

Moose Management Report and Plan, Game Management Unit 3:

Report Period 1 July 2010–30 June 2015, and
Plan Period 1 July 2015–30 June 2020

Richard E. Lowell



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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 Thomas V. Schumacher, 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 in Unit 3 during the 5 regulatory years 2010–2014 and plans for survey and inventory management activities in the following 5 regulatory years, 2015–2020. 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 on our website to inform the public about wildlife management activities. In 2016 the Alaska Department of Fish and Game’s Division of Wildlife Conservation (ADF&G/DWC) launched this new type of 5-year report to more efficiently report on trends and describe potential changes in data collection activities. 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

Game Management Unit 3 is Southeast Alaska, also known as Alaska’s Panhandle, and is part of the Region I management area for ADF&G/DWC. It covers an area of approximately 3,000 square miles on islands in the central portion of the Panhandle (Fig. 1). Kupreanof, Kuiu, Etolin, Wrangell, Mitkof, and Zarembo, in descending order, are the largest islands in the unit. Smaller islands include several near the mouth of the Stikine such as Rynda, Kadin, and Sokolof islands. Moose have been sighted on all of these islands, but are believed to be most numerous on Kupreanof and Mitkof islands.

Most land area in Unit 3 is within the Tongass National Forest and under federal ownership, with smaller parcels under tribal, state, and private ownership. In addition to moose, deer, wolves, and black bears are also present and widely distributed throughout Unit 3. Small numbers of brown bears also occur on those islands separated from the mainland by short water crossings.

Moose habitat in Unit 3 primarily consists of old-growth spruce-hemlock forest and clearcut areas. Extensive clearcutting on many of the islands has resulted in early successional vegetation which may temporarily provide good moose browse. Some wintering areas have been tentatively identified on Kupreanof Island from Castle River on Duncan Canal to Tunehean and Irish creeks and Big John Bay on Keku Strait and from Portage Bay to Duncan Canal, and also on the southeast portion of Wrangell Island, and on western Mitkof Island, including Blind Slough. However, no estimate has been made of the amount or quality of moose range in the unit. Moose may compete with deer for winter browse.

Summary of Status, Trend, Management Activities, and History of Moose in Unit 3

Moose only recently colonized Unit 3 but now occur on all the major islands within the unit. They are believed to be the western Canada moose (*Alces alces andersoni*) subspecies. Beginning in the late 1940s and early 1950s moose began colonizing the Unit 3 islands from the Stikine River and possibly Thomas Bay populations on the Unit 1B mainland. Those source

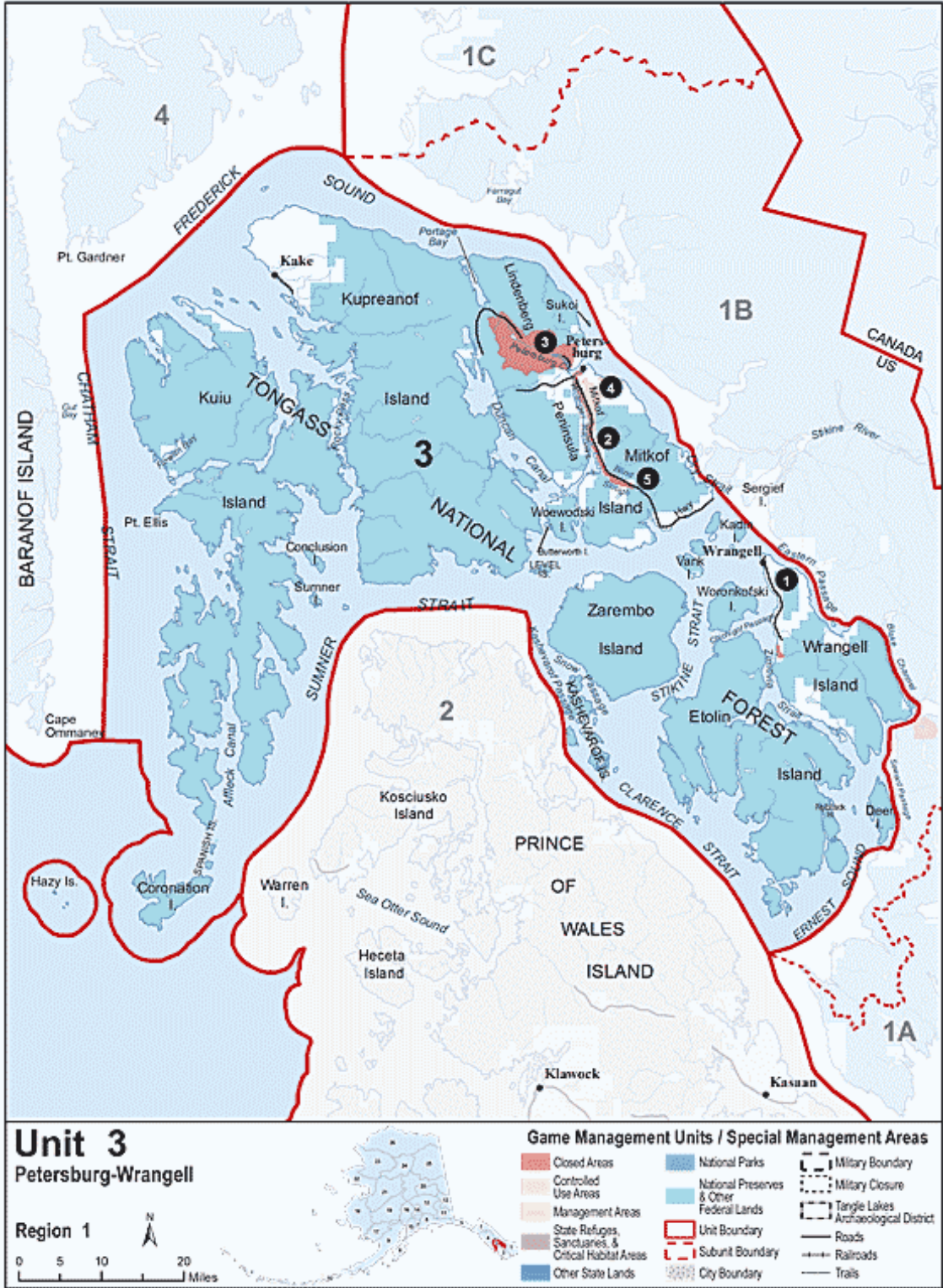


Figure 1. Map of Alaska Game Management Unit 3.

populations were established earlier by moose traveling down the Stikine River corridor from British Columbia, Canada. Increased sightings and rising hunter harvest over the last few decades indicate that moose have increased in numbers and expanded their range throughout the Unit 3 islands.

From 1960 through 1967 the Unit 3 moose season was open from 15 September through 15 October with a 1-bull limit. However, because of low numbers the season was closed from 1968 until 1990 when the season reopened on Wrangell Island 1–15 October with a 1-bull bag limit, a spike-fork or 50-inch antler restriction, and a harvest ticket requirement. In 1991 the season was also reopened on Mitkof and Woewodski islands 1–15 October with a 1-bull bag limit, a spike-fork or 50-inch antler restriction, and a harvest ticket requirement. In 1993 the remainder of Unit 3 was opened 1–15 October with a 1-bull bag limit, a spike-fork, 3-brow tine, or 50-inch antler restriction, and a registration permit requirement throughout the unit. Action by the Alaska Board of Game (board) effective 1 July 1995 put all of Units 1B and 3 and that portion of Unit 1C south of Point Hobart under a common registration permit hunt (RM038, Fig. 2), and, with the exception of experimental any-bull drawing permit hunts offered from RY05 to RY08 this has been the only state-offered hunt for moose in Unit 3 since that time. From RY00 through RY09 the Unit 3 harvest made up 56% of the overall RM038 harvest, ranging from 42% to 68% annually. During the same period, an average of 966 permits were issued annually for the RM038 hunt area.

From 1995 to 2008 the entire RM038 hunt area, including Unit 3, was managed with season dates of 15 September–15 October, a 1-bull bag limit, and a spike-fork, 3-brow tine, or 50-inch antler restriction. The antler restrictions adopted throughout the RM038 hunt area in 1995 were originally developed for Alaska–Yukon moose (*Alces alces gigas*) on the Kenai Peninsula and later applied to western Canada moose inhabiting the central Panhandle. For genetic or environmental reasons moose in this area seldom acquire antler spreads in excess of 50 inches, and often develop atypical antler configurations. As a result, it was widely believed that the spike-fork, 3-brow tine, or 50-inch antler restrictions failed to partition the harvest among various age classes as intended and were protecting mature bulls in excess of those needed for breeding. Nonetheless, given the high level of interest and participation in the RM038 moose hunt, the antler restrictions in place at the time did a good job of constraining the moose harvest to sustainable levels.

Modifying the moose antler restrictions to allow the harvest of bulls with 2 brow tines on both antlers had been suggested in the past. At the time, however, bulls with 2 brow tines on both antlers were among the protected segment of the population, therefore the department lacked sufficient information on the age structure of these bulls to allow their harvest without risking overharvest.

At the department's request, in 2004 the board established a limited number of any-bull drawing permit hunts within portions of Units 1B and 3. The any-bull drawing hunts were intended to gather information on the age structure and antler characteristics of that segment of the bull population otherwise protected under the existing antler restrictions. After 3 seasons of limited any-bull harvest, the department felt it had sufficient information to safely recommend that the then existing spike-fork, 3-brow tine, or 50-inch antler restrictions be modified to also allow the harvest of bulls with 2-brow tines on both antlers.

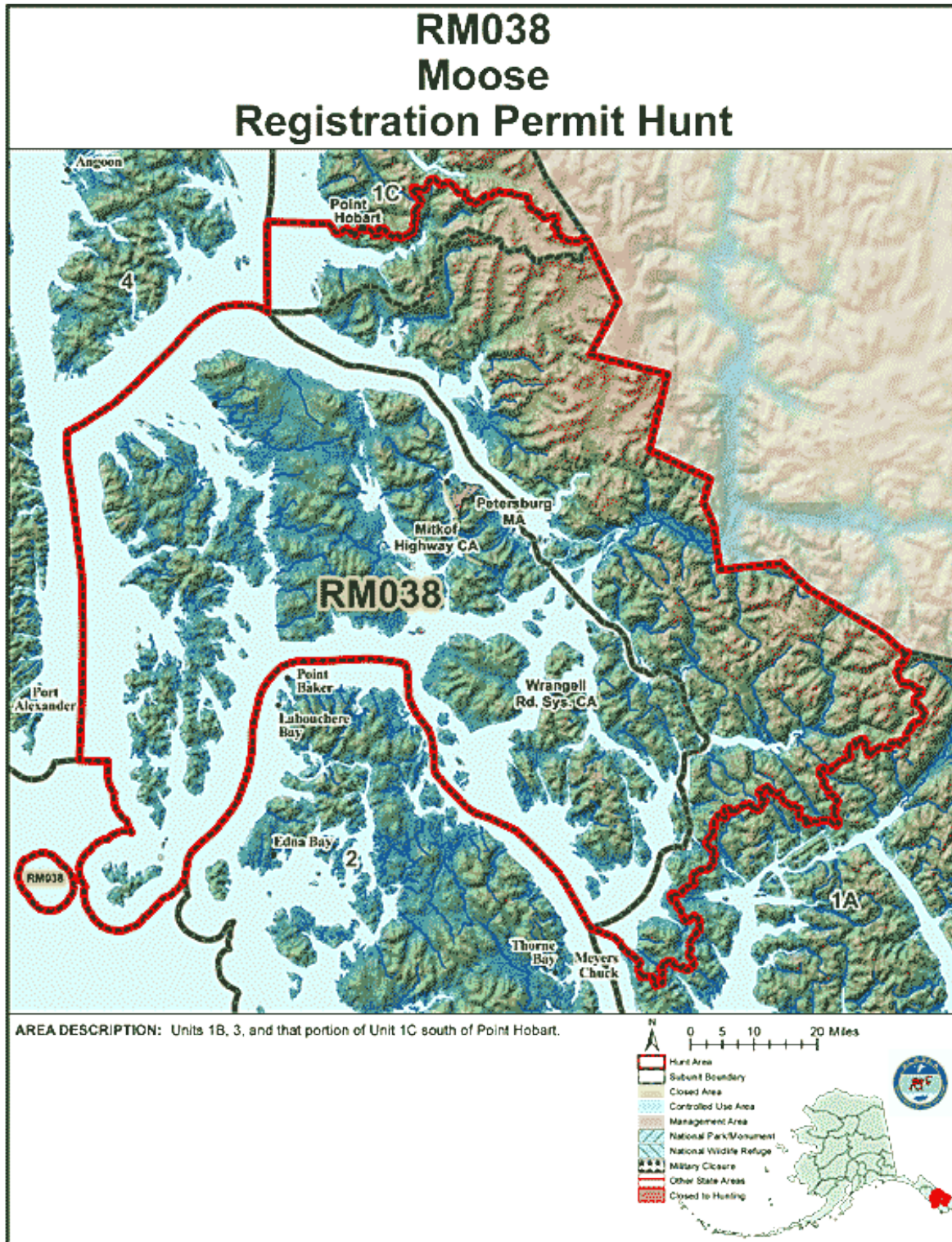


Figure 2. Map showing boundaries of the RM038 hunt area in Southeast Alaska.

Analysis of the antler and age data collected from the any-bull drawing permit hunts indicated that the median age of an RM038 bull with 2 brow tines on both antlers was 6 years of age. Under the existing selective harvest strategy that put most bulls with 2 brow tines on both antlers in an age class considered suitable for harvest. We therefore felt that liberalizing the antler restrictions to also allow the harvest of bulls with 2 brow tines on both antlers would provide additional harvest opportunity without jeopardizing the health of the RM038 moose herd.

In fall 2008, based in large part on age and antler data collected during the any-bull moose drawing permit hunts conducted 2005–2008, the board authorized liberalization of the moose antler restrictions for the RM038 hunt area. As a result, beginning with the 2009 season, the RM038 antler restrictions were liberalized to allow the harvest of bulls that possessed spike-forked antlers or 50-inch spreads, or antlers with 3 or more brow tines on at least 1 side, or 2 or more brow tines on both sides.

The current antler restrictions for moose in the RM038 hunt are among the most liberal in the state. That, combined with a month-long season that fully encompasses the rut, affords hunters ample opportunity to harvest a moose. If not for several factors, including that much of the RM038 hunt area is remote and inaccessible to hunters and moose sightability is hampered by dense coniferous forests, the area might otherwise be incapable of sustaining such liberal antler restrictions and season dates.

Because aerial surveys cannot be used to estimate abundance or composition of moose populations in Unit 3, antler restrictions are relied on heavily to ensure the annual harvest remains within sustainable levels. Consequently, with the exception of the experimental any-bull drawing permit hunts, the department has supported proceeding only with hunts that include self-limiting regulations (such as limiting the harvest to only bulls possessing specific antler configurations); these hunts allow the population's size to be regulated by the carrying capacity of the habitat while providing substantial hunting opportunity.

Information on the distribution of moose in Unit 3 is derived primarily from hunter harvest locations, observations by state and federal biologists, and anecdotal reports from the public. No moose research has been conducted in the unit, and little is known about moose movement patterns. Harvest records indicate that moose are expanding their range in Unit 3 despite the relative lack of deciduous riparian vegetation typical of most moose habitat elsewhere in the region.

Management Direction

EXISTING WILDLIFE MANAGEMENT PLANS

In the late 1980s Region I developed a moose management plan intended to guide management of moose populations throughout the region through RY94 (ADF&G 1990). However, the plan did not include specific management objectives for Unit 3 because it was believed that a scarcity of information about habitat capacity, moose numbers, hunter interest and likely levels of hunter effort and success made it inadvisable to set measurable population and harvest objectives for the unit.

In response to increasing harvest and hunter participation ADF&G first set management objectives for Unit 3 moose in 1995. The department's plans for managing moose in Unit 3 have been detailed in species management reports. These plans have been regularly reviewed and modified through public comments, staff recommendations, and Board actions, with changes recorded in the reports. The plan portion of this report contains the current management plan for moose in Unit 3.

GOALS

The Region I moose management plan (ADF&G 1990) identified the following general goals 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 hunting and not 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

Prior to 2006, state law contained a positive customary and traditional use finding for moose in Stikine River drainages specifying that a harvest of 40 moose annually was necessary to meet subsistence needs. In fall 2006, the board expanded the customary and traditional use finding beyond the Stikine drainages to include all of Units 1B and 3. As a result, the 40 moose necessary for subsistence now applies to all of Units 1B and 3.

Intensive Management

In 1998 the board made a negative determination for Intensive Management (5 AAC 92.108) of moose populations in Units 1B and 3. Aside from the customary and traditional use finding for 40 moose per year from Unit 1B and 3 combined, no other population or harvest objectives have been prescribed by law or regulation

MANAGEMENT OBJECTIVES

Prior to 1995, the Unit 3 moose harvest was sporadic and we were unsure how persistent the population or harvest would be. ADF&G cannot estimate the Unit 3 moose population by aerial survey because of the difficulty of seeing moose in a mostly forested landscape. Consequently, in succeeding years when harvest and hunter numbers continued to increase it became apparent that more moose inhabited the islands than was originally thought.

ADF&G first set management objectives for Unit 3 moose in 1995. In response to increasing harvest and hunter participation, in 1997 the management objectives were increased to match the apparent capacity of the herd to sustain a larger harvest and effort.

Because we do not currently have a way to estimate abundance or trend of this population and know little about moose ecology in this area or the habitat's long-term ability to support moose, post hunt population objectives are speculative and unverifiable.

<u>Unit 3:</u>	<u>Plan Objective</u>
Post hunt numbers	400
Annual hunter kill	40
Number of hunters	470
Hunter-days of effort	2,300
Hunter success	10%

MANAGEMENT ACTIVITIES

Before acquiring an RM038 registration permit, all hunters are required to watch ADF&G's video "Is This Moose Legal" (1995; an updated version is in development) to become familiar with moose antler architecture and antler restrictions. All successful hunters must present the antlers attached to the skull plate to ADF&G representatives so that antler architecture can be documented, and compliance with antler restrictions can be verified. They are also required to turn in the lower front teeth for aging. Since 1997 we have also asked all RM038 hunters to report the number of moose (by sex and age class), wolves, and bears they observed during the hunting season.

1. Population Status and Trend

The Unit 3 moose population is the most enigmatic in Southeast Alaska. No aerial surveys have been conducted in Unit 3 because dense forest cover and the lack of information regarding winter concentration areas make them impractical. As a result, the numbers, distribution, and demographic parameters of moose in Unit 3 remain unknown.

The number of moose observed and reported by hunters on registration hunt reports provides some of the limited information on population composition in the unit. We use observations reported by hunters on registration hunt report cards to infer the moose population composition in the unit. Because these data are anecdotal and not systematic, there is a high likelihood of replicate sightings and so we interpret the data cautiously.

Harvest data and anecdotal information collected by ADF&G wildlife biologists over a period of many years continue to indicate a low to moderate moose population that is expanding. Densities appear to be the greatest on Kupreanof and Mitkof islands. Information is insufficient, however, to accurately estimate moose numbers in the unit. Predators, including wolves and black bears, exist on most islands in the unit, and a few brown bears exist on some islands close to the mainland, but the extent of predation on moose is unknown.

ACTIVITY 1.1. Monitor abundance and age and sex ratios of moose through observations of hunters reported on required registration permit hunt reports.

Data Needs

Estimates of abundance are commonly used to inform harvest strategies. However, there are currently no estimates of moose numbers in Unit 3. Dense forest cover and the lack of any concentrated winter areas on the islands make aerial surveys of moose populations impractical. No population surveys have ever been conducted and the numbers, sex and age ratios, cow:calf ratios, and other population characteristics of moose in Unit 3 are unknown.

Methods

We collect hunter observations of moose, including the number of bulls, cows, and calves observed, on required registration permit hunt reports. Those reports provide the only index of relative abundance and composition for the population over time.

Results and Discussion

The recorded observations of hunters provide some of the limited information available on population composition in the unit (Table 1). Hunter observations have been validated with biological data for detecting change in abundance and age-sex composition of moose in Norway (Solberg and Saether 1999) and Sweden (Ericsson and Wallin 1999).

Table 1 summarizes moose sightings reported by hunters participating in RM038. The number of moose reported seen ranged from 2.2 to 3.2 moose per hunter. The relatively high bull-to-cow and calf-to-cow ratios derived from hunter-reported sightings may be explained by hunters seeing the same moose several times over the course of the month-long season and several different hunters reporting sightings of the same moose. Bull:cow ratios derived from hunter reported observations in neighboring Unit 1B were 3 to 4 times higher, and calf:cow ratios about double, those observed during aerial surveys of the Stikine River drainage.

Table 1. Number of moose observed and reported by Unit 3, Alaska moose hunters on registration hunt reports, regulatory years^a 2010 through 2014.

Regulatory year	No. hunters	Bulls	Cows	Calves	Total	Bull:cow	Calf:cow
2010	512	476	652	398	1,526	73:100	61:100
2011	490	545	670	338	1,553	81:100	50:100
2012	493	484	421	203	1,108	115:100	48:100
2013	497	433	544	346	1,323	80:100	64:100
2014	469	435	570	322	1,327	76:100	56:100

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

Recommendations for Activity 1.1.

Efforts to monitor the abundance of moose and the age and sex composition of the population using hunter observations that are recorded on required registration permit hunt reports should be continued.

2. Mortality–Harvest Monitoring and Regulations

ACTIVITY 2.1. Monitor hunter harvest, effort and success.

Data Needs

We gather data on hunter harvest, effort and success as another way of monitoring hunter interest and the abundance of moose in the unit.

Methods

Hunters in Unit 3 must possess an RM038 registration permit before taking to the field in search of moose. At the time the permit is issued hunters are also provided with a mail-in hunt report card. Submitting a hunt report is mandatory for all permittees whether they hunt or not. Hunt reports provide the department with information, including the number of participants in the hunt, number of days hunted, date and location of hunt, transportation method, and use of commercial services.

Results and Discussion

Permit Hunts

Action by the Alaska Board of Game (BOG) effective 1 July 1995 put all of Units 1B and 3 and that portion of Unit 1C south of Point Hobart under one registration permit hunt (RM038).

Season and Bag Limit

Season and Bag Limit Unit 3

Nonresident and resident hunters 15 Sep–15 Oct

1 bull with spike-fork antlers or 50-inch antlers or antlers with 3 or more brow tines on 1 side, or 2 or more brow tines on both sides by registration permit only.

Harvest by Hunters–Trappers

Harvest levels and population characteristics can fluctuate from year to year as a result of both hunting and natural processes. Because antler restrictions are intended to focus harvest pressure on younger and older bulls, overwinter survival and the number of calves and yearlings recruited into the population can greatly influence harvest levels from one year to the next.

During the report period (RY10–RY14), the Unit 3 moose harvest averaged 51 per year, ranging from a low of 36 in RY12 to a high of 57 in RY14 (Table 2). We exceeded the Unit 3 management objective of 40 hunter killed moose annually during 4 years of 5 years in the reporting period; the objective was not met in RY12, when 36 moose were taken.

Table 2. Unit 3 moose harvest, regulatory years^a 2010 through 2014.

Year	Hunter harvest reported							
	M	(%)	F	(%)	Unknown	Total	Illegal	Total
2010 ^b	50	(100)	0	(0)	0	50	3	53
2011	49	(100)	0	(0)	0	49	7	56
2012	33	(100)	0	(0)	0	33	3	36
2013	47	(100)	0	(0)	0	47	8	55
2014	50	(100)	0	(0)	0	50	7	57

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

^b Includes one DLP (defense of life or property).

Hunter Effort, Residency, and Success

Most hunters who participate in the Unit 3 moose hunt are local residents of Petersburg, Wrangell, and Kake. Local residents, therefore, represent the largest group of successful hunters. However, as the Unit 3 moose harvest has increased over the years we have seen increasing interest and participation by nonlocal Alaska residents. During the report period, local residents represented 76% of successful hunters, nonlocals 21%, and nonresidents just 3% (Table 3).

The average annual success rate for Unit 3 moose hunters during the report period was 10%, ranging from a low of 7% in RY12, to a high of 12% in RY14. The unit met the management objective of 10% annual hunter success during 4 of the 5 years in the report period.

Table 3. Unit 3 moose hunter residency and success, regulatory years^a 2010 through 2014.

Year	Successful					Unsuccessful					Total hunters
	Local ^b resident	Nonlocal resident	Non-resident	Total	(%)	Local ^b resident	Nonlocal resident	Non-Resident	Total	(%)	
2010	40	12	1	53	(10)	400	58	1	459	(90)	512
2011	43	12	1	56	(11)	365	60	9	434	(86)	490
2012	26	8	2	36	(7)	386	60	11	457	(93)	493
2013	41	12	2	55	(11)	360	72	8	440	(89)	495
2014	45	10	2	57	(12)	339	64	7	410	(88)	467

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

^b Residents of Kake, Petersburg, and Wrangell.

Harvest Chronology

Harvest chronology for Unit 3 moose varies from year to year. In general, most bulls are killed during the first half of the season and the success rate typically declines as the season progresses. During the report period, however, more of the Unit 3 harvest occurred later; the weeks with the highest to lowest harvest, respectively, were the fourth, second, third, and first weeks of the season (Table 4). Most hunters are in the field early in the season, and except for weekends, effort tends to drop off as the season progresses. Inclement weather does not appear to slow hunting effort early in the season.

Table 4. Unit 3 moose harvest chronology in, regulatory years^a 2010 through 2014.

Regulatory year	15–21 Sep	22–28 Sep	29 Sep–5 Oct	6–15 Oct	Total
2010	8	18	13	14	53
2011	4	17	14	21	56
2012	4	8	17	7	36
2013	9	14	15	17	55
2014	10	16	12	19	57

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

Transport Methods

During all 5 years of the reporting period, most successful Unit 3 moose hunters used highway vehicles, and the rest, from higher to lower use, boats, 4-wheelers, and airplanes (Table 5).

Table 5. Unit 3 successful moose hunter transport methods, regulatory years^a 2010 through 2014.

Year	Airplane	Boat	Highway vehicle	3- or 4-wheeler	Horse	Unknown	Total
2010	1	14	33	4	0	1	53
2011	3	12	34	7	0	0	56
2012	1	12	21	2	0	0	36
2013	5	18	30	2	0	0	55
2014	0	24	30	3	0	0	57

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

Other Mortality

Predators (wolves, black bears, and a few brown bears) exist on most of the islands, but the extent of predation on moose is unknown. Although moose are a relatively recent inhabitant of Unit 3, and not a long standing customary and traditional food source for local Natives, we have and will continue to experience an increase in the number of requests to harvest moose out-of-season for funerary and cultural education activities. Poaching of moose undoubtedly occurs in Unit 3, but we don't know how prevalent it is.

Results Compared to Objectives

Table 6 summarizes which of the Unit 3 moose management objectives were, or were not, met during the report period.

It is not currently possible to census moose in the unit; therefore, we are unable to evaluate compliance with the management objective for post hunt numbers of moose.

The harvest objective of 40 moose annually in Unit 3 was met in 4 of the 5 years of the reporting period; in RY12, 36 moose were taken.

With the exception of 2014 when 467 hunters took to the field the number of hunters exceeded the management objective of 470 annually during 4 of the 5 years of the reporting period, averaging 491 annually and ranging from 467 to 512 hunters per year.

Hunter-days of effort exceeded the management objective of 2,300 days of effort during all 5 years of the reporting period, averaging 3,197 per year and ranging from 3,014 to 3,393 hunter-days of effort annually.

The overall success rate for Stikine River moose hunters was 10%, ranging from a low of 7% in RY12, to a high of 12% in RY14. The area met the management objective of 10% annual hunter success during 4 of the 5 years of the report period; in RY12 success was 7%.

Table 6. Progress toward meeting the Unit 3 moose management objectives, regulatory years^a 2010 through 2014.

	Objective	2010	2011	2012	2013	2014	5-year average
Post hunt numbers	400	ND ^b	ND ^b	ND ^b	ND ^b	ND ^b	ND
Annual hunter kill	40	53	56	36	55	57	51
Number of hunters	470	512	490	493	495	467	491
Hunter-days of effort	2,300	3,296	3,393	3,111	3,169	3,014	3,197
Hunter success	10%	10%	11%	7%	11%	12%	10%

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

^b No data. We are unable to quantify moose numbers in Unit 3.

Alaska Board of Game Actions and Emergency Orders

No Board of Game actions took place, and no emergency orders were issued regarding Unit 3 moose during the report period.

Recommendations for Activity 2.1

Hunter effort and success should continue to be monitored through a mandatory hunt report.

ACTIVITY 2.2. Monitor number, age, and antler configurations of harvested moose by requiring hunt reports and examining antlers and collecting lower jaws for aging from successful hunters during the required moose check-in process. Data Needs

Although estimates of moose abundance are commonly used to inform harvest strategies elsewhere, there are currently no unitwide estimates of moose numbers in Unit 3. Dense forest cover and the lack of concentrated wintering areas make aerial surveys impractical. As a result, we are forced to rely primarily on antler restrictions and harvest data to ensure the harvest remains within sustainable limits and enough bulls survive to provide timely and complete breeding of cows.

Methods

Hunters in Unit 3 must obtain an RM038 registration permit before taking to the field in search of moose. At the time the permit is issued hunters are provided with a mail-in hunt report card. Submission of a hunt report is mandatory for all permittees whether they hunt or not. Hunt report data provide the department with information on the number of hunters, number of days hunted, date and location of hunt, transportation method, and hunter use of commercial services.

RM038 permit conditions require hunters to bring antlers of harvested moose to ADF&G to verify compliance with antler restrictions and to collect information on antler architecture. Hunters are also required to submit the lower jaw of harvested moose for extraction of teeth for aging purposes (Fig. 3). Tooth samples are submitted to a commercial laboratory (Matson's Laboratory, Manhattan, Montana) for cementum aging which allows us to correlate antler architecture with age. Such information has been used in the past to refine the RM038 antler regulations.

Results and Discussion

The age distribution of bull moose harvested in Unit 3 during the report period is shown in Figure 4. The median age of a bull harvested in Unit 3 was 2 years of age ($n = 248$), and within the entire RM038 hunt area was 3 years of age ($n = 418$). The median age of a bull harvested in Unit 3 with 2 brow tines on both antlers was 6 years of age ($n = 80$), and 5 years of age within the RM038 hunt area as a whole ($n = 30$). The median age of a bull with 3 or more brow tines on at least one antler ($n = 23$) was also 6 years of age in Unit 3 and 5 years of age within the entire RM038 hunt area ($n = 44$).

The degree of “noncompliance” with the existing antler restrictions will continue to function as the primary trigger for Emergency Season closures.

Recommendations for Activity 2.2.

The number, distribution, age, and antler configurations of moose harvested in Unit 3 should continue to be monitored.



Moose

Name [REDACTED] *# 31*

Harvest Ticket or Permit # 0000031 *4P*

Date of Kill 9-26-15

Specific Location of Kill Portage Bay

ADF&G Use Only 03Z-X51-3601

Sex M Spread 42 1/2

Points LF 7 Points RT 7

Brow Tines LF 2 Brow Tines RT 3

Use Back for Comments 6 YEARS OF AGE

Figure 3. Example of Unit 3, Alaska moose antlers, and the associated tooth envelope upon which the hunter's name and permit number, harvest location, antler spread and spread measurement, and moose age are recorded at the time of antler check-in.

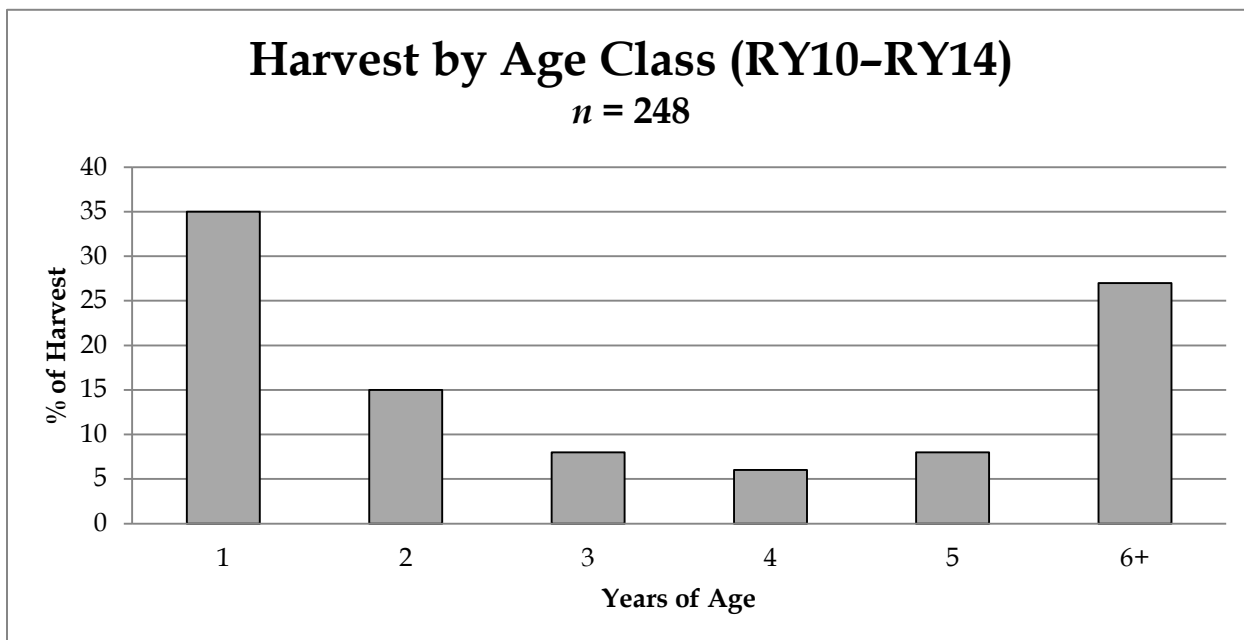


Figure 4. Unit 3, Alaska moose harvest by age class, regulatory years^a 2010 through 2014.

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

3. Habitat Assessment–Enhancement

There were no habitat enhancement activities during this period, though habitat changes are important to the future of moose in the unit.

Moose habitat capability in Unit 3 is unknown and difficult to quantify. No estimate has been made of the amount or quality of moose range in the unit. While browse utilization surveys may be useful for evaluating where moose and deer populations stand relative to carrying capacity, determining the level of browse offtake attributed to each species will be difficult.

Recent increases in moose distribution and abundance in Unit 3 are likely linked to natural colonization of available habitat and a temporary increase in forage resulting from clearcut timber harvest. Unit 3 moose habitat consists primarily of old-growth spruce-hemlock forest and clearcut areas. Extensive clearcutting of conifer stands on many of the islands, has resulted in early successional vegetation which may temporarily provide good moose browse.

Because Unit 3 moose appear to depend on deciduous vegetation in clearcut areas rather than the more persistent riparian or glacial forelands vegetation typical of most Southeast Alaska moose range, it is unclear whether a viable population can be sustained over the long term as existing clearcuts advance in age and browse availability decreases; the forage enhancement from clearcuts lasts for only about 20–25 years of the 100 to 150 years of a timber harvest rotation. After that initial period, a second-growth coniferous forest becomes established and eventually shades out and eliminates understory forage species. The short-term advantages of clearcutting for moose may be offset by the longer period of reduced forage in the second-growth conifer

forest and the loss of shelter habitat for moose during the time when the area is a clearcut. Left untreated, the dense, closed canopy forests characteristic of young, naturally regenerating second-growth conifer stands will reduce carrying capacity for both moose and deer. The only way to prevent further decline of moose habitat will be to institute additional habitat manipulation procedures that are likely to be controversial. No habitat enhancement projects specifically intended to benefit moose have been attempted in Unit 3. While primarily intended as a silvicultural practice, pre-commercial thinning and pruning has been performed in many young second-growth stands in the unit and likely provides some short term benefit to moose. These efforts provide a secondary benefit to moose by improving and extending habitat suitability: the thinning reduces canopy cover, which permits sunlight to reach the forest floor and increase the production of understory forage plants.

Both biologists and hunters are concerned over the eventual loss of habitat and resulting decline in food availability for both moose and deer in Unit 3. Any attempted remedies involving habitat manipulation need to be undertaken with the involvement of the U.S. Forest Service (USFS), which manages most land area in Unit 3.

Data Needs

No moose research has been conducted in Unit 3, therefore we lack information needed to identify important wintering areas in which to evaluate browse condition and the level of offtake. This limits our understanding of whether population growth for a higher harvestable surplus is feasible.

Because most land in Unit 3 is under federal ownership and managed primarily for timber production, precommercial and commercial thinning of second growth stands is dictated by USFS silviculture practices and the availability of federal funding for thinning. The habitat capability and condition of moose range in Unit 3 is unknown. Therefore, we cannot assess whether population growth for a higher harvestable surplus is feasible.

Determining the distribution of major browse communities and level of browse offtake in key moose wintering areas could help gauge moose nutritional condition and identify potential enhancement sites.

Methods

No projects are underway at this time.

Results and Discussion

No projects are underway at this time.

Recommendations for Habitat Assessment-Enhancement

Determine whether forage assessment or other habitat evaluation is feasible for habitat communities in Unit 3, and identify potential methods of browse enhancement.

NONREGULATORY MANAGEMENT PROBLEMS OR NEEDS

Both the state and federal subsistence hunts for Unit 3 moose are managed under a single state registration permit (RM038). Because proxy hunting for others is not allowed in antler-restricted moose hunts, state regulations prohibit hunters from harvesting moose on behalf of other individuals. However, under the designated hunter provision in federal subsistence regulations, any federally qualified hunter can harvest moose on behalf of another federally qualified beneficiary who is 10 years of age or older. Some individuals who are ineligible to obtain a state registration permit as a result of having failed to submit a mandatory hunt report during the preceding regulatory year can easily circumvent this regulation by simply acting as a federal designated hunter for another qualified subsistence user. Similarly, those who have already filled their bag limit by harvesting a legal or illegal moose, can continue to hunt and harvest additional moose on behalf of a qualified beneficiary under the federal designated hunter provision. The department routinely issues in excess of 1,000 permits each year for the opportunity to harvest approximately 90 antler restricted moose annually from Units 1B, 3, and southern 1C combined. The situation of individuals exploiting the federal designated hunter provision in order to harvest more than one moose has led to public dissatisfaction with federal regulations.

Data Recording and Archiving

Permit Overlays – Hard copies are retained in the Petersburg (PSG) Area Office, and stored electronically in WinfoNet.

Hunt reports – Hard copies are retained in the PSG Area Office, and stored electronically in WinfoNet.

Harvest data – Data are entered electronically in WinfoNet. Annual harvest summaries are compiled and stored on Area Biologist and Program Technician's desktop computers and are back up on the network server; H:relowell (\\dfg.alaska.local\home\Petersburg).

Antler photos – Photos are stored electronically on Area Biologist desktop computer and backed up on the network server; H:relowell (\\dfg.alaska.local\home\Petersburg).

Antler data – Data are recorded on tooth envelopes and entered electronically in WinfoNet. Hardcopies of tooth envelopes with antler data are stored in the Petersburg Area Office.

Age data – Age data received from the laboratory are archived in WinfoNet. Once returned tooth cementum specimens are stored in Petersburg Area Office storage area.

Agreements

ADF&G and the U. S. Fish and Wildlife Service, Office of Subsistence Management have agreed to management both the state and federal subsistence hunts for Unit 3 moose under a single state registration permit (RM038) with concurrent season dates and bag limit .

Permitting

None

Conclusions and Management Recommendations

Moose colonizing Unit 3 responded favorably to the temporary increase in available browse resulting from extensive clearcut logging, but the dense, closed canopy forests resulting from the natural regeneration of second-growth stands will eventually shade-out understory vegetation greatly reducing available browse. Both biologists and hunters are concerned over the eventual loss of habitat and resulting decline in food availability for both moose and deer.

Forest management activities and road construction will undoubtedly have the greatest effect on Unit 3 moose numbers and hunting opportunity. Despite recent increases in both abundance and distribution of moose in the unit we cannot estimate how long Unit 3 habitat will support a viable moose population. The desire to rebuild Sitka black-tailed deer populations on the Unit 3 islands compounds the complexity of establishing moose management goals because habitat alterations like clearcut logging that benefit moose are detrimental to deer during winters with deep snow.

Variation in winter weather conditions and predation can have profound influences on overwinter survival and recruitment of moose. Winter-related reductions in the recruitment of young, reduced overwinter survival of moose, predation by wolves and bears, and perhaps, emigration of moose from the neighboring Unit 1B mainland can influence the number of bulls available for harvest in Unit 3.

For genetic or environmental reasons moose in the central Panhandle seldom acquire antler spreads in excess of 50 inches, and often develop atypical antler configurations. As a result, it was widely believed that the spike-fork, 3-brow tine, or 50-inch antler restrictions failed to partition the harvest among various age classes as intended and were protecting mature bulls in excess of those needed breeding. In 2008 the Board of Game adopted a department sponsored proposal to liberalize the moose antler restrictions for the RM038 hunt area to allow the harvest of bulls with 2 or more brow tines on both antlers. The new, more liberal, antler regulation took effect during the 2009 season and is believed to be partially responsible for the relatively high harvest that year.

ADF&G recommends that the state and federal moose hunts in Units 1B and 3, and the extreme southern portion of Unit 1C continue to be managed by a common registration permit hunt, and that the season dates remain from September 15 through October 15 with a bag limit of one bull with spike/fork or 50-inch antlers or 3 or more brow tines on one antler, or 2 or more brow tines on both antlers. The management objectives for Unit 3 moose should be updated to reflect increases seen in recent years in harvest levels, the number of participating hunters, and days of hunter-effort.

II. Project Review and RY15–RY19 Plan

Review of Management Direction

MANAGEMENT DIRECTION

The antler restrictions currently in place for moose harvest in Unit 3 are among the most liberal in the state, and when combined with a month-long season that fully encompasses the rut, they afford hunters ample opportunity to harvest a moose. If not for several factors, including the fact that Unit 3 currently supports an eruptive moose population, much of the unit is remote and inaccessible to hunters, and moose sightability is hampered by dense coniferous forests, the unit might otherwise be incapable of sustaining such liberal antler restrictions and season dates.

No changes to the current management direction for moose in Unit 3 are recommended at this time; however, because the unit cannot be surveyed using standard techniques, the management objectives should be reviewed and modified to make use of the information that is available.

GOALS

No change.

CODIFIED OBJECTIVES

No change.

Amount Reasonably Necessary for Subsistence Uses (ANS)

No change.

Intensive Management

No change.

MANAGEMENT OBJECTIVES

Review of Objectives

The existing management objectives for moose in Unit 3 are based on specific targets for post-hunt numbers of moose, annual hunter harvest, number of hunters, hunter-days of effort, and hunter success rate (Table 6).

In the absence of information on the number, distribution, sex and age ratios, and other population characteristics of moose in Unit 3, annual harvest trends and other hunt statistics are relied on to evaluate our ability to maintain sustainable populations and harvest of moose in the unit. Trends in the number of bulls taken, the distribution of the harvest, and antler configurations and mean age of harvested bulls are currently the most useful tools available for assessing trends in the unit's moose population.

The antler restrictions for RM038 moose were liberalized in 2009 to allow the harvest of bulls with 2 brow tines on both antlers. This regulatory change resulted in an increase in the annual harvest, which in turn sparked greater interest in Unit 3 moose hunting, and increases in the number of hunters and hunter-days of effort. The averages of harvest indices from the most recent 5 years (RY10-RY14) have been used as the basis for updating the management objectives for moose in Unit 3.

It is not currently possible to census or estimate numbers of moose in the unit. Given the inability to evaluate compliance with the objective for post-hunt numbers of moose, this management objective should be eliminated for Unit 3. Specific recommendations below are based on information collected during the period RY10 – RY14.

The moose harvest in Unit 3 during the most recent 5-years (RY10–RY14) averaged 54 bulls annually, ranging from 36 to 64 bulls per year. Therefore, the management objective for annual hunter kill should be increased from the existing objective of 40 to 55 moose per year.

During RY10–RY14 hunter success in Unit 3 averaged 10%, ranging from 7% to 12%. The management objective for hunter success should remain 10% annually in keeping with the 5-year average.

For the RY15–RY19 planning period we decided to drop the management objectives for the number of hunters and hunter-days of effort for moose in Unit 3 and replace them with CPUE expressed as hunter-days per harvested moose. During RY10–RY14 the CPUE for moose in this area averaged 1 moose per 62 days of effort, ranging from 53 to 86 hunter-days per harvested moose. Therefore, during the period RY15–RY19 the CPUE for Unit 3 should be set at 1 moose per 62 days of effort in keeping with the most recent 5-year average.

Revised Management Objectives

<u>Unit 3</u>	<u>Revised Plan Objectives</u>
Annual hunter kills	55
CPUE (hunter-days per harvested moose)	62
Hunter success	10%

In the absence of information on the number, distribution, sex and age ratios, and other population characteristics of moose throughout most of Unit 3, annual harvest trends and other hunt statistics are used to evaluate our ability to maintain sustainable populations and harvest of moose in the unit.

- Monitoring trends in the number of bulls taken, and the spatial distribution of the harvest.
- Monitoring trends in the age structure of harvested bulls
- Monitoring trends in the antler configurations of harvested bulls.

- Using the level of noncompliance with antler regulations as a trigger for early season closures to prevent overharvest.

REVIEW OF MANAGEMENT ACTIVITIES

1. Population Status and Trend

ACTIVITY 1.1. Monitor abundance of moose including age and sex ratios through observations of hunters reported on required registration permit hunt reports.

Data Needs

No change.

Methods

Since 1997 we have asked all RM038 hunters to report the number of moose (by sex and age class), wolves, and bears they observed during the hunting season. This will continue.

2. Mortality-Harvest Monitoring

ACTIVITY 2.1. Monitor age and antler configurations of harvested moose by examining antlers and collecting lower jaws for aging from successful hunters during the required moose check-in process.

Data Needs

No change.

Methods

Mandatory check-in of harvested moose will be continued to obtain antler measurements and tooth samples in order to monitor the age structure of harvested bulls. Age of harvested animals and other harvest information, including annual kill, and hunter success rates, will be used as additional means of monitoring population characteristics of the Unit 3 moose population.

Work with research staff or a biometrician to develop a population model for estimating harvest surplus based on historic information on bull age structure in harvest, and hunter observations of moose age-sex classes.

3. Habitat Assessment-Enhancement

ACTIVITY 3.1. Assess available moose browse and potential for improving moose forage.

Data Needs

No estimate has been made of the amount or quality of moose range in the unit. It may be possible to use radio collars to detect seasonal movement patterns, identify important forage areas and range areas for enhancement.

Methods

Work with a researcher and biometrician to evaluate ways of monitoring and quantifying availability and use of winter forage by moose and deer as an S&I or research project.

Cooperate with the USFS or the Alaska Department of Natural Resources, Division of Forestry to identify previously harvested forest stands where moose forage production could be enhanced using precommercial or commercial thinning treatments.

NONREGULATORY MANAGEMENT PROBLEMS OR NEEDS

Data Recording and Archiving

No changes recommended.

Agreements

No changes recommended.

Permitting

No changes recommended.

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