Moose Management Report and Plan, Game Management Units 25A, 25B, and 25D:

Report Period 1 July 2010–30 June 2015, and

Plan Period 1 July 2015–30 June 2020

Jason R. Caikoski

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Alaska Department of Fish and Game   Division of Wildlife Conservation

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PREPARED BY:

Jason R. Caikoski
Wildlife Biologist II

APPROVED BY:

Doreen I. Parker McNeill
Management Coordinator

REVIEWED BY:

Jackie J. Kephart
Assistant Management Coordinator

Laura A. McCarthy
Publications Specialist II

John W. Merickel
Biometrician II

Alyssa L. Crawford
Biometrician II

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This species management report and plan was reviewed and approved for publication by Doreen I. Parker McNeill, Region III Management Coordinator for the Division of Wildlife Conservation, Fairbanks.

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Purpose of this Report

This report provides a record of survey and inventory management activities for moose (*Alces alces*) in Units 25A, 25B, and 25D for the previous 5 regulatory years (RY; RY10–RY14) and plans for survey and inventory management activities in the 5 years following the end of that period (RY15–RY19). A regulatory year 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 and supersedes the 1976 draft Alaska wildlife management plans (ADF&G 1976).

I. RY10–RY14 Management Report

Management Area

Unit 25D consists of the upper Yukon River valley also known as the Yukon Flats. Major drainages within the unit include the main stem of the upper Yukon, Hodzana, Hadweenzik, lower Chandalar, Christian, lower Birch, and lower Porcupine river drainages. Unit 25B is situated to the east of Unit 25D and includes the upper Porcupine, Black, Kandik, and Nation river drainages. Unit 25A consists of the south slope of the Brooks Range from the Canada border, west to include all of the Chandalar river drainages. Other large drainages within Unit 25A include the Sheenjek and Coleen rivers.

Summary of Status, Trend, Management Activities, and History of Moose in Units 25A, 25B, and 25D

Unit 25D has 7 communities (Beaver, Birch Creek, Chalkyitsik, Circle, Fort Yukon, Stevens Village, and Venetie). Residents of these communities have historically and still continue to harvest moose as their primary wild food resource (Van Lanen et al. 2012). The importance of moose to these communities and other Alaska residents, despite historically low moose densities, resulted in moose being identified as an intensive management (IM) species for Unit 25D. Therefore, legal and management goals for Unit 25D and eastern Unit 25B reflect harvest needs for those subunits, and most of the Unit 25 moose funding is allocated to monitor or research moose populations in Unit 25D.

During the early to mid-1990s a cooperative effort between ADF&G, U.S. Fish and Wildlife Service (USFWS), and local residents of Unit 25D resulted in 2 educational videos on moose management in the Yukon Flats, emphasizing the adverse effects of harvesting cow moose. During this period it also became evident that there was substantial local concern about the status of moose populations, opposition to the taking of cow moose, and support for increased enforcement, biological studies, predator control, and local involvement in moose management.

As a result, ADF&G initiated a cooperative effort in 2001 to develop a moose management plan for the Yukon Flats. By 2002 the *Yukon Flats Cooperative Moose Management Plan* (YFCMMP) was completed and endorsed by the Board of Game (board) (Yukon Flats Moose Management Planning Committee 2002). The plan was developed under the sponsorship of ADF&G-Division of Wildlife Conservation, in cooperation with the Yukon Flats Fish and Game Advisory Committee through the Yukon Flats Moose Management Planning Committee, an advisory group created specifically for the planning project. Other involved stakeholders included the Council of Athabascan Tribal Governments (CATG), individual tribal governments, USFWS-Yukon Flats National Wildlife Refuge, USFWS-Office of Subsistence Management, and other interested users of the Yukon Flats moose resource. This effort focused on community and agency initiatives that together could maintain or increase moose abundance especially in key hunting areas near local communities. YFCMMP was designed to promote moose population growth in the Yukon Flats through the following guidelines: 1) improve moose harvest reporting to better document subsistence needs and improve management; 2) reduce predation on moose by increasing the harvest of bears and wolves (*Canis lupus*); 3) minimize illegal cow moose harvest and reduce harvest of cows for ceremonial purposes to improve recruitment; 4) inform hunters and others about the low moose population on the Yukon Flats, and avenues people can take to help in the effort to increase moose abundance; and 5) use both scientific information and traditional knowledge to help make management decisions.

In March 2006 the board requested that ADF&G develop an IM plan for moose in the Yukon Flats in response to public proposals that requested predator control for wolves and bears in Unit 25D to reduce predation on moose. In March 2008 ADF&G presented IM options to the board that explored a wide spectrum of management options to increase moose abundance in the Yukon Flats. The presentation acknowledged the difficulty of implementing broad-scale predator control on USFWS lands and focused on the feasibility of increased wolf and bear harvest on smaller private lands surrounding villages in order to increase moose survival. IM objectives also included improved reporting by local residents and reduced illegal cow harvest. Many of the recommendations made in the IM proposal mirrored those previously identified in YFCMMP.

During 2008–2011 ADF&G conducted an IM feasibility assessment to evaluate the efficacy of implementing an IM plan in western Unit 25D. The assessment used data from existing monitoring programs conducted by ADF&G and USFWS and implementation of new programs in coordination with the Beaver Tribal Council and CATG. The IM assessment focused on evaluating whether the following 4 objectives were achievable and sustainable: 1) increase black (*Ursus americanus*) and brown bear (*U. arctos*) harvest; 2) increase wolf harvest; 3) obtain accurate harvest reporting for moose, black bears, grizzly bears, and wolves; and 4) eliminate illegal and potlatch harvest of cow moose. The results of the feasibility assessment concluded that public-based efforts to reduce black bear, brown bear, and wolf abundance to levels sufficient to improve moose survival was not currently possible. In addition, department-based predator control was not permitted on federal land which accounts for most of western Unit 25D. As a result, current management direction focuses on monitoring moose population status and improving harvest reporting rates to provide for maximum sustained harvest. Caikoski (2012) provides a more comprehensive description of the results of the feasibility assessment.

Management Direction

EXISTING WILDLIFE MANAGEMENT PLANS

- The plan section of this document outlines the current plan for moose in Units 25A, 25B, and 25D, superseding the 1976 draft Alaska wildlife management plans (ADF&G 1976).

GOALS

Unit 25 Overall

- Protect, maintain, and enhance the moose population and its habitat in concert with other components of the ecosystem while providing for maximum sustained harvest.

Unit 25A

- Provide an opportunity to hunt under aesthetically pleasing conditions and provide for subsistence use.

Units 25B and 25D

- Provide for subsistence use and for the greatest opportunity to harvest moose.
- Protect, maintain, and enhance the Yukon Flats moose population and habitat, maintain traditional lifestyles, and provide opportunities for use of the moose resource.
- Increase the harvestable surplus of bull moose in key hunting areas near local communities by reducing mortality from bear and wolf predation.
- Improve moose harvest reporting.
- Minimize cow moose harvest, recognizing that some cows will probably be taken for ceremonial purposes when bull moose are seasonally in poor condition.
- Work with local communities to implement harvest strategies to increase bear and wolf harvest.

CODIFIED OBJECTIVES (5 AAC 99.025 AND 5 AAC. 92.108)

Amounts Reasonably Necessary for Subsistence Uses

- C1. Unit 25D East: 150–250 moose.
- C2. Unit 25D West: 50–70 moose.

Intensive Management

- C3. Population objective: 10,000–15,000 moose.
- C4. Harvest objective: 600–1,500 moose.

MANAGEMENT OBJECTIVES

Unit 25 Overall

- M1. Maintain a minimum of 40 bulls:100 cows as observed in fall composition surveys.

Unit 25D

- M2. Increase the size of the moose population by 2–5% annually in key hunting areas near local communities in Unit 25D.

- M3. With assistance from ADF&G-Division of Subsistence, implement a systematic household harvest survey in Unit 25D to obtain 90% reporting.

- M4. Reduce illegal and potlatch harvest of cow moose to less than 5% of total annual harvest.

MANAGEMENT ACTIVITIES

Unit 25 Overall

- Monitor moose population status through annual surveys.

Unit 25D

- Continue efforts to communicate with and educate local residents about moose management and the effects of cow moose harvest.
- Work with natural resource offices in local communities to obtain and exchange information on moose populations and management issues.
- Develop cooperative management programs involving state, federal, and tribal management organizations to help improve local harvest monitoring and reporting.

1. Population Status and Trend

ACTIVITY 1.1. Geospatial population estimation survey Unit 25D (objectives C1–C4 and M1–M2).

Data Needs

Moose abundance, and age and sex composition are important to monitor population status and trend and to estimate harvestable surplus. The geospatial population estimation (GSPE) method provides estimates of abundance, age, and sex composition with associated precision. These estimates are needed periodically to evaluate whether IM population and harvest objectives are being met, if harvestable surplus is adequate for amounts reasonably necessary for subsistence (ANS) objectives, and to estimate harvestable surplus to provide for maximum hunter opportunity through general seasons and bag limits.

<u>Survey Area</u>

The Unit 25D East survey area (2,936 mi^2) includes low elevation and some upland habitat adjacent to the Yukon, Porcupine, and Black rivers in an area extending from near the mouth of the Chandalar River east to the vicinity of Chalkyitsik, and from Shuman House on the Porcupine River south to the Sucker River drainage and Mardow Lake area southeast of Fort Yukon. The survey area includes 553 GSPE sample units, each defined by 2 minutes of latitude and 5 minutes of longitude, or approximately 5.3 mi^2 (DeLong 2006; Kellie and DeLong 2006). Sample units were classified as either high-density strata (>1 moose) or low-density strata (≤1 moose) and were originally based on a stratification survey conducted in October 1999 (R. O. Stephenson, Wildlife Biologist, ADF&G, Fairbanks, and T. Waggoner, Council of Athabascan Tribal Governments, 1999 unpublished eastern Yukon Flats moose population survey report, Fairbanks). Since 1999 classification of strata has been occasionally modified to reflect count data from surveys.

GSPE Survey Methods

A GSPE survey was not conducted during RY10–RY14. A GSPE survey was conducted in RY15, and survey methods are reported below.

In 2015 we used 3 contract pilots and surveyed 102 GSPE sample units (Kellie and DeLong 2006) from the Unit 25D East survey area during 9–13 November. We randomly selected 90 sample units (60 high-density strata units and 30 low-density strata units) using Microsoft® Excel for Windows® software. An additional 12 sample units (7 high-density strata units and 5 low-density strata units) were selected non-randomly to fill "holes" created by the random selection (Kellie and DeLong 2006). The entire survey area consisted of 264 high-density strata units and 289 low-density strata units. Search intensity averaged 5.7 min/mi^2. Survey conditions (Gasaway et al. 1986) with regard to snow (age and percent cover) and light (intensity and type) during the survey were either classified as excellent or good by survey observers.

Sightability Correction Factor Estimation Methods

In 2015 we followed recommendations and guidelines by Seaton (2014) to conduct sightability trials on pilot–observer pairs who surveyed the Unit 25D East survey. We used 30 radiocollared moose in the Unit 25D West survey area to conduct trials on pilot–observer pairs who surveyed the adjacent Unit 25D East survey area. Pre-survey telemetry flights resulted in most radiocollared moose (26 of 30) in strata classified as high-density. Therefore, we did not design the sightability trials to estimate strata specific sightability because obtaining adequate sample sizes for the low-density strata would not be feasible. Our objective was to obtain at least 10 trials per pilot–observer pair for a total of 30 trials. Sample size for sightability correction factor (SCF) trials were based on recommendations by Seaton (2014) and funding limitations.

Results and Discussion

The observable moose population estimate for the Unit 25D East survey area was 997 moose (±18% @ 90% confidence interval [CI]), and the estimated SCF was 1.09 (±8% @ 90% CI; Table 1). The adjusted moose population estimate incorporating the estimated SCF was 1,082 moose (±20% @ 90% CI) representing a density of 0.34 moose/mi^2. The estimated bull:cow

ratio and calf:cow ratio was 35 bulls:100 cows (±36% @ 90% CI) and 80 calves:100 cows (±19% @ 90% CI), respectively (Table 2).

The 2015 population estimate was higher compared to the previous survey in 2007 but within the range of values since 2004 (Table 1). Most of the increase in the number of moose in 2015 compared to previous surveys was the result of more calves (Table 1). The high calf:cow ratio observed in the 2015 survey was consistent with a high calf:cow ratio observed in radiocollared moose in the western portion of Unit 25D (Hinkes et al. 2015).

Estimates of SCF values vary between survey areas and between years within a survey area based on differing habitat types, search intensity, survey conditions, and pilot–observer experience (Boertje et al. 2009; Keech 2012; Seaton 2014). Although not ideal, we used SCF trials conducted in the Unit 25D West survey area as a proxy for the Unit 25D East survey area. True sightability between the 2 survey areas in 2015 was likely very similar because habitat, moose density, and snow cover was nearly identical. In addition, we used the same pilot– observer pairs for SCF trials in Unit 25D West as those used to survey Unit 25D East.

Recommendations for Activity 1.1

Modify frequency of GSPE survey.

ACTIVITY 1.2. Extrapolation of Unit 25D GSPE survey estimates to the entire subunit (objectives C1–C4).

Data Needs

Unit 25D has an IM population objective of 10,000–15,000 moose. In addition, the subunit has a positive finding for customary and traditional use of moose and an ANS of 50–70 moose in Unit 25D East and 150–250 moose in Unit 25D West. However, we did not conduct a unitwide survey to estimate population size to evaluate whether IM population objectives were met, or if moose population size was sufficient to meet ANS objectives. To evaluate the Unit 25D moose population relative to IM and ANS objectives, density estimates from GSPE surveys conducted in portions of Unit 25D were extrapolated to the subunit scale.

Methods

The estimated moose population size for all of Unit 25D was obtained by extrapolating the estimated density range from the Unit 25D East survey area across the remainder of Unit 25D East (10,750 mi^2) and by extrapolating the estimated density range from the Unit 25D West survey area (Lake 2015) across the remainder of Unit 25D West (6,750 mi^2). The interval used for the range in density estimates is the 90% CI as calculated from GSPE surveys, including SCF and its associated precision at the 90% level. The extrapolated densities for Units 25D East and 25D West were then converted to total moose for each respective area and summed to obtain the total moose population size range for Unit 25D.

Results and Discussion

Based on the most current estimated moose density range (0.29–0.44 moose/mi^2) from the 2015 fall survey (includes an estimate of SCF) conducted in a portion of Unit 25D East, the extrapolated moose population in all of Unit 25D East (10,750 mi^2) is 3,118–4,730 moose. Based

on the estimated moose density range (0.32–0.52 moose/mi^2) from the 2015 fall survey conducted in a portion of Unit 25D West (includes an estimate of SCF), the extrapolated moose population in all of Unit 25D West (6,750 mi^2) is 2,565–4,455 moose. Combining extrapolated estimates for Units 25D East and 25D West, the total moose population for Unit 25D (17,500 mi^2) is 5,683–9,185 moose (0.32–0.52 moose/mi^2).

Recommendations for Activity 1.2

Continue with no change.

ACTIVITY 1.3. Moose composition count surveys in Unit 25A (objective M1).

Data Needs

Occasional composition surveys to monitor age and sex components, particularly the bull:cow ratio, are needed to evaluate whether harvest levels are sustainable and to address public concerns regarding overharvest.

Methods

During 30 October–1 November 2012 we conducted a low-intensity survey of the upper Coleen River drainage using a contracted Cessna 182 Skylane and department observer. We searched all moose habitat (primarily willow) which extended from the river bottom to approximately 4,000 feet in elevation. The survey was flown at 300–700 feet above ground level and at a ground speed of 110–120 mph. Snow cover was complete and less than 1-week old, light type varied from bright to flat, and light intensity varied from high to medium. We classified all moose observed as cow, calf, or bull. Bulls were further classified by antler width as yearling (spike, fork or palmated antlers less than 31″), 31″–40″, 41″–50″ and >50″. GPS locations were taken for each moose group observed (a moose group includes observations of single moose). Total search time was 6 hours 5 minutes. All data were recorded on a standard moose survey form.

Results and Discussion

We observed 79 moose in 29 groups composed of 32 cows, 12 calves, and 35 bulls (Table 3). The observed calf:cow ratio was 38 calves:100 cows, and the observed bull:cow ratio was 109 bulls:100 cows. Eighty-six percent of moose groups (*n* = 29) observed contained 1–4 moose, and the remaining groups contained 6–9 moose. Moose were observed throughout the survey area at elevations ranging from 2,000–3,500 feet.

Recommendations for Activity 1.3

Modify by scheduling a desired survey interval and additional survey areas.

2. Mortality–Harvest Monitoring and Regulations

ACTIVITY 2.1. Monitoring and analyzing harvest data (objectives C1–C4, and M1).

Data Needs

Monitoring and analyzing harvest data are essential to evaluate harvest objectives and to determine if harvest levels are sustainable.

Methods

Unit 25A and 25B

We estimate annual harvest from general season harvest report cards that hunters are required to submit. Harvest data are summarized from ADF&G's Wildlife Information Network (WinfoNet) moose database by regulatory year, hunter residency, and hunter success rate.

Unit 25D

Although hunters are required to obtain and report using harvest report cards, participation by local residents of Unit 25D is poor. Therefore, annual local harvest is estimated from ADF&G-Division of Subsistence household surveys (Van Lanen et al. 2012) and by reports from CATG. These reports and surveys provide estimates of the number of moose taken and do not include success rate, harvest chronology, or antler width measurements and antler configurations. In years when harvest data are not estimated or collected, harvest is assumed to be similar to the range reported in prior years. We estimate annual harvest from nonlocal and nonresident hunters from general season harvest report cards that hunters are required to submit.

Table 1. Unit 25D East moose population estimates from fall geospatial population estimates, Northeast Alaska, 2004–2015.

Survey year	Number of cows @ 90% CI[a]	Number of bulls @ 90% CI	Number of calves @ 90% CI	Population estimate @ 90% CI	SCF[b] estimate @ 90% CI	Population estimate with SCF @ 90% CI	Average density (moose/mi^2)
2004	394 ± 20%	171 ± 27%	203 ± 26%	773 ± 17%	n/a	n/a	0.26
2005	419 ± 23%	337 ± 26%	243 ± 27%	1,008 ± 20%	n/a	n/a	0.34
2006	405 ± 20%	244 ± 27%	151 ± 30%	799 ± 17%	n/a	n/a	0.27
2007	286 ± 25%	189 ± 36%	111 ± 33%	585 ± 23%	n/a	n/a	0.20
2015	457 ± 20%	161 ± 34%	369 ± 25%	997 ± 18%	1.09 ± 8%	1,082 ± 20%	0.34

[a] CI = confidence interval.
[b] SCF = sightability correction factor.

Table 2. Unit 25D East moose population composition estimates from fall geospatial population estimates, Northeast Alaska, 2004–2015.

Survey year	Bulls:100 cows @90% CI[a]	Yearling bulls:100 cows @90% CI	Calves:100 cows @90% CI
2004	43 ± 30%	10 ± 35%	51 ± 32%
2005	80 ± 29%	22 ± 36%	58 ± 35%
2006	60 ± 30%	12 ± 46%	37 ± 30%
2007	64 ± 39%	15 ± 50%	39 ± 31%
2015	35 ± 36%	7 ± 64%	80 ± 19%

[a] CI = confidence interval.

Table 3. Unit 25A Coleen River drainage fall moose survey trend count results, Northeast Alaska, 2012.

Survey year	Number of cows	Number of bulls	Number of calves	Bulls:100 cows	Yearling bulls:100 cows	Calves:100 cows	Total moose observed
2012	32	35	12	109	6	38	79

Results and Discussion

Unit 25A

Average annual reported moose harvest in Unit 25A during RY10–RY14 was 43 moose (range = 42–45, Table 4). The total number of hunters averaged 111 (range = 95–130) per year, and annual success rate averaged 39% (range = 32%–46%, Table 5). Annual harvest, the number of hunters, and success rates have remained relatively stable over the past 10 years (Caikoski 2014).

Unit 25B

Average annual reported moose harvest in Unit 25B during RY10–RY14 was 29 moose (range = 26–32, Table 4). The total number of hunters averaged 82 (range = 76–96) per year, and annual success rate averaged 35% (range = 31%–42%, Table 6). Annual harvest, number of hunters, and success rates have remained relatively stable over the past 10 years (Caikoski 2014).

Unit 25D

Average annual reported moose harvest under the general season in Unit 25D (25D East) during RY10–RY14 was 24 moose (range = 18–28, Table 4). The total number of hunters averaged 97 (range = 93–104), and success rates averaged 30% (range = 21%–35%, Table 7).

An average of 53 (range = 32–75) TM940 permits (Unit 25D West) were issued per year during RY10–RY14 (Table 8). Average annual reported harvest was 5 moose (range = 2–11), and success rate averaged 22% (range = 9%–37%, Table 8). A total of 75 permits were available in each year, and this hunt went undersubscribed in all years except RY11 (Table 8).

Reporting rates by residents of Unit 25D have historically been low when using general season harvest tickets or Tier II permits. ADF&G-Division of Subsistence conducted comprehensive household surveys of Unit 25D communities in 2008 and 2009. Results of those surveys estimate local hunters harvested 104 moose in 2008 and 123 moose in 2009 (Van Lanen et al. 2012). The 2008 and 2009 ADF&G estimates fall within the range reported by CATG for 1993–2007 when 94–228 moose were reported harvested annually (CATG 2007). Although the household surveys conducted by ADF&G-Division of Subsistence and CATG were in communities located in Unit 25D, some moose were reported to have been taken in adjacent Units 25A and 25B. ADF&G-Division of Subsistence household surveys were not conducted during RY10–RY14; however, we assume harvest levels by residents of Unit 25D during RY10–RY14 were similar to those estimated by ADF&G in 2008 and 2009.

Alaska Board of Game Actions and Emergency Orders

There were no Board of Game actions or emergency orders during the report period.

Recommendations for Activity 2.1

Continue with no change.

Table 4. Reported[a] moose harvest by game management unit (GMU), Northeast Alaska, regulatory years[b] 2010–2014.

Regulatory year	Reported harvest by GMU		
	25A	25B	25D
2010	43	26	25
2011	43	32	24
2012	45	25	25
2013	42	30	18
2014	42	30	28
Mean[c]	43	29	24

[a] Source: ADF&G's Wildlife Information Network (WinfoNet) moose database.
[b] Regulatory year begins 1 July and ends 30 June (e.g., regulatory year 2010 = 1 July 2010–30 June 2011).
[c] Mean values are rounded to the nearest whole number.

Table 5. Unit 25A moose hunter residency and success, Northeast Alaska, regulatory years[a] 2010–2014.

Regulatory year	Successful					Unsuccessful					Total hunters
	Resident	Nonresident	Unk	Total	(%)	Resident	Nonresident	Unk	Total	(%)	
2010	24	19	0	43	(39)	36	28	2	66	(61)	109
2011	18	25	0	43	(45)	30	22	0	52	(55)	95
2012	26	19	0	45	(41)	36	28	2	66	(59)	111
2013	21	21	0	42	(39)	32	34	1	67	(61)	109
2014	19	23	0	42	(32)	45	43	0	88	(68)	130
Mean[b]	22	21	0	43	(39)	36	31	1	68	(61)	111

[a] Regulatory year begins 1 July and ends 30 June (e.g., regulatory year 2010 = 1 July 2010–30 June 2011).
[b] Mean values are rounded to the nearest whole number.

Table 6. Unit 25B moose hunter residency and success, Northeast Alaska, regulatory years[a] 2010–2014.

Regulatory year	Successful					Unsuccessful					Total hunters
	Resident	Nonresident	Unk	Total	(%)	Resident	Nonresident	Unk	Total	(%)	
2010	23	3	0	26	(34)	45	5	0	50	(66)	76
2011	27	5	0	32	(42)	39	4	2	45	(58)	77
2012	23	2	0	25	(33)	43	7	1	51	(67)	76
2013	27	1	2	30	(35)	46	9	0	55	(65)	85
2014	27	3	0	30	(31)	59	7	0	66	(69)	96
Mean[b]	25	3	0	29	(35)	46	6	1	53	(65)	82

[a] Regulatory year begins 1 July and ends 30 June (e.g., regulatory year 2010 = 1 July 2010–30 June 2011).
[b] Mean values are rounded to the nearest whole number.

Table 7. Unit 25D moose hunter residency and success, Northeast Alaska, regulatory years[a] 2010–2014.

Regulatory year	Successful					Unsuccessful					Total hunters
	Resident	Nonresident	Unk	Total	(%)	Resident	Nonresident	Unk	Total	(%)	
2010	36	0	0	36	(35)	61	4	3	68	(65)	104
2011	25	1	2	28	(30)	62	2	1	65	(70)	93
2012	29	0	1	30	(30)	62	7	1	70	(70)	100
2013	17	1	2	20	(21)	68	4	3	75	(79)	95
2014	31	0	0	31	(33)	58	6	0	64	(67)	95
Mean[b]	28	0	1	29	(30)	62	5	2	68	(70)	97

[a] Regulatory year begins 1 July and ends 30 June (e.g., regulatory year 2010 = 1 July 2010–30 June 2011).
[b] Mean values are rounded to the nearest whole number.

Table 8. Permit hunt TM940 harvest data[a], Northeast Alaska, regulatory years[b] 2010–2014.

Regulatory year	Permits issued	Successful hunters (%)		Unsuccessful hunters (%)		Did not hunt (%)		Did not report (%)		Total harvest
2010	73	11	(37)	19	(63)	32	(44)	11	(15)	11
2011	75	7	(25)	21	(75)	37	(49)	10	(13)	7
2012	32	4	(25)	12	(75)	15	(47)	1	(3)	4
2013	46	2	(9)	21	(91)	20	(43)	3	(7)	2
2014	40	3	(14)	18	(86)	18	(45)	1	(3)	3
Mean[c]	53	5	(22)	18	(78)	24	(46)	5	(8)	5

[a] Source: ADF&G's Wildlife Information Network (WinfoNet) database.

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

[c] Mean values are rounded to the nearest whole number.

3. Habitat Assessment–Enhancement

None.

NONREGULATORY MANAGEMENT PROBLEMS OR NEEDS

None.

Data Recording and Archiving

Harvest data will be stored on an internal database housed on a server (http://winfonet.alaska.gov/index.cfm). Electronic copies of data, reports, and memorandums will be stored in the WinfoNet – Data Archive. Moose Management Program Units 25ABD. Project ID: GMU 25ABD Moose. Primary Region: Region III.

Agreements

None.

Permitting

None.

Conclusions and Management Recommendations

CODIFIED OBJECTIVES

Amounts Reasonably Necessary for Subsistence Uses

C1. Unit 25D East: 150–250 moose. The ANS objective was met because a 5% harvest rate from the 2015 extrapolated population estimate is 284–459 bull moose.

C2. <u>Unit 25D West: 50–70 moose</u>. The ANS objective was met because a 5% harvest rate from the 2015 extrapolated population estimate is 156–237 bull moose.

<u>Intensive Management</u>

C3. <u>Population objective: 10,000–15,000 moose</u>. The IM population objective was not met because the upper end of the 2015 extrapolated population estimate (5,683–9,185 moose) was below the lower end of the IM population objective.

C4. <u>Harvest objective: 600–1,500 moose</u>. The intensive management harvest objective was not met because a 5% harvest rate from the 2015 extrapolated population estimate results in a harvestable surplus of 284–459 moose.

MANAGEMENT OBJECTIVES

<u>Unit 25 Overall</u>

M1. <u>Maintain a minimum of 40 bulls:100 cows as observed in fall composition surveys</u>. This objective was met for the composition survey in Unit 25A in 2012 when 109 bulls:100 cows were observed. This objective was not met in Unit 25D East for the 2015 GSPE survey based on the point estimate of 35 bulls:100 cows. However, the upper end of the 90% CI (22–48 bulls:100 cows) exceeds 40 bulls:100 cows.

<u>Unit 25D</u>

M2. <u>Increase the size of the moose population by 2–5% annually in key hunting areas near local communities in Unit 25D</u>. This objective was met based on the moose abundance estimate in 2015 (997 ± 18%) compared to the previous survey in 2007 where abundance was estimated at 585 ± 23%.

M3. <u>With assistance from ADF&G–Division of Subsistence, implement a systematic household harvest survey in Unit 25D to obtain 90% reporting</u>. This objective was not met because household surveys were not conducted.

M4. <u>Reduce illegal and potlatch harvest of cow moose to less than 5% of total annual harvest</u>. It is unknown if this objective was met because there is no method to measure this accurately.

II. Project Review and RY15–RY19 Plan

Review of Management Direction

MANAGEMENT DIRECTION

There are no changes in management direction for Units 25A, 25B, or 25D. Based on the results of the IM feasibility assessment, which was completed in 2011, management direction will focus on monitoring moose population status and improving harvest reporting rates to provide for maximum sustained harvest.

GOALS

Unit 25 Overall

- Protect, maintain, and enhance the moose population and its habitat in concert with other components of the ecosystem while providing for maximum sustained harvest.

Unit 25A

- Provide the greatest sustained opportunity to participate in hunting moose.

Units 25B and 25D

- Provide the greatest sustained opportunity to participate in hunting moose.

REVIEW OF GOALS

The management goals for RY15–RY19 were revised from the RY10–RY14 report period. For Unit 25A we removed the goal that provided for aesthetically pleasing hunt conditions because this is a human value and should be addressed by the public and Board of Game.

For Units 25B and 25D we removed the portion of the goal pertaining to providing for subsistence use because this is required by law, is addressed in the codified objectives portion of the plan and is provided for in the remaining portion of the goal. We removed the goal of working with local communities to implement harvest strategies to increase bear and wolf harvest because feasibility assessments have demonstrated that increased public harvest of wolves and bears is unlikely to result in moose population growth. We also removed the goals to improve moose harvest reporting and to minimize cow moose harvest because we do not have a specific management objective or activity associated with these goals. Most harvest in the Black River, Little Black River and Salmon Fork drainages of Unit 25B and in Unit 25D is by local residents of Beaver, Birch Creek, Chalkyitsik, Circle, Fort Yukon, Stevens Village, and Venetie. Harvest reporting from these communities is very low, and efforts in the past to improve reporting have not resulted in better reporting. ADF&G-Division of Subsistence household surveys are not conducted in this portion of the state. Public outreach and education concerning minimizing cow moose harvest was conducted during the previous 10 years. Some local residents of the area believe there has been a reduction in cow moose harvest. We are unable to measure the effects of the outreach and education because of low reporting and the inability to detect a change in the cow moose portion of the population estimate using the techniques currently available.

CODIFIED OBJECTIVES (5 AAC 99.025 AND 5 AAC. 92.108)

Amounts Reasonably Necessary for Subsistence Uses

    C1: Unit 25D East: 150–250 moose.
    C2: Unit 25D West: 50–70 moose.

Intensive Management

    C3: Population objective Unit 25D: 10,000–15,000 moose.

    C4: Harvest objective Unit 25D: 600–1,500 moose.

MANAGEMENT OBJECTIVES

Unit 25A

    M1: Maintain a minimum of 40 bulls:100 cows in the posthunt population.

    M2: Maintain a 5-year running mean of ≥35 bulls harvested annually.

    M3: Maintain a 5-year running mean of ≥30% success rate.

Unit 25B

    M4: Maintain a minimum of 40 bulls:100 cows in the posthunt population.

    M5: Maintain a 5-year running mean of ≥25 bulls harvested annually.

    M6: Maintain a 5-year running mean of ≥30% success rate.

Unit 25D

    M7: Maintain a minimum of 40 bulls:100 cows in the posthunt population.

REVIEW OF MANAGEMENT OBJECTIVES

The management objectives for RY15–RY19 were revised from the RY10–RY14 report period. We added 2 harvest monitoring objectives each for Unit 25A and Unit 25B. These new objectives reflect long-term harvest levels and success rates that have demonstrated sustainability for their respective units. These objectives also recognize that Unit 25A and Unit 25B are rarely surveyed and are appropriately monitored through reported harvest. If harvest objectives are not met for these units based on the criteria outlined below, we will evaluate whether additional surveys or regulatory changes are needed. All units have an objective to maintain at least 40 bulls:100 cows. The desired high bull:cow ratio allows for a higher harvest rate (5%) and partially mitigates for low moose densities. For Unit 25D we removed the objective to increase the moose population by 2–5% annually because this objective is not measurable based on the precision level associated with population surveys and survey frequency. We removed the objective to conduct ADF&G–Division of Subsistence household surveys because there is no longer funding to conduct these. We removed the objective to reduce illegal and potlatch harvest of cow moose because there is no method to measure this objective.

Below are the criteria we will use to determine whether codified and management objectives were met during RY15–RY19.

C1: Considered to be met if 5% (harvest rate) of the midpoint from the most recent extrapolated fall population estimate in Unit 25D East is greater than or equal to the lower end of the ANS value (150 moose).

C2: Considered to be met if 5% (harvest rate) of the midpoint from the most recent extrapolated fall population estimate in Unit 25D West is great than or equal to the lower end of the ANS value (50 moose).

C3: Considered to be met if the midpoint from the most recent extrapolated fall population estimate in Unit 25D is greater than or equal to the lower end of the IM population objective (10,000 moose).

C4: Considered to be met if 5% (harvest rate) of the midpoint from the most recent extrapolated fall population estimate in Unit 25D is greater than or equal to the lower end of the IM harvest objective (600 moose).

M1: Considered to be met if the bull:cow ratio from composition surveys is ≥40 bulls:100 cows.

M2: Considered to be met if the 5-year mean of harvested bull moose during RY15–RY19 is ≥35 bulls.

M3: Considered to be met if the 5-year mean success rate during RY15–RY19 is ≥30%.

M4: Considered to be met if the point estimate of the bull:cow ratio from the most recent GSPE survey is ≥40 bulls:100 cows.

M5: Considered to be met if the 5-year mean of harvested bull moose during RY15–RY19 is ≥25 bulls.

M6: Considered to be met if the 5-year mean success rate during RY15–RY19 is ≥30%.

M7: Considered to be met if the point estimate of the bull:cow ratio from the most recent GSPE survey is ≥40 bulls:100 cows.

REVIEW OF MANAGEMENT ACTIVITIES

1. Population Status and Trend

ACTIVITY 1.1. Geospatial population estimation (GSPE) survey in in Unit 25D (objectives C1, C2, C3, C4, M1, M7).

Data Needs

Periodically scheduled estimates of abundance with associated precision will be used to monitor population size and bull:cow ratios to evaluate codified and management objectives and to

provide moose population size and ratios to advisory committees, the Board of Game, and the public.

Methods

- Conduct a GSPE survey (DeLong 2006; Kellie and DeLong 2006; Ver Hoef 2001, 2008) of the Fort Yukon survey area at an interval of 1 survey every 3 years. *Needs biometric and research staff review. Survey interval is partially based on providing information to the public, not in detecting statistical change in population size.*

- Sample ≥100 survey units (sample density ≥18%) consisting of approximately 70% high density strata and 30% low density strata to maintain a desired precision of ≤±25% at the 90% CI.

- Conduct SCF trials if funding is available or adjust GSPE estimate using the 2015 SCF estimate and associated precision if funding is not available. *Needs biometric and research staff review.*

ACTIVITY 1.2. Extrapolation of the Unit 25D survey estimates to the entire subunit (objectives C1, C2, C3, C4).

Data Needs

Extrapolation of GSPE survey estimates conducted in portions of Unit 25D to the entire subunit is necessary to evaluate IM and ANS codified objectives.

Methods

The estimated moose population size for all of Unit 25D will be derived by extrapolating the estimated density range from the most recent Unit 25D East fall survey area across the remainder of Unit 25D East (10,750 mi^2) and by extrapolating the estimated density range from the most recent Unit 25D West fall survey area across the remainder of Unit 25D West (6,750 mi^2). The interval used for the range in density estimates is the 90% CI as calculated from GSPE surveys including SCF (if available) and its associated precision at the 90% level. If a survey-specific SCF is not available, the 2015 SCF will be used. The extrapolated densities for Unit 25D East and Unit 25D West will be converted to total moose for each respective area and summed to obtain the total moose population size for Unit 25D.

ACTIVITY 1.3. Composition surveys in Unit 25A (objective M1).

Data Needs

Low moose density (<0.2 moose/mi^2), noncontinuous moose habitat (mountains and open tundra), and remoteness of Unit 25A makes conducting GSPE population estimates impractical. However, monitoring bull:cow ratios are necessary to ensure harvest levels are sustainable and to address any concerns by advisory committees or the public.

Methods

- Conduct a fall composition survey to estimate bull:cow ratios in Unit 25A at an interval of 1 survey every 3 years. The survey will occur in years when the Unit 25D GSPE does not occur.

- Composition surveys will occur in 2 locations: 1) upper Coleen River; and 2) North Fork, South Fork, and Middle Fork Chandalar River.

- Surveys will be conducted by searching moose habitat in the above-mentioned areas until 200 moose are classified. *Needs biometric and research staff review, sample size of 200 is a placeholder, and survey technique needs discussion.*

ACTIVITY 1.4. Composition surveys in Unit 25B (objective M4).

Data Needs

Low moose density (<0.2 moose/mi^2) and remoteness of Unit 25B makes conducting GSPE population estimates impractical. However, monitoring bull:cow ratios are necessary to ensure harvest levels are sustainable and to address any concerns by advisory committees or the public.

Methods

- Conduct a fall composition survey in Unit 25B at an interval of 1 survey every 3 years. The survey will occur in years when the Unit 25D GSPE survey does not occur.

- Composition survey will occur in the Black, Little Black, Nation, and Kandik river drainages.

- Surveys will be conducted by searching moose habitat in the above-mentioned habitats until 200 moose are classified. *Needs biometric and research staff review, sample size of 200 is a placeholder, and survey technique needs discussion.*

2. Mortality–Harvest Monitoring

ACTIVITY 2.1. Monitor and analyze harvest data (objectives M2, M3, M5, M6).

Data Needs

Monitoring and analyzing harvest data are essential to evaluate harvest objectives and determine if harvest levels are sustainable.

Methods

- Summarize annual reported harvest for Unit 25A and Unit 25B and use the 5-year mean of reported harvest to evaluate M2 and M5, respectively.

- Summarize the annual reported success rate for Unit 25A and Unit 25B and use the 5-year mean of reported success rates to evaluate M3 and M6, respectively.

3. Habitat Assessment–Enhancement

None.

NONREGULATORY MANAGEMENT PROBLEMS OR NEEDS

None anticipated at this time.

Data Recording and Archiving

Harvest data will be stored on an internal moose database housed on a server (https://winfonet.alaska.gov/index.cfm). Electronic copies of data, reports, and memorandums will be stored in the WinfoNet – Data Archive. Moose Management Program Units 25ABD. Project ID: GMU 25ABD Moose. Primary Region: Region III.

Agreements

None.

Permitting

None.

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