

Dall Sheep Management Report and Plan, Game Management Units 13A, 13E, 14A, and 14B, Talkeetna Mountains and Chulitna–Watana Hills:

Report Period 1 July 2011–30 June 2016, and

Plan Period 1 July 2016–30 June 2021

Christopher J. Brockman



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Plan Period 1 July 2016–30 June 2021

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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 website.

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

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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 Talkeetna Mountains of Units 13A, 13E, 14A, and 14B for the 5 regulatory years (RY) RY11–RY15 and plans for survey and inventory management activities in the 5 years following the end of that period, RY16–RY20. A regulatory year 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 and supersedes the 1976 draft Alaska wildlife management plans (ADF&G 1976).

I. RY11–RY15 Management Report

Management Area

The Talkeetna Mountain Range and Chulitna–Watana Hills (TCW; Units 13A, 13E, 14A [north], and 14B; 14,849 mi²) are located in Southcentral Alaska (Figure 1). It is approximately 100 miles long and 80 miles wide and runs primarily north to south. It is bounded on the north by the Denali Highway, the west by the Parks Highway, the south by the Glenn Highway, and the east by Lake Louise Road, Lake Louise and the Tyone River, and the Susitna River upstream of the confluence with Tyone River. Dall sheep habitat is alpine habitat with sufficient vertical relief to provide sheep with escape terrain. Winter range is characterized by windswept hillsides that allow for grazing on frozen grasses and sedges. The majority of the sheep observed in surveys are located in the Unit 13A portion of the mountains.

Summary of Status, Trend, Management Activities, and History of Dall Sheep in Units 13A, 13E, 14A, and 14B, Talkeetna Mountains and Chulitna–Watana Hills

The first large-scale Dall sheep survey in TCW was conducted in 1974. Although a final estimate of the total number of sheep was not specifically stated (McIlroy 1976), the population contained approximately 2,500–3,000 sheep in 1974, assuming 80% of the sheep were counted. Sheep densities have historically been highest in the count areas surrounding the Chickaloon river drainage. Due to time, weather, and financial constraints generally only 2 or 3 trend count areas in Units 14A and 14B are flown in a year (Figures 2 and 3). During the late 1980s the population estimate for TCW was approximately 2,500 sheep (Grauvogel 1990). Included in the estimate were approximately 200 sheep in the Sheep Mountain Closed Area; an area that has been closed to hunting since the 1940s. A harsh winter in 1999–2000 decreased the population to approximately 1,750 sheep (McDonough 2002). By 2003 the population had increased to approximately 2,000 sheep. From 2003 to 2010 the population remained in the range of 1,500–2,000 sheep. Recently the population appears to have grown to approximately 2,500 sheep.

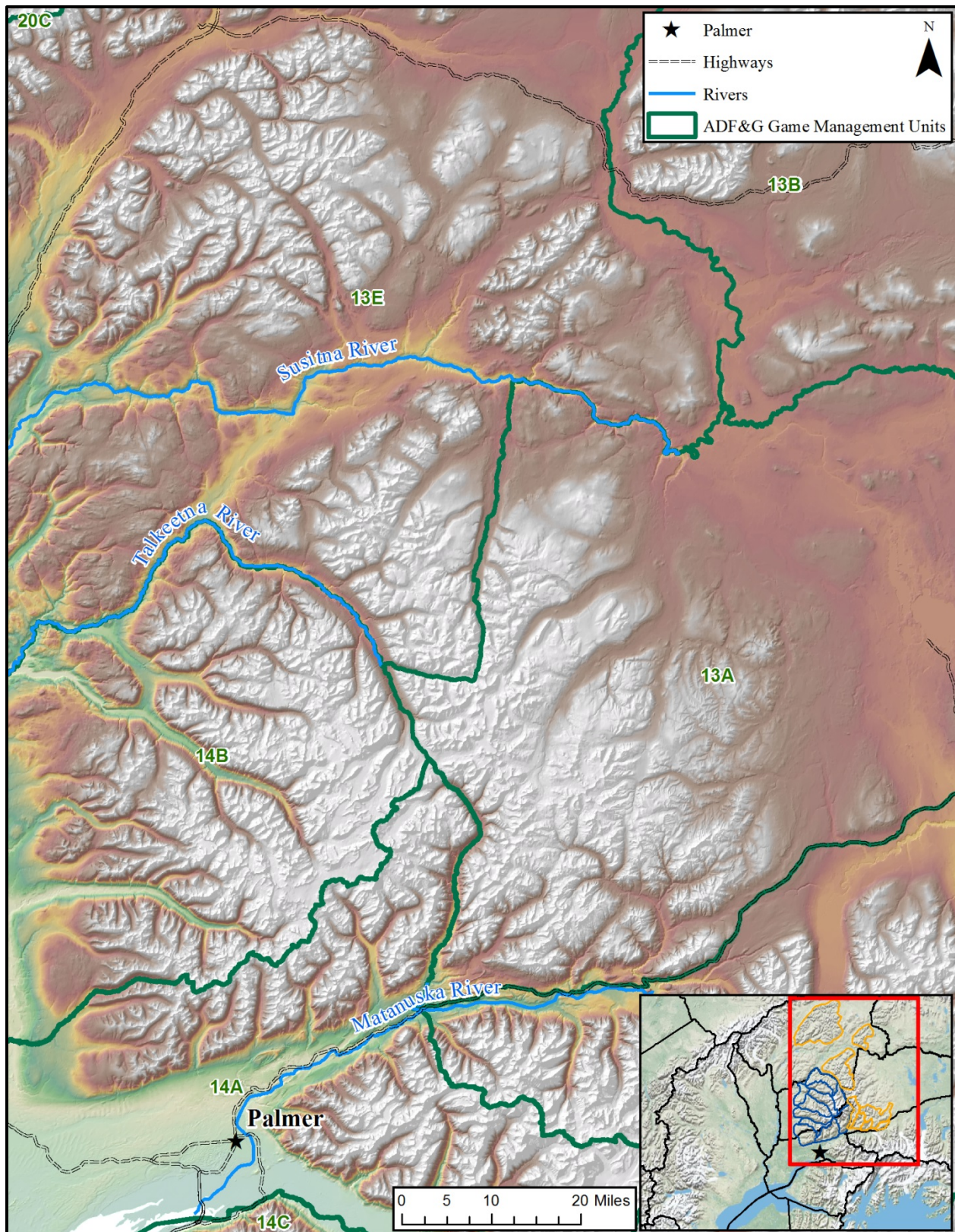


Figure 1. Talkeetna Mountain Range and Chulitna–Watana Hills in Southcentral Alaska.

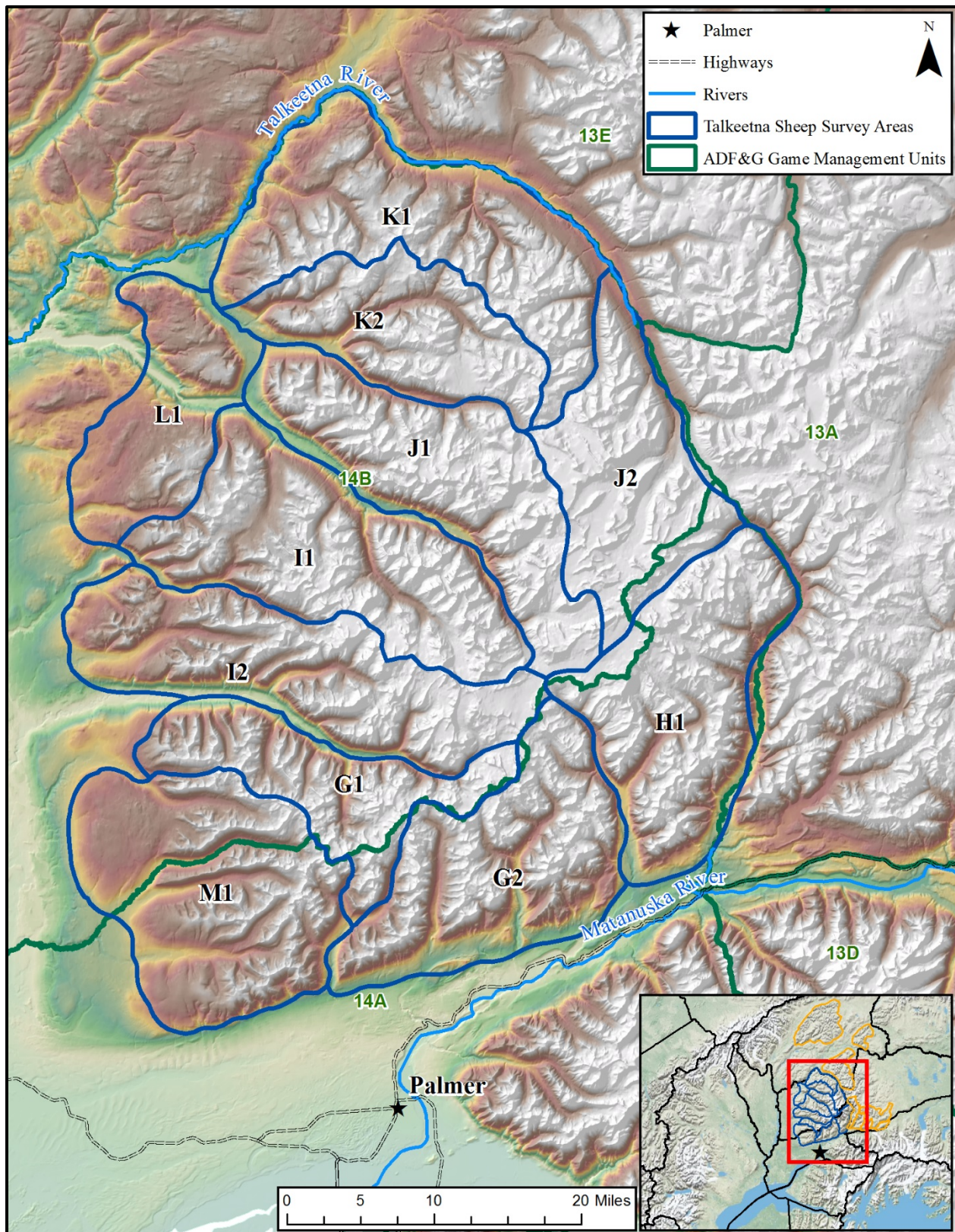


Figure 2. Survey count areas in Units 14A and 14B of the Talkeetna Mountain Range, Southcentral Alaska.

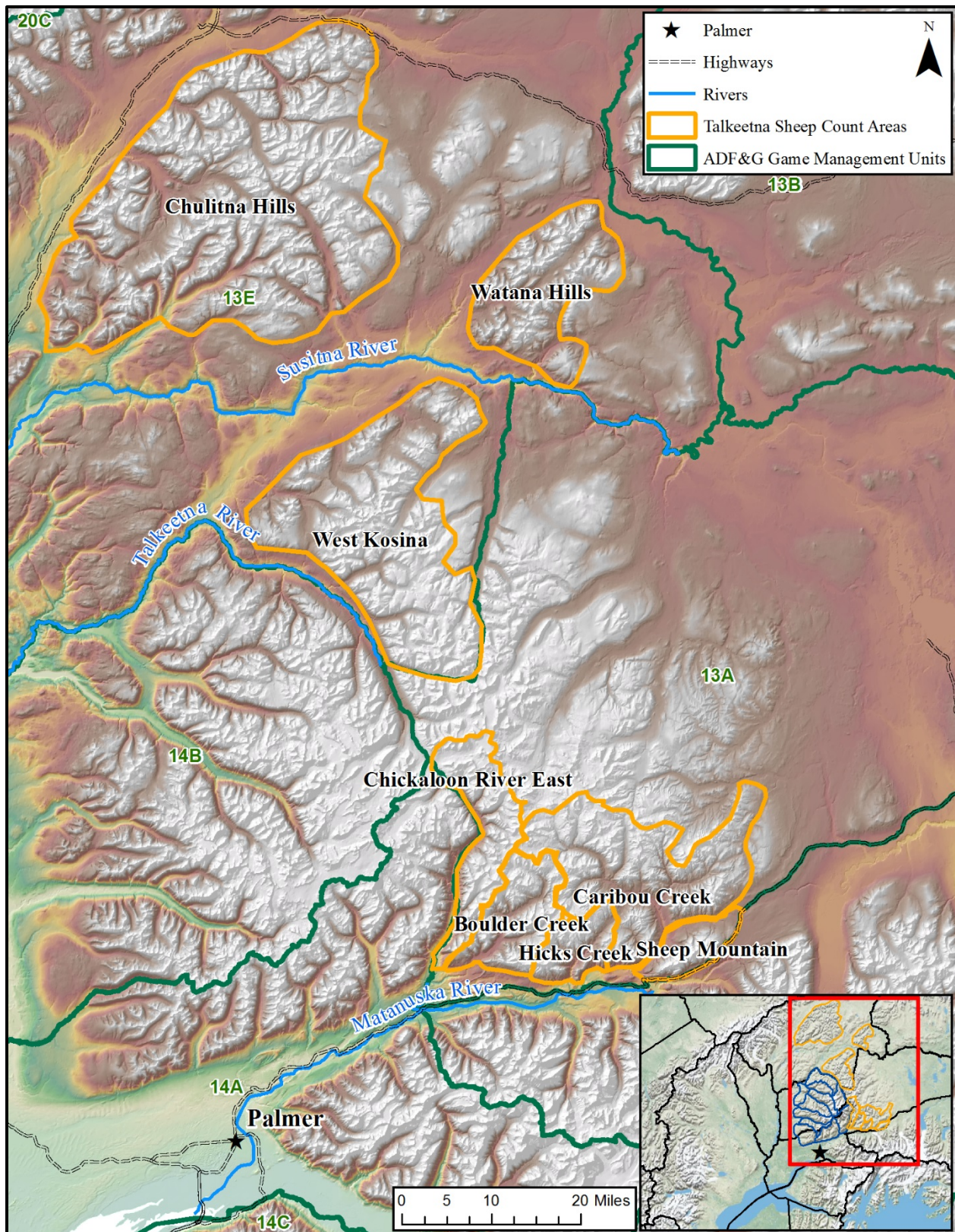


Figure 3. Survey count areas in Units 13A and 13E of the TCW portion of the Talkeetna Mountains, Southcentral Alaska.

Sheep harvests in TCW have been limited to adult rams and harvest data have been collected from hunter harvest reports since 1967. Sheep harvests were initially managed under a ¾-curl or greater horn size regulation resulting in annual harvests that averaged 90 rams from 1967 through 1978. In 1979 sheep hunting regulations were changed to define a legal ram as having ⅞-curl or greater horn. Under the new regulation sheep harvests averaged 87 rams annually from 1979 through 1988. In 1989 the horn size of a legal animal was changed again with the implementation of a full-curl or greater horn size regulation. At first, annual harvests remained relatively unchanged, averaging 85 rams from 1990 through 1999, but decreased to an average of 56 rams during 2000–2009 after the sheep population declined during winter 1999–2000 (McDonough 2002). The reported harvests from TCW reached a peak of 118 rams in 1969 and 1986. Since then, the highest reported harvest was 109 rams taken in 1995.

Management Direction

EXISTING WILDLIFE MANAGEMENT PLANS

- *Alaska Wildlife Management Plans: Southcentral Alaska* (ADF&G 1976) includes sheep management plans for the following areas: western Talkeetna Mountains, Nelchina Basin, and Sheep Mountain. Sheep management strategies have been modified over the years based on public comment, department recommendations, and Alaska Board of Game actions. A record of these changes can be found in the division's management report series.
- The Division of Wildlife Conservation strategic plan (ADF&G 2002).
- See the plan section of this document for the current management plan for sheep in the Talkeetna Mountains and Chulitna–Watana Hills.

GOALS

- Provide the greatest sustainable opportunity to participate in hunting sheep (outside the Sheep Mountain Closed Area)
- Provide an opportunity to view, photograph, and enjoy sheep within the Sheep Mountain Closed Area in Unit 13A

CODIFIED OBJECTIVES

Amounts Reasonably Necessary for Subsistence Uses

There is a negative customary and traditional use determination for Talkeetna Mountains sheep and therefore no amounts necessary for subsistence.

Intensive Management

Sheep are not designated as an intensive management species in the state of Alaska. Intensive management predation control programs implemented for moose (*Alces alces*) or caribou (*Rangifer tarandus*) may affect predation levels on sheep.

MANAGEMENT OBJECTIVES

- Maintain sheep populations that will sustain an annual harvest of 75 full-curl rams.

MANAGEMENT ACTIVITIES

Assessing population status and trends, monitoring harvest and mortality, and assessing habitat conditions are integral components of management of Dall sheep in the Talkeetna Mountains. Survey and inventory management activities used to monitor the population are described below.

1. Population Status and Trend

ACTIVITY 1.1. Conduct aerial population surveys for sex and age composition in count areas to determine population size, composition, productivity, and trends.

Data Needs

Dall sheep abundance is a basis from which sustainable harvest may be estimated and provides a density context for interpreting nutritional condition relative to habitat conditions. Sex and age composition information can be used to determine appropriate harvest levels and recruitment into the population. Sex and age ratio data may also be used to model population structure and trends.

Methods

Aerial surveys using fixed-wing aircraft are conducted in established trend count areas to determine sheep population trends and sex and age composition (Figure 1; Appendix). Surveys are generally conducted in July or early August when most of the previous winter's snow has melted and prior to the sheep hunting season (10 August). An experienced pilot–observer team flies geographic contours systematically within a count area at 70–80 mph searching for sheep and recording data. Each sheep or group of sheep that is observed during the survey is circled to determine sex and curl classification and number of animals present. 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 when conditions allow.

Results and Discussion

The estimated population for sheep in TCW increased from 2,000–2,500 in 1994 to 2,500–3,000 sheep in 1999. A severe winter in 1999–2000 decreased the overall sheep population about 40% and reduced the year's lamb recruitment by 75% (McDonough 2002). Surveys conducted between 2000 and 2003 suggested that the overall sheep population was beginning to recover from the decline. Surveys conducted during this reporting period indicate that the population size remains stable in the trend areas (Table 1). All count areas were surveyed in 2015 and 1,961 sheep were observed. Assuming 80% of the sheep are observed during surveys, the current minimum population is approximately 2,451 sheep. Percent lambs and percent of rams that are full curl have increased during this reporting period in all survey units. This indicates the population is likely to begin growing, and it is likely to begin providing increased harvest in the next reporting period.

Recommendations for Activity 1.1

Modify.

- Surveys should be continued, and frequency of surveys should be increased to every third year. In addition to continuing the survey additional effort should be focused on estimating sightability using repeated measures surveys such as a binomial mixture model. Composition accuracy may also be improved with the use of cameras for classifying sheep.

2. Mortality–Harvest Monitoring and Regulations

ACTIVITY 2.1. Monitor Dall sheep mortality through sealing, field observations, hunter harvest reports, contacts with hunters, and reports of other causes of mortality.

Data Needs

Monitoring, collecting, and analyzing harvest data are critical for sustained yield management. Information collected from harvest reports can inform management decisions regarding season length, permit levels, and appropriate methods of take.

Methods

Sheep harvested in the Talkeetna Mountains are required to be sealed at an ADF&G office. During the sealing process horns are evaluated for legality, aged, measured, and a permanent plug with a unique number is affixed to one of the horns.

Season and Bag Limit

Dall sheep hunting in the Talkeetna Mountains is through a general season harvest ticket for residents and nonresidents. The bag limit is 1 ram with full-curl or greater horn size. The season is 10 August–20 September for all hunters.

Results and Discussion

Harvest by Hunters

Harvest by hunters was below management objectives during this reporting period with an average annual harvest of 38 rams during RY11–RY15 (Table 2). Harvests were similar to the last reporting period (RY10–RY12; Rinaldi 2014), which averaged 35 rams per year, and remain lower than the average of 82 rams during RY90–RY00.

The average horn size (35.4 inches) and the percentage of horns greater than 40 inches (4.2%) is similar to the last reporting period (Table 2).

Table 1. Talkeetna Mountains and Chulitna–Watana Hills summer aerial sheep composition counts, Southcentral Alaska, regulatory years^a 2011–2015.

Regulatory year	Full curl ^b	% of Rams	<Full curl	Ewes ^c	Lambs	% of Sheep	Sheep/Hour	Total sheep
<i>Boulder Creek</i>								
2011	9	10	78	198	85	23	185	370
2012 ^e								
2013	3	5	52	93	13	8	73	161
2014 ^e								
2015	5	6	71	125	70	26	75	271
<i>Chickaloon River – East</i>								
2011	4	8	46	46	28	23	68	124
2012 ^e								
2013	5	9	49	62	9	7	58	125
2014 ^e								
2015	4	8	50	67	33	21	37	154
<i>Hicks Creek</i>								
2011	0	0	17	130	51	26	198	198
2012 ^e								
2013	0	0	19	80	15	13	88	114
2014 ^e								
2015	0	0	34	42	17	18	53	96 ^d
<i>Caribou Creek</i>								
2011	3	5	58	230	76	21	113	367
2012 ^e								
2013	3	2	142	235	79	17	78	459
2014 ^e								
2015	1	1	106	261	56	13	67	424
<i>Sheep Mountain</i>								
2011	0	0	8	62	16	19	128	86
2012 ^e								
2013	1	10	10	32	7	14	86	50
2014 ^e								
2015	5	23	17	31	15	22	52	68
<i>Watana Hills</i>								
2011	0	0	15	35	12	19	39	62
2012 ^e								
2013	0	0	14	22	5	12	19	41
2014 ^e								
2015	3	23	10	13	7	21	10	33

Regulatory year	Full curl ^b	% of Rams	<Full curl	Ewes ^c	Lambs	% of Sheep	Sheep/ Hour	Total sheep
<i>Chulitna Hills</i>								
2011 ^e								
2012 ^e								
2013	2	2	92	150	33	12	11	277
2014 ^e								
2015	6	9	62	118	63	25	11.2	249
<i>West Kosina</i>								
2011 ^e								
2012 ^e								
2013	2	3	60	99	33	17	33	194
2014 ^e								
2015	6	16	31	94	41	24	34	172
<i>Little Susitna to King's River (G2)</i>								
2011								
2012	0	0	18	54	17	19	12.1	89
2013 ^e								
2014	3	9	30	63	13	12	14.4	109
2015	2	15	11	32	14	24	9.3	59
<i>Sheep River – Iron Creek(J1)</i>								
2011								
2012	0	0	11	18	6	17	3.8	35
2013 ^e								
2014 ^e								
2015	4	10	33	23	15	20	10.7	75

^a A regulatory year begins 1 July and ends 30 June, e.g., regulatory year 2011 = 1 July 2011–30 June 2012.

^b Does not include an unknown number of legal rams at least 8 years old or with both horn tips broken.

^c Includes yearlings of both sexes.

^d Includes unclassified sheep.

^e No survey was conducted.

Table 2. Talkeetna Mountains and Chulitna–Watana Hills sheep harvest, Southcentral Alaska, regulatory years^a 2011–2015.

Regulatory year	Rams ^b	Average horn length (inches)	% ≥ 40 inches	Ewes	Total sheep
2011	43	35.37	4.6	0	43
2012	31	35.2	3.2	0	31
2013	42	34.75	0	0	42
2014	36	36.4	8.3	0	36
2015	38	35.4	5	0	38

^a A regulatory year begins 1 July and ends 30 June, e.g., regulatory year 2011 = 1 July 2011–30 June 2012.

^b Includes only rams for which horn length was reported.

Hunter Residency and Success

The total number of hunters has remained stable during this reporting period (Table 3). The success rate of hunters during RY11–RY15 (12.8%) was slightly lower than the previous reporting period (14.3%). Nonresidents continued to be more successful than residents. During RY11–RY15 nonresidents accounted for 12% of hunters but took 45% of the sheep (Table 3). This success is attributed to fact that nonresidents are required to hunt with Alaska-licensed guides or an Alaska resident within second-degree of kinship; and typically use both guides to access remote areas.

Table 3. Talkeetna Mountains and Chulitna–Watana Hills sheep hunter residency and success, Southcentral Alaska, regulatory years^a 2011–2015.

Regulatory year	Successful				Unsuccessful				Total hunters
	Local ^b resident	Nonlocal resident	Nonresident	Total (%)	Local ^b resident	Nonlocal resident	Nonresident	Total (%)	
2011	11	12	20	43 (15)	111	115	11	237 (85)	280
2012	11	8	12	31 (10)	129	124	14	267 (90)	298
2013	14	9	19	42 (14)	116	130	9	255 (86)	297
2014	15	6	15	36 (12)	134	106	14	254 (88)	290
2015	14	5	19	38 (13)	110	108	28	246 (87)	284

^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 13A, 13E, 14A and 14B.

Harvest Chronology During RY11–RY15, 49% of the reported harvest was taken during the first week of the season and 70% during the first 2 weeks of the season (Table 4).

Table 4. Talkeetna Mountains and Chulitna–Watana Hills sheep harvest chronology percent by harvest period, Southcentral Alaska, regulatory years^a 2011–2015.

Regulatory year	Harvest chronology percent by period						<i>n</i>
	8/10–8/16	8/17–8/23	8/24–8/30	8/31–9/6	9/7–9/13	9/14–9/20	
2011	37	26	12	13	5	7	43
2012	58	13	19	0	10	0	31
2013	57	19	7	5	7	5	42
2014	42	28	14	3	8	5	36
2015	53	16	11	5	11	4	38

^a A regulatory year begins 1 July and ends 30 June, e.g., regulatory year 2011 = 1 July 2011–30 June 2012.

Transport Methods The majority of successful hunters used fixed-wing aircraft or all-terrain vehicles to access their hunting areas (Table 5).

Table 5. Talkeetna Mountains and Chulitna–Watana Hills sheep harvest percent by transport method, Southcentral Alaska, regulatory years^a 2011–2015.

Regulatory year	Percent of harvest by transport method							<i>n</i>
	Airplane	Horse	Boat	ATV ^b	ORV ^c	Highway vehicle	Unknown	
2011	49	5	0	40	0	2	4	43
2012	42	0	0	48	0	10	0	31
2013	52	0	0	40	0	5	3	42
2014	58	3	0	36	0	3	0	36
2015	42	0	3	42	5	5	3	38

^a A regulatory year begins 1 July and ends 30 June, e.g., regulatory year 2011 = 1 July 2011–30 June 2012.

^b ATV = all-terrain vehicle.

^c ORV = off-road vehicle.

Alaska Board of Game Actions and Emergency Orders

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

Recommendations for Activity 2.1

Modify. As this area is managed under the full-curl regulations it is by default managed for maximum opportunity to hunt. For this reason, there is no harvest or population objective.

3. Habitat Assessment–Enhancement

None.

NONREGULATORY MANAGEMENT PROBLEMS OR NEEDS

Data Recording and Archiving

- Harvest data, survey data and copies of sealing forms are stored on an internal database housed on a server (<http://winfonet.alaska.gov/index.cfm>).
- Field data sheets are scanned and housed on the network server in the Palmer Area Biologist office (O:\WC\Palmer Area Office Folder\Species\Sheep\Scanned Archive Files) and stored in file folders located in the Palmer Assistant Area Biologist's office.
- Data from surveys conducted by the Glennallen office 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 servers.

Agreements

None.

Permitting

None.

Conclusions and Management Recommendations

Dall sheep abundance and harvests have been considerably lower than in the previous decade, and harvests remain well below the 75-rams/year objective. Population size and trend appear to be independent of the number of rams harvested in TCW. Additionally, because the number of ewes and lambs, which are not part of the harvest, remains low, there is no indication that hunting is limiting the population. This same trend has also been noted in the Chugach Range.

Periodic surveys of the TCW sheep population should be conducted in the count areas in Units 13 and 14 on a more consistent basis to adequately assess population trends. Complete surveys conducted on a 3-year basis in all count areas would provide a more meaningful measure of the population trend, which could be used to identify significant changes in population size and herd composition.

New and additional tools and methods could be used to address some of the data needs we currently have. For instance, the use of digital single-lens reflex cameras (DSLR) may increase our accuracy in identifying horn-curl class. Additionally, improving our surveys to account for variation in sightability would give managers a tool to determine with some degree of statistical precision the changes in population size. A tool that may work to achieve this goal is the use of binomial mixture models that require repeated sampling. These methods would require additional time and money that are likely not available but would enhance our understanding of population changes and improve ability to accurately classify sheep demographics.

During the March 2007 Board of Game meeting sheep hunting opportunity in the Chugach Range was restricted by the adoption of a draw permit hunt structure. Sheep managers initially thought that this change would shift hunting pressure to TCW and result in increased complaints of crowding in TCW. To date these concerns have not been realized. In fact, the total number of hunters in TCW appears to have decreased slightly over the past decade.

II. Project Review and RY16–RY20 Plan

Review of Management Direction

MANAGEMENT DIRECTION

The management direction for TCW should be modified to reflect meaningful and realistic goals and objectives that are appropriate in the context of current access, hunting pressure, and sheep populations. The following modifications are recommended for and coincide with statewide goals (ADF&G 2002) within the frameworks of sustained yield and species conservation.

GOALS

- Provide the greatest sustainable opportunity to participate in hunting sheep (outside the Sheep Mountain Closed Area).
- Provide an opportunity to view, photograph, and enjoy sheep within the Sheep Mountain Closed Area in Unit 13A.

CODIFIED OBJECTIVES

Amounts Reasonably Necessary for Subsistence Uses

There is a negative customary and traditional use determination for Talkeetna Mountains sheep and therefore no amounts reasonably necessary for subsistence.

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.

REVIEW OF MANAGEMENT OBJECTIVES

- As this area is managed under the full-curl regulations it is by default managed for maximum opportunity to hunt. For this reason, there is no harvest or population objective.

REVIEW OF MANAGEMENT ACTIVITIES

1. Population Status and Trend

ACTIVITY 1.1. Continue to conduct aerial population surveys for sex and age composition in the unit to determine population size, composition, productivity, and trends. Test the use of DSLR cameras to assist in classification of horn curl and sex composition.

Data Needs

Dall sheep abundance is a basis from which sustainable harvest may be estimated and provides a density context for interpreting nutritional condition relative to habitat conditions. Sex and age composition information can be used to determine appropriate harvest levels and recruitment into the population. Sex and age ratio data may also be used to model population structure and trends.

The use of DSLR cameras may increase our accuracy in identifying horn-curl class which may be used as a proxy for age.

Methods

Aerial surveys will be conducted every 3 years providing weather and time constraints do not create conflicts with survey requirements for the Chugach and the Alaska ranges. Surveys need to be conducted when most of the previous winter's snow has melted and prior to the sheep hunting season (10 August). In most years this occurs in July. Cameras should be used to photograph rams to better assess horn-curl class and age during routine surveys.

ACTIVITY 1.2. Conduct a repeated surveys study to assess sightability and obtain a population estimate.

Data Needs

Improving our surveys to account for variation in sightability would give managers a tool to determine with some degree of statistical precision the changes in population size by providing a density estimate. A tool that may work to achieve this goal is a binomial mixture model that requires repeated sampling. These methods would require additional time and money that are likely not available but would enhance our understanding of population changes and improve ability to accurately classify sheep demographics.

Methods

In conjunction with routine aerial surveys repeated sampling with additional pilot-observer teams would allow for analysis of sightability using binomial mixture models. This could lead to a correction factor that was survey-area specific.

2. Mortality–Harvest Monitoring

ACTIVITY 2.1. Monitor harvest through harvest and sealing records.

Data Needs

Dall sheep harvest data are necessary to annually assess trends in harvest, corroborate anecdotal or incidental observations, survey results, and ensure that the population is not being harvested in excess of sustained yield.

Methods

No change from report. Harvested Dall sheep will continue to be sealed and collected information will be entered and stored in a database accessible through ADF&G's Wildlife Information Network (WinfoNet). Sealing data will be queried and analyzed annually or more frequently as needed.

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 section, this document.

Agreements

None.

Permitting

No change from report section, this document.

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ADF&G (Alaska Department of Fish and Game). 1976. Alaska wildlife management plans: Southcentral Alaska (draft proposal; subsequently approved by Alaska Board of Game). Division of Game, Federal Aid in Wildlife Restoration Project W-17-R, Juneau.

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Appendix. Mountain goat–sheep survey form, Southcentral Alaska.

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