

Moose Management Report and Plan, Game Management Unit 5:

Report Period 1 July 2015–30 June 2020, and
Plan Period 1 July 2020–30 June 2025

Roy Churchwell



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Plan Period 1 July 2020–30 June 2025

PREPARED BY:

Roy Churchwell
Juneau/Douglas Area Biologist

APPROVED BY:

Richard Nelson
Management Coordinator

PUBLISHED BY:

Patricia Harper
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 Richard Nelson, Management Coordinator for Region I 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 moose (*Alces alces*) in Unit 5 for the 5 regulatory years 2015–2019 and plans for survey and inventory management activities in the following 5 regulatory years, 2020–2024. A regulatory year (RY) begins 1 July and ends 30 June (e.g., RY14 = 1 July 2014–30 June 2015). 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) launched this 5-year report to more efficiently report on trends and to describe potential changes in data collection activities over the next 5 years. It replaces the moose management report of survey and inventory activities that was previously produced every 2 years.

I. RY15–RY19 Management Report

Management Area

The Unit 5 management area is 5,800 mi², including the mainland Gulf of Alaska coast from Cape Fairweather to Icy Bay and inland to the Canadian border (Fig. 1). The unit has 2 administrative units, 5A and 5B. Unit 5A covers Cape Fairweather to Yakutat Bay. Unit 5B covers Yakutat Bay to Icy Bay and is remote and mostly accessed by aircraft or boat. Yakutat is the only municipality in Unit 5 (population 579; U.S. Census Bureau 2020), and the major economic drivers are fishing, logging, and jobs with tribal, municipal, state, and federal governments. Nearly all of Unit 5A is within Tongass National Forest, Glacier Bay National Park, or the Glacier Bay National Preserve. The Park was established in 1925. Almost all of Unit 5B is within Wrangell–St. Elias National Park and Preserve, which was designated as a provision of the Alaska National Interest Lands Conservation Act (ANILCA) legislation in 1980.

Much of the Unit 5 mainland is comprised of glaciers, but between the icefields and the coast are rocky cliffs, upland alpine areas, and steep coniferous forest slopes that drop down to the Yakutat Forelands. The alpine supports grasses, sedges, and forbs important to mountain goats as summer forage. In the winter goats feed on these same plants where the wind has scoured the snow away or they feed on shrubs and ferns protected from deeper snow under the coniferous canopy. Unit 5 has a subarctic climate with temperate rainforests. The average daily high temperature in January is 36°F and in August is 57°F (NOAA 2018). Yakutat is considered one of the wettest towns in the state, recording average annual precipitation of 130 inches, including 150 inches of snow that falls between November and April (NOAA 2018).

Summary of Status, Trend, Management Activities, and History of Moose in Unit 5

Moose were first documented along the lower Alsek River in eastern Game Management Unit 5 in the late 1920s or early 1930s. Range expansion to the west followed slowly, with animals not documented on the Malaspina Forelands west of Yakutat Bay until the 1950s. It is believed that the glaciers and waters of Icy Bay curtailed westward movement of this moose population.

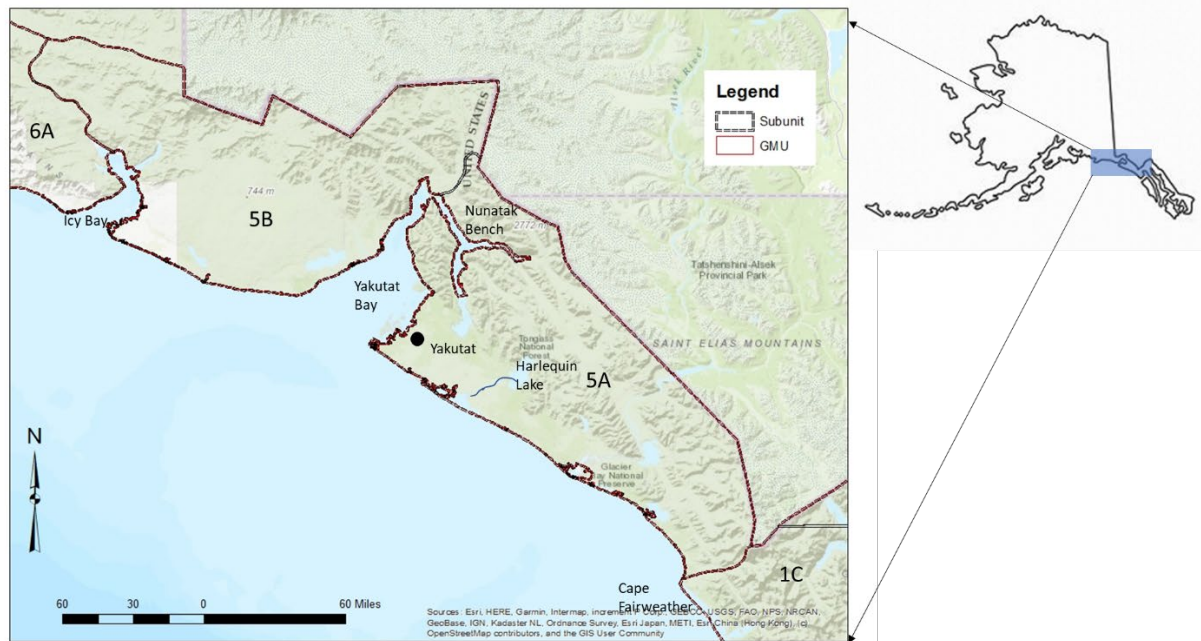


Figure 1. Map of Game Management Unit (GMU) 5, Southeast Alaska.

The moose population in Unit 5 grew rapidly and peaked in the early 1960s, with a population estimate exceeding 2,000 animals. The population began declining toward a biological carrying capacity (thought to be substantially lower than 2,000) in the mid-1960s. During this period, aggressive harvest strategies, including cow hunts, were employed to lower the moose numbers and prevent degradation of moose habitat. Poor reproductive success and severe winters in 1970 and 1972 depressed moose numbers further and resulted in the Unit 5A moose-hunting season being closed from 1974 to 1977. After the hunting closures in the mid-1970s, the Yakutat Forelands moose population slowly increased to its present level of 600–800 animals. The population appears to have reached present-day carrying capacity of the area. A moose population study conducted on the Yakutat Forelands during 2000–2002 by the U. S. Forest Service (USFS) and ADF&G indicated that cow moose were in good condition, with high pregnancy and twinning rates, indicative of healthy moose with good habitat.

The Nunatak Bench area was closed to hunting after rising water levels from the Hubbard Glacier ice dam flooded much of the moose habitat there in the summer of 1986, resulting in a dramatic decline in moose in this area. We presume moose immigrated to adjacent areas to escape the high-water levels that displaced them from low lying habitats. The increased water level was also found to have flooded and killed willow shrubs, a main source of browse for moose. Following the retreat of the Hubbard Glacier and subsidence of the waters of Russell Fjord in the fall of 1986, moose slowly recolonized this area over the next 7 years. Based on 1994 aerial survey counts, the Alaska Board of Game (BOG) reopened moose hunting in this area, beginning with the 1995 season. However, the Hubbard Glacier blocked off Russell Fjord again when it advanced in 2002. The water level rose approximately 65 feet, again drowning much of the moose habitat in the area. The moose season for the Nunatak Bench area has been closed since that time due to low moose numbers.

Since 1978, Unit 5 moose hunting under state regulation has been managed under a registration permit system. In 1991, a federal subsistence season was instituted that ran concurrently with the state season. This federal season restricted hunting on federal public lands to local resident hunters during the first week of the season. In 1996, the Federal Subsistence Board lengthened the federal season by 1 week, starting it a week earlier than the state season (8 October compared to 15 October). Although the concurrent seasons had been managed under the state's registration permit system, the new "early hunt" was administered under a separate federal registration permit issued by the USFS and the National Park Service and prohibited hunting on federal public lands except by Yakutat residents 8–21 October. However, a block of 9 nonfederal townships lies near Yakutat where non-federally qualified subsistence users can legally hunt during the first week of the state season that begins 15 October. Just prior to the 2004 hunting season, ADF&G worked with the USFS to craft a joint state and federal permit that now serves as the only permit needed to hunt the Yakutat Forelands. Development of this joint permit made it possible for the department to track all hunting effort and obtain necessary data for management of moose in this area.

Beginning in 2007, the department worked with the USFS to reduce the joint state and federal moose hunt guideline harvest levels on the Yakutat Forelands to accommodate lower than optimal bull-to-cow ratios. In 2007, the guideline harvest level was reduced from 30 to 20 for that portion of Unit 5A west of the Dangerous River and 20 moose east of the Dangerous River. In 2008, the guideline was raised to 25 bulls on each side and recently was raised to 30 bulls during the current reporting period. ADF&G biologists will continue to monitor the moose population bull-to-cow ratios through aerial surveys and recommend adjusting the guideline harvest levels as needed.

Management Direction

For management purposes, we have separated the moose in Unit 5 into 3 distinct populations, with separate management objectives for each: Unit 5A Yakutat Forelands, Unit 5A Nunatak Bench, and Unit 5B Malaspina Forelands.

EXISTING WILDLIFE MANAGEMENT PLANS

Region I developed a moose management plan in the late 1980s that was intended to guide management through RY94, the *Strategic Plan for Management of Moose in Region I, Southeast Alaska* (ADF&G 1990). That plan included objectives and management strategies for moose populations throughout the region. Though it has continued to provide a basis for moose management in the region, the plan has not been formally updated.

While overall goals of the plan remain important, management objectives and harvest management strategies have changed since the plan was written based on public comment, staff recommendations, and Board of Game actions. These periodic changes in management planning have been reported in the division's previous species management reports. The plan portion of this report contains the current management plan for moose in Unit 5.

GOALS

Regionwide moose management goals were established during creation of the Region I moose management plan in the late 1980s (ADF&G 1990). These goals are general and applicable to the entire region:

1. To maintain, protect, and enhance moose habitat and other components of the ecosystem.
2. To maintain viable populations of moose in their historic range throughout the region.
3. To manage moose on a sustained yield basis.
4. To manage moose in a manner consistent with the interests and desires of the public.
5. To manage primarily for meat, rather than trophy hunting of moose.
6. To manage for the greatest hunter participation possible consistent with maintaining viable populations, sustained yield, subsistence priority, and the interests and desires of the public.
7. To provide opportunities to view and photograph moose for the benefit of non-hunters (nonconsumptive users) of moose.
8. To develop and maintain a database useful for making informed management decisions.

CODIFIED OBJECTIVES

Amounts Reasonably Necessary for Subsistence Uses

The Alaska Board of Game has made a positive finding for customary and traditional use of moose in Unit 5 and set 50 moose as the amount necessary for subsistence (ANS; 5 AAC 99.025(a)(8)).

Intensive Management

The Unit 5 moose population is not subject to intensive management at this time.

MANAGEMENT OBJECTIVES

The following objectives for Unit 5 from the regionwide moose management plan and more recent biological data helped guide management during RY15–RY19 (ADF&G 1990):

<u>Plan</u>	<u>Objective</u>
<i>Unit 5A Yakutat Forelands</i>	
Post-hunt moose numbers (estimated)	600–800
Annual hunter kill (average)	60
Post-hunt bull:cow ratio	25:100
Number of hunters (annual average)	250
Hunter-days of effort (annual average)	1,025

Hunter success (annual average) 28%

Unit 5A Nunatak Bench

Post-hunt moose numbers (estimated) 50
Annual hunter kill (average) 5
Post-hunt bull:cow ratio 25:100
Number of hunters (annual average) 10
Hunter-days of effort (annual average) 60
Hunter success (annual average) 50%

Unit 5B Malaspina Forelands

Post-hunt moose numbers (estimated) 250
Annual hunter kill (average) 25
Post-hunt bull:cow ratio 25:100
Number of hunters (annual average) 12 50
Hunter-days of effort (annual average) 200
Hunter success (annual average) 50%

MANAGEMENT ACTIVITIES

1. Population Status and Trend

ACTIVITY 1.1. Conduct post-hunt aerial surveys in 5A Yakutat Forelands every year and every other year in 5A Nunatak Bench and 5B Malaspina Forelands.

Data Needs

Estimates of population size, including minimum counts, and age and sex composition are used to inform management. Moose range throughout most of Unit 5 and minimum counts, age composition, and sex ratios are needed for each population managed. Population models have been created to assist management in setting harvestable goals.

Methods

If weather and pilot availability allow, abundance and composition surveys are conducted when there is adequate snow cover and prior to antler drop, ideally using fixed-winged aircraft (Piper PA-18 Super Cub or equivalent aircraft). However, suitable aircraft (Super Cub) are not readily available in Yakutat, so a Cessna 185 or 206 aircraft may be used for surveys and the survey may occur after antler drop. During surveys, the number of animals and age and sex of each animal are recorded. Due to the inability to accurately distinguish between adult males and females following antler drop (after December 1), adult moose lacking antlers and not accompanied by a calf are recorded as “unknown sex.”

Several factors affect the ability to conduct comprehensive annual moose surveys in the Yakutat area. Variable snow coverage, strong winds, inclement weather, and aircraft availability in Yakutat all affect when and where surveys are conducted. Consequently, survey frequency and coverage can vary considerably from year to year (Table 1). Surveys of the Yakutat Forelands in

Table 1. Aerial survey data for moose in Unit 5, Alaska, regulatory years 2010–2019.

Regulatory Year	Bulls ^a	Cows ^a	Calves ^a	Unk ^b	Total moose	Count time (hrs)	Bulls per 100 cows ^a	Calves per 100 cows ^a	Calves % in herd	Moose per hour
<u>5A Yakutat Forelands</u>										
2010	No Survey									
2011	28	141	60	0	229	2.1	20	43	26	109
2012	3	12	14	168	197	2.3	2	NA	7	86
2013	25	61	10	2	98	4.4	40	16	10	22
2013 ^c	18	36	41	117	212	4.1	12	27	19	52
2014	No Survey									
2015	109	128	151	440	828	13.3	19	27	18	62
2016	122	77	87	257	543	8.4	37	26	16	65
2017–2018	No Survey									
2019	6	13	16	309	344	6.2	2	5	5	56
<u>5A Nunatak Bench</u>										
2010–2011	No Survey									
2012	NA	2	2	8	12	0.8	NA	NA	17	15
2013–2014	No Survey									
2015	3	2	3	6	14	1.1	NA	NA	21	13
2016–2018	No Survey									
2019 ^d	NA	NA	NA	7	7	NA	NA	NA	NA	NA
<u>5B Malaspina Forelands</u>										
2010–2014	No Survey									
2015	66	31	39	177	313	3.25	32	19	12	96
2016–2019	No survey									

^a Due to survey timing, poor snow conditions, extreme winds, and less than ideal survey aircraft, herd composition.

^b Unknown sex are considered female for purposes of ratio calculations.

^c Composition survey of west side of Dangerous River, under poor survey conditions.

^d Survey was aborted due to poor weather conditions.

Unit 5A are generally biannual, although in some years we only attempt moose composition surveys. Surveys of the Nunatak Bench are attempted every other year because the population has declined dramatically due to 2002 flooding of the best habitat when the Hubbard Glacier most recently dammed Russell Fjord. Surveys in Unit 5B are less frequent. The area is remote and receives less hunting pressure than elsewhere in Unit 5, and it can be adequately managed with less frequent surveys.

Portions of the Yakutat and the Malaspina forelands consist of dense coniferous forests that make it difficult to detect moose. A moose study conducted on the Yakutat Forelands during 2000–2004 by USFS and ADF&G yielded a moose sightability model (estimated proportion of moose seen on any given survey) that provided a sightability correction factor for most available habitats (Oehlers et al. 2012). In general, observers see approximately 70% of the moose across the entire survey area. Although this model was developed in Unit 5A on the Yakutat Forelands, it is used to provide insight into survey results in Unit 5B as well. Nunatak Bench lacks coniferous forest, so sightability is much higher in this area. However, due to the dense alder thickets, and the difficulty of seeing moose in dark environmental backdrops, a solid snow base is essential to provide for a reliable survey in this area.

Results and Discussion

Aerial surveys were conducted in regulatory years 2015, 2016, and 2019 for the Yakutat Forelands, in RY15 and RY19 (aborted) for the Nunatak Bench, and in RY15 for the Malaspina Forelands. Due to a lack of favorable weather, surveys were not conducted at regular intervals in Unit 5 and survey objectives were not met. Counts were adequate to continue the current harvest, with counts of 65–56 moose per hour. The final survey with 56 moose per hour was conducted with high winds, which made detection difficult and moose numbers were likely higher than what was observed. A sex composition survey has not been conducted since 2013 and completing one should be a goal during the next management period. All indications are that moose numbers have not recovered at the Nunatak Bench, with only 7 moose observed during a partial survey in RY19. This indicates that the habitat still will not support the moose population at a level to allow hunting. The last moose count of the Malaspina Forelands was high in RY16, and with little hunter harvest in this area there has not been a need to return and count the forelands. However, it should be a goal of the next management period to count the Malaspina Forelands.

Recommendations for Activity 1.1

Continue to conduct aerial surveys, trying to census the Yakutat Forelands biannually and the other areas less frequently.

2. Mortality-Harvest Monitoring and Regulations

ACTIVITY 2.1.

Monitor trends in hunter effort, and abundance and distribution of moose including age and sex composition through hunter reports on required registration permits. Data needs and methods are the same for Activity 2.2.

ACTIVITY 2.2. Monitor number, age, and antler configurations of harvested moose by examining antlers (opportunistically) and collecting lower jaws for aging from successful hunters.

Data Needs

Monitoring and analyzing harvest data are essential to determining whether our harvest objectives have been met and to ensuring that harvests are sustainable.

Methods

Hunters in Unit 5 are required to obtain a registration permit for the hunt they are planning to participate in before entering the field (RM059- Unit 5A Nunatak Bench; RM061-Unit 5A-Yakutat Forelands Joint State-Federal Permit; and RM062-Unit 5B Malaspina Forelands; Fig. 2). Each permit requires the hunter’s demographic information, including their hunting license number, and includes a punch ticket that hunters must get validated upon successful harvest of a moose. Each permit also contains a mail-in hunt report card. Submission of a hunt report is mandatory for all permittees regardless of whether they hunt or not. Hunt reports provide the department with information on the number of days hunted, date and location of hunt and harvest, method of transport to the field, and any use of commercial services.

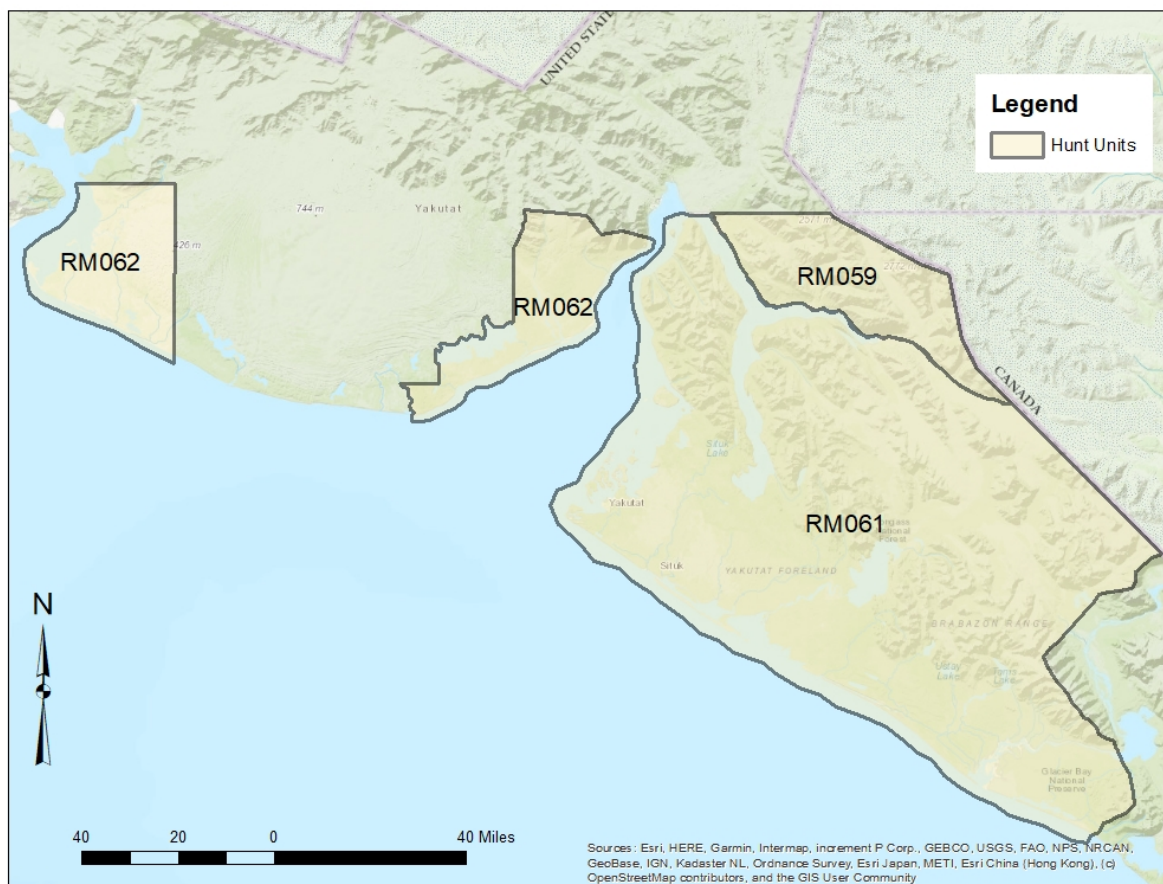


Figure 2. Map of the moose registration hunts (RM062 – Malaspina Foreland, RM059 – Nunatak Bench, and RM061 – Yakutat Forelands) for Unit 5, Alaska.

All successful moose hunters are required to inform ADF&G of their harvest within 5 days of the kill, except that 24-hour reporting is required west of Dangerous River for RM061, and are required to bring the front portion of the lower jaw to ADF&G so teeth can be pulled for aging. Successful hunters in Unit 5 are asked to voluntarily send antler photos to the department which allow us to correlate antler architecture with age. Such information has been used for insight into recruitment and to refine antler regulations.

Season and Bag Limit

Season and bag limits	Resident and nonresident hunter
<i>Unit 5A, except Nunatak Bench</i>	15 October–15 November
1 bull by registration permit only; up to 60 bulls may be taken; the commissioner may close the season in the portion west of the Dangerous River when 30 bulls have been taken from that area	
[The state season rarely opens because the entire harvest quota is usually taken during the first week of the federal subsistence season, which opens 8 October.]	
<i>Unit 5A, Nunatak Bench</i>	15 November–15 February
1 moose by registration permit only; up to 5 moose may be taken	
<i>Unit 5B</i>	15 September–15 December
1 bull by registration permit only; up to 25 bulls may be taken	

Results and Discussion

Harvest by Hunters-Trappers

5A Yakutat Forelands: Moose harvest has increased in this reporting period compared to the previous 5 years, with an average of 50 moose harvested RY15–RY19 compared to 38 moose harvested RY10–RY14 (Table 2). This is because the number of animals that could be harvested was increased from a total of 55 to 60 at the beginning of this review period with an allowed 30 animals harvested from the west side of the Dangerous River before the season is closed in that area. Furthermore, harvest on the east side has increased with greater hunter participation in the last 5 years, which may be in part due to the high hunter success in this hunt. Hunter participation in the west-side hunt has decreased however, and overall hunter participation numbers are lower this reporting period (average 122 hunters RY15–RY19) compared to the last 5 years (average 131 hunters RY10–RY14).

Table 2. Unit 5, Alaska harvest, number of hunters, and success, regulatory years 2010–2019.

Regulatory year	Bulls	Cows	Unknown	Total harvest	Hunters	Percent success
<u>5A Yakutat Forelands</u>						
2010	37	0	0	37	136	27
2011	38	0	0	38	147	26
2012	40	0	0	40	128	31
2013	33	0	0	33	119	28
2014	44	0	0	44	125	35
2015	50	0	0	50	130	38
2016	44	0	0	44	120	37
2017	57	0	0	57	129	44
2018	47	0	0	47	104	45
2019	52	0	0	52	125	42
<u>5A Nunatak Bench</u>						
2010–2014	No Hunt					
2015–2019	No Hunt					
<u>5B Malaspina Forelands</u>						
2010	4	0	0	4	12	33
2011	3	0	0	3	14	21
2012	4	0	0	4	9	44
2013	3	0	0	3	12	25
2014	5	0	0	5	14	36
2015	20	0	0	20	37	54
2016	9	0	0	9	21	43
2017	6	0	0	6	23	26
2018	10	0	0	10	18	56
2019	16	0	0	16	40	40

In addition to high hunter success in Unit 5A, age structure of harvested bull moose provides valuable population information (Table 3). The yearling and 2.5- to 3.5-year-old bull component of the harvest was very strong in all of these years, suggesting good recruitment for those age classes. This information suggests that the moose population is doing well at this time.

5A Nunatak Bench: A post-harvest count of at least 25 moose is required to open this hunt, but after habitat impacts from flooding with movement of the Hubbard Glacier, the area has been unable to support a moose population at this level. This hunt was not opened during this reporting period (Table 1), and it does not seem like there will be enough moose to open it in the near future.

Table 3. Age structure of harvested moose in Unit 5, Alaska, regulatory years 2010–2019.

Regulatory year	Age class								Total harvest	Percent aged	Mean age
	1.5	2.5	3.5	4.5	5.5	6.5	7-9	10+			
<u>5A Yakutat Forelands</u>											
2010	15	6	8	0	4	2	1	0	37	97	3.0
2011	18	9	4	1	2	4	0	0	38	100	2.8
2012	13	16	6	1	1	0	2	2	40	98	2.8
2013	9	7	9	2	2	1	3	2	33	100	2.9
2014	21	5	7	5	1	3	1	1	44	98	2.4
2015	12	15	9	9	3	0	0	2	50	100	3.3
2016	12	17	8	1	1	0	2	1	44	95	3.0
2017	14	23	10	4	1	0	1	2	57	96	3.0
2018	14	13	10	3	4	2	0	0	47	98	3.0
2019	9	16	11	7	3	3	2	0	52	98	3.0
<u>5A Nunatak Bench</u>											
2010–2014	No Harvest										
2015–2019	No Harvest										
<u>5B Malaspina Forelands</u>											
2010	1	1	0	1	1	0	0	0	4	100	3.5
2011	0	0	1	0	0	0	0	0	3	33	3.5
2012	1	1	0	0	2	0	0	0	4	100	3.8
2013	1	1	0	0	0	0	0	0	3	67	1.5
2014	0	1	3	0	1	0	0	0	5	100	2.2
2015	2	5	2	3	4	1	3	0	20	100	4.4
2016	1	0	4	4	0	0	0	0	9	100	3.7
2017	1	1	2	0	0	1	0	0	5	100	3.5
2018	1	4	2	1	0	0	1	0	10	90	3.5
2019	3	3	0	4	0	1	1	1	15	87	4.6

Malaspina Forelands: With few moose counts of this area, management has been informed primarily by harvest data. The number of hunters and harvest increased substantially after several reporting periods of decline in this unit. The average annual harvest for the previous 5-year period (RY10–RY14) was 4 moose, compared to 12 moose RY15–RY19. Hunter success and age structure imply that the moose population in this unit is doing well.

Permit Hunts

Two state hunts and 1 joint state/federal registration permit hunt were used to manage moose hunting effort in Unit 5: RM059 (Unit 5A-Nunatak Bench), RM062 (Unit 5B- Malaspina Forelands), and RM061 (Unit 5A-Yakutat Forelands-joint state/federal permit), respectively. The USFS helps manage the RM061 hunt by issuing a federal emergency order (EO) concurrently with the state EO to close the season when guideline harvest levels are reached. The department issues all registration permits and collects all permit reports, analyzes all hunt data, and is responsible for issuing emergency orders to close the state portion of the season.

The average number of hunters getting permits and participating in the RM061 hunt has decreased: annually, an average of 160 hunters got permits and 122 participated RY15–RY19 compared to averages of 172 and 131 hunters, respectively, RY10–RY14 (Table 4). Much of this change was on the west side of the Dangerous River, indicating a decrease in local hunter participation. In contrast, hunter participation in RM062 has increased, with an annual average of 39 hunters getting permits and 28 people hunting RY15–RY19, compared to 28 and 12 people, respectively, RY10–RY14). The decline in hunters in RM061 was not the result of an increase in RM062 as many of the new hunters in RM062 were nonresidents.

Hunter Residency and Success

Much of the harvest in the Unit 5A moose hunt occurs in the first 1–2 weeks, and because the most easily accessible land is under federal management, harvest by Yakutat residents predominates (Table 5). Of the 311 moose harvested during this reporting period in Unit 5, 70% were harvested by local residents, 18% by Alaska residents living outside of Unit 5, and 11% by nonresidents, RY15–RY19 (Table 5). These proportions of the harvest are similar to the previous 5-year period, when 71% were harvested by local residents, 22% by Alaska residents living outside of Unit 5, and 7% by nonresidents RY10–RY14. Most moose taken by local hunters were taken during the first week of the season due to the “early” season for Unit 5A residents on federal lands. RY19 was the first year that the state season had fully opened on the west side of the Dangerous River, and it was open for 1 day before the quota of 30 moose was filled. All of the harvest from that side of the river was from local residents in RY19. Except for RY19, the harvest quota for the area west of the Dangerous River (30 bulls) has been achieved in less than a week, resulting in federal and state season closures in that area. Consequently, the state season rarely opens. After the west side of the Dangerous River quota is met, many local hunters who have not yet harvested an animal are reluctant to charter a plane to areas on the east side to attempt hunting moose. During this report period nonlocal hunters increased their use of areas farther from Yakutat (especially east of the Dangerous River) and in those areas accessible only by airplane.

In Unit 5B, harvest chronology often reflects several boat-based parties of hunters working together to harvest moose, generally during October. The Malaspina Forelands hunt is typically dominated by nonlocal residents because access is more difficult and expensive, and poor weather often deters local hunters from traveling to this area by small boat. However, Unit 5 residents can take advantage of favorable weather conditions to cross Yakutat Bay, which increases harvest in some years. Hunting out of the Icy Bay Lodge by mostly nonresident hunters also increased during this reporting period. The lodge provides housing and transportation by 4-wheeler for hunters. During this report period Unit 5 residents took 23% (14 moose) of the Unit 5B moose harvest, nonresidents took 46% (28), and other Alaska residents took the remaining 31% (19) of the harvest (Table 5). The Unit 5B season remains open until 31 December but fall and early winter weather conditions make access to the unit difficult.

Table 4. Unit 5, Alaska, Hunter effort and success, regulatory years 2010–2019.

Regulatory year	Permits issued	Successful hunters			Unsuccessful hunters			Total hunters		
		No. hunters	Total days	Avg. days	No. hunters	Total days	Avg. days	No. hunters	Total days	Avg. days
<u>5A Yakutat Forelands</u>										
2010	174	37	96	2.6	99	449	4.5	136	545	4.0
2011	188	38	107	2.8	109	489	4.5	147	596	4.1
2012	166	40	114	2.9	88	356	4.0	128	470	3.7
2013	162	33	76	2.3	86	406	4.7	119	482	4.1
2014	172	44	105	2.4	81	279	3.4	125	384	3.1
2015	159	50	129	2.6	80	293	3.7	130	422	3.2
2016	160	44	65	1.5	76	297	3.9	120	362	3.0
2017	157	57	124	2.2	72	259	3.6	129	383	3.0
2018	148	47	109	2.3	57	181	3.2	104	290	2.8
2019	175	52	122	2.3	73	292	4.0	125	414	3.3
<u>5A Nunatak Bench</u>										
2010–2014					No Hunts					
2015–2019					No Hunts					
<u>5B Malaspina Forelands</u>										
2010	35	4	5	1.3	8	28	3.5	12	33	2.8
2011	33	3	8	2.7	11	70	6.4	14	78	5.6
2012	28	4	18	4.5	5	7	1.4	9	25	2.8
2013	21	3	6	2.0	9	32	3.6	12	38	3.2
2014	25	5	12	2.4	9	24	2.7	14	36	2.6
2015	48	20	61	3.1	17	62	3.6	37	123	3.3
2016	40	9	31	3.4	12	44	3.7	21	75	3.6
2017	23	6	16	2.7	17	90	5.3	23	106	4.6
2018	30	10	23	2.3	8	26	3.3	18	49	2.7
2019	53	15	54	3.6	24	137	5.7	39	191	4.9

Table 5. Annual moose kill in Unit 5, Alaska, by community of residence, regulatory years 2010–2019.

Regulatory year	Total harvest	Yakutat	Juneau	Ketchikan	Sitka	Pelican	Hoonah	Petersburg	Haines	Wrangell	Other AK	Nonresident
<u>5A Yakutat Forelands</u>												
2010	37	22	5	0	1	0	0	0	0	0	7	2
2011	38	25	5	0	1	0	0	0	0	0	4	3
2012	40	27	9	0	0	0	0	0	0	0	2	2
2013	33	27	2	0	1	0	0	0	0	0	1	2
2014	44	41	3	0	0	0	0	0	0	0	0	0
2015	50	39	4	0	1	1	0	0	0	0	1	4
2016	44	37	4	0	0	1	0	0	0	0	1	1
2017	57	46	4	0	1	1	0	0	0	0	4	0
2018	47	42	1	0	0	1	2	0	0	0	0	1
2019	52	40	4	0	2	0	0	0	0	0	5	1
<u>5A Nunatak Bench</u>												
2010–2014	No Hunt											
2015–2019	No Hunt											
<u>5B Malaspina Forelands</u>												
2010	4	2	1	0	1	0	0	0	0	0	0	0
2011	3	2	0	0	1	0	0	0	0	0	0	0
2012	4	0	0	0	0	0	0	0	0	0	1	3
2013	3	1	1	0	0	0	0	0	0	0	0	1
2014	5	3	0	0	0	0	0	0	0	0	0	2
2015	20	3	1	1	2	0	0	0	1	0	3	9
2016	9	3	1	2	0	0	0	0	0	0	0	3
2017	6	1	0	2	0	0	0	0	0	0	0	3
2018	10	4	1	0	0	0	0	0	0	0	2	3
2019	16	3	1	1	0	0	0	0	1	0	0	10

Transport Methods

The type of transport used by successful hunters varies, reflecting difficulties in the logistics of access (Table 6). Boats, 3- or 4-wheelers, and highway vehicles continue to dominate modes of transportation. The use of aircraft decreased significantly since the beginning of the previous reporting period, possibly due to reductions in air services available in Yakutat. Three and 4-wheelers, and other forms of off-road vehicles (ORVs) are probably underrepresented because some hunters reporting highway vehicles likely used off-road vehicles as well. Many unsuccessful hunters also use these machines for access. Virtually every fish camp has one or more of these machines present, and although these off-road vehicles have been used in Yakutat for many years, more hunters seem to be using them as a primary method of access. They are commonly used to drag whole moose from a kill site to the nearest road. Rutted meadows from wheeled vehicles are a common sight in Unit 5A.

Despite the importance of aircraft for nonlocal hunter transportation, relatively few Yakutat residents use them. Most locals hunt with the aid of riverboats, ORVs, or highway vehicles, while most nonresident hunters charter aircraft for access or pilot their own planes. The use of aircraft generally increases later in the season as nonlocal hunters begin hunting where there are no roads.

Commercial Services

Commercial services were used by 15% of Unit 5 moose hunters during the report period (Table 7). Nonlocal hunters were more likely to use commercial services, usually for transport to the field. Commercial services were used by a higher percentage of Unit 5B hunters (59%) than Unit 5A hunters (5%). This difference in commercial services used can be attributed to the difficulty of accessing Unit 5B.

Other Mortality

In RY19 a cow moose was killed in defense of life and property when it charged a couple that was deer hunting just off Cannon Beach Road. There were no other unusual moose mortality events during this reporting period.

Alaska Board of Game Actions and Emergency Orders

Unit 5 moose hunts on the west side of the Dangerous River were closed after the quotas were met or exceeded in each year of the reporting period. The Alaska Board of Game reauthorizes the Nunatak Bench antlerless moose hunt annually. The Malaspina Forelands hunt did not reach the 25 moose quota and was not closed during this period.

Recommendations for Activity 2.1 and 2.2

- Continue to monitor total harvest for comparison with management objectives.
- Continue to monitor antler structure and age data to inform management decisions.

Table 6. Transport methods used by successful hunters, Unit 5, Alaska, regulatory years 2010–2019.

Regulatory year	<u>Airplane</u>		<u>Boat</u>		<u>3- or 4- wheeler</u>		<u>ORV</u>		<u>Highway Vehicle</u>		<u>Foot</u>	
	Total	Percent	Total	Percent	Total	Percent	Total	Percent	Total	Percent	Total	Percent
<u>5A Yakutat Forelands</u>												
2010	12	(32)	10	(27)	11	(30)	0	---	4	(11)	0	---
2011	12	(32)	6	(16)	10	(26)	0	---	10	(26)	0	---
2012	8	(20)	13	(33)	10	(25)	0	---	9	(22)	0	---
2013	3	(9)	10	(30)	8	(24)	1	(3)	8	(24)	3	(10)
2014	4	(9)	21	(48)	11	(25)	1	(2)	7	(16)	0	---
2015	4	(8)	13	(26)	15	(30)	5	(10)	13	(26)	0	---
2016	6	(14)	11	(25)	14	(32)	2	(4)	8	(18)	3	(7)
2017	6	(11)	22	(39)	19	(33)	0	---	10	(17)	0	---
2018	8	(17)	17	(36)	8	(17)	0	---	14	(30)	0	---
2019	6	(12)	9	(17)	20	(38)	1	(2)	14	(27)	2	(4)
<u>5A Nunatak Bench</u>												
2010–2014	No Hunt											
2015–2019	No Hunt											
<u>5B Malaspina Forelands</u>												
2010	1	(25)	3	(75)	0	---	0	---	0	---	0	---
2011	2	(67)	0	---	1	(33)	0	---	0	---	0	---
2012	1	(25)	0	---	3	(75)	0	---	0	---	0	---
2013	2	(67)	0	---	1	(33)	0	---	0	---	0	---
2014	1	(17)	2	(33)	1	(17)	2	(33)	0	---	0	---
2015	10	(50)	1	(5)	7	(35)	2	(10)	0	---	0	---
2016	7	(78)	1	(11)	1	(11)	0	---	0	---	0	---
2017	3	(50)	1	(17)	1	(17)	1	(17)	0	---	0	---
2018 ^a	4	(44)	2	(22)	3	(33)	0	---	0	---	0	---
2019	8	(50)	4	(25)	1	(6)	3	(19)	0	---	0	---

^a One hunter did not report transportation.

Table 7. Commercial services used by hunters, Unit 5, Alaska regulatory years 2010–2019.

Regulatory year	Unit residents		Other AK residents		Nonresidents		Total use		Transport	Registered guide	Other services
	No	Yes	No	Yes	No	Yes	No	Yes			
<u>5A Yakutat Forelands</u>											
2010	78	9	21	24	1	3	100	36	36	0	1
2011	91	6	23	14	3	8	117	28	27	0	1
2012	88	4	12	16	1	3	101	23	21	1	1
2013	91	2	16	5	1	2	106	9	4	2	3
2014	98	7	10	5	2	2	100	14	11	2	1
2015	103	1	25	2	2	3	130	6	2	2	2
2016	92	1	15	9	1	0	108	10	9	0	1
2017	96	1	29	1	1	1	126	3	2	0	1
2018	82	2	15	2	2	0	99	4	3	0	1
2019	87	1	27	7	3	1	117	9	7	1	1
<u>5A Nunatak Bench</u>											
2010–2014	No Hunt										
2015–2019	No Hunt										
<u>5B Malaspina Forelands</u>											
2010	7	0	1	2	0	1	8	3	3	0	0
2011	2	1	1	4	0	5	3	10	7	3	0
2012	4	0	0	2	0	3	4	5	5	0	0
2013	4	4	0	1	0	3	4	8	7	1	0
2014	5	2	1	2	3	1	9	5	5	0	0
2015	8	2	4	10	4	9	16	21	18	1	2
2016	3	3	2	6	6	1	11	10	10	0	0
2017	1	2	1	6	2	11	4	19	14	0	5
2018	6	0	0	7	2	2	8	9	8	1	0
2019	7	0	5	13	5	10	17	23	19	0	4

3. Habitat Assessment-Enhancement

ACTIVITY 3.1. Monitor browse condition.

Data Needs

Monitoring forage utilization by moose and forage plant condition enables evaluation of whether moose density is having an adverse effect on habitat. This is necessary to meet the goal of protecting moose habitat.

Methods

The department is not monitoring habitat condition or browsing intensity in Unit 5. However, a moose habitat selection study was conducted by USFS and ADF&G between 2002 and 2004, and methods and results are presented in Oehlers et al. 2011.

Results and Discussion

See Oehlers et al. 2011.

Recommendations for Activity 3.1

The moose population in Unit 5 seems to be stable at this time, and a forage study is not recommended. Even though habitat may be compromised on the Nunatak Bench, the number of moose in this area are not likely to show heavy browsing in the habitat available.

NONREGULATORY MANAGEMENT PROBLEMS OR NEEDS

Data Recording and Archiving

- Harvest data are stored on an internal database housed on a server (<http://winfonet.alaska.gov/index.cfm>). Field data sheets for surveys are stored in file folders in filing cabinets in the Douglas area office.
- All other electronic data and files, such as survey memos and reports, are located on the computer and regional server (S:\Region1 Shared-DWC\S&I-Survey Memorandum) in the Douglas area office area biologist cubicle. Field data sheets, paper files, hard copies, etc. are in the file cabinet located in the Douglas area office beside the area biologist's cubicle.
- Antler photos are located on the area biologist's laptop computer.

Agreements

- ADF&G–USFS Memorandum of Understanding, Agreement No. 14-MU-11100500-022.

Until recently there was a memorandum of understanding (MOU) between ADF&G and the U.S. Forest Service, but then there was a disagreement between the two agencies and the (MOU) was not renewed during this reporting period. However, there are indications of positive progress in addressing issues, and it is expected a new MOU will be signed during RY20–RY24.

Permitting

None.

Conclusions and Management Recommendations

Of all the moose hunts in Southeast Alaska, the hunts in Unit 5 have seen some of the most change between this review period and the last one. The number of local hunters hunting west of the Dangerous River dropped slightly, but harvest and success increased. The increase in harvest was due to an increase in the annual harvest quota by 10 animals across the unit, with 5 animals west of and 5 animals east of the Dangerous River. The number of nonlocal hunters east of the Dangerous River increased slightly, and similarly, the number of nonresident hunters increased in Unit 5B. The increased interest in these hard to get to hunts may be due in part to high hunter success in these areas. There has also been a decrease in aircraft use compared to early in the previous 5 years, which is likely due to fewer charter operators working out of Yakutat in the fall.

The Nunatak Bench moose population remains low, likely due to the 2002 damming of Russell Fjord by the Hubbard Glacier, which flooded wintering habitat and killed browse plants. The department will continue to monitor this population and will allow hunting only when moose numbers can support a harvest.

Excluding the Nunatak Bench, the moose populations seem to be stable and should be able to support the current harvest quota if the population is not impacted by heavy snows in future winters.

II. Project Review and RY20–RY24 Plan

Review of Management Direction

MANAGEMENT DIRECTION

There are no changes in management direction for moose in Unit 5 expected for this planning period.

GOALS

Regionwide moose management goals were established during creation of the Region I moose management plan in the late 1980s (ADF&G 1990). The following goals from that plan are general and applicable to the entire region:

1. To maintain, protect, and enhance moose habitat and other components of the ecosystem.
2. To maintain viable populations of moose in their historic range throughout the region.
3. To manage moose on a sustained yield basis.

4. To manage moose in a manner consistent with the interests and desires of the public.
5. To manage primarily for meat, rather than trophy hunting of moose.
6. To manage for the greatest hunter participation possible consistent with maintaining viable populations, sustained yield, subsistence priority, and the interests and desires of the public.
7. To provide opportunities to view and photograph moose for the benefit of non-hunters (nonconsumptive users) of moose.
8. To develop and maintain a database useful for making informed management decisions.

CODIFIED OBJECTIVES

Amounts Reasonably Necessary for Subsistence Uses

The Alaska Board of Game has made a positive finding for customary and traditional use of moose in Unit 5 and set 50 moose as the amount necessary for subsistence (ANS; 5 AAC 99.025(a)(8)).

Intensive Management

The unit 5 moose population is not expected to be subject to intensive management.

MANAGEMENT OBJECTIVES

The following objectives, based on existing biological data, have been identified by staff with input from the public and are contained in the Strategic Plan for Management of Moose in Region I, Southeast Alaska (ADF&G 1990). They are compared with current population estimates and use levels (these estimates include data from both state and federal hunts).

<u>Plan</u>	<u>Objective</u>
<i>Unit 5A Yakutat Forelands</i>	
Post-hunt moose numbers (estimated)	600–800
Annual hunter kill (average)	60
Post-hunt bull:cow ratio	25:100
Number of hunters (annual average)	250
Hunter-days of effort (annual average)	1,025
Hunter success (annual average)	28%
<i>Unit 5A Nunatak Bench</i>	
Post-hunt moose numbers (estimated)	50
Annual hunter kill (average)	5
Post-hunt bull:cow ratio	25:100
Number of hunters (annual average)	10
Hunter-days of effort (annual average)	60
Hunter success (annual average)	50%

Unit 5B Malaspina Forelands

Post-hunt moose numbers (estimated)	250
Annual hunter kill (average)	25
Post-hunt bull:cow ratio	25:100
Number of hunters (annual average)	50
Hunter-days of effort (annual average)	200
<u>Hunter success (annual average)</u>	<u>50%</u>

REVIEW OF MANAGEMENT ACTIVITIES

1. Population Status and Trend

ACTIVITY 1.1. Continue to conduct post-hunt aerial surveys in 5A Yakutat Forelands every year and every other year in 5A Nunatak Bench and 5B Malaspina Forelands.

Data Needs

Estimates of population size, including minimum counts, and age and sex composition will be used to inform management. Moose range throughout most of Unit 5 and minimum counts, age composition and sex ratios, are needed for each population managed. Population models will be created to assist management in setting harvest goals.

Methods

If weather and pilot availability allow, abundance and composition surveys will be conducted when there is adequate snow cover and prior to antler drop, ideally using fixed-winged aircraft (Piper PA-18 Super Cub or equivalent aircraft). However, suitable aircraft (Super Cub) are not readily available in Yakutat, so a Cessna 185 or 206 aircraft may be used for surveys and the survey may occur after antler drop. During surveys, the number of animals and age and sex of each animal will be recorded. Due to the inability to accurately distinguish between adult males and females following antler drop (after December 1) adult moose lacking antlers and not accompanied by a calf are recorded as “unknown sex.”

2. Mortality-Harvest Monitoring

ACTIVITY 2.1. Monitor trends in hunter effort, and abundance and distribution of moose including age and sex composition through hunter reports on required registration permits. Data needs and methods are the same for Activity 2.2.

ACTIVITY 2.2. Monitor number, age, and antler configurations of harvested moose by examining antlers (opportunistically) and collecting lower jaws for aging from successful hunters.

Data Needs

Monitoring and analyzing harvest data will be essential to determining whether our harvest objectives have been met and to ensuring that harvests will be sustainable.

Methods

Hunters in Unit 5 are required to obtain a registration permit for the hunt they are planning to participate in before entering the field (RM059- Unit 5A Nunatak Bench; RM061-Unit 5A-Yakutat Forelands Joint State-Federal Permit; and RM062-Unit 5B Malaspina Forelands). Each permit requires the hunter's demographic information including their hunting license number and includes a punch ticket that hunters must get validated upon successful harvest of a moose. Each permit also contains a mail-in hunt report card. Submission of a hunt report is mandatory for all permittees regardless of whether they hunt or not. Hunt reports provide the department with information on the number of days hunted, date and location of hunt and harvest, method of transport to the field, and any use of commercial services.

All successful moose hunters are required to inform ADF&G of their harvest within 5 days of the kill, except that 24-hour reporting is required west of Dangerous River for RM061 and are required to bring the front portion of the lower jaw to ADF&G so teeth can be pulled for aging. Successful hunters in Unit 5 are asked to voluntarily send antler photos to the department which allows us to correlate antler architecture with age. Such information has been used in the past to provide insight to recruitment and refine antler regulations.

3. Habitat Assessment-Enhancement

ACTIVITY 3.1. Monitor browse condition

Data Needs

Monitoring foraging intensity and forage plant condition enables evaluation of whether moose density is having an adverse effect on habitat. This is necessary to meet the goal of protecting moose habitat.

Methods

The department is not monitoring habitat condition or browsing intensity in Unit 5.

NONREGULATORY MANAGEMENT PROBLEMS OR NEEDS

The department will continue to work with the USFS and Federal law enforcement to gain compliance with hunt conditions, specifically with reporting harvest on time.

Data Recording and Archiving

- Harvest data are stored on an internal database housed on a server (<http://winfonet.alaska.gov/index.cfm>). Field data sheets for surveys are stored in file folders in filing cabinets in the Douglas area office.
- All other electronic data and files, such as survey memos and reports, are located on the computer and regional server (S:\Region1 Shared-DWC\S&I-Survey Memorandum) in the Douglas area office area biologist cubicle. Field data sheets, paper files, hard copies, etc. are in the file cabinet located in the Douglas area office beside the area biologist's cubicle.

- Antler photos are located on the area biologist's laptop computer.

Agreements

- Finalize ADF&G–USFS Memorandum of Understanding.

Permitting

None

References Cited

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