Species Management Report and Plan ADF&G/DWC/SMR&P–2019–2

Dall Sheep Management Report and Plan, Game Management Units 20B, 20F, and 25C, White Mountains:

Report Period 1 July 2011–30 June 2016, and

Plan Period 1 July 2016–30 June 2021

Mark Nelson

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Alaska Department of Fish and Game Division of Wildlife Conservation

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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 Doreen Parker McNeill, Management Coordinator for Region III for the Division of Wildlife Conservation.

Species management reports and plans are available via the Alaska Department of Fish and Game's public website (www.adfg.alaska.gov) or by contacting Alaska Department of Fish and Game's Division of Wildlife Conservation, PO Box 115526, Juneau, AK 99811-5526; phone: (907) 465-4190; email: dfg.dwc.publications@alaska.gov. The report may also be accessed through most libraries, via interlibrary loan from the Alaska State Library or the Alaska Resources Library and Information Services (www.arlis.org).

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Purpose of this Report

This report provides a record of survey and inventory management activities for Dall sheep in the White Mountains in Units 20B, 20F, and 25C for the 5 regulatory years 2011–2015 and plans for survey and inventory management activities in the following 5 regulatory years 2015–2019. A regulatory year (RY) begins 1 July and ends 30 June (e.g., RY10 = 1 July 2010–30 June 2011). 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 Division of Wildlife Conservation 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 report of survey and inventory activities that was previously produced every 3 years.

I. RY11–RY15 Management Report

Management Area

The White Mountains encompass approximately 534 mi^2 of Dall sheep habitat in east-central Alaska and mostly includes portions of game management units 20B, 20F, and 25C, including the White Mountains National Recreation Area (WMNRA) and the Steese National Conservation Area (SNCA). The primary Dall sheep habitat in the White Mountains is the alpine areas above tree line around Victoria Mountain, Mount Schwatka, Mount Prindle, and Lime Peak (also referred to as Rocky Mountain), but Dall sheep also occupy lower elevations in close proximity to alpine habitat. Temperatures occasionally reach 70° to 80° F in the summer and -40° to -50° F in winter.

Summary of Status, Trend, Management Activities, and History of Dall Sheep in the White Mountains, Units 20B, 20F, and 25C

Dall sheep in the White Mountains occur in widely distributed groups associated with mountainous alpine habitats. Starting in 1999, the area surveyed for sheep was standardized to include the area of Big Bend along Fossil Ridge (Limestone Ridge) to Windy Gap, Windy Gap along Fossil Ridge to Willow Creek, Cache Mountain, Lime Peak (Rocky Mountain), Mount Prindle, Mount Schwatka, and Victoria Mountain. Finding and counting sheep that are below tree line is difficult and complicates the population estimates; however, we account for missed sheep by adding 15% to the count to estimate the entire population (Whitten 1997). Since 1999 the population estimate has been as high as 825 (1999) and as low as 285 (2014).

Management Direction

Existing Wildlife Management Plans

There are no formal current management plans specific to White Mountains Dall sheep.

Guidance in an outdated plan (ADF&G 1976) has been adapted through public input and Board of Game action over the years. Those changes have been reported in previous species management reports. The most recent of these covered RY10–RY13 (Hollis 2014). The plan presented later in this report sets out the management goals and objectives for RY16–RY20.

GOALS

During RY10–RY13, the White Mountains Dall sheep management goal was as follows:

G1) Maintain a harvestable population of Dall sheep within the White Mountains (Hollis 2014).

CODIFIED OBJECTIVES

Amounts Reasonably Necessary for Subsistence Uses

The board has not made a customary and traditional use finding for the White Mountains Dall sheep population.

Intensive Management

The White Mountains Dall sheep population is not in an intensive management program.

MANAGEMENT OBJECTIVES

During RY10–RY13, the White Mountains Dall sheep management objective was as follows:

M1) Maintain for the opportunity to harvest full-curl rams from a population of at least 250 Dall sheep (Hollis 2014).

MANAGEMENT ACTIVITIES

1. Population Status and Trend

ACTIVITY 1.1. Population abundance (minimum count) and composition.

Data Needs

Minimum count population data and composition estimates are necessary to monitor and inform the public, including hunters, advisory committees, and the Board of Game, of the status of the Dall sheep population and potential trends in the White Mountains.

Methods

Population abundance (minimum count) and composition surveys were conducted annually in the White Mountains during RY11–RY15 in areas known to contain most of the Dall sheep habitat (Fig. 1). All surveys were flown in a Piper PA-18 Super Cub or Aviat Husky and were flown during late June through early August, when snow cover in the alpine is typically at or near its lowest level.

Survey crews consisted of a pilot and an observer seated behind the pilot. All of the pilots were experienced with Dall sheep surveys, while observer experience levels varied. The flight path/technique varied by pilot/observer team, but all available sheep habitat, including alpine and subalpine habitat was covered by low-level (≤500 ft above ground level) survey at 60–80 mph.

The survey areas were standardized in 1999 and include the seven areas shown in Figure 1 (Big Bend along Fossil Ridge to Windy Gap, Windy Gap along Fossil Ridge to Willow Creek, Cache Mountain, Lime Peak, Mount Prindle, Mount Schwatka, and Victoria Mountain. When sheep were observed, the group size, location (latitude and longitude), and composition were recorded. Composition was defined by the following categories: ewe (or ewe-like; this category includes yearlings of both sexes and rams of ¼ curl or less), lamb, sublegal ram (<full curl but >¼ curl ram), and legal (≥full curl ram or both horns broken). Whitten (1997) estimated that 15% of Dall sheep are not visible during aerial surveys; therefore, we applied a sightability correction factor (SCF) of 15% to the minimum count to estimate population size (Table 1).

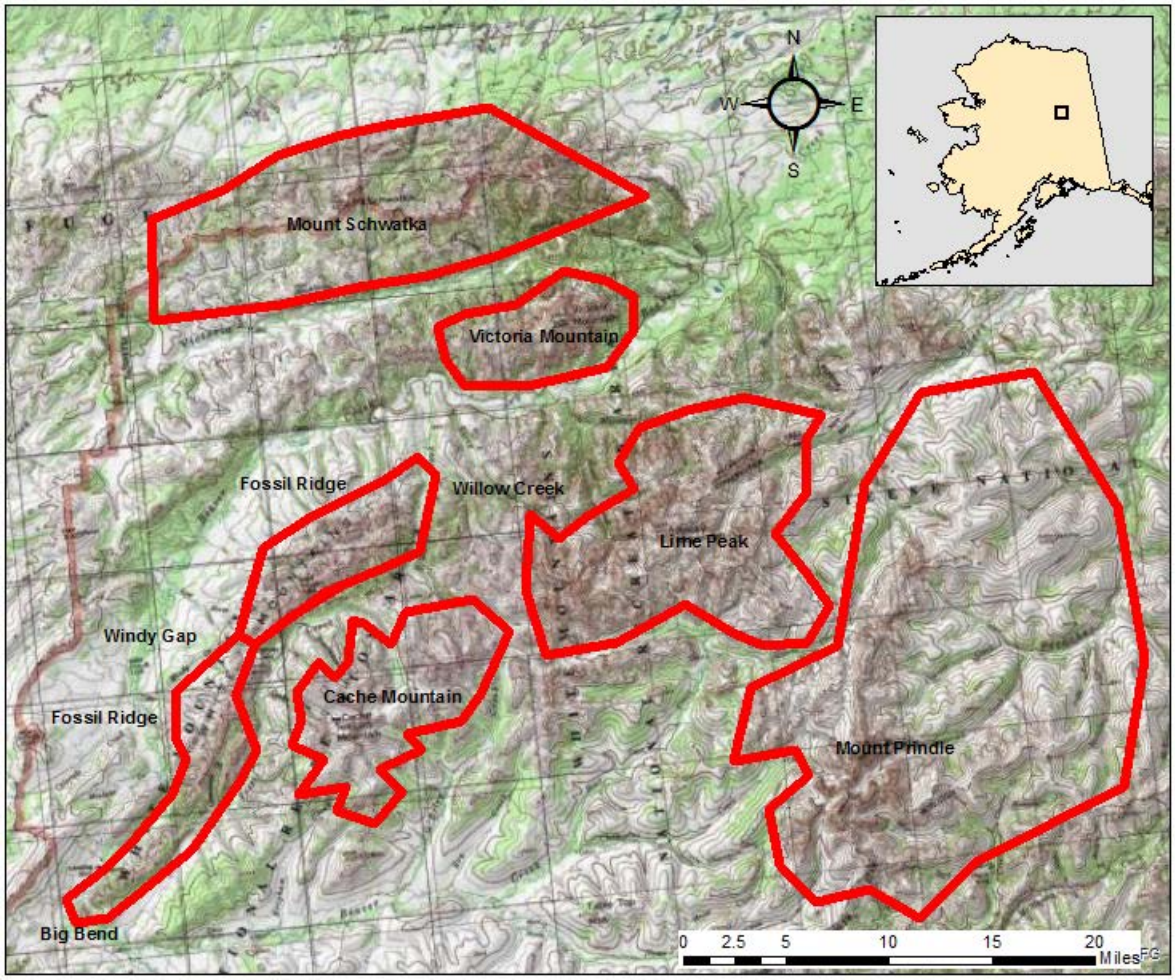

Figure 1. Aerial Dall sheep survey areas within the White Mountains, Alaska.

Table 1. White Mountains aerial Dall sheep composition counts, 1999–2015, Alaska.

Date	Rams			Rams: 100 ewes	Ewes	Lambs	Lambs: 100 ewes	Total sheep count	Estimated population (count +15%)
	Legal	Sublegal	Total						
August-99	26	125	151	37	406	160	39	717	825
August-00	24	121	145	38	381	41	11	567	652
July-02	25	125	150	57	262	73	28	485	558
July-03	21	70	91	29	318	99	31	508	584
August-04	19	107	126	48	262	55	21	443	509
August-05	25	107	132	42	317	64	20	513	590
August-06	21	102	123	38	321	39	12	483	555
July-07	16	55	71	31	229	79	34	379	436
July-08	21	22	43	19	224	99	44	366	421
July-11	21	131	152	44	342	86	25	580	667
July-12	15	129	144	49	292	55	19	491	565
July-13	10	109	119	47	254	41	16	414	476
July-14	13	69	82	61	134	32	24	248	285
July-15	19	75	94	47	199	62	31	355	408

Note: Data presented within the box are for the current reporting period.

RY11. Surveys were conducted during July 2011 within the White Mountains. All survey areas were included. Total survey flight time was 10 hours 48 minutes.

RY12. Surveys were conducted by the U.S. Fish and Wildlife Service (USFWS) and Alaska Department of Fish and Game (ADF&G) in cooperation with Bureau of Land Management (BLM) during July 2012. USFWS surveyed Victoria Mountain and Mount Schwatka on 12 July. ADF&G, with funding from BLM, surveyed Cache Mountain, Fossil Ridge, Lime Peak, and Mount Prindle on 27 and 28 July. Pilot Marty Webb and observer Carl Roberts conducted the survey on both days. The weather in the vicinity of Mount Prindle prevented a survey. The total survey time was 4 hours 15 minutes for USFWS and 6 hours 27 minutes for ADF&G for a total of 10 hours 42 minutes. Weather conditions were excellent during the survey. Dall sheep appeared to be spread across all elevations, including habitat below tree line, due to a lack of insects, which may result in lower sightability.

RY13. Surveys were conducted during July 2013 within the White Mountains. All survey areas were included. Total survey flight time was 13 hours 22 minutes.

RY14. Surveys were conducted by the USFWS, BLM, and ADF&G during July 2014. USFWS surveyed Victoria Mountain and Mount Schwatka on 30 July with pilot Nikki Guldager and observer Bryce Lake. BLM surveyed Cache Mountain and Mount Prindle on 30 July with pilot

Marty Webb and observer Jim Herriges. ADF&G surveyed Fossil Ridge and Lime Peak on 31 July with pilot Marty Webb and observer Tony Hollis; however, due to poor weather Fossil Ridge was not surveyed. The total survey time was 6 hours 27 minutes and except for over Fossil Ridge the weather was excellent. Dall sheep appeared to be spread across all elevations, including habitat below tree line due to a lack of insects, which may have resulted in lower sightability.

RY15. Surveys were conducted by the USFWS and ADF&G in cooperation with BLM during July 2015. USFWS surveyed Victoria Mountain and Mount Schwatka on 13 July with pilot Nikki Guldager and observer Bryce Lake. ADF&G, with funding from BLM, surveyed Cache Mountain and Fossil Ridge on 29 July and Lime Peak on 31 July. Pilot Marty Webb and observer Tony Hollis conducted the survey on both days. The weather in the vicinity of Mount Prindle prevented a survey. The total survey time was 3 hours 18 minutes for USFWS and 7 hours 30 minutes for ADF&G for a total of 10 hours 48 minutes. Weather conditions were moderate to good, with pilots experiencing calm winds in the morning and increasing wind and turbulence in the afternoon.

Results and Discussion

The population of Dall sheep in the White Mountains has been surveyed periodically since 1970. Survey techniques used and area covered were standardized in 1999 to include the seven areas depicted in Figure 1. Since 1999, the same areas have been searched during each survey, except for when poor weather prohibited searching an area. The mean annual population estimate, with 15% SCF included, from RY11 through RY15 was 480 (±13 sheep at 95% CI) Dall sheep (range 667 to 285) which was less than the mean from RY99 through RY10 (mean 570; range 825 to 421; Table 1). The average annual number of rams counted per 100 ewes during RY11 through RY15 (50 rams:100 ewes) was higher than during RY99 through RY10 (38 rams:100 ewes) which could indicate more rams in the population or fewer ewes. The mean number of rams counted annually during the surveys has not changed (118 in RY11–RY15 and 115 in RY99–RY10), but the annual average number of ewes counted in the current period (244 in RY11–RY15) was fewer than the mean number counted previously (302 in RY99–RY10).

During the current reporting period, RY14 stands out as exceptionally poor. During spring 2013, winter-like conditions persisted well into May. This appears to have led to widespread deaths of young sheep in the White Mountains and elsewhere around the region (U.S. Department of Agriculture 2013, Wells 2018).

Recommendations for Activity 1.1.

- Continue to conduct annual surveys to monitor the total number of Dall sheep and changes in demographics.
- Utilize memos to archive details of future abundance and composition surveys to reduce detail in the methods and results sections of future operational plans and management reports.

2. Mortality–Harvest Monitoring and Regulations

ACTIVITY 2.1. Monitor and analyze harvest data.

Data Needs

Harvest data are necessary to determine whether the management objective has been achieved.

Methods

Annual harvest was estimated from mandatory harvest report cards and through the mandatory horn sealing process. Successful hunters were required to have the horns sealed within 30 days of the date of kill at an ADF&G office. During the sealing process, a uniquely numbered aluminum plug was placed in the horn, the sheep was aged, a broken determination (both, 1, or neither horns broken) was made, and measurements (including total length and base circumference) were taken. If timely harvest reports were not received, hunters who provided contact information received a reminder email and/or letter.

Season and Bag Limit

The sheep hunting season for resident and nonresident hunters during RY11–RY15 was 10 August–20 September with a bag limit of 1 ram with a full-curl or larger horn, with both horns broken, or at least 8-years old. This regulation has been in place since RY87 (Table 2).

Results and Discussion

Harvest by Hunters-Trappers

Sheep harvest within all portions of the White Mountains has been limited to 1 ram (full-curl or larger horns, both horns broken, or more than 8 years old) and a 6-week season (10 August–20 September) since RY87 (Table 2). Hunter success has remained relatively unchanged from RY06–RY15 and ranged from 8% (RY09) to 29% (RY06; Table 3). The annual average annual hunter success during RY11–RY15 was ~17% (an annual average of 47 hunters harvesting 8 rams; Table 3).

The full-curl harvest strategy allows for maximum opportunity to hunt Dall sheep in the White Mountains. Because it is a relatively hands-off management approach, the associated cost is minimal (Whitten 2001). The average number of Dall sheep hunters in the White Mountains annually has decreased slightly from 65 per year (RY06–RY10) to 47 per year (RY11–RY15) while the average number of Dall sheep harvested each year also decreased from 11 rams per year to 8 rams per year during the same periods, respectively (Table 3).

Hunter Residency and Success

The mean annual success rate during RY11–RY15 was 18% (Table 3), which is the same as the previous 5-year period. Hunters pursuing Dall sheep in the White Mountains are predominately residents of Alaska; there have never been more than 3 nonresident hunters in a single season.

Table 2. White Mountains Dall sheep seasons and bag limits, regulatory years[a] 1983–2015, Alaska.

Regulatory year(s)	Season	Bag limit	Legal horn size[b]		Broken horns	Age
			Portion in Unit 20	Portion in Unit 25	Portion of units 20 and 25	
1983	10 Aug-20 Sep	1 ram	⅞-curl horn or larger	⅞-curl horn or larger	both horns broken	≥8 horn annuli
1984-1986	10 Aug-20 Sep	1 ram	Full-curl horn or larger	⅞-curl horn or larger	both horns broken	≥8 horn annuli
1987-2015	10 Aug-20 Sep	1 ram	Full-curl horn or larger	Full-curl horn or larger	both horns broken	≥8 horn annuli

[a] Regulatory year begins 1 July and ends 30 June (e.g., regulatory year 2006 = 1 July 2006–30 June 2007).

Table 3. White Mountains Dall sheep hunter residency and success, regulatory years[a] 2006–2015, Alaska.

Regulatory year	Successful hunters				Unsuccessful hunters				Total	
	Resident	Nonresident	Unspecified	Total	Resident	Nonresident	Unspecified	Total	Hunters	% Success
2006	14	1	1	16	38	1	1	40	56	29
2007	8	1	0	9	51	1	0	52	61	15
2008	16	0	0	16	59	0	0	59	75	21
2009	4	0	0	4	46	1	0	47	51	8
2010	12	0	0	12	66	1	1	68	80	15
2011	7	0	0	7	33	0	0	33	40	18
2012	8	0	0	8	43	2	0	45	53	15
2013	5	1	0	6	51	0	0	51	57	11
2014	6	2	0	8	38	0	0	38	46	17
2015	10	1	0	11	25	3	0	28	39	28

[a] Regulatory year begins 1 July and ends 30 June (e.g., regulatory year 2006 = 1 July 2006–30 June 2007).
Note: Data presented within the box are for the current reporting period.

Harvest Chronology

The majority of the harvest occurred during the first two weeks of the season and the average date of harvest during RY11–RY15 was 17 August (Table 4).

Transport Methods

Successful hunters continue to use airplanes as their main means of transportation (average annual airplane use was 52% during RY11–RY15 and 63% during RY06–RY10; Table 4). Other means of average annual transportation methods for successful hunters during RY11–RY15 were ATV ($\bar{x}$ = 33%), boat ($\bar{x}$ = 10%), horse ($\bar{x}$ = 3%), and highway vehicle ($\bar{x}$ = 3%; Table 4).

Alaska Board of Game Actions and Emergency Orders

No board actions were taken specific to White Mountains Dall sheep during RY11–RY15, but 2 changes to the hunting season were added for RY16. First, a youth-only season was established during 1–5 August for resident and nonresident youths (11–17 years of age) when accompanied by a resident hunter 21 years of age and older. A successful harvest counts toward the bag limit of both the youth and the accompanying adult. Second, the bag limit for youth and adult nonresident hunters was changed from 1 ram with full curl horn or larger to 1 ram with full curl horn or larger every 4 years.

Recommendations for Activity 2.1.

- Continue to monitor harvest by sealing records and harvest ticket reports.

3. Habitat Assessment-Enhancement

No habitat assessment or enhancement activities were conducted RY11–RY15.

NONREGULATORY MANAGEMENT PROBLEMS OR NEEDS

No nonregulatory management problems or needs were identified during this reporting period.

Data Recording and Archiving

- All electronic files such as survey memos, reports, survey data, and maps are located on ADF&G's Fairbanks server (S:\Fairbanks Area\Operational Planning\Sheep\White Mountains). All hard copy data sheets, paper files, etc. are found in the file cabinet in room 151 of the Fairbanks office.
- Electronic copies of survey memos, survey data, and maps are stored in the Division of Wildlife Conservation's WinfoNet data archive. Project Title: Fairbanks area\White Mountains Sheep. Primary Region: Region III.

Table 4. White Mountains Dall sheep harvest characteristics (mean age of harvested ram, percent broken horns, mean length of horn, mean base circumference, mean day of harvest per year, and percent of successful hunters using a type of transportation), regulatory years[a] 2006–2015, Alaska.

	Mean					Transportation used by successful hunters					
Regulatory year	Age (yr)	Broken (%)	Length (in)	Base (in)	Harvest (date)	Airplane	ATV	Boat	Highway Vehicle	Horse	ORV
2006	9	44%	32.1	13.3	20-Aug	62%	38%	0%	0%	0%	0%
2007	9	44%	30.9	13.1	24-Aug	70%	0%	10%	10%	0%	10%
2008	11	44%	32.8	13.3	26-Aug	71%	29%	0%	0%	0%	0%
2009	10	50%	35.5	14.3	29-Aug	0%	100%	0%	0%	0%	0%
2010	9	60%	30.8	13.6	18-Aug	70%	20%	10%	0%	0%	0%
2011	9	73%	34.1	13.3	24-Aug	55%	18%	27%	0%	0%	0%
2012	9	25%	34.3	13.6	14-Aug	50%	50%	0%	0%	0%	0%
2013	8	20%	34.7	13.0	14-Aug	60%	20%	20%	0%	0%	0%
2014	8	50%	31.4	13.4	17-Aug	75%	0%	13%	0%	13%	0%
2015	8	40%	32.9	13.4	17-Aug	30%	60%	0%	10%	0%	0%

[a] Regulatory year begins 1 July and ends 30 June (e.g., regulatory year 2006 = 1 July 2006–30 June 2007).
Note: Data presented within the box are for the current reporting period.

Agreements

None.

Permitting

None.

Conclusions and Management Recommendations

The management goal to maintain a harvestable population of Dall sheep within the White Mountains was met during RY11–RY15. Minimum count and composition surveys suggest that the White Mountains sheep population has slightly decreased, most likely due to a delayed spring breakup in 2013 and not related to hunter harvest.

While the number of Dall sheep harvested declined slightly, the percent of hunters successfully harvesting rams remained similar, suggesting that the current management strategy is working as intended. No changes in seasons and bag limits are recommended at this time.

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II. Project Review and RY16–RY20 Plan

Review of Management Direction

MANAGEMENT DIRECTION

The RY10–RY13 management direction and goal for the White Mountains are appropriate to continue for RY16–RY20.

GOALS

The goal for the RY16–RY20 reporting period will be as follows:

G1) Maintain a harvestable population of Dall sheep in the White Mountains.

CODIFIED OBJECTIVES

No new codified objectives are anticipated for RY16–RY20.

MANAGEMENT OBJECTIVES

M1) Maintain the opportunity to harvest full-curl rams from a population of at least 250 Dall sheep.

- The primary purpose of this management objective is to provide for the maximum opportunity to harvest Dall sheep while focusing the harvest on mature rams. This strategy has proven to be a cost-effective approach to allow maximum harvest without impacting the production of lambs and recruitment of young sheep (Whitten 2001).

REVIEW OF MANAGEMENT ACTIVITIES

1. Population Status and Trend

ACTIVITY 1.1. Monitor population abundance (minimum count) and composition (Objective M1).

Data Needs

No change from prior reporting period. Minimum count population data and composition estimates will be used to 1) inform the public of population status and trends, and 2) for general long-term monitoring of the population, for purposes including meeting management objective M1.

Methods

Aerial survey methods will be the same as those described for RY11–RY15.

RY16–RY17 – Aerial surveys were completed during July and the results are included in Table 1.

RY18–RY20 – Aerial surveys will be completed during July.

2. Mortality-Harvest Monitoring

ACTIVITY 2.1. Monitor and analyze harvest data (Objective M1).

Data Needs

No change from prior reporting period. Harvest data are necessary to assess whether management objective M1 has been achieved.

Methods

No change from prior reporting period.

3. Habitat Assessment-Enhancement

No habitat assessment or enhancement activities are planned for RY16–RY20.

NONREGULATORY MANAGEMENT PROBLEMS OR NEEDS

No nonregulatory management problems or needs are identified for the RY16–RY20 reporting period.

Data Recording and Archiving

Recording

- Dall sheep survey form (archived in *WinfoNet* under *Data Archive* [folder *Fairbanks Area Office*]).
- ArcGIS version 10.3 (store and analyze spatial data).

Archiving

- Harvest data will be stored on an internal database housed on the Wildlife Information Network (WinfoNet) server (http://winfonet.alaska.gov/index.cfm) and archived in *WinfoNet* under *Harvest Information*.
- All electronic files such as survey memos, reports, survey data, and maps will be located on the Fairbanks server (S:\Fairbanks Area\Operational Planning\Sheep\White Mountains). All hard copy data sheets, paper files, etc. will be stored in the file cabinet in room 151, Mark Nelson's office.
- In addition, electronic copies of survey memos, survey data, and maps will be stored in the WinfoNet Data Archive. Project Title: Fairbanks Area Office. Primary Region: Region III.

Agreements

None.

Permitting

None.

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