

University of Nebraska - Lincoln

DigitalCommons@University of Nebraska - Lincoln

The Prairie Naturalist

Great Plains Natural Science Society

2008

MORTALITY OF AN AMERICAN MARTEN FROM AN OFF-HIGHWAY VEHICLE

Joshua B. Smith

Jonathan A. Jenks

Follow this and additional works at: <https://digitalcommons.unl.edu/tpn>



Part of the [Biodiversity Commons](#), [Botany Commons](#), [Ecology and Evolutionary Biology Commons](#), [Natural Resources and Conservation Commons](#), [Systems Biology Commons](#), and the [Weed Science Commons](#)

This Article is brought to you for free and open access by the Great Plains Natural Science Society at DigitalCommons@University of Nebraska - Lincoln. It has been accepted for inclusion in The Prairie Naturalist by an authorized administrator of DigitalCommons@University of Nebraska - Lincoln.

MORTALITY OF AN AMERICAN MARTEN FROM AN OFF-HIGHWAY VEHICLE -- Cause-specific mortality in American marten (*Martes americana*) populations has been documented throughout North America (e.g., Maine [Hodgman et al. 1994, Hodgeman et al. 1997], Ontario [Thompson 1994], Quebec [Potvin and Breton 1997], Oregon [Bull and Heater 2001], and British Columbia [Poole et al. 2004]). Studies of trapped and untrapped populations have typically implicated predation as the leading cause of natural mortality (Hodgman et al. 1994, Bull and Heater 2001, Poole et al. 2004). Coyote (*Canis latrans*; Bull and Heater 2001, Hodgman et al. 1994, Hodgman et al. 1997), raptors (Thompson 1994, Hodgman et al. 1997, Bull and Heater 2001), red fox (*Vulpes vulpes*; Thompson 1994, Hodgman et al. 1994), fisher (*Martes pennanti*; Hodgman et al. 1997), and bobcat (*Lynx rufus*; Bull and Heater 2001) have been identified as predators of American marten. Other known causes of natural mortality include intraspecific killing (Hodgman et al. 1994, Hodgman et al. 1997, Bull and Heater 2001), disease (Thompson 1994), and exposure (Bull and Heater 2001).

Studies of heavily exploited American marten populations have shown that trapping might account for up to 90% of American marten mortalities (Hodgman et al. 1994). Additionally, human-induced mortalities from trap-related injuries (i.e., traps targeting other furbearers; Potvin and Breton 1997), shootings (Potvin and Breton 1997), and on-road vehicles (Potvin and Breton 1997) have been documented. However, there have been no published reports of American marten killed from direct contact with Off-Highway Vehicles (OHV; i.e., all-terrain vehicles [ATV], off-road motorcycles or dirt bikes, snowmobiles, and four-wheel drive vehicles).

While there are several reviews of the effects of OHVs and recreational activity on wildlife populations (Knight and Gutzwiller 1995, Joslin and Youmans 1999), most studies have focused on physiological (Creel et al. 2002) or behavioral (Van Dyke et al. 1986, Riley et al. 2003) responses to disturbance; none have addressed the potential for direct mortality. In 2005, we documented the death from an OHV of a juvenile, female American marten (F299) that had been radiocollared during a study documenting the distribution and abundance of American marten in the Black Hills, South Dakota (Smith 2007); the Institutional Animal Care and Use Committee at South Dakota State University approved all handling protocols (Approval Number 04-A030).

We relocated F299 16 times between the date of capture (3 August 2005) and the date she was discovered dead. We located the carcass on 9 September 2005 in a dry creek bed in the Northeast region of the Black Hills, South Dakota, approximately 1-km south of the nearest secondary road. The base of the creek contained numerous large rocks making it impassable via ATV. A visual inspection of the carcass indicated severe rub marks and patches of hair missing on the head, shoulders, back, and front legs. The bottom third of the animal was beneath a small rock (approximately half the size of the American marten) and had

been compressed severely dorso-ventrally, suggesting that the American marten had been run over by a vehicle. An inspection of the head and upper torso showed no signs of puncture wounds or trauma typically associated with predation. Due to the nature of the wounds, the ruggedness of the terrain, and the fact that we were unable to gain access to the creek bed via ATV, we concluded that the animal was crushed by a large OHV. We noted potential den site locations within 2 meters of the death site. Based on the physical evidence at the death site, we are certain the animal was not killed by being directly under the rock. Although the exact circumstances leading to the mortality are unknown, possibly the animal was denned in the creek and consequently struck and killed while attempting to escape the approaching OHV. The general area where the carcass was discovered is a popular destination for off-road enthusiasts, and during the course of our study, we routinely witnessed OHV traffic in adjacent areas.

While probably not a significant source of mortality in American marten populations, the potential for injury or death from OHV contact does exist. With an estimated 11 million visits to national forests nationwide (USDA Forest Service 2003), use of OHVs for recreational purposes is one of the fastest growing activities in the United States (Cordell et al. 2005). Thus, we think OHV use should be considered when addressing long-term viability of American marten populations, especially in sensitive areas, such as the Black Hills of South Dakota and Wyoming.

Financial support for our project was provided by the Federal Aid to Wildlife Restoration Act under project W-75-R (Study No. 7525) administered by the South Dakota Department of Game, Fish and Parks. We thank Civil Air Patrol pilots L. Becht and G. Kirk for assistance with aerial telemetry flights and C. N. Jacques for helpful comments on earlier drafts.--*Joshua B. Smith¹ and Jonathan A. Jenks. Department of Wildlife and Fisheries Sciences, South Dakota State University, Brookings, SD 57007-1696. ¹Corresponding author. E-mail address: josh_fl50@yahoo.com.*

LITERATURE CITED

- Bull, E. L., and T. W. Heater. 2001. Survival, causes of mortality, and reproduction in the American marten in Northeastern Oregon. *Northwestern Naturalist* 82:1-6.
- Cordell, H. K., C. J. Betz, G. Green, and M. Owens. 2005. Off-highway vehicle recreation in the United States: a national report from the national survey on recreation and the environment. United States Department of Agriculture, Forest Service, Southern Research Station, Athens, Georgia.
- Creel, S., J. E. Fox, A. Hardy, J. Sands, B. Garrot, and R. O. Peterson. 2002. Snowmobile activity and glucocorticoid stress responses in wolves and elk. *Conservation Biology* 16:809-814.

- Hodgman, T. P., D. J. Harrison, D. D. Katnik, and K. D. Elowe. 1994. Survival in an intensively trapped marten population in Maine. *Journal of Wildlife Management* 58:593-600.
- Hodgman, T. P., D. J. Harrison, D. M. Phillips, and K. D. Elowe. 1997. Survival of American marten in an untrapped forest preserve in Maine. Pp. 86-99 *in Martes: taxonomy, ecology, techniques, and management* (G. Proulx, H. N. Bryant, and P. M. Woodard, editors). Provincial Museum of Alberta, Edmonton, Canada.
- Joslin, G., and H. Youmans. 1999. The effects of recreation on Rocky Mountain wildlife: A review for Montana. Committee on Effects of Recreation on Wildlife, Montana Chapter of the Wildlife Society.
- Knight, R. L., and K. J. Gutzwiller. 1995. *Wildlife and recreationists: Coexistence through management and research*. Island Press, Washington, District of Columbia.
- Poole, K. G., A. D. Porter, A. Vries, C. Maundrell, S. D. Grindal, and C. C. St. Clair. 2004. Suitability of a young deciduous-dominated forest for American marten and the effects of forest removal. *Canadian Journal of Zoology* 82:423-435.
- Potvin, F., and L. Breton. 1997. Short-term effects of clearcutting on martens and their prey in the boreal forest of western Quebec. Pp. 452-474 *in Martes: taxonomy, ecology, techniques, and management* (G. Proulx, H. N. Bryant, and P. M. Woodard, editors). Provincial Museum of Alberta, Edmonton, Canada.
- Riley, S., R. M. Sauvajot, T. Fuller, E. York, D. Kamradt, C. Bromley, and R. Wayne. 2003. Effects of urbanization and habitat fragmentation on bobcats and coyotes in southern California. *Conservation Biology* 17:566-576.
- Smith, J. B. 2007. Assessing American marten use of track-plate box surveys for estimating population size in the Black Hills of South Dakota. M.S. Thesis, South Dakota State University, Brookings.
- Thompson, I. D. 1994. Marten populations in uncut and logged boreal forests in Ontario. *Journal of Wildlife Management*, 58:272-280.
- United States Department of Agriculture Forest Service. 2003. *Unmanaged Motorized Recreation*. <http://www.fs.fed.us/publications/policy-analysis/unmanaged-recreation-position-paper.pdf>. Accessed 24 February 2008.
- Van Dyke, F. G., R. H. Brocke, H. G. Shaw, B. B. Ackerman, T. P. Hemker, and F. G. Lindzey. 1986. Reactions of mountain lions to logging and human activity. *Journal of Wildlife Management* 50:95-102.

Received: 13 March 2008

Accepted: 22 March 2009

Associate Editor for Mammalogy: Christopher Jacques