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## **CHAPTER 5: MOOSE MANAGEMENT REPORT**

From: 1 July 2011

To: 30 June 2013

### **LOCATION**

**GAME MANAGEMENT UNIT:** 3 (3,000 mi<sup>2</sup>)

**GEOGRAPHIC DESCRIPTION:** Islands of the Petersburg, Kake, and Wrangell area

### **BACKGROUND**

Isolated populations of moose (*Alces alces*) occur on the major islands of Unit 3 and are believed to be the *andersonii* subspecies. Moose on the Unit 3 islands emigrated in the past several decades from the Stikine and possibly Thomas Bay populations on the Unit 1B mainland. Increased sightings during the 1980s and 1990s suggest that moose populations and distribution are increasing and moose now occur on all major islands in the unit.

### **HABITAT DESCRIPTION**

Recent increases in moose distribution and abundance in Unit 3 are likely linked to timber harvest. Unit 3 moose habitat consists primarily of old-growth spruce-hemlock forest and clearcut areas. Extensive clearcutting on many of the islands has resulted in early successional vegetation that may temporarily provide good moose browse. No estimate has been made of the amount or quality of moose range in the unit.

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. Left untreated, the dense, closed canopy forests characteristic of young, naturally regenerating second-growth conifer stands will reduce moose carrying capacity. 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 the unit. Although primarily intended as a silvicultural practice, pre-commercial thinning and pruning has been performed in some young second-growth stands in the unit. These efforts provide a secondary benefit to moose by improving and extending habitat suitability by reducing canopy cover, which permits sunlight to reach the forest floor and increase the production of understory forage plants. These benefits are relatively short-lived, approximately 20–25 years, after which canopy closure again results in loss of understory vegetation.

## HUMAN-USE HISTORY

### *Regulation History*

From 1960 through 1967 the Unit 3 moose season was open from 15 September through 15 October with a 1-bull limit. 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 reopened on Mitkof Island 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. The present season dates of 15 September–15 October have been in effect since 1995.

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 a common registration permit hunt (RM038). A legal moose for this hunt is a bull with a spike-fork or 50-inch antlers or 3 brow tines on at least 1 side.

Speculation has long existed that those antler restrictions, which were developed for the *gigas* subspecies of moose found elsewhere in Alaska, are overly restrictive when applied to the smaller *andersonii* subspecies inhabiting the Central Panhandle. In fall 2004 the BOG adopted a department sponsored proposal to implement drawing permit hunts allowing the taking of a limited number of “any-bull” moose in Unit 1B and Unit 3. The registration moose hunt (RM038) in effect during this report period allows the taking of only those bulls that meet the spike-fork, 50-inch antlers or 3 brow tines on at least one side criteria.

In fall 2006, the Board of Game adopted a Regionwide regulation stating that a broken, damaged or altered antler does not satisfy the spike-fork requirement in antler restricted moose hunts. This regulation resulted from a steadily increasing number of bulls being checked in annually that met the specified point requirements only as a result of broken or damaged antlers, and from a growing suspicion that hunters may be intentionally modifying antlers. In 2007, the Board of Game removed the broken antler requirement from Unit 1D (the only other unit at the time with the regulation) leaving RM038 as the only hunt with this specific regulation.

In the Petersburg Management Area (Units 1B and 3) prior to 2002 state subsistence law included a positive customary and traditional use determination for moose only in the Stikine River drainages of Unit 1B. The amount reasonably necessary to meet subsistence needs was set at 40 moose annually. In 2002 the customary and traditional use determination for moose was expanded to include not only the Stikine River drainages, but all of Units 1B and 3. In fall 2006, the Board of Game determined that moose taken in these units during the any-bull drawing permit hunts were considered part of the amount necessary to meet subsistence needs. As a result, to ensure that enough moose were available for harvest to meet subsistence needs, nonresidents were excluded from participation in any-bull drawing hunts in Units 1B and 3.

In fall 2008, based in part on age and antler data collected during the any-bull moose drawing permit hunts implemented in 2004, the Board of Game liberalized the moose antler restrictions for the RM038 hunt area. As a result, beginning with the 2009 season, a legal bull must possess

spike-forked antlers or 50-inch antlers or antlers with 3 or more brow tine at least 1 side, or 2 or more brow tines on both sides. In a related action, the board eliminated the DE047 and DM048 any-bull drawing hunts until such time that the impact of the new liberalized antler restrictions on the RM038 moose herd could be evaluated.

### *Historical harvest patterns*

The average annual harvest during the 1990s was 19 bulls, although during 1990 the season was open only on Wrangell Island, and during 1991 and 1992 the season was opened only on Wrangell and Mitkof islands. Between 1993 (the year the entire unit opened to moose hunting) and 2000, the average annual harvest was 24 bulls. During the 10-year period 2001–2010, the average annual harvest increased to 42 bulls. While the increased harvest was in part due to the any-bull drawing permit hunts held during 2005–2008, and liberalization of antler restrictions starting in 2009, moose distribution and abundance does appear to be increasing throughout Unit 3.

Unit 3 moose harvest chronology has varied. Most bulls are killed during the first half of the season and the harvest rate declines as the season progresses. Most hunters are in the field early in the season and then effort drops, except on weekends. Inclement weather does not seem to reduce hunting effort early in the season.

### *Historical harvest locations*

In 1990, the year the season first opened in Unit 3, moose hunting was restricted to Wrangell Island and 3 bulls were killed. In 1992 and 1993 the season was opened on both Wrangell and Mitkof islands, and a total of 10 and 17 bulls were harvested, respectively. Since 1993, the year all of Unit 3 was opened to moose hunting, most of moose harvested in the unit have come from Mitkof and Kupreanof islands. In recent years Kupreanof has surpassed all other Unit 3 islands as the unit's leading moose producer.

## **MANAGEMENT DIRECTION**

### **MANAGEMENT OBJECTIVES**

During the formulation of the Region I (Southeast Alaska) moose plan in the late 1980s (Alaska Department of Fish and Game 1990), we were unaware that by the mid-1990s a moose population would be established in Unit 3 capable of supporting an annual harvest. Harvesting a Unit 3 moose is often opportunistic, and habitat management and road construction will undoubtedly have greater effect on moose numbers and hunting opportunity than other factors. 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. Moose numbers are currently high enough to support a hunting season in Unit 3, and we intend to continue the hunt as long as it does not affect the integrity of the population. We have established the following draft goals for Unit 3 moose, which are based on a crude estimate of the population size, limited knowledge of habitat utilization and moose movements, and anecdotal information from people in the field.

The Alaska Department of Fish and Game (ADF&G) first set management objectives for Unit 3 moose in 1996. Prior to that year, the harvest was sporadic and we were unsure how persistent

the population or harvest would be. After 5 years, when the annual harvest increased from 8 moose to as many as 19 and hunter participation grew from 24 to nearly 400 hunters, we decided some preliminary management objectives were necessary. However, ADF&G has never tried to 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. We increased the objectives to match the apparent capacity of the herd to sustain a larger harvest and effort.

<u>Unit 3:</u>	<u>Plan Objective</u>	<u>2011</u>	<u>2012</u>
Post hunt numbers	400	N/A	N/A
Annual hunter kill	40	56	36
Number of hunters	470	490	493
Hunter-days of effort	2,300	3,393	3,111
Hunter success	10%	11%	7%

## **METHODS**

We opportunistically checked hunters and harvested moose in the field. We also required hunters to bring antlers of harvested moose to ADF&G to verify compliance with antler restrictions, and to submit the lower jaw of harvested moose for aging purposes. Since 1997 we have asked hunters to report the total number of moose (by sex and age class), wolves, and bears they observed during the hunting season.

Harvest data were summarized by regulatory year (RY), which begins 1 July and ends 30 June (e.g. RY11 = 1 July 2011–30 June 2012).

## **RESULTS AND DISCUSSION**

ADF&G considers the Unit 3 hunt to be an opportunistic hunt on a population that relies on atypical habitat and whose permanence is unknown. With no definitive information on the current population or habitat carrying capacity, population objectives are only speculative. Consequently, with the exception of the experimental any-bull drawing permit hunts, we have supported only hunts with self-limiting regulations (such as limiting the harvest to only bulls possessing specific antler configurations). We believe such hunts enable the population to thrive as permitted by the carrying capacity of the habitat while providing hunting opportunity. However, for genetic or environmental reasons moose in this unit do not develop antler configurations that correlate well with age. Unit 3 moose rarely achieve 50-inch antler spreads, and in some areas the population appears to contain a surplus of sublegal bulls in excess of that needed to ensure timely breeding of cows. The any-bull drawing permit hunts authorized by the BOG in 2004 both facilitated the removal of some surplus bulls and provided information on the age structure and antler characteristics of that segment of the bull population otherwise protected under the existing antler restrictions. The data collected led to Board of Game changes to the RM038 antler restrictions for future seasons

Long-term persistence of Unit 3 moose may depend upon a major habitat enhancement program or continued clearcut logging, which may be detrimental to deer populations. ADF&G is

currently unwilling to take such a proactive approach. Our current objectives are to “passively manage” the hunt, keeping seasons open as long as moose appear to be abundant, noting harvest and hunter effort, but not actively attempting to increase moose numbers.

## **POPULATION STATUS AND TREND**

### *Population Size and Composition*

The Unit 3 moose population is the most enigmatic in Southeast Alaska. No aerial surveys have ever been conducted in Unit 3 because dense forest cover and the lack of any winter concentration areas make them impractical. Harvest data and anecdotal information collected by ADF&G wildlife biologists over a period of many years continue to suggest a low to moderate population that is increasing in both distribution and abundance. Densities seem to be the greatest on Mitkof and northwestern Kupreanof 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 is unknown.

Likewise, definitive sex and age ratios, calf-to-cow ratios, and other population characteristics are unknown. We infer the moose population composition from observations reported by hunters on registration hunt report cards. Because this data is anecdotal and not systematic, there is a high likelihood of replicate sightings and we interpret it with caution. In 2011, 490 RM038 moose hunters reported observing 1,553 moose in Unit 3, including 545 bulls, 670 cows, and 338 calves, for a bull-to-cow ratio of 81:100 and a calf-to-cow ratio of 50:100. In 2012, 493 RM038 moose hunters reported observing 1,108 moose, including 484 bulls, 421 cows, and 203 calves, for a bull-to-cow ratio of 115:100 and a calf-to-cow ratio of 48:100.

### *Distribution and Movements*

Moose appear to be expanding their range in Unit 3 despite the lack of deciduous riparian vegetation typical of most moose habitat in the region. They have been seen crossing Dry Straits between Farm Island on the Stikine River delta and Mitkof Island. At low tide this strait can be crossed easily and moose are reported to move in both directions.

## **MORTALITY**

### *Harvest*

#### Season and Bag Limit

#### Nonresident and resident hunters

Unit 3

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

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.

Hunter Harvest. In 2011, 490 hunters harvested 56 moose, including 7 illegal kills, in Unit 3 (Tables 1 and 2). The harvest of 56 moose in 2011 was the third highest unitwide harvest on

record. In 2012, 493 hunters harvested 36 moose, including 3 illegals. The unitwide harvest of 36 moose in 2012 represents the lowest harvest since 2008.

Hunter Residency and Success. The overwhelming majority of those who participate in the Unit 3 moose hunt are local residents of Petersburg, Wrangell, and Kake (Table 2). Local residents, therefore, typically represent the largest group of successful hunters. The overall success rate for all residency groups combined was 11% in 2011 and 7% in 2012; these rates were above and below, respectively, the preceding 10-year average (RY01–RY10) of 8% success. Just 10 and 13 nonresident hunters participated in the Unit 3 moose hunt in 2011 and 2012, respectively, and only 3 were successful.

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. In 2011 most of the annual harvest occurred during the fourth and second weeks of the season. In 2012 most of the annual harvest occurred during the third and second weeks of the season (Table 3).

Harvest in Wildlife Analysis Areas (WAAs). During the report period hunters reported harvesting moose in 17 Unit 3 WAAs. In 2011 the largest percentage of the annual harvest occurred in WAA # 5132 (27%) on northwest Kupreanof Island, followed by WAA # 2007 (21%) on Mitkof Island. In 2012 the largest percentage of the harvest also occurred in WAAs # 5132 (42%), followed by # 2007, #5131 and #5134 each with 11% percentage of the harvest.

Guided hunter harvest. Currently, no guided moose hunts are offered in the unit.

Transport Methods. During both years of the reporting period, most successful Unit 3 moose hunters used highway vehicles to access their hunting areas; a smaller number used boats (Table 4).

#### *Other Mortality*

Wolves are common throughout Unit 3 and predation by wolves on adult and calf moose has been well documented. Substantial predation of moose calves by black bears has been documented in other areas and probably occurs in Unit 3 as well. Poaching of moose undoubtedly occurs in Unit 3; however, we don't know how prevalent it is.

## **CONCLUSIONS AND RECOMMENDATIONS**

The Unit 3 moose population responded favorably to the initial increase in available browse resulting from extensive clearcut logging, but the dense, closed canopy forests caused by the natural regeneration of second-growth stands will eventually decrease the amount of available browse. Both biologists and hunters are concerned over the eventual loss of habitat and resulting decline in food availability for moose and deer. Any attempted remedies involving habitat manipulation need to be undertaken with the involvement of the U.S. Forest Service, which manages nearly all of the land in Unit 3.

The annual hunter kill exceeded the management objective of 40 moose during 2011, but was below the objective in 2012. The number of hunters was also above the management objective of 470 hunters during both years of the report period. Hunter days of effort was well above the

management objective of 2,300 days during both years. Success rates of 11% in 2011 and 7% in 2012 were above and below, respectively, the management objective of 10% annually. The harvest of 56 moose in 2011, the third year the harvest of bulls with 2 or more brow tines on both antlers was allowed, represents the third highest Unit 3 moose harvest since the inception of the moose hunt in 1993. The harvest of 36 moose in 2012 was the lowest harvest since 2008. In 2011, 16 (29%) of the 56 bulls harvested in Unit 3 had 2 brow tines on both antlers. In 2012, 14 (39%) of the 36 bulls harvested had 2 brow tines on both antlers. We recommend that the current antler regulations remain in effect while we continue to monitor the impact of the liberalized antler restrictions on the moose herd.

The Unit 3 moose population is believed to be below carrying capacity and predation by wolves and black bears is thought to be the primary factor limiting the population. Although moose density varies from island to island, the Unit 3 moose population appears to be expanding in both distribution and abundance. Since 2000 the moose harvest from the Unit 3 islands has regularly exceeded that of the Unit 1B mainland and this was the case during the report period.

We recommend that the RM038 hunt area, including 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 15 September through 15 October with a bag limit of 1 bull with spike-forked antlers or 50-inch antlers or antlers with 3 or more brow tines on at least 1 side, or 2 or more brow tines on both sides.

### REFERENCES CITED

Alaska Department of Fish and Game (ADF&G). 1990. Strategic plan for management of moose in Region I, Southeast Alaska 1990–1994. Division of Wildlife Conservation, Juneau.

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Table 1. Unit 3 moose harvest, regulatory years 1999 through 2012.

Year	Hunter harvest reported							Total
	M	(%)	F	(%)	Unk.	Total	Illegal	
1999 <sup>a</sup>	24	(100)	0	(0)	0	24	2	26
2000	30	(100)	0	(0)	0	30	1	31
2001 <sup>a</sup>	24	(100)	0	(0)	0	24	1	25
2002	25	(100)	0	(0)	0	25	1	26
2003	39	(100)	0	(0)	0	39	2	41
2004	40	(100)	0	(0)	0	40	1	41
2005 <sup>b, c</sup>	58	(98)	0	(2)	0	58	1	59
2006 <sup>c</sup>	41	(100)	0	(0)	0	41	2	43
2007 <sup>c</sup>	32	(100)	0	(0)	0	32	1	33
2008 <sup>bc</sup>	28	(100)	0	(0)	0	28	6	34
2009	59	(98)	1	(2)	0	60	4	64
2010 <sup>a</sup>	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

<sup>a</sup> Includes one DLP

<sup>b</sup> Numbers do not equal total because the cow was also illegal

<sup>c</sup> Includes DM047 and DM048 harvest



Table 2. Unit 3 moose hunter residency and success, regulatory years 1999 through 2012.

Year	Successful					Unsuccessful					Total hunters
	Local <sup>a</sup> resident	Nonlocal resident	Non- resident	Total	(%)	Local <sup>a</sup> resident	Nonlocal resident	Non- resident	Total	(%)	
1999	26	0	0	26	(5)	430	34	2	466	(95)	492
2000	27	4	0	31	(6)	435	33	5	473	(94)	504
2001	22	3	0	25	(5)	402	31	1	434	(95)	459
2002	25	1	0	26	(6)	398	31	0	429	(94)	455
2003	38	3	0	41	(8)	421	48	2	471	(92)	512
2004	39	2	0	41	(8)	431	28	0	459	(92)	500
2005	47	10	2	59	(11)	445	24	0	469	(89)	528
2006	38	4	1	43	(9)	410	38	0	448	(91)	491
2007	26	7	0	33	(7)	397	48	3	448	(93)	481
2008	29	4	1	34	(7)	367	68	3	438	(93)	472
2009	48	16	0	64	(13)	375	44	3	422	(87)	486
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

<sup>a</sup> Residents of Kake, Petersburg, and Wrangell

Table 3. Unit 3 moose harvest chronology in, regulatory years 1999 through 2012.

Year	15–21 Sep	22–28 Sep	29 Sep–5 Oct	6–15 Oct	Total
1999	7	5	5	9	26
2000	11	7	5	8	31
2001	11	2	3	7	23
2002	6	6	5	9	26
2003	13	6	7	15	41
2004	10	12	6	13	41
2005	19	21	8	11	59
2006	6	7	11	19	43
2007	6	7	6	14	33
2008 <sup>a</sup>	4	2	14	13	34
2009	14	12	19	19	64
2010	8	18	13	14	53
2011	4	17	14	21	56
2012	4	8	17	7	36

<sup>a</sup>Numbers do not equal total due to one unknown

Table 4. Unit 3 successful moose hunter transport methods, regulatory years 1999 through 2012.

Year	Airplane	Boat	Highway vehicle	3/4 wheeler	Horse	Unknown	Total
1999	3	5	17	1	0	0	26
2000	2	6	23	0	0	0	31
2001	0	5	18	0	0	0	23
2002	0	7	19	0	0	0	26
2003	0	11	29	1	0	0	41
2004	0	11	30	0	0	0	41
2005	1	8	46	4	0	0	59
2006	3	10	28	2	0	0	43
2007	3	8	20	2	0	0	33
2008	0	10	21	3	0	0	34
2009	0	13	38	12	0	1	64
2010	1	14	33	4	0	1	53
2011	3	12	34	7	0	0	56
2012	1	12	21	2	0	0	36