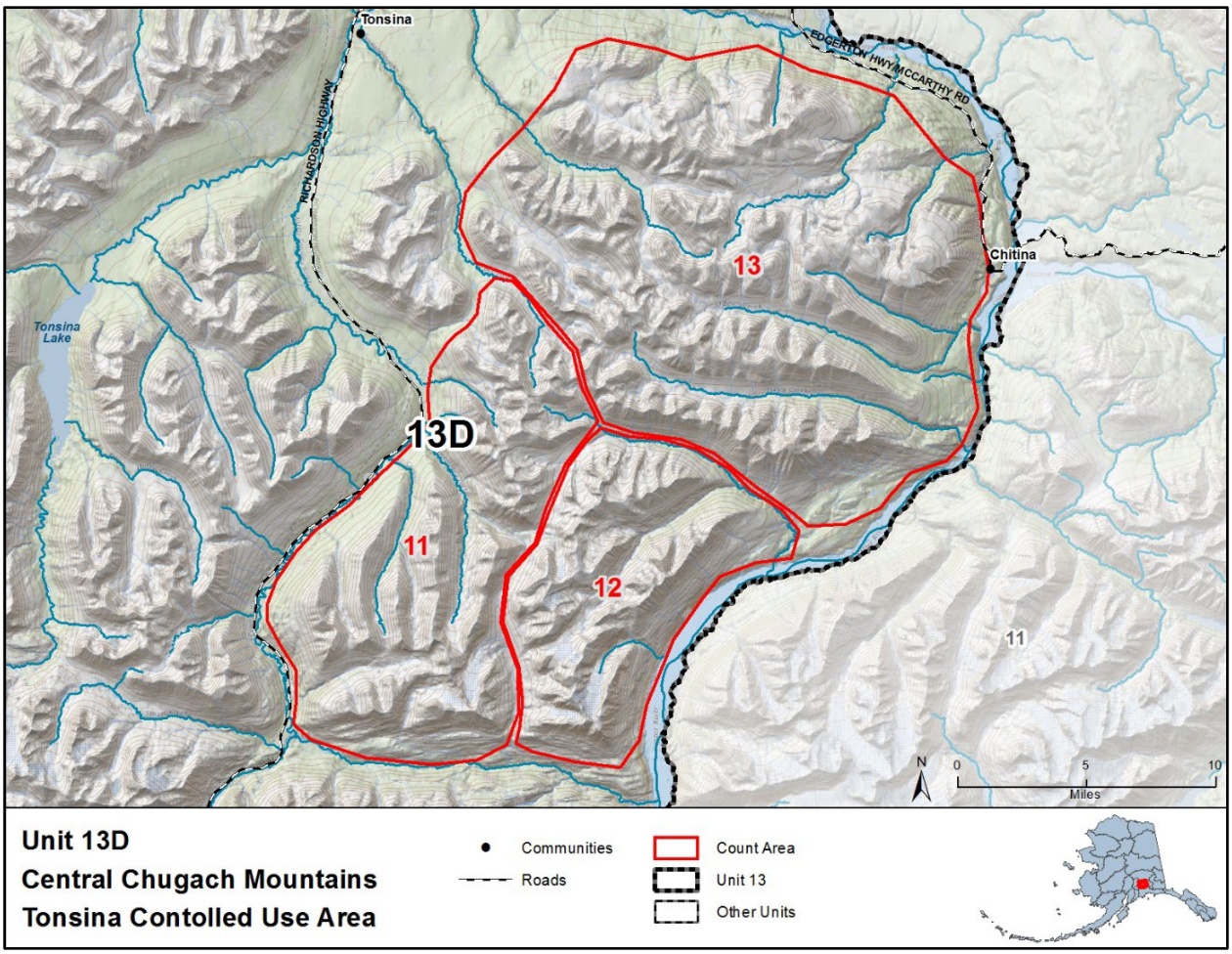


Source: ©ADF&G 2019

Figure 3. Relief map showing sheep trend count areas in the Tazlina-East portion of the Central Chugach range, Unit 13D, Southcentral Alaska.

TONSINA CONTROLLED USE AREA

Count areas 11, 12, and 13 cover eastern Unit 13D in the Tonsina Controlled Use Area (TCUA; Fig. 4). The observed number of sheep in the TCUA increased from a low of 148 in 1976 to a high of 312 in 1992. Periodic surveys indicate that the population fluctuates, with observed sheep oscillating between 155 and 230 sheep annually with a most recent five-year average of 186 sheep. In 2014, 138 total sheep were observed, the lowest number recorded for the TCUA (Table 3).



Source: ©ADF&G 2019

Figure 4. Relief map showing sheep trend count areas in the Tonsina Controlled Use Area of Unit 13D, Central Chugach Mountains, Southcentral Alaska.

Recommendations for Activity 1.1.

Modify.

- Continue to conduct surveys of the established CAs.
- Develop a schedule to increase frequency of surveys in popular hunting areas (TCUA) and in neglected survey areas that have demonstrated a consistent population of sheep (CA8).
- Continue to use cameras when possible to aid in the classification of ram horn curl.
- Adopt additional ram classification categories to include: rams with one-quarter curl horns (Class I), rams with one-half curl horns (Class II), rams with 3-quarter curl horns (Class III), and rams with horns ≥ full curl (Geist 1971; Appendix B).

Table 1. Tazlina-West Dall sheep composition counts, Alaska, regulatory years 2011–2015.

Trend count area	Regulatory year	Total rams	Full curl	(%)[a]	Ewes and ewe-likes	Lambs	(%)[b]	Lambs:100 ewe-likes	Rams: 100 ewe-likes	Total sheep observed
CA1	2012	1	0	(0)	20	3	(13)	15.0	5.0	24
	2013	5	0	(0)	38	18	(30)	47.4	13.2	61
	2014	2	0	(0)	22	3	(11)	13.6	9.1	27
CA2	2012	38	6	(16)	95	27	(17)	28.4	40.0	160
	2013	39	4	(10)	58	16	(14)	27.6	67.2	113
	2014	36	3	(8)	44	6	(7)	13.6	81.8	86
CA16	2011	13	1	(8)	49	13	(17)	26.5	26.5	75
	2012	15	2	(13)	35	8	(14)	22.9	42.9	58
	2013	13	0	(0)	70	31	(27)	44.3	18.6	114
	2014	16	0	(0)	45	3	(5)	6.7	35.6	64
CA17	2011	31	3	(10)	46	9	(11)	19.6	67.4	86
	2012	23	2	(9)	62	20	(19)	32.3	37.1	105
	2013	23	4	(17)	28	6	(11)	21.4	82.1	57
	2014	10	0	(0)	13	2	(8)	15.4	76.9	25
CA18	2011	56	11	(20)	166	48	(18)	28.9	33.7	270
	2012	45	12	(27)	82	17	(12)	20.7	54.9	144
	2014	41	4	(10)	38	9	(10)	23.7	107.9	88

[a] Percent full curl is calculated as a proportion of total rams.

[b] Percent lambs is calculated as a proportion of total sheep observed.

Table 2. Tazlina-East Dall sheep composition counts, Alaska, regulatory years 2012–2015.

Trend count area	Regulatory year	Total rams	Full curl (%)[a]		Ewes and ewe-likes	Lambs (%)[b]		Lambs:100 ewe-likes	Rams: 100 ewe-likes	Total sheep observed
CA3	2012	66	13	(20)	158	45	(17)	28.5	41.8	269
	2014	69	7	(10)	120	23	(11)	19.2	57.5	212
CA4	2012	0	0	(0)	12	1	(8)	8.3	0.0	13
	2014	2	0	(0)	3	1	(17)	33.3	66.7	6
CA5	2012	2	0	(0)	10	3	(20)	30.0	20.0	15
	2014	4	0	(0)	7	1	(8)	14.3	57.1	12
CA7	2012	28	8	(29)	27	2	(4)	7.4	103.7	57
	2014	9	3	(33)	54	18	(22)	33.3	16.7	81
	2015	13	3	(23)	41	18	(25)	43.9	31.7	72
CA8	2014	18	3	(17)	1	0	(0)	0.0	–	19
	2015	10	0	(0)	28	15	(28)	53.6	35.7	53
CA9	2012	4	0	(0)	101	27	(21)	26.7	4.0	132
	2014	19	2	(11)	31	9	(15)	29.0	61.3	59
	2015	2	1	(50)	27	12	(29)	44.4	7.4	41

[a] Percent full curl is calculated as a proportion of total rams.
[b] Percent lambs is calculated as a proportion of total sheep observed.

Table 3. Tonsina Controlled Use Area Dall sheep composition counts, Alaska, regulatory year 2014.

Trend count area	Regulatory Year	Total rams	Full curl (%)[a]		Ewes and ewe-likes	Lambs (%)[b]		Lambs:100 Ewe-likes	Rams: 100 Ewe-likes	Total sheep observed
TCUA	2014	42	4	10%	78	18	13%	23.0	53.8	138

[a] Percent full curl is calculated as a proportion of total rams.
[b] Percent lambs is calculated as a proportion of total sheep observed.

2. Mortality-Harvest Monitoring and Regulations

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

Data Needs

Monitoring and analyzing harvest data and sealing records annually is important to understand hunter effort and success in Unit 13D, which is critical for sustained yield management.

Methods

Individuals who obtain a permit from ADF&G to harvest Dall sheep are required to report on their permit after a successful harvest, or after the end of the season. Successful hunters must bring horns attached to the skull into an ADF&G office to be sealed, at which point detailed horn measurements are collected as well as the standard hunt information collected on the harvest report form. Sheep horns are sealed with the placement of a metal plug with individual identification number in 1 horn.

Season and Bag Limit

Current sheep season dates and bag limits are available on the ADF&G website:

http://www.adfg.alaska.gov/index.cfm?adfg=wildliferegulations.hunting

Unit 13 hunting season and bag limit during RY11–RY15

		Open seasons	
State hunts	Bag limit	Resident	Nonresident
Harvest Ticket – Youth hunt only	1 ram with full-curl horn or larger	1 Aug–5 Aug	1 Aug–5 Aug
Harvest Ticket	1 ram with full-curl horn or larger	20 Aug–20 Sept	20 Aug–20 Sept
Draw Hunts S160/260[a]	1 ram	20 Aug–20 Sept	20 Aug–20 Sept
Draw Hunts S165/265[a]	1 ram with full-curl horn or larger	20 Aug–20 Sept	20 Aug–20 Sept

[a] resident/nonresident.

Results and Discussion

Harvest by Hunters

Sheep harvests for the Unit 13 portion of the central Chugach Mountains are reported in Table 4. The annual ram harvest for this reporting period ranged 14–27 with an average of 19.6 per year. The number of hunters that reported hunting in Unit 13D during this reporting period ranged from 54 to 84, averaging 74 hunters annually. Across Unit 13D, the average annual horn length, excluding double broken horns, ranged from 36.4" to 38.5" and averaged 37.7" during this

reporting period. The average age of rams harvested was 8.6-years old and no ewes were reported harvested.

Table 4. Chugach Mountains, Unit 13D Dall sheep harvest, Alaska, regulatory years 2011–2015.

Regulatory year	Rams	Average horn length (inches) of rams	% of horn length ≥40 inches	Ewes	Total sheep
2011	27	38.3	19	0	27
2012	24	37.8	29	0	24
2013	17	36.4	24	0	17
2014	16	36.7	19	0	16
2015	14	36.6	0	0	14

The harvest of trophy class rams (≥ 38 inches) peaked in the mid-1990s in Unit 13D, with 35 of the rams taken in RY94 having horn lengths ≥ 38 inches and with 14 of the rams taken in RY95 having horn lengths ≥ 40 inches (18% of the total harvest). The harvest of large rams declined over time. By RY02, only 10 of the rams taken had horn lengths ≥ 38 inches, and only 2 rams had horns ≥ 40 inches (4% of total harvest). The number of large rams increased somewhat between RY03 and RY05, but total harvest and the number of large rams taken began declining again in RY06.

In RY08, the hunt structure for most of the central Chugach within Unit 13D changed from 1 general season hunt area to 2 drawing hunt areas. The bag limit for the drawing hunt area created west of the Tazlina Glacier (Tazlina-West, DS160 and DS260) was established as 1 ram. The other drawing hunt area, between the Tazlina Glacier and Richardson Highway (Tazlina-East, DS165 and DS265), was established as 1 ram with full-curl or larger horns. During the first year of the drawing hunts, 3 rams were taken by hunters in the Tazlina-West drawing hunt area, none of which had horn lengths ≥ 38 inches. In the Tazlina-East drawing hunt area, 2 of the 3 rams harvested had horn lengths ≥ 38 inches. In RY09, of the 13 rams taken by drawing hunters in both areas combined, 5 had horns that were ≥ 38 inches, with 1 of the rams having horns that were ≥ 40 inches. The number of trophy class rams harvested by all drawing permit hunters continued to increase each season and peaked in RY12 when 13 rams were taken with horns ≥ 38 inches, 7 of which had horn lengths ≥ 40 inches. However, the number of rams with horns ≥ 38 inches taken by drawing hunters declined again to 5 in RY13, 4 in RY14, and 5 in RY15. During this reporting period an average of 8 rams were harvested annually by drawing permit hunters with horns ≥ 38 inches.

The number of reported Unit 13D drawing permit hunters is influenced by the number of permits issued annually. During this reporting period, the number of Tazlina-West drawing permitees that reported hunting ranged from 7 to 13 and averaged 10 hunters. The reported annual harvest ranged from 3 to 8 and averaged 5. The average annual horn length of harvested rams, excluding double broken horns, ranged from 30.6" to 38.3" and averaged 34.5" during this reporting period. The average age of harvested rams was 8.0-years old. During this reporting period, and reflective of the 1 ram bag limit for the Tazlina-West drawing area, only 44% of rams harvested were full-curl or larger.

The number of reported hunters in the Tazlina-East drawing area ranged from 13 to 38 and averaged 25 hunters during this reporting period. The reported harvest ranged from 4 to 19 and averaged 10 rams. Excluding double broken horns, the average annual horn length of harvested rams ranged from 36.8" to 39.4" and averaged 38.7". During this reporting period 88% of rams harvested were full-curl or larger, and the average age was 8.7.

In Unit 13D general season hunters are limited to hunting in the Tonsina Controlled Use Area (TCUA). An average of 38 hunters have reported hunting sheep in the TCUA since 1983. During this reporting period the number of general season hunters that reported hunting in the TCUA ranged from 29 to 45 and averaged 37 hunters. Excluding double broken horns, annual average horn lengths ranged from 35.2" to 38.7" and averaged 36.6" during this reporting period. The annual average age of rams harvested ranged from 7.5- to 10-years old and averaged 8.9-years old during this reporting period.

Permit Hunts

Since RY08, drawing permits have been issued for 2 hunt areas in Unit 13D. Permit numbers were initially set conservatively to allow sheep numbers to increase. In the Tazlina-West drawing area, 8 permits were allocated for residents (DS160) and 2 permits were allocated for nonresidents (DS260), with a bag limit of 1 ram. In RY12, resident DS160 permits increased to 10. The following year the number of both resident and nonresident permits increased to 13 and 3 respectively, and remained at that level through RY14. Permit success declined in RY14, and the number of DS160 permits was lowered back to 10 in RY15, with DS260 permits decreased to 2. Resident DS160 hunter success ranged from 0% to 67% during this reporting period and averaged 41%. RY14 was the least successful year when no resident successfully harvested a sheep. Nonresident DS260 hunters averaged 80% success during this reporting period.

When permit hunts began in RY08, 33 permits were allocated for residents (DS165) and 8 permits were allocated for nonresidents (DS265) in the Tazlina-East drawing hunt area. The bag limit was 1 ram with full-curl horns or larger. In RY12, DS165 permits increased to 40 and DS265 permits increased to 10. After a decline in permit success (16%) in RY13, resident DS165 permits were decreased to 20, and nonresident DS265 permits to 5. Resident drawing hunter success ranged from 8% to 60% success during this reporting period, averaging 27% success. Nonresident DS265 hunters averaged 79% success.

Hunter Residency and Success

Hunter residency data for Unit 13D are reported in Table 5. The percentage of nonresident hunters and the percentage of rams harvested by those nonresidents increased dramatically during the 1990s and the early 2000s. In RY05, 34% of hunters were nonresidents and they took 61% of the total sheep harvested. In RY07, there was a pulse of resident hunters in Unit 13D, likely in response to the planned implementation of drawing hunts the following year. When the drawing hunts were established in RY08, the board allocated 20% of available permits to nonresidents. For RY10, 12% of hunters were nonresidents, and those nonresidents comprised 45% of successful hunters. During this reporting period, 19% of sheep hunters in Unit 13D were nonresidents averaging a take of 49% of the total sheep harvest.

The nonresident percentage of hunters in the TCUA has generally been lower than the remainder of Unit 13D. During this reporting period, 13% of all TCUA hunters were nonresidents.

Table 5. Unit 13D Dall sheep hunter residency and success, Alaska, regulatory years 2011–2015.

Regulatory year	Successful Hunters			Unsuccessful Hunters			Total Hunters
	Resident	Nonresident	Total	Resident	Nonresident	Total	
2011	14	13	27	49	2	51	78
2012	14	10	24	53	7	60	84
2013	9	8	17	59	6	65	82
2014	7	9	16	37	1	38	54
2015	6	8	14	52	5	57	71

Harvest Chronology

Harvest chronology for sheep harvested in Unit 13D is reported in Table 6. Harvest patterns have changed dramatically over time in Unit 13D. Through the early 1990s it was common to see rams harvested throughout the entire 6-week season. During the late 1990s and early 2000s the percentage of the harvest occurring in the first week of the season increased significantly. For RY11–RY15, 46% of the drawing hunt harvest and 80% of the general season harvest occurred during the first week of the season.

Table 6. Dall sheep harvest chronology percentage by harvest period, in the Unit 13D portion of the Chugach Mountains, regulatory years 2011–2015.

Regulatory year	Harvest chronology percent by harvest 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	33	15	15	15	15	7	27
2012	61	4	26	4	0	4	23
2013	65	18	6	12	0	0	17
2014	56	13	13	0	13	6	16
2015	57	29	7	0	0	7	14

Note: Data in this table represents only reports with date of kill.

Transport Methods

During this reporting period 40% of all Unit 13D hunters used an aircraft, only slightly lower than the average of 43% who accessed their hunt from a highway vehicle. Of the successful hunters, an average of 72% used an aircraft and 17% accessed their hunt with a highway vehicle (Table 7). Aircraft has consistently been the most popular and successful method of transportation for Unit 13D drawing hunters. In the TCUA, where sheep hunting by motorized vehicle is not allowed, hunters use highway vehicles almost exclusively.

Table 7. Dall sheep harvest percentage by transport method in Unit 13D, regulatory years 2011–2015.

	Harvest percent by transport method								
Regulatory year	Airplane	Horse	Boat	ATV	Snow-machine	ORV	Highway vehicle	Other	n[a]
2011	78	0	4	7	0	0	11	0	27
2012	79	0	4	0	0	0	17	0	24
2013	76	0	0	6	0	6	12	0	17
2014	63	0	0	13	0	0	25	0	16
2015	57	0	7	0	0	7	29	0	14

[a] Total harvest with transportation data.

Other Mortality

Prior to 2009, no studies had been conducted in Unit 13D addressing Dall sheep mortality factors. Recent research has begun to address predation on lambs and ewes, as well as other mortality causes between the Matanuska and Tazlina glaciers. Some of the mortality factors identified thus far include pneumonia, avalanches, and predation by eagles, wolverines, bears, and wolves (Lohuis 2016).

Alaska Board of Game Actions and Emergency Orders

No Board of Game actions were taken for this area during this reporting period.

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 is stored on ADF&G's Wildlife Information Network database (WinfoNet) server (http://winfonet.alaska.gov/index.cfm).
- Federal elder sheep hunt harvest data must be obtained from the NPS, and is stored electronically on the Glennallen 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.
- An internal unpublished memorandum on survey results including cost, conditions, dates flown, and count information is written upon completion of surveys each season and transmitted to appropriate staff and supervisors.

Agreements

Not applicable.

Permitting

None.

Conclusions and Management Recommendations

The Dall sheep population in the central Chugach Mountains in Unit 13D occupies such a broad area that it has proven difficult to monitor population trends with budget and weather constraints. These factors have contributed to the collection of only intermittent survey data, which may explain widely fluctuating population estimates. However, trend data from Unit 13D suggests that total sheep numbers in the central Chugach range have declined, primarily due to a decrease in the number of ewes and lambs observed during surveys. The primary limitations on sheep abundance in the Chugach Mountains appear to be nutrition and stochastic factors that affect productivity and survival (Lohuis 2016).

The number of sheep observed in Unit 13D declined by 35% between 2003 and 2006 though the number of hunters remained the same. The increase in hunting competition for a limited number of rams resulted in complaints of overcrowding, and a decrease in hunt quality. In response, ADF&G proposed changing the hunt structure in most of 13D from general season to a draw. The BOG adopted the proposed draw structure in 2007. The first season where drawing hunts were implemented was in 2008 in 13D. A combined total of 51 sheep drawing permits were issued, and the number of sheep hunters in that portion of the Central Chugach dropped by 80%. During this reporting period hunter success averaged 45% for all drawing hunts in 13D. This was an increase from the 5 years prior to the hunt structure change when hunter success averaged 33%.

Future Dall sheep management in the central Chugach Mountains should reflect the historical trophy value of the area while acknowledging the high demand for high quality sheep hunting opportunities. While the concept of what constitutes a trophy Dall sheep may be largely subjective, the Chugach range has been known to produce highly desirable heavy horned rams.

Current Dall sheep management in the central Chugach Mountains reflects the historical trophy value of the area. The TCUA was originally established to provide a quality experience as well as the continued opportunity to take a trophy class ram. Due to the difficulty involved in hunting the TCUA, the objectives are expected to be attained under the general season. It is reasonable to assume that existing drawing hunts west of the Richardson Highway will also allow the same objectives to be met.

Ongoing research in the central Chugach is documenting baseline health parameters, as well as monitoring productivity and survival, and will be invaluable in understanding the underlying factors behind the population dynamics in the area.

II. Project Review and RY16–RY20 Plan

Review of Management Direction

MANAGEMENT DIRECTION

No change from report.

GOALS

No change from report.

CODIFIED OBJECTIVES

Amounts Reasonably Necessary for Subsistence Uses

No change from report.

Intensive Management

No change from report.

MANAGEMENT OBJECTIVES

No change from report.

REVIEW OF MANAGEMENT ACTIVITIES

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 continue to be conducted on the following schedule:

Schedule	Count Areas
Survey Annually	TCUA (CA 11, 12, 13)
Survey Semi-Annually	Tazlina-West (CA 1, 2, 16, 17, 18); Tazlina-East (CA 3, 4, 5, 7, 8, 9)

Count areas 6 and 10 are considered to encompass low sheep density areas, have not been flown in many years, and will not be included in the survey schedule. Surveys will be conducted using a more detailed ram age classification structure according to Geist 1971 (Appendices B and C).

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 planned.

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.

References Cited

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Geist, V. 1971. Mountain sheep: A study in the behavior and evolution. The University of Chicago Press, Chicago, IL.

Lohuis, T. 2016. Ewe Dall's sheep survival, pregnancy and parturition rates, and lamb recruitment in GMU 13D, Chugach Mountains, Alaska. Alaska Department of Fish and Game, Division of Wildlife Conservation, Federal Aid Final Research Performance Report 1 July 2015–30 June 2016, Federal Aid in Wildlife Restoration Project 6.16, Juneau.

McDonald, L. L., D. Strickland, D. Taylor, J. Kern, and K. Jenkins. 1991. Estimation of Dall sheep numbers in Wrangell–St. Elias National Park and Preserve–July 1991. Technical Research Work Order Prepared for the National Park Service, Alaska Region, Anchorage.

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Appendix A. Current sheep/goat survey data form.

SHEEP/GOAT DATE: _________ Pg_____ of ______

Where:

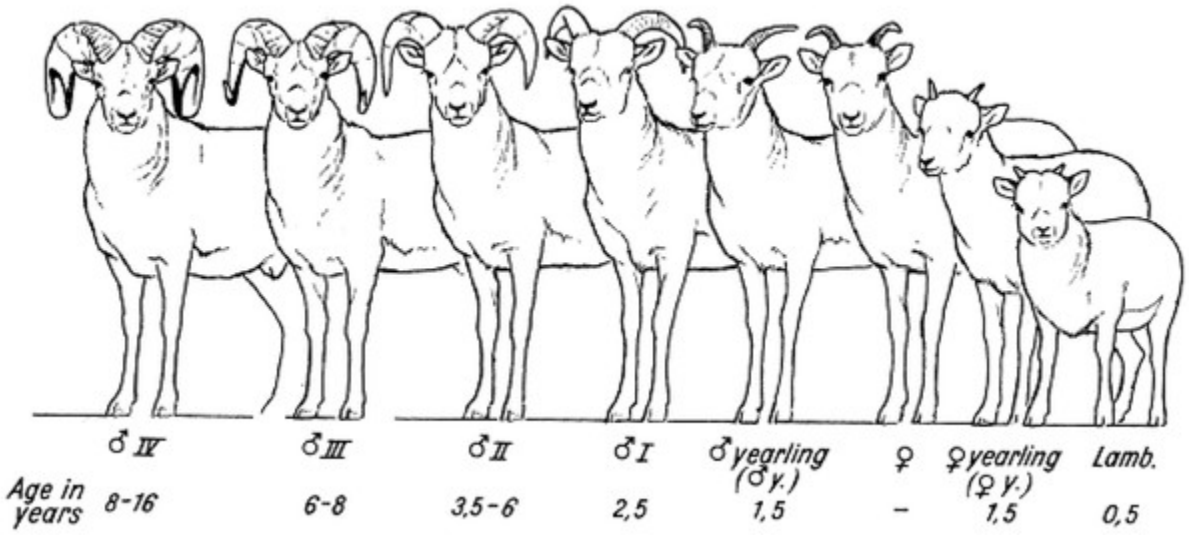
Take off: Start Survey: End Survey: Land time:

Who (observer/pilot):

Conditions?

Waypoint	Full-Curl	<Full-Curl		Ewes	Lambs		Goats	Kids	Comments

Appendix B. Dall sheep horn classification (Geist 1971).



Appendix C. Sheep/Goat survey data form.

MOUNTAIN GOAT AND SHEEP SURVEY FORM

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

Date:_____ Count Area: _____

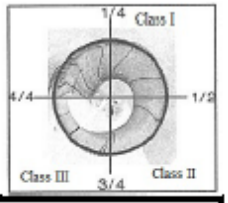
Pilot_____ Observer _____

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.
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Other pages											
Total											


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