

INITIAL USE OF MOOSE CALF HUNTS TO INCREASE YIELD, ALASKA

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ABSTRACT: In 2002 the Board of Game authorized Alaska's first permit hunts specifically for calf moose (*Alces alces*). We promoted these calf hunts to help stabilize a high-density, food-stressed moose population and to compensate for declining harvests of bulls. Low harvest rates of cows (=1% of the prehunt cow population, 1996–2001) were tightly controlled by the public. High harvest rates of bulls (21–26% of the prehunt bull population, 1995–1999) resulted in bull:cow ratios declining below the management objective of 30:100. To conserve bulls, the previous bag limit of any bull was changed to bulls with specific antler configurations. Simultaneously, 300 calf drawing permits were made available in 7 different hunt areas with the allocation of permits based on estimated moose densities within individual hunt areas. We issued 274 permits, but 61% of the permittees did not participate, in part to protest the hunt. Of 108 hunters, 33 reported taking a calf. The harvest accounted for about 1.3% (33/2,500) of the estimated prehunt calf population and 7% (33/471) of the total reported harvest. The calf harvest contributed only marginally to meeting the Game Management Unit 20A harvest mandate of 500–720 moose. We observed decreasing acceptance of calf hunts and increasing acceptance of cow hunts during 2002 and 2003. In 2004 we expect to substantially increase the harvest of cows and calves using registration and late season hunts and continuing education programs. We deem gaining public acceptance of cow and calf hunts in increasing, food-stressed Alaska moose populations to be a long-term, challenging, yet worthwhile endeavor.

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Calf moose (*Alces alces*) hunts have been used as a management tool to achieve a wide range of objectives in the United States, Canada, and Scandinavia. For example, Alberta, British Columbia, Newfoundland, Idaho, Montana, North Dakota, Utah, and Wyoming have all used limited antlerless permits to harvest cows and calves in selected management units to maintain balanced sex ratios and provide additional hunting opportunities (Timmermann and Buss 1998). In Ontario, where there is no harvest restriction on calves and every licensed hunter is eligible to take a calf (Hooper and Wilton 1995), increased calf harvests, concurrent with reduced bull and cow harvests, were used as a tool aimed at doubling the provincial moose population (Timmermann

and Whitlaw 1992, Timmermann and Rempel 1998). In Scandinavia, where calves comprise 40% of the total harvest each year (H.R. Timmermann, Ontario Ministry of Natural Resources, personal communication) maximizing harvest is paramount.

In 2002 we promoted the first Alaskan drawing hunts for calf moose. Moose density was high and slowly increasing in this area, yet twinning rates had declined to low levels indicating the population should be stabilized (Gasaway et al. 1992:24). Also, harvest of bulls needed to become more restrictive, because bull:cow ratios were declining. Reductions in total moose harvest in this area have legal ramifications under an intensive management law. Ramifications include consideration of predator

control programs and habitat improvement projects. While promoting calf hunts, we continued our decade-long encouragement for prescribed burns to rejuvenate habitat and improve moose productivity.

Prior to 2002 and after 2003 in Alaska, bulls were defined as any male moose, so male calves were legal bulls, and calves were also legal in the relatively few antlerless hunts. In discussions with area biologists statewide we found calf harvest in Alaska to be a small portion (< 5%) of the annual harvest. Calves were taken incidentally each year but demand was very low. The drawing hunts we proposed for calves posed a different problem because state law requires that the majority of citizens' advisory committees, residing in or adjacent to the management area, approve of antlerless hunts prior to the Board of Game's vote. We successfully argued for calf hunts in 2002 and 2003, despite a Board initiated 2-year ban on calf hunts statewide (except approved permit hunts) in 2003. We also successfully argued to rescind this statewide ban in 2004, because there was no biological justification for the ban and it was an impediment to effective management.

Our objective here is to document Alaska's initial use of permit hunts specifically for calf moose. We discuss the problems encountered and make recommendations regarding the use of calf hunts to increase yield and hunting opportunity.

STUDY AREA

Our study area encompassed Game Management Unit (GMU) 20A immediately south of Fairbanks and across the Tanana River. The study area is in Interior Alaska and is centered around 64°10'N latitude and 147°45'W longitude. Game Management Unit 20A encompasses 17,000 km², but only 13,044 km² is below the upper limits of vegetation characteristically used by moose. Gasaway et al. (1983) and Boertje

et al. (1996) described the physiography, habitat, climate, major predator and prey species, and moose population status and harvest from 1963 through 1994.

The moose population peaked at an estimated 23,000 in 1965, likely due to large-scale burns in the early 1940s and extensive predator control in the 1950s. The population declined to approximately 2,800 in 1975 because of a series of bad winters, accompanying high predation, and overharvest. The population increased to 11,000–13,000 by 1995 due to hunting restrictions, periodic wolf control, and sustained wolf harvest.

Moose numbers increased more slowly through 2003 as twinning rates declined. In November 2003, GMU 20A had the highest moose density in Alaska for any equivalent-sized area. We estimated 16,446 moose \pm 2,365 (90% CI) in 13,044 km² of moose habitat. Methods for estimating moose numbers included the use of spatial statistics and a sightability correction factor of 1.12 (Gasaway et al. 1986, Ver Hoef 2001). We also documented the lowest moose twinning rates in Alaska (0–18%) during 1993–2003 (Boertje et al. 1996, 2000). Twinning rates were higher (32–40%) during 1979–1983, when moose density was relatively low (Gasaway et al. 1983). During most years, we used transect surveys a few days after the median calving date to estimate twinning rates. We used radiocollared moose to determine the median calving date, and, in a few years, to estimate twinning rates.

Moose seasons and bag limits in GMU 20A varied markedly in recent history. Long seasons and hunts for both antlered and antlerless moose were common through the 1960s and early 1970s when moose numbers were high. Following the low point in the population in 1975, hunting seasons were shortened to 10 days and bag limits limited to bulls-only. As moose numbers increased from the late 1970s through the

mid-1990s, seasons were progressively lengthened to as many as 25 days. Antlerless hunts were resumed again in 1996, primarily to maximize harvest, but harvest of antlerless moose remained very low (60–75 cow moose, 1% of the prehunt cow population) through 2001 (except 1999 when 0 were harvested). High harvest rates (21–26%) of the prehunt bull population from 1995 to 1999 resulted in bull:cow ratios declining below the management objective of 30:100. In 2000, the hunting season was shortened 5 days to reduce bull harvests. Additionally, in 2002, antler restrictions were instituted to further reduce the harvest of bulls to a sustainable level.

Most successful moose hunters accessed GMU 20A by airplane, propeller/jet boat, or ATV/off-road vehicles and to a lesser extent via horses, airboats, and highway vehicles. Less than 5% of GMU 20A was accessible by road, but seasonal military and mining trails provided access to the foothills in autumn and winter. The only significant human settlements occurred along the perimeter of the game management unit although 1 subdivision was near the center of the unit and remote cabins and airstrips were scattered throughout much of the unit.

METHODS

In 2002, 300 calf moose permits were available by lottery. Applications were accepted only in May, as for most drawing hunts in Alaska. The hunt period was 1–25 September. Game Management Unit 20A was divided into 7 different hunt areas with 1 hunt area divided temporally into 2 hunts (1–13 and 14–25 September) for a total of 8 different hunts. The allocation of permits was based on estimates of calf moose numbers within individual hunt areas from population surveys (Gasaway et al. 1986, Ver Hoef 2001) conducted the previous November (2001). These estimates were ad-

justed slightly upwards based on the 2002 trend in parturition rates from radiocollared moose in central GMU 20A. We also had 175 cow moose permits available by lottery in May for 2 hunt areas (3 different hunts) within GMU 20A. We compared the proportional use of cow permits with those of calf permits to assess whether holders of calf permits protested the calf hunt by not hunting.

Our goal in the first year was to have hunters harvest up to 5% of the prehunt calf population. Based on our experience with drawing permit hunts for antlerless moose, we assumed harvest success rates would not exceed 50%. Therefore, the number of permits made available for each hunt area equaled 10% of the estimated prehunt calf population. For example, in hunt area DM755, we estimated a prehunt population of 300 calves and issued 30 permits for an estimated harvest of up to 15 calves.

Successful applicants to the calf and cow lotteries were notified in early July. Successful applicants for the calf hunts received a letter with their permit explaining: (1) how to distinguish a calf from a yearling; (2) estimated weight range of calves in September; and (3) safety tips regarding cows that may be aggressive after their calves were shot. Successful applicants to both calf and cow lotteries were notified that they were prohibited from hunting for bulls in GMU 20A, which was intended to reduce hunting pressure on the bull segment of the population. All hunters were required to report to the Alaska Department of Fish and Game if they successfully harvested a moose, were unsuccessful, or did not hunt.

RESULTS

Of the 300 calf permits in 2002, 274 were issued to hunters and 61% failed to hunt (Table 1). This failure to hunt was significantly higher than the failure of cow

Table 1. Calf moose harvest data by permit hunt for Game Management Unit 20A, central Tanana River valley, Alaska, 2002.

Hunt	Permits			Unsuccessful		Successful		Males	%	Females	%	Unk	%	Harvest
	issued	Did not hunt	%	hunters	%	hunters	%							
DM750	65	39	60	20	77	6	23	2	33	4	67	0	0	6
DM752	65	44	68	13	62	8	38	3	38	5	63	0	0	8
DM754	37	23	62	9	64	5	36	2	40	3	60	0	0	5
DM755	30	6	20	16	67	8	33	5	63	3	38	0	0	8
DM756	5	1	20	2	50	2	50	0	0	2	100	0	0	2
DM757	20	10	50	9	90	1	10	1	100	0	0	0	0	1
DM758	33	27	82	4	67	2	33	0	0	2	100	0	0	2
DM759	19	16	84	2	67	1	33	1	100	0	0	0	0	1
Totals	274	166	61	75	69	33	31	14	42	19	58	0	0	33

permittees to hunt (Z -value = 6.5, $P < 0.0001$). Of the 175 permittees for cow hunts, 54 (31%) did not hunt. Reported harvest of calves totaled 33 (14 male and 19 female). Three of the 8 hunts were under-subscribed; remoteness of these hunt areas was likely a contributing factor.

The calf harvest accounted for about 1.3% (33/2,500) of the estimated prehunt calf population and 7% (33/471) of total reported harvest. In contrast, the harvest of bulls accounted for about 14% (344/2,500) of the prehunt bull population and 73% (344/471) of the total harvest. The harvest of cows accounted for about 1.2% (94/7,600) of the prehunt cow population and 20% (94/471) of the total harvest.

DISCUSSION

The calf harvest contributed only marginally to meeting the harvest objective of 500–720 moose. This was primarily due to the poor participation in the calf hunts. Based on conversations with hunters, letters to the editor of local newspapers, and comments on harvest report cards, it was apparent that a large number of hunters applied for the permits with no intention of using them. Secondly, the success rate of those that did hunt was lower than expected, likely because harvesting a calf was more difficult than hunters anticipated. Cows with calves cannot be lured to a call, tend to be more wary and alert, and typically utilize heavier cover than bulls and barren

cows.

The calf hunts were contentious, particularly among local citizens' advisory committees and hunters. Interestingly, there was no opposition by anti-hunting or animal rights organizations. Rather, one group commented that they favored the hunts because they emulated natural mortality more closely than bulls-only hunts. Primary arguments against the calf hunts were philosophical, cultural, and biological in nature. Many individuals made ethical statements such as "you just don't shoot calves," or "it's just not right to shoot calves." A woman testified that after her son had shot a calf she felt "embarrassed". Some comments were more anthropomorphic in nature. For example, a note on a harvest report card in which the permit holder did not hunt stated simply "saved a calf". Some individuals implied that shooting a calf was cruel to the mother. Significant opposition to the calf hunts also came from 2 Native Athabaskan communities. At a public meeting in which the reauthorization of the calf hunts was being discussed, several elders stated that it was not their custom to hunt calves and that they disliked the taste of calf meat.

Another common argument was that calves provided little or no meat. However, we had provided information to the hunting public regarding estimated September weights of calves (135–190 kg) from studies conducted in central GMU 20A during

1997–2001. A male, twin calf shot on 16 September had a gutted weight of 102 kg, a dressed weight of 76 kg, and yielded 43 kg of meat (bones removed). The estimated live weight of that calf based on a standard formula applied to cattle (live weight = 2 × dressed weight) was 152 kg. The yield in meat from calf moose is similar to that of adult barren-ground caribou (*Rangifer tarandus*), which, like moose, are hunted primarily for human consumption by Alaskan residents.

The potential danger associated with cows in defense of their downed calves was also a concern of hunters. Many individuals were concerned that hunters would be injured or even killed by defensive cows when approaching a downed calf. Others felt that a large number of aggressive cows would be shot, the meat left to rot, and that these incidents would go unreported. To the contrary, we received no reports, official or otherwise, of overly aggressive cows, cows being shot, or of any hunter being injured by an aggressive cow. In Manitoba, V. Crichton (Manitoba Department of Natural Resources, personal communication) reported that, to his knowledge, there have been no documented cases of injury to hunters or aggressive cows being shot during calf hunts.

The main biological argument from the public against calf hunts was that the harvest of calves would eliminate future breeding stock and particularly bulls, which would lead to decimation of the moose population and hunting opportunity for bulls. This concern persisted despite our repeated explanations that: (1) only about 5% of the prehunt calf population would be harvested annually; (2) the moose population was food-stressed at the current density and was not declining; and (3) the harvest of calves was partially compensatory. The scenario often heard from the public was that predation is largely additive to harvest

(Gasaway et al. 1983; i.e., predators are killing healthy calves). Merit exists in this argument, but we presented data that calf mortality was high (47%) compared with annual cow mortality of about 2% between the ages of 2 and 7 (Boertje et al. 2000). Therefore, cow harvest would more likely constitute additive mortality, whereas calf harvest may not, particularly at high density (Euler 1983, Timmermann and Rempel 1998).

In retrospect, more public education was needed to harvest significant numbers of calves, because no prior hunts in Alaska had targeted calves and because shooting calves became highly controversial. Similar public resistance occurred in the 1960s when attempts were made to introduce antlerless hunts (Rausch et al. 1974). Furthermore, antlerless hunts reinstated in GMU 20A in 1996 were also highly controversial. However, by 2002, antlerless hunts had gained popularity with the hunting public. Thus, time may be central to gaining public acceptance of calf hunts.

In 2004 we expect to test whether cow and calf harvests can be substantially increased with registration and late season hunts for antlerless moose hunts not specific to calves. Registration hunts, unlike drawing permit hunts, are much less restrictive and would allow greater latitude in terms of the number of permits issued and season length. We envision issuing several thousand registration permits, requiring a short reporting period for successful hunters, and closing the hunt by Emergency Order once the desired harvest has been reached. We established quotas for each of the 7 hunt areas. This approach is much more costly but will allocate permits to those hunters willing to take a cow or calf rather than to those individuals desiring to “save a calf”. In addition, the antlerless season will potentially remain open into December, well beyond the 1–25 Septem-

ber season for bulls. Thus, additional hunting opportunity will be provided when most big game hunts are closed.

RECOMMENDATIONS

To reduce the moose population to the management objective of 10,000–12,000 moose, we are recommending registration and late season antlerless hunts to increase harvest and hunting opportunity while maintaining ≥ 30 bulls:100 cows. Ultimately, we hope these hunts will improve public acceptance of calf hunts. Once the population is reduced below 12,000 moose, we will attempt to sustain a harvest ratio of approximately 60 bulls:20 cows:20 calves.

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