

Moose Management Report and Plan, Game Management Unit 7:

Report Period 1 July 2015–30 June 2020, and
Plan Period 1 July 2020–30 June 2025

Jason Herreman and Nicholas Fowler



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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 Jeff Selinger, Management Coordinator for Region II 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 Unit 7 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., RY14 = 1 July 2014–30 June 2015). 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 7 consists of 3,520 mi² on the eastern side of the Kenai Peninsula and is bounded by the western edge of the Kenai Mountains, the Russian River, and the Harding Ice Field on the west and the western edge of the Sargent Ice Field and eastern edge of Spencer Glacier on the east (Fig. 1). The landscape of Unit 7 consists of mountainous terrain interspersed with river and creek drainages, a few large lakes, and ice fields. Riparian areas and hillsides are densely forested until reaching the alpine zone. Federally managed lands make up approximately 78% of Unit 7: 50% U.S. Forest Service (USFS)-Chugach National Forest, 22% National Park Service-Kenai Fjords National Park, and 5% U.S. Fish and Wildlife Service-Kenai National Wildlife Refuge.

Most of Unit 7 is currently in a late successional stage comprised of mature stands of spruce, hemlock, birch, aspen, cottonwood, and alpine vegetation. No large fires have occurred in Unit 7 in the last 50 years. In 2019, a small portion of the Swan Lake Fire burned into the Chugach Mountains near Juneau Creek (Alaska Interagency Coordination Center 2021). The 2002 Chugach National Forest management plan prescribed a minimal acreage to be burned each year for wildlife enhancement (2,248 acres per year) and fuels management (400 acres per year) dependent upon budgets, conditions, and resources (USDA Forest Service 2002). No prescribed fire has been conducted since 2001 (Jeff Bouschor, Fire Management Officer, USFS, personal communication). Additionally, 323 acres per year were prescribed to be treated for wildlife habitat using mechanical treatment and 375 acres per year were prescribed for uneven age timber harvest (USDA Forest Service 2002). The management plan was revised in 2020 and the objectives were modified removing most of the previously defined acreage goals (USDA Forest Service 2020). The 2020 plan does still call for an average of 450 acres to be treated annually for fuels management using a combination of mechanical treatment and prescribed fire. It further states the desired objective of maintaining early seral vegetation established through natural processes, vegetation management, and prescribed fire to provide suitable forage for sustainable moose populations. It does not however provide clear goals to reach this objective, nor does it define what is a sustainable moose population.

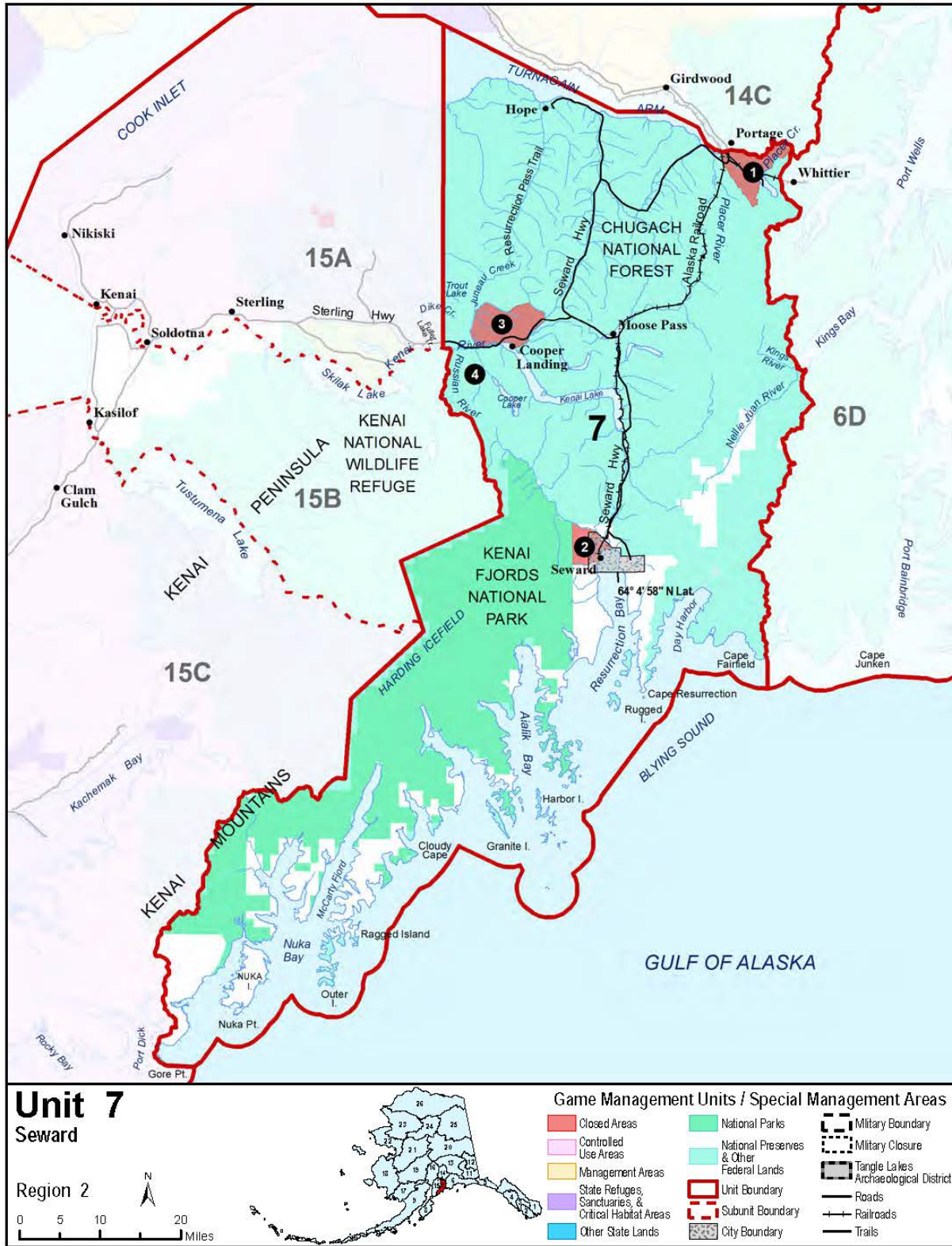


Figure 1. Map showing the Unit 7 boundaries with indicators of controlled use areas (numbered circles), administrative subunits, and federal lands as found in the Alaska Hunting Regulations.

Summary of Status, Trend, Management Activities, and History of Moose in Unit 7

The moose population in Unit 7 is believed to be at a low overall density relative to historic levels and other game management units on the Kenai Peninsula as noted from fall composition surveys, hunter reports, and anecdotal observations. Severe winters with deep snow are normal for this unit and may contribute to a high mortality rate for moose in this area. During winter, animals have been observed concentrated in lower riparian areas containing winter browse and lower relative snow depths.

A moose population estimate has never been conducted in Unit 7. Trend count areas were established in the 1960s but have not been consistently flown. Little moose monitoring or research was conducted by the department in the 1970s and early 1980s in this unit due to budget constraints and other priorities. Survey efforts increased in the 1990s, and since then the Resurrection Creek (survey area 7) and Juneau Creek (survey area 11) trend count areas have been surveyed when possible. While data from composition counts conducted in different years are not rigorously comparable because survey intensity and conditions are inconsistent, these data provide indications of population trend. The limited composition counts suggest a steadily declining population trend over the last decade and a significant decline in the Unit 7 moose population since the 1970s.

Approximately 8% of the moose harvest on the Kenai Peninsula over the past 20 years has come from Unit 7. The highest recorded harvest in Unit 7 occurred in 1963 peaking at 427 moose. Harvest remained relatively steady throughout the 1960s and early 1970s averaging 159 moose (1964–1974). Recorded harvest fluctuated from 1975 to 1990 between 36 and 101 moose and has steadily declined since that time. Hunter participation, despite significant changes in seasons and bag limits, was relatively consistent up until 2011 when severe harvest restrictions were instituted (mean: 362 hunters per year, 1966–2010). Between 2011 and 2015 average yearly hunter participation in the general season hunt dropped to 147 hunters per year. Harvest restrictions were relaxed in 2013 with the addition of spike bulls back into legal harvest, and in 2019, 3-brow-tine bulls once again became legal for harvest. Participation, however, has not rebounded.

Management Direction

EXISTING WILDLIFE MANAGEMENT PLANS

The 1976 Alaska wildlife management plan (ADF&G 1976) contains 3 sections that applied to moose management within Unit 7: the Kenai Peninsula, Resurrection Pass, and Portage Glacier moose management plans. The Kenai Peninsula plan identified goals and guidelines for both Units 7 and 15, in areas outside of Resurrection Pass and Portage Glacier, which included providing the greatest opportunity to participate in hunting moose while providing for optimum harvest; and opportunities to view, photograph, and enjoy moose. The Resurrection Pass plan contained the goals to provide opportunity to hunt large antlered moose under aesthetically pleasing conditions and to provide the opportunity to view, photograph, and enjoy moose. The

Portage Glacier plan focused on viewing and photography, and closed moose hunting in the Portage Glacier Valley.

Recent management objectives, harvest strategies, and subsequent changes have resulted from public comment, staff recommendations, and Board of Game actions, and have been reported in the division's previous species management reports. The plan portion of this report contains the current management plan for moose in Unit 7.

GOALS

- Protect, maintain, and enhance the moose population and its habitat in concert with other components of the ecosystem.
- Provide the greatest sustained yield opportunity to participate in hunting moose.
- Provide an opportunity for nonconsumptive uses (e.g., to view and photograph moose).

CODIFIED OBJECTIVES

Amounts Reasonably Necessary for Subsistence Uses

The Alaska Board of Game has issued a negative customary and traditional use finding under 5 AAC 99.025(8) for moose in Unit 7; therefore, no part of the harvest is specifically allocated for subsistence use.

Intensive Management

The Alaska Board of Game established a negative intensive management finding for the Unit 7 moose population under 5 AAC 92.108 in 1999.

MANAGEMENT OBJECTIVES

1. Maintain a healthy population of moose with a minimum bull-to-cow ratio of 20–25:100.
2. Promote public safety by maintaining the moose population at a level that reduces moose conflicts with Unit 7 residents, and by participating in land management decisions that affect moose movements in an effort to direct moose into areas with lower vehicle traffic.

MANAGEMENT ACTIVITIES

1. Population Status and Trend

ACTIVITY 1.1. Conduct composition counts in trend survey areas 7 and 11 semiannually in late November or early December.

Data Needs

Data on moose population health and status are needed to inform management action. The composition count method provides a reliable metric that can be obtained most years to provide trend data for analysis.

Methods

Composition counts are conducted annually from a Piper PA18 Super Cub or equivalent aircraft if conditions and funding allow in established trend count areas. Major drainages, which are areas where moose congregate after snow accumulation in Unit 7, are flown for complete coverage and all moose sighted are categorized as cow, calf, or bull in the following categories: 1 antler on either side that is a spike (1 point) or a fork (2 points), antlers on both sides greater than a fork, 31–40 inches, 41–50 inches, and greater than 50-inch antlers. From these counts the following metrics are calculated: bull-to-cow ratio, calf-to-cow ratio, percent calves, total moose, and moose per hour flown. Currently composition counts are conducted in trend areas 7 (Resurrection Creek Drainage) and 11 (Juneau Creek Drainage).

The actual number of moose counted during composition counts is not rigorously comparable between all years, because survey intensity and conditions are inconsistent. Composition counts are designed to achieve an adequate sample of moose to calculate ratios of bulls to cows and calves to cows.

Results and Discussion

No composition counts were conducted during the report period due to funding, weather, and logistical constraints. Data from previous reporting periods suggests the Unit 7 moose population was on a downward trajectory and no habitat changes or changes in environmental conditions have occurred that would suggest a cessation of that trajectory.

Recommendations for Activity 1.1

Continue composition counts in trend areas 7 and 11 as an index of population trends.

2. Mortality-Harvest Monitoring and Regulations

ACTIVITY 2.1. Monitor annual harvest and mortality patterns in Unit 7.

Data Needs

Annual harvest summaries are needed to establish harvest quotas to ensure we are managing within sustained yield. Monitoring and documentation of roadkill, train mortality, and illegal take also help to ensure that harvest is maintained within sustained yield limits.

Methods

Harvest is monitored through mandatory sealing of antlers and harvest reports from harvest tickets and permit reports that are recorded in ADF&G's Wildlife Information Network (WinfoNet), the central ADF&G harvest database. Documentation of roadkills and trankills comes from trooper dispatch reports and railroad incident reports. Illegal harvest is documented from sealing reports, trooper reports, and other incidental findings. Roadkill, trankill, and illegal

harvest data are maintained at the local level on the Homer office shared network drive: (O:)DWC/ADF&G-Homer Files/Species Data/Moose.

Season and Bag Limit

The general season for Unit 7 was open 20 August–20 September from 1993 to 2014. In 2015, the season dates were changed to 1–25 September. From 1987 to 2010, the bag limit was 1 bull with a spike or fork on at least 1 antler, or 50-inch antlers, or 3 or more brow tines on either side (SF-50-3bt). In 2011, the bag limit was restricted to 1 bull with 50-inch antlers or antlers with 4 or more brow tines on at least 1 side (50-4bt). In 2013, spike bulls were added back into the harvest (S-50-4bt). In 2019, 3 brow tine bulls were added back into the harvest (S-50-3bt).

Current Unit 7 moose season dates and bag limits are available online: <http://www.adfg.alaska.gov/index.cfm?adfg=wildliferegulations.hunting>.

Federal regulations allow hunting by federally qualified rural residents on federal lands (Chugach National Forest) with a season date of 10 August–10 September with a bag limit of 1 bull SF-50-3bt. Current regulations and information on qualified users can be found online: <http://www.doi.gov/subsistence>.

Results and Discussion

Harvest by Hunters-Trappers

The average annual general season reported harvest from RY15 through RY19 in Unit 7 was 12 moose. This is similar to the previous 5-year average of 10 moose and is lower than the 1963–1983 historic average of 104 moose per year. The most likely cause for harvest decline is a significant decline in population levels and legal animals available for harvest. Accidental deaths were higher than hunter harvest during RY15–RY19 (Table 1).

Table 1. Unit 7, Alaska reported general season moose harvest and accidental death, regulatory years (RY) 2015–2019.

Regulatory year	Reported hunter harvest				Accidental death			Total reported mortality
	Bull	Cow	Unknown	Total	Road	Train	Total	
2015	16	0	0	16	23	0	23	39
2016	12	0	0	12	14	2	16	28
2017	9	0	0	9	11	0	11	20
2018	8	0	0	8	13	0	13	21
2019	13	0	0	13	14	3	17	30

Permit Hunts

Information for permit hunts DM210 and DM211, which includes land in both Units 7 and 14C, is reported in the Unit 14C moose management report and plan (Spivey 2022). Permit hunt DM522, which encompassed portions of Units 7 and 15A has been suspended since 2008 due to low moose numbers.

Hunter Residency and Success

A little under half of all general season hunters in RY15–RY19 were residents of Unit 7. The annual success rate fluctuated between 6% and 11%, which is similar to previous averages (Table 2).

Harvest Chronology

Moose were harvested throughout the season with no discernable pattern (Table 3).

Transport Methods

Highway vehicles remain the chief transportation method used by successful hunters in Unit 7 (Table 4).

Other Mortality

Highway vehicles killed an average of 15 moose per regulatory year during the past 5 years (RY15–RY19) in Unit 7 (Table 1). This is a slight increase from the previous 5-year average (RY10–RY14) of 13. The effect of wolf and bear predation on moose and the degree of illegal take are unknown. In addition, the level of mortality for moose during years of heavy snow accumulation may be a limiting factor.

Alaska Board of Game Actions and Emergency Orders

During the March 2015 meeting, the Board of Game (BOG) changed the general season dates to 1–25 September. In 2016, the Board of Game established that a point within 2 inches of the base and less than 3 inches long does not count as a point. In 2017, moose hunter orientation became required for all Kenai Peninsula moose hunters. At the March 2019 Board of Game meeting, moose with 3 brow tines were added to the bag limit. BOG meeting summary information is available on the ADF&G website:

<http://www.adfg.alaska.gov/index.cfm?adfg=gameboard.meetinginfo>.

Recommendations for Activity 2.1

Continue monitoring harvest through antler sealing and harvest tickets and documenting other sources of human-caused mortality.

3. Habitat Assessment-Enhancement

ACTIVITY 3.1. Monitor moose browse production and removal on a triannual basis to better understand sustainability of moose density.

Data Needs

Monitoring forage plants provides information about the amount of available browse removed by the existing moose population and the degree of browsing pressure during the life of the plant (Seaton 2002). Browse biomass removal is an indicator of moose nutritional condition (Seaton 2002, Boertje et al. 2007, Seaton et al. 2011). Monitoring browse plant architecture provides additional information on the effects of moose browsing on vegetation condition as a function of

Table 2. Unit 7, Alaska residency and success rates of general season moose hunters, regulatory years 2015–2019.

Regulatory year	Successful				Unsuccessful				Total hunters
	Local ^a resident	Nonlocal resident	Nonresident	Total (%)	Local ^a resident	Nonlocal resident	Nonresident	Total (%)	
2015	8	6	2	11	59	71	6	89	152
2016	6	5	1	7	72	76	17	93	177
2017	8	1	0	6	51	71	9	94	140
2018	5	2	1	6	58	66	4	94	136
2019	5	8	0	10	49	59	5	89	127

^a Local = residents of Unit 7.

Table 3. Unit 7, Alaska moose general season harvest chronology (percent of harvest), regulatory years 2015–2019.

Regulatory year	Week ending (%)					Percent unknown	Number reported ^a
	1-September	8-September	15-September	22-September	29-September		
2015	0	20	13	47	20	0	15
2016	9	9	55	18	9	0	11
2017	0	22	11	44	22	0	9
2018	0	0	38	38	13	13	8
2019	8	8	31	38	15	0	13

^a Not all hunters reported harvest dates.

Table 4. Unit 7 general season transport methods for successful moose hunters (percent of harvest), regulatory years 2015–2019.

Regulatory year	Percent of harvest							Number reported	
	Unknown	3- or 4-wheeler	Plane	Boat	Foot	Highway vehicle	Horse/dog team		ORV
2015	0	0	13	0	0	81	6	0	16
2016	0	0	8	0	0	92	0	0	12
2017	11	0	0	11	11	67	0	0	9
2018	0	0	25	0	13	50	0	13	8
2019	0	0	23	8	0	69	0	0	13

moose density (Seaton 2002, Paragi et al. 2015). Browse data are best used in conjunction with weather, body condition, and other animal parameters to assess habitat condition and trend, to gauge whether more or less moose can be sustained on the landscape.

Methods

Forage plant production, architecture, and browse removal are characterized using methods from Seaton (2002).

Results and Discussion

No habitat assessment surveys were completed during RY15–RY19 due to lack of funding, staff capacity, and other priorities.

Recommendations for Activity 3.1

Continue to conduct browse surveys as staff capacity and budgets allow.

ACTIVITY 3.2. Complete habitat enhancement activities to increase moose population numbers.

Data Needs

Work with land managers to identify treatment areas that would be most beneficial to facilitate future prescribed and wildland fire use and provide protection to communities from wildfires. Opportunities may exist in conjunction with the U.S. Forest Service during their planned efforts to mitigate spruce bark beetle kill in developed areas (e.g., campgrounds, trailheads) in Unit 7.

Methods

No habitat enhancement activities were planned or completed during the reporting period.

Results and Discussion

Nothing to report.

Recommendations for Activity 3.2

Continue (no action) but consider identifying data needs and habitat conditions that would warrant the cost and staff time for habitat enhancement. Identifying conditions under which habitat enhancement could occur will require working with the USFS as the land-managing agency. Collaboration should be conducted under the Kenai Peninsula All Lands All Hands initiative through AFG&G's Wildlife Habitat Enhancement Program.

NONREGULATORY MANAGEMENT PROBLEMS OR NEEDS

No nonregulatory management problems or needs have been identified at this time. Viewing opportunities for moose remain available throughout Unit 7 but are limited due to current population levels.

Data Recording and Archiving

- Composition count data are stored on the computer server in the ADF&G office in Homer (O:\DWC\ADF&G-Homer Files\Species Data\Moose\Survey Data).
- Field data sheets are stored at the ADF&G office in Homer, in filing cabinets in the Homer assistant area biologist's office. These are also scanned and housed on a computer network server (O:\DWC\ADF&G-Homer Files\Species Data\Moose\Survey Data).

Agreements

No management agreements exist for Unit 7 moose.

Permitting

No specific permits related to moose management exist for Unit 7.

Conclusions and Management Recommendations

The apparent decline in the moose population in Unit 7 is suspected to be due to lack of suitable winter habitat. Anecdotal reports from local residents and hunters suggest the population has declined from levels seen in the 1980s. Moose vehicle collisions, long-term harvest trends, and composition counts also all indicate a decline. The main cause is likely generally poor habitat due to forest succession. In the future, it would be beneficial to work with the U.S. Forest Service to generate a long-term plan to address habitat concerns.

Moose numbers in Unit 7 appear to be chronically low and according to our limited data it appears we are meeting only a portion of our management objectives. Roadkill and human conflicts with moose are low in Unit 7, but this appears to be due to low moose numbers rather than good land management practices. We expect bull-to-cow ratios to increase to described management objectives due to the harvest restrictions imposed in 2011. Unfortunately, population numbers are not likely to increase until large-scale habitat manipulation or natural improvements in moose habitat occur.

The Federal Subsistence Board granted residents of Cooper Landing (2008) and Hope (2010) a moose season on federal lands that starts on 10 August in Unit 7. This season was previously only open to residents of Chenega Bay and Tatitlek. The department will continue to work with the Board of Game to address Kenai Peninsula moose population concerns and moose management strategies. The department will continue to recommend to the Federal Subsistence Board that it implement similar and consistent strategies to those being used by the department.

II. Project Review and RY20–RY24 Plan

Review of Management Direction

MANAGEMENT DIRECTION

There are no new management plans or broad changes in management direction.

GOALS

- Protect, maintain, and enhance the moose population and its habitat in concert with other components of the ecosystem.
- Provide the greatest sustained yield opportunity to participate in hunting moose.
- Provide an opportunity for nonconsumptive uses (e.g., to view and photograph moose).

CODIFIED OBJECTIVES

Amounts Reasonably Necessary for Subsistence Uses

No change is expected.

Intensive Management

No change is expected.

MANAGEMENT OBJECTIVES

Objectives will remain the same as during RY15–RY19:

- M1. Maintain a healthy population of moose with a minimum bull to cow ratio of 20–25:100.
- M2. Maintain moose populations at a level to promote public safety through directed harvest and participate in land management decisions that affect moose movements in an effort to direct moose into areas with lower vehicle traffic.

REVIEW OF MANAGEMENT ACTIVITIES

All RY15–RY19 activities will be continued for RY20–RY24 with changes to needs and methods as described below.

1. Population Status and Trend

ACTIVITY 1.1. Conduct composition counts in survey areas 7 and 11 semiannually in late November or early December.

Data Needs

In addition to previously stated data needs, population estimates conducted a minimum of every 3 years, or a reliable population metric would increase the ability to manage this population on a sustainable basis.

Methods

Efforts will be undertaken to develop a method to conduct a population estimate or a reliable population metric for Unit 7. Three methods that could potentially be developed include a FLIR (forward-looking infrared radar), a genetics-based population survey, or a late winter drainage

corridor survey focused on counting all visible moose that are driven into lower riparian areas by snow loads at higher elevations.

2. Mortality-Harvest Monitoring

ACTIVITY 2.1. Monitor annual harvest and mortality patterns in Unit 7.

Data Needs

No change from prior reporting period.

Methods

Current data collection methods are sufficient. However, currently, the WinfoNet data system tracks only legal harvest that is documented through a harvest ticket or permit report. All other documented mortality including known illegal harvest, defense of life or property (DLP) kills, roadkill, trainkill, and “legal harvest” that is not properly reported on a harvest ticket will continue to be maintained in the moose harvest database located on the Homer office shared drive (O:\DWC\ADF&G-Homer Files\Species Data\Moose\Moose Harvest).

3. Habitat Assessment-Enhancement

ACTIVITY 3.1. Monitor moose browse production and removal on a triannual basis to better understand sustainability of moose density.

Data Needs

No change from prior reporting period.

Methods

Institution of browse surveys following the methods of Seaton (2002) could be used as a metric to help monitor population levels, since population estimates are not feasible using current methods.

ACTIVITY 3.2. Complete habitat enhancement activities to increase moose population numbers.

Data Needs

No change from prior reporting period.

Methods

No change from prior reporting period.

NONREGULATORY MANAGEMENT PROBLEMS OR NEEDS

A reliable moose population estimation technique that can be applied in years of low snow and in densely forested areas needs to be developed. As climate change continues, current survey

techniques are likely to become less reliable for all management areas. We will continue to work with research staff to explore and develop new research techniques.

Data Recording and Archiving

- Composition count data are stored on the computer server in the ADF&G office in Homer (O:\DWC\ADF&G-Homer Files\Species Data\Moose\Survey Data).
- Field data sheets are stored at the ADF&G office in Homer, in filing cabinets in the Homer assistant area biologist's office. These are also scanned and housed on a computer network server (O:\DWC\ADF&G-Homer Files\Species Data\Moose\Survey Data).
- Historical (pre-2010) survey notes and data sheets are stored in the Homer assistant area biologist's office and are being scanned; digital copies are being stored on the network server (O:\DWC\ADF&G-Homer Files\Species Data\Moose\Survey Data).

Agreements

There are no planned moose specific management agreements for Unit 7 during RY20–RY24.

Permitting

The department does not expect to seek or issue any moose related permits in Unit 7 during RY20–RY24.

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