Persistent Spillback of Bovine Tuberculosis from White-tailed Deer to Cattle in Michigan, USA: Mitigation Strategies and Needs

Kurt VerCauteren, Michael Lavelle, Henry Campa, III
Managing bTB in other wildlife reservoirs around the world

- United Kingdom
  - Battling bTB in Eurasian badger and cattle
- Spain
  - Battling bTB in wild boar, red deer and cattle
- New Zealand
  - Battling bTB in brushtail possums and cattle
- Australia
  - Eradicated bTB in cattle and water buffalo after nearly 30yrs
- Canada
  - Battling bTB in WT deer, bison, elk, and cattle
- Minnesota, USA
  - Eradicated bTB in WT deer and cattle by responding aggressively
History of bovine tuberculosis (bTB) in the United States

- Zoonotic disease of livestock caused by *Mycobacterium bovis*
- Relatively common in cattle and occasionally in humans in late 1800s and early 1900s
- US Bovine Tuberculosis Eradication Program of 1917 cut prevalence from 5% to < 0.001% nationwide
Recent findings:
- bTB-positive deer found in Ogemaw, Roscommon, and Presque Isle counties (2017)
- bTB-positive cattle found in Ottawa and Kalamazoo Counties (2016)
- bTB-positive cattle traced back to Huron and Newaygo counties (2016 and 2017)
“…deer are only just able to maintain bTB in the community as a reservoir…. only small changes to direct contact transmission are necessary to make deer an inviable bTB reservoir.” (From Wilber et al. Submitted)
Factors contributing to bTB in MI: baiting and feeding

“Most hunters (71%) approved or strongly approved of people hunting deer with bait” - From MI Deer Harvest Survey (Frawley 2017).

From Rudolph et al. 2006. Regulating Hunter Baiting for White-tailed deer in Michigan…
Factors contributing to bTB in MI: concentrations of deer

Natural and unnatural concentrations of deer in and around sources of abundant food resources and thermal cover
Factors contributing to bTB in MI: livestock practices
Factors contributing to bTB in MI: livestock practices
What works: common key components

- Implementation of mitigation measures to **reduce transmission**
- Management strategies to reduce prevalence in **host species**
- Well-defined **objectives**
- Collaboration and stakeholder **support**
### "Best Fence" Selection Model

<table>
<thead>
<tr>
<th>Field and Crop Parameters</th>
<th>Fence Parameters</th>
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<tbody>
<tr>
<td>hectares</td>
<td>fence cost per m</td>
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<td>percent dam</td>
<td>fence perimeter</td>
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Research on interactions between livestock and wildlife
Research involving other species
Wildlife Risk Mitigation Project (WRMP)

- Initiated in 2008
- Goal: to enroll commercial farms in program to adopt biosecurity practices that reduce the risk of cattle coming into contact with infected free-ranging deer
  - Fence in feed – and keep the gates closed
  - Store feed in buildings
  - Feed cattle away from deer cover
  - Feed cattle daily
  - Provide water to cattle where it cannot be contaminated by deer
  - Use disease control permits from DNR to keep deer numbers down on cattle farms
Despite increased on-farm efforts, bTB persists…

Recent upswing in bTB occurrences in cattle are putting Michigan’s bTB status at risk.
Enhanced Wildlife Risk Mitigation Project

- Initiated in 2018
- Increased efforts required for producers to sell cattle beyond only to slaughter
- Continued use of WRMP biosecurity practices with addition of:
  - Intensified on-farm assessment and plan development
  - Focused deer removals by Wildlife Services
  - Cost-share program to improve on-farm wildlife biosecurity
Potential solutions: make a plan and stick with it

I am directing that the Departments of Community Health, Agriculture and Natural Resources jointly develop management plans for eradicating bovine tuberculosis in Michigan deer.

The eradication strategy should at least include the following:

1. Define an implementation strategy for a mandatory feeding ban in the five-county area;
2. Develop wild deer herd harvest quotas consistent with the eradication of bovine tuberculosis;

This issue requires your continued attention, supportive resources and strong leadership. The Agriculture Commission and the Natural Resources Commission will also be meeting jointly to discuss and where appropriate take action to eradicate bovine tuberculosis. The safety of the public health, the vitality of our agricultural industries and the health of our wild resources continue to be among my highest priorities. I am confident that by working together we will effectively resolve this matter.

Thank you for your cooperation.
Potential solutions: shift in harvest strategies

Although effective in increasing harvest, earn-a-buck program proved unpopular in WI. A similar response has been seen with strategies to increase deer harvest in MI.
“Even the maximum annual antlerless harvest over the last decade (4,388 in 2003) was less than one thousandth of the available opportunity” (Ramsey et al. 2014)
Potential solutions: hunter recruitment

- 40% of Americans participated in wildlife-related activities in 2016 revealing an increase of > 14 million people since 2011 (USFWS 2016)

- American hunter numbers dropped by > 2 million since 2011 (USFWS 2016)

- Number of hunters in MI declined by 14% since 2006 (Frawley 2017)

Based on social media, popularity of hunting for food appears to be increasing, thus demand for opportunity may as well
Potential solutions: reducing deer numbers through novel strategies

Deer Exchange Program

Stephen Vantassel
Potential solutions: deer vaccination program
Potential solutions: habitat manipulation

Michigan White-tailed Deer Stand Specific Habitat Management Guidelines

Goals (collaborative cost-share effort on private lands):
• Improve deer habitat
• Increase landowner partnerships
• Increase deer harvest through hunter access
• Reduce deer damage and disease transmission

Alpena-Montmorency Conservation District

2018 Deer Habitat Improvement Program
Potential solutions: building and maintaining support

Support needed from all sides:
- Elected officials
- Landowners/producers
- Proponents
- Opponents
Discussion and Questions?

Phone: (970) 266-6093
Email: kurt.c.vercauteren@aphis.usda.gov
Questions?


USDA bTB status zoning

- Modified Accredited zone (MAZ) = the 4-county area of NELP which encompasses Deer Management Unit (DMU 452)

- Accredited-free zone = essentially the rest of MI