**ALASKA DEPARTMENT OF FISH AND GAME**
**DIVISION OF WILDLIFE CONSERVATION**
**PO Box 115526**
**Juneau, AK 99811-5526**

# ANNUAL SURVEY AND INVENTORY

**STATE:** Alaska

**GRANT AND SEGMENT NO.** W-33-11 **PROJECT NO.** 1.0 Moose

**PERIOD:** 1 July 2012 – 30 June 2013

**PROJECT LOCATION:** Statewide: Activities in Regions I, II, III, IV, and V

**PROJECT TITLE:** The Status of Alaska Moose and Factors Influencing Their Populations

**REPORT DESCRIPTION:** This performance report describes Moose survey and inventory activities. Activities are listed by region and game management unit.

## Region I—Southeast Alaska

### Regionwide Activities

ACTIVITY 1: Provide information to state and federal regulatory processes on moose management.

We provided data associated with moose populations and harvest to the Board of Game during the FY.

ACTIVITY 2: Monitor the harvest through analysis of registration, Tier II, and drawing permit data including collection of incisors for aging and photos of antlers.

Information on days of effort, and location of successful and unsuccessful hunts was collected from all hunters via permit hunt reports.

*Unit 1A:* Two bull moose were harvested, and incisors were collected for aging these animals. Photos of each set of antlers were also obtained. Hunter success rate was 12.5%.

*Unit 1B*: Thirty bull moose were harvested, and incisors were collected for aging these animals. Photos of each set of antlers were also obtained.

*Unit 1C:* Thirty four bull moose were harvested. Incisors were collected for aging from all but a few of the moose, and antler photos were taken of most of the bulls. Within the Gustavus portion of Unit 1C, all bulls taken at Gustavus were checked for antler configuration because of the spike fork 50” or 3 brow tine antler restriction hunt.

*Unit 1D*: Twenty two bulls were harvested. Incisors, antler measurements, antler point counts, and antler photos were collected from each of the harvested bull moose.

*Unit 3:* Thirty six bulls were harvested. Incisors were collected for aging and antler photos were obtained from these moose.

*Unit 5:* Forty four bull moose were harvested throughout the unit. Incisors were collected from all harvested bull moose, and photos of antlers were obtained for nearly all specimens.

ACTIVITY 3: Collect anecdotal information about Region I moose populations through contacts with hunters.

Staff in Douglas and those in the outer offices of Haines and Yakutat discussed moose management with hunters during the permitting process as well as when hunters dropped off their moose jaws and/or hunt reports. In addition, Douglas staff spent time in the field at Gustavus and Haines during the moose hunts to collect samples and to interact with hunters and to discuss moose populations and moose management. Douglas staff attended Advisory Committee meetings in Juneau, Haines, Yakutat, and Gustavus to discuss moose management issues. Staff also conducted public meetings in Haines, and Gustavus to specifically address moose management issues.

Staff in the Petersburg area office discussed moose management and the status of the Unit 1B and 3 moose population with the Board of Game and interested hunters from Petersburg, Wrangell, Kake and other communities. During fall 2012, staff again collected anecdotal information on the number of bulls, cows, and calves observed by hunters during the moose hunting season by way of a question on the RM038 moose registration permit hunt report.

ACTIVITY 4: Conduct aerial surveys to assess sex and age composition of moose in key management areas of the region.

Sex and age composition was attained in Unit 1B (Stikine River), 1C (Gustavus, and Berners Bay), 1D, and 5A.

*Unit 1B:* Sixty five moose were counted (8 bulls, 41 cows, 16 calves).

*Unit 1C:* Two hundred twenty seven moose were counted in 2 areas, Gustavus and Berners Bay (42 bulls, 28 calves, 81 cows and 76 moose of unknown sex).

*Unit 1D*: One hundred seventy seven moose were counted (42 bulls, 109 cows, 24 calves, and 2 unknown sex).

*Unit 5A-Yakutat forelands*: No surveys were conducted in FY13.

ACTIVITY 5: Conduct calf production surveys as time and budget allows.

No calf production surveys were conducted in the Petersburg Area due to sightability problems associated with leaf-out of vegetation.

*Unit 1C*: Productivity surveys were conducted in Gustavus and Berners Bay for the sample of collared cow moose. Both ground tracking and helicopter tracking were used to locate the animals and determine if they had a calf.

Activity 6: Conduct moose browse surveys and habitat analysis on discreet moose winter ranges throughout Region I.

No browse surveys or habitat analysis were conducted during this report period.

**Activities by Unit**

**Unit 1B:**

Activity 1: Obtain age estimates of harvested moose by sectioning incisor teeth.

Incisors from 30 bull moose were collected and sent to a lab for aging.

Activity 2: Collect information on age and antler architecture of all harvested moose to evaluate current antler restrictions.

The 2012 fall season was the 4th year of the liberalized season where moose with 2 brow tines on each side were legal for harvest. Age data collected from 9 bulls that had two brow tines on both antlers had a median age of 4 years, which was less than desired under the current selective harvest strategy.

**Unit 1C:**

Activity 1: Do at least one sex and age composition survey each of the Berners Bay, Taku River, Endicott/St. James Bay, and Gustavus Forelands populations.

Two hundred twenty seven moose were counted in 2 areas, Gustavus and Berners Bay: (42 bulls, 28 calves, 81 cows and 76 moose of unknown sex). Surveys were not conducted in the Taku River or in the Endicott River.

Activity 2: Monitor habitat conditions on the Gustavus Forelands by ground surveys of willow browse, using standard counts of number of leaders, amount of annual production, and level of browsing by moose.

Browse surveys were not conducted during this FY.

Activity 3: Monitor radio collared moose in Gustavus and Berners Bay to provide insight into moose body condition, pregnancy status, survival, and movement patterns.

Gustavus: Thirty nine collared moose were monitored.
Berners Bay: Thirty eight collared moose were monitored.

**Unit 1D:**

ACTIVITY 1: Do at least one sex and age composition survey of the Chilkat Valley population.

One hundred seventy seven moose were counted (42 bulls, 109 cows, 24 calves, and 2 unknown sex).

Activity 2: Monitor habitat conditions in the Chilkat Valley by ground surveys of willow browse, using standard counts of number of leaders, amount of annual production, and level of browsing by moose.

Browse surveys were not conducted during this report period.

**Unit 2**

Activity 1: Document reported moose sightings in Unit 2.

Anecdotal reports of moose were noted.

**Unit 3**

Activity 1: Opportunistically collect anecdotal information about moose populations of Mitkof, Wrangell, Kupreanof, and adjacent islands.

This was accomplished during the sealing of bears and in talking to moose hunters and deer hunters.

Activity 2: Obtain age estimates of harvested moose by tooth section.

Teeth from 36 bulls were sent in for age analysis.

Activity 3: Collect information on age and antler architecture of all harvested moose to evaluate current antler restrictions.

The 2012 fall season was the 4th year of the liberalized season where moose with 2 brow tines on a side were legal for harvest. Age data collected from 13 bulls that had two brow tines on both antlers had a median age of 7 years, which remained in keeping with the current selective harvest strategy.

**Unit 5**

Activity 1: Conduct at least one sex and age composition survey each for the Yakutat Forelands, Nunatak Bench, and Malaspina Forelands populations.

No surveys were conducted during this FY.

**Submitted by:** Neil Barten, Region I Management Coordinator

## Region II – Southcentral Alaska

**Regionwide:**

ACTIVITY : Prepare biennial regional moose management reports.

Moose management report was drafted and submitted for publication in 2012. Staff continue to collect information for preparation of the next report.

ACTIVITY : Conduct aerial sex and age composition surveys in all units to determine status, trend, productivity, and mortality of moose.

Surveys were completed in selected hunt areas within individual GMUs. See Unit specific activities.

ACTIVITY : Monitor the moose harvest through field observations, hunter harvest reports, and contact with hunters.

These are standard activities accomplished in each office. See Unit specific activities.

ACTIVITY : Provide information to state and federal regulatory processes on moose management.

Staff routinely interact with federal staff and discuss management of moose relative to the respective regulatory systems. Staff attended the state Board of Game meeting during this reporting period.

**Activities by Unit:**

**Unit 6**

ACTIVITY : Snow conditions did not allow for moose survey completion this year.

ACTIVITY : We issued 234 permits for a total harvest of 46 moose.

**Units 7&15**

ACTIVITY : Six composition surveys in Unit 15A tallied 372 moose, a bull:cow ratio of 30:100, and 16% calves. No composition surveys were conducted in Unit 15B. Three composition surveys in Unit 15C tallied 650 moose, a bull:cow ratio of 22:100, and 11% calves. No composition surveys were conducted in Unit 7.

ACTIVITY : Hunter harvest and participation were both down during the reporting period compared to historic numbers most likely due to hunting restrictions put in place to increase bull to cow ratios. These restrictions appear to have been effective in meeting the objective as per our composition counts reported above. Harvest for the general season was 35 bulls taken, with an additional 40 moose taken on drawing permits, and 9 animals harvested under the subsistence season. 656 hunters participated during the general season and an additional 138 participated in the draw and subsistence hunts.

ACTIVITY : Skilak Loop Wildlife Management Area: provide opportunities to view moose in cooperation with Kenai National Wildlife Refuge. No explicit activities were conducted to aid in moose viewing.

ACTIVITY : GSPE surveys were conducted during February in units 15A and 15C. The population estimate produced for 15A was 1569 (±300, 95% CI), a decrease from the previous population

estimate. The survey in 15C produced an estimate of 3,204 moose (±650, 95% CI), which is an increase from the last population estimate.

**Unit 14C**

ACTIVITY : Surveys were not conducted during this reporting period due to inclement weather and lack of snow coverage.

ACTIVITY : 102 moose were harvested during the reporting period including 25 cows and 77 bulls.

**Submitted by: Gino Del Frate**

**Date: 6 September 2013**

## Region III – Interior Alaska

**Regionwide Activities**

ACTIVITY 1: Monitor harvest and analyze harvest data.

Monitored preliminary harvest of 3,576 moose during general season and registration and drawing permit hunts and analyzed harvest data.

ACTIVITY 2: Monitor natural mortality and analyze mortality data.

Monitored natural mortality and analyzed mortality data.

ACTIVITY 3: Provide moose management information to state and federal regulatory processes.

Provided information to 15 State fish and game advisory committees, the Alaska Board of Game, and 2 Federal regional advisory councils and the Federal Subsistence Board.

ACTIVITY 4: Capture approximately 50 moose to deploy radiocollars and collect information on movements, productivity, and/or morality.

Captured 43 moose in Unit 19A and 60 moose in Unit 24B to deploy radiocollars, with no capture related mortalities, and collected information on movements, productivity and/or mortality.

**Activities by Unit**

**Unit 12**

ACTIVITY 1: Conduct geostatistical population estimation or trend/composition surveys.

Completed population estimation surveys in a 2,702 $mi^2$ area in northwest Unit 12 resulting in a population estimate of 2,690-3,426 moose and a bull:cow ratio of 28 bulls:100 cows in this portion of Unit 12.

**Unit 19**

ACTIVITY 1: Conduct trend/ composition surveys.

Planned but did not conduct composition/trend surveys in eastern Unit 19A, western Unit 19A, and in the Farewell area in Unit 19C.

Conducted a GSPE moose population and composition estimation survey in Unit 19D near McGrath in Nov 2012 and obtained an estimate of 1337 moose ± 199 at 90% CI in a 1,118 $mi^2$ area with 35 (±11) calves:100 cows, 38 (±5) bulls:100 cows, and 7 (±2) yearling bulls:100 cows.

ACTIVITY 2: Conduct spring calf twinning surveys.

Conducted a spring calf twinning survey in Unit 19A in early June 2013. We found 41 cows with litters, including 23 sets of twins (54% twinning rate).

ACTIVITY 3: Conduct snow depth aerial surveys.

Conducted aerial snow depth surveys between November 2012 and April 2013.

**Unit 20A**

ACTIVITY 1: Conduct geostatistical population estimation surveys.

Conducted geostatistical population estimation surveys, estimating 12,193 moose.

ACTIVITY 2: Conduct spring calf twinning surveys.

Conducted May twinning surveys (12%, $n$ = 123).

**Unit 20B**

ACTIVITY 1: Conduct a geospatial population estimation or trend area surveys.

Conducted geostatistical population estimation surveys in eastern 20B (2310 moose); unable to complete surveys in remainder of unit due to weather.

ACTIVITY 2: Conduct spring calf twinning surveys.

Conducted May twinning surveys (Minto Flats = 22%, Central Unit 20B = 6%).

**Unit 20D**

ACTIVITY 1: Conduct a Geo-Statistical population estimate.

Conducted geostatistical population estimation surveys in southern Unit 20D (estimate not yet available) and in northern 20D (2,406 moose).

ACTIVITY 2: Conduct spring calf twinning surveys.

Conducted spring moose calf twinning surveys, resulting in a 27% twinning rate.

**Unit 20E**

ACTIVITY 1: Conduct moose population estimation surveys.

Completed population estimation surveys in a 4,630 $mi^2$ area in southern Unit 20E resulting in a population estimate of 3,512-4,817 moose and a bull:cow ratio of 53 bulls:100 cows.

ACTIVITY 2: Conduct spring twinning surveys.

Conducted a moose twinning survey in southwest Unit 20E to evaluate nutritional condition of habitat for moose, resulting in a twinning rate estimate of 32%.

**Unit 21A and 21E**

ACTIVITY 1: Conduct trend/composition surveys.

Planned but did not conduct composition–trend surveys in the Yukon-Innoko area in Unit 21E and the Innoko area in Unit 21A because of poor survey conditions.

ACTIVITY 2: Conduct spring calf twinning surveys.

Coordinated with the Innoko National Wildlife Refuge as they conducted a moose twinning survey in Unit 21E where they found 56 cows with litters, including 18 cows with twins and a 32% twinning rate.

ACTIVITY 3: Conduct snow depth aerial surveys.

Conducted aerial snow depth surveys between November 2012 and April 2013.

**Unit 21B**

ACTIVITY 1: Conduct population estimation or trend area surveys.

Planned but did not conduct surveys due to poor survey conditions.

ACTIVITY 2: Assist US Fish and Wildlife Service in the operation of a hunter checkstation on the Nowitna River.

Provided support to hunter checkstation and checked 92 hunters with 31 moose harvested.

**Unit 21C**

ACTIVITY 1: Conduct a hunter check station on the Koyukuk River.

In combination with Units 21D and 24, registered 572 hunters at a check station on the Koyukuk River and checked 229 moose.

**Unit 21D**

ACTIVITY 1: Conduct fall trend area surveys.

Planned but did not conduct fall surveys due to poor survey conditions.

ACTIVITY 2: Conduct spring twinning surveys.

Planned but did not conduct twinning surveys due to flooding.

ACTIVITY 3: Conduct a hunter check station on the Koyukuk River.

In combination with Units 21C and 24, registered 572 hunters at a check station on the Koyukuk River and checked 229 moose.

**Unit 24**

ACTIVITY 1: Conduct fall trend area surveys.

Planned but did not conduct fall surveys due to poor survey conditions.

ACTIVITY 2: Conduct spring twinning surveys.

Counted 49 cow:calf pairs.

ACTIVITY 3: Operate a hunter check station on the Koyukuk River.

In combination with Units 21C and 24, registered 572 hunters at checkstation on the Koyukuk River and checked 229 moose.

ACTIVITY 4: Conduct GSPE moose survey.

Planned but did not conduct a survey due to poor survey conditions

**Units 25A, 25B and 25D**

ACTIVITY 1: Conduct a geostatistical population estimation surveys or composition surveys.

No surveys conducted in Unit 25D because of poor survey conditions; trend survey completed in a portion of Uni25A.

**Units 26B and 26C**

ACTIVITY 1: Conduct riparian zone minimum direct count surveys.

Conducted a riparian zone minimum direct count survey in April 2013, with preliminary data indicating 396 moose including 36 calves observed.

**Submitted by:** Roy A. Nowlin, Region III Management Coordinator

## Region IV—Southcentral and Southwest Alaska

**Project Location:** Game Management Units 9, 11, 13, 14A, 14B, 16, and 17

**Regionwide:**

ACTIVITY 1: Prepare biennial regional moose management reports.

Biennial moose management reports were written and submitted to the region for editing.

ACTIVITY 2: Conduct aerial sex and age composition surveys in all units to determine status, trend, productivity, and mortality of moose.

*Unit 9:* A composition survey of the Unit 9C and Nakeen area of 9B was conducted December 2012. Poor weather allowed a partial survey only. Bulls: 7, Cows: 35, Calves: 2, Total: 43.

*Unit 11:* Composition surveys were flown during November in CA 11. Bulls: 120, Cows: 143, Calves: 19, Total: 282.

*Unit 13:* Composition surveys were flown during November in 8 distinct count areas. Bulls: 1,154, Cows: 3,667, Calves: 583, Total: 5,404.

*Unit 14 A&B:* Sex and age composition surveys were flown during November in Unit 14A. Bulls: 189, Cows: 737, Calves: 205, Total: 1131.

*Unit 16 & 17:* No sex and age compositions surveys for moose were conducted because insufficient snow precludes fall moose surveys in this area.

ACTIVITY 3: Monitor the moose harvest through field observations, hunter harvest reports, and contact with hunters.

| Unit | Male | Female | Unknown | Total Harvest |
|---|---|---|---|---|
| *Unit 9:* | 92 | 0 | 0 | 92 |
| *Unit 11:* | 50 | 0 | 0 | 50 |
| *Unit 13:* | 708 | 5 | 0 | 713 |
| *Unit 14A:* | 321 | 122 | 4 | 447 |
| *Unit 14B:* | 43 | 1 | 0 | 44 |
| *Unit 16:* | 328 | 10 | 7 | 345 |
| *Unit 17:* | 194 | 0 | 3 | 197 |

**Activities by Unit:**

**Unit 14A&14B:**

ACTIVITY 1: Conduct a fall moose census (GSPE) in select areas.

Poor snow conditions prevented GSPE surveys of Unit 14.

ACTIVITY 2: Monitor moose population for diseases including Chronic Wasting Disease.

Disease surveillance was conducted on samples from road-kill and hot spot hunt moose.

**Unit 16:**

ACTIVITY 1: Conduct a fall moose census (GSPE) in select areas.

Poor snow conditions prevented GSPE surveys in Unit 16.

**Unit 17**

ACTIVITY 1: Conduct a spring moose population survey (modified Gasaway or VerHoef) in select areas.

No population estimation survey was conducted in Unit 17 because of space and time conflicts with wolf control program in Unit 17.

**Submitted by:** Lem Butler, Region IV Management Coordinator

**Date:** 15 August, 2013

## Region V—Northern and Western Alaska

**Regionwide:**

ACTIVITY 1: Provide information to State and Federal regulatory processes on moose management.

Area management staff reviewed State and Federal regulatory proposals, attended regulatory process meetings, and presented moose information to the State Board of Game, State Fish and Game Advisory Committees, Federal Subsistence Board, and Federal Subsistence Regional Advisory Councils.

**Activities by Unit:**

**Unit 18:**

ACTIVITY 1: Conduct fall aerial sex and age composition surveys and calf production surveys in selected portions of Unit 18.

Weather prevented us from flying composition surveys in the fall of 2012.

ACTIVITY 2: Conduct spring aerial surveys (trend area surveys, distribution surveys, or calf production surveys) in selected portions of Unit 18 to assess population trend and recruitment.

We flew spring twining surveys on the Yukon River and Kuskokwim Rivers in late May 2013. In three days of flying we observed a total of 59 cows accompanied by calves. Twinning rates were 49% in the Lowest Yukon area, and 52% in the Kuskokwim area.

ACTIVITY 3: Conduct geostatistical population estimation surveys (GSPE), (regular) population estimation surveys, riparian zone minimum direct count surveys, or other appropriate census techniques, to estimate the size of moose populations in selected portions of Unit 18.

We conducted a GSPE survey in February 2013 in the Paimiut Count Area. The midpoint of the estimate was 5597 moose with a 90% confidence interval of 14.9%. The calf:adult ratio was 36 calves:100 adult moose.

ACTIVITY 4: Monitor overall hunting activity through hunter checkstations, harvest reporting, hunter contacts, and field observations.

We analyzed harvest reports and found that 479 moose were reported taken in Unit 18 in the Yukon drainage. Hunters also reported harvesting 3 moose in the Kanektok River

drainage and 18 in the Goodnews River drainage. We contacted moose hunters opportunistically throughout the year. We also spent approximately 6 days contacting hunters by boat in the Bethel area on the Kuskokwim River during the hunting season for registration permit hunt RM615. Harvest was 102 moose in RM615 in RY12.

ACTIVITY 5: Monitor other mortality factors through public contacts and field observations.

We observed very little wolf sign or wolves during moose calving surveys. We received fewer reports from hunters/trappers and the public regarding wolf kills than in the past several years.

ACTIVITY 6: Assess habitat quality through browse surveys and field observations.

No work was completed toward this activity during the reporting period because department biologists were assigned to other S&I activities.

ACTIVITY 7: Capture adult or short yearling moose to attach radio collars, assess body condition in relation to habitat quality, and collect samples for disease and contaminant profiles. (All animal capture activities will follow the protocols established in the ADF&G Division of Wildlife Conservation "Animal Welfare Policy" and its wildlife capture and restraint manual.)

We captured, weighed and fitted VHF collars on 23 short yearling cow moose in April 2013.The average weight of these was 175 kg. Blood samples were taken to participate in trace mineral data studies done by staff in Fairbanks. There were no capture mortalities during this activity.

ACTIVITY 8: Monitor distribution, movement, and dispersal of collared moose using radiotelemetry data and aerial survey observations.

We have periodically monitored the 23 cow moose that have been fitted with radio collars.

ACTIVITY 9: Work with the Association of Village Council Presidents (AVCP), Kuskokwim Native Association (KNA), The Kuskokwim Corporation (TKC), U.S. Fish and Wildlife Service (FWS), Unit 19 and 21A/E area biologist, affected Advisory Committees, local moose hunters, and other users to resolve conflicts between upriver and downriver uses.

Much of the upriver-downriver conflicts along the Yukon River have been resolved as moose populations have become established and increased in the downriver areas. Along the Lower Kuskokwim River, we have implemented a quota-based registration permit moose hunt and the availability of hunting opportunity has helped alleviate the conflicts between user groups. We also fielded numerous questions regarding hunting moose upriver on the Kuskokwim River.

ACTIVITY 10: Continue educational efforts toward increasing moose populations in the smaller drainages in Unit 18.

Along with the USFWS, we continue to provide summary information at meetings arranged by villages, Advisory Committees, and Regional Advisory Councils.

ACTIVITY 11: Implement the cooperative moose management strategy for the Kuskokwim River moose population with participation from the Lower Kuskokwim Advisory Committee, the Yukon Delta National Wildlife Refuge (YDNWR), and interested local groups and communities.

We attended and presented information at several public meetings including: Lower Kuskokwim Advisory Committee meeting; Y-K Delta Regional Advisory Council meeting.

ACTIVITY 12: Develop an ongoing cooperative moose management strategy for the moose population within the Togiak Refuge portion of Unit 18 with local village leaders, members of the Central Bering Sea Advisory Committee, the Regional Advisory Council, the Togiak National Wildlife Refuge (TNWR), and interested local groups and communities.

The Unit 18 communities of Goodnews Bay and Platinum and other agency participants agreed to continue the strategy to encourage moose to colonize the Goodnews River drainage and the portion of Unit 18 south of the Goodnews River drainage during this reporting period.

**Unit 22:**

ACTIVITY 1: Conduct a geostatistical population estimation survey (GSPE) or a riparian zone minimum direct count survey in a portion of the unit to monitor trends in population size, sex/age composition, and recruitment.

A geospatial moose census was completed in Unit 22C and the western portion of Unit 22B. Unit 22C has an observable moose census estimate of 429 moose (±17% at 90% C.I.), and the calf:adult ratio is 15 calves:100 adults. The Unit 22B area has an observable mose census estimate of 618 moose (±19% at 90% C.I.), and the calf:adult ratio is 10 calves:100 adults. We estimated sightability in the Unit 22B area and found a sightability correction factor of 1.26 (SE=0.180). The estimate of total abundance in the Unit 22B area in this case is 767 (+/-29% at 90% C.I.).

ACTIVITY 2: Complete trend area surveys, sex and age composition surveys, or other aerial surveys (where appropriate) during late fall and early spring to provide an index of moose population status and trends, sex and age composition, and yearling recruitment.

Staff completed fall composition surveys in Units 22C during the reporting period. We classified 237 moose and found 17 bulls:100 cows and 17 calves:100 adults. Additional fall recruitment surveys were not completed because staff also captured muskox during the same time period.

Spring recruitment surveys were not completed because a geostatistical population estimate survey was completed during the spring in Units 22B and 22C, and staff also classified muskox in Unit 22B and 22C during the same time period.

ACTIVITY 3: Monitor human and natural mortality factors affecting the population.

Human harvest was monitored through the harvest ticket/registration permit reporting system and community-based harvest assessment surveys. No surveys were attempted to determine natural mortality rates of Seward Peninsula moose. Anecdotal evidence indicates bear predation on moose calves is depressing moose populations in much of the unit, specifically in areas of Units 22A and 22B.

ACTIVITY 4: Evaluate hunting mortality by analyzing all moose harvest data.

Hunt reports were received for a bull fall registration hunts (RM840 including hunt areas: Unit 22C, Unit 22B west of the Darby Mountains, Unit 22D Kuzitrin River drainage, and Unit 22D Southwest, and RM841 in the central portion of Unit 22A), an antlered bull

winter registration hunt (RM849 including Unit 22B west of the Darby Mountains), a nonresident bull registration hunt (RM842 in a portion of Unit 22D), and 2 antlerless fall registration hunts (RM850 and RM852 in Unit 22C). Harvest from other areas of the unit was monitored by harvest ticket report cards (GM000). Total reported harvest for Unit 22 during the reporting period was 182 moose (Unit 22A-31, 22B-30, 22C-37, 22D- 70, 22E-14). The Department documented 193 moose in 2011-2012, 168 moose in 2010-2011, and 192 moose in 2009-2010 through similar reporting methods.

ACTIVITY 5: Improve harvest reporting through public education and improved communication and by conducting Community-based Harvest Assessments in selected villages.

The importance of harvest reporting was emphasized to registration permit recipients, village license vendors, and hunters at village meetings in Nome, Shishmaref, Wales, Brevig Mission, Teller, White Mountain, Golovin, Elim, Koyuk, and Unalakleet. Public service announcements were posted in Nome and residents of Unit 22 villages were notified by radio announcements. Compliance with reporting requirements has improved in the registration hunts in the Nome area; however village surveys remain a more effective method of obtaining village harvest data.

ACTIVITY 6: Evaluate hunting regulations and recommend changes, if necessary, for conservation purposes.

Hunting regulations were evaluated at an annual Advisory Committee meeting and an annual Regional Advisory Council meeting. There were no changes to moose regulations during the reporting period.

ACTIVITY 7: Use public education to improve understanding of hunting regulations and the value of conserving moose populations, and to obtain better harvest data through increased harvest reporting.

Staff attended Advisory Committee meetings, federal Regional Advisory Council meetings, and the annual Reindeer Herders Association meeting to improve public understanding of harvest reporting and status of moose populations.

**Unit 23:**

ACTIVITY 1: Conduct geostatistical population estimation surveys, sex and age composition surveys, and calf survival counts where appropriate in the unit to monitor trends in population density, sex and age composition, and recruitment.

A geospatial population census was conducted during this reporting period in the portion of Unit 23 containing the Lower Noatak Drainage , Cape Krusenstern,and the Wulik and Kivalina drainages in early March 2013. Density of adult moose was 0.21 moose/$mi^2$ and the calf:adult ratio was 11:100.

Sex and age composition data was also collected using a geospatial approach in the in the in the portion of Unit 23 containing the Lower Noatak Drainage , Cape Krusenstern,and the Wulik and Kivalina drainages in November 2011. The population sex ratio was 45 bulls:100 cows. The population age ratio was 12 calves:100 cows.

Both the population estimate and the composition surveys were joint efforts between NPS, USFWS, BLM, and ADF&G.

ACTIVITY 2: Perform twinning surveys (calf production surveys) to monitor changes in habitat quality.

Scheduling conflicts prevented twinning surveys this year.

ACTIVITY 3: Monitor hunting activity and harvests through the statewide harvest ticket system, Community-based Harvest Assessments, public contacts and field observations.

We monitored hunting activity and harvests through the statewide harvest ticket, registration permit and drawing permit systems and community-based harvest assessments: 433 hunters reported taking 131 moose through the statewide harvest ticket system and the registration permit system. Community-based harvest assessments suggested residents of Unit 23 have taken 400-425 moose annually during recent years, substantially more than indicated by harvest ticket hunt reports. Nonresident hunters (49 reported) took 22 moose.

ACTIVITY 4: Continue the Unit 23 User Issues planning process to minimize user-group conflicts in relation to biological parameters of moose.

Staff participated in the May 2013 meeting of the Unit 23 User Issues working group. Summary information is posted at ADF&G website: http://www.adfg.alaska.gov/index.cfm?adfg=wildlifeplanning.unit23

ACTIVITY 5: Use public education to improve understanding of hunting regulations and the value of conserving moose populations, and to obtain better harvest data through increased harvest reporting.

We spoke with many local and nonlocal hunters to improve the accuracy of moose harvest data. Public Service Announcements were recorded for radio broadcast to help educate the hunters about regulations and acquiring the necessary permits. This year, harvest reports were actively pursued by staff and nearly 100% compliance was achieved.

ACTIVITY 6: Monitor predator populations and other mortality factors by logging bear and wolf observations during moose surveys, and through field observations and public contacts.

Incidental observations of bear, wolves, and other wildlife species were recorded during moose surveys during April and November 2013. Due to small sample size, no additional analysis was completed.

ACTIVITY 7: Examine dead moose to look for causes of death

Locations of moose mortalities were noted during GSPE census surveys in April 2013, but no site visits were completed due to determine cause of death.

**Unit 26A:**

ACTIVITY 1: Survey unit-wide riparian zones and other suitable areas of willow habitat, using trend area surveys, riparian zone minimum direct count surveys, or other appropriate census techniques to estimate the moose population trend in Unit 26A.

We conducted a riparian zone direct minimum count in the trend count area for moose in Unit 26A on 2-3 April 2013. We counted a total of 308 moose. There were 260 adults and 48 short yearlings that had survived the winter (16%), including 6 set of twins.

ACTIVITY 2: Conduct a fall aerial sex and age composition survey of the Colville River population.

We conducted a fall sex and age composition survey from 3-5 November 2012. We observed 168 moose, including 57 bulls (69 bulls:100 cows), 83 cows, and 28 calves (34 calves:100 cows, 17%). There was 1 set of twins. Antler spreads were estimated and 12% were less than 30 inches, 12% were 30-39 inches, 11% were 40-49 inches, 37% were 50-59 inches, and 28% were over 60 inches.

ACTIVITY 3: Conduct spring, summer, and fall radio telemetry surveys to examine calf production and survival and adult distribution and mortality rates.

We conducted radio telemetry calving surveys on 8-12 June. We observed 20 cows that had 13 calves (65 calves:100 cows). There were 2 sets of twins (15.4% twinning rate).

ACTIVITY 4: Monitor predator populations by logging bear and wolf observations during moose surveys and other mortality factors through field observations and public contacts.

We observed 15 wolves, 2 bears, 3 wolverines, and 0 lynx during the spring trend count of 2013.

Activity 5: Examine dead moose to look for causes of death, disease, mineral deficiencies, and contaminants.

We examined and collected samples from dead moose that were found during the trend count in April and calving surveys in June.

ACTIVITY 6: Evaluate quantity and quality of moose browse in portions of Unit 26A.

We helped collect samples to assess the quality of moose browse in Unit 26A during the following plant phenology periods: late winter, green-up, peak growth, and senescence. These samples are currently being analyzed for leaf nitrogen, digestible proteins, and tannin-protein precipitation capacity.

ACTIVITY 7: Monitor hunting activity and harvests through the statewide harvest ticket system, Community-based Harvest Assessments, public contacts and field observations.

Hunt report information indicates that 3 bulls were harvested in drawing hunt DM981, 2 moose were harvested in DM980, and 4 moose were harvested in the general season hunt.

ACTIVITY 8: Develop updated population objectives in cooperation with the public and other agencies.

We worked with the North Slope Borough Fish and Game Management Committee to discuss population and management objectives.

**Submitted by:** Peter Bente, Survey and Inventory Coordinator, Region V

**Date:** 1 September 2013