Species Management Report and Plan ADF&G/DWC/SMR&P–2017–9

Moose Management Report and Plan, Game Management Unit 5:

Report Period 1 July 2010–30 June 2015, and

Plan Period 1 July 2015–30 June 2020

Stephanie Sell

2017

Alaska Department of Fish and Game Division of Wildlife Conservation

Species Management Report and Plan ADF&G/DWC/SMR&P-2017-9

Moose Management Report and Plan, Game Management Unit 5:

Report Period 1 July 2010–30 June 2015, and

Plan Period 1 July 2015–30 June 2020

PREPARED BY:

Stephanie Sell
Area Biologist

APPROVED BY:

Thomas Schumacher
Management Coordinator

Alaska Department of Fish and Game
Division of Wildlife Conservation
PO Box 115526
Juneau, AK 99811

Hunters are important founders of the modern wildlife conservation movement. They, along with trappers and sport shooters, provided funding for this publication through payment of federal taxes on firearms, ammunition, and archery equipment, and through state hunting license and tag fees. This funding provided support for Federal Aid in Wildlife Restoration Moose Survey and Inventory Project 1.0.

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 Thomas Schumacher, Management Coordinator 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, Alaska 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).

Please cite this document as follows:

Sell, S. 2017.Moose management report and plan, Game Management Unit 5: Report period 1 July 2010–30 June 2015, and plan period 1 July 2015–30 June 2020. Alaska Department of Fish and Game, Species Management Report and Plan ADF&G/DWC/SMR&P-2017-9 Juneau.

Contents

List of Figures

List of Tables

List of Appendices

Purpose of this Report

This report provides a record of survey and inventory management activities for moose in Unit 5 for the previous 5 regulatory years and plans for survey and inventory management activities in the 5 years following the end of that period. 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 analyses to help guide and record its own efforts but is also provided to the public to inform them of wildlife management activities. In 2016 the Alaska Department of Fish and Game's Division of Wildlife Conservation launched this new type of 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 moose management report of survey and inventory activities that was previously produced every 2 years.

I. RY10–RY14 Management Report

Management Area

Unit 5 encompasses an area of approximately 5,800 mi^2 of mainland in northern Southeast Alaska and the eastern Gulf of Alaska coast from Cape Fairweather to Icy Bay (Fig. 1). Yakutat has a maritime climate characterized by relatively mild but often rainy weather with heavy snowfall in the winter months. Unit 5 is comprised of many large glacial systems, including the Malaspina and Hubbard glaciers, icefields, fjords, complex river systems, dense forested habitat with large meadow systems, tidelands and estuaries. Land management in this area is complex, with a variety of state and federal agencies and Alaska Native corporations playing roles. Geographic features divide Unit 5 moose into 3 discrete populations (5A Yakutat Forelands, 5A Nunatak Bench, 5B Malaspina Forelands).

Yakutat Forelands: The Yakutat Forelands extend from Cape Fairweather in the east to Disenchantment Bay and Hubbard Glacier in the west, covering more than 2,700 square miles. An estimated 450–600 square miles is moose habitat, including both meadows and forested habitats with complex river systems. The area is frequently subject to winters with heavy snow.

Nunatak Bench: Nunatak Bench is bordered by Hubbard Glacier to the west, Art Lewis Glacier to the east, and Nunatak/Russell Fjord to the south. It lies within the Russell Fjord Wilderness Area of the Tongass National Forest. The area is estimated to cover over 200 square miles. Only a small portion of the area is moose habitat with most of that consisting of glacial ice and rock. The prime winter browse areas are the outwash plain of the Butler Glacier, Nunatak Bench, and Seal Bay. No study has been conducted on the condition of the moose range on Nunatak Bench, and no estimate of the habitat capability of the area exists. The advancing Hubbard Glacier has the ability to temporarily close Nunatak/Russell Fjord inundating low elevation moose habitat.

Malaspina Foreland: Game Management Unit 5(B) extends from Disenchantment Bay and Hubbard Glacier in the east to the west side of the Guyot Hills in Icy Bay in the west; a total area of 2,500 square miles. Most of the area is covered by glaciers, notably the Malaspina and including the Hubbard, Lucia, Tyndall, and Yahtse glaciers. Only about 300 square miles is moose habitat, including both meadows and forested habitats, mostly on the Malaspina Forelands

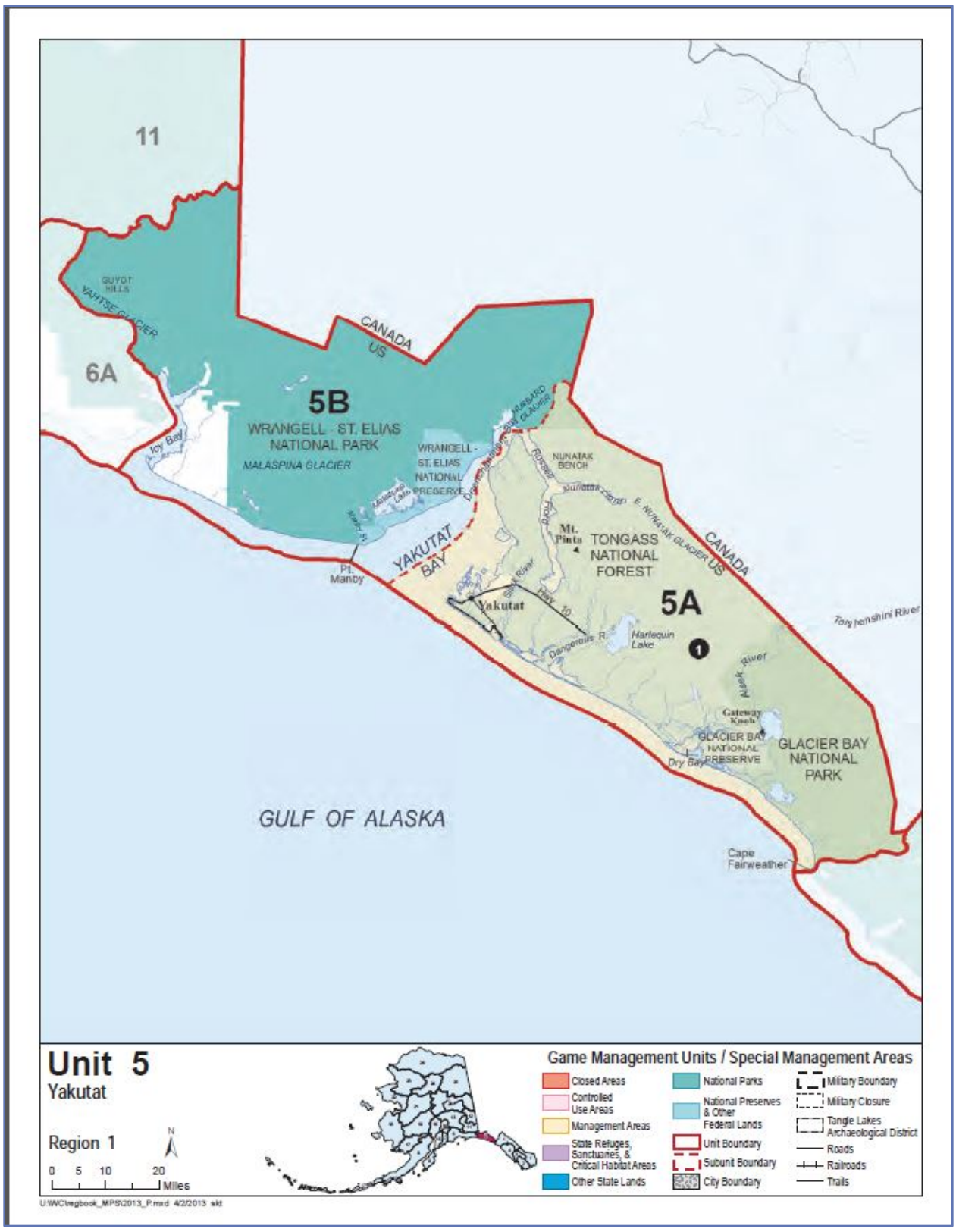

Figure 1. Unit 5 boundary from Cape Fairweather to Icy Bay, Alaska.

which are the outwash plains of the Malaspina Glacier. The area is frequently subject to winters of heavy snowfall.

All of Game Management Unit 5(B) is either in the Wrangell–St Elias National Park and Preserve or is owned by the Chugach Alaska Corporation, a Native Corporation. Most moose habitat is within national park preserve boundaries where regulations allow hunting. Most of the best moose habitat on the western portion of the forelands near Pt. Riou is on land owned by the Chugach Alaska Corporation. To date, the Corporation has allowed public access for hunting on its land.

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. Moose slowly expanded to the west with the first moose documented on the Malaspina Forelands west of Yakutat Bay in the 1950s. It is believed that the glaciers and waters of Icy Bay curtailed westward expansion of this moose population.

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 more realistic 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 a threshold that is at the carrying capacity of the area. A moose population study conducted on the Yakutat Forelands during 2000–2004 by the U.S. Forest Service and the Alaska Department of Fish and Game (ADF&G) indicated that cow moose were in good condition, with high pregnancy and twinning rates, indicative of healthy moose with good habitat. Additionally, population models were created during the radio-collaring portion of the study to help better understand sightability during aerial surveys (Oehlers et al. 2012). Brown and black bears and wolves inhabit this area, and predation is thought to be a major limiting factor for this population.

The Nunatak Bench area was closed to hunting in the summer of 1986 when the advancing Hubbard Glacier dammed Russell Fjord, flooding much of the moose habitat. That event resulted in a dramatic decline in this small, somewhat isolated population. Following the retreat of the Hubbard Glacier and subsidence of the waters of Russell Fjord in the fall of 1986, much of the winter browse available to the Nunatak Bench moose population was dead. However, over the next 7 years the vegetation recovered and moose slowly recolonized the area. Based on 1994 aerial survey counts, the Alaska Board of Game (BOG) reopened moose hunting beginning with the 1995 season. In 2002 the Hubbard Glacier again advanced and dammed Russell Fjord. The water level rose approximately 65 feet, again drowning much of the moose habitat. The moose season has been closed since that time due to low moose numbers.

Since 1978 the state hunting season for moose in Unit 5 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 U.S. Forest Service (USFS) and the National Park Service and prohibited hunting on federal public lands from 8–21 October except by Yakutat residents.

Prior to the 2004 hunting season, the 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.

Prior to 2012 a block of state-selected land on the Yakutat Forelands near town allowed non-federally qualified subsistence users to legally hunt during the first week of the state season. Those townships happened to be high quality moose habitat with relatively good access and close to Yakutat. In 2012 those lands reverted to federal management, eliminating opportunity for non-federally qualified users and federally qualified users from outside Yakutat. Due in part to this change in land management, the joint guideline harvest quota for moose west of the Dangerous River is now often reached before the state season opens.

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 allow for an increase in bull: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. In 2008 the guideline was raised to 25 bulls. Biologists will continue to monitor the moose population bull: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.

EXISTING WILDLIFE MANAGEMENT PLANS

Region I developed a moose management plan in the late 1980s (ADF&G 1990) intended to guide management through RY 1994. With the exception of the Gustavus population, the 1990 plan included objectives and management strategies for moose populations throughout the region. That plan has never been formally updated.

Although the overall goals of the original plan are still important(e.g. maintain habitat, maintain viable population, manage moose on a sustained yield basis), the 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. The following 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 nonhunters (nonconsumptive users) of moose.
8. To develop and maintain a database useful for making informed management decisions.

CODIFIED OBJECTIVES

Amounts Reasonably Necessary for Subsistence Harvest

The Board of Game has made a positive finding for customary and traditional use of moose in Game Management Unit 5 and set 50 moose as the amount necessary for subsistence.

Intensive Management

None

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 Southeast Alaska (ADF&G 1990). The plan portion of this report contains the current management plan for moose in Unit 5.

Plan	Objective
Unit 5A Yakutat Forelands	
Post-hunt moose numbers (estimated)	600–800
Annual hunter kill (average)	55

Plan	Objective
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)	50
Hunter-days of effort (annual average)	200
Hunter success (annual average)	50%

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

Methods

When weather and pilot availability allows, 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 we often use Cessna 185 or 206 aircraft for surveys. 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) we categorize adult moose lacking antlers and not accompanied by a calf as “unknown sex.”

Several factors affect our 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 we conduct surveys. Consequently, survey frequency and coverage can vary considerably from year to year (Table 1). The Yakutat Forelands in Unit 5A are generally surveyed annually, although in some years we attempt surveys only to acquire a sample of moose for composition analysis. We try to survey Nunatak Bench 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. We survey in Unit 5B less frequently. The area is remote and receives less hunting pressure than elsewhere in Unit 5, so we believe it can be adequately managed with less frequent surveys.

Table 1. Unit 5, Alaska aerial survey data, regulatory years[a] 2010 through 2014.[b]

Year	Bulls	Cows	Calves	Unk[c]	Total moose	Count time (hrs)	Bulls per 100 cows	Calves per 100 cows	Calves % in herd	Moose per hour
					5A Yakutat Forelands					
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[d]	18	36	41	117	212	4.1	12	27	19	52
2014					No Survey					
					5A Nunatak Bench					
2010–2011					No Survey					
2012	NA	2	2	8	12	0.8	NA	NA	17	15
2013–2014					No Survey					
					5B Malaspina Forelands					
2003	20	19	20	94	153	4.2	NA	NA	NA	36
2004					No Survey					
2005	6	8	9	43	66		NA	NA	14	NA
2006	0	21	21	125	167	4.8	NA	NA	13	35
2007	NA	13	13	56	82	3.7	NA	NA	16	22
2008–2014					No Survey					

[a] A regulatory year begins 1 July and ends 30 June, e.g., regulatory year 2010 = 1 July 2010–30 June 2011.
[b] Due to survey timing, poor snow conditions, extreme winds, and less than ideal survey aircraft, herd composition data is not often not reliable and is noted as (NA=data not available).
[c] Unknown sex are considered female for purposes of ratio calculations.
[d] Composition survey of west side of Dangerous River-under poor survey conditions.

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 has given us a sightability correction factor for most available habitats. 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, we use it to provide insight into our 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

Results of aerial surveys in Unit 5 are presented in Table 1. Composition surveys are not always possible because suitable survey conditions and aircraft availability often do not coincide until after bulls begin to shed their antlers and differentiating male and female moose is not possible. For additional insight into the makeup of our moose populations, we collected lower jaws from each harvested moose from successful hunters, providing us with the age structure of the harvest (Tables 2).

Yakutat Forelands: Aerial surveys during RY11–RY13 found 98–229 total moose (Table 1). No surveys were conducted in RY10 or RY14 due to aircraft or pilot availability or weather. In all years we were able to complete surveys on the west side of the Dangerous River, but we were only able to survey east of the Dangerous River during one year. Management objectives for surveys were not met during the report period, and bull:cow ratios were not met due to late season surveys and antler drop.

Nunatak Bench: The only survey conducted in this area was during RY12 with 12 total moose observed. This moose herd continues to suffer the effects of habitat depletion from the 2002 flooding and periodic winters with very deep snow. Managers will attempt to survey this area every other year to determine if a sufficient number of moose are present to support a hunt.

Malaspina Forelands: We have no direct data on the status of the Malaspina Forelands moose population as no surveys have been conducted since 2008 because of poor weather conditions and aircraft availability. Efforts will be made in the next report period to get a survey completed in this area.

Recommendations for Activity 1.1.

Continue to conduct aerial surveys at a minimum on the West side of the Dangerous River annually, and continue to make attempts to survey all other areas every other year.

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.

Table 2. Unit 5 age structure of harvested moose, regulatory years[a] 2003 through 2014.

Year	Age Class																Total	%	Mean
	0.5	1.5	2.5	3.5	4.5	5.5	6.5	7.5	8.5	9.5	10.5	11.5	12.5	13.5	14.5	15.5	kill	Aged	Age
Yakutat Forelands																			
2003	0	11	4	7	2	1	1	0	0	0	0	0	1	0	0	0	30	90	3.2
2004	1	12	12	6	3	2	0	3	1	0	0	0	0	0	0	0	40	100	3.1
2005	0	14	9	5	2	0	2	3	0	0	0	0	0	0	0	0	37	95	3.0
2006	0	9	11	4	2	1	1	0	1	0	0	0	1	0	0	0	33	91	3.2
2007	0	14	12	14	4	1	0	0	1	0	0	0	0	0	1	0	48	98	3.1
2008	0	9	7	10	6	2	1	0	0	0	0	0	0	0	0	0	35	100	3.2
2009	0	9	10	7	3	5	1	0	2	0	0	0	0	0	0	0	38	97	3.4
2010	0	15	6	8	0	4	2	1	0	0	0	0	0	0	0	0	37	97	3.0
2011	0	18	9	4	1	2	4	0	0	0	0	0	0	0	0	0	38	100	2.8
2012	0	13	16	6	1	1	0	0	2	0	0	0	0	0	0	0	40	98	2.8
2013	0	9	7	9	2	2	1	1	2	0	0	0	0	0	0	0	33	100	2.9
2014	0	21	5	7	5	1	3	0	1	0	0	0	0	0	0	0	44	98	2.4
5A Nunatak Bench																			
2003	0	0	1	0	0	0	0	1	0	1	0	0	0	0	0	0	3	100	6.5
2004	0	0	0	1	0	0	0	1	2	0	0	0	0	0	0	0	4	100	7.0
2005	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	---	---
2006–2014	No Harvest																		
5B Malaspina Forelands																			
2003	0	0	1	0	3	2	0	2	0	0	0	0	0	0	0	0	9	89	5.3
2004	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	---
2005	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	---	---
2006	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	2	100	7.5
2007	0	2	1	3	2	1	0	0	0	0	0	0	0	0	0	0	10	90	3.4
2008	0	4	0	2	2	1	0	0	0	0	0	0	0	0	0	0	9	100	3.1
2009	0	2	3	1	1	2	0	0	0	0	0	0	0	0	0	0	11	82	3.3
2010	0	1	1	0	1	1	0	0	0	0	0	0	0	0	0	0	4	100	3.5
2011	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	3	33	3.5
2012	0	1	1	0	0	2	0	0	0	0	0	0	0	0	0	0	4	100	3.8
2013	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	3	67	1.5
2014	0	1	3	0	1	0	0	0	0	0	0	0	0	0	0	0	5	100	2.2

[a] A regulatory year begins 1 July and ends 30 June, e.g., regulatory year 2010 = 1 July 2010–30 June 2011.

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 (Fig. 2); RM061-Unit 5A-Yakutat Forelands Joint State-Federal Permit (Fig. 3); and RM062-Unit 5B Malaspina Forelands (Fig. 4)). 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 participants in the hunt, 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 and 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.

Season and Bag Limit

Season and bag limits	Resident and nonresident hunter
Unit 5A, except Nunatak Bench 1 bull by registration permit only; up to 55 bulls may be taken; the commissioner may close the season in that portion west of the Dangerous River when 25 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 Oct. 8.]	15 Oct–15 Nov
Unit 5A, Nunatak Bench 1 moose by registration permit only; up to 5 moose may be taken	15 Nov–15 Feb
Unit 5B 1 bull by registration permit only; up to 25 bulls may be taken	15 Sep–15 Dec

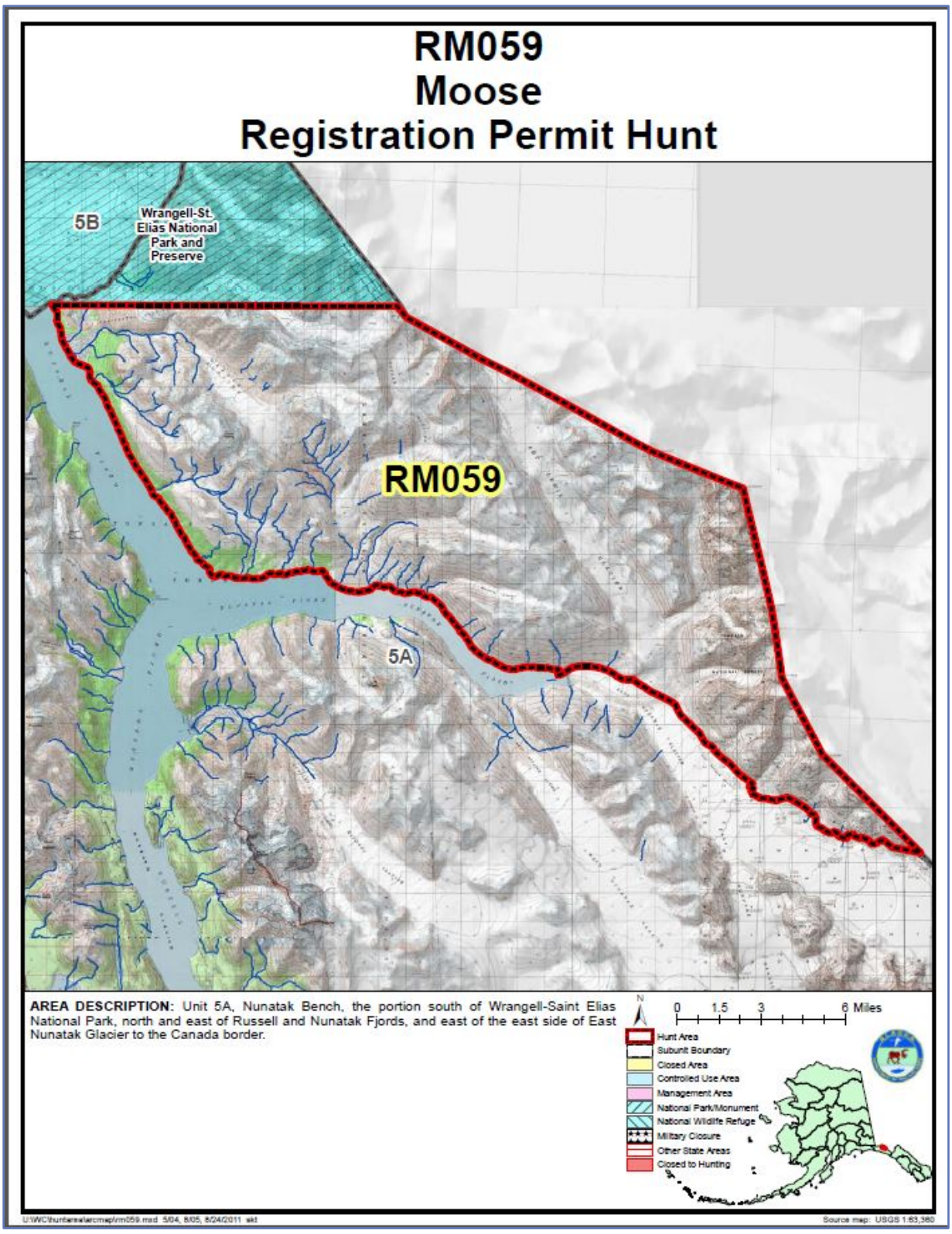

Figure 2. Bull moose registration permitted hunt RM059, regulatory years[a] 2010–2014.

[a] A regulatory year begins 1 July and ends 30 June (e.g., regulatory year 2010 = 1 July 2010–30 June 2011.

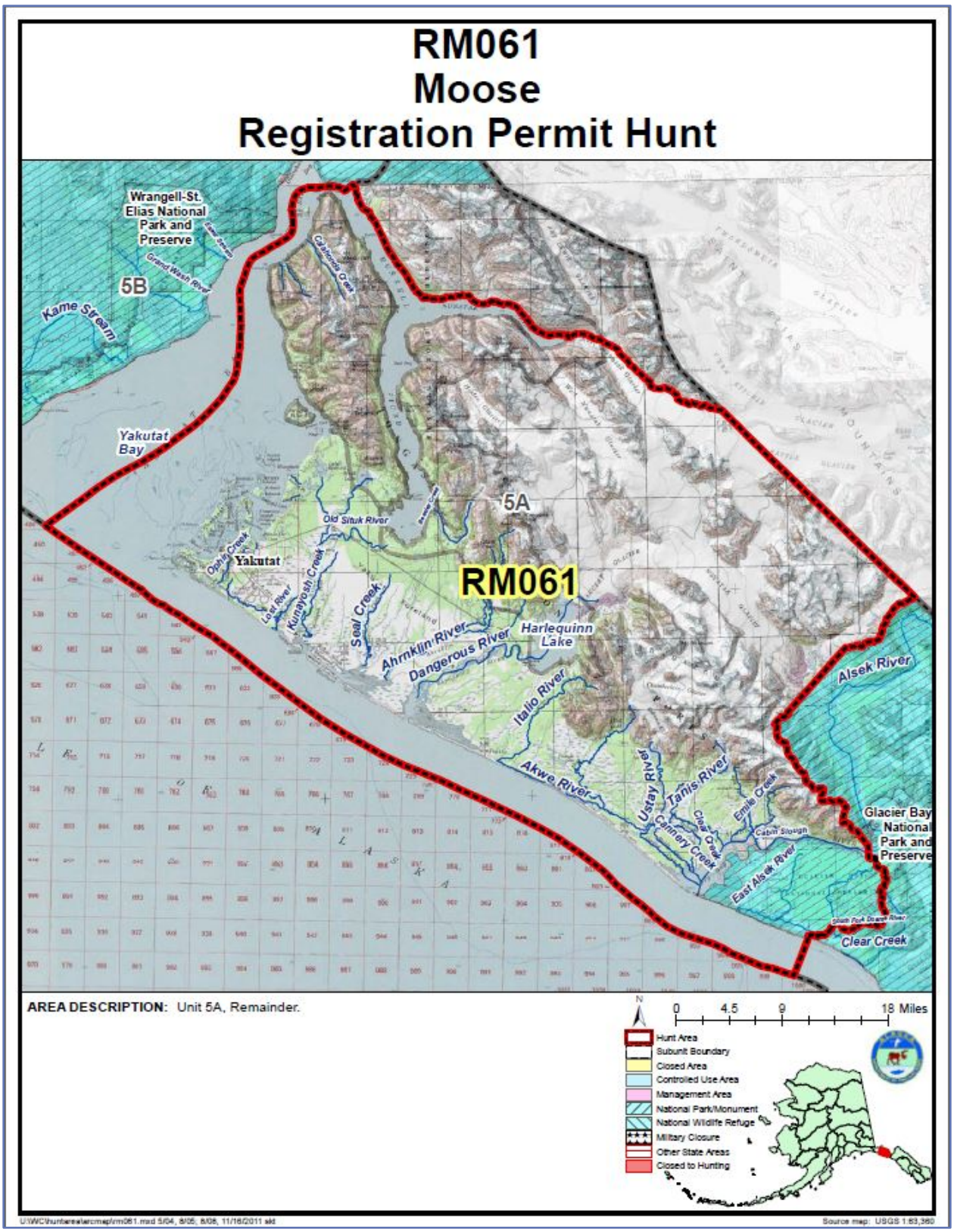

Figure 3. Bull moose hunt RM061 in Unit 5A, regulatory years[a] 2010–2014.

[a] A regulatory year begins 1 July and ends 30 June (e.g., regulatory year 2010 = 1 July 2010–30 June 2011.

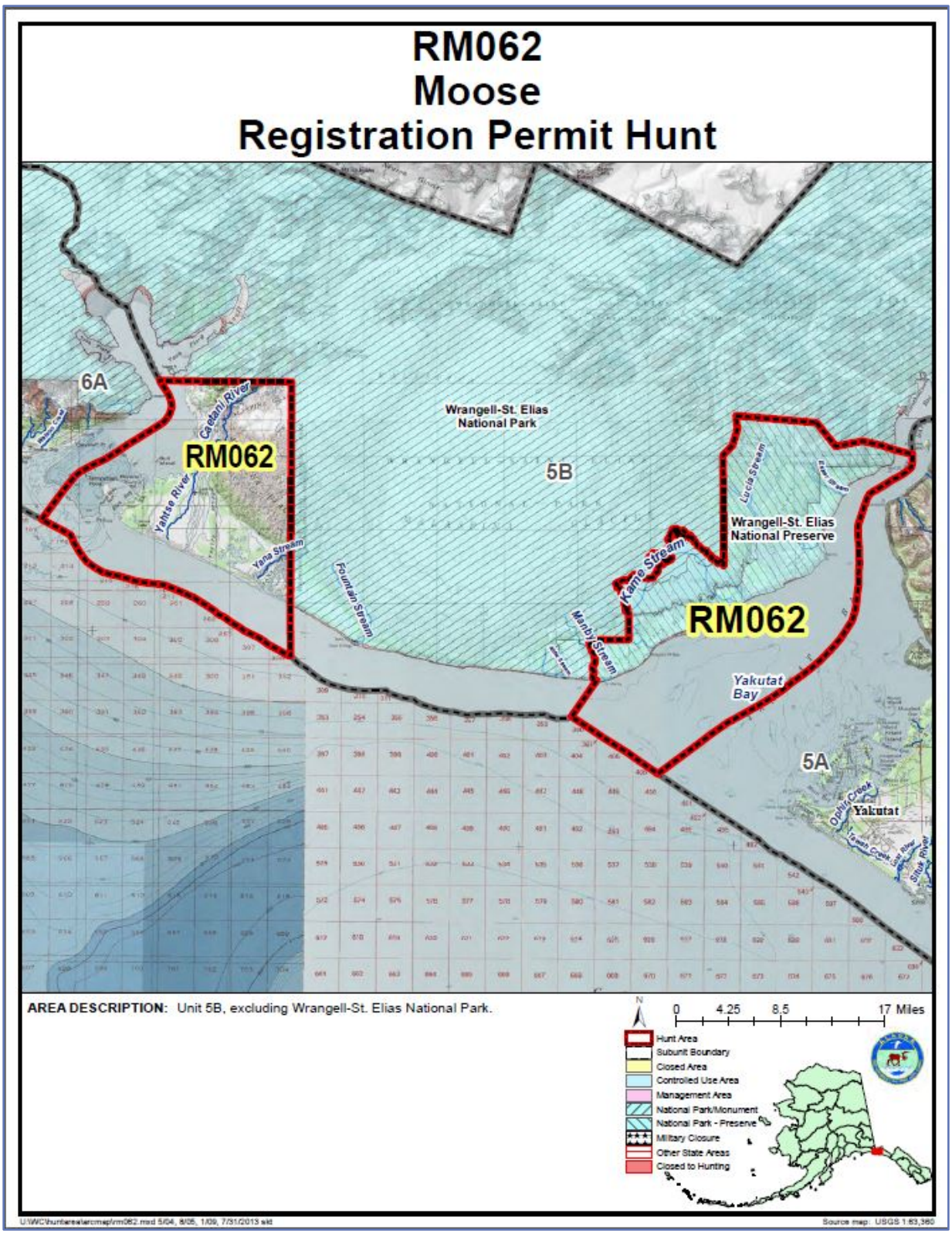

Figure 4. Bull moose registration permit hunt RM062 in Unit 5B, regulatory years 2010–2014.

[a] A regulatory year begins 1 July and ends 30 June (e.g., regulatory year 2010 = 1 July 2010–30 June 2011.

Results and Discussion

Harvest by Hunters-Trappers

5A Yakutat Forelands: The annual harvest of moose in Unit 5A (Yakutat Forelands) during the report period averaged 38 moose (Table 3) and is below our management objective. Each year during this report period the quota for the west side of the Dangerous River was achieved or exceeded, and that portion of the hunt was closed by emergency order. From October 8–October 21 federal public lands are only open to moose hunting by residents of Unit 5A. Most land in the Yakutat area is federally managed, so nearly all harvest was by Yakutat residents usually prior to the state season opening. In addition to sex composition data, age structure of harvested bull moose provides valuable population information (Table 2). The yearling and 2–3 year old bull component of the harvest was very strong in all of these years suggesting good recruitment for those age classes. Based on aerial survey data moose numbers are healthy, with no reason to suspect the population has changed dramatically in recent years. With the paucity of reliable bull:cow ratio data over time, we don't know if the proportion of bulls in the herd has changed from historical proportions (Table 1).

5A Nunatak Bench: No registration permits were issued for the Nunatak Bench portion of Unit 5 (RM059), therefore no moose were harvested during the report period. This area has been closed to moose hunting since RY06 due to low numbers of moose observed during aerial surveys. Managers will not consider a limited harvest until at least 25 total moose are observed during aerial surveys.

5B Malaspina Foreland: Moose harvest in Unit 5B decreased from an average of 6 to 4 during RY05–RY09 and RY10–RY14, respectively (Table 3). Access to Unit 5B is often limited by weather and once on the ground dense vegetation and difficult terrain cause hunters to remain close to the beach. This suggests hunters may not be using much of the available moose habitat and the overall harvest may be less than it could be. The number of hunters and days hunted (Table 4) decreased again during this report period, which was reflected in a decline in the number of moose taken. In contrast to the relatively consistent age of moose harvested in Unit 5A, the mean age of harvested Malaspina Forelands moose has been erratic, ranging between 1.5 and 7.5 years since 1999. The mean age of 3.0 during the report period is within the age structure range of the last 10 years. Typically, the presence of young bulls in the harvest occurs when the total harvest is higher than the 10-year average but because of the low hunter effort and harvest in the unit, the usefulness of the age data is limited.

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 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. Successful hunters must

Table 3. Unit 5, Alaska harvest,[a] hunters, and success, regulatory years[b] 2003 through 2014.

Year	No. males	No. females	No. unknown	Total kill	No. hunters	% success
			5A Yakutat Forelands			
2003	30	0	0	30	137	22
2004	40	0	0	40	172	23
2005	37	0	0	37	158	23
2006	33	0	0	33	127	26
2007	48	0	0	48	151	32
2008	35	0	0	35	139	25
2009	38	0	0	38	143	27
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
			5A Nunatak Bench			
2003	2	1	0	3	8	38
2004	2	2	0	4	5	80
2005	0	0	0	0	3	0
2006			Season Closed by Emergency Order			
2007–2014			---			
			5B Malaspina Forelands			
2003	9	0	0	9	28	32
2004	2	0	0	2	18	11
2005	0	0	0	0	15	0
2006	2	0	0	2	13	15
2007	10	0	0	10	35	29
2008	9	0	0	9	31	29
2009	11	0	0	11	30	37
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

[a] Includes moose harvested under federal ceremonial permits.
[b] A regulatory year begins 1 July and ends 30 June, e.g., regulatory year 2010 = 1 July 2010–30 June 2011.

provide the lower front portion of the jaw from the animal taken and deliver a completed hunt report to the department no later than 5 days after their harvest. Hunters are asked to voluntarily provide a photograph of harvested bull moose antlers for age and antler development comparisons. When possible department staff contacts hunters in the field to collect hunt information, permit report cards, biological samples, and photographs of harvested moose.

Under the joint state/federal permits for the Yakutat Forelands (RM061) a mean of 172 permits were issued during the report period (Table 4). A majority of hunters that obtain this permit are trying to harvest bull moose on the west side of the Dangerous River as the road and major river systems allow relatively easy access to large meadow systems at minimal cost. Combining all years of the report period, 76% of the permittees hunted the Yakutat Forelands.

Table 4. Unit 5 hunter effort and success, regulatory years 2003 through 2014.[a]

		Successful hunters			Unsuccessful hunters			Total hunters		
Year	Permits issued	No. hunters	Total days	Avg. days	No. hunters	Total days	Avg. Days	No. hunters	Total days	Avg. days
				5A Yakutat Forelands						
2003	171	30	78	2.6	107	586	5.5	137	664	4.8
2004	211	40	121	3.0	132	744	5.6	172	865	5.0
2005	197	37	145	3.9	121	470	3.9	158	615	3.9
2006	174	33	74	2.2	94	428	4.6	127	502	4.0
2007	196	48	148	3.1	103	454	4.4	151	602	4.0
2008	182	35	110	3.1	104	465	4.5	139	575	4.1
2009	192	38	134	3.5	105	564	5.4	143	698	4.9
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
				5A Nunatak Bench						
2003	14	3	3	1.0	5	6	1.2	8	9	1.1
2004	13	4	6	1.5	1	2	2.0	5	8	1.6
2005	13	0	0	0	3	5	1.7	3	5	1.7
2006	Season Closed by Emergency Order									
2007–2014	---									
				5B Malaspina Forelands						
2003	53	9	37	4.1	19	93	4.9	28	130	4.6
2004	44	2	20	10	16	87	5.4	18	107	5.9
2005	30	0	0	0	15	95	6.3	15	95	6.3
2006	26	2	13	6.5	11	100	9.1	13	113	8.7
2007	54	10	34	3.4	25	140	5.6	35	175	5.0
2008	44	9	23	2.6	22	138	6.3	31	161	5.2
2009	55	11	22	2.0	19	98	5.2	30	120	4.0
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	9	32	3.6	12	38	3.2
2014	25	5	12	2.4	9	24	2.7	14	36	2.6

[a] A regulatory year begins 1 July and ends 30 June, e.g., regulatory year 2010 = 1 July 2010–30 June 2011.

For the unit 5B-Malaspina Forelands (RM062) a mean of 28 permits were issued during the report period (Table 4); however, the number of permits in this area varies annually. The number of hunters decreased significantly from the previous report period; fewer hunters may have gone afield due to record snowfalls in 2011 and decreasing air charter services during the winter months. Of all the permit holders only 43% attempted to hunt on the Malaspina Forelands. As noted above, Unit 5B can be difficult to access, so if hunters can participate in the Unit 5A hunt they likely choose to because of easier access and relatively good harvest opportunities close to Yakutat.

Staff from the USFS and both ADF&G fisheries divisions continued to assist with issuing registration permits and monitoring these hunts. Enforcement personnel from the USFS also helped monitor the Unit 5A hunt periodically during the report period. We used reminder emails and multiple reminder letters to increase compliance with reporting requirements for state permit hunts. Adoption of the joint state/federal permit during RY04 made it easier for ADF&G to keep track of the reporting process for RM061. Hunter noncompliance with reporting in a timely manner results in moose harvests exceeding our objectives on the west side of the Dangerous River annually.

Hunter Residency and Success

A majority 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. During the report period, residents of Yakutat took 142 of 192 of the bulls (74%) harvested in 5A (Table 5). The federal season opens on 8 October and the state season opens a week later on 15 October. However, until 22 October, only federally qualified subsistence hunters can hunt on federal land in Unit 5A. The majority of 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. Since management of the 9 townships transferred back to the USFS in 2012, the harvest quota for the area west of the Dangerous River (25 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 quota is met many hunters 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 have the ability to take advantage of weather breaks to cross Yakutat Bay by boat, which increases harvest in some years. During this report period Unit 5 residents took 42% of the Unit 5B moose harvest, nonresidents took 32%, and other Alaska residents took the remaining 26% 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 5. Unit 5 annual moose kill by community of residence, regulatory years[a] 2003 through 2014.

Year	Total kill	Yakutat	Juneau	Ketchikan	Sitka	Pelican	Hoonah	Petersburg	Haines	Wrangell	Other AK	Nonresident
						5A Yakutat Forelands						
2003	30	20	7	0	2	0	0	0	0	0	1	0
2004	40	30	5	0	2	0	0	0	0	0	1	2
2005	37	23	7	0	3	0	0	0	0	0	2	2
2006	33	23	6	0	0	0	0	0	0	0	3	1
2007	48	33	10	0	0	0	0	0	0	0	2	3
2008	35	22	6	0	0	0	0	0	0	0	6	1
2009	38	23	10	0	2	0	0	0	0	0	3	0
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
						5A Nunatak Bench						
2003	3	3	0	0	0	0	0	0	0	0	0	0
2004	4	4	0	0	0	0	0	0	0	0	0	0
2005	0	0	0	0	0	0	0	0	0	0	0	0
2006						Season Closed by Emergency Order						
2007–2014						---						
						5B Malaspina Forelands						
2003	9	3	1	0	0	0	0	0	0	0	0	5
2004	2	1	0	0	0	0	0	0	0	0	0	1
2005	0	0	0	0	0	0	0	0	0	0	0	0
2006	2	0	0	0	0	0	0	0	0	0	1	1
2007	10	5	0	0	1	0	0	0	0	0	1	3
2008	9	4	0	1	0	0	0	0	0	0	1	3
2009	11	3	0	0	1	0	1	0	0	0	3	3
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

[a] A regulatory year begins 1 July and ends 30 June, e.g., regulatory year 2010 = 1 July 2010–30 June 2011.

Transport Methods

The type of transport used by successful hunters varies, reflecting difficulties in the logistics of access (Table 6). Boat, 3- or 4-wheelers, and highway vehicles continue to dominate modes of transportation. The use of aircraft decreased significantly in RY13 and RY14, possibly due to reductions in air services available in Yakutat. Access by airplane in more recent years tends to be by hunters that pilot their own aircraft. Three and 4-wheelers, and other forms of off-road vehicles (ORVs) are probably underrepresented because some hunters reporting highway vehicles or "other" 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 25% 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. Nonresidents used a registered guide in many cases, especially in Unit 5B where there is a lodge that caters to nonresident clients on the west side of the Malaspina Forelands. Commercial services were used by a higher percentage of Unit 5B hunters (51%) than Unit 5A hunters (17%). This difference in commercial services used can be attributed to the difficulty in accessing Unit 5B.

Other Mortality

The winter of RY11 was one of the most severe on record in many parts of Southeast Alaska, with above average snowfall in Yakutat. The winters of RY07–RY08 were only slightly less extreme. Snowfall amounts were slightly below average during the winter of RY12 giving moose a respite after a series of difficult winters. Winter mortality from consecutive hard winters has been detected in other northern Southeast Alaska moose populations and Unit 5 moose have likely experienced above average winter mortality as well. Predation by bears and wolves has always been a factor in the 5A moose populations.

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.

Table 6. Unit 5 transport methods used by successful hunters, regulatory years[a] 2003 through 2014.[b]

Year	Airplane		Boat		3 or 4 wheeler		ORV		Highway vehicle		Foot	
	Total	(%)	Total	(%)	Total	(%)	Total	(%)	Total	(%)	Total	(%)
5A Yakutat Forelands												
2003	6	(22)	7	(26)	7	(26)	1	(4)	6	(22)	0	---
2004	7	(18)	15	(38)	8	(20)	1	(2)	9	(22)	0	---
2005	6	(16)	9	(24)	14	(38)	0	---	8	(22)	0	---
2006	6	(18)	14	(43)	8	(24)	0	---	5	(15)	0	---
2007	11	(23)	17	(35)	12	(25)	2	(4)	6	(13)	0	---
2008	7	(20)	9	(26)	15	(43)	0	---	3	(8)	1	(3)
2009	13	(34)	7	(18)	11	(29)	1	(3)	6	(16)	0	---
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	---
5A Nunatak Bench												
2003	0	---	3	(100)	0	---	0	---	0	---	0	---
2004	0	---	4	(100)	0	---	0	---	0	---	0	---
2005	0	---	0	---	0	---	0	---	0	---	0	---
2006	Season Closed by Emergency Order											
2007–2014	---											
5B Malaspina Forelands												
2003	1	(11)	5	(56)	3	(33)	0	---	0	---	0	---
2004	0	---	1	(50)	1	(50)	0	---	0	---	0	---
2005	0	---	0	---	0	---	0	---	0	---	0	---
2006	0	---	0	---	2	(100)	0	---	0	---	0	---
2007	4	(40)	2	(20)	4	(40)	0	---	0	---	0	---
2008	4	(44)	2	(23)	3	(33)	0	---	0	---	0	---
2009	5	(46)	0	---	4	(36)	2	(18)	0	---	0	---
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	---

[a] A regulatory year begins 1 July and ends 30 June, e.g., regulatory year 2010 = 1 July 2010–30 June 2011.
[b] Not all information is available for each hunter; calculations for any given field may only include a subset of hunters.

Table 7. Unit 5, Alaska commercial services used by hunters, regulatory years[a] 2003 through 2014.[b]

Year	Unit residents No	Unit residents Yes	Other AK residents No	Other AK residents Yes	Nonresidents No	Nonresidents Yes	Total use No	Total use Yes	Transport	Registered guide	Other Services
					5A Yakutat Forelands						
2003	84	3	26	14	0	0	110	17	16	0	1
2004	117	2	26	20	2	5	145	27	23	3	1
2005	111	5	18	19	1	3	129	27	25	2	0
2006	98	0	17	10	0	1	115	11	10	1	0
2007	95	2	16	25	3	9	114	36	35	1	0
2008	100	1	17	20	1	0	118	21	21	0	0
2009	78	7	22	31	3	1	103	39	38	0	1
2010	78	9	21	24	1	3	100	36	36	0	1
2011	91	6	23	14	3	8	119	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
					5A Nunatak Bench						
2003	5	0	2	0	0	0	8	0	0	0	0
2004	5	0	0	0	0	0	5	0	0	0	0
2005	3	0	0	0	0	0	3	0	0	0	0
2006					Season Closed by Emergency Order						
2007–2014					---						
					5B Malaspina Forelands						
2003	13	1	1	4	1	9	15	14	5	8	1
2004	3	0	1	7	1	7	5	14	8	6	0
2005	1	0	4	0	1	9	6	9	0	9	0
2006	2	0	1	1	0	9	3	10	1	9	0
2007	9	2	1	4	1	18	11	24	15	9	0
2008	8	5	0	7	0	11	8	23	17	6	0
2009	9	0	4	6	0	10	13	16	10	6	0
2010	7	0	1	2	0	1	9	3	3	0	0
2011	2	1	1	4	0	5	4	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

[a] A regulatory year begins 1 July and ends 30 June, e.g., regulatory year 2010 = 1 July 2010–30 June 2011.
[b] Not all information is available for each hunter; calculations for any given field may only include a subset of hunters.

Recommendations for Activities 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.

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.

Evaluate the value of monitoring browse condition.

NONREGULATORY MANAGEMENT PROBLEMS OR NEEDS

It appears that hunters on the west side of the Dangerous River commonly fail to report as required within 5 days of harvesting a moose with the intent of prolonging the hunt to allow friends or family opportunity to harvest a moose. This practice results in the harvest quota being exceeded by 1 to 5 bulls, (up to 20%) each year, and may account for apparent slow progress toward increasing the proportion of bulls to the management objective of 25 bulls per 100 cows. This situation illustrates the need to maximize the efficiency of ongoing coordination among ADF&G, the Wildlife Trooper, and USFS enforcement staff to ensure hunters in this area report in a timely fashion.

The federal Designated Hunter Program allows designated hunters to simultaneously harvest moose for multiple people. The result has been that a few efficient hunters account for a majority of the harvest. Some concerned residents of Yakutat would like to see opportunity and harvest on the west side of the Dangerous River more equitably distributed and take limited to one moose per household.

Data Recording and Archiving

Recording:

- Moose survey form (Appendix A)
- ADF&G–USFS Memorandum of Understanding (Appendix B)
- Joint state/federal annual press release justifying bull moose quota in Unit 5 (Appendix C)

Archiving:

- Harvest data are stored on an internal database housed on the Fish and Game network (http://winfonet.alaska.gov/index.cfm). Field data sheets for surveys are stored in file folders in filing cabinets in the Douglas Area Office (Room 104).
- All other electronic data and files such as survey memos and reports are located on the computer and regional server (H:\Aerial surveys\Moose) in the Douglas area office Area Biologist cubicle. Field data sheets, paper files, hard copies, etc. are located in the file cabinet located in the Douglas Area Office beside the Area Biologist's cubicle.
- Permit Overlays. Hard copies are retained in the Douglas Area Office warehouse, and electronically in WinfoNet.
- Antler photos are located on the computer and regional server on the area biologist laptop computer (S:\Region1Shared-DWC\Offices\Douglas\Stephanie Sell\MooseAntler).

Agreements

- ADF&G–USFS Memorandum of Understanding (Appendix B)
- Joint state/federal annual press release justifying bull moose quota in Unit 5 (Appendix C)

Conclusions and Management Recommendations

None of the management objectives for Unit 5 moose hunts were met during this report period. The most glaring shortfalls have been in the harvests, which were well below the objectives, except for the portion of Unit 5A west of the Dangerous River. The decline in harvest in the remainder of Unit 5 may be related to the difficulty and expense of accessing hunting opportunity away from the Yakutat road system and does not reflect a decline in moose abundance. The moose populations appear to be stable or slowly increasing. The number of yearling and 2-year-old bulls in the harvest remains strong, suggesting recruitment continues to be good.

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, and more recently, several winters with very deep snow. The department will continue to monitor this population and will allow hunting only when moose numbers can support a harvest.

Complete fall sex and age composition counts for all Unit 5 moose herds should be a priority during the next report period. Reliable survey data will allow us to both better interpret the

decline in moose harvest and make necessary adjustments to our management strategies. The lower guideline harvest west of the Dangerous River should be kept in place until bull:cow ratios meet the management objective.

II. Project Review and RY15–RY19 Plan

Review of Management Direction

MANAGEMENT DIRECTION

There are no changes in management direction for moose in Unit 5.

CODIFIED OBJECTIVES

Amount Reasonably Necessary for Subsistence Uses (ANS)

The Board of Game has made a positive finding for customary and traditional use of moose in Game Management Unit 5 and set 50 moose as the amount necessary for subsistence.

Intensive Management

None

MANAGEMENT OBJECTIVES

The following objectives reflect the current report period, the actual data during RY10–RY14, and where managers project our plan objectives should be in future reporting periods for moose in Unit 5. Initial objectives were contained in the Strategic Plan for Management of Moose in Region I, Southeast Alaska (ADF&G 1990), however objectives have been changed since the original plan was written to reflect current population estimates and use levels, and actions taken from public comment, staff recommendations and Board of Game meetings.

	Current report period objective (RY10–RY14)	Report period actual	Plan objective (RY15–RY19)
Unit 5A Yakutat Forelands			
Post-hunt moose numbers (estimated)	600–800	600–800	1,000
Annual hunter kill (average)	55	38	55
Post-hunt bull:cow ratio	25:100	14:100	25:100
Number of hunters (annual average)	250	131	250
Hunter-days of effort (annual average)	1,025	495	600
Hunter success (annual average)	28%	29%	28%

	Current report period objective (RY10–RY14)	Report period actual	Plan objective (RY15–RY19)
Unit 5A Nunatak Bench			
Post-hunt moose numbers (estimated)	50	12	25
Annual hunter kill (average)	5	0	5
Post-hunt bull:cow ratio	25:100	NA	25:100
Number of hunters (annual average)	10	0	10
Hunter-days of effort (annual average)	60	0	60
Hunter success (annual average)	50%	0%	50%
Unit 5B Malaspina Forelands			
Post-hunt moose numbers (estimated)	250	200	250
Annual hunter kill (average)	25	4	25
Post-hunt bull:cow ratio	25:100	NA	25:100
Number of hunters (annual average)	50	12	50
Hunter-days of effort (annual average)	200	42	200
Hunter success (annual average)	50%	32%	50%

REVIEW OF MANAGEMENT ACTIVITIES

1. Population Status and Trend

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

Data Needs

No changes. We currently conduct surveys annually when conditions allow.

Methods

No change from the previous reporting period.

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

No change. We continue to collect harvest data annually.

Methods

No change from the current reporting period.

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. 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.

Recommendations for Activity 3.1

Evaluate the value of monitoring browse condition.

NONREGULATORY MANAGEMENT PROBLEMS OR NEEDS

Continue to work with the USFS and Federal law enforcement to gain compliance in hunt conditions specifically with reporting harvest on time.

Data Recording and Archiving

Recording:

- Moose survey form (Appendix A)

Archiving:

- Harvest data are stored on an internal database house on the 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 (Room 104).
- All other electronic data and files such as survey memos and reports are located on the computer and regional server (H:\Aerial surveys\Moose) in the Douglas area office Area Biologist cubicle. Field data sheets, paper files, hard copies, etc. are located in the file cabinet located in the Douglas Area Office beside the Area biologist's cubicle.
- Permit Overlays. Hard copies are retained in the Douglas Area Office warehouse, and electronically in WinfoNet.
- Antler photos are located on the computer and regional server on the area biologist laptop computer (S:\Region1Shared-DWC\Offices\Douglas\Stephanie Sell\MooseAntler).

Agreements

- ADF&G–USFS Memorandum of Understanding (Appendix B)
- Joint state/federal annual press release justifying bull moose quota in Unit 5 (Appendix C)

References Cited

Alaska Department of Fish and Game (ADF&G). 1990. Strategic plan for management of moose in Region I, Southeast Alaska 1990– 94. Division of Wildlife Conservation, Douglas, Alaska.

Oehlers, S. A., R. T. Bowyer, F. Huettmann, D. K. Person, and W. B. Kessler. 2012. Visibility of moose in a temperate rainforest. Alces 48:89–104.

Appendix A. Moose survey form.

Moose Survey Form (v. 11/29/12) Page__________of__________

Area:	Date:	Observers/Pilot:	Aircraft Type:	Start Time:
Sky Conditions: Clear Ptly Cloudy Overcast/Flat		Wind Speed:	Temp:	Stop Time:
Snow Depth (in.):	Fresh Snow (in.)/Age (days):	% of Area Covered by Snow:	Snow on Trees?	Total Survey Time:
Comments:				

WPT/ Group	Bulls			Cows			Unk Sex	# Adults Checked for Collars	Collared Moose Data									Comments
	L	M	S	C0	C1	C2			Moose ID	Seen During Survey (Yes, No)	Activity (Bedded, Standing)	Light (Sun, Shade, Flat)	% Canopy Cover (10m radius)	Spruce <10m	Habitat (Mdw, Low Shb, Tall Shb, Conf, Mxd. Fst.)	% Snow (Complete Veg Visible Ground Visible)	Photo #	
										Y N	B S	Su Sh Fl		Y N	M LS TS C MF	C V G		
										Y N	B S	Su Sh Fl		Y N	M LS TS C MF	C V G		
										Y N	B S	Su Sh Fl		Y N	M LS TS C MF	C V G		
										Y N	B S	Su Sh Fl		Y N	M LS TS C MF	C V G		
										Y N	B S	Su Sh Fl		Y N	M LS TS C MF	C V G		
										Y N	B S	Su Sh Fl		Y N	M LS TS C MF	C V G		
										Y N	B S	Su Sh Fl		Y N	M LS TS C MF	C V G		
										Y N	B S	Su Sh Fl		Y N	M LS TS C MF	C V G		
										Y N	B S	Su Sh Fl		Y N	M LS TS C MF	C V G		
										Y N	B S	Su Sh Fl		Y N	M LS TS C MF	C V G		
										Y N	B S	Su Sh Fl		Y N	M LS TS C MF	C V G		
										Y N	B S	Su Sh Fl		Y N	M LS TS C MF	C V G		
										Y N	B S	Su Sh Fl		Y N	M LS TS C MF	C V G		
										Y N	B S	Su Sh Fl		Y N	M LS TS C MF	C V G		
										Y N	B S	Su Sh Fl		Y N	M LS TS C MF	C V G		
										Y N	B S	Su Sh Fl		Y N	M LS TS C MF	C V G		

Appendix B. First page of memorandum of understanding on joint cooperation in forest plan implementation.

USDA, Forest Service — OMB 0596-0217 FS-1900-15

FS Agreement No. 11-MU-11100500-022
Cooperator Agreement No.

MEMORANDUM OF UNDERSTANDING
Between The
State of Alaska, through the Departments of Natural Resources and Fish and Game,
And The
USDA, FOREST SERVICE
TONGASS NATIONAL FOREST

This MEMORANDUM OF UNDERSTANDING (MOU) is hereby made and entered into by and between the State of Alaska, through the Departments of Natural Resources and Fish and Game, hereinafter referred to as "State of Alaska," and the USDA, Forest Service, Tongass National Forest, hereinafter referred to as the "U.S. Forest Service."

Title: JOINT COOPERATION IN FOREST PLAN IMPLEMENTATION

I. **PURPOSE:** The purpose of this MOU is to maintain an established framework of cooperation between the U.S. Forest Service and the State of Alaska related to implementing and monitoring the Tongass Land and Resource Management Plan (Forest Plan). The U.S. Forest Service will lead efforts to implement, amend, or revise the Forest Plan and requests the State of Alaska to act as a cooperating agency in these efforts – the State of Alaska will accept the U.S. Forest Service's request on a case-by-case basis – all in accordance with the following provisions and terms as defined in attached Exhibit 1. This MOU will replace MOU Agreement Numbers 08-MU-11100500-109, 08-MU-11100500-110 & 09-MU-11100500-030.

II. STATEMENT OF MUTUAL BENEFIT AND INTERESTS:

The U.S. Forest Service and State of Alaska have mutual interests to work together towards sustainability across environmental, social, and economic sectors, as they relate to the Forest Plan, for benefit of the public interest.

The U.S. Forest Service and State of Alaska intend to work cooperatively to facilitate adaptive management processes to efficiently and economically complete resource management projects proposed on the Tongass National Forest. The specific mechanism to complete this cooperation will include this MOU, but may also include cost share agreements, Sikes Act contracts, and other specific agreements.

In consideration of the above statements, the parties agree as follows:

III. STATE OF ALASKA SHALL:

A. Recognize that the U.S. Forest Service has the primary responsibility for managing the fish and wildlife habitat resources on the Tongass National Forest.

Page 1 of 7

Appendix C. Federal Subsistence Board news release on bull moose harvest quota.

U.S. Fish and Wildlife Service
Bureau of Land Management
National Park Service
Bureau of Indian Affairs

Federal Subsistence Board
News Release

Forest Service

For Immediate Release:
September 7, 2016

Contact: Lee Benson
907-784-3359
labenson@fs.fed.us

Bull moose harvest quota established for Unit 5A, except Nunatak Bench

The Yakutat District Ranger, under authority delegated by the Federal Subsistence Board, has established the moose harvest quota for Unit 5A, except the Nunatak Bench, at 55 bulls. No more than 25 of those bulls are to be taken from the area west of the Dangerous River. This quota is effective for the 2016 Federal Subsistence moose season, which is October 8 to November 15, 2016. The Alaska Department of Fish and Game (ADF&G) has established the same quota in Unit 5A for the State season, effective October 15, extending through the end of the State season on November 15. The State and Federal quotas are not cumulative.

The most recent survey (2015) by the Alaska Department of Fish and Game indicate a slightly improved but continued low bull:cow ratio, particularly on the western forelands. The Yakutat area received heavy snowfall during the 2011-2012 winter, which may have impacted the overall population. The mild winters of 2014 and 2015 are thought to have resulted in improved over-winter survival for ungulate populations region wide, and an increase in the number of calves seen during the 2015 survey indicate healthy recruitment. The 2015 survey found the bull:cow ratio (16 bulls:100 cows) had improved from the 2013 survey (12 bulls:100 cows), but remains well below our management objective of 25 bulls:100 cows. Results of the 2015 survey also indicate that moose numbers remain at moderate levels and will need more time to fully recover. The harvest quota has been established to improve the bull:cow ratio and increase productivity of the herd with the goal of higher future harvest quotas and increased long-term subsistence harvest opportunities.

Hunters are also reminded that they are **required to report harvest within three days of taking a moose** or risk a citation. Prompt reporting helps ensure that we do not exceed the quota and continue to rebuild this population and increase the bull:cow ratio.

For additional information, contact U.S. Forest Service Yakutat District Ranger Lee Benson or Wildlife Biologist Susan Oehlers at 907-784-3359.

-end-


ALASKA
DEPARTMENT OF FISH AND GAME