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CHAPTER 13: DALL SHEEP MANAGEMENT REPORT

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

LOCATION

GAME MANAGEMENT UNIT: Portions of Units 20B, 20D, and 20E (1,641 mi^2)

GEOGRAPHIC DESCRIPTION: Tanana Hills

BACKGROUND

The Dall sheep population in the Tanana Hills comprises several small, discrete groups or subpopulations separated by areas of unsuitable habitat. These subpopulations persist at low density because the physical geography of the area provides relatively low-quality Dall sheep habitat (Kelleyhouse and Heimer 1989). The Tanana Hills were not glaciated during the most recent glacial advance and have little uplift. They are at fairly low elevation and have a rolling rather than rugged physiography that limits escape terrain. Most of the sheep habitat in this area is remote and difficult to access, and historically there was little consumptive and nonconsumptive use of the sheep populations.

MANAGEMENT DIRECTION

MANAGEMENT GOALS

- Maintain a harvestable population of Dall sheep fluctuating within historical levels of abundance and the carrying capacity of their habitat.

MANAGEMENT OBJECTIVE

- Provide opportunity for up to 50 hunters to harvest mature rams.

RELATED MANAGEMENT ACTIVITY

- Monitor harvest through hunter contacts and harvest or permit reports.

METHODS

We analyzed data on harvest success, hunter participation rate, residence and effort, transportation type used to access the hunt area, and horn size and age. Harvest data were summarized by regulatory year (RY), which begins 1 July and ends 30 June (e.g., RY10 = 1 July 2010 through 30 June 2011).

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

We surveyed the Mount Harper–upper Goodpaster River–Tanana Hills and Glacier Mountain controlled use area (CUA) in a Piper PA-18 Super Cub. This area consisted of 2 main survey areas in the hills along the boundary of Units 20B, 20D, and 20E. Along the Units 20D and 20E boundary, the survey area included Mount Harper and sheep habitat in the upper drainages of the Healy River, Boulder Creek, and the Eisenmenger Fork of the Goodpaster River. Along the Units 20B and 20D boundary the survey area in Unit 20D included sheep habitat in the upper drainages of the Goodpaster River, Slate Creek, and Glacier Creek. In Unit 20B the survey area included sheep habitat in the upper Charley River, Stone Boy Creek, Porcupine Creek, and Upper and Lower Boulder Creek. The Glacier Mountain CUA is in Unit 20E.

Surveys were timed to avoid turbulence by conducting flights in the early morning, generally starting about 0530 hours, or evening, starting about 1900 hours. Survey altitude was 300–700 feet above ground level. Data and search times were recorded in reference to major drainages and recorded on 1:250,000 scale USGS topographic maps. In addition, the latitude and longitude of each observation were recorded. Sheep were classified as lambs, rams ≥½ curl with full-curl rams identified when possible, and others which included ewes and rams <½ curl.

RESULTS AND DISCUSSION

POPULATION STATUS AND TREND

Population Size and Composition

Mount Harper–upper Goodpaster River. An aerial survey of the Mount Harper–upper Goodpaster River area on 30 July 2010 located 80 sheep. The composition was 17 rams (including 2 with full curl horns), 11 lambs, and 52 ewe-like sheep. Ewe-like sheep included adult females plus yearlings and 2-year-olds of both sexes. Resulting composition ratios are 33 rams:100 ewe-like sheep, 21 lambs:100 ewe-like sheep, and 14% lambs in the population (Table 1). Survey time totaled 8.7 hours.

During an aerial survey on 25 July 2011, 107 sheep were observed. The composition was 29 rams (including 7 with full curl horns), 19 lambs, and 59 ewe-like sheep. Resulting composition ratios were 49 rams:100 ewe-like sheep, 32 lambs:100 ewe-like sheep, and 18% lambs in the population (Table 1). Survey time totaled 6.8 hours.

A partial aerial survey of the Mount Harper-upper Goodpaster River area was conducted on 31 July 2012 that resulted in an incomplete count of 59 sheep: 15 rams (including 3 with full-curl horns), 10 lambs, and 34 ewe-like sheep (Table 1). Composition ratios were not calculated due to incomplete survey. The survey was not completed due to poor survey conditions. Survey time totaled 3 hours.

Glacier Mountain. The Glacier Mountain CUA survey was flown on 30 July 2012. Survey time totaled 1.95 hours. We sighted 159 sheep: 57 rams (including 9 with full-curl horns), 8 lambs, and 94 ewe-like sheep. Resulting composition ratios were 61 rams:100 ewe-like sheep, 9 lambs:100 ewe-like sheep, and 5% lambs in the population (Table 2).

In 2013 the Glacier Mountain CUA was surveyed on 13 July. Survey time totaled 1.7 hours. Sixty-three sheep were seen: 17 rams (including 2 with full-curl horns), 3 lambs, and 43 ewe-like sheep. Resulting composition ratios were 40 rams:100 ewe-like sheep, 7 lambs:100 ewe-like

sheep, and 5% lambs in the population (Table 2). In spring 2013, freezing rain and ice followed by prolonged winter conditions with deep snow during May likely affected adult survival as well as lamb production and survival. The 2013 lamb:ewe ratio was the lowest observed in the Glacier Mountain CUA since at least 2000. Similar reductions in sheep populations and productivity were observed throughout the Interior in 2013.

Distribution and Movements

No sheep movement data were collected during RY10–RY13.

MORTALITY

Harvest

Season and Bag Limit. The open season for resident and nonresident hunters in the Tanana Hills in Units 20B, 20D, and 20E was 10 August–20 September; the bag limit was 1 ram with full-curl or longer horns, with both horns broken, or at least 8-years old. A drawing permit was required to hunt the Mount Harper DS206 hunt area defined as that portion of Units 20D and 20E north of the Alaska Highway and north and west of the north bank of the Middle Fork Fortymile River upstream from and including the Joseph Creek drainage. A harvest ticket was required for the remainder of Unit 20E and Unit 20B that we surveyed. Hunters who used the Glacier Mountain CUA could not use motorized vehicles from 5 August through 20 September.

Alaska Board of Game Actions and Emergency Orders. No action was taken by the Alaska Board of Game and no emergency orders were issued during RY10–RY13.

Harvest by Hunters.

Mount Harper — During RY10–RY12, harvest was low, with 2 sheep killed in RY11 (Table 3). Average horn size and age for the sheep killed in RY11 was 40.1 inches and 11 years old (Table 3), which met the harvest objective.

Tanana Hills — During RY10–RY12, Tanana Hills sheep harvest averaged 9 sheep/year (range 6–11). The reported harvest was higher compared to the reported harvest during RY07–RY09 (5 sheep/year; range 3–7). Average horn length was 35.9 inches. Average age of sheep harvested was 9.1 years, which met the harvest objective (Table 4).

Hunter Residency and Success.

Mount Harper — Most hunters in the Mount Harper DS206 drawing permit hunt continue to be nonlocal residents. No nonresidents reported hunting in this area during RY10–RY12 (Table 5).

Tanana Hills — Most hunters in the Tanana Hills continued to be Alaska residents. One nonresident reported hunting in this area during RY10–RY12. The total number of hunters (n = 82) was higher during RY10–RY12 than during RY07–RY09 (n = 53; Table 6).

Harvest Chronology.

Mount Harper — The 2 sheep killed in the Mount Harper DS206 drawing permit hunt during RY10–RY12 were killed during the fifth week of the 6-week hunting season (Table 7).

Tanana Hills — The highest percentage of harvest during RY10 and RY11 occurred in the first 7 days of the hunting season. Harvest in RY12 occurred throughout most of the hunt season (Table 7).

Transport Methods.

Mount Harper — The 2 rams taken in DS206 during RY10–RY12 were taken by hunters using aircraft to access the hunt area (Table 8).

Tanana Hills — Aircraft, ATV, highway vehicle, airboat, and horse were the most common transport methods for successful hunters in the Tanana Hills outside of the DS206 hunt area (Table 8).

Other Mortality

Most Dall sheep mortality in the Tanana Hills is likely due to natural factors. However, we do not know the primary limiting factors to population growth. Wolf, grizzly bear, and golden eagle predation has been observed (Gardner 2002). Escape terrain is limited, increasing predator effectiveness. We have no data on the limiting effects of weather, accidents, disease, or winter habitat.

HABITAT

Assessment

Kelleyhouse and Heimer (1989) detailed an explanatory hypothesis of habitat limitation based on physical geography of the Tanana Hills. Although it is unlikely that summer range is limiting in extent or quality, it seems probable that winter range availability may limit population growth. Inconsistent winter winds and snow depth combine to produce variable winter foraging conditions.

Mount Harper is known to have mineral potential and has been subjected to mining operations in the past. More mineral exploration is expected. Any mining development of the area should include sufficient measures to minimize disturbance of sheep or destruction of sheep escape cover and winter range. The Alaska Department of Fish and Game (ADF&G), Division of Wildlife Conservation biologists will coordinate with ADF&G, Division of Habitat staff and landowners to ensure impacts to sheep habitat are considered during future mining development.

Vegetation succession and fire suppression have reduced habitat suitability in lower elevation winter ranges and travel routes. Implementation of the *Alaska Interagency Fire Management Plan* (Alaska Wildland Fire Coordinating Group 2010) should result in a near-natural fire regime throughout this area, possibly benefiting the sheep population.

CONCLUSIONS AND RECOMMENDATIONS

We met our management objective to provide opportunity for up to 50 hunters. A total of 93 hunters pursued sheep in the Tanana Hills, including the Mount Harper (DS206) hunt area during RY10–RY12. Reported harvest in the RY10–RY12 Tanana Hills general season was higher than the last reporting period. Harvest reports suggest the increased harvest is primarily due to increased hunter effort. The reported harvest levels for the past 2 reporting periods are

sustainable for the next reporting period. No change in management direction is recommended at this time. The management goals and objectives will be as follows for the next reporting period:

MANAGEMENT GOALS

- Maintain a harvestable population of Dall sheep fluctuating within historical levels of abundance and the carrying capacity of their habitat.

MANAGEMENT OBJECTIVE

- Provide sheep hunting opportunity for up to 50 hunters over a 3-year period.

RELATED MANAGEMENT ACTIVITIES

- Monitor harvest through hunter contacts and harvest or permit reports.

- Identify proposed or planned mining development in the Tanana Hills and assess the potential impacts to Dall sheep habitat and life history requirements.

- Survey the entire Tanana Hills sheep range each year.

The Tanana Hills sheep population tends to be widely dispersed, often below tree line. The area has few trails or suitable aircraft landing sites. However, currently there is renewed mining interest in the area. Any mining development of the area should include sufficient measures to minimize disturbance of sheep or destruction of sheep escape cover and winter range.

It has been difficult to monitor population trends of the Tanana Hills subpopulation due to budget limitations and variable summer weather. Sheep distribution and movements during the summer and fall months have been documented by aerial surveys and hunter reports. However, little is known about rutting and lambing areas and winter distribution. Periodic surveys should be conducted to assess habitat use and to identify winter range.

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Table 1. Mount Harper–upper Goodpaster River and Tanana Hills Dall sheep composition counts from aerial surveys, 2005–2012.

Sex/age class	2005	2007	2008	2009	2010	2011	2012
Legal rams[a]	5	9	9	6	2	7	3
Sublegal rams[b]	8	11	37	31	15	22	12
Unclassified rams	0	0	0	0	0	0	0
Total rams	13	20	46	37	17	29	15
Ewes[c]	27	67	40	50	52	59	34
Lambs	9	21	14	17	11	19	10
Yearlings	0	0	0	0	0	0	0
Unidentified	0	0	0	4	0	0	0
Total other sheep	36	88	54	71	63	78	44
Total sheep	49	108	100	108	80	107	59[d]
Legal rams:100 ewes	19	13	23	12	4	12	
Sublegal rams:100 ewes	30	16	93	62	29	37	
Total rams:100 ewes	48	30	115	74	33	49	
Lambs:100 ewes	33	31	35	34	21	32	
% Lamb	18	19	14	16	14	18	

[a] Full curl or larger. Full curl includes rams with the tips of both horns broken.
[b] Greater than ½-curl but less than full curl.
[c] Ewe classification also includes yearlings of both sexes and rams of ½-curl or less.
[d] Incomplete survey, composition ratios not calculated.

Table 2. Glacier Mountain controlled use area sheep composition counts from aerial surveys, 2000–2005 and 2012–2013[a].

Sex/age class	2000	2001	2002	2003	2004	2005	2012	2013
Legal rams[b]	6	7	2	5	5	5	9	2
Sublegal rams[c]	27	18	14	10	19	11	48	15
Unclassified rams	0	0	0	0	0	0	0	0
Total rams	33	25	16	15	24	16	57	17
Ewes[d]	61	50	46	37	48	72	94	43
Lambs	6	11	15	12	26	20	8	3
Unidentified	0	0	0	0	0	0	0	0
Total other sheep	67	61	61	49	74	92	102	46
Total sheep	100	86	77	64	98	108	159	63
Legal rams:100 ewes	10	14	4	14	10	7	10	5
Sublegal rams:100 ewes	44	36	30	27	40	15	51	35
Total rams:100 ewes	54	50	34	41	50	22	61	40
Lambs:100 ewes	10	22	33	32	54	28	9	7
% Lamb	6	13	19	19	27	19	5	5

[a] No surveys during 2006–2011.
[b] Full curl or larger.
[c] Greater than ½-curl but less than full curl.
[d] Ewe classification also includes yearlings of both sexes and rams of ½-curl or less.

Table 3. Mount Harper DS206 drawing permit sheep harvest, regulatory years[a] 2005–2012.

Regulatory year	Permits issued	Did not hunt	Unsuccessful hunters	Successful hunters	$\bar{x}$ Horn length	$\bar{x}$ Age	Total harvest
2005	4	1	1	2	35.25	6.5	2
2006	4	2	0	2	35.75	8.5	2
2007	4	2	2	0			0
2008	4	3	1	0			0
2009	4	2	1	1	42.0	13	1
2010	4	1	3	0			0
2011	4	0	2	2	40.1	11	2
2012	4	0	4	0			0

[a] Regulatory year begins 1 July and ends 30 June (e.g., regulatory year 2005 = 1 July 2005–30 June 2006).

Table 4. Tanana Hills sheep harvest, regulatory years[a] 2005–2012.

Regulatory year	Rams	$\bar{x}$ Horn length	$\bar{x}$ Age	Ewes	Total sheep
2005[b]	8	35.7	9.8	0	8
2006[b]	2	37.3	9.5	0	2
2007[b]	7	37.1	10.0	0	7
2008[b]	3	39.0	10.3	0	3
2009[b]	5	33.1	8.8	0	5
2010[b]	6	36.6	9.7	0	6
2011[b]	10	35.8	9.7	0	10
2012[b]	11	35.3	8.0	0	11

[a] Regulatory year begins 1 July and ends 30 June (e.g., regulatory year 2005 = 1 July 2005–30 June 2006).
[b] Includes Unit 20B UCUs 400, 405, 600, 604, and 605, and Unit 20E UCUs 100, 101, 102, 103, 104, 303, 304, 305, and Glacier Mountain controlled use area (UCU 802).

Table 5. Tanana Hills, drawing permit hunt DS206 (Mount Harper) sheep hunter residency and success, regulatory years[a] 2005–2012.

	Successful				Unsuccessful				
Regulatory year	Local resident[b]	Nonlocal resident	Nonresident	Total (%)	Local resident[b]	Nonlocal resident	Nonresident	Total (%)	Total hunters
2005	0	2	0	2 (50)	0	2	0	2 (50)	4
2006	0	2	0	2 (50)	0	2	0	2 (50)	4
2007	0	0	0	0 (0)	0	2	0	2 (100)	2
2008	0	0	0	0 (0)	0	1	0	1 (100)	1
2009	0	1	0	1 (50)	0	1	0	1 (50)	2
2010	0	0	0	0 (0)	0	3	0	3 (100)	3
2011	0	2	0	2 (50)	0	2	0	2 (50)	4
2012	0	0	0	0 (0)	0	4	0	4 (100)	4

[a] Regulatory year begins 1 July and ends 30 June (e.g., regulatory year 2005 = 1 July 2005–30 June 2006).
[b] Residents of Unit 20D.

Table 6. Tanana Hills, Unit 20B outside the White Mountains and Unit 20E outside of DS206, sheep hunter residency and success[a], regulatory years[b] 2005–2012.

	Successful				Unsuccessful				
Regulatory year	Local resident[c]	Nonlocal resident	Nonresident	Total (%)	Local resident[c]	Nonlocal resident	Nonresident	Total (%)	Total hunters
2005	0	8	0	8 (73)	0	3	0	3 (27)	11
2006	0	3	0	3 (21)	0	13	0	13 (81)	16
2007	0	7	0	7 (47)	0	8	0	8 (53)	15
2008	0	3	0	3 (23)	0	10	0	10 (77)	13
2009	0	5	0	5 (20)	2	16	2	20 (80)	25
2010	0	6	0	6 (24)	0	19	0	19 (76)	25
2011	0	10	0	10 (33)	1	19	0	20 (67)	30
2012	0	10	1	11 (41)	2	14	0	16 (59)	27

[a] Excludes hunters in permit hunts.
[b] Regulatory year begins 1 July and ends 30 June (e.g., regulatory year 2005 = 1 July 2005–30 June 2006).
[b] Residents of Unit 20E and Salcha.

Table 7. Tanana Hills area sheep harvest chronology percent by month/day, regulatory years[a] 2005–2012.

Hunt	Regulatory year	Harvest chronology percent by month/day							
		8/10–8/16	8/17–8/23	8/24–8/30	8/31–9/6	9/7–9/13	9/14–9/20	Unknown	*n*
DS206	2005	100	0	0	0	0	0	0	2
	2006	100	0	0	0	0	0	0	2
	2007	0	0	0	0	0	0	0	0
	2008	0	0	0	0	0	0	0	0
	2009	100	0	0	0	0	0	0	1
	2010	0	0	0	0	100	0	0	0
	2011	0	0	0	0	0	0	0	0
	2012	0	0	0	0	0	0	0	0
Tanana Hills	2005	25	0	0	25	50	0	0	8
	2006	33	67	0	0	0	0	0	3
	2007	29	0	14	43	14	0	0	7
	2008	67	0	33	0	0	0	0	3
	2009	80	0	20	0	0	0	0	5
	2010	50	17	0	0	33	0	0	6
	2011	40	20	20	0	20	0	0	10
	2012	27	27	18	9	0	18	0	11

[a] Regulatory year begins 1 July and ends 30 June (e.g., regulatory year 2005 = 1 July 2005–30 June 2006).

Table 8. Tanana Hills area sheep percent harvest by transport method, regulatory years[a] 2005–2012.

Permit hunt	Regulatory year	Harvest percent by transport method									
		Airplane	Horse	Boat	3- or 4-wheeler	Snowmachine	ORV	Highway vehicle	Other	Unknown	*n*
DS206	2005	100	0	0	0	0	0	0	0	0	2
	2006	100	0	0	0	0	0	0	0	0	2
	2007	0	0	0	0	0	0	0	0	0	0
	2008	0	0	0	0	0	0	0	0	0	0
	2009	100	0	0	0	0	0	0	0	0	1
	2010	0	0	0	0	0	0	0	0	0	0
	2011	100	0	0	0	0	0	0	0	0	2
	2012	0	0	0	0	0	0	0	0	0	0
Tanana Hills	2005	88	0	0	0	0	0	0	0	13	8
	2006	67	0	0	0	0	0	33	0	0	3
	2007	14	29	14	0	0	0	29	0	14	7
	2008	100	0	0	0	0	0	0	0	0	3
	2009	60	0	0	40	0	0	0	0	0	5
	2010	67	0	0	0	0	0	0	33[b]	0	6
	2011	50	0	0	20	0	0	20	10[b]	0	10
	2012	36	18	9	9	0	0	27	0	0	11

[a] Regulatory year begins 1 July and ends 30 June (e.g., regulatory year 2005 = 1 July 2005–30 June 2006).
[b] Airboat is the transport method.