THE HORSESHOE POSTURE IN MOOSE - A REACTION TO PERCEIVED THREATS

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ABSTRACT: A behaviour pattern of bull moose was noted when confronted with aircraft during surveys and occasionally on the ground when threatened. The pattern is called the horseshoe posture and involves shifting of the back hooves toward the front hooves with the legs now forming a triangle with the abdomen. The pattern was noted in yearling, teen, prime, and senior bulls, but not cows. No head tilting was noted as described for caribou during the rut, but there was rubbing together of the tarsal glands. Bulls did not exhibit the horseshoe posture when confronted with an artificial head and antlers.

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Some postures related to specific activities of moose have not been well described. The posture described by Bubenik (1975) as the horseshoe posture has been reported infrequently. He described a tilted head display frequently done by bull caribou (*Rangifer tarandus*) during aggression displays in the rutting period. He further suggested that the tilted head is common in many ungulates and is universal in the 'horned' ungulates. In all these species the head is postured frontally and the attitude is used when a foreign object is seen. He explained the tilted head posture in reindeer as typical for an offensive-defensive threat and that it could be used as a single element with the neck in line with the body or turned to the side. It is also used as a reinforcing or a complementary element in other search-images and resembles a 'horseshoe' posture. This display is common among Odocoileinae. It shows slight specific variation in white-tailed deer (*Odocoileus virginianus)* where it is performed in both sexes. In the moose (*Alces alces*) it is limited to the male, and only when incited. In general, the hind legs are close to the forelegs, the back is arched, penis erect or hanging down, and tarsal glands together and (not always) moistened by urine (Bubenik 1975). He suggests it is performed fully by alpha or solitary males.

Bubenik (1975) also suggests that in caribou the 'white-of-eyes' and husky sounds can be mixed in the display of the tilted head. Bubenik (1975) describes encounters with bull caribou interspersed with females in which some bulls were responding with the horseshoe posture, an erect penis and moistening of the tarsal glands.

Crichton (1987) suggested that this behaviour is a reliable technique for the identification of bull moose observed during aerial surveys. Timmermann and Buss (1998) suggested that when aroused from beds by searching aircraft, adult bulls frequently move their hind legs forward in a urination-like posture and that only rarely do rising cows exhibit the same behaviour.

Beginning in the winter of 1972/73, while flying moose surveys in Manitoba I noticed some animals when aroused from their beds would shift the back feet forward, positioning them just posterior to the front feet. In this position, the ventral portion of the abdomen along with the front and rear legs when

viewed from the side resembled a triangle. Further, it became apparent that the only moose performing this behaviour were males either with or without antlers and that it was being done by all ages including calves-of-the-year. Although the total number of occasions this behaviour was seen was not recorded, it is estimated that it was approximately 750 times. Bulls would maintain this position for 10-20 seconds and then move off either running or walking.

The first opportunity to observe this behaviour on the ground was in Riding Mountain National Park in Manitoba in early January when the snow depth was about 20 cm. On this occasion, while travelling on a park road, I noted 6 moose in a small meadow. As I approached on foot with only a camera, all ran off with the exception of 3 bulls which, based on antler architecture, I classified as yearlings and 2-year olds. The bulls watched intently as I slowly approached to within about 75 m at which time all 3 displayed the horseshoe posture. With heads erect and pointed forward, they maintained the posture for 10-20 seconds and then bolted. This behaviour was recorded on a video camera. I examined each location where they had been standing and there was evidence that they had urinated on their hind legs, as there was urine on the snow at each site.

The second occasion for viewing this behaviour close at hand was during a September moose hunt. While sitting in a canoe on the Bloodvein River in eastern Manitoba a yearling bull appeared on the riverbank nonchalantly feeding and oblivious to our presence. We watched the animal for a few minutes until he noticed us at which time we were about 100 m away. He immediately stopped feeding and his body length was parallel to the river. He assumed the horseshoe posture with the head erect and pointing forward, held the position for 10-20 seconds and subsequently ran off. The site where he was standing was examined but I was unable to detect evidence of urination.

The third, and perhaps best opportunity for viewing and recording this behaviour from the ground, occurred in July in the Chapleau Crown Game Preserve in northern Ontario. While travelling north on a road within the preserve, I noted a mature bull with velveted antlers feeding in a small pond adjacent to the road. He moved off when the vehicle stopped. I was able to enter the bush without being seen and followed above and slightly behind him on a ridge as he moved slowly along stripping leaves from aspen. He stopped and laid down after about 300 m. I approached unobserved to within about 15 m of his resting location and remained here for about one half hour taking video and noting resting behaviours. Eventually, I emitted the sound of a cow and after repeated calls he rose from his bed, looked in my direction and slowly moved off toward the road feeding as he went. As he approached the road, a moving vehicle alerted him and he stopped and remained motionless for a few minutes, turned around and moved back to where I was now standing in plain view on the ridge. As he approached, he stepped over a fallen log, stopped and assumed the horseshoe posture with an uplifted forward pointing head, shuffled the hind feet toward the front (Fig. 1) and rubbed the tarsal glands together. He held this position for about 15 seconds and then bolted past me. At no time was there any vocalization. Most of his activities, from the time he was aroused from his bed until he disappeared, including assuming the horseshoe posture, were recorded on video. I examined the site as well as the video but was unable to ascertain if urination had occurred.

The fourth occasion to view this behaviour occurred while attending the 37th North American Moose Conference in northern

Fig. 1. Bull moose displaying horseshoe posture. Note the forward pointing, uplifted head, position of the back hooves in relation to the front hooves and the closeness of the back legs compared to the wider stance of the front legs. From the side, the front and back legs and the abdomen resemble a triangle.

Maine. While watching a bull moose early one morning at a mineral lick, the bull became rather agitated as the sound of traffic increased on the highway about 150 m away. When a large truck went by, the bull ran for a few steps, suddenly stopped, assumed the horseshoe posture and urinated profusely on his hocks. His level of agitation remained and about 2 minutes after assuming the posture the first time, he repeated the behaviour again, with some urination on the tarsal gland, before running off into the adjacent bush. The behaviour was again recorded with a video camera.

In all situations, by assuming the horseshoe posture, the bulls, whether they be yearlings, teens, primes, or seniors, appear to be responding to perceived threats. Nothing resembling the tilted head posture as described by Bubenik (1975) for caribou was noted. Neither the tilted head phenomenon nor the horseshoe posture have been observed in bull moose on the ground when I have approached them while wearing an artificial head and antlers during the rutting period. In each observation, whether it be on the ground or from an aircraft, the head was held in an upright and forward pointing position. During aerial surveys, animals which are observed to perform this behaviour can be classed as bulls. In all situations where the behaviour was observed, whether it be on the ground or from an aircraft, the situation could, from the moose's perspective, be viewed as an anthropogenic threat, with the gesture by some being to assume the horseshoe posture.

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