

# *Michigan Department of Agriculture*

Potential High Risk Area  
Shiawassee Circle

## *Final Report*

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## Disease Background:

Bovine Tuberculosis (TB) is an infectious disease caused by the bacteria *Mycobacterium bovis*. Although the primary host for *M. bovis* is cattle, the bacteria can infect many mammals, including humans and white-tailed deer. Michigan is the first state in the nation to have a reservoir of bovine TB infection in wild white-tailed deer and exposure to infected deer is a risk for infection in cattle and other animals. Cattle can become infected by close contact with infected deer or by eating feed contaminated by infected deer. Disease in wild white-tailed deer has proved problematic, challenging and expensive in the bovine TB eradication effort. The goal of the Michigan Department of Agriculture's (MDA) bovine TB eradication effort is to eliminate bovine TB in domestic cattle and bison and regain TB free status for the entire state.

## Background Shiawassee County:

On December 29, 2007, a hunter-harvested 18-month old deer from Shiawassee County was found to have lesions in the chest compatible with bovine TB. Samples from the deer were sent to the Michigan Department of Community Health (MDCH) for testing. Preliminary results obtained on January 16, 2008 suggested the deer was infected with bovine TB with confirmatory culture results obtained on February 22, 2008. The strain of bovine TB in the deer from Shiawassee County was determined to be identical to the strain found in cattle and deer in Northern Lower Michigan.

Confirmation of bovine TB by culture can take up to eight weeks. MDA sent a letter to all cattle and bison farmers in a 10-mile circle surrounding the location where the deer was found on January 31, 2008. The letter was sent prior to confirmation of bovine TB in the deer to expedite TB testing of cattle. The letter requested that farmers schedule bovine TB testing for late winter/early spring. Testing of cattle was scheduled prior to final confirmation for convenience of both the farmers and MDA or United States Department of Agriculture (USDA) testing staff – it is easier to gather cattle before they go to pasture and it is more convenient for farmers to test before they begin planting.

## Shiawassee County - Potential High Risk Area:

The Animal Industry Act, Public Act 466 of 1988, as amended, Section 9, permits the MDA Director to establish high-risk and potential high-risk areas. "High-Risk Area" means an area where bovine tuberculosis has been diagnosed in livestock. "Potential High-Risk Area" means an area where bovine tuberculosis has been identified only in wild animals.

Confirmation that the hunter harvested wild white-tailed deer was infected with bovine TB resulted in MDA establishing a "Potential High-Risk Area" for bovine TB, which was a 10-mile radius in Shiawassee County, extending into Clinton County - around Township 6N, Range 2E, Section 3, on March 3, 2008. The potential high-risk area in Shiawassee County was referred to as the "Shiawassee Circle."

The order required all cattle and bison herds within the "Shiawassee Circle" have a whole herd bovine TB test. Whole herd testing included all animals 12 months of age and older. The order required that testing must be completed or scheduled within six months of designating a potential high-risk area. Testing was at no financial cost to the farmers and was scheduled and conducted by MDA or its agents.

## Shiawassee County Bovine TB Testing Plan:

MDA mailed letters to impacted Shiawassee County beef and dairy farmers. The letters explained bovine TB testing requirements and the 10-mile radius "Potential High-Risk" designations in their counties. An informational meeting was held in Shiawassee County on Wednesday, February 13, 2008. Officials from MDA, MDCH, the Michigan Department of Natural Resources (DNR), USDA, and industry organization leaders attended the meeting.

The Incident Command System (ICS) was used to organize the TB testing in the 10-mile Shiawassee circle. This system, developed by fire fighters in areas of wildfire, provides an organized approach to address/manage an event/incident. Forest Services “Para-Military” Structure has been successfully used in a variety of situations since the 1970s. The ICS provides a structured, yet flexible way to manage an ongoing situation, with emphasis on communication. The ICS team consisted of individuals from MDA, USDA Veterinary Services, MDCH, and the Michigan State Police.

Bovine TB testing in the Shiawassee Circle started on March 4, 2008 with 4,249 head on 164 cattle farms being tested with the caudal fold tuberculin (CFT) test. Of those animals, 128 responded to the CFT test and required additional testing by either gamma interferon or the comparative cervical test. Two bovine from separate cattle herds were sent for necropsy, and laboratory testing - they were negative for bovine TB. Testing revealed no evidence of bovine TB in any cattle in this 10-mile circle. After whole herd testing revealed no evidence of bovine TB in Shiawassee County cattle herds, the potential high-risk designation was officially dropped (December 1, 2008). One herd of eight cattle “pets” remained on quarantine until tested and cleared in January, 2010.

## DNR/DNRE Deer Surveillance:

In 2007, the DNR conducted surveillance testing in Shiawassee County on 16 wild deer and found no evidence of bovine TB. After the one positive deer was found in 2008, to determine if bovine TB might be a problem in wild white-tailed deer in Shiawassee County, the DNR examined 152 hunter harvested deer from the 2008 archery and firearm seasons; and an additional 328 were taken and tested in 2009. Of the deer examined, none had suspicious lesions. No additional infected deer were identified from this effort. The newly established Department of Natural Resources and Environment (DNRE) will continue to conduct surveillance testing in the Shiawassee area at 300 deer per year through 2013.

The strain of *Mycobacterium bovis* that infected the Shiawassee County deer is identical to the strain found in Northern Lower Michigan deer and cattle, and is called “the Michigan strain.” This suggests the deer may have come from Northern Lower Michigan, however genetic testing to determine the origin of the Shiawassee deer was inconclusive. Officials were unable to determine if the deer had originated in the TB zone and moved or if it was born in the Shiawassee County area.

## MDA Industry Survey:

MDA, in cooperation with Michigan Cattlemen’s Association, Michigan Milk Producers Association and the Michigan Farm Bureau, conducted a survey of cattle farmers within the 10-mile Shiawassee circle. Seventy-eight of 154 surveys were returned. Although Shiawassee County beef and dairy farmers found the whole herd test inconvenient, they accepted the reason for testing. Most did not believe that one deer infected with bovine TB was sufficient to motivate management changes. Most were supportive of decreasing deer numbers.

## Conclusion:

After identification of one hunter harvested wild white-tailed deer with bovine TB, testing of all cattle within a 10-mile radius revealed no evidence of bovine TB in cattle. Testing of wild deer in the Shiawassee circle revealed no additional evidence of bovine tuberculosis in wild white-tailed deer. Although the infected Shiawassee deer had the strain of bovine TB found in Northern Lower Michigan (the “Michigan strain”), the origin of the deer could not be determined. Thus, it appears this was an isolated incident of infection, without evidence of additional bovine TB infection in domestic cattle or wildlife.