
**THE ECONOMIC IMPACT OF BOVINE TB
ON THE TOURISM INDUSTRY IN
NORTHEAST MICHIGAN**

(EXECUTIVE SUMMARY)

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EXECUTIVE SUMMARY

This study was undertaken to develop an estimate of the economic impact on the Northeast Michigan tourism industry resulting from the occurrence of Bovine TB in the area. Recognizing the complexities that would be involved and the possible sensitivity of the estimates to the research methods employed to measure them, the research strategy developed for this study included three alternative methods to estimate impacts. Each is a proven methodology but, in this case, presented troubling limitations. The research methods employed in this study included: 1) an on-site survey of 900 travelers who stopped at three lower peninsula Welcome Centers (Clare, Dundee and New Buffalo) conducted between July and September 2002; 2) a telephone survey of 2,024 randomly selected households in Michigan, Ontario, Ohio, Indiana, Illinois and Wisconsin conducted between August 15 and December 12, 2002; and 3) a mail survey of 791 lower peninsula Michigan resident deer hunters conducted between February 31 and March 21, 2003.

This three-pronged research strategy in effect yields independent observations of the economic impact of Bovine TB associated with different populations that exhibit a degree of overlap. The telephone survey was of the broad, general population within Michigan's prime travel market area. The on-site Welcome Center population was of known Michigan travelers, a small fraction of whom reside outside of the region targeted in the telephone survey. The deer hunter mail survey targeted the narrowest population of the three surveys. Since deer hunters are clearly far more likely to have modified their travel behavior due to Bovine TB, a larger number of them were deemed necessary for our planned analysis than could be contacted in either of the other two surveys. And, a separate questionnaire was deemed necessary to generate more information from them. As a result of the three surveys, we have more information to compare and contrast, which not only provides estimates in which we are more confident but also helps to see how the impacts are distributed between deer hunters and other travelers.

The premise that underlies the estimates generated can be summarized as follows: "People must be aware that Bovine TB exists in Northeast Michigan and be concerned enough about it to modify their travel behavior to be counted as being a loss to the area's tourism industry." The projected loss in tourist numbers was derived directly from data generated in the three surveys. These were then used to project the dollars of direct tourist expenditures lost drawing upon relevant secondary data series. The overall methodology for deriving lost expenditure estimates is presented in the next section of the full report, and highlights are provided below.

Awareness of Bovine TB – Awareness of Bovine TB in Michigan is relatively low (7.3 %) across the general population in Michigan, adjacent states and Ontario. However, nearly half (47%) those contacted while traveling in Michigan are aware that the disease is present in Michigan, and slightly more than half (57%) of those that are aware of it in Michigan could pinpoint its location in Northeast Michigan. Thus, slightly more than a quarter (26.8%) of those who travel in Michigan are aware that Bovine TB is present in Northeast Michigan, and only they constitute the pool of Michigan travelers that could possibly have been influenced to modify their travel behavior because of the presence of the disease in Northeast Michigan. Nearly all (98.5%) of licensed deer hunters, on the other hand, are aware that Bovine TB exists in Michigan. While this reflects very positively on programs designed to educate deer hunters about the disease, it also confirms that the disease has the potential to significantly reduce deer hunter traffic into the region and thereby negatively impact the businesses that rely on them for income.

Impact on Travel Behavior – The level of awareness of the existence of Bovine TB in Northeast Michigan begins to shed light on its potential impact, but unless people perceive themselves at some risk because of it, they are not likely to modify their travel behavior. The disease is not readily transmitted to humans, or even to deer hunters who come in contact with an infected animal, if simple precautions are

used. While the actual risk to humans is believed to be minimal, it is what people perceive the risk to be and not reality that influences behavior, including travel behavior. How respondents to the three surveys indicated they would modify travel to an area where Bovine TB is present varies markedly across each responding population. Nearly 40% of the general population would not visit an infected area at all or would visit less frequently. Only 8% of Michigan travelers interviewed would similarly modify their travel behavior. About 11% of hunters who had hunted in Northeast Michigan stopped hunting there because of the disease, and 4% of all deer hunters indicated they have never hunted there because of Bovine TB. Together “hunters who stopped” and “those who never hunted” total 6.6% of total licensed Michigan deer hunters, or about 45,000 deer hunters.

Translating Lost Visitors to Lost Visitor Spending – Information collected in the three surveys provided directly usable information that was used to derive estimates of the volume of visitors lost in Northeast Michigan due to Bovine TB in four of the six projections techniques that were employed (Method 2 for the general population and current travelers and both Method 1 and 2 for deer hunters). The Method 1 applied to derive expenditure estimates for the general and Michigan traveler population did not require deriving volume lost estimates. For all six projection methods, it was necessary to draw upon information from one or more other sources to arrive at estimates of the loss of tourists’ expenditures attributable to Bovine TB. Examples include: The 1995 American Travel Survey conducted by the U.S. Census Bureau, MDNR Michigan deer hunter statistics, Michigan Travel Activity reports and the Michigan Travel Market Survey. The latter two sources are products of the research program at the Michigan Travel, Tourism and Recreation Resource Center that are largely funded by the Michigan Agricultural Experiment Station and Michigan State University Extension.

Four annual expenditure estimates were derived for the general population (telephone survey) and four for the Michigan traveler population (welcome center survey). Two were derived for the deer hunter population. These ten estimates ranged from a low of \$12.75 million to a high of \$39.5 million. All ten are objective and based upon credible data, thus could be considered defensible. Further consideration of the process employed to derive those estimates reveals particular statistics used in each process to which resulting estimates are particularly sensitive. Employing a degree of informed judgment, essentially selecting an average between the high and low range for these most influential statistics, results in the reduced set of estimates in the table below.

Table Executive Summary 1. Refined Estimates of the Annual Economic Impact of Bovine TB on Northeast Michigan’s Tourism Industry.

	Michigan Travelers (Welcome Center Survey)	General Population (Telephone Survey)	Deer Hunters (Mail Survey)
Method 1	\$19,125,000	\$25,500,000	
Method 2	\$19,736,886	\$26,327,548	
			\$20,064,537

Employing yet another round of judgment, we developed a most probable point estimate of the reduction in tourism expenditures due to Bovine TB, which is equal to about \$25,000,000 annually. The logic we employed to arrive at this estimate is:

1. The estimates derived for Michigan travelers and the general population exhibit little variation between those using either Method 1 or Method 2. So, our estimates are not sensitive to method used to develop them.

2. The difference between estimates derived from the general population and Michigan traveler population is tied to differing responses to the set of questions on the two surveys relating to awareness of and response to the presence of Bovine TB. However, there is no objective basis for judging which is the better estimate.
3. The case for weighting the general population based estimate higher than the Michigan traveler based estimate that was used rests in the deer hunter estimate, which is slightly higher than the Michigan traveler estimate. This is mathematically impossible and logic would suggest that the total impact of Bovine TB extends beyond deer hunters.

Thus, we conclude the following:

1. The best point estimate of the annual loss of tourism expenditures to Northeast Michigan attributable to Bovine TB is about \$25 million.
2. Nearly 80% of this loss is attributable to deer hunters.
3. We are confident that the annual minimum loss exceeds \$20 million and the maximum loss does not exceed \$40 million.

Accounting for the Multiplier – The direct tourism expenditures lost due to Bovine TB do not represent the total annual impact of the disease on the area's economy because of the ripple effect the lost dollars would have had as they recirculated in the local economy. The total annual impact on the economy of the dollars lost can be approximated employing a reasonable tourism industry multiplier. In the rural economy, which typifies this region, the tourism multiplier is likely to range between 1.3 and 1.5. Thus the total estimate using the \$25 million point estimate provided above is between \$32.5 and \$37.5 million.

Conclusions

To put the \$25 million lost to Bovine TB in perspective, we project that Northeast Michigan captures about 10% of Michigan's total pleasure travelers (a.k.a. tourists). The total direct traveler expenditures captured in Michigan in 2000 was \$12.8 billion according to the Travel Industry of America. Northeast Michigan's share thus would be about \$1.28 billion. The \$25 million lost to Bovine TB annually thus is only about 2% of the region's overall tourism market. Has Bovine TB had a negative impact on the Northeast Michigan tourism industry? Yes, it certainly has. However, it is also true that a 2% annual loss in tourists' expenditures is not enough to cripple the industry or to merit over emphasizing Bovine TB in region's overall tourism development or marketing strategies.

It is, however, also important to recognize that the profit margin on sales for many individual tourism businesses is slim. Even a 2% loss in sales can be problematic for such marginal businesses, especially, because the profit margin on additional sales is relatively high once the business covers its fixed cost burden from prior sales. And, it is also important to emphasize that the reported economic impact estimates will recur each year that the "conditions" upon which they are based persist. The challenge facing the Northeast Michigan tourism industry thus is to develop effective strategies that will mitigate these conditions and thereby reduce the negative economic impact of Bovine TB.

Table Executive Summary 2. Projections of the Annual Impacts of Bovine TB on NE Michigan Tourism.

	Current Michigan Travelers (Welcome Center Survey)	General Population (Telephone Survey)
Bovine TB Awareness		
1. % of respondents aware of Bovine TB in Michigan	47.0%	7.3%
2. % of aware respondents that are aware of Bovine TB in NE Michigan	57.0%	N/A
3. % of total Michigan travelers aware of Bovine TB in NE Michigan (2.*3.)	26.8%	N/A
Impact on Travel Behavior		
4. % of aware respondents that would travel elsewhere	3.0%	11.0%
5. % of aware respondents that would travel to an infected area less often	5.0%	28.0%
6. % of total Michigan travelers that would "go elsewhere" (4.*3.),(4.*1.)	0.8%	0.8%
7. % of total Michigan travelers that would "go less often" (5.*3.),(5.*1.)	1.3%	2.0%
8. % of total Michigan travelers that would reduce travel to NE Michigan (6.+7.)	2.1%	(in MI) 2.8%
Projections of Travel Expenditures Lost in NE Michigan		
9. Minimum % of total direct travel expenditures lost	1.0%	1.0%
10. Maximum % of total direct travel expenditures lost	2.0%	3.0%
11. Total domestic direct travel expenditures in Michigan in 2000 (TIA)- Method 1	\$12,800,000,000	\$12,800,000,000
12. Total domestic travel expenditures/trip in Michigan in 2000 (MTMS)- Method 2	\$474	\$474
Projections of Household Trips Lost in NE Michigan		
13. Total household trips in Michigan (ATS) in 1995	21,939,000	21,939,000
14. Growth rate/year of total household trips in Michigan (Michigan Travel Activity Reports)	4.0%	4.0%
15. % of Michigan travelers that visit NE Michigan (MTMS)	10.0%	10.0%
16. Projected household trips in Michigan in 2001 [13.*(1+14). ⁶]	27,759,834	27,759,834
17. Projected minimum household trips lost in NE Michigan (16.* 9.*15.)	27,760	27,760
18. Projected maximum household trips lost in NE Michigan (16.* 10.*15.)	55,520	83,280
Projections of Bovine TB's Economic Impact on NE Michigan		
19. Projected minimum Bovine TB economic impact in NE Michigan (TIA) (11.*9.*15.)- Method 1	\$12,800,000	\$12,800,000
20. Projected maximum Bovine TB economic impact in NE Michigan (TIA) (11.*10.*15.)- Method 1	\$25,600,000	\$38,400,000
21. Projected minimum Bovine TB economic impact in NE Michigan (MTMS) (12.*17.)- Method 2	\$13,158,161	\$13,158,161
22. Projected maximum Bovine TB economic impact in NE Michigan (MTMS) (12.*18.)- Method 2	\$26,316,323	\$39,474,484

Note. Method 1 is based on TIA's data for Michigan total travel expenditures. Method 2 is based on daily travel expenditure from the Michigan Travel Market Survey.

Data used in this table are from the findings of this study, travel expenditures in MI from the Travel Industry Association of America (TIA), the Michigan Travel Market Survey conducted by the MSU Tourism Resource Center, the 1995 American Travel Survey conducted for the US Bureau of Transportation Statistics by the US Census Bureau, and the Michigan Travel Activity Reports produced by the MSU Tourism Resource Center.

Table Executive Summary 2. (Continued.)

	Michigan Deer Hunters (Mail Survey)
Bovine TB Awareness and Impact on Deer Hunting Behavior	
1. % of respondents aware of Bovine TB in Michigan	98.5%
2. % of NE Michigan deer hunters that stopped hunting in NE Michigan due to Bovine TB	10.8%
3. % of Michigan deer hunters that never hunted deer in NE Michigan due to Bovine TB	4.0%
4. % of total Michigan deer hunters lost in NE Michigan due to Bovine TB (2.*9.)+(3.*8.)	6.6%
Projections of Michigan Deer Hunters & Hunting Days Lost in NE Michigan	
5. Projected number of Michigan (archery + firearm) deer hunters (2002-MDNR)	743,000
6. Projected number of (archery + firearm) hunting days in Michigan (2002-MDNR)	10,100,000
7. % of Michigan deer hunters who hunt in the LP	92.7%
8. % of LP deer hunters never hunted deer in NE Michigan	61.4%
9. % of LP deer hunters have hunted deer in NE Michigan	38.6%
10. Number of Michigan LP deer hunter lost in NE Michigan (5.*7.*4.)	45,629
11. Mean deer hunting days per year (2002)	22.3
12. Number of hunting days lost in NE Michigan (10.*11.)- Method 1	1,017,528
13. Number of hunting days lost in NE Michigan (6.*7.*4.)- Method 2	620,260
Projections of Bovine TB's Economic Impact on Deer Hunting in NE Michigan	
14. % of deer hunting day trips > 50 miles away from home	8.0%
15. % of deer hunting overnight trips > 50 miles away from home	36.5%
16. Expenditures/day on day trips (> 50 miles)	\$96.4
17. Expenditures/day on overnight trips (> 50 miles)	\$46.0
18. Projected total deer hunting day-trip expenditures lost (12*14.*16.) - Method 1	\$7,847,173
19. Projected total deer hunting overnight-trip expenditures lost (12.*15.*17.) - Method 1	\$17,084,288
20. Projected total deer hunting expenditures lost in NE Michigan (18.+19.) - Method 1	\$24,931,460
21. Projected total deer hunting expenditures lost in NE Michigan [(13.*14.*16.)+(13.*15.*17)] - Method 2	\$15,197,614

Note. LP = Lower Peninsula. Method 1 is based on number of hunters lost. Method 2 is based on number of hunting days lost. Data used in this table are from the findings of this study and the Michigan DNR's 2002 deer hunters and hunter-days projections.