Alaska Department of Fish and Game
Division of Wildlife Conservation
(907) 465-4190--PO Box 115526
Juneau, AK 99811-5526

CHAPTER 35: MOOSE MANAGEMENT REPORT

From: 1 July 2011
To: 30 June 2013[1]

LOCATION

GAME MANAGEMENT UNIT: 26A (56,000 mi^2)

GEOGRAPHICAL DESCRIPTION: Western North Slope

BACKGROUND

Archaeological evidence indicates moose have been present on the North Slope either sporadically or at low densities for many years. Since about 1940, moose populations have increased in size and have become well established in Unit 26A. Nearly all moose are confined to riparian habitat along river corridors during winter. During summer, many moose move into small tributaries and hills surrounding riparian habitat, and some disperse as far as the foothills of the Brooks Range and across the coastal plain. The largest winter concentrations of moose are found in the inland portions of the Colville River drainage.

Since 1970, late-winter surveys have been conducted annually to assess population status and short yearling (10-month-old calf) recruitment. Trend area counts were conducted each spring and complete census surveys of all major drainages in Unit 26A were completed in 1970, 1977, 1984, 1991, 1995, 1999, 2002, 2005, 2008, and 2011. Census surveys indicate that the population increased steadily from a count of 1,219 moose in 1970 to 1,535 in 1991, declined to 326 by 1999 (79% decline), increased to 1,180 in 2008, and declined to 609 moose in 2011 (Trent 1989; Carroll 2012). In trend area counts the number of moose declined from 610 in 2007 to 265 in 2010. In 2011 and 2012 we counted 282 and 284 moose, respectively, indicating that the declining trend may have ended (Carroll 2012).

The population decline of the 1990s was due to high adult mortality and poor calf survival. Fall composition surveys indicated that the parturition rate and/or summer survival were very low, as only 4%, 2%, and 0% calves were counted in 1993, 1994, and 1995, respectively. The decline appeared to be a combination of malnourishment, bacterial diseases, mineral deficiency, predation, weather factors, and competition with snowshoe hares (Carroll 1998). Samples were collected from hunter-killed moose and those that were found dead in 1995 and 1996. In addition, we captured, examined, sampled, and radiocollared 45 female and 5 male moose in 1996 and 1997. Analysis indicated that nearly all of the moose tested were marginally deficient

[1] This unit report also includes data collected outside the reporting period at the discretion of the reporting biologist.

in copper. Some of the cows captured in 1996 and 1997 tested positive for antibodies to the bacteria *Brucella suis biovar 4* (8 of 43) and *Leptospira interrogans serovar pomona* (6 of 30). Both diseases cause abortions and weak calves. Relatively high moose populations in the 1980s and early 1990s may have led to overbrowsing. Snowshoe hares moved into the area in the early 1990s and irrupted, placing further stress on the browse plants. Wolf and grizzly bear numbers were at relatively high levels during the time of the decline.

Radiotracking surveys and trend area counts indicated that the population began to recover in 1996, due to increased adult and calf survival rates. The mortality rate among collared adults averaged about 7% per year 1996–2003. Short yearling counts indicated recruitment ranged from 17% to 26% between 1997 and 2007, resulting in an increase from 152 moose in 1996 to 610 moose in the trend count area in 2007 (Carroll 2008). Recruitment rates declined drastically to 2% in both 2009 and 2010, resulting in a reduction in the trend area count to 265 moose. There was a modest increase in 2011 and 2012 to 11% and 18% and the number in the trend count area slowly increased to 284 (Carroll 2012).

Aircraft were used to transport moose hunters, gear, and moose parts in Unit 26A during all or part of the season from the early 1970s (Trent 1989) to 1995. Due to the population decline more restrictive regulations were instituted in the mid-1990s, including a ban on the use of aircraft to hunt moose between 1996 and 2005. As the population increased, regulations were liberalized, and, at its fall 2005 meeting, the Board of Game initiated a drawing permit hunt that allowed a limited number of hunters to use aircraft during moose hunts. Most local hunters travel by boat along the Colville River to hunt moose. The mean reported harvest from 1985 to 1993 was 59 moose per year, with a high of 67 in 1991. The harvest decreased to 40 during 1994–1995 and 14 in 1995–1996 as the moose population declined and regulations became more restrictive. Hunters harvested from 0 to 5 moose per year between 1996 and 2001 (Carroll 2002). For the period 2002–2010, hunters harvested from 5 to 13 moose annually (Carroll 2012).

MANAGEMENT DIRECTION

MANAGEMENT GOALS

- Allow for the recovery of the Unit 26A moose population and maintain a population of over 1,000 moose, with a bull:cow ratio of over 30:100.

- Maintain a moose population capable of satisfying subsistence and general hunt needs.

MANAGEMENT OBJECTIVES

- Conduct a unitwide spring census every 3–5 years and yearly spring trend area counts to assess population trend and recruitment.

- Conduct a yearly fall aerial sex and age composition survey of the Colville River population.

- Conduct radiotelemetry surveys to examine calf production and survival, distribution, and mortality rates each summer, fall, and spring.

- Monitor predator populations and other mortality factors through counts, field observations, and public contacts.

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

- Develop updated population objectives in cooperation with the public and other agencies.

METHODS

Piper PA–18 and Cessna 182 aircraft were used to conduct census, trend area, and fall composition counts. During the riparian zone minimum direct count census we attempted to survey all available moose habitat in Unit 26A. The trend count area included the Colville River valley from the mouth of the Killik River to the mouth of the Anaktuvuk River; the Chandler River below Sivugak Bluff; and the Anaktuvuk River below Table Top Mountain. During fall composition counts, we surveyed the trend count area, plus other selected areas, such as the lower Colville River and the Killik River. For all surveys we flew over suitable riparian habitat and attempted to locate all the moose in the survey areas. We determined short yearling recruitment and total number of moose during spring surveys; we determined sex and age composition, and estimated the antler size of bulls during the fall surveys. Surveys to locate and observe radiocollared moose were flown in conjunction with these surveys.

Calving success and twinning rate surveys were flown during the second week of June. We radiotracked all collared cows, obtained global positioning system locations, and recorded whether they had 0, 1, or 2 calves. Then the number of calves per 100 cows and the twinning rate (number of sets of twins divided by the number of parturient collared females) were calculated. Any cows that did not have calves early in the survey period were observed again later.

We are working with another department employee to collect browse samples to assess the quality of moose browse in Unit 26A. Browse samples were collected on a yearly basis from areas where moose were browsing in late winter, at green-up, at peak growth, and at senescence of the plants. These samples are being analyzed for leaf nitrogen, digestible proteins, and tannin-protein precipitation capacity. Results can be compared to samples from other parts of the state to give us an idea of the relative quality of the browse in Unit 26A.

Harvest data were summarized by regulatory year (RY), which begins 1 July and ends 30 June (e.g., RY11 = 1 July 2011–30 June 2012). Harvest data were compiled from harvest reports submitted by hunters, from subsistence harvest surveys, and from talking to hunters.

RESULTS AND DISCUSSION

POPULATION STATUS AND TREND

Population Size and Trend

We completed a census 6–9 April 2014 and counted a total of 294 moose, including 290 adults and 4 short yearlings (10-month-old calves) for a 1% recruitment rate. This was a 75% decrease from the 2008 census, when we counted 1,180 moose (Table 1, Fig. 1).

Trend area counts were conducted 11–12 April 2012, 2–3 April 2013, and 6–9 April 2014. In 2012, we counted 284 moose, including 233 adults and 51 calves (18% recruitment rate). In 2013, we counted 308 moose, including 260 adults and 48 short yearlings (16% recruitment rate). In 2014, we counted 165 moose, including 164 adults and only 1 calf (1% recruitment rate). These counts indicate that, after declining to 265 moose within the trend count area in

2010, the number slowly grew to 308 moose in 2013, but crashed again to 165 moose in 2014 (Table 2, Figure 2). There was a very late spring in 2013, which resulted in malnourishment, very poor calf survival, and a 47% decline between 2013 and 2014.

Past trend counts indicated that the number of moose in the trend area declined during the period 1991 (647 moose) until 1996 (152 moose), then increased steadily until 2005 (602 moose), remained stable until 2007 (610 moose), and declined to 265 moose in 2010 (Table 2, Figure 2).

Population Composition

The percentage of short yearlings counted in spring surveys was very low in 2009 and 2010 (2% both years), but improved to 11% in 2011, 18% in 2012, and 16% in 2013. In 2014 it dropped to 1% (Table 2, Fig. 2).

On spring calving surveys during 9–12 June 2012 we observed 25 collared cows and 9 had no calf, 10 had 1 calf, and 6 had twins (88 calves:100 cows and 38% twins). During 8–12 June 2013 we observed 20 collared cows and 7 had no calf, 11 had 1 calf, and 2 had twins (65 calves:100 cows and 15% twins). The calculated number of calves:100 cows was relatively high in 2012 and midrange in 2013. The percentage of twins was midrange in 2012 and fairly low in 2013 (Table 3).

Fall composition surveys were flown in 2001, 2012, and 2013 (Table 4). During 11–14 Nov 2011 we observed 131 moose within the trend count area, including 43 bulls (67 bulls:100 cows), 64 cows, and 24 calves (38 calves:100 cows, 18% calves). During 3–5 Nov 2012 we observed 168 moose, including 57 bulls (69 bulls:100 cows), 83 cows, and 28 calves (34 calves:100 cows, 17% calves). During the fall of 2013 we surveyed from 8–12 November, but there was very little snow cover and many moose had not moved into the river bottoms. We saw only 58 moose, including 17 bulls (42 bulls:100 cows), 41 cows, and 0 calves (0 calves:100 cows, 0% calves). We also radiotracked and found 14 collared cows. Seven of these were dead and 7 had no calves. All of these moose were alive the previous June and most of them had calves. There was a serious mortality event during the summer of 2013.

Antler widths were estimated for all bulls sighted during fall composition surveys and are summarized in Table 5. With improved calf survival beginning in 2011 there was a modest increase in the percentage of bulls in the smaller antler size age groups.

Distribution and Movements

By late winter most moose can be found along major rivers and tributary streams of the Colville River drainage system. During late April, with diminishing snow cover in the foothills, moose begin to move away from the riparian corridors. During late May and early June many parturient cows move away from the river bottoms to calve. Bull moose disperse widely during the summer months, ranging from the northern foothills of the Brooks Range to the Arctic coast. Most cow moose move out of the river bottoms, but stay near riparian habitat during summer months, while some range onto the coastal plain. During fall, as snow cover accumulates, moose move back into the riparian corridors of the large river systems.

MORTALITY

Harvest

Season and Bag Limit.

Regulatory year RY11 and RY12	Resident Open Season (Subsistence and General Hunts)	Nonresident Open Season
Unit 26A: that portion west of 156° 00′ W. longitude and excluding the Colville River drainage.		
1 moose; a person may not take a calf or a cow accompanied by a calf	1 Jul–14 Sep (harvest ticket hunt)	No open season
Unit 26A: that portion in the Colville River drainage up-stream from and including the Anaktuvuk River drainage.		
1 bull	1 Aug–14 Sep (harvest ticket hunt)	No open season
Or 1 bull by drawing permit (excludes Anaktuvuk Pass Controlled Use Area)	1 Sep–14 Sep (Permit Hunt DM980/981)	1 Sep–14 Sep (Permit Hunt DM980/981)
Or 1 moose; a person may not take a calf or a cow accompanied by a calf	15 Feb–15 Apr (harvest ticket hunt)	No open season
Remainder of Unit 26A.	1 Aug–14 Sep (harvest ticket hunt)	No open season

Moose hunters, except for permit holders under DM980/981, may not use aircraft to transport hunters, hunting equipment, or parts of moose. Aircraft cannot be used to hunt moose in the Anaktuvuk Pass Controlled Use Area.

Board of Game Actions and Emergency Orders (EO). During its January 2014 meeting the Board of Game adopted regulations to lengthen the season for the harvest ticket hunt in the Colville River drainage up-stream from and including the Anaktuvuk River drainage and in Unit 26A Remainder (the rest of the Colville River Drainage and Ikpikpuk River drainage). The season was changed from 1 August–14 September to 1 August–30 September. The board also changed the drawing permit regulation so that 20% of permits would go to nonresident hunters rather than up to 20% going to nonresidents. In response to low moose populations the

department issued an EO for RY14 that closed the drawing permit hunts, all nonresident hunts, and the winter hunt. It also shortened the fall harvest ticket hunts on the Colville and Ikpikpuk River drainages to 1 August–14 September.

Hunter Harvest. Hunter harvest and antler size for general season harvest are summarized in Tables 6 and 7. During the reporting period only one cow was harvested and most bulls harvested were over 50 inches.

Permit Hunts. In RY11 for DM980 5 permits were issued but no people hunted. For DM981 5 permits were issued, 4 people hunted, and 4 bull moose were harvested.

In RY12 for DM980 5 permits were issued, 3 people hunted, and 2 bull moose were harvested and for DM981 5 permits were issued, 3 people hunted, and 3 bull moose were harvested.

In RY13 for DM980 5 permits were issued but no people hunted and for DM981 5 permits were issued, 4 people hunted, and 3 bull moose were harvested.

Hunter Residency and Success. Hunter residency is summarized in Table 8. The number of nonlocal resident and nonresident hunters declined because of a reduction in the number of drawing permits issued and due to land access restrictions enforced by the landowner, Arctic Slope Regional Corporation.

Harvest Chronology. Harvest chronology is summarized in Table 9. As in past years, most moose were harvested during the first week of September, with the next highest harvests occurring in the second week of September (RY12) and in August (RY13). One moose was taken during the winter hunt.

Transport Methods. Transportation methods are summarized in Table 10. Most local residents used boats. Nonlocal residents and nonresidents used aircraft. Winter hunters used snow machines.

Other Mortality

After 3 years of slow growth from 265 moose counted in the trend count area in 2010 to 308 in 2013, the number crashed to 165 in 2014. Fall surveys indicated that much of the mortality occurred during the summer of 2013. Winter conditions persisted for 2–3 weeks longer than normal during the spring of 2013 and that was probably a major factor in the die-off.

Wolf predation is often a major factor in moose population fluctuations in Unit 26A. Wolf surveys indicated that wolf density declined from 4.1 wolves per 1,000 km^2 in 1994 to 1.6 wolves per 1,000 km^2 in 1998 and remained low through most of the period of moose population growth. However, during the fall 2007 moose composition count we observed 37 wolves compared to less than 10 in previous years. During a 2008 reconnaissance track wolf survey, we found 4.4 wolves per 1,000 km^2 in the core area for the Unit 26A moose population (Carroll 2009). In addition, the number of wolves seen during moose surveys increased substantially from 0.1 per hr in 2002 to 3.1 per hr in 2009. The moose population declined during this period of higher wolf density. The wolf sighting rate was 0.5 per hr in 2011, 2.6 wolves per hr in 2012, and 0.8 per hr in 2013.

Bear predation, particularly of calves, is probably also a substantial factor. From observations during surveys for other species and hunter reports, bears appear to be plentiful in the area.

Malnourishment appeared to be a factor in the 2008–2010 population decline. In 2008, we captured 22 short yearling (10-month-old) females and most of them were small and appeared to be malnourished. The weights of the short yearlings ranged 252–400 pounds and averaged 322 pounds. Short yearling moose calves have been weighed in other areas and the Unit 26A short yearlings were the lightest recorded in the state. In other areas the average weight has ranged 341–470 pounds. During the time of the capture operation, samples were collected from several carcasses that were found during surveys, and bone marrow indicated that most of those were malnourished. The survival rate of the collared yearlings was quite low, with only 3 still alive after 3 years.

Thus far, analyses of blood, hair, and fecal samples have not identified causes for increased mortality during the population decline of 2008–2010. Earlier, during the mid-1990s decline, several moose tested positive for antibodies to the bacteria *Brucella suis Biovar 4* (8 of 43) and *Leptospira interrogans serovar pomona* (6 of 30). However, analyses of samples from the current decline have not indicated a prevalence of bacterial disease. In addition, there have been no contaminants or parasites found that would lead to increased mortality. Nearly all of the moose have tested to be marginally deficient in copper, and this could affect their immunity and general fitness, but this probably has not changed from past years.

One cause for the increased mortality could be starvation due to a change in food quantity or quality (see section on Habitat). Another possible cause for the poor condition of many of the moose, particularly the calves, could be increased stress due to the sudden increase in the number of wolves. Before 2007, they probably encountered very few predators. After 2007, there were large packs of wolves working all of the major drainages, which probably caused stress to most of the moose that were present there.

HABITAT

Assessment

A survey was conducted to determine the quantity of browse available to moose in the winter in the riparian area in April 2008. Results of the study indicated a 12% browse removal rate, which is similar to other areas in the state with moderate browsing and twinning rates. It would appear that the quantity of browse was adequate and was not the reason for starvation in some of the moose.

In a collaborative effort, another department employee collected browse samples in Unit 26A and is assessing its quality. Samples were collected from areas where moose were browsing in late winter, at green-up, at peak growth, and at senescence of the plants. These samples are being analyzed for leaf nitrogen, digestible proteins, and tannin-protein precipitation capacity. Analysis is still in progress but preliminary results indicate that digestible protein quality of *Salix alaxensis* gathered during the winters of 2009 and 2010 along the Colville River was very low compared to other areas of the state (Bill Collins, ADF&G unpublished data).

One factor that could affect browse plants is that there are a large number of snowshoe hares in the area, which also consume willows. Hares often eat bark as well as branch ends from the

willows, which may stress the plants causing them to produce more tannins or other substances that may make them difficult to digest and less nourishing.

Enhancement

There were no habitat enhancement projects.

NONREGULATORY MANAGEMENT ISSUES/NEEDS

Under land-claims procedures, the Arctic Slope Regional Corporation selected most of the land along the Colville, Anaktuvuk, Chandler, and Killik rivers and this land has been transferred to them. The corporation is closing these lands to sport hunting and fishing and they will be open only for subsistence activities for shareholders and other qualified subsistence users that are residents of Native communities of the North Slope. The corporation lands encompass much of the hunt area for Unit 26A moose, so this has a large influence on how we manage hunts in this area.

CONCLUSIONS AND RECOMMENDATIONS

After several years of increasing population numbers, riparian zone minimum population censuses indicated that the Unit 26A moose population declined from 1,180 moose in 2008 to 294 moose 2014 (a 75% decline since 2008). Trend area counts completed each year along the Colville, Anaktuvuk, and Chandler rivers in the core area of the moose range indicated that the number of moose in the trend count area grew slowly from 265 moose in 2010 to 308 moose in 2013. However, the population again crashed during 2013–2014 and 165 moose (including only 1 short yearling) were counted in April 2014. A fall composition survey in November 2013 indicated that much of the mortality occurred during the summer of 2013. Winter conditions persisted for 2 to 3 weeks longer than normal during the spring of 2013 and that was probably a major factor in the die-off.

Malnourishment was apparently an issue in the decline from 2008 to 2010. Samples collected in 2008 showed short yearlings were small and malnourished. In 2009 and 2010 samples of blood, hair, and fecal content showed no indication of bacterial diseases contaminants, or parasites that would lead to increased mortality. Nearly all of the samples showed moose to be marginally deficient in copper, and this could affect their immunity and general fitness, but this probably has not changed from past years. Weather records indicated no unusual conditions that would have led to mortality.

Browse quantity and/or quality have been examined for sources of malnourishment. Browse removal rates (12%) were similar to other areas in the state with moderate browsing and twinning rates, and the quantity of browse seemed to be adequate to support the population. Preliminary analysis of browse quality from Colville River samples collected in 2009–2010 suggests that digestible protein quality of *Salix alaxensis* was very low compared to other areas of the state, probably leading to malnourishment. Unit 26A moose are at the northern limit of possible moose range and the vegetation they utilize has a very short growing season, which probably has an effect on the quality of the browse. In addition, snowshoe hares are numerous in the area and the combined impact of both species on browse plants could cause the plants to produce tannins, reducing their nutritional value.

Wolf predation continues to be an important factor in moose population fluctuations. The increasing number of wolves in the area coincided with the declining number of moose and low recruitment from 2008 to 2010. The number of wolves seen during moose surveys began to decline in 2010 and the recruitment number increased, causing the moose population to slowly grow. The reduction in wolf numbers resulted from 2 years of successful harvest by local hunters in the core moose habitat area surrounding Umiat. Bear predation, particularly of calves, has probably also been a substantial factor.

Due to the substantial decline in moose numbers, the department issued an EO for RY14 that closed the drawing permit hunts, all nonresident hunts, and the winter hunt. It also shortened the fall harvest ticket hunts on the Colville and Ikpikpuk River drainages to 1 August–14 September. A very limited summer moose hunt in western Unit 26A from 1 July–14 August remains open because very few moose are harvested in this hunt. The situation will be reassessed at the 2016 Board of Game meeting and regulations will be adjusted.

REFERENCES CITED

Carroll G. M. 1998. Unit 26 A moose survey-inventory management report. Pages 457–471 [*In*] M.V. Hicks, editor. Moose management report of survey-inventory activities, 1 July 1995–30 June 1997. Alaska Department of Fish and Game, Division of Game, Federal Aid in Wildlife Restoration Study 1.0, Juneau.

_____. 2002. Unit 26A moose management report. Pages 567–581 [*In*] C. Healy, editor. Moose management report of survey and inventory activities 1 July 1999–30 June 2001. Alaska Department of Fish and Game, Division of Wildlife Conservation, Federal Aid in Wildlife Restoration Project 1.0. Juneau.

_____. 2008. Unit 26A moose management report. Pages 648–667 [*In*] P. Harper, editor. Moose management report of survey and inventory activities 1 July 2005–30 June 2007. Alaska Department of Fish and Game, Division of Wildlife Conservation. Federal Aid in Wildlife Restoration Project 1.0, Juneau.

_____. 2009. Unit 26A wolf management report. Pages 265–278 [*In*] P. Harper, editor. Wolf management report of survey and inventory activities 1 July 2005–30 June 2008. Alaska Department of Fish and Game, Division of Wildlife Conservation, Project 14.0, Juneau.

_____. 2010. Unit 26A moose management report. Pages 643–665 [*In*] P. Harper, editor. Moose management report of survey and inventory activities 1 July 2007–30 June 2009. Alaska Department of Fish and Game, Federal Aid in Wildlife Restoration Project 1.0. Juneau.

_____. 2012. Unit 26A moose management report. Pages 655–676 [*In*] P. Harper, editor. Moose management report of survey and inventory activities 1 July 2009–30 June 2011. Alaska Department of Fish and Game, Species Management Report ADF&G/DWC/SMR-2012-5, Juneau.

Trent J. N. 1989. Unit 26A moose survey-inventory report. Pages 353–360. In S. O. Morgan, editor. Moose annual report of survey-inventory activities, 1 July 1987–30 June 1988. Volume XIX, Part VIII, Alaska Department Fish and Game. Federal Aid in Wildlife Restoration. Progress Report, Study 1.0. Juneau.

PREPARED BY:

Geoffry Carroll
Wildlife Biologist III

SUBMITTED BY:

Peter Bente
Management Coordinator

Please cite any information taken from this section, and reference as:

Carroll, G. 2014. Unit 26A moose management report. Chapter 35, pages 35-1 through 35-22 [*In*] P. Harper and L. A. McCarthy, editors. Moose management report of survey and inventory activities 1 July 2011–30 June 2013. Alaska Department of Fish and Game, Species Management Report ADF&G/DWC/SMR-2014-6, Juneau.

While this unit report was actually published in 2016, it is part of the set of 2014 unit species management reports, so we suggest citing the report as a 2014 report to maintain its relationship to the other 2014 unit reports.

Product names used in this publication are included for completeness but do not constitute product endorsement.

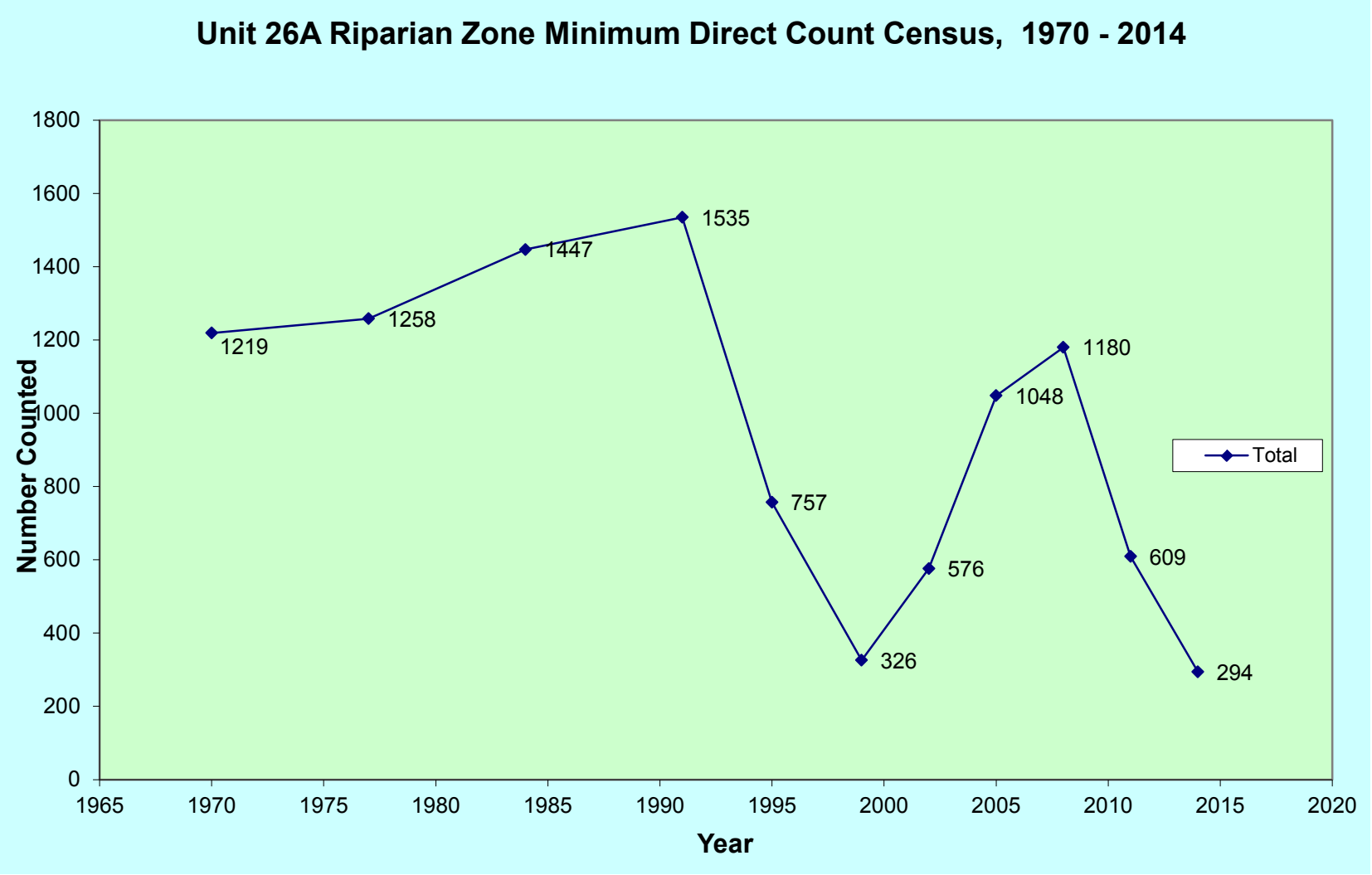

Figure 1. Unit 26A riparian zone minimum direct count census 1970–2014.

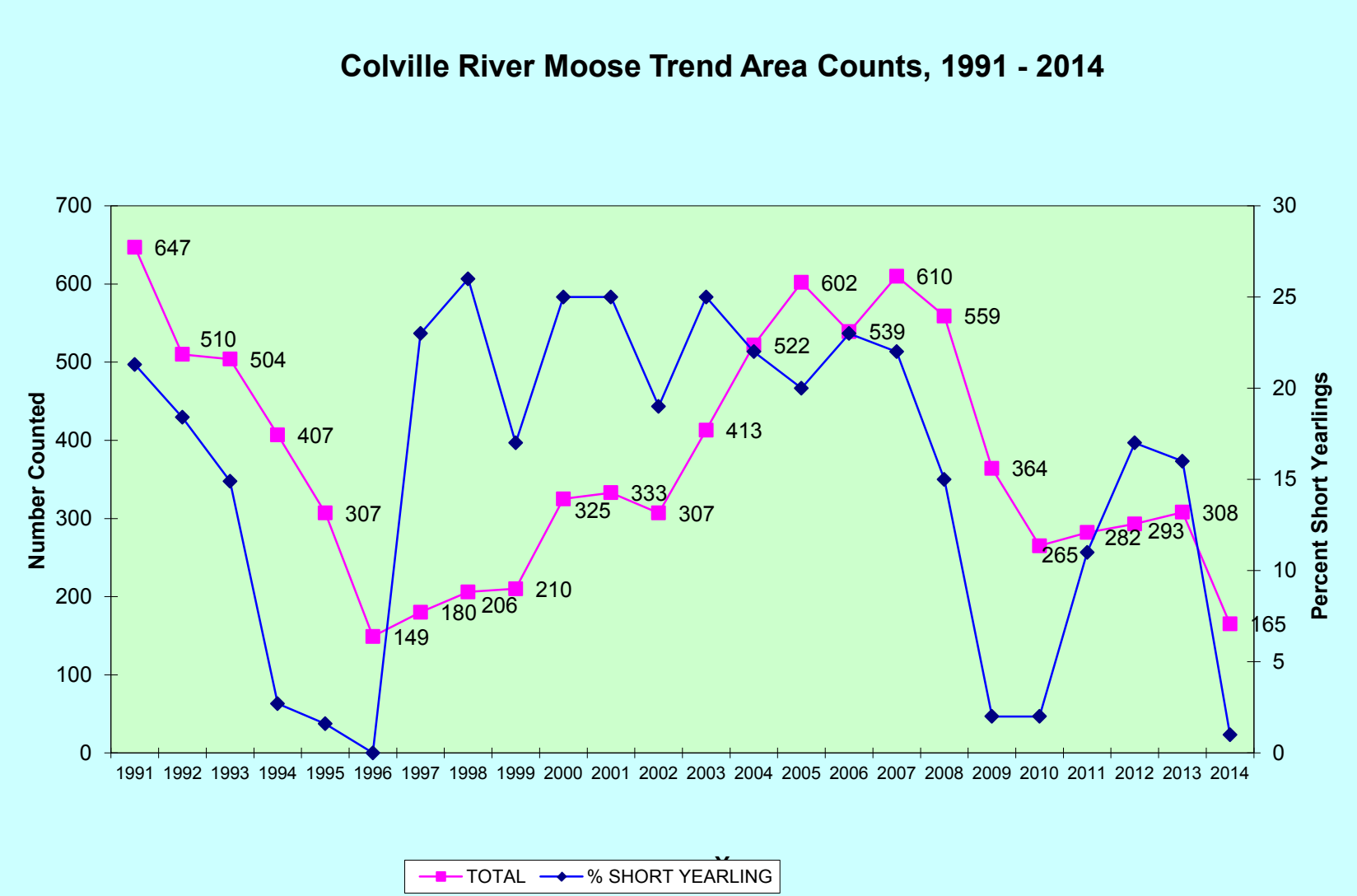

Figure 2. Unit 26A moose trend counts and percentage of short yearlings: Colville River between the mouths of Anaktuvuk and Killik rivers, Anaktuvuk River from the mouth to Sivugak Bluff, Chandler River from the mouth to Table Top Mountain, 1991–2014.

Table 1. Number of adult and 10-month-old calf moose from Unit 26A censuses during April, 1970–2014.

Year	Adults	10-month-old calves	Total[a]	% Calves
1970	911	308	1,219	25
1977	991	267	1,258	21
1984	1,145	302	1,447	21
1991	1,231	304	1,535	20
1995	746	11	757	1
1999	274	52	326	16
2002	502	74	576	13
2005	863	185	1,048	18
2008	1,023	157	1,180	13
2011	545	64	609	11
2014	290	4	294	1

[a] Includes moose counted on the Itkillik River which is part of the Colville River drainage in Unit 26B. In 2014, there were 14 moose, including 0 calves, on the Itkillik River.

Table 2. Unit 26A moose trend counts during April: Anaktuvuk River from the mouth to Sivugak Bluff, Chandler River from the mouth to Table Top Mountain, and Colville River between the mouths of the Anaktuvuk and Killik rivers, 1980–1981, and 1983–2014.

Year	Total moose	Adults	Short yearlings	Short yearling (%)
1980	841	676	165	20
1981	639	594	45	7
1983	315	268	47	15
1984	756	590	166	22
1985	757	613	144	19
1986	866	678	188	22
1987	700	627	73	10
1988	684	602	82	12
1989	699	630	69	10
1990	617	543	74	12
1991	647	516	131	20
1992	510	416	94	18
1993	504	424	80	16
1994	407	396	11	3
1995	307	302	5	2
1996	152	151	1	<1
1997	180	139	41	23
1998	206	153	53	26
1999	210	174	36	17
2000	325	245	80	25
2001	333	251	82	25
2002	307	267	40	13
2003	413	309	104	25
2004	522	407	115	22
2005	602	481	121	20
2006	539	413	126	23
2007	610	475	135	22
2008	559	475	84	15
2009	364	356	8	2
2010	265	260	5	2
2011	282	250	32	11
2012	284	233	51	18
2013	308	260	48	16
2014	165	164	1	1

Table 3. Calving surveys of radiocollared cows with twinning rate, June, 1996–2013.

Year	Total cows	Calves:100 cows	Pairs of twins	Twins:100 cows	Percent twins[a]
1996	23	91	3	13	17%
1997	44	66	4	9	16%
1998	43	58	5	12	25%
1999	40	92	13	33	54%
2000	35	69	8	23	50%
2001[b]	18	83	2	11	15%
2002	28	82	6	21	35%
2003	25	92	7	28	44%
2004	16	68	4	25	57%
2006[c]	83	42	10	12	40%
2008 [c]	78	44	7	9.0	26%
2009	16	69	3	19	38%
2009[c]	31	55	5	16	42%
2010	31	71	2	6	10%
2011	28	75	4	14	24%
2012	25	88	6	24	38%
2013	20	65	2	10	15%

[a] Number of sets of twins/number of parturient females.
[b] Incomplete survey.
[c] Survey done without radio collars.

Table 4. Unit 26A fall aerial moose composition trend area counts during November, 1990–2013.

Year	Bulls:100 cows	Calves:100 cows	Calves (%)	Adults	Total moose
1990	33	45	25	277	371
1991	40	39	22	254	325
1992	36	41	23	190	248
1993	36	6	4	381	397
1994	35	3	2	287	293
1995[a]	70	0	0	34	34
1996	60	44	22	126	161
1997	46	40	22	80	102
1998	64	35	18	131	159
1999	49	52	26	155	209
2001	69	30	15	258	304
2002	52	49	24	253	334
2003	75	57	25	217	288
2004	60	37	19	255	313
2005	66	37	18	188	230
2006	59	40	20	252	316
2007	63	37	18	239	293
2008	69	12	7	231	247
2009	71	13	7	204	219
2010	97	25	11	136	153
2011	67	38	18	107	131
2012	69	34	17	140	168
2013[a]	42	0	0	58	58

[a] Survey incomplete due to late fall conditions.

Table 5. Percent bull moose observed by antler width categories (inches) during fall composition surveys, Unit 26A, 1996–2013.

	Antler width category, percent observed					
Year	<30 in	30–39 in	40–49 in	50–59 in	≥60 in	*N*
1996	0	0	38	45	17	47
1997	4	8	16	48	24	25
1998	13	22	14	31	20	51
1999	18	16	12	28	26	51
2001	13	18	17	32	20	105
2002	15	12	16	25	32	91
2003	10	18	17	29	26	93
2004	24	18	10	38	10	99
2005	19	15	19	25	22	75
2006	18	16	19	26	21	93
2007	21	14	17	25	23	92
2008	20	18	22	29	11	94
2009	8	5	34	41	12	85
2010	10	5	10	51	24	67
2011	5	7	23	46	19	43
2012	12	12	11	37	28	57
2013[a]	18	12	18	28	24	17

[a] Survey incomplete due to late fall conditions.

Table 6. Unit 26A moose harvest, RY90 through RY13.

Regulatory year	Reported hunter harvest		
	Male	Female	Total
RY90	60	4	64
RY91	59	8	67
RY92	52	8	60
RY93	53	8	61
RY94	36	4	40
RY95	14	0	14
RY96	0	0	0
RY97	2	0	2
RY98	5	0	5
RY99	2	0	2
RY00	0	0	0
RY01	4	0	4
RY02	10	0	10
RY03	5	0	5
RY04	4	1	5
RY05	9	2	11
RY06	8	3	11
RY07	11	1	12
RY08	11	0	11
RY09	9	1	10
RY10	13	0	13
RY11	6	0	6
RY12	8	1	9
RY13	5	0	5

Table 7. Number of bull moose harvested in antler width categories (inches) in Unit 26A, RY96 through RY13.

Regulatory year	Unknown	<20	20–29	30–39	40–49	50–59	≥60	*N*
RY96	0	0	0	0	0	0	0	0
RY97	0	1	0	0	1	0	0	2
RY98	0	1	1	1	1	0	1	5
RY99	0	1	0	1	0	0	0	2
RY00	0	0	0	0	0	0	0	0
RY01	3	1	0	0	0	0	0	4
RY02	1	0	0	1	5	3	0	10
RY03					1	2	2	5
RY04	1				1	2		4
RY05			1	1	3	3	1	9
RY06	3	2	0	1	0	2	0	8
RY07	7[a]	0	0	0	4	0	1	12
RY08	4[a]	0	0	1	0	3	3	11
RY09	2	0	0	0	1	5	2	10
RY10	5				1	5	2	13
RY11		0	1	0	1	1	3	6
RY12		1	0	0	2	0	5	8
RY13				2	0	3	0	5

[a] Antler size was inadvertently excluded from hunter report cards for the drawing hunt.

Table 8. Moose hunter residency and success, Unit 26A, RY90 through RY13.

	Successful hunters						Total hunters				
Regulatory year	Local res[a]	Non-local res[b]	Nonres[c]	Unknown	Total	(%)	Local res[a]	Non-local res[b]	Nonres[c]	Unknown	Total
RY90	8	19	35	2	64	65	13	40	43	3	99
RY91	9	37	29	1	76	75	13	51	37	1	102
RY92	12	16	29	3	60	57	25	35	41	4	105
RY93	7	22	29	3	61	79	11	30	32	4	77
RY94	8	7	24	1	40	74	11	14	29	0	54
RY95	4	3	6	1	14	33	13	12	15	3	43
RY96	0	0	0	0	0	0	4	2	0	0	6
RY97	2	0	0	0	2	10	20	0	0	0	20
RY98	5	0	0	0	5	25	18	2	0	0	20
RY99	2	0	0	0	2	14	12	2	0	0	14
RY00	0	0	0	0	0	0	UNK[d]	UNK	UNK	UNK	UNK
RY01	4	0	0	0	4	UNK	UNK	UNK	UNK	UNK	UNK
RY02	8	2	0	0	10	53	11	8	0	0	19
RY03	4	1	0	0	5	56	6	3	0	0	9
RY04	5	0	0	0	5	38	9	4	0	0	13
RY05	9	2	0	0	11	79	11	3	0	0	14
RY06	8	3	0	0	11	69	10	5	1	0	16
RY07	4	7	0	1	12	57	5	15	0	1	21
RY08	4	4	3	0	11	65	4	10	3	0	17
RY09	2	5	3	0	10	67	2	10	3	0	15
RY10	4	8	1	0	13	72	6	10	2	0	18
RY11	2	3	1	0	6	100	2	3	1	0	6
RY12	4	5	0	0	9	90	4	6	0	0	10
RY13	2	2	1	0	5	50	6	3	1	0	10

[a] Local resident hunters are residents of the North Slope Borough.
[b] Nonlocal resident hunters are residents of the State of Alaska, but not residing in the North Slope Borough.
[c] Nonresident hunters.
[d] Unknown (UNK) number of total hunters. Moose population was low and the hunt was restricted.

Table 9. Percent chronology of moose harvest, Unit 26A, RY96 through RY13.

Regulatory year	Harvest periods						
	July	Aug	1–7 Sep	8–14 Sep	15 Feb–15 Apr	Unknown	*N*
RY96[a]	–	–	–	–	–	–	0
RY97[a]		100	–	–	–	–	2
RY98[a]		100	–	–	–	–	5
RY99[a]		100	–	–	–	–	2
RY00[a]	–	–	–	–	–	–	–
RY01[a]		100	–	–	–	–	–
RY02		20	80				
RY03		20	80				5
RY04	20	40	20	20			5
RY05		9	73	–	18		11
RY06		36	36	18	10		11
RY07	8	26	58	8	0		12
RY08	0	18	64	9	9		11
RY09	0	10	80	0	10		10
RY10	0	14	70	8	8		13
RY11			83	17			6
RY12		0	67	22	11		9
RY13		40	60				5

[a] Season open only in August.

Table 10. Percent transport methods for moose harvest in Unit 26A, RY94 through RY13.

	Percent method of transportation					
Regulatory year	Airplane	Boat	3 or 4 wheeler	Snowmachine	ORV	*N*
RY94	78	18	0	2	2	40
RY95	50	43	7	0	0	14
RY96	–	–	–	–	–	0
RY97	–	100	–	–	–	2
RY98	–	100	–	–	–	5
RY99	–	100	–	–	–	2
RY00	–	–	–	–	–	–
RY01	–	100	–	–	–	–
RY02		100				
RY03		100				5
RY04		80			20	5
RY05		82		18		
RY06	27	64	-	9		11
RY07	59	33	8	0		12
RY08	55	36		9		11
RY09	80	10		10		10
RY10	69	23		8		13
RY11	67	33				6
RY12	56	33		11		9
RY13	60	40				5