Risks Associated with the Transmission of Bovine Tuberculosis from White-Tailed Deer to Cattle in Michigan: Current Research

Are R. Berentsen
*USDA APHIS WS National Wildlife Research Center, Fort Collins, Colorado*

Mike R. Dunbar
*USDA APHIS WS National Wildlife Research Center, Fort Collins, Colorado*

Regina Ebersole
*USDA APHIS WS National Wildlife Research Center, Fort Collins, Colorado*

Robert G. McLean
*USDA APHIS WS National Wildlife Research Center, Fort Collins, Colorado*

Follow this and additional works at: [https://digitalcommons.unl.edu/michbovinetb](https://digitalcommons.unl.edu/michbovinetb)

Part of the [Veterinary Medicine Commons](https://digitalcommons.unl.edu/michbovinetb)

Berentsen, Are R.; Dunbar, Mike R.; Ebersole, Regina; and McLean, Robert G., "Risks Associated with the Transmission of Bovine Tuberculosis from White-Tailed Deer to Cattle in Michigan: Current Research" (2008). *Michigan Bovine Tuberculosis Bibliography and Database*. 24. [https://digitalcommons.unl.edu/michbovinetb/24](https://digitalcommons.unl.edu/michbovinetb/24)

This Article is brought to you for free and open access by the Wildlife Disease and Zoonotics at DigitalCommons@University of Nebraska - Lincoln. It has been accepted for inclusion in Michigan Bovine Tuberculosis Bibliography and Database by an authorized administrator of DigitalCommons@University of Nebraska - Lincoln.
Risks Associated with the Transmission of Bovine Tuberculosis from White-Tailed Deer to Cattle in Michigan: Current Research

Are R. Berentsen, Mike R. Dunbar, Regina Ebersole, and Robert G. McLean
USDA APHIS WS National Wildlife Research Center, Fort Collins, Colorado

Abstract: Bovine tuberculosis (bTB) is a contagious disease of livestock, wildlife, and humans. Typically, it is transmitted through inhalation of aerosolized bacilli and direct or indirect contact between animals. In northeastern Michigan, bTB is endemic in white-tailed deer, and evidence suggests deer have spread the disease to domestic cattle. Previous research indicates bTB transmission likely occurs through contamination of cattle feeding sources by infected deer and subsequent use by cattle. We are investigating deer movements in relation to farm management practices such as feeding schedules as well as locations of cattle feeding areas, hay storage sites, barns, and water sources. All locations are plotted using ArcMap software. Regular communication with cooperators allows for updates in feeding schedules and locations. We are capturing free-ranging white-tailed deer and fitting them with radio collars equipped with a global positioning system (GPS). As of 15 February 2008, we have retrieved GPS collars from 7 of 16 deer collared in 2007, and 7 new collars have been deployed since 1 January 2008. Each retrieved collar has recorded over 2,500 data points, and preliminary results suggest individual deer are staying within 1.5 km of their capture site. Spatial analysis on deer locations relative to livestock management practices and farm structures will take place when all data is retrieved in late 2008 and early 2009. Once complete, we hope this information will allow us to recommend mitigating measures for livestock producers to reduce the risk of transmission of bTB from free-ranging white-tailed deer to domestic cattle.

Key Words: bovine tuberculosis, disease, Michigan, Mycobacterium bovis, Odocoileus virginianus, white-tailed deer

Suggested citation:
Proc. 23rd Vertebr. Pest Conf. (R. M. Timm and M. B. Madon, Eds.)
Published at Univ. of Calif., Davis. 2008. Pp. 277-279.
STUDY SITES
Study sites are beef cattle farms ranging from 30-160 ha in and around DMU 452. Each farm manages ≥20 cattle annually and includes wooded areas that serve as cover and winter deer habitat (Figure 2). All farms use similar feeding and management practices, including pasturing cattle during the summer, storing hay bales in high fenced areas, and storing supplemental feed in a closed barn. One study site has been previously infected with bTB, and 3 of the study sites are in close proximity to infected or previously infected farms.

METHODS
Deer were trapped from 19 January to 16 March 2007 and from 5 January to 5 March 2008 using collapsible Clover traps (Figure 3). Traps were baited with shelled corn soaked in molasses and checked daily after 8:00 A.M. If overnight temperatures were forecasted below -17.8ºC, traps were closed for the night. Captured deer were physically restrained or restrained by collapsing the trap (Figure 4). Upon capture, deer age (fawn vs. adult) was determined from body size and structure. Adult and yearling deer were fitted with uniquely colored and numbered ear tags and a radio collar equipped with a global positioning system (GPS) (Figures 5 and 6) (Advanced Telemetry Systems, Inc., Isanti, MN). Each GPS collar is programmed to record a location every 2 hours for 1 year after activation before dropping off. Deer are tracked bi-weekly using VHF telemetry to monitor for mortalities and determine whether deer are remaining on or near study sites.

RESULTS AND DISCUSSION
To date, 137 deer have been captured during 2,357 trap nights, resulting in 27 collared adult does on 4 properties in 3 Michigan counties. Ten collars have been retrieved, and each collar has recorded over 2,500 data points. Preliminary movement data suggest most deer are staying within 1.5 km of their capture site. Movement data will be correlated with farming practices, the location of feeding and watering areas, farm structures, and habitat types to determine potential interaction and thus the spread of disease between deer.
and cattle. Spatial analysis on deer locations relative to livestock management practices and farm structures will take place when all data is retrieved in late 2008 and early 2009. Once complete, we hope this information will allow us to recommend mitigating measures for livestock producers to reduce the risk of transmission of bTB from free ranging white-tailed deer to domestic cattle.

ACKNOWLEDGMENTS
The authors wish to thank Michigan Dept. of Natural Resources, Michigan Dept. of Agriculture, Wildlife Services Operations in Michigan, USDA Veterinary Services, and the numerous technicians who assisted with this study. A special note of thanks is extended to the private landowners who participated in the study.

LITERATURE CITED
PALMER, M. V., W. R. WATERS, and D. L. WHIPPLE. 2004. Shared feed as a means of deer-to-deer transmission of Mycobacterium bovis. J. Wildl. Dis. 40(1):87-91.
SCHMITT, S. M., S. D. FITZGERALD, T. M. COOLEY, C. S. BRUNING-FANN, L. SULLIVAN, D. BERRY, T. CARLSON, R. B. MINNIS, J. B. PAYEUR, and J. SIKARSKIE. 1997. Bovine tuberculosis in free-ranging white-tailed deer from Michigan. J. Wildl. Dis. 33(4):749-758.

Figure 6. Deer with blindfold, ear tags, and radio collar.