

SCIENCE MARCHES FORWARD: THE EVER-EVOLVING SCIENCE OF CHRONIC WASTING DISEASE

SCIENCE BLASTS



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Chronic Wasting Disease (CWD) is one of the greatest threats facing North American wildlife species today. This disease, caused by an infectious protein or “prion,” is spreading across the United States and Canada, affecting wild and captive populations of species in the deer family (Cervidae). Species most directly affected by CWD include whitetail deer, mule deer, and elk. However, research suggests that many other species in the family Cervidae are also likely susceptible to this disease.

CWD is similar to other prion diseases, such as scrapie in sheep or “mad cow” (BSE or bovine spongiform encephalopathy) in cattle. The disease is characterized by the progressive degeneration of the central nervous system and is 100 percent fatal. The prions that cause the disease remain infectious outside the animal and spread through environmental contamination, such as infected bedding, soil, or vegetation, as well as animal-to-animal contact. There are no known treatments, cures, or vaccines for this disease nor conclusive evidence regarding the possibility of human infection. In addition, the most reliable tests for CWD require tissue samples, which can only be obtained after the animal dies.

CWD was first discovered by scientists in 1967, and ever since then, the scientific community has been working to help managers understand the many challenges posed by this disease. Scientific studies of CWD’s biology and transmission pathways are highly active research areas.

Last June, researchers from around the world met in Denver, Colorado, to discuss the latest scientific developments regarding CWD. Some of the findings presented at this conference are truly daunting: the disease is actually changing the demographics and age structures of certain cervid populations; CWD prions can indeed contaminate sites such as mineral licks where cervids congregate; and researchers have now confirmed that female white-tail deer can transmit CWD to their offspring before birth. However, there are some hopeful signs: new techniques greatly improve our ability to detect CWD in both animal and environmental samples; preliminary research suggests that dogs may be able to detect CWD-infected animals in much the same way that dogs can also be used to detect certain human diseases; and we are getting ever closer to having tests that can reliably detect the disease in live animals.

Despite this recent scientific activity, we still have some significant unknowns in our knowledge and understanding of CWD. How are we going to manage this disease in wild free-ranging cervid populations while at the same time meeting the needs and expectations of the hunting public? Some of the most commonly proposed management approaches involve dramatic reductions in herd size and reductions in activities such as supplemental feeding, nutrient provision, and the elimination of baits or scents that could congregate animals in such a way that the disease can spread. These are not popular ideas among the

hunting public at large! Careful research is needed to examine these recommendations closely and study them in the field to determine which approach works and under what circumstances. And we still do not have conclusive evidence regarding the most important question for hunters and their families: could this disease actually jump the species barrier and begin infecting humans who consume meat from infected animals?

As discussed in an earlier column, members of the scientific community are coming together in unique ways to help address these major problems. One of the most promising efforts is the CWD Research Consortium created by former Boone and Crockett Fellow Dr. Sonja Christensen at Michigan State University, working with partners at other universities in the upper Midwest. This research consortium links major research universities nationwide with federal and state agencies to help tackle some of the thorniest scientific questions regarding

CWD and its management. The consortium has unparalleled abilities to bring in new lines of evidence (such as a library of tissue samples from infected animals), new techniques (such as detailed geospatial models), and new partners, including scientists from the public health, human dimensions, and social science arenas. One of the most exciting projects being considered by the consortium is an effort to work with the state fish and wildlife agencies across the midwestern states to improve decision-making around CWD at individual agencies and to apply some of the new and most promising scientific findings to actual on-the-ground cervid management.

Dr. Sonja Christensen is also involved in another exciting effort to assist the state fish and wildlife agencies in improving their

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management of wildlife disease issues within their borders. With support from the U. S. Fish and Wildlife Service, the Association of Fish and Wildlife Agencies (AFWA) has hired a dedicated wildlife disease coordinator in each of its four regions to assist the state fish and wildlife agencies in responding to the challenges posed by wildlife diseases, particularly CWD. These coordinators are helping states connect more effectively with scientific researchers, obtain faster and more accurate diagnoses of wildlife disease outbreaks, and improve planning and coordination around wildlife disease issues. Sonja coordinates this entire network through her work as the part-time wildlife health and disease coordinator at AFWA.

Another important scientific effort that is just now gearing up is a major multi-year study by the National Academies of Science and Medicine (NASEM) to examine the causes and methods of transmission of CWD among both captive as well as wild cervid populations. The NASEM includes many of the nation's top scientists among its members and is well known for producing careful, well-reasoned "gold standard" scientific reports on controversial topics. This study will review our understanding of CWD transmission and make recommendations for management, research, and study.

Finally, my program, the USGS Cooperative Fish and Wildlife Research Unit Program, which was founded by Boone and Crockett Club Member Jay "Ding" Darling in 1932, is actively exploring

how we might be able to leverage our scientific resources and capacity across our 42 (soon to be 43) research units across the country. The 126 scientists in our program have a tremendous range of expertise in all aspects of wildlife science relevant to disease management—from genetics to genomics, from spatial ecology to structured decision-making, from deer ecology to disease etiology, and from habitat management to hunter education. Boone and Crockett Professional Member Jen Mock is working with our scientists to explore the notion of creating a wildlife disease "community of practice" within the Cooperative Fish and Wildlife Research Unit Program, which would bring together scientists from diverse backgrounds to tackle some of the most intractable problems associated with the most complicated disease issues, particularly CWD.

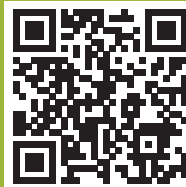
The scientific effort to understand and manage CWD is truly impressive and, if successful, will provide the knowledge and information needed to help our state and federal wildlife managers address this major challenge to our wildlife resources and hunting heritage. I have great confidence in our wildlife scientists, and I look forward to continuing to share with the readers of *Fair Chase* the latest research findings about CWD and other critical wildlife diseases. ■



Elk on a feedground in Wyoming.



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Read more about the Club's involvement with CWD



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A bull elk with chronic wasting disease. The emaciated appearance and drooping ears are characteristic of latter stages of infection.