



FIELD NOTES



THE NEWSLETTER OF
THE SOUTHWEST WISCONSIN CWD, DEER AND PREDATOR STUDY



Causes of Death in WI Deer

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Are deer dying of Chronic Wasting Disease? Does CWD kill deer in a way unique to the disease, or just make them more likely to die of a secondary infection, such as pneumonia, or get picked off by a predator or hit by a car? Determining causes of death for deer is a wild forensic puzzle that defies neat categorization, but that's one of our goals for the Southwest WI CWD, Deer and Predator study.

We're investigating deer deaths so we can pinpoint whether CWD plays a role in shaping deer populations over time. So far, of the 160 collared deer whose deaths we've investigated, we found hunter harvest to be the most common cause of mortality, followed by coyote predation, starvation, vehicle collision and pneumonia, which all came in roughly equal to one another. We describe these causes of mortality in greater detail below.

The causes and their relative importance can vary by region of the state, while individual causes may be influenced in different ways by CWD. As we gather more data, we'll be able to take a deeper look at these questions. (The deer referenced in this article were 6 months or older at time of death; newborn deer face



Collared buck in a field. Photo credit: Jerry Davis

a very different set of risks than older deer).

We're at the mid-point of our data collection for the study, which means we have a lot of preliminary information—the end results may not match what we've found so far, so we need to be cautious in our interpretations.

“There can be a lot of uncertainty surrounding the deaths of some deer. A deer may simultaneously have multiple severe infections and be emaciated, so which affliction killed it? It can be impossible to tell,” said Dan Storm, Deer and Elk Research Scientist. “The stories nature tells are wild and complicated, but they're also fascinating, and they can take some time to untangle.”

Except for hunter-harvested deer, our field crew conducts thorough investigations of the ground around each carcass to look for animal tracks, scat and other signs, and then brings the carcass back to a lab for a necropsy, conducted by veterinary pathologists at the UW-Madison unless the animal is too decomposed or heavily eaten to transport.

Here are some of our main takeaways:

- Deer with CWD die of starvation at a much higher rate and in a much different manner than those without. We could consider these deer as “dying of CWD” as it is the classic “wasting” that people see in the end stages of the disease.
- A better way to look at the data is to consider how CWD influences the risk of death from all potential causes, as this will give us the fullest picture of how CWD affects deer populations.
- Going forward, we'll take a quantitative look at this data and ask questions like: what percentage of deer on an annual basis die in these specific ways, and how does the deer's CWD infection status change the picture?

Hunter Harvest

Hunter harvest is by far the most common way adult deer have died in this study. These deaths are four times more common than from any other source. Ultimately, we'll estimate harvest rates, or the percentage of deer that are harvested each fall, and how these rates differ between males and females, young and old deer and those with and without chronic wasting disease. We'll also look at how harvest rates are split between archery and firearm seasons.

Coyote Predation

Deer we suspect were killed by coyotes tended to be less than 1 year old and killed in late winter/early spring (March was the month with the greatest number of apparent coyote predations). We saw the same thing in our studies in the Northwoods and Northeast WI farm country. We can't say with certainty whether these deer were killed by coyotes because it can be difficult to distinguish between scavenging and predation—the coyotes eat the evidence.

Sometimes, like in the case of a juvenile buck killed March 23, we know for sure. The hind legs of the deer were eaten but the rest of the body was intact. The pathologist found punctures on the neck around the windpipe, along with significant bleeding, which tells us the deer's heart was beating at the time those punctures were made. This is a classic way that coyotes finish off their prey.

We're not always so lucky: Often, there is little left of the carcass to examine, and in other cases, snowfall, snow melt, and rain obscure other clues, such as evidence for a chase or struggle.

We're looking at our suspected coyote deaths with caution for several reasons—some of these apparent predations may actually be scavenging, and some of the deer may have been severely compromised from something else which made it easier for the coyote to kill them (it's common for adult deer killed by coyotes to have something wrong with them, such as being emaciated or having a prior injury.)

Starvation

Starvation deaths are the clearest case so far of a type of death that is more common among deer that tested positive for chronic wasting disease; in fact, all of the deer in our study observed to have starved tested positive for the disease. This contrasts sharply with our earlier studies in the Northwoods and Northeast Wisconsin farm country, where starvation in late winter and spring was common among juvenile deer, particularly in the Northwoods study area.

Given the abundance of row crops and the shorter, milder winters in the southwest part of the state, we wouldn't expect starvation to be nearly as common. Starvation in deer who test negative for the disease usually occurs in late winter or spring—they run out of energy reserves before the spring green-up comes and rescues them. An otherwise healthy deer would not starve any other time of the year.

What we see in cases of CWD is quite different: We've observed starvation deaths at the expected times, March for instance, but we've also had deer starve in August, September, and November. These deer are obviously not starving from lack of food, but rather their neurological condition prevents them from eating enough—this is the classic “wasting” that gives the disease its name.

Vehicle Collision

We already know vehicle collisions are variable and dependent on road networks and traffic, but it's interesting to see how common these collisions are compared to other types of deaths. In rural farmland areas, we'd typically expect vehicle collisions to be the second most common way adult deer die, after hunting. In the last study, this was the case in our farmland study area, but not in the Northwoods study area, which has much less traffic.

Pneumonia

Pneumonia is a sometimes-fatal lung infection which can be caused by a variety of organisms, including viruses, bacteria and fungi. These organisms most commonly enter the lungs through inhalation, aspiration (food, water or saliva entering the lungs), or septicemia (they travel through the blood from a different location). Pathogens don't always cause pneumonia and can be found in healthy animals.

We expected that some of our deer with CWD would die of pneumonia because one of the physical manifestations of the disease is reduced ability to swallow, which could lead to foreign material such as food and rumen fluid in the lungs, causing aspiration pneumonia. They may also have impaired immune function and become less able to fight off the infection.

We also found that some deer that tested negative for CWD died of pneumonia. At the moment, we can't say for sure how they contracted it or the organism or pathogen responsible. A tricky aspect of pneumonia is that multiple pathogens can be present in the lungs of a single deer, and it's difficult to determine which initiated the pneumonia or contributed most to the deer's sickness. To investigate this further, we will be collecting nasal swabs from deer at capture and screening lung tissue of dead deer to determine the range of pathogens that are circulating in our herd.

Other Causes

We have a few cases that didn't fit into a neat category, which we expected, including a large buck with CWD that died of a brain abscess and a juvenile buck that had a severe bacterial infection of the gastrointestinal tract.

Unrecovered Kill

Unrecovered kill, which is uncommon, is our term for a deer that dies from wounds afflicted by a hunting weapon, but which is not recovered by a hunter. Some hunters may be interested to know whether this happens more often in deer shot with archery tackle versus firearms. We don't have the data yet to say, and considering how rare this is, we may not even when the study is complete.