

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

Report Period 1 July 2016–30 June 2021, and
Plan Period 1 July 2021–30 June 2026

Jason Herreman



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PREPARED BY:

Jason Herreman

Assistant Area Biologist

APPROVED BY:

Jeff Selinger

Management Coordinator

REVIEWED BY:

Tom Lohuis

Research Coordinator

Kyle Smith

Wildlife Research Biologist

PUBLISHED BY:

Susan Erben

Technical Reports Editor

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Alaska Department of Fish and Game

Division of Wildlife Conservation

PO Box 115526

Juneau, AK 99811-5526



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Species management reports and plans provide information about species that are hunted or trapped and management actions, goals, recommendations for those species, and plans for data collection. Detailed information is prepared for each species every 5 years by the area management biologist for game management units in their areas, who also develops a plan for data collection and species management for the next 5 years. This type of report is not produced for species that are not managed for hunting or trapping or for areas where there is no current or anticipated activity. Unit reports are reviewed and approved for publication by regional management coordinators and are available to the public via the Alaska Department of Fish and Game's public website.

This species management report and plan was reviewed and approved for publication by Jeff Selinger, Management Coordinator for Region II for the Division of Wildlife Conservation.

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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 Game Management Units 7 and 15 for the 5 regulatory years 2016–2020 and plans for survey and inventory management activities in the next 5 regulatory years, 2021–2025. A regulatory year (RY) begins 1 July and ends 30 June (e.g., RY15 = 1 July 2015–30 June 2016). This report is produced primarily to provide agency staff with data and analysis to help guide and record agency 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, the department) Division of Wildlife Conservation (DWC, the division) launched this 5-year report to report more efficiently on trends and to describe potential changes in data collection activities over the next 5 years. It replaces the Dall sheep management report of survey and inventory activities that was previously produced every 3 years.

I. RY16–RY20 Management Report

Management Area

The management area comprises Units 7 (3,520 mi²), 15A (1,314 mi²), 15B (1,121 mi²), and 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 comprises 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 (KNWR); and 1% other federal land. The KNWR is the largest landholder in Units 15A and 15B and all Dall sheep habitat is found within the KNWR boundaries. The majority of sheep habitat in Unit 15C, which is southeast of Tustumena Lake and the Fox River, also falls within the boundaries of the KNWR. 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: the Cooper Landing Closed Area (CLCA), Round Mountain (RndMt), and Crescent Lake (338).

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 slaughtered in significant numbers in the early 1900s during the building of the Alaska Central railroad and the gold rush days of the Hope-Sunrise placer mining district. In the late 1930s, however, substantial numbers were reported in the Snow River area (370 sheep) and the Indian Creek drainage (500 sheep) (Scott et al. 1950). During this time the annual bag limit was one ram. Federal managers closed the Kenai Peninsula to sheep hunting in 1942 due to low numbers. In 1949 a population estimate of 350 animals for the entire Peninsula was reported (Scott et al. 1950). The Cooper

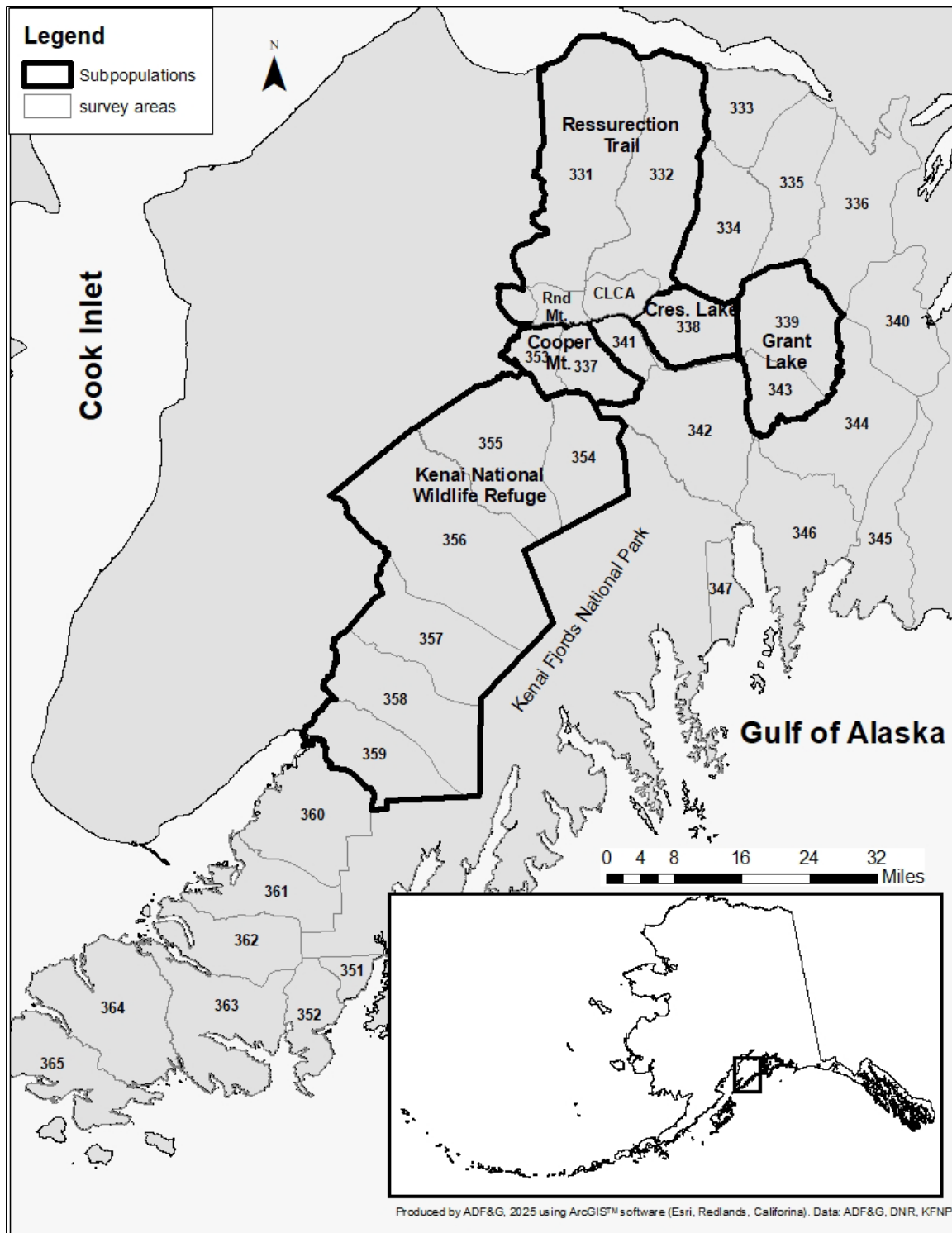


Figure 1. Dall sheep survey units and subpopulations for the Kenai Peninsula GMUs 7 and 15. Sheep have only consistently been found in 13 of these units (331, 332, 334, 337-339, 343, 344, 353, 355-358) since annual surveys began in the late 1960s.

Note: RndMt refers to Round Mountain, Cooper Mt refers to Cooper Mountain, Cres. Lake refers to Crescent Lake, and CLCA stands for the Cooper Landing Closed Area.

Landing Closed Area (CLCA) 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 $\frac{3}{4}$ -curl or larger, with a 10–31 August general season. In 1964, this season was extended until 20 September. Regulations then remained the same until 1979 when the bag limit was changed to 1 ram $\frac{7}{8}$ -curl or larger. In 1990, the state adopted the full-curl management strategy, and the bag limit on the Kenai has remained at 1 ram full curl or larger for the general season hunt since that time.

Consistent aerial sheep survey efforts began in 1968. Since that time, a portion of the Kenai Mountains have 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 based on minimum count survey information. Sheep numbers have continuously declined since the late 1990s.

Factors driving the continued decline of sheep numbers on the Kenai Peninsula at this time are unknown, but may include disease, predation, winter weather severity, and habitat change. The current hypothesis of management staff is that changing habitat conditions because of climate change is the likely driving factor. Habitat changes related to climate change may negatively affect sheep via warmer wetter winters (Nichols 1971) and/or the tree/shrub line moving upslope and increasing in density causing a loss of foraging habitat (Dial et al. 2007, Dial et al. 2016). Warmer wetter winters can decrease food availability through heavy wet snow that does not blow off slopes and icing events that trap forage below layers sheep are unable to dig through. Wetter heavier snow can also add an increased cost to locomotion. This hypothesis is supported by work conducted by Lohuis et al. (2018) in the Chugach Mountains.

Management Direction

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 Dall 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 was focused on providing the opportunity to view, photograph, and enjoy sheep, while 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 management 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 under 5 AAC 99.025.

Intensive Management

No Dall sheep populations are identified for intensive management under 5 AAC 92.106.

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 triennial minimum Dall sheep counts in Units 7 and 15 using fixed wing aircraft when appropriate conditions exist.

Data Needs

A minimum count of sheep is needed to monitor the population trajectory and determine whether hunting opportunity is available.

Methods

Minimum count surveys are conducted using a PA-18 or similar type aircraft in conjunction with mountain goats (*Oreamnos americanus*) when weather conditions allow; meaning the flight and visibility ceilings are high enough to survey the entire area, the 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” that 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, 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 and increasing altitude with each subsequent pass. 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 at low altitude, animals higher on the ridge are less likely to move down into the alder line where they would be unobservable on later passes. Survey length varies by count conditions, area covered, and the number of animals seen.

Results and Discussion

Minimum counts were accomplished in all sheep management units on a 3-year minimum rotational cycle through RY19 (Table 1). In RY20, no budget was available to focus survey efforts on sheep-specific areas for the Kenai Peninsula due to Covid-related budget shortfalls within the department. Survey data collected in RY20 was from one sheep management unit, Indian Creek (count area 356), flown as a priority mountain goat survey area. The general population trend suggests that numbers continue to decline and only a limited number of full-curl rams exist in the population for harvest each year.

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 (count area 338). Within these areas, sheep numbers have declined over the past 5 years (Tables 2a–2e). Sheep numbers in the Resurrection Trail, Grant Lake, Cooper Mountain, and Crescent Lake areas are all approaching or below what has been recommended as a minimum viable population for wild sheep. While the exact number needed to maintain a viable population has been debated, translocation efforts and modeling approaches would suggest minimum viable population numbers for wild sheep lie somewhere between 30 and 50 animals (Berger 1990; Krausman et al. 1993; Goodson 1994; Wehausen 1999; Singer et al. 2000a, b).

As such, research needs to be initiated to determine the connectivity of these areas, the cause of continued declines, what actions if any can be taken to reverse the declines, and whether harvest at these low numbers is additive or compensatory. Until more information is known, and it can be shown that harvest is not additive to the declines, managers should take a precautionary approach. Population levels in the Cooper Mountain and Crescent Lake areas dropped below the suggested minimum viable population level of 50 sheep, and legal rams were not observed in these areas or in the Round Mountain permit area during recent minimum-count flights, which caused harvest to be suspended in the Crescent Lake and Round Mountain permit areas in 2021 (outside the report period). Harvest should likely be suspended in the Cooper Mountain area as well.

Table 1. Aerial sheep composition counts, Units 7 and 15, regulatory years 2016–2020, Southcentral Alaska.

Regulatory year	Rams		Ewe-likes ^a	Unclassified sheep	Lambs	Total sheep observed ^b	Sheep/hour	Number of units surveyed	Population trend ^c
	Full curl	<Full-curl or unclassified							
2016	4	100	231	2	48	385	16	10	476
2017	7	80	199	2	47	335	8	8	473
2018	7	66	174	2	48	297	17	6	435
2019	2	29	77	2	16	126	9	7	399
2020 ^d	2	10	76	0	16	104	21	1	384

^a “Ewe-likes” includes ewes, yearlings of both sexes, and rams of ¼ curl or less.

^b The location and number of areas surveyed varies by year.

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

^d No budget was available in RY20 for sheep-specific surveys on the Kenai Peninsula due to Covid-related budget shortfalls within the department. The RY20 survey data shown in the table was collected in one sheep management unit, Indian Creek (count area 356), during mountain goat survey flights.

Table 2a. Resurrection Trail unit, minimum count data and population trend by subpopulation, Units 7 and 15A, regulatory years 2016–2020, Southcentral Alaska.

Regulatory year	331		Round Mountain		332		CLCA		Total sheep trend	Lambs:100 ewe-likes ^a
	Total sheep	Lambs	Total sheep	Lambs	Total sheep	Lambs	Total sheep	Lambs		
2016	–	–	65	18	–	–	11	0	131	49
2017	81	13	–	–	–	–	38	0	119	16
2018	50	6	–	–	18	3	–	–	68	26
2019	–	–	–	–	–	–	–	–	68	–
2020	–	–	–	–	–	–	–	–	68	–

Note: Column headers 331 and 332 are count areas. Round Mountain is a permit area and CLCA stands for Cooper Landing Closed Area. Population trend is an interpolation of the most recent minimum count data for each area.

^a “Ewe-likes” includes ewes, yearlings of both sexes, and rams of ¼ curl or less.

Table 2b. Kenai National Wildlife Refuge unit, minimum count data and population trend by subpopulation, Units 15B and 15C, regulatory years 2016–2020, Southcentral Alaska.

Regulatory year	354		355		356		357		358		359		Total sheep trend	Lambs: 100 ewe-likes ^a
	Total sheep	Lambs	Total sheep	Lambs	Total sheep	Lambs	Total sheep	Lambs	Total sheep	Lambs	Total sheep	Lambs		
2016	–	–	27	5	112	4	–	–	2	0	0	0	182	9
2017	–	–	–	–	–	–	31	6	–	–	–	–	172	43
2018	0	0	29	2	148	32	39	4	13	1	0	0	229	6
2019	–	–	–	–	–	–	–	–	–	–	–	–	205	–
2020	–	–	–	–	104	16	–	–	–	–	–	–	181	21

Note: Column headers 354–359 are the count areas in the units. Population trend is an interpolation of the most recent minimum count data for each area.

^a “Ewe-likes” includes ewes, yearlings of both sexes, and rams of ¼ curl or less.

Table 2c. Grant Lake unit, minimum count data and population trend by subpopulation, Unit 7, regulatory years 2016–2020, Southcentral Alaska.

Regulatory year	339		343		344		Total sheep trend	Lambs: 100 ewe-likes ^a
	Total sheep	Lambs	Total sheep	Lambs	Total sheep	Lambs		
2016	34	3	22	3	–	–	56	21
2017	25	4	–	–	6	0	55	19
2018	–	–	–	–	–	–	58	–
2019	23	2	28	3	11	0	62	12
2020	–	–	–	–	–	–	62	–

Note: Column headers 339, 343, and 344 are the count areas in the unit. Population trend is an interpolation of the most recent minimum count data for each area.

^a “Ewe-likes” includes ewes, yearlings of both sexes, and rams of ¼ curl or less.

Table 2d. Cooper Mountain unit, minimum count data and population trend by subpopulation, Units 7 and 15B, regulatory years 2016–2020, Southcentral Alaska.

Regulatory year	337		353		Total sheep trend	Lambs:100 ewe-likes ^a
	Total sheep	Lambs	Total sheep	Lambs		
2016	25	3	29	5	54	23
2017	—	—	—	—	48	—
2018	—	—	—	—	41	—
2019	20	5	15	1	35	25
2020	—	—	—	—	35	—

Note: Column headers 337 and 353 are the count areas in the units. Population trend is an interpolation of the most recent minimum count data for each area.

^a “Ewe-likes” includes ewes, yearlings of both sexes, and rams of ¼ curl or less.

Table 2e. Crescent Lake unit, minimum count data and population trend by subpopulation, Unit 7, regulatory years 2016–2020, Southcentral Alaska.

Regulatory year	338		Total sheep trend	Lambs:100 ewe-likes ^a
	Total sheep	Lambs		
2016	58	7	58	21
2017	50	10	50	33
2018	—	—	39	—
2019	28	5	28	38
2020	—	—	28	—

Note: Column header 338 is the count area in the unit. Population trend is an interpolation of the most recent minimum count data for each area.

^a “Ewe-likes” includes ewes, yearlings of both sexes, and rams of ¼ curl or less.

Recommendations for Activity 1.1

Continue monitoring Dall sheep by conducting sheep surveys on a 3-year rotational basis by functional sheep area in conjunction with mountain goat surveys. Survey Resurrection Trail, 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. Close all areas with a subpopulation below 50 sheep to hunting.

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 the ADF&G Wildlife Information Network database (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.

Season and Bag Limit

Seasons and bag limits are listed online at

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

	Unit and Bag Limits	Resident/Nonresident Open Seasons
Unit 7	DS150 ^a : One ram full curl or larger	10 Aug–20 Sep
	DS156 ^a : 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
Unit 15	DS150 ^a : 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

^a No permits were issued for DS150 or DS156 in 2021 or 2022.

Results and Discussion

Harvest by Hunters

Hunter harvest continues to decline with the population. The average yearly total sheep harvest over the RY16–RY20 reporting period was 5 animals (Table 3). This is down from the previous 5-year (RY11–RY15) average of 10 animals and is further below the long-term average (RY81–RY15) of 24 animals. The success rate of hunters also declined during RY16–RY20 to 8% from the previous 5-year average of 12% (Table 3).

Permit Hunts

A small portion of the Kenai sheep harvest is managed under draw permit. ADF&G has decreased the number of permits available in recent years as sheep populations have continued to decline (Table 4). The success rate of permit hunters has averaged 33% during RY16–RY20, which is higher than the general season success rate.

Hunter Residency and Success

During RY16–RY20, Alaska resident hunters continued to be responsible for the majority of sheep harvest (81%) and hunting pressure (96%) on the Kenai (Table 3). Nonresident sheep harvest made up 19% of the harvest and 4% of the overall effort. The nonresident hunters' success rate of 31% is disproportionately higher than the resident success rate of 7%. This may be due to the guide requirement for nonresident hunters.

Table 3. Sheep hunter residency and success in the general season, Units 7 and 15, regulatory years 2016–2020, Southcentral Alaska.

Regulatory year	Successful					Unsuccessful				Total hunters
	Local resident ^a	Nonlocal resident ^a	Non-resident	Total ^b	Percent success	Local resident ^a	Nonlocal resident ^a	Non-resident	Total ^b	
2016	1	1	1	3	3	35	45	4	84	87
2017	2	4	1	7	12	23	27	1	51	58
2018	0	5	1	6	8	24	41	0	65	71
2019	1	2	1	4	6	28	38	2	68	72
2020	2	3	1	6	9	18	44	2	64	70

^a Local resident refers to residents of Units 7 and 15; nonlocal resident refers to Alaska residents who live outside Units 7 and 15.

^b Includes those with unspecified residency.

Table 4. Drawing permit hunts, Units 7 and 15, regulatory years 2016–2020, Southcentral Alaska.

	Regulatory Year	Number of permits issued	Number of hunters	Harvest	Percent success
Round Mountain (DS 150)	2016	3	3	1	33
	2017	3	2	1	50
	2018	3	3	1	33
	2019	3	2	1	50
	2020	2	2	1	50
Crescent Lake (DS 156)	2016	6	5	2	40
	2017	6	5	0	0
	2018	6	5	0	0
	2019	4	4	0	0
	2020	2	2	1	50

Note: After the RY16–RY20 reporting period, permit hunts were closed in RY21.

Harvest Chronology

The majority of sheep harvest (58%) occurred during the first week of the general season during RY16–RY20 (Table 5), which is similar to RY11–RY15 (67%). Note that an early (1–5 August) 5-day youth season was added in RY16.

Table 5. General season sheep harvest chronology, Units 7 and 15, regulatory years 2016–2020, Southcentral Alaska.

Regulatory year	Harvest periods							Harvest
	1–5 Aug ^a	10–16 Aug ^b	17–23 Aug	24–30 Aug	31 Aug–6 Sep	7–13 Sep	14–20 Sep	
2016	0	2	0	0	1	0	0	3
2017	0	4	0	1	1	1	0	7
2018	1	3	0	0	2	0	0	6
2019	0	3	1	0	0	0	0	4
2020	0	3	3	0	0	0	0	6

^a An early (1–5 August) 5-day youth season was added in RY16.

^b The first week of the general season.

Transport Methods

The most common methods of transport to the field during RY16–RY20 were 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. The KNWR, which holds a significant portion of the sheep population, does not allow wheeled access to sheep country, and aircraft access is limited to a small number of lakes where it is legal to land a floatplane. On the Chugach National Forest, human-powered or pack animal access from major road systems is relatively easy.

Table 6. Transportation used by successful general season sheep hunters, Units 7 and 15, regulatory years 2016–2020, Southcentral Alaska.

Regulatory year	3- or 4-Wheeler	Airplane	Boat	Highway vehicle	Horse or dog team	ORV ^a	Unknown	Harvest
2016	0	1	0	1	0	0	1	3
2017	0	2	2	3	0	0	0	7
2018	0	2	0	4	0	0	0	6
2019	0	2	0	2	0	0	0	4
2020	0	3	1	2	0	0	0	6

^a ORV stands for off-road vehicle.

Alaska Board of Game Actions and Emergency Orders

- In 2016, the Board of Game passed a statewide bag limit for nonresidents of 1 sheep every 4 years.
- A 5-day youth-only season was established statewide in 2016 from 1 August to 5 August.

Recommendations for Activity 2.1

Continue monitoring Dall sheep harvest through horn sealing.

3. Habitat Assessment-Enhancement

No activities for Dall sheep habitat assessment or enhancement were included in Units 7 and 15 Dall sheep management during RY16–RY20.

NONREGULATORY MANAGEMENT PROBLEMS OR NEEDS

Data Recording and Archiving

- Dall sheep and goat survey data sheets (Appendix 1) are stored in the Homer ADF&G office filing cabinet.
- Electronic records of the survey results, track files, and animal locations are stored on the Division of Wildlife Conservation shared drive in Homer at the following address:
O:\DWC\ADF&G-Homer Files\Species Data.
- State Dall sheep harvest data are stored on an internal database, ADF&G's WinfoNet.

Agreements

Currently there are no agreements with other agencies pertaining to Dall sheep management.

Permitting

No permits were needed to conduct Dall sheep management activities in Units 7 and 15 during RY16–RY20.

Conclusions and Management Recommendations

Dall sheep on the Kenai Peninsula are in a long-term decline. Survey efforts, until 2020, 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 managed under the full curl harvest strategy and harvest has declined in conjunction with population declines. Several of our subpopulations however, are approaching or below 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 quality or

quantity. Work conducted by Dial et al. (2007) and Dial et al. (2016) suggests that shrub line is increasing in elevation at 2.3 meters per year moving upslope and the overall amount of sheep habitat may be diminishing due to climate change. Climate change may also be 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 help better understand the cause of sheep declines and the connectivity of subpopulations, and to help develop a plan to potentially reverse this trend. Should minimum count numbers in subpopulations continue to decline, harvest should be halted until numbers increase.

In 2020, the Federal Subsistence Board, over objections by the department, passed a new draw hunt for $\frac{3}{4}$ -curl rams for the community of Ninilchik in Unit 15 (DS1509) with management authority delegated to the KNWR manager. In 2022, the Federal Subsistence Board created a new hunt in Unit 7 for federally qualified subsistence users to be managed by the Seward district ranger of the U.S. Forest Service. Additionally, the Federal Subsistence Board delegated specific regulatory authority to the Seward District ranger to issue emergency or temporary special actions if necessary to ensure the conservation of a healthy wildlife population for federal public lands subject to Alaska National Interest Lands Conservation Act (ANILCA) Title VII jurisdiction within Unit 7 for the management of Dall sheep. The federal subsistence system continues to remain a challenge for state managers on the Kenai Peninsula.

II. Project Review and RY21–RY25 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 Dall sheep management in Units 7 or 15 during RY21–RY25.

Amounts Reasonably Necessary for Subsistence Uses

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

Intensive Management

No Dall sheep populations are identified for intensive management under 5 AAC 92.106.

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

Data Needs

No change from RY16–RY20.

Methods

Minimum count surveys will continue to be conducted on a 3-year minimum rotational basis following protocols established during RY16–RY20. Surveys, however, will be rotated by subpopulation, and frequency will 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 RY16–RY20.

Methods

No change from RY16–RY20.

3. Habitat Assessment-Enhancement

ACTIVITY 3.1. Work with land management agencies to begin habitat assessment and enhancement activities by subpopulation range (new).

Data Needs

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

Methods

Basic habitat assessment of Dall sheep range by subpopulation should be undertaken and compared to previous work conducted on the Kenai (Culbertson et al. 1980, Culbertson et al. 1981, Culbertson et al. 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 in Units 7 and 15 exist at this time.

Data Recording and Archiving

- Dall sheep and goat survey data sheets are stored in the ADF&G Homer office filing cabinet (Appendix 1).
- Electronic records of the survey results, track files, and animal locations are stored on the Division of Wildlife Conservation common server in Homer at the following address: O:DWC\ADF&G-Homer Files\Species Data.

Agreements

Currently there are no agreements with other agencies pertaining to Dall sheep management.

Permitting

No Dall sheep-specific permits are expected in RY21–RY25.

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Appendix A. Kenai Peninsula mountain goat and Dall sheep survey form

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			
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												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			

