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CHAPTER 11: DALL SHEEP MANAGEMENT REPORT

From: 1 July 2010
To: 30 June 2013[1]

LOCATION

GAME MANAGEMENT UNIT: 20A (6,796 mi^2)

GEOGRAPHIC DESCRIPTION: North side of the Alaska Range east of the Nenana River, west of the Delta River, and south of the Tanana River

BACKGROUND

The mountains of Unit 20A remain one of the most popular Dall sheep hunting areas in Interior Alaska because of their proximity to Fairbanks, the general hunting season, and the opportunity to hunt other species. Management in Unit 20A provides for a wide variety of hunting opportunities and includes areas closed to the use of motorized vehicles (except aircraft) and an area open to hunting by bow and arrow only. Since 1984, reported harvests have ranged from 27 to 163 rams taken by 143–410 hunters.

Heimer and Watson (1986) summarized Unit 20A population trends. Sheep numbers grew to be relatively high by the 1960s, probably due to widespread predator control programs before statehood and favorable weather conditions. Aerial sheep surveys conducted before 1978 indicated a minimum estimate of 3,576 sheep in Unit 20A. McNay (1990) estimated 5,000 sheep inhabited the unit in 1989 based on an assumed sightability of 70–80%, incomplete coverage of some sheep habitat, and population growth since 1977. An extensive aerial survey conducted in 1994 indicated the sheep population declined during the early 1990s to about 2,000 sheep (Whitten and Eagan 1995). The population probably declined from reduced productivity and increased mortality due to a series of years with unfavorable weather. Overharvest was not a concern because hunting was restricted to the taking of older rams.

Research in Unit 20A included a study comparing population and horn characteristics of sheep in Unit 20A with those in Unit 12 (Heimer and Watson 1986), a study of sheep use of the Dry Creek mineral lick (Heimer 1974), and a study of movements and seasonal ecology of sheep on Fort Greely (Spiers and Heimer 1990). More recent research included Whitten and Eagan's (1995) evaluation of sheep monitoring methods and development of a double sampling technique, Scotton's (1997) investigation of the causes and magnitude of lamb mortality, and Arthur's (2003) research on interrelationships of Dall sheep and predators.

[1] At the discretion of the reporting biologist, this unit report may contain data collected outside the report period.

MANAGEMENT DIRECTION

MANAGEMENT GOAL

- Maintain a harvestable population of Dall sheep fluctuating within historical limits of abundance.

MANAGEMENT OBJECTIVES

- Manage for a Dall sheep population of approximately 5,000 sheep.
- Provide the opportunity for hunters to harvest mature rams during a general hunting season.

METHODS

Based on harvest reports, we evaluated harvest, hunter use patterns, and characteristics of sheep taken by hunters. Harvest data were summarized by regulatory year (RY), which begins 1 July and ends 30 June (e.g., RY12 = 1 July 2012–30 June 2013).

We conducted aerial surveys on 6–7 July 2011 and 12–13 July 2013 to monitor population status. We surveyed sections I–IV in central Unit 20A, an area of 200 mi^2 (Fig. 1). Sections I–III are located between the Wood and Little Delta rivers, section IV is south of sections I–III between the West Fork Little Delta River and Buchanan Creek, and a small portion of the upper Wood River (Arthur 2003). Data collected in sections I–III are comparable to earlier surveys flown in the same area since 1983. Section IV is a relatively new sample area that does not have comparable historical data. Therefore, Section IV data are not reported in this report because 1) the area is a low density area that does not have many sheep to count and 2) the area has not been flown consistently in the past so the data are not comparable to previous years. The 2011 and 2013 surveys were conducted from R-44 helicopters (Whitten and Eagan 1995). We flew contours of all sheep habitat within the survey sections and classified sheep as lambs, yearlings, ewes, or rams, and further classified rams according to horn size (Whitten and Eagan 1995).

RESULTS AND DISCUSSION

POPULATION STATUS AND TREND

Population Size and Composition

We believe that Unit 20A sheep population was stable or increasing during RY10 and RY11, but declined during RY12. Total sheep counted in the survey sections I–III rose from 496 sheep in RY02 to 882 in RY10 and 823 in RY11, indicating a likely increase. However, during 12–13 July 2013 the count dropped to 625, indicating a decline during RY12. No surveys were conducted during RY12 (Table 1).

Dale (1999) reported the Unit 20A sheep population likely increased between 1996 and 1998, based on strong lamb:ewe and yearling:ewe ratios during those years. Modest lamb:ewe and yearling:ewe ratios observed in 2000 and 2001 suggest the Unit 20A sheep population was stable between 1998 and 2001 (Young 2008). Strong lamb:ewe ($\bar{x}$ = 41:100; range 28:100–46:100) and yearling:ewe ratios ($\bar{x}$ = 27:100; range = 22:100–31:100) also suggest a stable or increasing population during 2005–2011. The low lamb:ewe ratio (11:100) observed in July 2013 indicates poor lamb recruitment during spring 2013, likely caused by the abnormally late spring and snow

cover during the lambing season. This ratio was the lowest observed in this area since surveys began in 1984.

MORTALITY

Harvest

Seasons and Bag Limit. The sheep hunting season was open 10 August through 20 September throughout RY10–RY12. The bag limit was 1 ram with a full-curl or larger horn, with both horns broken (broomed), or at least 8-years old.

Alaska Board of Game actions and Emergency Orders. The Alaska Board of Game did not change any seasons or bag limits for sheep in Unit 20A during RY10–RY12, and we issued no emergency orders. However, in 2004 the board adopted a statewide provision that required sealing of sheep horns in most units, including Unit 20A, by Alaska Department of Fish and Game (ADF&G) personnel.

Harvest by Hunters. Reported harvests increased from a 3-year average of 92 (range 86–97) rams during RY07–RY09 to 103 (range 94–112) during RY10–RY12 (Table 2).

Mean horn length of harvested rams has ranged from 34 to 36 inches since the bag limit changed from ⅞-curl to full curl in RY84 (Table 2). In RY12 the mean horn length (33.7 inches) dropped slightly below 34 inches, but does not cause concern at this time. There has been no apparent trend in the percentage of harvested rams with ≥40-inch horns over the past 12 years (Table 2). The proportion of rams harvested with horns ≥40 inches long was 1.6% during RY98–RY00 compared to 4.8% (8 of 167) during RY01–RY03, 1.9% (4 of 216) during RY04–RY06, 0.7% (2 of 278) during RY07–RY09, and 1.9% (6 of 311) during RY10–RY12. The average age of rams harvested during RY10–RY12 was 8.4 years.

Hunter Residency and Success. Success rates remained higher for nonresidents than for resident hunters (Table 3). During RY10–RY12, nonresident success was 67–80%, while Alaska resident success was 25–29%. Overall success rates were 39–46% during RY10–RY12.

Harvest Chronology. During RY10–RY12, 39–62% of the sheep harvest in Unit 20A occurred during the first 10 days of the season (Table 4). Harvest tended to taper off as the season progressed.

Transport Methods. The Wood River and Yanert controlled use areas were closed to the use of motorized vehicles, except aircraft, for big game hunting and transportation during the sheep hunting season. These areas contain approximately half the Dall sheep range in Unit 20A. Accordingly, most of the successful sheep hunters used airplanes or horses for transportation. Three- or 4-wheelers were the third most common method used by successful sheep hunters (Table 5).

Natural Mortality

No unusual natural mortality was known to occur during RY10 and RY11. However, based on the lowest documented lamb:100 ewe ratio in July 2013 (11 lambs:100 ewes; Table 1), there appears to have been significant natural mortality in RY12, particularly of lambs. The July 2013 survey also suggests that the ewes/ewe-like and yearlings experienced high mortality but rams

did not suffer a decline. Poor lamb and yearling survival during RY12 was likely due to an abnormally late spring. A majority of the sheep habitat was still snow covered during the lambing season. The combination of a longer than normal winter and snow cover during the lambing season likely caused the decrease in this population. These same conditions and results were documented in other portions of the Alaska Range and in the Brooks Range (J. Gross, ADF&G, personal communication; K. Rattunberry, National Park Service, personal communication).

HABITAT

Assessment

No significant human-caused disturbance or destruction of sheep habitat occurred in Unit 20A during RY10–RY12. In 2009, a 409 km^2 forest fire occurred in the Totatlanika River canyon and on the north side of Rex Dome. This fire burned through known sheep habitat and likely had a year-long negative effect on sheep habitat in that area. The benefits in the next 5 or more years (e.g., new forage growth and delaying shrub encroachment) are expected to outweigh the short-term habitat degradation.

CONCLUSIONS AND RECOMMENDATIONS

We met our goal of maintaining a harvestable population of Dall sheep fluctuating within historical limits of abundance during RY10–RY12. However, we probably did not meet our population objective of 5,000 sheep. This population objective may be unrealistic for a relatively small sheep population subject to occasional severe weather events and variable levels of predation. Because our survey activities do not allow us to determine a unitwide population estimate, we cannot evaluate whether we are meeting out management objective of maintaining a population of 5,000 sheep. We will no longer have this management objective in future management reports. Therefore, our goal and objective will be as follows:

MANAGEMENT GOAL

- Maintain a harvestable population of Dall sheep fluctuating within historical limits of abundance.

MANAGEMENT OBJECTIVE

- Provide the opportunity for hunters to harvest mature rams during a general hunting season.

In the absence of predator control, we expect harvests to remain below levels sustained in the mid- to late 1980s ($\bar{x}$ = 134 rams, 1984–1989). Conversely, we also expect harvests to remain above levels that followed the steep population decline precipitated by the harsh winter of 1991–1992 ($\bar{x}$ = 49 rams, 1992–2001), until another severe weather event causes a similar population setback. The severe spring of RY12 appears to have affected the 2013 cohort and likely some of the adult ewes, but did not appear to cause a major population decline in the areas surveyed, as the ram portion of the population did not appear to decline. The small 2013 cohort will likely affect ram harvest in RY21 when those rams become legal for harvest. We will continue to monitor the sheep population in Unit 20A to determine whether the lamb recruitment improves in subsequent years. No changes in seasons and bag limits are recommended at this time. We met our objective of providing the opportunity for hunters to harvest mature rams during a general

hunting season, with 94–112 mature rams harvested annually during RY10–RY12. Continuing to restrict harvest to full-curl rams should allow us to continue to meet this objective and provides the greatest sustainable annual hunting opportunity and greatest sustainable annual harvest.

REFERENCES CITED

Arthur, S. M. 2003. Interrelationships of Dall sheep and predators in the central Alaska Range. Alaska Department of Fish and Game, Division of Wildlife Conservation, Research Final Performance Report 1 July 1998–30 June 2003, Federal Aid in Wildlife Restoration Project 6.13, Juneau.

Dale, B. W. 1999. Unit 20A Dall sheep. Pages 93–100 [*In*] M. V. Hicks, editor. Sheep management report of survey and inventory activities. Alaska Department of Fish and Game, Division of Wildlife Conservation, Federal Aid in Wildlife Restoration Study 6.0, Juneau.

Heimer, W. E. 1974. The importance of mineral licks to Dall sheep in Interior Alaska and its significance to sheep management. Proceedings of the biennial symposium Northern Wild Sheep Council 3:49–63.

Heimer, W. E., and S. M. Watson. 1986. Comparative dynamics of dissimilar Dall sheep populations. Alaska Department of Fish and Game, Division of Game, Final Research Report 1 July 1979–30 June 1985, Federal Aid in Wildlife Restoration Job 6.9R, Juneau.

McNay, M. E. 1990. Unit 20A Dall sheep. Pages 70–83 [*In*] S. O. Morgan, editor. Dall sheep annual management report of survey–inventory activities 1 July 1988–30 June 1989. Alaska Department of Fish and Game, Division of Wildlife Conservation, Federal Aid in Wildlife Restoration Study 6.0, Juneau.

Scotton, B. D. 1997. Estimating rates and causes of neonatal lamb mortality of Dall sheep in the central Alaska Range. Alaska Department of Fish and Game, Division of Wildlife Conservation, Research Final Report 1 May 1995–30 June 1997, Federal Aid in Wildlife Restoration Study 6.12, Juneau.

Spiers, J. K., and W. E. Heimer. 1990. Dall sheep movements near Fort Greely, Alaska: Preliminary findings. Proceedings of the biennial symposium Northern Wild Sheep and Goat Council 7:31–37.

Whitten, K. R., and R. M. Eagan. 1995. Estimating population size and composition of Dall sheep in Alaska: Assessment of previously used methods and experimental implementation of new techniques. Alaska Department of Fish and Game, Division of Wildlife Conservation, Research Progress Report 1 July 1994–31 December 1994, Federal Aid in Wildlife Restoration Study 6.11, Juneau.

Young, D. D. 2008. Unit 20A Dall sheep. Pages 114–122 [*In*] P. Harper, editor. Dall sheep management report of survey and inventory activities 1 July 2004–30 June 2007. Alaska Department of Fish and Game, Division of Wildlife Conservation, Federal Aid in Wildlife Restoration Project 6.0, Juneau.

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

Hollis, A. L. 2014. Unit 20A Dall sheep. Chapter 11, pages 11-1 through 11-10 [*In*] P. Harper and L. A. McCarthy, editors. Dall sheep management report of survey and inventory activities 1 July 2010–30 June 2013. Alaska Department of Fish and Game, Species Management Report ADF&G/DWC/SMR-2014-4, Juneau.

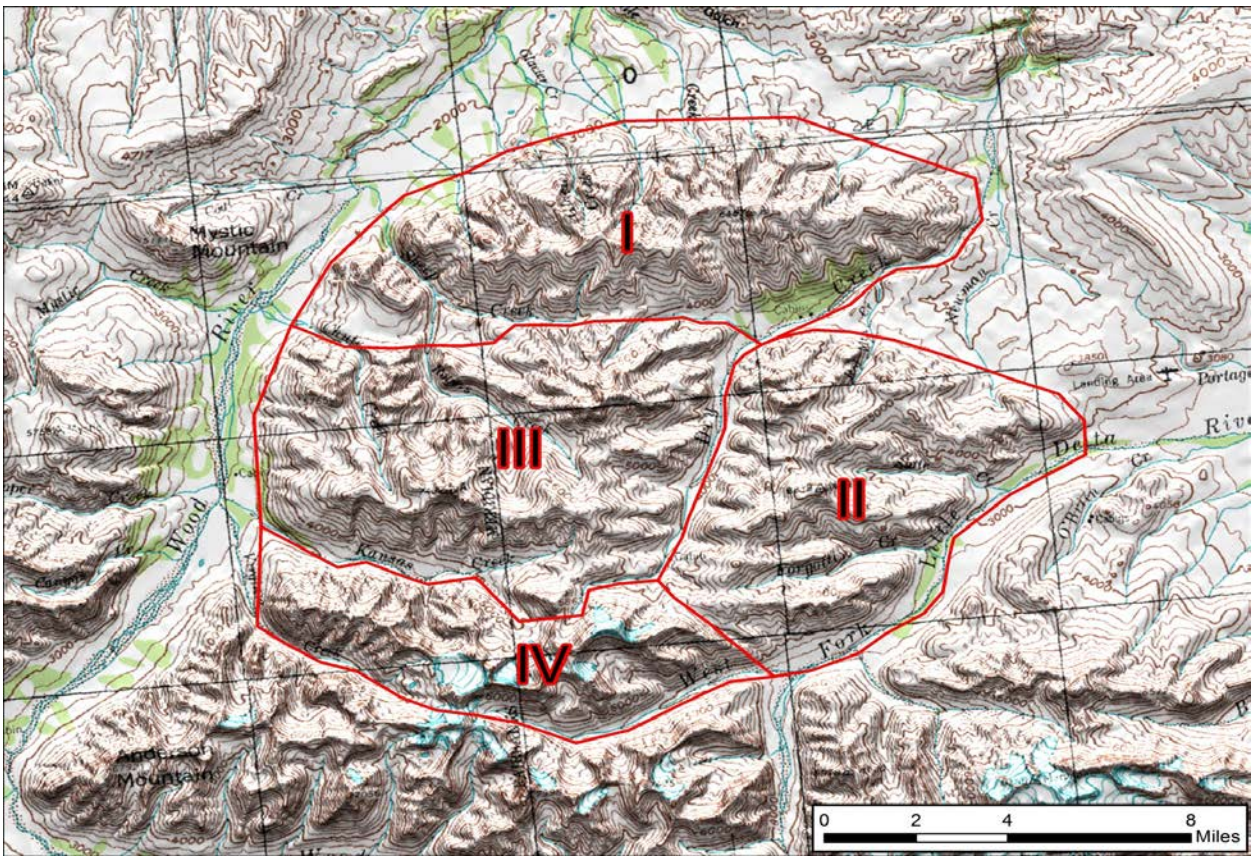

Figure 1. Unit 20A sheep survey area, Sections I–IV.

Table 1. Unit 20A sheep composition counts in Sections I–III, 2001 through 2013.

Survey date(s)	Rams:100 ewes[a]	% Full-curl rams	Lambs:100 ewes[a]	Yearlings:100 ewes[a]	Total sheep
21–22 June 2001	85	15	31	21	552
20 and 22 June 2002	69	11	49	8	496
20 June 2003	57	22	43	42	675
18–19 June 2004	81	17	41	29	523
21–22 June 2005	61	21	43	27	543
24 and 28 June 2006	83	19	44	27	717
14–15 June 2007	46	20	44	27	752
27 and 30 June 2009	52	7	28	31	743
17–18 June 2010	51	14	46	22	882
6–7 July 2011	47	11	30	17	823
12–13 July 2013	52	18	11		625

[a] Counts of ewes likely include some young rams.

Table 2. Unit 20A sheep harvest, regulatory years[a] 2003–2012.

Regulatory year	Reported harvest	Total hunters	Percent success	$\bar{x}$ Horn length (inches)[b]
2003	67	180	37	35.0
2004	51	187	27	35.0
2005	81	180	45	35.0
2006	85	196	43	35.1
2007	95	234	41	34.8
2008	86	214	40	34.3
2009	97	267	36	34.3
2010	112	238	47	34.4
2011	104	252	41	34.9
2012	94	234	40	33.7

[a] Regulatory year begins 1 July and ends 30 June (e.g., regulatory year 2003 = 1 July 2003–30 June 2004).
[b] Includes broomed horns.

Table 3. Unit 20A sheep hunter residency and success, regulatory years[a] 2003–2012.

Regulatory year	Successful					Unsuccessful					Total hunters
	Local[b] resident	Nonlocal resident	Nonresident	Unk	Total	Local[b] resident	Nonlocal resident	Nonresident	Unk	Total	
2003	23	7	37	0	67	52	45	14	2	113	180
2004	13	3	33	2	51	58	56	19	3	136	187
2005	21	17	42	1	81	53	29	16	1	99	180
2006	15	18	51	1	85	64	25	21	1	111	196
2007	21	12	62	0	95	69	46	24	0	139	234
2008	16	13	57	0	86	62	46	19	1	128	214
2009	13	17	65	2	97	79	62	25	4	170	267
2010	26	17	66	3	112	61	47	16	5	129	241
2011	21	19	62	2	104	64	56	24	5	149	253
2012	19	22	45	8	94	62	39	22	20	143	237

[a] Regulatory year begins 1 July and ends 30 June (e.g., regulatory year 2003 = 1 July 2003–30 June 2004).
[b] Includes all of Unit 20.

Table 4. Unit 20A sheep harvest chronology percent by period, regulatory years[a] 2003–2012.

Regulatory year	Harvest chronology percent by period					
	10–20 Aug	21–31 Aug	1–10 Sep	11–20 Sep	Unknown	*n*
2003	49	31	16	3	0	67
2004	69	12	14	4	2	51
2005	53	28	14	4	1	79
2006	44	23	18	15	0	84
2007	42	27	17	12	2	95
2008	47	24	17	12	0	93
2009	48	27	13	9	2	97
2010	52	24	10	14	0	112
2011	39	34	13	12	2	104
2012	62	21	7	5	4	94

[a] Regulatory year begins 1 July and ends 30 June (e.g., regulatory year 2003 = 1 July 2003–30 June 2004).

Table 5. Unit 20A sheep harvest percent by transport method, regulatory years[a] 2003–2012.

Regulatory year	Harvest percent by transport method							
	Airplane	Horse	Boat	3- or 4-wheeler	ORV	Highway vehicle	Unknown	*n*
2003	41	25	0	18	1	12	3	68
2004	46	29	0	17	2	4	2	52
2005	40	23	2	23	1	6	4	81
2006	42	28	4	19	2	1	4	85
2007	39	26	1	25	3	3	2	95
2008	49	17	2	16	3	5	6	93
2009	48	28	1	16	0	4	2	97
2010	34	30	0	18	5	10	3	111
2011	43	28	0	17	5	6	1	104
2012	34	28	0	23	2	11	2	94

[a] Regulatory year begins 1 July and ends 30 June (e.g., regulatory year 2003 = 1 July 2003–30 June 2004).