AgEcon SEARCH
RESEARCH IN AGRICULTURAL & APPLIED ECONOMICS

The World's Largest Open Access Agricultural & Applied Economics Digital Library

This document is discoverable and free to researchers across the globe due to the work of AgEcon Search.

Help ensure our sustainability.

Give to AgEcon Search

AgEcon Search
http://ageconsearch.umn.edu
aesearch@umn.edu

*Papers downloaded from **AgEcon Search** may be used for non-commercial purposes and personal study only. No other use, including posting to another Internet site, is permitted without permission from the copyright owner (not AgEcon Search), or as allowed under the provisions of Fair Use, U.S. Copyright Act, Title 17 U.S.C.*

University of Wisconsin-Madison

July 2002 **Staff Paper No. 450**

The Economic Effects in 2002 of Chronic Wasting Disease (CWD) in Wisconsin

By

Richard C. Bishop

AGRICULTURAL & APPLIED ECONOMICS

STAFF PAPER SERIES

Copyright © 2002 by Richard C. Bishop. All rights reserved. Readers may make verbatim copies of this document for non-commercial purposes by any means, provided that this copyright notice appears on all such copies.

The Economic Effects in 2002 of Chronic Wasting Disease (CWD) In Wisconsin

by

Richard C. Bishop
Professor and Chair
Department of Agricultural and Applied Economics
University of Wisconsin-Madison

Wisconsin's 600,000 deer hunters will bear the brunt of the economic losses from chronic wasting disease (CWD) in the Wisconsin deer herd. This disease and the way it has been communicated to the people of the state have compromised an activity that hunters value highly. Methods are available to express these losses in dollars. The problem has yet to be studied enough to yield precise estimates. Nevertheless, I used values of deer hunting from Wisconsin and elsewhere and plausible assumptions explained below to make rough estimates. Wisconsin deer hunters could easily lose between $70 million and $100 million in recreation benefits this fall. More bad news about CWD would make the losses even larger.

Rather than calling attention to the economic losses that will be borne by deer hunters, press accounts have focused on lost deer hunter spending and resulting impacts on Wisconsin's economy. But unless there is more bad news, I doubt that these losses will be large. It is true that deer hunters spend substantial money on the sport. My estimate, explained below, is that they spent nearly $500 million annually in recent years. Because of CWD, they will probably spend tens of millions of dollars less on deer hunting this fall. However, as Wisconsin residents spend less on deer hunting, they will spend the money elsewhere in Wisconsin. Losses in the sectors of the economy that cater to deer hunters will mostly be counterbalanced by gains elsewhere. I do anticipate that Wisconsin will lose the expenditures of the out-of-state hunters who choose not to come here because of CWD, most likely between $5 million and $10 million in losses for 2002. This is not especially large in the context of the economy as a whole. However, some people, particularly in rural areas, will be adversely affected as urban hunters from Wisconsin and other states spend less money in rural areas of our state.

Assumptions for the 2002 Analysis

My analysis is based on the following assumptions:

1) I assume that no new information is forthcoming between now and the end of the deer-hunting season about the potential human health effects of eating venison from deer with CWD. Should it become clear that eating CWD venison causes a significant increase in the risk of illness and death in people, both hunting

expenditures and the lost nonmarket value of the hunt could decline by a lot more than my predictions here would indicate.

2) I assume that nothing new is learned about the potential effects of the disease on animals other than deer and elk. If the disease can be transmitted to domestic animals or other wild animals, my predictions will not apply.

3) I assume that, in the next seven months, we will not find the disease in deer outside of the area around Mt. Horeb. If cases are found outside the area, it could further reduce hunting participation and the overall value of the hunt.

Judging the Decline in 2002 Deer Hunting Participation

A big unknown is how much deer hunting participation will be affected by recent news about CWD. The press recently reported a St. Norbert College survey of deer hunters across the state. It asked, among other things, "Would you consider not hunting deer in Wisconsin because of CWD?" 36% of those surveyed said yes. A poll conducted by the University of Wisconsin Survey Center between June 8 and June 17 found that 75% of the hunters surveyed had not changed their hunting plans for fall as a result of CWD.

My colleague Tom Heberlein is a UW-Madison rural sociologist who has studied hunters and hunting in Wisconsin and elsewhere for decades. Tom and I believe that it would be easy to overestimate the effects of CWD on hunting participation this fall. We expect, based on the assumptions above and our experience, that the number of deer hunters and hunter-days will decline between 10% to 20% during the 2002 hunting season. Deer hunting is deeply entrenched in Wisconsin's culture and we think it unlikely that 30% or more of deer hunters statewide will stay away this fall provided we get no more bad news. Our judgment on this is also informed my past research on the effects of contaminants in sport caught fish. Despite years of warning about PCBs and mercury in Wisconsin fish, a large majority of potential anglers are fishing and eating their catch from waters that are subject to these concerns. I will proceed assuming that the reduction in deer hunting-days will be between 10% and 20%. The calculations are transparent so that others who would like to estimate the value using higher or lower declines in participation may do so.

Market Losses

As a point of departure, let's draw on *1996 The National Survey of Fishing, Hunting, and Wildlife-Related Recreation*, published by the U.S. Fish and Wildlife Service.[1] This is a nationwide survey that is done roughly every five years with samples

[1] U.S. Department of the Interior, Fish and Wildlife Service, and U.S. Department of Commerce, Bureau of the Census. *1996 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation: Wisconsin*. FWS/96-WI, Issued April 1998.

large enough to make estimates about participation and expenditures by hunters, anglers, and other wildlife enthusiasts at the state level. The Fish and Wildlife Service estimated based on this survey that about 552,000 people hunted deer in Wisconsin in 1996.[2] They estimated that Wisconsin deer hunting was responsible for 5,244,000 hunter-days.[3]

According to this same source, Wisconsin's big game hunters spent an estimated $282,439,000 on travel and equipment in 1996. Since 90% of all big game hunting-days were spent hunting deer (bear and turkey are also considered big game in the survey), we might suppose that about 90% of the dollars spent or about $254 million were spent on deer hunting. This covers only equipment and travel and deer hunters spent money on other things too. Other hunting costs are mostly made up of magazine subscriptions, membership dues and contributions, land leasing and ownership, licenses, stamps, tags, and permits. These costs are only reported for all hunting. Deer hunting is not separated out. For all Wisconsin hunting (including deer, small game, migratory birds, etc.) spending for purposes other than travel and hunting equipment amounted to an estimated $438 million in 1996. Since deer-hunting days amounted to 52.2% of all hunting-days, I will assume that 52.2% of all hunting spending other than for equipment and travel was for deer hunting. That would be about $228 million. Hence the total spending on deer hunting in Wisconsin for travel, hunting equipment, and other hunting costs is estimated to be $482 million ($254 million plus $228 million) or a little less than $900 per deer hunter.[4]

Now, if we assume that concerns about CWD lead to reduced hunting participation of 10% to 20% in the fall of 2002, applying these percentages to total spending implies that spending on deer hunting would go down by between $48 million to $96 million.[5] This, of course, is a lot of money. Businesses that cater to deer hunters will see substantial losses of revenues. Incomes of Wisconsin households will decline by several tens of millions of dollars. Furthermore, some rural households depend on businesses like motels, eating and drinking establishments, deer processing facilities, and gas stations where hunters from urban areas spend money locally. If fewer hunters come, these households will see their incomes fall.

So CWD's effects will be felt in the Wisconsin economy this fall. At the same time, it is important not to make too big a deal out of market losses. Consider:

---

[2] The Wisconsin DNR says that it sold over 688,000 licenses in 2001. The USFW figures are based on reported hunting in the previous year. Not every one who buys a license hunts. It is also possible that deer hunting participation may have grown in the last 5 years. Maybe the Fish and Wildlife Service numbers are a little low since they are based on a sample rather than the entire population.

[3] This is 9.5 days per hunter, when the gun deer season is only 9 days long and shorter in some areas. The number of days is increased by then 250,000 licensed bow hunters who hunt over an extended season beginning in mid-September and ending in early January.

[4] $480 million divided by 552,000 deer hunters equals $873.

[5] Admittedly, this is based on figures from the *National Survey* …, which has estimates for 1995, not 2002. However, at least in the years prior to CWD, deer hunting did not change very much from year to year. The DNR reports about 685,000 people were licensed for gun deer hunting in 1995 and about 688,000 in 2001. So, we can take the 1995 numbers are roughly indicative of the economic situation today.

- In the context of Wisconsin's economy taken as a whole, this is not very much money. It is less than $20 per Wisconsin citizen. Or consider the recent headline in the *Capital Times* indicating that the costs of campaigning for governor will total $30 million. We may shake our heads about spending so much on politics, but no one fears that it will bankrupt us.

- It is true that tourism is a significant part of the Wisconsin economy, but deer hunting is a very small part of the tourist economy. Less than 10 percent of deer hunters are nonresidents. Hence losses from a decline in out-of-state tourism (assuming a 10% to 20% reduction in nonresident deer hunting) would amount to only $5 million to $10 million in lost tourism revenues. Wisconsin's revenues from tourism are measured in billions of dollars.

- Since nonresident hunting is a small share, most of the estimated $48 million to $96 million in lost deer hunter spending will be associated with resident deer hunters. This will certainly hurt some businesses and households, as I have already mentioned, but these dollars will not evaporate. Residents who hunt deer less or not at all will spend the money elsewhere, probably largely within the state. This will benefit businesses and households outside the hunting economy. Losses from reduced deer hunting will likely be counterbalanced by gains elsewhere in Wisconsin's economy.

Hence, I would conclude that the net loss to Wisconsin's economy as a whole, which is due only to reduced spending by nonresident deer hunters, will likely be in the $5 million to $10 million range for 2002.

Nonmarket Losses

To account for the most important economic effects of CWD, natural resource economists would argue that we should look beyond what deer hunters spend. Deer hunting is important to a Wisconsin's citizens and the concern that deer may be tainted will reduce the value of the sport to deer hunters this fall. The question is, how much?

In considering the total economic value of deer hunting, let's start with the "price" of deer hunting. If you are a resident of Wisconsin, you can buy a deer license for $20. That could be considered the "price" of a season of deer hunting. But deer hunting is worth more than that. The expenditure figures discussed in the preceding section led me to estimate that in 1996, deer hunters spent almost $900 on average to participate in the sport. In a sense, the "price" of a season of deer hunting is $900. But $900 is the *cost* of deer hunting, not its value. Deer hunters on average must place a value of at least $900 each on a season of deer hunting. Otherwise they would not continue to spend that kind of money to do it. Economists reason that most of them must have a value greater than the $900 they spend. If they got only $900 worth of pleasure out of deer hunting, they would just break even.

That so many people seem to care about deer hunting means they are getting more value out of it than the $900 they are spending to do it. Economists call this extra value their "consumer surplus" or simply "surplus value." Surplus value is the maximum amount they would be willing to pay for the hunting opportunity over and above what it costs them. This is a long standing and widely accepted principle of resource economics.

Back in the 1980s, Tom Heberlein and I were actually able to charge hunters extra for deer hunting permits at Sandhill Wildlife Area in Wood County, Wisconsin, to get a measure in real dollars of this surplus value. I have also conducted a number of other studies to estimate these kinds of values, as have other resource economists around the country. If we were to do studies today in Wisconsin, I believe we would find that the surplus value associated with deer hunting would be in the neighborhood of $40 per day. Actually this figure is probably conservatively low. The reason is that most studies value hunting at specific sites or in specific areas when there are alternative sites or areas that are not too distant. Here we are trying to look at the whole state of Wisconsin. If deer hunting were not possible anywhere in Wisconsin, those wanting to hunt would have to go out of state, not just over to the next county or region in their home state as most studies assume. My $40 per hunter-day figure is also plausible when it's compared with the roughly $90 per day that hunters actually do spend.[6] We can very safely assume that hunters are getting surplus value of $40 per day on average above and beyond the $90 they are actually spending.

So, using the $40 figure, simple multiplication yields an estimate of the surplus value of deer hunting in Wisconsin. The roughly 5 million days of hunting the Fish and Wildlife Service estimated in 1996 would be worth $200 million. Let's take that figure as the annual surplus value of deer hunting in Wisconsin.

Now notice that $200 million is the value in the pre-CWD days. The onset of the disease and all the uncertainty it has created seem very likely to reduce this figure and the reduction would represent the economic losses to Wisconsin deer hunters from CWD. We can anticipate two kinds of losses. First, as we have seen already, the total number of deer hunting-days seems likely to decline. Here I will use my assumed decline of 10% to 20%. Second, for those who continue to hunt, the quality of the remaining hunter-days seems likely to decline. At least for the time being, the worries associated with CWD's possible, but unknown, effects on human health will be on nearly everybody's mind. This seems likely to affect the surplus value of remaining hunter-days. I am going to assume, for the sake of making a rough estimate, that this will reduce the surplus value per hunter-day by $10 to $15 dollars.

If the decline in hunter-days is 10 percent and the reduction in quality of remaining hunter days causes their value to drop from $40 to $30, then the total loss for

[6] In the preceding footnote, we estimated hunters spent $873 per season in 1996. This figure divided by 9.5 days equals about $90 per hunter day.

2002 would be $68 million.[7] If the decline in hunter-days is 20% and the value of remaining hunter-days drops to $25, this loss jumps to $105 million.[8]

So, my conclusion is that a large share of the losses from CWD in 2002 will be borne by the hunters themselves and my educated guess is that these losses will run somewhere between $68 million and $105 million. This makes the average loss per deer hunter between $123 and $190, based on the pre-CWD number of deer hunters.

[7] 10% of days is 524,400 multiplied by $40 is $21 million after rounding to the nearest million dollars. This would leave 4,719,000 days, which, when multiplied by $10 and rounding equals $47 million. Adding up then yields the reported figure of $68 million.

[8] 20% of days equals 1,048,800 multiplied by $40 yield $42 million after rounding. That would leave 4,195,000 days subject to a $15 per day loss or $63 million after rounding, for a combined total of $105 million.