Moose Management Report and Plan, Game Management Unit 1D:

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

Carl H. Koch



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Alaska Department of Fish and Game

Division of Wildlife Conservation

Moose Management Report and Plan, Game Management Unit 1D:

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

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This species management report and plan was reviewed and approved for publication by Thomas V. Schumacher, Management Coordinator for the Division of Wildlife Conservation, Douglas.

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Cover photo: Bull moose during an aerial survey along the Takhin River area. ©2015 ADF&G. Photo by Carl H. Koch.

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Purpose of this Report

This report provides a record of survey and inventory management activities for moose in Unit 1D for the previous 5 regulatory years and plans for survey and inventory management activities for 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 analysis 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 (ADF&G) Division of Wildlife Conservation (DWC) launched this 5-year report to more efficiently report on trends and describe potential changes in data collection activities over the next 5 years. It replaces the moose management reports of survey and inventory activities that were previously produced every 2 years.

I. RY10–RY14 Management Report

Management Area

Unit 1D (Fig. 1) is on the northern Southeast Alaska mainland lying north of the latitude of Eldred Rock, excluding Sullivan Island and the Berners Bay drainages. Although the management area is 2,854 mi², moose primarily inhabit the Chilkat River valley and the Chilkat Peninsula. The lower Chilkat Valley has a maritime climate with cool, often wet summers. Precipitation declines with distance away from saltwater. Winter weather varies by location. The Haines area in the lower Chilkat Valley averages about 200 inches of snow each winter with temperatures near freezing. Moving up the valley, winter temperatures are colder and total snowfall and accumulated snowpack increase. Snowpack in the upper valley can exceed 10 feet. The topography consists of coastal mountains surrounding deep U-shaped river valleys created by glacial action. The larger rivers are shallow and fast-flowing with wide, braided channels. The mouths of rivers often contain alluvial fans of gravel, boulders, and silt. Silt deposition and glacial rebound at the mouth of the Chilkat River has created a large flat delta with varied seral vegetation types. Forest cover on upland slopes consists of Sitka spruce-western hemlock (Picea sichensis-Tsuga heterophyla) forest with black cottonwood (Populus trichocarpa) and paper birch (*Betula papyrifer*) (Hundertmark 1983). Lowlands including river bars support varying vegetation types ranging from willow (*Salix* spp.) and alder (*Alnus* spp.) to spruce-hemlock forest and mature cottonwood. In 1990 the department estimated 200–250 mi² of summer range and 110–120 mi² of winter range, including 80 mi² of preferred winter range in Unit 1D (ADF&G 1990), but that amount may be declining due to isostatic rebound and forest succession. There are also small pockets of moose habitat in the Chilkoot, Katzehin, and Warm Pass valleys, and along the western shore of Lynn Canal (ADF&G 1990).



Figure 1. Game Management Unit 1D, Southeast Alaska.

The majority of moose habitat in Unit 1D occurs within the Haines State Forest boundary. The "Haines State Forest Management Plan" states that ~42,000 acres of operable timber will be harvested with the primary method being clear-cutting (Alaska Department of Natural Resources [DNR] 2002). The plan also states that some mixed stands will regenerate as Sitka spruce after harvest (DNR 2002). Young clear-cuts can provide early successional vegetation which has value as browse during summer and low-snow winters. However, during a deep-snow winter moose in the Chilkat Valley favored mixed deciduous-coniferous forest (Hundertmark 1983). The value of forest stands as winter habitat for moose declines when logged forest is managed to promote only Sitka spruce as called for in the "Haines State Forest Management Plan" (DNR 2002). That habitat change in addition to ongoing glacial rebound and natural succession may limit the habitat capability for moose in Unit 1D.

Summary of Status, Trend, Management Activities, and History of Moose in Unit 1D

Moose first arrived in the Chilkat Valley from Canada around 1930. Abundant browse resulting from postglacial successional vegetation allowed the population to rapidly increase, and in 1959 the first hunting season was opened. From 1959–1963 hunts were restricted to bulls and averaged 60 bulls per year. From 1964–1976 both bulls and cows were harvested because of concern over deteriorating range conditions caused by heavy browsing (ADF&G 1990). The maximum harvest occurred in 1966 when 92 bulls and 60 cows were harvested. In 1968 the population estimate peaked at 500–700 moose. Subsequent surveys suggested that the population had decreased to ~ 400 animals by the 1980s, and the most recent survey estimated the population at 250–350 animals (Sell 2012). The long-term decline in this population is most likely related to forest succession and declining abundance of preferred browse species. In recent years the timing of surveys has varied due to inconsistent snow cover. Caution is advised when interpreting survey findings because not all areas were surveyed each year.

The Alaska Board of Game (BOG) implemented a Tier II subsistence hunt for the 1990 season. However, widespread dissatisfaction with the allocation of only 20 Tier II permits and concerns about the status of the population contributed to local opposition to the hunt. In 1991 no permits were issued. In 1992 the season was closed early by emergency order. In 1993 BOG authorized a Tier II antler-restricted hunt for Unit 1D (Sell 2012). This slowed the pace of the hunt and allowed more hunter opportunity while affording protection to bulls that did not meet antler requirements. Current regulations authorize issuing up to 250 Tier II permits and hunters must report to the checkstation within 3 days of harvesting a moose. Based on aerial surveys and the likely size of the population, the management objective for harvest was 20–25 bulls. Beginning in RY08, BOG extended the season by 1 week allowing for additional hunter opportunity.

Management Direction

EXISTING WILDLIFE MANAGEMENT PLANS

In the late 1980s ADF&G developed a management plan for moose throughout Region I (Southeast Alaska) including Unit 1D (ADF&G 1990) intended to guide management through

RY94. With the exception of the Gustavus population, the 1990 plan included objectives and management strategies for each population.

Although the overall goals of the plan are 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 comments, BOG actions, and ADF&G staff recommendations. The periodic changes in management planning have been reported in the division's species management reports. The plan portion of this report contains the current management plan for moose in Unit 1D.

GOALS

Region I moose management goals were established when the Region I moose management plan was created in the late 1980s. The following goals are general and applicable to the entire region:

- 1. Maintain, protect, and enhance moose habitat and other components of the ecosystem.
- 2. Maintain viable populations of moose in their historic range throughout the region.
- 3. Manage moose on a sustained yield basis.
- 4. Manage moose in a manner consistent with the interests and desires of the public.
- 5. Manage primarily for meat, rather than trophy hunting of moose.
- 6. 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. Provide opportunities to view and photograph moose for the benefit of nonconsumptive users of moose.
- 8. Develop and maintain a database for making informed management decisions.

CODIFIED OBJECTIVES

Amounts Reasonably Necessary for Subsistence Harvest

This is a Tier II subsistence hunt. BOG determined that 100% of allowable annual harvest is the amount necessary for subsistence.

Intensive Management

BOG has made a negative finding regarding intensive management for moose in Unit 1D (5 AAC 92.108). This is unlikely to change due to historic harvest levels and limits of the habitat capability of the Chilkat River Valley to support a large increase in the moose population.

MANAGEMENT OBJECTIVES

Population management objectives identified by department staff for Unit 1D are as follows:

1. Maintain a posthunt population of at least 200 moose.

- 2. Maintain a posthunt bull-to-cow ratio of 25:100.
- 3. Sustain a harvest of 20–25 moose annually.

When the 1990 moose management plan was written, biologists recognized that loss of habitat due to succession was likely to occur and that moose habitat capability is likely affected by other land uses in the area (e.g., logging). The ability to manipulate changes in habitat in ways that may benefit moose is limited as other agencies must follow their own management plans (e.g., "Haines State Forest Management Plan"). Since the moose management plan (ADF&G 1990) was developed, subsequent management reports document changes in management objectives developed by agency staff based on available data (e.g., aerial surveys, harvest records) and public comments. The posthunt population objective was reduced to 200 in 2004 based on variation in aerial survey methods, lower estimated population, and other factors (Hessing 2004).

MANAGEMENT ACTIVITIES

We held annual fall moose meetings in Haines during which we discussed harvest history, results from aerial surveys, and showed the "Is This Moose Legal?" video in order to aid hunters complying with antler restrictions.

All hunters are required to bring antlers and a lower jaw specimen to the Haines ADF&G office within 3 days of harvesting a moose. Antler morphology data, photos, and tooth specimens were collected from harvested moose. Harvested moose that did not meet antler requirements were confiscated and the meat donated to charity. The use of antler restrictions was intended to protect enough breeding age bulls to provide a sustainable population. However, the strategy was developed in Southcentral Alaska where only *Alces alces gigas* occur. Moose in Unit 1D are a mixture of *A. a. andersoni* and *A. a. gigas* subspecies. Due to differences in antler morphology among subspecies, this strategy may not be as effective for Unit 1D moose. We will continue to evaluate age of harvested bulls and antler configuration as a management tool.

Aerial composition surveys were conducted annually after the hunting season closed as soon as complete snow coverage was present.

In March 2010, 1 moose was captured and a radio collar was attached during removal from a wolf snare. That collar was used to monitor the status of the moose.

1. Population Status and Trend

ACTIVITY 1. Aerial surveys to obtain minimum counts and age-sex composition of the herd.

Data Needs

Moose abundance and age-sex composition are important components for managing moose populations. These data are used to track population trends, assess whether objectives are being met, and manage harvest. Additionally these data allow staff to monitor effects of management decisions and regulatory changes.

Methods

Surveys were conducted in a Piper Super Cub with one observer during 2010, 2011, and March 2015. During 2012 and 2013, in order to accommodate additional personnel, a Cessna 180 was used with 2 observers.

Surveys were conducted in the Chilkat River Valley after the close of the fall moose hunting season using fixed-wing aircraft at 300–500 foot above ground level when adequate snow cover was present. The primary survey route covered the Chilkat River Valley from Murphy Flats to Turtle Rock, and the Takhin, Tsirku, and Kelsall river valleys. Using binoculars, moose were identified by sex and age class and bulls were classified as small, medium or large based on antler configuration. Locations of all moose were recorded with a handheld GPS and age-sex data were recorded on survey forms. Minimum counts were tallied and bulls:100 cows and calves:100 cows were calculated.

Results and Discussion

The timing and quality of surveys was weather dependent and variable throughout the reporting period. We conducted composition surveys in the fall of each year except 2014 when the survey was delayed until March 2015 due to lack of adequate snowfall. Survey conditions varied from excellent in 2011 to poor in March 2014.

Moose counted during surveys represent the minimum number of moose in the population. Counts for the Chilkat River Valley surveys during the reporting period ranged from a low of 147 total moose during RY14 to a high of 212 total moose in RY11 (Table 1). The mean count for the reporting period was 179 total moose, a 10% decrease from the mean count of 199 total moose for RY05–RY09. We have no collared moose to inform sightability of moose during surveys of the Haines population. Therefore, when we see fewer than 200 moose, we cannot be certain that our posthunt population objective was met.

The objective of 25 bulls:100 cows was met during RY10–RY12. During RY13 the survey was conducted after moose began antler drop biasing the number low. In RY14 a lack of adequate snow cover delayed the survey until March, well after bulls dropped antlers and gender was difficult to determine (Table 1). The mean bull:cow ratio for RY10–RY12 was 41:100 (range 39–45). This was similar to the mean bull:cow ratio of 38:100 for RY05–RY09.

Mean calves:100 cows was 22:100 for RY10–RY12 (Table 1). Because the gender was difficult to determine during RY13 and RY14 surveys, the number of calves seen per 100 cows during those years are likely biased low. The mean for RY05–RY09 was 26 calves:100 cows. The 10-year mean was 23 calves:100 cows.

In RY10 and RY14 we also surveyed the Katzehin River using a Piper Super Cub in conjunction with other fieldwork. There were collared moose in this isolated population, so we estimated sightability for all moose based on the proportion of collared moose seen. During the RY10 Katzehin River survey we counted a total of 12 calves, 22 cows, 2 bulls, and 3 unknown sex moose (39 moose overall). Using sightability of collared moose, we estimated the total size of this population at $69(\pm 38)$ moose. During the RY14 Katzehin River survey we counted a total of 32 moose; 4 bulls, 3 calves, and 25 cows. The population estimate based on sightability was

						Count					
Regulatory	Total	Total	Total		Total	time	Bulls:	Calves:	Calves % in	Moose/	
year	bulls	cows	calves	Unk	moose	(hr)	100 F	100 F	population	hour	
2000	28	30	35	129	222	5.5			16	40	
2001	38	153	30		221	5.2	25	20	14	42	
2002°											
2003	29	103	26		158	4.4	28	25	16	36	
2004	23	45	52	119	239	4.4			22	54	
2005	46	118	39		203	5.0	39	33	19	41	
2006	49	106	31	2	188	4.4	46	29	16	43	
2007	43	144	23	1	211	4.3	30	16	11	49	
2008	25	22	23	140	210	5.7			11	37	
2009	38	110	27	8	183	4.7	35	25	15	39	
2010	47	120	27	3	197	6.0	39	23	14	33	
2011	57	127	28		212	6.0	45	22	13	35	
2012	42	109	24	2	177	4.4	39	22	14	40	
2013	23	116	21	3	163	5.3	20	18	13	31	
2014		13	12	122	147	6.0			8	24.5	
^a Regulatory yea ^b Surveys condu- ^c No survey.	^a Regulatory year begins 1 July and ends 30 June, e.g., regulatory year 2000 = 1 July 2000–30 June 2001. ^b Surveys conducted after antler drop biasing bull:cow and calf:cow ratios. ^c No survey.										

Table 1. Historic Unit 1D (Chilkat River Valley) aerial moose survey data, Southeast Alaska, regulatory years^a 2000–2014^b.

 $32(\pm 0)$. Sightability estimates should be viewed with caution because only 6 collared animals were present during RY10 and only 3 during RY14.

Recommendations for Activity 1.

We recommend that annual fall population and composition surveys continue and that 20–40 adult cow moose be fitted with VHF radio collars to allow mark-resight population estimates and to inform sightability.

2. Mortality-Harvest Monitoring and Regulations

ACTIVITY 2. Monitor harvest and other mortality including age and antler configuration of harvested moose.

Describe Data Needs

Monitoring harvest data is important to determine if the antler restriction strategy is appropriate and if harvest is sustainable.

Methods

We documented annual harvest using a mandatory checkstation staffed by agency personnel throughout the season. Hunters were required to report if they hunted, hunt duration, location, transport means, and date of kill (for successful hunters) on hunt report cards. All hunters were required to produce a 5-inch section of lower jaw for aging by cementum analysis (Table 2). We document antler morphology of harvested bulls by taking specific measurements and photographs.

Results and Discussion

We monitored harvest through mandatory checkstations. During RY10–RY14 on average 23 bulls (range 21–28) were harvested annually (Table 3). An average of 3 bulls/year that did not meet antler restriction requirements were confiscated and donated to charity. We considered the number of spike-forked animals harvested to be an index of recruitment of bulls into the population. The number of yearlings in the harvest varied considerably averaging 7/year (range 3–10). The proportion of bulls in ages 2–5 ranged from 27% to 58% of the total harvest (Table 2). Some of the harvested animals fell in the sublegal antler category, and a small number of animals with broken antlers would likely have been sublegal had their antlers been intact. Because 27–58% of harvested bulls were in the 2- to 5-year-old age category meant to be protected by antler restrictions, we need to evaluate whether those restrictions are effective for the Haines population.

								Ag	ge (yr)								_		
Regulatory																	Total	%	Mean
year	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
2000	0	2	3	1	1	3	2	0	1	0	0	0	0	0	0	0	19	68	4.4
2001	0	8	1	1	3	1	1	1	1	0	0	0	0	0	0	0	17	100	3.5
2002	0	3	2	4	5	1	1	2	2	0	0	0	0	0	0	0	22	91	4.5
2003	0	3	1	3	3	8	0	2	0	0	0	0	0	0	0	0	21	95	4.5
2004	0	4	2	4	3	3	0	3	0	0	0	0	0	0	0	0	19	100	4.1
2005	0	8	1	5	1	2	0	0	0	0	0	0	0	0	0	0	18	94	2.8
2006	0	12	3	3	3	2	2	2	0	0	0	0	0	0	0	0	27	100	3.3
2007	0	6	8	4	1	0	2	0	0	0	1	0	0	0	0	0	22	100	3.2
2008	0	6	7	2	1	8	2	1	1	1	0	0	0	1	0	0	30	100	4.5
2009 ^b	0	6	3	2	2	1	2	1	1	0	0	0	0	0	0	0	18 ^b	100	3.7
2010	0	7	4	1	4	2	1	1	0	0	1	0	0	0	0	0	21	100	3.7
2011	0	10	1	2	3	0	1	2	0	0	1	0	1	0	0	0	21	100	4.2
2012	0	7	4	4	2	2	0	0	2	1	0	0	0	0	0	0	22	100	3.7
2013	0	8	3	5	2	3	2	3	0	0	0	0	0	0	0	0	26°	93	3.8
2014	0	2	0	5	9	1	1	1	1	0	0	0	0	0	0	0	22^d	83	4.5

Table 2. Unit 1D age structure of harvested moose, Southeast Alaska, regulatory years^a 2000–2014.

^a Regulatory year begins 1 July and ends 30 June, e.g., regulatory year 2000 = 1 July 2000-30 June 2001.
 ^b Does not include 1 unsalvaged illegal harvest.
 ^c Does not include the ages from 2 unrecovered illegal moose.
 ^d No age available for 2 moose.

		Successful hunters			Uns	uccessful h	unters	Total hunters			
Regulatory	Permits	No.	Total	Avg. no.	No.	Total	Avg. no.	No.	Total	Avg. no.	
year	issued	hunters	no. days	days	hunters	no. days	days	hunters	no. days	days	
2000	200	19	75	3.9	141	821	5.9	160	1,072	6.7	
2001	200	17	68	4.0	137	963	7.0	154	1,031	6.7	
2002	200	22	78	3.5	135	971	7.2	157	1,049	6.7	
2003	222	21	80	3.8	140	895	6.4	161	975	6.1	
2004	202	19	86	4.5	142	1,029	7.2	161	1,115	6.9	
2005	220	18	87	4.8	148	934	6.3	166	1,021	6.2	
2006	220	27	77	2.9	150	934	6.2	177	1,011	5.7	
2007	220	22	104	4.7	156	1,430	9.2	178	1,534	8.6	
2008	220	30	203	6.8	155	1,365	8.8	185	1,568	8.5	
2009	251	18	90	5.0	197	1,863	9.5	215	1,953	9.1	
2010	250	21	104	5.0	168	1,451	8.6	189	1,555	8.2	
2011	250	21	84	4.0	172	1,471	8.2	193	1,501	7.7	
2012	250	22	154	7.0	177	1,436	8.3	199	1,590	8.2	
2013	257	26	131	5.0	185	1,654	8.9	211	1,785	8.5	
2014	250	22	163	7.4	152	1,278	8.4	174	1,441	8.3	

Table 3. Unit 1D moose hunter effort and success, Southeast Alaska, regulatory years^a 2000–2014.

^a Regulatory year begins 1 July and ends 30 June, e.g., regulatory year 2000 = 1 July 2000-30 June 2001.

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Harvest by Hunters

Season and bag limit	Resident hunters	Nonresident hunters
1 bull with spike-fork or	15 Sep–7 Oct	No open season
50-inch antlers or antlers	(Subsistence hunt only)	
with 3 or more brow tines on		
one side by Tier II		
subsistence hunting permit		
only; up to 250 permits may		
be issued.		

Permit Hunts

TM059 is the only hunt that occurs in Unit 1D. Harvest during RY10–RY14 ranged from 21 in 2010 to 26 bulls in 2013 (Table 3). Mean annual harvest during RY10–RY14 was 22.4. This was similar to the mean of 23 for RY05–RY09. Two hundred and fifty permits were issued each year except during 2013 when 257 were issued.

Hunter Residency and Success

During the report period local residents were once again the primary moose hunters (Table 4). Residents of Haines and Klukwan harvested 107 of 112 moose taken during the report period. Hunter success ranged from 11% to 13% during the report period with a mean success rate of 11.6% (Table 5). The average number of days among successful hunters ranged from 4.0 to 7.4 (Table 3). Total hunter days averaged 1,574 during the report period with a high of 1,785 during 2013 and a low of 1,441 during 2014.

Harvest Chronology

The season remained open during every year of the report period. Harvest was highest during the first week of the season during every year of the report period except for 2012 (Table 6). This is likely due to the most easily identified legal animals being harvested quickly. Overall 47% of all spike-forked moose, 42% of all moose in the 3 brow tine class, and 40% of moose with 50-inch or greater antler spread were harvested within the first week of the report period (Table 6). A total of 12 sublegal animals were harvested during the entire report period (5 during week 1, 5 during week 2, and 2 during week 3). Two illegal bulls were harvested during 2010, one of which was harvested 2 days before the season began and 2 moose were left lay in the field during 2013.

Transport Methods

The majority of successful hunters used boats or highway vehicles during the report period (Table 7). Boat use ranged from 48% to 73% of all successful hunters. Use of highway vehicles ranged from 15% to 29%. Off-road recreational vehicle (ORV) use by successful hunters ranged from ranged from 0% to 19%. Hunters did not use commercial services during this report period. Historically commercial service use has always been very low (Table 8).

Regulatory	Total					Other	
year	kill	Haines	Skagway	Juneau	Sitka	Alaska	Nonresident
2000	19	17	0	1	0	1	0
2001	17	16	0	0	1	0	0
2002	22	21	1	0	0	0	0
2003	21	18	0	3	0	0	0
2004	19	18	1	0	0	0	0
2005	18	15	0	2	0	1	0
2006	27	25	0	1	1	0	0
2007	22	20	0	1	1	0	0
2008	30	30	0	0	0	0	0
2009	18^{b}	17	0	1	0	0	0
2010	21	19	0	1	1	0	0
2011	21	20	0	1	0	0	0
2012	22	22	0	0	0	0	0
2013	26°	26	0	0	0	0	0
2014	22	20	0	1	1	0	0

Table 4. Unit 1D annual moose kill by community of residence, Southeast Alaska, regulatory years^a 2000–2014.

2017222001100a Regulatory year begins 1 July and ends 30 June, e.g., regulatory year 2000 = 1 July 2000–30 June 2001.b Does not include 1 unsalvaged illegal harvest.c Does not include 2 unsalvaged illegal harvest.

Regulatory	No.	No.	No.	Total	No.	Percent
year	males	females	unknown	kill	hunters	success
2000	19	0	0	19	160	12
2001	17	0	0	17	154	11
2002	22	0	0	22	157	14
2003	21	0	0	21	161	13
2004	19	0	0	19	161	12
2005	18	0	0	18	166	11
2006	27	0	0	27	177	15
2007	22	0	0	22	178	12
2008	30	0	0	30	185	16
2009	18 ^b	0	0	18 ^b	215	8
2010	21	0	0	21	189	11
2011	21	0	0	21	193	11
2012	22	0	0	22	199	11
2013	26°	0	0	26°	211	12
2014	22	0	0	22	174	13

Table 5. Unit 1D moose harvests, number of hunters, and percent success, Southeast Alaska, regulatory years^a 2000–2014.

^a Regulatory year begins 1 July and ends 30 June, e.g., regulatory year 2000 = 1 July 2000–30 June 2001.
^b Does not include 1 unsalvaged illegal harvest.
^c Does not include 2 unsalvaged illegal harvest.

		15–2	1 Sep			22-2	28 Sep		29 Sep-7 Oct			
Regulatory	Spike-	3 brow			Spike-	3 brow			Spike-	3 brow		
year	fork	tine	>50"	Sublegal	fork	tine	>50"	Sublegal	fork	tine	>50"	Sublegal
2010	4	3	2	2	0	1	1	1	2	4	0	0
2011	6	2	3	1	3	1	1	1	1	1	1	0
2012	3	2	1	0	4	1	1	2	4	1	2	1
2013	5	5	0	1	4	4	1	0	1	4	0	1
2014	1	6	2	1	0	3	1	1	2	2	3	0

Table 6. Unit 1D summary of harvest chronology, Southeast Alaska, regulatory years^a 2010–2014.

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

Regulatory	Airplane	Boat	ORV ^b	Highway vehicle	Other				
year	Total (%)	Total (%)	Total (%)	Total (%)	Total (%)				
2000	0 (0)	12 (63)	2 (11)	5 (26)	0 (0)				
2001	1 (6)	14 (82)	0 (0)	2 (12)	0 (0)				
2002	2 (9)	12 (55)	2 (9)	5 (23)	1 (5)				
2003	1 (5)	13 (62)	1 (5)	3 (14)	3 (14)				
2004	0 (0)	11 (58)	1 (5)	6 (32)	1 (5)				
2005	0 (0)	12 (66)	3 (17)	3 (17)	0 (0)				
2006	2 (7)	14 (52)	3 (11)	7 (26)	1 (4)				
2007	0 (0)	14 (64)	5 (23)	3 (14)	0 (0)				
2008	0 (0)	16 (53)	2 (7)	11 (37)	1 (3)				
2009	0 (0)	10 (56)	3 (17)	2 (11)	3 (17)				
2010	1 (5)	10 (48)	4 (19)	5 (24)	1 (5)				
2011	0 (0)	12 (57)	3 (14)	6 (29)	0 (0(
2012	0 (0)	16 (73)	0 (0)	4 (18)	2 (9)				
2013	0 (0)	18 (69)	4 (15)	4 (15)	0 (0)				
2014	0 (0)	11 (50)	3 (14)	4 (18)	4 (18)				
^a Regulatory year begins 1 July and ends 30 June, e.g., regulatory year 2000 = 1 July 2000–30 June 2001. ^b ORV = off-road vehicles.									

Regulatory	Unit residents		it residents Other Alaska residents			use	
year	No	Yes	No	Yes	No	Yes	Other services
2000	130	1	12	1	142	2	0
2001	128	1	8	0	136	1	0
2002	134	0	9	0	143	0	0
2003	136	3	6	1	142	4	0
2004	135	1	10	0	145	1	0
2005	145	2	9	1	154	3	0
2006	169	0	8	0	177	0	0
2007	174	0	4	0	178	0	0
2008	178	0	7	0	185	0	0
2009	201	1	12	0	213	1	0
2010	179	0	9	0	188	0	0
2011	183	0	11	0	194	0	0
2012	187	0	12	0	199	0	0
2013	197	0	12	0	209	0	0
2014	163	0	11	0	174	0	0

Table 8. Unit 1D commercial services used by moose hunters, Southeast Alaska, regulatory years^a 2000–2014.

^a Regulatory year begins 1 July and ends 30 June, e.g., regulatory year 2000 = 1 July 2000–30 June 2001.

Other Mortality

Other anthropogenic causes of mortality include collisions with highway vehicles and occasionally moose killed out of season in defense of life or property. In such cases we attempt to provide any salvageable meat to charity.

Local residents have maintained an interest in harvesting moose for funeral ceremonies and cultural education permits requesting about 1–2 permits annually. ADF&G works with local law enforcement to provide meat from sublegal bulls that have been confiscated or road killed moose in good condition. If these requests increase significantly we will continue to work with interested groups to make sure harvest aligns with management objectives and harvest strategies.

Brown bears, black bears, and wolves inhabit Unit 1D, but we do not know the degree to which predation may limit the Haines moose population. Historically, wolf harvest in Unit 1D has been relatively low, averaging 7 per year during this report period. Although we do not have data to directly quantify effects of predation on moose calves, we do calculate percent of calves counted during aerial surveys. The average percent calves for the report period (12%) was very near the 10-year average (13%) indicating there likely has not been a significant increase in predation on calves during the report period. Collaring adult cows would allow us to document survival of adults and calves.

This report period included winters with very deep and very little snow. Deep snow winters may increase calf mortality. As forest succession advances throughout the Chilkat Valley, availability of moose forage, particularly during winter, may decrease, and that could affect reproduction and calf survival (Hundertmark et al. 1983).

Alaska Board of Game Actions and Emergency Orders

There were no BOG actions or emergency orders issued during the report period affecting this hunt.

Recommendations for Activity 2.

Continue to collect harvest information, but analyze current antler restrictions relative to ages of harvested moose and bull:cow ratios to determine if they protect an appropriate proportion of breeding-aged bulls.

3. Habitat Assessment-Enhancement

ACTIVITY 3. Conduct moose browse surveys.

Describe Data Needs

Availability of forage, particularly winter forage, may limit moose in the Haines area. However, we did not collect any information on availability or use of winter browse.

Recommendations for Activity 3.

Based on availability of staff time and funding, consider beginning annual browse surveys. Consult biometrician and moose specialist for study design.

NONREGULATORY MANAGEMENT PROBLEMS OR NEEDS

Data Recording and Archiving

RECORDING:

- Moose survey form (Appendix A).
- Moose antler measurement form (Appendix B).
- Moose hunt log sheet (Appendix C).
- GPS waypoints and tracks-Garmin 76Csx handheld.

ARCHIVING:

- Harvest data are stored on internal ADF&G database on a server (<u>http://winfonet.alaska.gov/index.cfm</u>).
- Field data sheets from surveys and antler measurements are stored in file drawers in area management section downstairs Douglas Area Office. Scanned copies of completed forms are stored on the Douglas ADF&G network drive S:\Region1Shared-DWC\Offices\Douglas\Carl Koch\Moose
- GIS survey data are stored on the Assistant Area Biologist computer C:\GIS_data\Haines\Survey_data and the Region 1 server S:\Region1Shared-DWC\Offices\Douglas\Carl Koch\Moose.

Conclusions and Management Recommendations

Based on aerial survey data we believe that we should continue using the management objective of a posthunt population of 200 moose. Absent better population data, we believe the harvest objective of 20–25 bulls remains appropriate.

Aerial surveys during the report period suggest that the moose population has remained relatively stable. However, during the last 2 years of the report period lack of adequate snow cover delayed surveys until well after antler-drop confounding collection of demographic data. Collaring a sample of adult cow moose would enable mark-resight population estimates, estimates of sightability during surveys, and estimates of adult and calf survival. Therefore, we recommend collaring and maintaining a sample of 20–40 moose.

In the late 1960s ADF&G biologists documented deteriorating range conditions due to heavy browsing and suggested that habitat management may be needed to sustain or grow the Chilkat Valley moose population (ADF&G 1990). McCarthy (1990) suggested examining the relationship between timber harvest and moose habitat in the Chilkat Valley. We recommend investigating the feasibility and utility of annual surveys to investigate browse availability and use of winter browse.

II. Project Review and RY15–RY19 Plan

Review of Management Direction

MANAGEMENT DIRECTION

There are no broad changes in management direction.

OBJECTIVES

There are no recommended changes to objectives.

CODIFIED OBJECTIVES

Amount Reasonably Necessary for Subsistence (ANS)

BOG determined that 100% of allowable harvest is necessary for subsistence in Unit 1D.

MANAGEMENT OBJECTIVES

Population management objectives identified by department staff for Unit 1D are as follows:

- 1. Maintain a posthunt population of at least 200 moose.
- 2. Maintain a posthunt bull-to-cow ratio of 25:100.
- 3. Sustain a harvest of 20–25 moose annually.

REVIEW OF MANAGEMENT ACTIVITIES

1. Population Status and Trend

ACTIVITY 1.1. Aerial surveys to obtain minimum counts and age-sex composition of the herd.

Data Needs

No changes. We currently conduct annual minimum count surveys when snow cover allows.

Methods

No change from previous report period.

ACTIVITY 1.2. <u>Radiocollar cow moose to improve population estimates and learn about cow and calf survival</u>.

Data Needs

Better ways of estimating the true size and make-up of the population may allow additional hunting opportunity. We recommend collaring a sample of adult cow moose to facilitate mark-

resight and modelled population estimates incorporating sightability data and estimates of cow and calf survival.

Methods

We recommend collaring 20–40 adult cow moose with long-lasting VHF radio collars using standard ADF&G capture methods. Collared moose will allow improved population estimates. We will also use telemetry during ground-based or aerial surveys to estimate survival, recruitment, and cause of mortality.

2. Mortality-Harvest Monitoring

ACTIVITY 2. <u>Monitor harvest and other mortality including age and antler configuration of harvested moose</u>.

Data Needs

No changes recommended. However, a more in-depth analysis of harvest data we currently collect may suggest whether changes to the harvest strategy are needed.

Methods

In addition to methods used for the previous reporting period, an analysis of age vs. antler morphology and bull:cow ratios will allow an evaluation of the current antler restrictions.

3. Habitat Assessment-Enhancement

ACTIVITY 3. Conduct moose browse surveys.

Data Needs

Information about browse availability is limited to work done in the 1980s (Hundertmark 1983) and one survey conducted in 2007 (Neil Barten, Area Biologist, ADF&G, Douglas, May 2007 unpublished preliminary data summary). The 2007 data indicates that many willows were either too tall to browse or had evidence of overbrowsing. Further investigation is needed to determine if browse availability is limiting the size of the moose population.

Methods

Exact methods will depend on input from the ADF&G biometrician and moose specialist. Plots will be visited annually during the spring and measurements of browse activity will be obtained in order to determine availability and amount of use of browse species. The moose specialist estimates this could be accomplished in 2–4 days per year.

NONREGULATORY MANAGEMENT PROBLEMS OR NEEDS

Data Recording and Archiving

RECORDING:

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- Moose antler measurement form (Appendix B).
- Moose hunt log sheet (Appendix C).
- GPS waypoints and tracks-Garmin 76Csx handheld.

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- GIS survey data are stored on the Assistant Area Biologist computer C:\GIS_data\Haines\Survey_data and the Region 1 server S:\Region1Shared-DWC\Offices\Douglas\Carl Koch\Moose.

Agreements

There are no agreements currently affecting these activities.

Permitting

Institutional Animal Care and Use Committee approval and appropriate training will be obtained prior to any moose captures.

Acknowledgments

Pilots Lynn Bennett and Drake Olson assisted with aerial surveys. Cheryl McRoberts and the staff at the American Bald Eagle foundation in Haines, Alaska provided a venue and audiovisual aids for annual public moose meetings. Program technician Faith Lorentz assisted with staffing the hunter checkstation and data collection from hunters. Alaska Wildlife Troopers from Haines and Juneau assisted with enforcement issues and transferring illegally harvested moose to charities to be sure no salvageable meat went to waste. Laura McCarthy provided a review of this document for division and department standards and completed the publication process.

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Appendix A. Moose survey form.

vea:					<i>.</i>	Date:				Observers/F	Plot			Aircraft Typ	e:		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:					
ommen	ts:				•					•								
		Bulls			Cows							0	collared N	loose Data	1			Comments
WPT/ Group	L	м	s	CO	C1	C2	Unk Sex	# Adults Checked for Collars	Moose ID	Seen During Survey (Yes, No)	Activity (Bedded, Standing)	Light (Sun, Shade, Fiat)	% Canopy Cover (10m redua)	Spruce <10m	Habitat (Mdw, Low Shb, Tail Shb, Conf, Mxd. Fst.)	% Snow (Complete Veg Visible Ground Visible)	Photo #	
										Y N	B 8	Su Sh Fl		Y N	M LS TS C MF	c v a		
										Y N	8	Su Sh Fl		Y N	M LS TS C MF	c v c		
										Y N	B 8	Su Sh Fl		Y N	M LS TS C MF	c v a		
										Y N	в 8	Su Sh Fl		Y N	MLSTSCMF	c v g		
										Y N	B 8	Su Sh Fl		Y N	M LS TS C MF	c v a		
										Y N	B 8	Su Sh Fl		Y N	M LS TS C MF	c v c		
										Y N	B 8	Su Sh Fl		Y N	M LS TS C MF	c v a		
										Y N	B 8	Su Sh Fl		Y N	M LS TS C MF	c v g		
										Y N	B 8	Su Sh Fl		Y N	M LS TS C MF	c v a		
										Y N	B 8	Su Sh Fl		Y N	M LS TS C MF	c v g		
										Y N	B 8	Su Sh Fl		Y N	M LS TS C MF	c v c		
										Y N	B 8	Su Sh Fl		Y N	M LS TS C MF	c v g		
										Y N	B 8	Su Sh Fl		Y N	M LS TS CMF	c v g		
										Y N	B 8	Su Sh Fl		Y N	M LS TS C MF	c v g		
										Y N	B 8	Su Sh Fl		Y N	M LS TS C MF	C V G		
										Y N	B 8	Su Sh Fl		Y N	M LS TS C MF	c v c		

Appendix B. Moose antler measurement form.

TM059-2014

MOOSE ANTLER MEASUREMENTS (inches)

Permit # TM059			
Hunter's Name:		Date of Kill:	-
Kill Location:			-
Jaw: Y / N		Legal:Y / N	
Total Width:			
Antler Points (excl. brow):	R	L	
Brow Points:	R	L	
Beam circumference:	R	L	
Comments:			
Hunter Signature:		Beam Beam Beam Brow	Antler points
		Right	Left

Appendix C. Moose hunt log sheet.

TM059 2014

#	Hunter	Permit	Legal	Antler Config	Kill Date	Location	Antler Spread	L Brow	R Brow
1	Trainter		Legui	Conng	Dute	Location	Spread	DIOW	DIOW
2									
3									
4									
5									
6									
7									
8									
9									
10									
11									
12									
13									
14									
15									
16									
17									
18									
19									
20									
21									
22									
23									
24									
25									

