

CWD RESEARCH CONSORTIUM: SCIENTISTS TEAM UP TO FIGHT CHRONIC WASTING DISEASE

Chronic wasting disease, or CWD, has emerged as one of the top challenges facing wildlife managers today. This disease directly affects populations of North America's most popular and widely-hunted big game species, and its continued spread has the potential to undo many of our most significant wildlife conservation achievements. We once again have thriving herds of elk, mule deer, and white-tail deer across many of our landscapes thanks to the efforts of generations of Boone and Crockett members, state and federal biologists, and other dedicated conservationists. Diseases such as CWD can threaten these successes by decreasing the health and condition of individual animals, increasing animal mortality, reducing the number of older animals in free-ranging herds, and ultimately reducing overall herd size and health.

Chronic wasting disease is a 100 percent fatal disease of deer, elk, moose, and other members of the family Cervidae. Similar to bovine spongiform encephalopathy (also known as mad cow disease), CWD is characterized by progressive nervous system degeneration, leading to loss of body function and the animal's death. There is, at present, no vaccine or treatment for this disease, and scientists are still in the process of developing reliable methods for detecting CWD in live animals. Standard diagnostic tests are performed on dead animals.

Unlike many other diseases caused by viruses or bacteria, CWD is caused by a misfolded protein known as a "prion." The prion triggers other proteins in the nervous system to misfold, clogging cellular pathways leading to brain degeneration and, eventually, death. Misfolded proteins are also shed by the animal and can infect other

animals. At this writing, CWD has been detected in 30 U.S. states and four Canadian provinces in free-ranging cervids and/or commercial captive cervid herds. Fortunately, the disease has not yet been detected in humans. However, similar diseases have jumped the species barrier in the past, and humans have their own prion diseases, which are rare.

Chronic wasting disease presents some unique challenges for managing wildlife habitats. Reports in the scientific literature suggest that infectious CWD prions may persist for long periods, essentially dormant in the environment, only to reinfect animals decades later. The prion proteins can also be taken up by plants and will bind to certain forms of soil particles, where other animals can consume them and potentially even trigger disease in those animals.

The available management strategies for



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addressing CWD in wild herds are limited and generally involve measures such as the removal of affected animals, reductions in overall herd size, and elimination of practices that result in close contact between animals, such as supplemental feeding or baiting. Many of these practices are not popular with hunters or the general public. Even the complete removal of all animals may not eliminate all risks from residual prion contamination in the environment.

Fortunately, there is some hope! A group of the nation's most brilliant scientists with expertise in diverse areas like wildlife disease, wildlife biology and management, quantitative modeling,

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The management of CWD is beset with difficult and thorny problems, as well as many unanswered questions involving the following:

- Methods for decontamination under real-world conditions
- The relative magnitude and risk involved in captive cervid versus wild cervid management
- The pathways of prion replication and shedding in host animals
- The extent to which prions persist in natural environments
- The extent to which soil and vegetation uptake represent significant infection pathways
- The relative impacts of captive cervid and dead carcass transport on the spread of the disease
- The effectiveness of proposed CWD management measures under actual field conditions



and human health has formed the CWD Research Consortium. I was privileged to attend the first meeting of this consortium in September 2019, and the group has been meeting at regular intervals ever since. In all of my years of attending meetings on CWD, this meeting was easily the best-run, most productive, and certainly the most well-attended by the key scientists and managers working to fight CWD. In one room, there were globally recognized experts on prion biology, USGS personnel responsible for mapping CWD cases, and USDA's captive cervid program administrator. Leaders from state and federal wildlife agencies and major leaders in the public health community (one of whom served on presidential panels regarding the COVID-19 crisis) were also in that room.

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The first consortium meeting was organized by Dr. Sonja Christensen, who received her Ph.D. at the Boone and Crockett Quantitative Wildlife Research Center at Michigan State University. Dr. Christensen studied under the late Dr. Bill Porter, the first Boone and Crockett Chair of Wildlife Conservation at Michigan State and a professional member of the Boone and Crockett Club. Dr. Christensen is a truly unique individual in the CWD research community, dividing

her time between her academic appointment at Michigan State, where she teaches and conducts original research, and the Association of Fish and Wildlife Agencies, where she works with state fish and wildlife agency leaders to support their work and coordination in fighting CWD. She did an extraordinary job organizing and facilitating this first meeting. The continued success of the consortium is due in significant part to her hard work and efforts behind the scenes.

Progress in any of these five focus areas (see box at the left) would benefit state and federal wildlife biologists working to manage CWD in cervid populations. Progress on multiple fronts could potentially be game-changing in the fight against CWD. Toward that end, consortium members engage in various projects associated with each of these objectives.

The consortium's work continues to expand, and interested researchers and prospective partners are invited to participate by visiting www.cwd-research.com. I am particularly pleased to



Read more about CWD

report that one of the staff in my program (the USGS Cooperative Fish and Wildlife Research Unit Program) is now chair of the consortium. Dr. Dan Walsh worked previously with the Colorado Division of Wildlife and the USGS National Wildlife Health Center before he joined the Montana Cooperative Wildlife Research Unit in 2022. In addition to his work on CWD, he has also studied chronic wasting disease, bighorn sheep respiratory disease, avian influenza, white-nose syndrome, New Castle disease, and others. I look forward to the continued growth and success of the CWD Research Consortium under Dan's capable leadership, and I look forward to sharing progress reports on the battle against CWD with the readers of *Fair Chase*. ■

The consortium's members and partners have identified five major areas of focus for collaborative research:

- Understanding disease transmission and pathogenesis (how it leads to animal death)
- Developing large-scale research facilities for answering questions about CWD
- Improving diagnostic testing for CWD, especially in live animals
- Evaluating management strategies and how they operate across state boundaries
- Enhancing coordination, understanding, and communication of social science as it relates to CWD research and management