

Notes

Coyote, *Canis latrans*, Predation on a Bison, *Bison bison*, Calf in Yellowstone National Park

J. W. SHELDON, GREGORY REED, A. CHEYENNE BURNETT, KEVIN LI, and ROBERT L. CRABTREE

Yellowstone Ecological Research Center, 2048 Analysis Drive, Bozeman, Montana 59718 USA

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We observed a single adult male Coyote (*Canis latrans*) kill a Bison (*Bison bison*) calf in Yellowstone National Park. The predation is, to our knowledge, the only direct and complete observation of a lone Coyote capturing and killing a Bison calf. The bison calf had unsuccessfully attempted to ford a river with a group and subsequently become stranded alone in the territory of a six-year-old alpha male Coyote.

Key Words: Coyote, *Canis latrans*, Bison, *Bison bison*, predation, Yellowstone.

In the Yellowstone ecosystem, Coyote spring/summer diet consists of small mammals and ungulate neonates, primarily American Elk calves (*Cervus elaphus*), but also Pronghorn (*Antilocapra americana*) calves and the fawns of Mule Deer (*Odocoileus hemionus*) and White-tailed Deer (*O. virginianus*) (Murie 1940; Gese and Grothe 1995; Gese et al. 1996). Bison (*Bison bison*) appear to be a rare food source for Coyotes. Murie's (1940) analysis of 5086 Coyote scats showed a percentage occurrence of 0.20% Bison, and Murie found it unlikely that Coyotes would kill Bison calves, recording that anecdotal reports of the same "lacked proof" (page 117). More recently, a study of Coyote predation on large ungulates in Yellowstone found that both White-tailed Deer and Elk were killed by packs of Coyotes hunting together in winter (Gese and Grothe 1995). No predation on Bison was recorded in either of these Yellowstone Coyote studies. Circumstantial evidence at kill sites in Yellowstone has suggested that predation on Bison calves by groups of Coyotes may occur, but no report has been published. A single instance of cooperative hunting by a Wolf (*Canis lupus*) accompanied by a pack of four Coyotes resulted in a Bison calf mortality (Smith et al. 2001). However, successful solo predation by a Coyote on a Bison has not, to our knowledge, been previously observed. An instance of predation on a calf after separation from the herd was observed in Elk Island National Park, Canada (Lu Carbyn, personal communication); however, a fence served to trap the calf. Our observation therefore extends what has been known about the predatory capacity of Coyotes with regard to large ungulates.

The observers (GR, ACB, and KL) arrived at a vantage point on the Lamar River, Yellowstone National

Park (44°54'48.774"N, 110°16'28.28"W) on 28 May 2009 at 1825 h. Yellowstone cinematographer Bob Landis reported (personal communication) that, at approximately 0700 h, a cow-calf herd of Bison swam the river from south to north, northeast of the observers' vantage point. During the crossing, a calf was washed 300–500 m downriver from the main group, emerging on the northern bank 100 m east of the vantage point. The Bison herd proceeded southward, leaving the calf behind on the opposite side of the river. By 1600 h, the Bison calf had bedded down west of the vantage point and the Coyote was present approximately 10 m from the calf. When GR, ACB, and KL arrived, the Coyote had already attacked the calf once, according to observers already present.

The Coyote, M361, was radio-tagged in October of 2004 (capture weight 13.2 kg) and had been monitored continuously since then. At the time of the event, he was the six-year-old alpha male of the Paradise Park pack, occupying a known home range which encompassed the kill site. The mean weight of Bison calf neonates is ~23 kg (Mattson 1997), thus the calf outweighed Coyote M361 by a factor of two.

The following observations were recorded on 28 May 2009:

1939 h M361 approached the bedded Bison calf from the rear and bit repeatedly at the hind legs. The calf stood up kicking, striking M361 in the head. This interaction lasted approximately 30 seconds, after which M361 moved to a position 10 m from the calf and bedded down. The calf remained standing.

2014 h The calf lay down approximately 10 m away from M361.

2132 h M361 stood up and attacked the calf. The calf stood up and kicked at M361 as he bit at the calf's back legs. M361 then bit the neck of the calf and pulled the calf to

the ground. The calf struggled for approximately two minutes as M361 continued to hold onto its neck.
 2134 h The calf stopped moving. M361 lay down next to the calf.
 2138 h M361 began feeding on the calf.

The predation sequence, which began before 1800 h, was concluded at 2134 h, an elapsed time of 3.5 hours. This "slow-motion" predation method has been observed in other ungulate encounters between Coyotes and Elk and White-tailed Deer: Gese and Grothe (1995) observed predation sequences by Coyotes lasting up to 21 hours. Prey may undergo physiological shock and/or become stiff during the extended interaction, providing a strategic advantage for the Coyotes. The extent to which shock/hypothermia resulting from the Bison calf's river crossing effort contributed to its vulnerability is unknown.

Coyotes are opportunistic predators capable of killing ungulate prey, usually hunting in packs. However, Bison embody a formidable set of anti-predator adaptations, including well-developed maternal guarding behaviors (Carbyn and Trotter 1987, 1988), general herd behaviors of cow-calf groups, and size constraints that regulate prey acquisition by the relatively small-framed and light-weight Coyote. The cost of predation attempts on ungulate neonates is demonstrably high: an alpha female Coyote with pups in the den was killed during a predation attempt on an Elk calf (unpublished data; this study; 2005), with her post-mortem indicating blunt-force trauma as the cause of death. Certainly, predation attempts on ungulate neonates are a high-risk activity for Coyotes. Notably, in eight out of nine predation attempts on large ungulate prey, the alpha male led the attack (Gese and Grothe 1995), as was also the case in our observation. In this instance, the stranding of the Bison calf was a causal factor leading to its death.

The observed successful kill by a single adult male Coyote shows that predation on Bison calves may be possible under certain, albeit rare, conditions involving separation of a calf from its mother. It also shows that the size/weight limit of prey for adult Coyotes may be revised slightly upward. The ecological context for the observed predation suggests that it may be part of a larger prey-switching phenomenon accompanying changes in spring use areas by ungulate prey, prima-

rily Elk (Garrott et al. 2007). Our observation is of additional interest because the Yellowstone ecological community embodies the southernmost outpost of an intact and functioning ungulate-predator system in North America, surrounded by areas of increasingly intensive human activity.

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