

## Documentation of Infanticide in American Marten (*Martes americana*)

AMY DUBRUIEL<sup>1,2</sup>, JAMES E. WOODFORD<sup>3</sup>, and DAVID M. MACFARLAND<sup>3</sup>

<sup>1</sup>Wisconsin Department of Natural Resources 2801 Progress Road, Madison, Wisconsin 53716 USA  
Current address: 1460 Sheldon Street, Saint Paul, Minnesota 55108 USA

<sup>2</sup>Corresponding author; amy.dubruiel@gmail.com

<sup>3</sup>Wisconsin Department of Natural Resources, 107 Sutliff Avenue, Rhinelander, Wisconsin 54501 USA

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Reports of male American Martens (*Martes americana*) interacting with pre-weaned kits are limited. During the post-release monitoring of American Martens translocated from Minnesota to northwestern Wisconsin in 2008–2010, we documented a male American Marten without a radio-collar ascending a den tree of a radio-collared female in 2011 and removing two pre-weaned kits. The female's movements immediately became unrestricted after the removal. We also documented two events where an uncollared male American Marten was at the den tree before and after the kit removal. Only female American Martens have been reported to provide care for kits. Visual inspection of the remote camera photographs suggests that all three events likely involved the same uncollared male American Marten. This is the first record of a male American Marten killing pre-weaned kits.

Key Words: *Martes Americana*; American Marten; kits; infanticide; den; Wisconsin

Accounts of American Martens (*Martes americana*) killing other American Martens in the wild are rare. To our knowledge, there are no accounts of American Martens killing pre-weaned kits (1–6 weeks old), but fatal interactions among juvenile and adult males have been reported (Bull and Heater 1995; Bull and Heater 2001). Intact carcasses and overlapping home range data suggest these events occur for territorial reasons (Bull and Heater 1995; Bull and Heater 2001). Jones et al. (1997) observed adult male American Martens at 6 of 16 (38%) maternal dens, with males scent marking, investigating, or stealing prey without causing harm to kits. Ruggiero and Henry (1993) observed dependent kits present during adult American Marten copulation events and even observed an adult male resting with a kit (15 weeks old) for approximately 4 hours.

Ninety American Martens (55 females) were captured in Minnesota and released in northwestern Wisconsin during a three-year translocation project from 2008 to 2010 (Woodford et al. 2013). For the post-release monitoring, 31 of the translocated animals were followed using radio-telemetry 1–3 times a week. The study area was centered on 46°17'N, 90°55'W and encompassed 1882 km<sup>2</sup> of the Chequamegon-Nicolet National Forest and surrounding areas (Woodford et al. 2013).

A radio-collared adult female (E35), released in the fall of 2010, started to restrict her movements and established a den in an Eastern White Cedar (*Thuja occidentalis*) between 15 and 21 April 2011. During this period, the locations of E35 were never >388 m from the den tree. This period coincides with the normal parturition period reported for American Martens (Henry and Ruggiero 1993\*; Henry et al. 1997; Jones et al. 1997; Erb et al. 2010\*).

E35 was radio-tracked to the den tree on 22 April 2011, and three infrared cameras (Reconyx PC900, Reconyx Inc., Holman, Wisconsin) were positioned around the tree to track her movements. Because of the den tree's proximity to other trees, it is possible that E35 was able to enter and exit the den by climbing to adjacent trees. On 23 and 29 April 2011, we located E35 at the den tree by walking in with the radio-telemetry unit. Between 26 April 2011 and 1 May 2011, E35 was photographed either entering or leaving the den tree on 14 different occasions. Radio-telemetry triangulations were conducted on 15, 20, 21, and 25 April and on 5 May 2011. We located E35 by walking in with a radio-telemetry unit on 1 and 2 May 2012. She was located at two trees other than the den tree on both occasions. The maximum distance E35 was recorded away from the den tree was 850 m, on 2 May 2012.

At 0857 CDT on 24 April 2011, an uncollared American Marten was photographed near cavities at the base of the den tree. The uncollared American Marten appeared to be exploring, and was not detected climbing the den tree. At 0842 on 4 May 2011, an uncollared American Marten was photographed ascending the den tree and then descending at 0848 with an American Marten kit in its mouth. An uncollared American Marten ascended again at 0855 and descended with a second kit at 0856. The kits would have been 10–14 days old.

E35 was not detected at the den by telemetry or by any of the cameras that day, and was not detected at the den again until 2146 on 7 May 2011. On 8 May 2011 at 0849, an uncollared male American Marten ascended and immediately descended the den tree. E35 was not detected at the den tree on this day.

The cameras remained at the den tree until 17 May 2011, but E35 was not detected again at the tree. Visual comparison of E35 and the uncollared American Marten from photographs in the exact same position on the den tree showed that the uncollared American Marten was much larger and 18% longer than E35. We therefore determined that the uncollared American Marten was a male. When captured and radio-collared on 18 October 2010, E35 was 61.5 cm long, only 11% shorter than the longest female American Marten (69 cm) measured in the study ( $N = 50$ ). Visual inspection of remote camera photographs and comparison of pelt coloration suggest it was likely that all three observations of the uncollared American Marten were of the same male.

Only female martens (both American Martens and European Pine Martens, *Martes martes*) have been observed rearing pre-weaned kits (Wynne and Sherburne 1984; Henry and Ruggiero 1993\*; Henry et al. 1997; Kleef and Tydeman 2009; Erb et al. 2010\*). It is therefore likely that the male was killing the kits during the removal and not transferring them to a new den. Remains of the kits were not found at the base of the den tree when an extensive search of the area was completed seven days later. Additionally, E35's telemetered movements became unrestricted within her home range immediately after the predation event (374 m on 5 May, 1362 m on 9 May, 745 m on 10 May, and 945 m on 12 May 2011). Henry et al. (1997) concluded that female American Martens with pre-weaned kits were less likely to frequently move to new maternal dens; Henry et al. (1997) found that the periods spent in the den were longer than the periods spent away.

Male American Marten activity around maternal dens is understudied, as are reasons why some interactions between adult male American Martens and kits are benign or, as we observed, fatal. Information on den site activity during the early part of the American Marten kit-rearing period is limited (Jones et al. 1997) or has been focused on the movements of females (Henry et al. 1997). We have found no documentation of an American Marten female moving another female's kits or of an American Marten male transporting kits to a new den location.

An additional element is that the infanticide occurred after there was an influx of animals on the landscape, potentially increasing competition for resources. The translocation of an already fertilized female into a resident male's territory could have triggered an infanticide response. Conversely, infanticide could be a mechanism used by males when they usurp the breeding territories of other males, whether it is a resident taking another resident's territory or a translocated animal taking the territory of a resident.

Understanding whether this was an isolated infanticide event, part of normal American Marten territorial

behavior, or the result of the translocation could be informative for management of threatened American Marten populations elsewhere.

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