

Dall Sheep Management Report and Plan, Game Management Units 7 and 15:

Report Period 1 July 2011–30 June 2016, and
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 Cynthia M. Wardlow, Region II Management Coordinator for the Division of Wildlife Conservation, Anchorage.

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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 Units 7 and 15 for the previous 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 them 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

Unit 7 (3,520 mi²); Unit 15A (1,314 mi²); Unit 15B (1,121 mi²); and Unit 15C (2,441 mi²).

Dall sheep range in Units 7 and 15 consists of the Kenai Mountains covering the majority of Unit 7, a fraction of Unit 15A, and the eastern edges of Units 15B and 15C. Approximately 78% of Unit 7 is comprised of federally managed lands: 50% U.S. Forest Service–Chugach National Forest; 22% National Park Service–Kenai Fjords National Park; 5% U.S. Fish and Wildlife Service–Kenai National Wildlife Refuge; and 1% other federal land. The Kenai National Wildlife Refuge is the largest landholder in Units 15A and 15B and all Dall sheep habitat is found within the refuge boundaries. The majority of sheep habitat in Unit 15C, which is southeast of Tustumena Lake, also falls within the boundaries of the Kenai National Wildlife Refuge. The Kenai Mountains are broken up into 32 sheep and goat survey units (Figure 1). Sheep have only consistently been found in 13 of these units (331, 332, 334, 337–339, 343, 344, 353, 355–358) since annual surveys began in the late 1960s. Three special management areas exist in Units 7 and 15 including the Cooper Landing Closed Area, Round Mountain, and Crescent Lake (338).

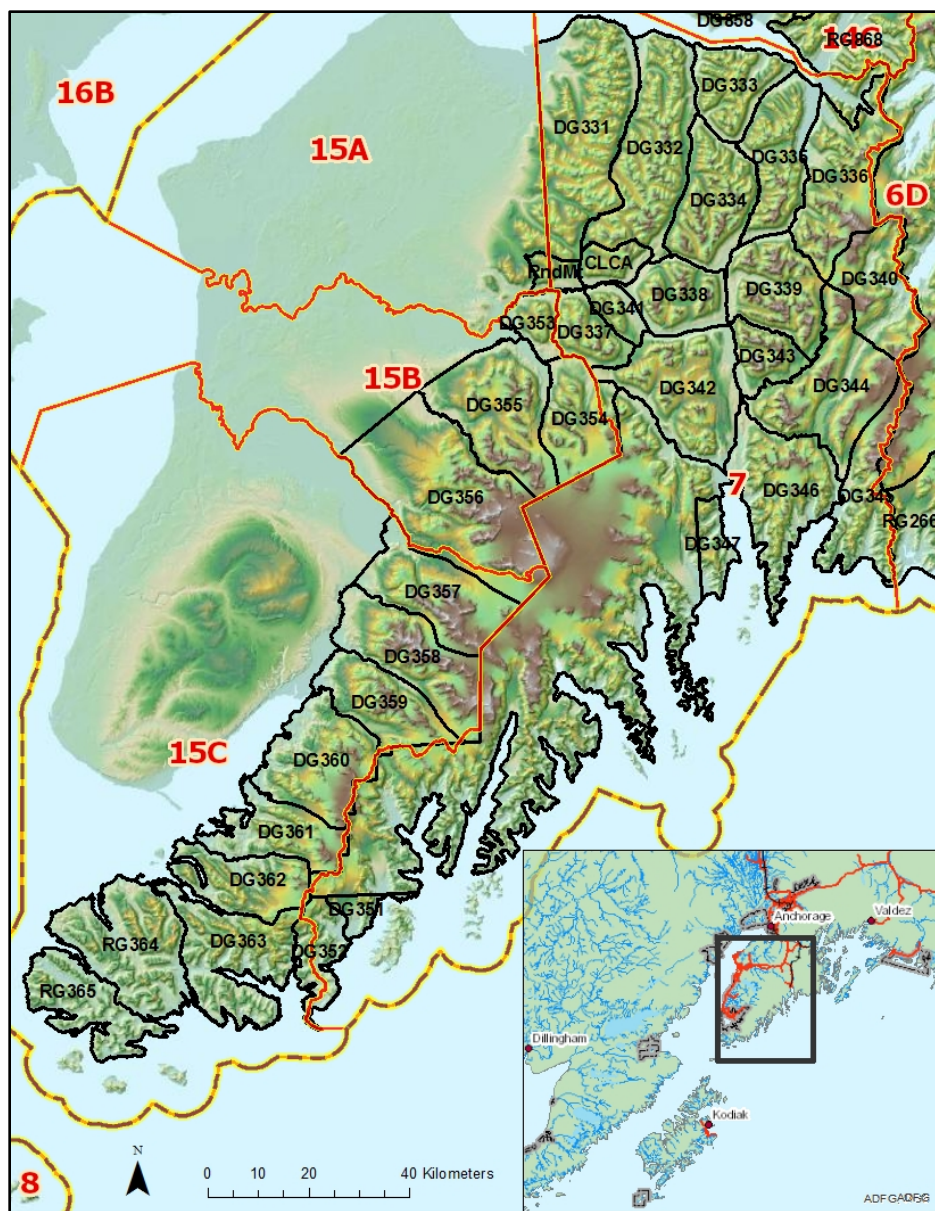


Figure 1. Dall sheep and mountain goat survey units for the Kenai Peninsula, Units 7 and 15, Southcentral Alaska.

Summary of Status, Trend, Management Activities, and History of Dall Sheep in Units 7 and 15

The Kenai Mountains are the southern limit of Dall sheep range in Alaska, which appears to play a key role in their current and historic numbers. Dall sheep were reportedly killed off in substantial numbers in the early 1900s during the building of the Alaska Central railroad and the rush days of the Hope–Sunrise placer mining district. In the late 1930s however, significant numbers were reported in the Snow River area (370) and the Indian Creek drainage (500) (Scott et al. 1950). During this time the annual bag limit was 1 ram. Federal managers closed the Kenai

Peninsula to sheep hunting in 1942 due to reportedly low numbers and a population estimate of 350 animals for the entire peninsula was given for 1949 (Scott et al. 1950). The Cooper Landing Closed Area was designated in 1953 closing all sheep and goat hunting in this area. In 1957, federal regulations list the reopening of sheep hunting on the Kenai Peninsula. The state took over management at statehood in 1959 and set the first bag limit at 1 ram 3/4 curl or larger with a 10–31 August general season. This season was later extended until 20 September in 1964, and regulations remained the same until 1979 when the bag limit was changed to 1 ram 7/8 curl or larger. Yearly aerial sheep surveys began in earnest in 1968 and since that time, a portion of Kenai sheep habitat has been surveyed each year. Minimum count surveys showed sheep numbers were substantially higher in 1968 (approximately 2,190 sheep) compared to the 1949 estimate of 350. From the late 1960s to late 1990s sheep numbers fluctuated between 1,000 and 2,000 animals. Unfortunately, sheep numbers have continuously declined since the late 1990s. In 1990, the state went to full-curl management and the bag limit on the Kenai has remained at 1 ram full curl or larger for the general season hunt since that time.

Factors driving the continued decline of sheep on the Kenai Peninsula at this time are unknown, but may include disease, predation, and habitat change. The current prevailing hypothesis is that changing habitat conditions with global climate change is the likely driving factor. Habitat changes, related to climate change, negatively affecting sheep include warmer wetter winters (Nichols 1971) and an increasing tree–shrub line and density causing a loss of habitat (Dial et al. 2007, 2016).

Management Direction

Adequately monitor population trends and allow for hunting opportunities with a sustainable harvest.

EXISTING WILDLIFE MANAGEMENT PLANS

- The 1976 Alaska wildlife management plan (ADF&G 1976) contained 4 separate sheep management plans for the Kenai Peninsula; the eastern Kenai Peninsula, Cooper Landing, Kenai Lake, and Tustumena sheep management plans. The primary goal of the eastern Kenai Peninsula plan was to provide the greatest opportunity to participate in hunting sheep. The Cooper Landing plan however was focused on providing the opportunity to view, photograph, and enjoy sheep. The Kenai Lake plan's primary goal was to provide the opportunity to take large sheep and the Tustumena plan focused on the harvest of sheep under aesthetically pleasing conditions.
- Recent management objectives, harvest strategies, and subsequent changes have resulted from public comment, staff recommendations, and Board of Game actions, and have been reported in the division's previous species management reports. The plan portion of this report contains the current management plan for sheep in Units 7 and 15.

GOALS

- Ensure long-term conservation of Dall sheep throughout their natural range on the Kenai Peninsula.

- Provide for sustainable harvest and viewing opportunities of Dall sheep on the Kenai Peninsula.

CODIFIED OBJECTIVES

No codified objectives exist for Dall sheep in Units 7 or 15.

Amounts Reasonably Necessary for Subsistence Uses

No subsistence finding currently exists for Dall sheep in Units 7 or 15.

Intensive Management

Dall sheep are not an intensive management species in Units 7 or 15.

MANAGEMENT OBJECTIVES

- Conduct minimum count surveys of all areas outside Kenai Fjords National Park at least once every 3 years.
- Maintain healthy, viable subpopulations (50 or more animals) of Dall sheep in Units 7 and 15.

MANAGEMENT ACTIVITIES

1. Population Status and Trend

ACTIVITY 1.1. Conduct a triannual minimum Dall sheep count in Units 7 and 15 using fixed-wing aircraft when appropriate conditions exist.

Data Needs

A minimum count of sheep is needed to ensure that a viable population of sheep persists on the Kenai Peninsula.

Methods

Minimum count surveys are conducted using a PA-18 or similar type aircraft when weather conditions allow; meaning the flight and visibility ceiling is high enough to survey the entire area, snow line is not a factor, and turbulence and temperatures are low, typically between July and September. All of these variables are figured into the “count condition” which is rated by the observer on a scale of 1–3 where 1 = excellent (good lighting, low temperature, overcast, smooth air, and observer alert); 2 = good to fair conditions; and 3 = poor (survey results likely to be significantly biased by the conditions, bumpy winds, high temps, poor lighting, sick observer).

Surveys are flown following the topography of the landscape. Transects are flown parallel to the mountain starting at the tree–alder line working up the mountain. Each face receives 2–3 passes depending on the mountain height and observability. When sheep are observed, the pilot circles the location so that the observer can note the number and classification of animals in each group.

Animals are classified into legal rams, sublegal rams, unclassified rams, ewe like, lambs, and unidentified. Additional animals are sometimes seen while circling. The location and movement of animals in the group is noted so that on consecutive passes animals are not recounted. By starting transects low, animals higher on the ridge are less likely to move down into the alder line where they are unobservable on consecutive passes. Survey length varies by count conditions, area covered, and the number of animals seen.

Results and Discussion

Minimum counts were accomplished in all Dall sheep management units on a 3-year minimum rotational cycle (Table 1). The general population trend suggests that numbers continue to decline and a limited number of full-curl rams exist in the population for harvest each year.

Table 1. Aerial sheep composition counts, Units 7 and 15, Southcentral Alaska, regulatory years^a 2011–2015.

Regulatory year	Rams			Unclassified		Total sheep observed ^b	Population trend ^c
	Full curl	<Full-curl or unclassified	Ewe like	sheep	Lambs		
2011	1	58	134	0	42	235	644
2012	3	37	42	0	10	92	603
2013	4	65	211	0	60	340	555
2014	1	51	186	28	21	287	495
2015	3	99	285	2	81	470	549

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

^b Location and number of areas surveyed varies by year.

^c Population trend is based on the most recent survey data for all management areas.

Five functional sheep areas or subpopulations are thought to exist within Units 7 and 15 based on our limited knowledge of sheep movement: 1) Resurrection Trail (count areas 331 and 332); 2) Kenai National Wildlife Refuge (count areas 354–359); 3) Grant Lake (count areas 339, 343, 344); 4) Cooper Mountain (count areas 337, 353); and 5) Crescent Lake (338). Within these areas, sheep numbers have declined over the past 5 years with the exception of Cooper Mountain, which has been maintained at minimal numbers (Table 2). Sheep numbers in Grant Lake, Cooper Mountain, and Crescent Lake are all at or approaching what has been recommended as a minimum viable population for wild sheep (50 animals, Berger 1990). As such, research needs to be initiated to determine connectivity of these areas, the cause of continued declines, and what actions can be taken to reverse the declines. Should population levels in any of these areas drop below the suggested minimum viable population level of 50 sheep, harvest should be suspended until levels can again be raised above 50 sheep.

Table 2. Population trend and percent lambs by subpopulation area, Units 7 and 15, Southcentral Alaska, regulatory years^a 2011–2015. Trend is an interpolation of the most recent minimum count data for each area. Percent lambs by year are calculated only from the portion of the area surveyed that year.

Regulatory year	Resurrection Trail		KNWR ^b		Grant Lake		Cooper Mountain		Crescent Lake	
	Total sheep trend	% Lambs	Total sheep trend	% Lambs	Total sheep trend	% Lambs	Total sheep trend	% Lambs	Total sheep trend	% Lambs
2011	170	17	233		93		51	14	97	
2012	161		225		74		51		92	11
2013	104	17	217	19	55	15	51		80	
2014	104	2	161	13	66		51	12	68	
2015	165	29	163	22	77	18	52	8	56	20

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

^b KNWR = Kenai National Wildlife Refuge.

Recommendations for Activity 1.1

Modify monitoring of Dall sheep to conduct sheep surveys on a 3-year rotational basis by functional sheep area in conjunction with mountain goat surveys. Survey Grant Lake, Cooper Mountain, and Crescent Lake on a yearly basis, when budgets and time allow, until numbers increase above 100 sheep in each area.

2. Mortality–Harvest Monitoring and Regulations

ACTIVITY 2.1. Monitor Dall sheep harvest through sealing records.

Data Needs

Horn sealing is needed annually to assess trends in harvest.

Methods

Horns from harvested sheep were sealed and accompanying data collected and archived in a database accessible through ADF&G's Wildlife Information Network (WinfoNet). Information recorded for each sheep includes curl, horn length and girth, date and location of kill, days hunted, method of take, and transportation used. Sealing is conducted by ADF&G personnel within 30 days of harvest. Harvest data are summarized by regulatory year (1 July–30 June).

Season and Bag Limit

Seasons and bag limits are listed online at

<http://www.adfg.alaska.gov/index.cfm?adfg=wildliferegulations.main>

Units and Bag Limits	Resident–Nonresident Open Seasons
<i>Unit 7</i>	
DS150: One ram full curl or larger.	10 Aug–20 Sep
DS156: One ram full curl or larger.	10 Aug–20 Sep
General: One ram full curl or larger.	10 Aug–20 Sep
Youth hunt: One ram full curl or larger.	1 Aug–5 Aug
<i>Unit 15</i>	
DS150: One ram full curl or larger.	10 Aug–20 Sep
General: One ram full curl or larger.	10 Aug–20 Sep
Youth hunt: One ram full curl or larger.	1 Aug–5 Aug

Results and Discussion

Harvest by Hunters

The average total sheep harvest over the past 5 seasons was 10 animals (Table 3). This is down from the previous 5-year average of 13 animals and far reduced from the long-term average (1981–2015) of 24 animals. The success rate of hunters has remained relatively stable over the past 5 years averaging 12%.

Table 3. Sheep hunter residency and success in the general season, Units 7 and 15, Southcentral Alaska, regulatory years^a 2011–2015.

Regulatory year	Successful					Unsuccessful				Total hunters
	Local ^b resident	Nonlocal resident	Nonresident	Total ^c	Percent success	Local ^b resident	Nonlocal resident	Nonresident	Total ^c	
2011	6	5	2	13	17	24	37	1	62	75
2012	3	5	2	10	11	41	37	3	81	91
2013	2	5	1	8	8	35	56	1	92	100
2014	2	6	0	8	11	21	42	2	66	74
2015	3	5	1	9	11	32	38	9	79	88

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

^b Residents of Units 7 and 15.

^c Includes unspecified residency.

Hunter Residency and Success

Resident hunters continue to be responsible for the majority of harvest and hunting pressure on the Kenai with nonresidents taking an average of only 1 animal per year (Table 3). While nonresidents make up a small fraction of the harvest and harvest effort, their success rate is significantly higher averaging 30% versus the resident success rate of 9%. This may be due to the guide requirement for nonresident hunters.

Permit Hunts

Only 9 draw permits are given out each year on the Kenai under our current management system. As such, very little of the total sheep harvest is taken under permit (Table 4). The success rate of permit hunters is higher than general season success rates averaging 23% over the past 5 years.

Table 4. Results of drawing permit hunt, Units 7 and 15, Southcentral Alaska, regulatory years^a 2011–2015.

Hunt	Regulatory year	No. of permits issued	No. of hunters	Harvest	Percent success
Round Mt. Ram (DS150)	2011	3	1	1	100
	2012	3	2	1	50
	2013	3	3	0	0
	2014	3	3	0	0
	2015	3	3	0	0
Crescent Lake Ram (DS156)	2011	6	3	1	33
	2012	6	3	1	33
	2013	6	5	1	20
	2014	6	4	0	0
	2015	6	3	0	0

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

Harvest Chronology

The majority of sheep harvest occurred during the first week of the season during this management period (Table 5), which is no change from the previous report period.

Table 5. Chronology of general season sheep harvest, Units 7 and 15, Southcentral Alaska, regulatory years^a 2011–2015.

Regulatory year	Harvest periods						Harvest
	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	7	2	1	1	1	1	13
2012	7	1	0	0	2	0	10
2013	7	0	0	0	0	1	8
2014	3	3	0	1	1	0	8
2015	8	0	1	0	0	0	9

^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 most common methods of transport to field are highway vehicle and airplane (Table 6). This is likely a reflection of where sheep populations are located on the Peninsula and the land management regulations that govern these areas. KNWR, which holds a significant portion of the sheep population, does not allow wheeled access to sheep country, and on the Chugach National Forest human-powered or pack animal access from major road systems is the most common means of access.

Table 6. Transportation used by successful Dall sheep hunters, Units 7 and 15, Southcentral Alaska, regulatory years^a 2011–2015.

Regulatory year	3- or 4-wheel ATV ^b	Airplane	Boat	Highway vehicle	Horse–Dog team	ORV ^c	Unknown	Harvest
2011	0	4	2	5	2	0	0	13
2012	0	6	1	2	0	0	1	10
2013	0	3	0	5	0	0	0	8
2014	1	2	2	1	1	0	1	8
2015	1	2	1	5	0	0	0	9

^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 vehicles.

^c ORV = off-road vehicles.

Results and Discussion

Overall sheep harvest opportunities and success rates continue to decline with the population.

Alaska Board of Game Actions and Emergency Orders

In 2015, the Board of Game passed a regulation prohibiting the use of aircraft to locate Dall sheep for hunting or to direct hunters to sheep during the open sheep hunting season from 10 August through 20 September.

Recommendations for Activity 2.1

Continue monitoring sheep harvest through horn sealing.

3. Habitat Assessment–Enhancement

ACTIVITY 3.1. No habitat assessment or enhancement activities were undertaken during this report period.

Recommendations for Activity 3.1

Modify habitat assessment and enhancement to begin habitat assessment and enhancement activities by subpopulation range.

NONREGULATORY MANAGEMENT PROBLEMS OR NEEDS

Data Recording and Archiving

- Sheep and goat survey data sheets are stored in the Homer office filing cabinet (Appendix).
- Electronic records of the survey results, track files, and animal locations are stored on the Homer office shared drive (O):DWC/ADF&G-Homer Files/Species Data/

Agreements

No sheep management agreements exist at this time.

Permitting

No sheep-specific permits exist at this time.

Conclusions and Management Recommendations

Dall sheep on the Kenai Peninsula are in a long-term decline. Current survey efforts have been adequate to document this decline. The cause of the decline is unknown but does not appear to be driven by harvest as the Kenai Peninsula is under full-curl harvest and harvest has declined in conjunction with population declines. Several of our subpopulations however, are approaching what the literature suggests as minimum viable populations for wild sheep, which in turn means the loss of any individuals from the population could be detrimental.

A likely cause of declining sheep numbers is the loss of quality winter habitat and thus a decrease in carrying capacity. No recent efforts have been made to evaluate habitat. Work conducted by Dial et al. (2007) and Dial et al. (2016) suggests that tree and shrub line are increasing and overall sheep habitat is diminishing due to climate change. Climate change is also likely causing a change in snow conditions with heavier wetter snow and increasing icing events. Such conditions have historically been documented to cause sheep declines (Nichols 1975). Research should be conducted to determine the cause of sheep declines, connectivity of subpopulations, and to help develop a plan to reverse this trend. Should the current trajectories continue and minimum count numbers indicate that numbers have dropped below minimum viable levels in any subpopulation (50 animals); harvest should be halted until numbers can be increased.

II. Project Review and RY16–RY20 Plan

Review of Management Direction

MANAGEMENT DIRECTION

The existing management direction and goals appropriately direct management of Dall sheep in Units 7 and 15.

GOALS

- Ensure long-term conservation of Dall sheep throughout their natural range on the Kenai Peninsula.
- Provide for sustainable harvest and viewing opportunities of Dall sheep on the Kenai Peninsula.

CODIFIED OBJECTIVES

No codified objectives exist for sheep in Units 7 or 15.

Amount Reasonably Necessary for Subsistence Uses

No subsistence finding currently exists for Dall sheep in Units 7 or 15.

Intensive Management

Dall sheep are not an intensive management species in Units 7 or 15.

MANAGEMENT OBJECTIVES

- Survey all areas outside Kenai Fjords National Park at least once every 3 years.
- Maintain a healthy, viable population of Dall sheep in Units 7 and 15.

REVIEW OF MANAGEMENT ACTIVITIES

1. Population Status and Trend

ACTIVITY 1.1. Conduct a triannual minimum Dall sheep count in Units 7 and 15 using fixed-wing aircraft when appropriate conditions exist.

Data Needs

No change from prior reporting period.

Methods

Minimum count surveys should continue to be conducted on a 3-year rotational basis following protocols established in the previous 5-year plan. Surveys, however, should be rotated by subpopulation and frequency should be increased as budgets allow for subpopulations below 100 animals.

2. Mortality–Harvest Monitoring

ACTIVITY 2.1. Monitor Dall sheep harvest through sealing records.

Data Needs

No change from the prior reporting period.

Methods

No change from the prior reporting period.

3. Habitat Assessment–Enhancement

ACTIVITY 3.1. No habitat assessment or enhancement activities were undertaken during this report period.

Data Needs

Data are needed on the current state of Dall sheep habitat by subpopulation.

Methods

Basic habitat assessment of Dall sheep range by management area should be undertaken and compared to previous work conducted on the Kenai (Culbertson et al. 1980, 1981, 1982). Vegetation yield and plant community composition can be measured using biomass removal clip and weigh line transect plots, the double sampling method of Pechanec and Pickford (1937), or an equivalent method.

In areas where vegetative yields are found to be lacking, tree line encroaching, or tree and shrub density increasing, the viability of using prescribed fire or other habitat enhancement techniques should be evaluated by land management agencies to increase forage production.

Previous work has shown that prescribed fire can increase carrying capacity of wild sheep range (Elliot 1978; Hoefs 1979; Culbertson and Walker 1981; Peek et al. 1984; Seip and Bunnell 1984). Factors that need to be considered before the application of prescribed fire include the ability of key forage species to resprout or reseed after burning, timing of burns to emphasize regrowth of desired species, and size and distribution of burn plots to prevent crowding of range before treatments yield forage growth. Burns on both summer and winter range can be beneficial as higher quality summer range can help sheep enter winter in better body condition providing a higher chance of survival on lower quality winter range. To achieve maximum benefit for winter ranges, windblown slopes that facilitate foraging should be identified for treatment.

NONREGULATORY MANAGEMENT PROBLEMS OR NEEDS

No nonregulatory management problems or needs exist at this time.

Data Recording and Archiving

- Sheep and goat survey data sheets are stored in the Homer office filing cabinet (Appendix).
- Electronic records of the survey results, track files, and animal locations are stored on the Homer office shared drive (O):DWC/ADF&G-Homer Files/Species Data/

Agreements

No management agreements exist at this time.

Permitting

No sheep-specific permits exist at this time.

References Cited

- (ADF&G) Alaska Department of Fish and Game. 1976. Alaska wildlife management plans: Southcentral Alaska (draft proposal subsequently approved by the Alaska Board of Game). Division of Game, Federal Aid in Wildlife Restoration Project W-17-R, Juneau.
- Berger, J. 1990. Persistence of different-sized populations: An empirical assessment of rapid extinctions in bighorn sheep. *Conservation Biology* 4(1):91–98.
- Culbertson, J. L., S. M. Howell, K. Nelson, and L. Nichols. 1982. Surprise Mt. Dall sheep winter range survey 1982. Chugach National Forest, Alaska Department of Fish and Game, and Kenai National Wildlife Refuge, Report.
- Culbertson, J. L., and R. M. Walker. 1981. Round Mountain fire effects and sheep range survey 1981. Seward Ranger District, Chugach National Forest, USDA. Forest Service, Project #308102.
- Culbertson, J. L., R. M. Walker, and G. Dunne. 1980. Round Mt. fire effects and sheep range survey 1980. Seward District, Chugach National Forest, USDA. Forest Service, Report.
- Culbertson, J. L., R. M. Walker, R. Howenstein, and J. Ver Hoef. 1981. Dall sheep winter range surveys 1980. Seward Ranger District, Chugach National Forest, USDA Forest Service, Report.
- Dial, R. J., E. E. Berg, K. Timm, A. McMahon, and J. Geck. 2007. Changes in the alpine forest-tundra ecotone commensurate with recent warming in southcentral Alaska: Evidence from orthophotos and field plots. *Journal of Geophysical Research* 112, G04015:1–15.
- Dial, R. J., S. T. Smeltz, P. F. Sullivan, C. L. Rinas, K. Timm, J. E. Geck, T. S. Carl, T. S. Golden, and E. C. Berg. 2016. Shrubline but not treeline advance matches climate

- velocity in montane ecosystems of south-central Alaska. *Global Change Biology* 22(5):1841–1856.
- Elliot, J. P. 1978. Range enhancement and trophy production in Stone Sheep. Pages 113–118 [In] *Proceedings Northern Wild Sheep and Goat Council*, 11–14 April 1978, Penticton, British Columbia, Canada.
- Hoefs, M. 1979. The use of prescribed burning to improve Dall sheep habitat in the Yukon. Pages 183–189 [In] *Proceedings of workshop “Wildlife and Wild Fire,”* 27–28 November 1979, Whitehorse, Yukon, Canada.
- Nichols, L. 1971. The Dall sheep and its management in Alaska. Pages 2–8 [In] E. Decker, editor. *Transactions of the 1st North American Wild Sheep Conference*, 14–15 April 1971, Fort Collins, Colorado. Colorado State University, Department of Fishery and Wildlife Biology, Fort Collins, Colorado.
- Nichols, L. 1975. Report and recommendations of the Dall and Stone Sheep Workshop Group. Pages 208–266 [In] J. B. Trefethen, editor. *The wild sheep in modern North America: Proceedings of the workshop on the management biology of North American wild sheep*, 18–20 June 1974, Missoula, Montana.
- Pechanec, J. F., and G. D. Pickford. 1937. A weight estimate method for determination of range or pasture production. *Journal of American Society of Agronomists* 29(11):894–904.
- Peek, J. M., D. A. Demarchi, R. A. Demarchi, and D. E. Stucker. 1984. Bighorn sheep and fire: seven case histories. Pages 36–43 [In] *Fire’s Effects on Wildlife Habitat Symposium Proceedings*, 21 March 1984, Missoula, Montana.
- Scott, R. F., E. F. Chatelain, and W. A. Elkins. 1950. The status of the Dall sheep and caribou in Alaska. *North American Wildlife Conference Transcripts* 15:612–626.
- Seip, D. R., and F. L. Bunnell. 1984. Range burning, Stone’s sheep and the leaky bucket. Pages 44–47 [In] *Fire’s Effects on Wildlife Habitat Symposium Proceedings*, 21 March 1984, Missoula, Montana.



Appendix. Kenai Peninsula mountain goat and Dall sheep survey form, Southcentral Alaska.

Kenai Mountain Goat Survey Form (July 2017) Page _____ of _____

Survey Unit:										Date:		Pilot/Observers:					
Sky Conditions: Clear Partly Cloudy Overcast										Ceiling:		Wind:		Aircraft Type:			
Temp1:			Temp2:			Temp3:			Temp4:			Start Survey:		Take off:			
Comments:										End Survey:		Landing:		Total Survey Time:		Total flight time:	

WPT/ Group	# Goats			# Sheep							Terrain	Habitat	Collared Goats		Comments/Bears
	Adults	Kids	Total	Ewe Like	Lambs	Legal Rams	Sub Rams	Unclass Rams	Un ID	Total			Collar IDs	Seen / Missed	
											S B VB	R M T SF MF S			
											S B VB	R M T SF MF S			
											S B VB	R M T SF MF S			
											S B VB	R M T SF MF S			
											S B VB	R M T SF MF S			
											S B VB	R M T SF MF S			
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											S B VB	R M T SF MF S			
											S B VB	R M T SF MF S			
											S B VB	R M T SF MF S			
Pg 1											Terrain:	Habitat:	Collar ID	Seen / Missed	Comments
Pg 2											Smooth	R = Rocky			
											Broken	M = Alpine Meadow			
Pg 3											Very Broken	T = Thicket			
												SF = Subalpine Fst.			
												MF = Mature Fst			
Total												S = Snow			

