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Note

Wolf (*Canis* sp.) attacks life-like deer decoy: insight into how wolves hunt deer?

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Abstract

We know of no documented observations of wolves (*Canis* sp.) detecting and then attacking a White-tailed Deer (*Odocoileus virginianus*) during spring, summer, or fall. We describe an observation of a wolf attacking a life-like, two-dimensional deer decoy in November 2017 near Killarney Provincial Park, Ontario, Canada. The wolf appeared to locate the decoy by sight rather than sound or scent, suggesting that the profile of a deer is sufficient to trigger an attack by a wolf.

Key words: Wolf; *Canis*; carnivore; hunting behaviour; predation; predator-prey; White-tailed Deer; *Odocoileus virginianus*; Killarney Provincial Park

White-tailed Deer (*Odocoileus virginianus*) are the primary prey of wolves (*Canis* sp.) throughout much of the southern boreal ecosystem in North America (Potvin *et al.* 1988; Benson *et al.* 2017; Gable *et al.* 2018). How and where wolves hunt and kill deer during winter is well understood because of the ease of observing wolf-hunting behaviour and locating kill sites from the air (Mech and Frenzel 1971; Fuller 1989; Mech *et al.* 2015). However, equivalent information for the snow-free months is rare, as wolves and deer primarily co-occur in densely forested areas (Demma *et al.* 2007). For example, there are no estimates of wolf kill rates of White-tailed Deer (adults or fawns) during spring to fall, and little information exists about where and how wolves successfully hunt and kill deer during this period (Demma *et al.* 2007; Mech *et al.* 2015). In a comprehensive review of wolf–deer interactions, Mech *et al.* (2015) provided descriptions of eight such interactions during the snow-free season. However, all of these observations occurred after the wolf or wolves had already detected and attempted to chase deer. To our knowledge, there are no observations that demonstrate how wolves find deer during spring to fall. Herein, we document a wolf (*Canis* sp. according to Rutledge *et al.* 2016) attacking a life-like deer decoy that provides rare insight into how wolves locate and detect deer during this period.

During the first week of November, D.P.G. was hunting White-tailed Deer on McGregor Island (46° 04′49″N, 81°35′18″W), about 2 km west of Killarney Provincial Park, Ontario, Canada. Before hunting, D.P.G. set-up a life-like, two-dimensional decoy of a squatting doe ("Estrous Betty", Montana Decoys, Hummelstown, Pennsylvania, USA). The decoy consisted of a life-size photograph of a deer with an internal wire frame, ~1.3 cm thick, for support (Figure 1). The decoy was oriented in an east–west direction so that profile views of the decoy could be seen from the north or south (Figure 2). D.P.G. also left doe urine (details on manufacturer not available) on a branch 1.5 m off the ground 1 m north of the decoy.

At about 1515, after setting up the decoy and dispensing the doe urine, D.P.G. situated himself in a tree stand on a rocky point 23 m west of the decoy. The stand faced east and overlooked a 100-m wide valley dominated by mature Sugar Maple (*Acer saccharum* Marshall) forest between two steep rock ridges (north and south of the stand; Figure 2). On both sides of the valley at the base of the ridges were prominent deer trails running east to west. Immediately to the west of the tree stand was a dense Balsam Fir (*Abies balsamea* (L.) Miller) lowland. About 50 m north of the northern ridge was a 0.5–1.0 km wide channel of
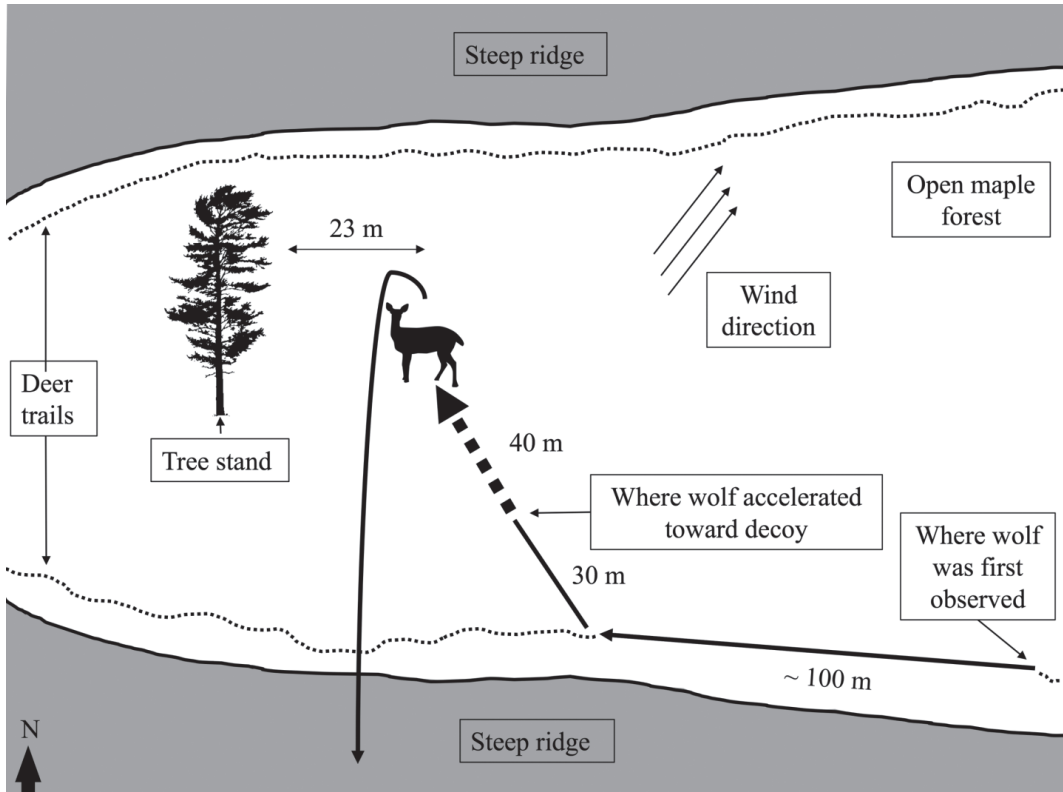
FIGURE 1. Life-like decoy of a White-tailed Deer (*Odocoileus virginianus*) that was attacked by a wolf (*Canis* sp.) 2 km west of Killarney Provincial Park, Ontario, Canada, during the first week of November 2017. Photo: Daniel Gable.

water; this channel surrounds McGregor Island. The maple forest that the stand overlooked had minimal understorey for about 150 m before transitioning to marshy lowland, which abutted a small shallow cove that was connected to the main water channel. D.P.G. accessed the stand by parking his boat at the northwestern opening of this cove (~300 m east by northeast of the stand). There was no snow cover during this period.

The sky was overcast with moderate (8–16 km/h) winds blowing from the west/southwest. At 1600, D.P.G. noticed a wolf about 150 m east by southeast of the stand trotting along the deer trail on the southern edge of the valley (Figure 2). Given the position of the decoy and the structure and arrangement of the trees, the wolf would have been unable to see the decoy when D.P.G. first spotted the wolf. We later verified this by walking to the wolf's location. The wolf continued at the same pace, moving east to west, until it was about 70 m southeast of the decoy (Figure 2). Without stopping, the wolf turned abruptly and started travelling directly toward the decoy. As the wolf approached, it appeared to be intently focussed on the decoy; however, it maintained a trotting pace

for another 30 m. When about 40 m from the decoy, the wolf suddenly sprinted toward the decoy and, when only a few metres away, lunged at it, latching onto its neck, leaving punctures in the fabric of the decoy. The force of the contact ripped the decoy from the ground and caused the wolf and decoy to tumble for about 10 m (total time 2–3 s). After the wolf had stopped its fall, it promptly stood up and jumped back about 10 m. It stood looking at the decoy for a few seconds with both ears and tail lowered. Within a few more seconds, the wolf ran quickly over the steep ridge to the south and disappeared from view.

We know of no other observation of a wolf travelling, detecting, and then attacking a deer or deer facsimile during the snow-free season. Although the decoy was not an actual deer, it looked exactly like a deer (Figure 1) and behaved (stood still staring at the wolf) as deer do when approached by predators (DeYoung and Miller 2011; Mech *et al.* 2015). Given this and the observed changes in the wolf's behaviour after it appeared to detect the deer, we believe that the wolf was convinced the decoy was a deer. As a result, we assert that the wolf's behaviour on detecting and approaching the decoy provides insight into how this

FIGURE 2. Route taken by a wolf (*Canis* sp.) that detected and then attacked a life-like decoy of a White-tailed Deer (*Odocoileus virginianus*) near Killarney Provincial Park, Ontario, Canada, in early November 2017.

wolf, and likely other wolves, may locate deer.

The wind direction and consistent wind flow would have made the doe urine difficult, and likely impossible (Conover 2007), for the wolf to detect during its approach, which strongly suggests that the wolf located the decoy visually. Wolves are thought to be adept at visually detecting slight movements, which likely helps in locating prey (Harrington and Asa 2003), but our observation suggests that wolves are capable of detecting motionless prey from considerable distances. We estimate that the wolf detected the decoy about 70 m away, although detection was likely aided by the minimal understorey and daylight conditions.

Although wolves likely rely on scent to locate deer when hunting (Mech *et al.* 2015), it appears they can also use visual detection, even if not associated with odour, sound, or any other cues. Dense vegetation throughout most of wolf–deer range likely limits visual detection of deer during the summer. However, events that reduce forest or understorey cover (e.g., forest fires, clear-cuts) could enhance the ability of wolves to detect deer and increase encounter rates between wolves and deer (Whittington *et al.* 2011)

and possibly wolf kill rates (Sand *et al.* 2005; Vander Vennen *et al.* 2016).

Mech *et al.* (2015: 26) noted that "when wolves detect deer, they usually proceed slowly and deliberately, ever on the alert". However, this wolf approached relatively rapidly after detecting the decoy, closing a ~70 m distance in a matter of seconds. Once 30 m away from the decoy, the wolf apparently decided that the deer (i.e., the decoy) was indeed vulnerable, possibly because it did not move, and sprinted toward it. Wolves generally assess the vulnerability of deer by approaching, chasing, and testing them. Most deer are not vulnerable to predation because they are in sufficiently good physical condition to easily out-run and evade wolves; therefore, most hunting attempts are short lived as wolves realize their efforts are futile (Mech *et al.* 2015).

Our observation provides the only information we are aware of about how at least one wolf approached and attacked what it thought was an adult White-tailed Deer during the snow-free season. Thus, whether the observation is the exception or represents normal behaviour is unknown. Still, it does provide new insight into the predatory behaviour of wolves.

The lack of information on wolf predation of deer—both fawns and adults—during the snow-free season is surprising given the amount of research on wolves, deer, and their interactions. Because of this, we recommend intensive research on wolf–deer interactions during summer as has been done recently with caribou (*Rangifer tarandus;* e.g., Whittington *et al.* 2011; Latham *et al.* 2013; Mumma *et al.* 2017). Indeed, as the range of White-tailed Deer continues to expand northward (Dawe and Boutin 2016), thereby increasing the area that wolves and deer co-occur, such information will only become more valuable and relevant for the conservation and management of both species (Latham *et al.* 2011).

Acknowledgements

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