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

Report Period 1 July 2015–30 June 2020, and

Plan Period 1 July 2020–30 June 2025

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Alaska Department of Fish and Game Division of Wildlife Conservation

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Species management reports and plans provide information about species that are hunted or trapped and management actions, goals, recommendations for those species, and plans for data collection. Detailed information is prepared for each species every 5 years by the area management biologist for game management units in their areas, who also develops a plan for data collection and species management for the next 5 years. This type of report is not produced for species that are not managed for hunting or trapping or for areas where there is no current or anticipated activity. Unit reports are reviewed and approved for publication by regional management coordinators and are available to the public via the Alaska Department of Fish and Game's public website.

This species management report and plan was reviewed and approved for publication by Lincoln Parrett, Regional Supervisor for the Division of Wildlife Conservation.

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Purpose of this Report

This report provides a record of survey and inventory management activities for moose (*Alces alces*) in Game Management Units 25A, 25B, and 25D for the 5 regulatory years 2015–2019 and plans for survey and inventory management activities in the next 5 regulatory years, 2020–2024. A regulatory year (RY) begins 1 July and ends 30 June (e.g., RY15 = 1 July 2015–30 June 2016). This report is produced primarily to provide agency staff with data and analysis to help guide and record agency efforts but is also provided to the public to inform it of wildlife management activities. In 2016 the Alaska Department of Fish and Game's (ADF&G, the department) Division of Wildlife Conservation (DWC) launched this 5-year report to report more efficiently on trends and to describe potential changes in data collection activities over the next 5 years. It replaces the moose management report of survey and inventory activities that was previously produced every 2 years.

I. RY15–RY19 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, Hadweenzic, lower Chandalar, Christian, lower Birch, and lower Porcupine rivers. 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. Combined, Units 25A, 25B, and 25D are approximately 47,968 mi^2.

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 historically harvested moose and continue to rely on moose as their main source of wild food (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 mandates 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 became evident that there was substantial local concern about the status of moose populations. This included 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 black and brown bears (*Ursus americanus and U. arctos*) 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 ways they can 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 strategies 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 produced an IM feasibility assessment for western Unit 25D. The assessment used data from existing monitoring programs conducted by ADF&G and USFWS as well as new data obtained through implementation of new research 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 and brown bear 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 feasibility assessment concluded that it was not currently possible for public efforts to reduce black bear, brown bear, and wolf abundance to levels sufficient for improving moose survival. 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, 2014) provides a more comprehensive description of the results of the feasibility assessment and Caikoski (2018) provides details of monitoring activities and results for regulatory years 2010–2014.

Management Direction

EXISTING WILDLIFE MANAGEMENT PLANS

Moose Management Report and Plan, Game Management Units 25A, 25B, and 25D: Plan period 1 July 2015–30 June 2020 (Caikoski 2018).

GOALS

G1. Protect, maintain, and enhance the moose population and its habitat in concert with other components of the ecosystem while providing for maximum sustained harvest.

G2. Provide the greatest sustained opportunity to participate in hunting moose.

CODIFIED OBJECTIVES

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 bull-to-cow ratio 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 bull-to-cow ratio 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 bull-to-cow ratio of 40 bulls:100 cows in the posthunt population.

MANAGEMENT ACTIVITIES

1. Population Status and Trend

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

Data Needs

Periodically scheduled estimates of abundance with associated precision were used to monitor population size and bull-to-cow ratios were used to evaluate codified and management objectives. Moose population estimates and sex ratios were reported to advisory committees, the Board of Game, and the public.

Methods

Survey Area

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, ADF&G Wildlife Biologist, and T. Waggoner, Council of Athabascan Tribal Governments, unpublished eastern Yukon Flats moose population survey report, 1999, Fairbanks). Since 1999, classification of strata has been occasionally modified to reflect count data from surveys.

GSPE Survey Methods

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 software. An additional 12 sample units (7 high-density strata units and 5 low-density strata units) were selected non-randomly to fill gaps 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. 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.

Presurvey 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% at 90% confidence interval [CI]), and the estimated SCF was 1.09 (±8% at 90% CI; Table 1). The adjusted moose population estimate incorporating the estimated SCF was 1,082 moose (±20% at 90% CI) representing a density of 0.34 moose/mi^2. The estimated bull-to-cow ratios and calf-to-cow ratios were 35 bulls:100 cows (±36% at 90% CI) and 80 calves:100 cows (±19% at 90% CI; 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-to-cow ratio observed in the 2015 survey was consistent with a high calf-to-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 were 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

Continue as follows:

- Conduct a GSPE survey (DeLong 2006; Kellie and DeLong 2006; Ver Hoef 2001, 2008) of the 25D East survey area at an interval of 1 survey every 3 years.

- 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.

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

Survey year	Number of cows at 90% CI[a]	Number of bulls at 90% CI	Number of calves at 90% CI	Population estimate at 90% CI	SCF[b] estimate at 90% CI	Population estimate with SCF at 90% CI	Average density (moose/mi^2)
2004	394 ± 20%	171 ± 27%	203 ± 26%	773 ± 17%	–	–	0.26
2005	419 ± 23%	337 ± 26%	243 ± 27%	1,008 ± 20%	–	–	0.34
2006	405 ± 20%	244 ± 27%	151 ± 30%	799 ± 17%	–	–	0.27
2007	286 ± 25%	189 ± 36%	111 ± 33%	585 ± 23%	–	–	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 at 90% CI[a]	Yearling bulls:100 cows at 90% CI	Calves:100 cows at 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.

ACTIVITY 1.2. Extrapolation of the Unit 25D survey estimates to the entire subunit (objectives C1, C2, C3, 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 with amounts necessary for subsistence use (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 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 (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 Unit 25D East and Unit 25D West were converted to total moose for each respective area and summed to obtain a plausible range for total moose population in 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. If funding is not available to conduct survey specific sightability trials, then use the SCF results from the 2015 survey.

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 make conducting GSPE population estimates impractical. However, monitoring bull-to-cow ratios is necessary to ensure harvest levels are sustainable and to address any concerns from advisory committees or the public.

Methods

No composition surveys of Unit 25A were conducted due to inadequate funding.

Results and Discussion

No composition surveys of Unit 25A were conducted due to inadequate funding.

Recommendations for Activity 1.3

Continue as follows:

- Conduct a fall composition survey to estimate bull-to-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.

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 make conducting GSPE population estimates impractical. However, monitoring bull-to-cow ratios is necessary to ensure harvest levels are sustainable and to address any concerns from advisory committees or the public.

Methods

No composition surveys of Unit 25B were conducted due to inadequate funding.

Results and Discussion

No composition surveys of Unit 25B were conducted due to inadequate funding.

Recommendations for Activity 1.4

Continue as follows:

- 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.

2. Mortality–Harvest Monitoring

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

Data Needs

Monitoring and analyzing harvest data is essential to evaluate harvest objectives and 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 return 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.

Results and Discussion

Unit 25A

Average annual reported moose harvest in Unit 25A during RY15–RY19 was 46 moose (range 44–51; Table 3). The total number of hunters averaged 121 (range 100–138) per year, and annual success rate averaged 39% (range 34%–44%; Table 4). Annual harvest, the number of hunters, and success rates have remained relatively stable over the past 10 years (Caikoski 2018).

Table 3. Reported moose harvest by game management unit (GMU), Northeast Alaska, regulatory years 2015–2019.

Regulatory year	Reported harvest by GMU[a]		
	25A	25B	25D
2015	44	34	32
2016	45	26	32
2017	48	28	33
2018	51	28	39
2019	44	24	42
Mean[b]	46	28	36

[a] Source: ADF&G's Wildlife Information Network (WinfoNet) database.
[b] Mean values are rounded to the nearest whole number.

Table 4. Unit 25A moose hunter residency and success, Northeast Alaska, regulatory years 2015–2019.

Regulatory year	Successful					Unsuccessful					Total hunters
	Resident	Nonresident	Unknown	Total	(%)	Resident	Nonresident	Unknown	Total	(%)	
2015	24	20	0	44	(44)	27	28	1	56	(56)	100
2016	22	23	0	45	(38)	36	36	0	72	(62)	117
2017	24	24	0	48	(35)	32	58	0	90	(65)	138
2018	29	22	0	51	(43)	29	40	0	69	(58)	120
2019	15	29	0	44	(34)	26	58	0	84	(66)	128
Mean[a]	23	24	0	46	(39)	30	44	<1	74	(61)	121

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

Unit 25B

Average annual reported moose harvest in Unit 25B during RY15–RY19 was 28 moose (range 24–34; Table 3). The total number of hunters averaged 85 (range 65–100) per year, and annual success rate averaged 33% (range 32%–40%; Table 5). Annual harvest, number of hunters, and success rates have remained relatively stable over the past 10 years (Caikoski 2018).

Unit 25D

Average annual reported moose harvest under the general season in Unit 25D (25D East) during RY15–RY19 was 36 moose (range 32–42; Table 3). The total number of hunters averaged 93 (range 82–102), and success rates averaged 38% (range 33%–41%; Table 6).

A total of 75 permits were available in each year, and this hunt went undersubscribed in all years. An average of 42 (range 28–56) TM940 permits (Unit 25D West) were issued per year during RY15–RY19 (Table 7). Of those 42 permits only 16 per year were reported as hunted and of those, an average of 41% were successful (range 29–50%; Table 7). Average annual reported harvest was 6 moose per year (range 4–10; Table 7).

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 RY15–RY19; however, we assume harvest levels by residents of Unit 25D during RY15–RY19 were similar to those estimated by ADF&G in 2008 and 2009.

Recommendations for Activity 2.1

Continue as follows:

- 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

No habitat assessment or enhancement projects have been implemented due to a long history of a low density moose population, high twinning rates, and low browse removal rates which all strongly indicate moose in these units are not limited by habitat.

Table 5. Unit 25B moose hunter residency and success, Northeast Alaska, regulatory years 2015–2019.

Regulatory year	Successful					Unsuccessful					Total hunters
	Resident	Nonresident	Unknown	Total	(%)	Resident	Nonresident	Unknown	Total	(%)	
2015	33	1	0	34	(34)	51	15	0	66	(66)	100
2016	22	4	0	26	(40)	35	4	0	39	(60)	65
2017	27	1	0	28	(32)	52	7	0	59	(68)	87
2018	23	5	0	28	(32)	48	11	0	59	(68)	87
2019	20	4	0	24	(28)	53	10	0	63	(72)	87
Mean[a]	25	3	0	28	(33)	48	9	0	57	(67)	85

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

Table 6. Unit 25D moose hunter residency and success, Northeast Alaska, regulatory years 2015–2019.

Regulatory year	Successful					Unsuccessful					Total hunters
	Resident	Nonresident	Unknown	Total	(%)	Resident	Nonresident	Unknown	Total	(%)	
2015	32	0	0	32	(33)	63	2	1	66	(67)	98
2016	29	0	3	32	(39)	46	4	0	50	(61)	82
2017	25	3	5	33	(40)	43	4	2	49	(60)	82
2018	38	1	0	39	(39)	57	4	1	62	(61)	101
2019	40	2	0	42	(41)	50	10	0	60	(59)	102
Mean[a]	33	1	2	36	(38)	52	5	1	57	(62)	93

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

Table 7. Permit hunt TM940 harvest data, Northeast Alaska, regulatory years 2015–2019.

Regulatory year	Permits issued	Number hunted	Successful hunters (%)		Unsuccessful hunters (%)		Did not hunt	Did not report	Total harvest
2015	41	21	6	(29)	15	(71)	18	2	6
2016	28	10	5	(50)	5	(50)	18	0	5
2017	36	12	4	(33)	8	(67)	22	2	4
2018	56	20	10	(50)	10	(50)	34	2	10
2019	50	16	7	(44)	9	(56)	30	4	7
Mean[a]	42	16	6	(41)	9	(59)	24	2	6

Note: Data from ADF&G's Wildlife Information Network (WinfoNet) database.
[a] Mean values are rounded to the nearest whole number.

NONREGULATORY MANAGEMENT PROBLEMS OR NEEDS

Data Recording and Archiving

Electronic copies of harvest data, reports, and memorandums are stored in the WinfoNet Data Archive (http://winfonet.alaska.gov/index.cfm). 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 in RY15 was met because a 5% harvest rate from the 2015 extrapolated population estimate is 284–459 bull moose. It is unknown if the ANS objective was met in RY16–RY19 because no population estimates were obtained in those years.

C2. Unit 25D West: 50–70 moose.
     The ANS objective in RY15 was met because a 5% harvest rate from the 2015 extrapolated population estimate is 156–237 bull moose. It is unknown if the ANS objective was met in RY16–RY19 because no population estimates were obtained in those years.

Intensive Management

C3. Population objective: 10,000–15,000 moose.
     The IM population objective was not met in RY15 because the upper end of the 2015 extrapolated population estimate (5,683–9,185 moose) was less than the lower end of the IM population objective. It is unknown if the IM population objective was met in RY16–RY19 because no population estimates were obtained in those years.

C4. Harvest objective: 600–1,500 moose.
     The IM harvest objective was not met in RY15 because a 5% harvest rate from the 2015 extrapolated population estimate results in a harvestable surplus of 284–459 moose. It is unknown if the IM harvest objective was met in RY16–RY19 because no population estimates were obtained in those years.

MANAGEMENT OBJECTIVES

Unit 25A

M1. Maintain a minimum bull-to-cow ratio of 40 bulls:100 cows in the posthunt population.
It is unknown if this objective was met for Unit 25A as no composition surveys were
conducted during RY15–RY19. However, based on light harvest in this unit and a bull-to-
cow ratio of 109 bulls:100 cows observed in a portion of Unit 25A in the 2012 survey
(Caikoski, 2018), it is likely that the bull-to-cow ratio in Unit 25A was above 40 bulls:100
cows during RY15–RY19.

M2. Maintain a 5-year running mean of ≥35 bulls harvested annually.
This objective was met during RY15–RY19 because the 5-year running mean for annual
harvest was 46 bulls (range 44–51 bulls).

M3. Maintain a 5-year running mean of ≥30% success rate.
This objective was met during RY15–RY19 because the 5-year running mean for annual
success rate was 39% (range 35%-44%).

Unit 25B

M4. Maintain a minimum bull-to-cow ratio of 40 bulls:100 cows in the posthunt population.
It is unknown if this objective was met during RY15–RY19 because no composition
surveys occurred in Unit 25B during the report period.

M5. Maintain a 5-year running mean of ≥25 bulls harvested annually.
This objective was met in RY15–RY19 because the 5-year running mean for annual
harvest was 28 bulls (range 28–40 bulls).

M6. Maintain a 5-year running mean of ≥30% success rate.
This objective was met in RY15–RY19 because the 5-year running mean for annual
success rate was 33% (range 28%–40%).

Unit 25D

M7. Maintain a minimum bull-to-cow ratio of 40 bulls:100 cows in the posthunt population.
This objective was not met in Unit 25D East with 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. It is not known if the objective was met in RY16-RY19
as no surveys were conducted.

II. Project Review and RY20–RY24 Plan

Review of Management Direction

MANAGEMENT DIRECTION

There are no changes in management direction for Units 25A, 25B, or 25D. The goals and objectives during RY15–RY19 are appropriate and will remain the same for RY20–RY24. Management direction will continue to focus on monitoring moose population status, harvest, and success rates to provide the opportunity for maximum sustained harvest.

GOALS

G1. Protect, maintain, and enhance the moose population and its habitat in concert with other components of the ecosystem while providing for maximum sustained harvest.

G2. Provide the greatest sustained opportunity to participate in hunting moose.

CODIFIED OBJECTIVES

Amounts Reasonably Necessary for Subsistence Uses

C1. Unit 25D East: 150–250 moose.
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. Unit 25D West: 50–70 moose.
Considered to be met if 5% (harvest rate) of the midpoint from the most recent extrapolated fall population estimate in Unit 25D West is greater than or equal to the lower end of the ANS value (50 moose).

Intensive Management

C3. Population objective Unit 25D: 10,000–15,000 moose.
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. Harvest objective Unit 25D: 600–1,500 moose.
Considered to be met if total harvest in Unit 25D is greater than or equal to the lower end of the IM harvest objective (600 moose).

MANAGEMENT OBJECTIVES

Unit 25A

M1. Maintain a minimum bull-to-cow ratio of 40 bulls:100 cows in the posthunt population.
Considered to be met if the bull-to-cow ratio from composition surveys is ≥40 bulls:100 cows.

M2. Maintain a 5-year running mean of ≥35 bulls harvested annually.
Considered to be met if the 5-year mean of harvested bull moose during RY20–RY24 is ≥35 bulls.

M3. Maintain a 5-year running mean of ≥30% success rate.
Considered to be met if the 5-year mean success rate during RY20–RY24 is ≥30%.

Unit 25B

M4. Maintain a minimum bull-to-cow ratio of 40 bulls:100 cows in the posthunt population.
Considered to be met if the point estimate of the bull-to-cow ratio from the most recent GSPE survey is ≥40 bulls:100 cows.

M5. Maintain a 5-year running mean of ≥25 bulls harvested annually.
Considered to be met if the 5-year mean of harvested bull moose during RY20–RY24 is ≥25 bulls.

M6. Maintain a 5-year running mean of ≥30% success rate.
Considered to be met if the 5-year mean success rate during RY20–RY24 is ≥30%.

Unit 25D

M7. Maintain a minimum bull-to-cow ratio of 40 bulls:100 cows in the posthunt population.
Considered to be met if the point estimate of the bull-to-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-to-cow ratios will be used to evaluate codified and management objectives. Moose population estimates and sex ratios will be provided 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.

- 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 if funding is not available, adjust the GSPE estimate using the 2015 SCF estimate.

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 make conducting GSPE population estimates impractical. However, monitoring bull-to-cow ratios is necessary to ensure harvest levels are sustainable and to address any concerns from advisory committees or the public.

Methods

- Conduct a fall composition survey to estimate bull-to-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.

- When moose are observed, they will be recorded based on classification (i.e. cow with no calf, cow with one calf, cow with twins, yearling bull, medium bull, large bull, or unknown moose.

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 make conducting GSPE population estimates impractical. However, monitoring bull-to-cow ratios is necessary to ensure harvest levels are sustainable and to address any concerns from 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.

- When moose are observed, they will be recorded based on classification (i.e. cow with no calf, cow with one calf, cow with twins, yearling bull, medium bull, large bull, or unknown moose.

2. Mortality–Harvest Monitoring

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

Data Needs

Monitoring and analyzing harvest data is 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

Data Recording and Archiving

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

Agreements

None.

Permitting

None.

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