Species Management Report and Plan ADF&G/DWC/SMR&P–2025–42

Moose Management Report and Plan, Game Management Unit 14B:

Report Period 1 July 2015–30 June 2020, and

Plan Period 1 July 2020–30 June 2025

Tim C. Peltier

2025

Alaska Department of Fish and Game Division of Wildlife Conservation

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PREPARED BY:

Tim C. Peltier
Regional Supervisor

APPROVED BY:

Todd A. Rinaldi
Management Coordinator

PUBLISHED BY:

Sally Kieper
Technical Reports Editor

Alaska Department of Fish and Game
Division of Wildlife Conservation
PO Box 115526
Juneau, AK 99811-5526

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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 Todd A. Rinaldi, Management Coordinator for Region IV for the Division of Wildlife Conservation.

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Please contact the authors or the Division of Wildlife Conservation at (907) 465-4190 if you have questions about the content of this report.

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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 Unit 14B 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 its own 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 Division of Wildlife Conservation 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 report of survey and inventory activities that was previously produced every 2 years.

I. RY15–RY19 Management Report

Management Area

Unit 14B covers approximately 2,512 mi^2 of the Talkeetna mountains. It consists of all land east of the Susitna River to its confluence with the Talkeetna River south and west to its headwaters, north of Willow Creek and Peters Creek to the headwaters, and the hydrologic divide separating the Susitna River and the Knik Arm Drainages to the outlet creek at Lake 4408 (Fig. 1). Much of the area is above timberline or is heavily forested with birch (*Betula* spp.), aspen (*Populus* spp.), and spruce (*Picea* spp.). Several of the large river valleys contain important wintering habitat for moose.

Summary of Status, Trend, Management Activities, and History of Moose in Unit 14B

The moose population in Unit 14B has increased since the mid-1900s, due in part to predator control efforts and vegetation changes resulting from increased human settlement (LeResche et al. 1974). Masteller (1995) calculated the first population estimate and determined the 1987 population was 2,814 (80% confidence interval [CI] = 2,566–3,062). Following the deep snow winter of 1989–1990, the population decreased about 35% (Masteller 1995). The population grew to 2,336 (80% CI = 1,809–2,863) by fall 1994; however, another severe winter in 1994–1995 may have resulted in up to 15% mortality (Griese 1998). Surveys completed in 2005 showed a decline to 1,413 (80% CI = 1,198–1,628; Peltier 2006). Surveys in 2009 identified an increasing trend with an estimate of 1,662 (90% CI = 1,379–1,945; Peltier 2012), and a survey conducted in 2013 confirmed the increasing trend with an estimate of 2,703 (90% CI = 1,838–3,568; Peltier 2017).

While harvest by hunters in the unit has always been affected by access issues, season and bag limits have driven the greatest changes in harvest (McDonough 2002). From 1966 to 1970, hunters killed an average of 144 moose annually, with most of those being bulls (Griese 1998). Liberal cow seasons allowed peak harvests to reach 372, 534, and 347 moose during 1971, 1984, and 1987, respectively (Griese 1993). With the decline in the moose population during the 1990s, the annual harvest fell to 58 moose and remained that low until 2009 (Peltier 2014).

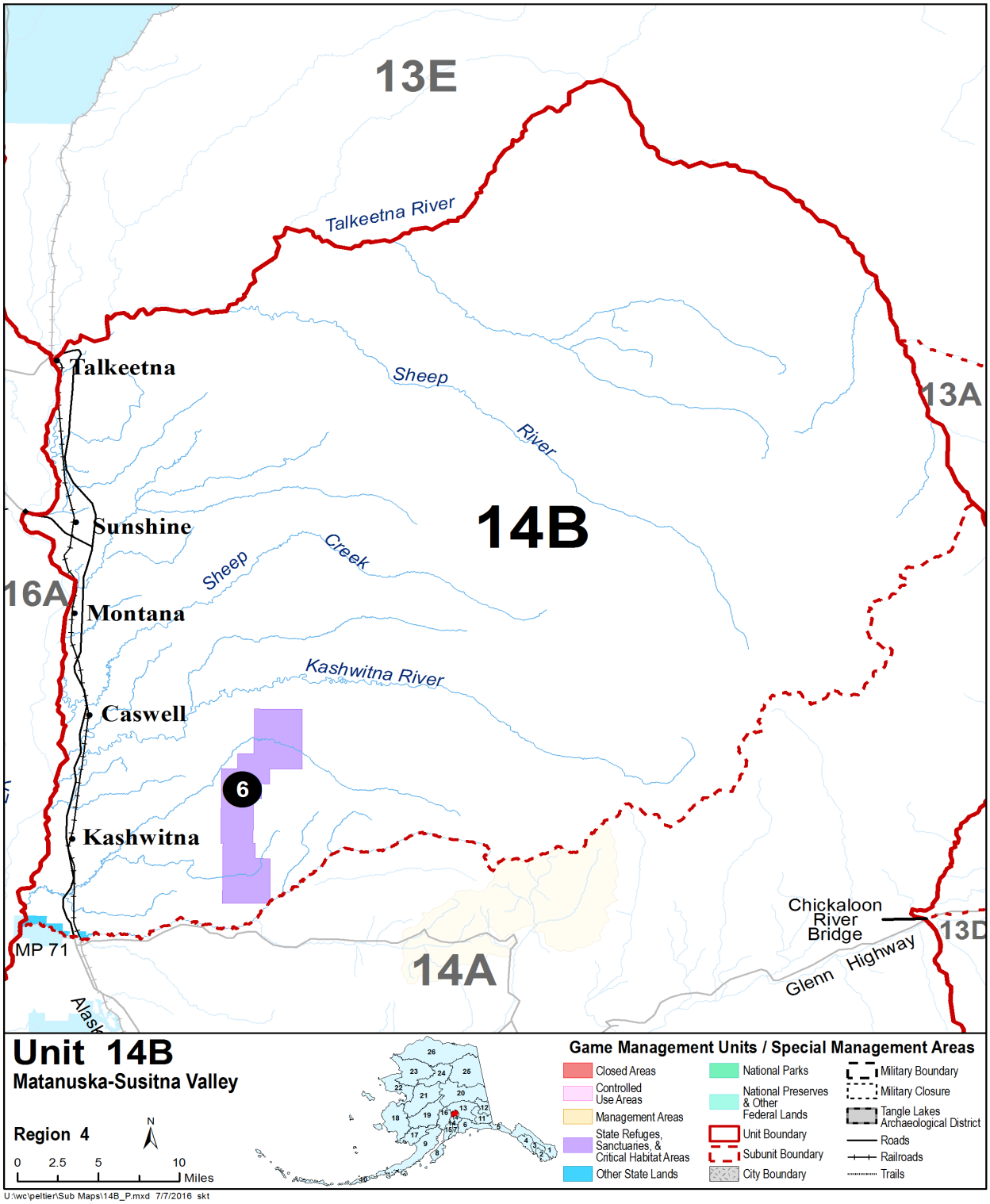

Figure 1. Map of Unit 14B in Southcentral Alaska, regulatory years 2015–2019.

Note: Area 6 is the Willow Mountain Critical Habitat Area.

The Alaska Railroad line travels between Seward and Fairbanks and was completed in 1923. The first moose mortality probably occurred soon after and has been an annual occurrence ever since. The railroad line includes 39 miles of track in Unit 14B. This section of track has few road crossings, and as a result, trains can achieve higher speeds than the more developed areas in neighboring Unit 14A. Moose use railroad tracks in winter for easier travelling, and their use becomes more pronounced in years of high snowfall; subsequently, annual moose mortality from trains can vary greatly and can become excessive in high snowfall years.

Moose vehicle collisions (MVCs) can be a significant mortality factor in the roaded areas of Alaska. Since its completion in 1971, the Parks Highway has served as the main thoroughfare for Unit 14B. The majority of development in the unit has been along this highway, and MVCs occur primarily along this road and along the Talkeetna Spur Road, the second most travelled road in the unit. Similar to moose railroad collisions, MVCs vary annually and are more common in years of high snowfall. Increased human population, development, and road expansion all combine to increase the number of MVCs occurring in the unit.

Management Direction

Existing Wildlife Management Plans

Direction in the Talkeetna Mountains and Talkeetna River Moose Management Plans (ADF&G 1976) has been reviewed and modified through public comments, staff recommendations, and Alaska Board of Game (BOG, the board) actions over the years. A record of these changes can be found in the division's management report series.

Goals

- Protect, maintain, and enhance the moose population and its habitat in concert with other components of the ecosystem to provide for high levels of human consumptive use.
- Optimize opportunity to participate in hunting moose.

Codified Objectives

Amounts Reasonably Necessary for Subsistence Uses

Unit 14B is in a nonsubsistence area and does not have a customary and traditional use determination.

Intensive Management

In 2001, the Alaska Board of Game found that moose are important for providing high levels of human consumptive use and adopted a positive finding for intensive management (IM) of moose in Unit 14B. Current IM objectives (5 AAC 92.108) are as follows:

- Population objective: 2,500–2,800 moose.
- Harvest objective: 100–200 moose.

MANAGEMENT OBJECTIVES

Population objectives for moose in Unit 14B are as follows:

1. Maintain a unitwide moose population of 2,500–2,800 moose.
2. Manage for a posthunt (fall) bull-to-cow sex ratio of 20–30:100.

MANAGEMENT ACTIVITIES

Assessing population status and trends, monitoring harvest and mortality, and assessing habitat conditions are integral components of moose management in Unit 14B. Survey and inventory management activities used to monitor populations in Unit 14B are described below.

1. Population Status and Trend

ACTIVITY 1.1. Conduct fall GSPE surveys to inventory and determine sex and age composition in the unit to determine population size, productivity, and trends.

Data Needs

Moose abundance is a basis from which sustainable harvest may be estimated and provides a density context for interpreting nutritional condition relative to habitat conditions. Sex and age composition information can be used to determine appropriate harvest levels and recruitment into the population. Sex and age ratio data may also be used to model population structure and trends.

Methods

Geospatial population estimator surveys (GSPE; Kellie and DeLong 2006) are conducted on all available moose habitat in the unit below 3,500 feet. Surveys are conducted between 1 November and 6 December on a triennial basis as weather and snow conditions permit. This approach produces population estimates and statistically bound sex and age composition estimates through a stratified random sampling design and geostatistical models of autocorrelation. It is designed for high search intensity (8–10 min/mi^2) from a PA-18 Super Cub or equivalent aircraft to obtain a relatively unbiased estimate of moose numbers, but ADF&G biologists also correct sightability for the lower search intensity that is typically achieved. Teams of pilots and observers record moose age and sex classes in the field for later analysis (Appendix A).

In Unit 14B, real-time stratification is generally used and is conducted with a 3- to 4-person crew from a Cessna 185 at approximately 1,000 feet above ground level prior to conducting the survey of the rest of the unit with Super Cubs. (Desktop stratifications are also developed using previous survey information and interpretation of available habitat maps). Stratification into high and low moose density is based on observed moose, moose tracks, and availability of favorable moose habitat. Using only 2 strata minimizes the effects of moose movements among strata on the spatial estimate and allows continuity of GSPE surveys across weather breaks during the survey. For stratification purposes, sample units that are likely to have fewer than 5 moose in the unit are considered low stratum and sample units that are likely to contain ≥5 moose are considered high-stratum units. Sightability correction factors (SCFs) are developed for each stratum by randomly

selecting a subset of the selected sample units and intensively searching a quarter of the sample unit at 10–12 min/mi^2 and noting the difference between the number of moose seen during the regular and intensive surveys.

Results and Discussion

The Unit 14B estimated moose population with SCF was above the population objective of 2,500–2,800 in RY19 (Table 1). All results are reported as a point estimate with a 90% CI range.

Due to a lack of favorable conditions in the fall of 2018, we conducted a sex and age composition survey in December, and a GSPE survey of the unit in February of 2019. During that survey, 49 of 118 high-stratum units were selected and 28 of 65 low-stratum units were selected for a total of 42% of the survey area. The resulting population estimate was 2,431 (2,021–2,841) moose, or 3,198 (2,687–3,709) with a SCF. As this survey was conducted in February, after antler drop, sex composition information was not available; however, the percent of calves observed was similar between the December composition survey and the February GSPE survey at 15% (14–16%) and 14% (12–16%), respectively.

Recommendations for Activity 1.1

Continue with modifications. GSPE surveys should continue to be completed on a triennial basis. To garner both population and composition information, a fall GSPE survey should be conducted when conditions and funding allow. When favorable survey conditions do not exist in the fall for multiple years, GSPE surveys may be completed in February and March. Spring surveys do not provide sex and age class data, but do provide information on moose abundance and density. Activity 1.1 and Activity 1.2 will be combined for the RY20–RY24 reporting period.

ACTIVITY 1.2. Conduct sex and age composition surveys if the period between GSPE surveys is great enough that it does not allow us to make informed management decisions.

Data Needs

Sex and age composition surveys can be completed posthunt, but prior to antler drop, to determine age and sex composition of the unit population when a fall GSPE is not logistically possible. These surveys can be used to determine appropriate harvest levels and recruitment into the population.

Methods

Using techniques similar to fall GSPE surveys, teams of pilots and observers fly between 300 and 800 feet above ground level and record all moose of each sex and age class encountered along a predefined route in areas of known wintering concentrations.

Results and Discussion

A sex and age composition survey was conducted in Unit 14B in December 2018. During that survey, a total of 1,499 moose were observed. The bull-to-cow ratio increased to 42:100, compared to 30:100 during the 2013 GSPE survey (Peltier 2017). The calf-to-cow ratio decreased from 28:100 to 24:100.

Table 1. Unit 14B moose fall composition and estimated population from geospatial population estimates, Southcentral Alaska, regulatory years 2015–2019.

Regulatory year	Bulls:100 cows[a]	Yearling bulls:100 cows[a]	Calves:100 cows[a]	Percent calves[a]	Adults	Moose observed	Estimated population[ab]	Estimated population with SCF[c]	Moose/mi^2 with SCF[c]
2015[d]	–	–	–	–	–	–	–	–	–
2016[d]	–	–	–	–	–	–	–	–	–
2017[d]	–	–	–	–	–	–	–	–	–
2018[e]	42 (31–53)	11 (6–16)	24 (16–40)	15 (14–16)	1,280	1,499	–	–	–
2019	–	–	–	14 (12–16)	972	1,136	2,431 (±17%)	3,198	2.8

[a] 90% percent confidence interval (CI) in parentheses.
[b] Geospatial population estimation (GSPE) method.
[c] Sightability Correction Factor (SCF). Based on habitat available as determined by the total area of the GSPE grid for each area.
[d] No surveys conducted.
[e] Sex and age composition survey. Population estimate not available.

Recommendations for Activity 1.2

Continue with modifications. Activity 1.1 and Activity 1.2 will be combined for the RY20–RY24 reporting period.

2. Mortality-Harvest Monitoring and Regulations

ACTIVITY 2.1. Monitor moose mortality through field observations, hunter harvest reports, contact with hunters, and reports of other sources of mortality on an annual basis.

Data Needs

Unit 14B was identified by BOG for IM of moose with a harvest objective of 100–200 moose annually. Monitoring, collecting, analyzing, and summarizing annual harvest data is critical for sustained yield management and to facilitate recommendations for BOG proposals. Reports from the Department of Public Safety and the Alaska Railroad provide information on additional causes of mortality.

Methods

Moose hunting effort in Unit 14B is recorded through the required moose harvest report completed and submitted by hunters that participate in hunting in the unit. These reports note the number of days hunted, location, methods of take and transportation, commercial services used, and the results of hunter effort, and are tracked through ADF&G's Wildlife Information Network (WinfoNet) moose database. Hunters may register for the AM415 targeted hunt in October. Applicants meeting the hunt requirements are randomly selected to harvest moose in nuisance situations or along the roadways in an effort to reduce the number of moose that could be subject to MVCs. AM415 hunters are required to report their efforts in a timely manner.

Season and Bag Limit

During the reporting period, the general season for both residents and nonresidents was 10–17 August (archery only) and 25 August–25 September (archery, firearm, and muzzleloader). Under the general season, hunters are limited to 1 bull with either spike or forked antlers, at least 3 brow tines on at least 1 side, or antlers ≥50 inches. A draw hunt with the bag limit of any bull began in RY19. Season and bag limit information is available on ADF&G's website: http://www.adfg.alaska.gov/index.cfm?adfg=wildliferegulations.hunting.

Results and Discussion

Hunt results are summarized in Table 2. Overall harvest by hunters averaged 108 moose annually during the RY15–RY19 reporting period. This is a 37% increase over the previous 5-year period. The harvest was within the IM harvest objective of 100–200 moose in 3 out of the 5 years of this reporting period.

Table 2. Unit 14B moose harvest and accidental death, Southcentral Alaska, regulatory years 2015–2019.

Regulatory year	Reported				Estimated			Accidental deaths[a]			Grand total
	Male	Female	Unknown	Total	Unreported[b]	Illegal[c]	Total	Road	Train	Total	
2015	110	0	0	110	11	20	31	31	10	41	182
2016	109	0	0	109	11	20	31	34	22	56	196
2017	125	0	0	125	13	20	33	26	60	86	244
2018	97	0	0	97	10	20	30	24	33	57	184
2019	98	0	0	98	10	20	30	94	117	211	339

[a] Road and train deaths are minimum numbers. Roadkills do not include unsalvageable animals.
[b] Derived by taking 10% of the total reported kill.
[c] Includes moose taken in defense of life or property.

Permit Hunts

During this reporting period, there were 2 permit hunts available in Unit 14B. The AM415 hunt allows hunters to take a moose that may become a public safety issue or to remove moose near roadways in an effort to reduce the number of MVCs that may arise when snow levels increase to the point that moose use roadways to travel. This hunt is opened by emergency order during the winter and is available to resident hunters who apply during the month of October. During this reporting period, it was used during RY15 only and was limited to bulls only. The other hunt was DM416, an any-bull draw hunt with season dates of 25 August–25 September and was available to residents only. This hunt was opened for the first time in RY19. The results of these hunts are shown in Table 3.

Hunter Residency and Success

Overall, hunter success rate for the reporting period was 19%, an increase of 3% from the previous 5-year average (Table 4). Unit 14 residents are responsible for the majority of moose taken in the unit. There was a 10% increase in the total number of hunters during the reporting period compared to the previous 5 years. Nonresident success rate was 34%. While nonresident moose hunters are not required to have a guide, the higher success rate may indicate more guide use among nonresidents, a greater effort among nonresidents, or a combination of the 2 factors.

Harvest Chronology

Typically, the greatest percentage of moose are taken during the last 10 days of the season, as moose become more vulnerable closer to the rut (Table 5). The 5-year average of bulls harvested in the last 10 days of the season was 49% in Unit 14B.

Transport Methods

All-terrain vehicles and highway vehicles account for the majority of transportation types used by successful hunters in the past 10 seasons (Table 6).

Other Mortality

Road and railroad mortality is highly variable and reflects the amount of snowfall received each winter, as moose use these routes for easier walking when there is deep snow (Table 2). For example, in RY19 the amount of snow received that winter was much higher than normal; this resulted in a combined road and rail mortality that was 2–5 times greater than any other year in the reporting period.

Alaska Board of Game Actions and Emergency Orders

During the spring 2018 BOG meeting, the board added a resident-only, any-bull draw hunt with season dates of 25 August–25 September. The hunt was first advertised in the winter draw period of 2018 and implemented in the RY19 season.

Recommendations for Activity 2.1

Continue.

Table 3. Unit 14B moose harvest by permit hunt, Southcentral Alaska, regulatory years 2015–2019.

Hunt number	Regulatory year	Permits issued	Percent did not hunt	Percent unsuccessful hunters	Percent successful hunters	Harvest			
						Bulls	Cows	Unknown	Total
AM415	2015	21	0	29	71	15	0	0	15
AM415	2016	0	–	–	–	–	–	–	–
AM415	2017	0	–	–	–	–	–	–	–
AM415	2018	0	–	–	–	–	–	–	–
AM415	2019	0	–	–	–	–	–	–	–
DM416	2019	25	16	67	33	7	0	0	7

Table 4. Unit 14B moose hunter residency and success, Southcentral Alaska, regulatory years 2015–2019.

Regulatory year	Successful						Unsuccessful						Total hunters
	Local resident[a]	Nonlocal resident	Nonresident	Unknown	Total	(%)	Local resident[a]	Nonlocal resident	Nonresident	Unknown	Total	(%)	
2015	79	5	9	2	95	(16)	445	16	23	5	489	(84)	584
2016	85	7	17	0	109	(19)	418	15	22	1	456	(81)	565
2017	99	8	18	0	125	(22)	407	15	30	1	453	(78)	578
2018	76	9	12	0	97	(19)	373	13	26	0	412	(81)	509
2019	79	4	8	0	91	(17)	408	14	25	2	449	(83)	540

Note: Does not include permit hunts.

[a] Unit 14 residents.

Table 5. Unit 14B moose harvest chronology by number of successful hunters, Southcentral Alaska, regulatory years 2015–2019

Regulatory	August			September					
year	10–17	20–26	27–31	1–7	8–14	15–20	21–25	Unknown	Total[a]
2015	2	10	8	12	14	27	22	0	95
2016	4	7	8	14	21	28	26	1	109
2017	4	11	12	20	22	21	33	2	125
2018	1	7	8	12	19	26	23	1	97
2019	5	4	10	13	10	21	24	4	91

Note: Open season is 10–17 August (archery only) and 25 August–25 September (archery, firearm, and muzzleloader) with antler restrictions (spike-fork, 3 brow tines, or antlers ≥50 inches).
[a] Chronology does not include moose taken out of season.

Table 6. Unit 14B transport methods of successful moose hunters, Southcentral Alaska, regulatory years 2015–2019.

	Transport method (%)									
Regulatory					Snow-		Highway			Successful
year	Airplane	Horse	Boat	ATV[a]	machine	ORV[b]	vehicle	Unknown	Airboat	hunters
2015	8	0	7	52	0	13	15	5	0	95
2016	11	0	6	54	0	9	15	5	0	109
2017	12	0	7	51	0	9	17	3	1	125
2018	10	0	4	43	0	14	15	14	0	97
2019	8	0	6	45	1	13	19	7	1	91

[a] ATV = all-terrain vehicle.
[b] ORV = off-road vehicle.

ACTIVITY 2.2. Age distribution of cows.

Data Needs

Determining the age distribution of cow moose may lead to understanding parameters of the population such as the potential for population growth. Comparisons of age distribution of cows harvested and animals collected from MVCs can enhance our understanding of how different age classes are subjected to different mortality events.

Methods

Hunters participating in targeted hunts (AM415) and people receiving moose through Department of Public Safety's roadkill salvage program are required to submit approximately 5 inches of the lower jaw to ADF&G. Submitted samples are examined for tooth wear and compared to teeth of known age moose for age analysis.

Results and Discussion

Teeth samples were not analyzed during the RY15–RY19 reporting period due to staff time constraints.

Recommendations for Activity 2.2

Discontinue.

3. Habitat Assessment-Enhancement

ACTIVITY 3.1. Assess habitat condition and browse utilization.

Data Needs

Monitoring forage plant condition and browse utilization by moose enables an evaluation of the impact of increasing moose density on the available habitat and can serve as a signal to liberalize harvest to avert habitat degradation and a subsequent decline in the moose population. By sampling Unit 14B, we will establish a baseline that we can use to monitor the effects of further population growth and its impact on the available browse.

Methods

Staff developed a browse survey sampling design based on the work of Paragi and Kellie (2011) and Seaton et al. (2011), with a modification that allowed for sampling in highly developed areas. Using the GSPE grid of Unit 14B, we randomly selected 40 units for sampling and selected plot centers randomly within those units.

Results and Discussion

Browse utilization assessment in Unit 14B did not occur during RY15–RY19. We anticipate completing the study in the future as time and resources allow.

Recommendations for Activity 3.1

Continue.

ACTIVITY 3.2. Modify fire suppression levels to allow for natural fire regime to enhance moose habitat.

Data Needs

Natural fires return forests to earlier seral stages which are more productive for moose and other wildlife. By reducing the level of fire suppression determined by Division of Forestry (DOF) from full to modified or limited, wildland firefighting efforts would be reduced should a natural fire occur in the unit. This in turn would allow more acres of mature stands to burn and return to earlier seral stages at minimal cost to the state.

Methods

ADF&G coordinated with DOF to determine where fire suppression levels could be reduced to modified or limited.

Results and Discussion

The modification of fire suppression levels is the responsibility of DOF.

Recommendations for Activity 3.2.

Discontinue.

NONREGULATORY MANAGEMENT PROBLEMS OR NEEDS

Data Recording and Archiving

Recording

- GSPE moose survey form (Appendix A).
- Moose browse survey form (Appendix B).

Archiving

- Survey and harvest data are stored on an internal database housed on a server (http://winfonet.alaska.gov/index.cfm). Field data sheets for surveys are stored in file cabinets located at the Palmer Area Office.
- All other electronic data and files, such as copies of field data sheets, survey memos, maps, and reports, are located on the in-house server (O:\\WC\Palmer Area Office Folder\Species\Moose).

Agreements

None.

Permitting

None.

Conclusions and Management Recommendations

As of June 2020, the management of the moose population is adequate to ensure that the population is within management objectives. GSPE estimates place the Unit 14B population slightly above the IM population objective with acceptable bull-to-cow and calf-to-cow ratios. GSPE surveys should be done every 3 years to ensure that any changes in abundance or population structure can be captured and adequately addressed by staff in a timely manner.

II. Project Review and RY20–RY24 Plan

Review of Management Direction

MANAGEMENT DIRECTION

There are no changes in the management direction for Unit 14B.

GOALS

There are no changes in the management goals from the RY15–RY19 report period.

CODIFIED OBJECTIVES

Amounts Reasonably Necessary for Subsistence Uses

Unit 14B is in a nonsubsistence area and does not have a customary and traditional use determination.

Intensive Management

IM objectives (5 AAC 92.108) are as follows:

Unit 14B Moose population	Finding	Population objective	Harvest objective
	Positive	2,500–2,800	100–200

MANAGEMENT OBJECTIVES

There are no changes to the management direction from the RY15–RY19 report period.

REVIEW OF MANAGEMENT ACTIVITIES

1. Population Status and Trend

ACTIVITY 1.1. Conduct aerial inventory and sex and age composition surveys in the unit to determine population size, composition, productivity, and trends.

Data Needs

Moose abundance is a basis from which sustainable harvest may be estimated and provides a density context for interpreting nutritional condition relative to habitat conditions. Sex and age composition information can be used to determine recruitment into the population and appropriate harvest levels. Sex and age ratio data may also be used to model population structure and trends.

Methods

Fall geospatial population estimator surveys (GSPE; Kellie and DeLong 2006) are preferred because they provide both an estimate of the total population, and age and sex ratio data, that are used in guiding management decisions. However, it is not always possible to do a fall survey as weather conditions may not be suitable, or higher priority surveys preclude our ability to conduct a fall survey. In that case, spring surveys will provide some valuable information on total population size. If conditions allow, we will conduct a truncated fall composition survey in anticipation of a spring survey, or plan for a truncated fall composition survey for the following fall after the spring survey.

GSPE surveys are conducted on all available moose habitat in the unit below 3,500 feet. Fall surveys are conducted between 1 November and 6 December on a triennial basis as weather and snow conditions permit. This approach produces population estimates and statistically bound sex

and age composition estimates through a stratified random sampling design and geostatistical models of autocorrelation. It is designed for high search intensity (8–10 min/mi^2) from a PA-18 Super Cub or equivalent aircraft to obtain a relatively unbiased estimate of moose numbers, but ADF&G biologists also correct sightability for the lower search intensity that is typically achieved. Teams of pilots and observers record moose age and sex classes in the field for later analysis (Appendix A).

When favorable survey conditions do not exist in the fall for multiple years, GSPE surveys may be completed in February and March. Spring surveys do not provide sex and age class data but do provide information on moose abundance and density. Using techniques similar to fall GSPE surveys, teams of pilots and observers fly between 300 and 800 feet above ground level and record all moose of each sex and age class encountered along a predefined route in areas of known wintering concentrations. While the spring GSPE surveys do not provide viable bull-to-cow ratios, they do provide total population size and percent calves information that are used as indicators of abundance and recruitment.

2. Mortality-Harvest Monitoring

ACTIVITY 2.1. Monitor moose mortality through field observations, hunter harvest reports, contact with hunters, and reports of other sources of mortality on an annual basis.

Data Needs

No change from RY15–RY19.

Methods

Moose hunting effort in Unit 14B will continue to be recorded through the required moose harvest reports that are submitted by hunters that participate in hunting in the unit. These reports note the number of days hunted, location, methods of take and transportation, commercial services used, and the results of hunter effort, and are tracked through ADF&G's WinfoNet moose database. Hunters may register for the AM415 targeted hunt in October. Applicants meeting the hunt requirements are randomly selected to harvest moose in nuisance situations or along the roadways in an effort to reduce the number of moose that could be subject to MVCs. AM415 hunters are required to report their efforts in a timely manner.

Staff will examine alternatives to the current hunting seasons and bag limits and make recommendations to BOG regarding methods for increasing the harvest in Unit 14B. These recommendations may include adjustments of the any-bull draw hunt, an increase in the length of the current season dates, and an adjustment to the season dates toward the end of September when bulls become more vulnerable to techniques such as calling.

3. Habitat Assessment-Enhancement

ACTIVITY 3.1. Assess habitat quality and availability.

Data Needs

Monitoring browse utilization by moose and forage plant condition enables an evaluation of the impact of increasing moose density on the available habitat and can serve as a signal to liberalize harvest in order to avert habitat degradation and any subsequent declines in the moose population. The maximum amount of habitat in the unit available to moose below 3,500 feet is 1,140 mi^2. An assessment of habitat quality and availability will enable us to refine the total amount of habitat available to the moose population. Browse sampling within the next 5 years will establish a baseline that can be used to monitor the effects of further population growth and its impact on the available browse.

Methods

Staff will utilize a browse survey scheme with a modification that allows for sampling in developed areas. Using the GSPE grid of Unit 14B, we will randomly select 40 units for sampling and select ≥30 plot centers randomly within those units for sampling. Within each plot, we will count preferred browse species and measure a subsample of preferred browse species, take photos, and record slope, aspect, and other data. (Appendix B). Data will then be analyzed for species composition, proportional offtake, and other parameters that we can use to compare with other results statewide.

NONREGULATORY MANAGEMENT PROBLEMS OR NEEDS

Data Recording and Archiving

Recording

- GSPE moose survey form (Appendix A).
- Moose browse survey form (Appendix B).

Archiving

- GSPE data will be stored on an internal database housed on a server (http://winfonet.alaska.gov/index.cfm). Digitized field data sheets are stored in file folders located in the Palmer assistant area biologist's office.
- Field data sheets will be scanned and housed on the computer server in the Palmer area biologist office (O:\WC\Palmer Area Office Folder\Species\Moose\Moose Population Estimation\14B Moose Survey Data\Archived Survey Sheets) and stored in file folders located in the Palmer assistant area biologist's office.

Agreements

None.

Permitting

None.

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Appendix A. Moose survey form used in stratified surveys such as the geospatial population estimator and for composition surveys

MOOSE SURVEY FORM

Date ____/____/____ Page ____ of ____

GMU ____ Count Area ____ Mi² in count area ____

Aircraft Type ____ Pilot/Observer ____/____ Cost/hr ____

WEATHER:

Cloudcover (%) ____ Precipitation ____ Temp ____

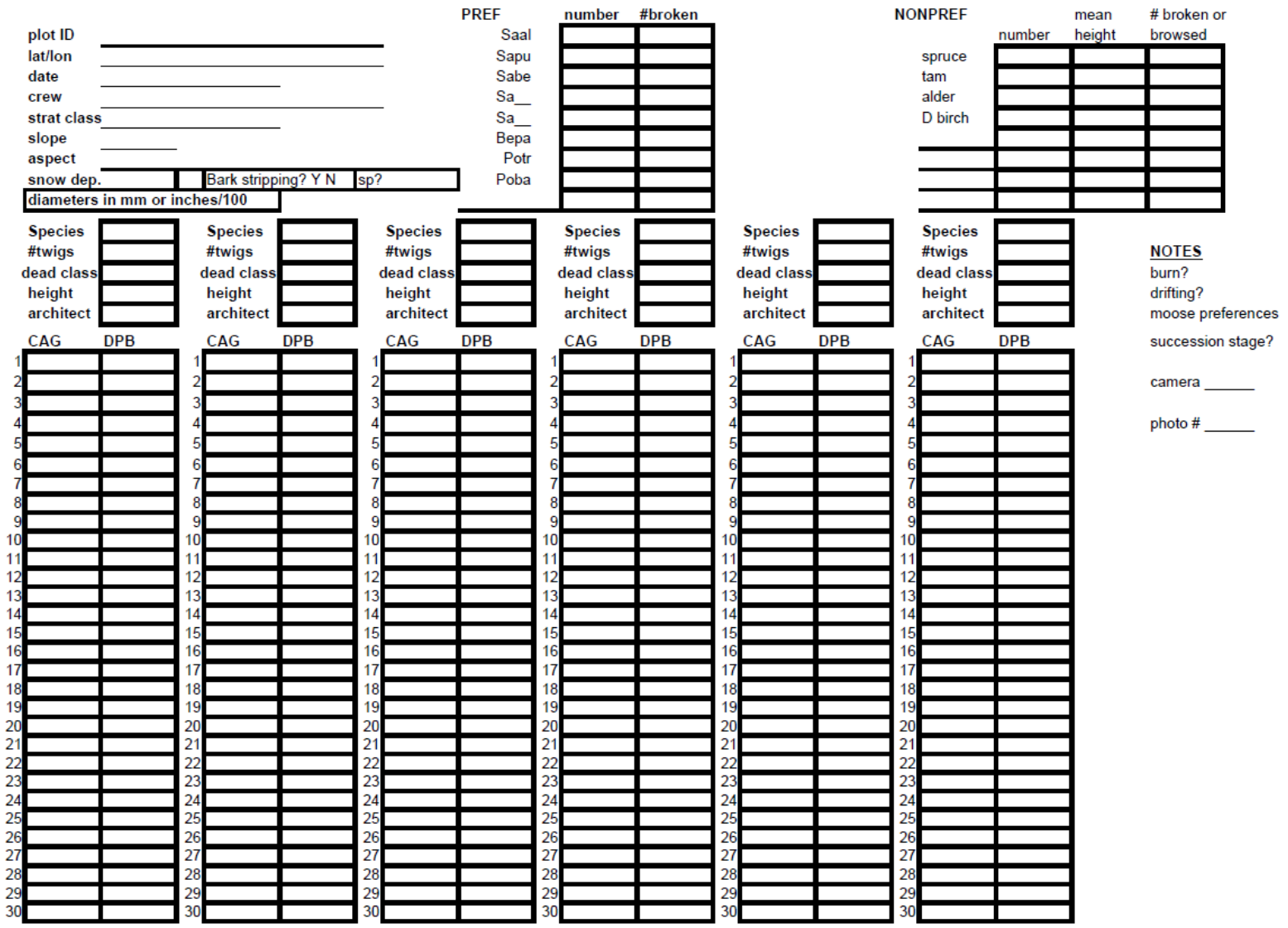
Wind Speed and Direction ____ Turbulence ____

CONDITIONS:

Light				Snow age and cover				Flight Time
Type		Intensity		Age		Cover		Depart
Bright	☐	High	☐	Fresh	☐	Complete	☐	Start Count
Flat	☐	Medium	☐	Moderate	☐	Low vegetation showing	☐	Stop Count
		Low	☐	Old	☐	Bare ground showing	☐	Return
								Flight Time
General Survey Conditions		☐ Excellent		☐ Good		☐ Fair	☐ Poor	Survey Time

	BULLS				COWS				Unk	
Group No.	Yearlings S/F ≤ 3 pt.		Med < 50"	Large ≥ 50"	w/o calf	w/1 calf	w/2 calf	Lone Calf	sex/ age	Remarks
1										
2										
3										
4										
5										
6										
7										
8										
9										
10										
11										
12										
13										
14										
15										
16										
17										
18										
19										
20										
Total Page 1										
Total Page 2										
Totals										

Appendix B. Browse survey data sheet. Page 1 of 2.



–Continued–

Appendix B. Browse survey data sheet. Page 2 of 2

Architecture classes (browsing history of the plant, includes this year, and all visible evidence of past years)
broomed- more than half of the CAG twigs rise from lateral twigs that are the result of browsing
unbrowsed- no evidence of past browsing
browsed- less than half of the CAG twigs rise from lateral twigs that are the result of browsing

Species					
#twigs					
dead class					
height					
architect					

	CAG	DPB	CAG	DPB	CAG	DPB	CAG	DPB	CAG	DPB	CAG	DPB
1												
2												
3												
4												
5												
6												
7												
8												
9												
10												
11												
12												
13												
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28												
29												
30												

Dead classes (amount of dead material that comprizes a plant)
X= no dead
L= less dead than live material
M= more dead than live material

STEPS IN SURVEY
1. Locate center of plot
2. Locate boundary of plot
3. If no pref plants, pick alt
4. Snow depth
5. Choose random distance and direction from center to start measuring closest plant of each pref species
6. Turn head and grab stem on plant
7. Measure 10 twigs starting at terminal end of that stem
8. height, # twigs, spp, arch. # stems only between 0.5m and 3.0m
9. Choose next random distance and direction from center for other plants to measure
9.5. Goal is 30 twigs/ spp
10. Estimate # of all woody browse plants by species in plot

TIPS
*Pref plant has CAG twigs between 0.5m and 3m
*Bepa, Saal, Sabe, etc., can be nonpref plants if they are too tall
*measure plant height from ground


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