

S. HRG. 116–151

**LEGISLATIVE HEARING ON A BILL TO CREATE
A U.S. FISH AND WILDLIFE SERVICE CHRONIC
WASTING DISEASE TASK FORCE**

HEARING
BEFORE THE
COMMITTEE ON
ENVIRONMENT AND PUBLIC WORKS
UNITED STATES SENATE
ONE HUNDRED SIXTEENTH CONGRESS

FIRST SESSION

DECEMBER 4, 2019

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COMMITTEE ON ENVIRONMENT AND PUBLIC WORKS

ONE HUNDRED SIXTEENTH CONGRESS
FIRST SESSION

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LEGISLATIVE HEARING ON A BILL TO CREATE A U.S. FISH AND WILDLIFE SERVICE CHRONIC WASTING DISEASE TASK FORCE

WEDNESDAY, DECEMBER 4, 2019

U.S. SENATE,
COMMITTEE ON ENVIRONMENT AND PUBLIC WORKS,
Washington, DC.

The committee met, pursuant to notice, at 10:05 a.m. in room 406, Dirksen Senate Office Building, Hon. John Barrasso (chairman of the committee) presiding.

Present: Senators Barrasso, Carper, Inhofe, Capito, Braun, Boozman, Ernst, Cardin, Gillibrand.

OPENING STATEMENT OF HON. JOHN BARRASSO, U.S. SENATOR FROM THE STATE OF WYOMING

Senator BARRASSO. Good morning. I call this hearing to order.

Today, this committee will examine draft legislation to address a growing wildlife health crisis. In October, this committee held a hearing to examine how disease impacts wildlife conservation as well as management. From that hearing, it became clear that one of the largest threats to the health of deer, elk, moose, and reindeer is chronic wasting disease.

Chronic wasting disease is a terrible, degenerative brain disease. It is highly contagious in animals. Symptoms develop slowly over time, but the disease is always fatal. Scientists and wildlife managers first detected the disease nearly 40 years ago. Since then, it has spread to at least 26 States and 4 Canadian provinces.

Since its discovery, scientists, State wildlife managers, and Federal agencies have worked to understand how the disease spreads. From their work, we now understand that the disease is spread by prions. Now, a prion is not a bacteria; it is not a virus, there are no treatments available, antibiotics are not effective. There is no effective vaccine.

I learned about prion disease in medical school. Prions are effectively misfolded proteins. When these proteins are abnormal, they cause similar diseases in sheep and in humans.

How those prions spread and infect other animals still remains a mystery. Research has not yet determined whether the disease is transmitted through nose-to-nose contact, or through animal waste, through carcasses of infected animals, or some other way. Some studies have even suggested prions can remain in the soil for up to 16 years.

There is a lot we do not know yet about this disease, including its risks to humans. That is why today we will discuss a draft bill to create a Chronic Wasting Disease Task Force at the U.S. Fish and Wildlife Service. This task force represents an opportunity to bring States, relevant Federal agencies, scientists, managers, and farmers to one table. Together, they can coordinate prevention and control efforts, and target future research to address unanswered questions.

States manage deer, elk, moose, and reindeer populations that are at risk. States like Wyoming and West Virginia manage wild herds and collect data from game farms. They have invested countless hours and dollars to develop strategies that may not always be consistent across State lines.

When he testified before this committee in October, Dr. Walter Cook, who is the wildlife population health veterinarian at Texas A&M, emphasized the need to coordinate research, to work on containment efforts, and on public education. He stated, "It would be ideal if a group of respected chronic wasting disease authorities could determine common management needs and overall public message."

To that end, this draft bill would combine expertise about wildlife from the U.S. Fish and Wildlife Service, data on farmland animals from the U.S. Department of Agriculture's Animal and Plant Health Inspection Service, and on-the-ground experience from the affected States.

This is a fight that must be fought on multiple fronts; in the wild, where the deer, the elk, and the moose roam vast spaces and on the farms that breed and raise these animals. Unchecked, this disease could truly be catastrophic for wildlife and local economies.

Across this Country, whole industries are built around wildlife, hunting, tourism, wildlife watching, and deer and elk farming. The Muley Fanatic Foundation in Wyoming told me that "There is no bigger threat to our big game populations than the spread of chronic wasting disease."

I believe this task force, and the pooled resources that it leverages, can be a turning point in the national fight against chronic wasting disease. We need a roadmap for the future, and sharing information is the place to start.

I would now like to ask Ranking Member Carper for his opening statement.

**OPENING STATEMENT OF HON. THOMAS R. CARPER,
U.S. SENATOR FROM THE STATE OF DELAWARE**

Senator CARPER. Thanks, Mr. Chairman. Who is from Wyoming?

Senator BARRASSO. The guy in the back, right there, is from Wyoming, with the mustache. The guy that looks like a rugged rancher, the individualist, a resilient guy. Looks like the Marlboro Man.

Senator CARPER. I see him, I see him. There you go.

[Laughter.]

Senator CARPER. Whether you are from Wyoming, or some other State, we welcome you warmly. Thank you for being here.

Mr. Chairman, colleagues, and to our witnesses and audience, although chronic wasting disease is an unfamiliar topic to most of us in the First State, that is Delaware, our neighbors in Maryland and

nearby Pennsylvania are dealing with it firsthand. I just spoke with Senator Cardin before he went off to be in a Foreign Relations Committee hearing, and he is going to try to get back. He said that they deal with it in Maryland, Western Maryland, up in that part of the State.

In the spirit of the golden rule, Delaware, my State, has an interest and an obligation to help prevent the spread of this deadly disease which adversely affects deer populations in many of our sister States. Deer are an important part of our ecosystem and link in the food chain. They are also an attraction for wildlife watching and hunting, two recreational activities enjoyed by our State's residents and visitors alike. In fact, I am told that seven out of every ten hunters in Delaware hunt deer.

Spending associated with hunting and wildlife watching provides a major boost to our State's economy. The money spent on equipment, on watching, and on transportation and so forth supports jobs and local businesses as well as many of our State's conservation efforts.

Additionally, the sale of all hunting licenses, tags, and stamps, when combined with funds generated from taxes on hunting equipment, comprise approximately 60 percent of Delaware's annual budget for wildlife programs, 60 percent. Furthermore, hunting in Delaware is Delaware's primary tool for deer management, as it is in many other States.

If chronic wasting disease spreads into Delaware, and it could, it would deter these hunters. In addition to the impact that it would have on our wildlife management revenues, it would force our State to revert resources to alternative deer management tools. While we may not have any context for managing the impact of chronic wasting disease in my State, we can certainly understand the major threat that it poses to States' environments, to the recreational opportunities, and their economies.

With the disease now detected in some 26 States nationwide, it is more important than ever that we work together to stop its spread and support the States, the tribes, and Federal agencies grappling with its impacts. The legislation we are considering today encourages Federal agencies and States to better coordinate their monitoring, their research, and management efforts.

With several Federal agencies implicated in addressing the disease, creating a Federal Chronic Wasting Disease Task Force could be one step in the right direction. In addition, as I think we will hear from our witnesses today, we know the task force is only part of the solution to the problem. The magnitude and severity of this disease demands a proportionate Federal response, which should include meaningful funding.

Over the past two Congresses, we have held multiple hearings on the conservation challenges facing our States, including management of wildlife diseases, human-wildlife conflicts, and species conservation. Time and again, the message from the States has been one that is clear. The best way the Federal Government can help States address conservation and management challenges is to ensure, to help to ensure, that they have adequate resources to do their job.

It is not all on us. It is not all on the Federal Government. It is a shared responsibility. States need to do their part. We have a responsibility as well.

As many of my colleagues have heard me say in this room, things worth having are worth paying for. I believe our Nation's precious wildlife resources are worth having, and I think most Americans would agree. That means we should work together to address both State and Federal funding needs while thinking creatively about how to pay for these investments.

Addressing chronic wasting disease is a high priority. Our committee is also pending before us numerous bipartisan wildlife conservation bills that will help protect species that I hope we will seriously consider as well. Each of our witnesses today brings expertise on many of these matters, and we look forward to hearing from you and to the conversation that will follow about how to comprehensively address chronic wasting disease and meet other conservation needs.

Again, thanks Mr. Chairman, for pulling this together. Thank you all for coming, sharing your thoughts with us, and responding to our questions. Welcome.

Senator BARRASSO. Thanks so much, Senator Carper.

Before we hear from our witnesses, I want to first introduce Brian Nesvik, who is the director of the Wyoming Game and Fish Department. He is no stranger to this committee. You have previously shared your wildlife expertise with this committee. You have been intimately involved in Wyoming's chronic wasting disease program for many years and a longtime game warden in Wyoming.

I also had the pleasure of sharing Thanksgiving with him and several visits with him overseas, I think starting in 2009, when you were deployed to Kuwait and with incursions into Iraq, commander of the 2d 300 field artillery unit with a mission of running convoy operations into Iraq, 2-300th. My father-in-law, Bob Brown, was a member of that group in the Korean War, and there is a long history.

I just had a chance to be with the 2-300th in Afghanistan last Thursday, as they are there continuing to keep us safe and free, but I appreciate your role commanding that group in the past.

Director Nesvik, I will thank you for your service to the Country, for all you do for Wyoming. Before we get to your testimony, I was going to ask Senator Capito if you would like to please introduce a visitor and a person who is going to testify today from West Virginia.

Senator CAPITO. I would, and thank you Mr. Chairman.

It is my pleasure to introduce my friend, our agriculture commissioner, Mr. Kent Leonhardt. He was elected in 2016 as our commissioner, and before that, he was in the West Virginia State Senate, representing my hometown of Glen Dale, West Virginia.

Throughout his tenure, Commissioner Leonhardt has really been an advocate for West Virginia farmers and the mission of the department. They have endeavored to break down silos to improve government efficiency, as we all know, that is not the easiest thing, and are working to update regulations to move our West Virginia agriculture industry forward. I thank him for that.

In addition to being a farmer himself, he is also a veteran. He served 20 years in the United States Marine Corps before retiring with the rank of Lieutenant Colonel.

I thought it would be interesting to point out to the committee that together, Commissioner Leonhardt and I have worked on a project of agri-therapy, a pilot program with the Woody Williams VA Medical Center in Huntington, West Virginia. This program will hopefully serve as a model to meet the mental and behavioral health care needs of our veterans, as well as provide them with new career opportunities in agriculture.

I want to thank Commissioner Leonhardt for his commitment to breaking down barriers, but also how we can better prevent the spread of chronic wasting disease within the wild and agricultural deer population. I am proud to say that West Virginia is ahead of the curve in this regard, thanks to the commissioner's efforts. While we still have much work to do, I am sure that with his experience, we will be able to move the ball forward.

I thank him for coming today, and I look forward to the panel. Thank you, Mr. Chairman.

Senator BARRASSO. Thank you. Senator Carper.

Senator CARPER. I just want to say to our Marine friends, and Army? Yes, Navy. Welcome. We have a football game coming up. [Laughter.]

Senator CARPER. I like to say to my friends who wear different uniforms, I say, different uniforms, same team, except when we play football. I spent a lot of years in the Navy, and we are just honored and grateful for your service. I am not sure if you have military experience as well. You are still young enough, you could survive.

[Laughter.]

Senator CARPER. We will work you into the lineup. Thank you, and as a native of West Virginia, Beckley County, great to see you. Thank you.

Senator BARRASSO. Thank you, Senator Carper. Our third witness today is Whit Fosburgh, who is the President and Chief Executive Officer of the Theodore Roosevelt Conservation Partnership. We welcome you as well.

We are going to start the testimony with Brian Nesvik. Brian, please proceed.

STATEMENT OF BRIAN NESVIK, DIRECTOR, WYOMING GAME AND FISH DEPARTMENT

Mr. NESVIK. Good morning, Chairman Barrasso and Ranking Member Carper and members of the committee. I appreciate the opportunity to appear before you to discuss a wildlife management challenge that, as the chairman outlined, is certainly important to my State.

While I speak to you today from a Wyoming wildlife manager perspective, this disease is a national problem. CWD continues to spread across our Country, and its impacts continue to increase, commensurate with changes in its distribution and prevalence in wild ungulates. This disease has been documented in 26 U.S. States and 3 Canadian Provinces. I direct your attention over to

this map that is a good visual depiction of where the disease has been documented in the United States and Canada.

Aside from wildlife health problems and potential implications to how wildlife are managed, this disease has economic effects and indirectly impacts the work State agencies are able to conduct on other high conservation priorities. The Association of Fish and Wildlife Agencies, or AFWA, estimates the States will spend \$84 million on testing and surveillance alone over the next 5 years.

Infrastructure at the Federal level that facilitates cross—

State and inter-agency coordination, planning and synchronization, is needed in this discussion draft bill, which would create a United States Fish and Wildlife CWD task force provides it.

This is a national problem that requires the collective thought, wisdom, and experience of members of the government, academia, non-governmental organizations, and elected leaders. Failing to find solutions to CWD could have significant implications to the manner in which wildlife is managed in our Country. Your consideration of this discussion draft is important, and I applaud your commitment to consider its provisions.

As you have read in my comprehensive written testimony, new research has changed the way wildlife managers evaluate the threat posed by CWD to deer, elk, and moose populations. Prior to research from the past five to 10 years, most wildlife managers and members of the public recognized the disease, but took the view that impacts to wild herds were minimal at the population scale. We now know that with high prevalence levels, the disease can limit and even reduce the health and viability of certain wildlife populations. Our citizens expect us to do our level best to find some solutions.

In Wyoming, we have recently redoubled our efforts to explore new options and change the way we think about attacking this problem. Our Game and Fish Commission has a long history of dealing with the disease ever since its discovery 4 years ago. Recently, our commission tasked the department with looking at all options to find solutions to slow its spread and to seek answers to tough questions requiring extensive research. Based on their leadership and resourcing, our department engaged in its own vaccine research in the recent past.

Our department has worked at the regional and national level with other experts to share ideas and identify potential management options. Our department recently convened a statewide citizen working group made up of 31 members of the public charged with studying the disease and making recommendations for future management.

Additionally, we established a committee comprised of senior leaders from across 20 Wyoming State agencies to specifically look for solutions to deal with carcass disposal, which is another problem that is created by CWD. Wyoming Legislature's Travel, Recreation, and Wildlife committee took this issue up for interim study, and like you, has received testimony regarding the disease, resources required to deal with it, and future plans to enhance our efforts.

We have found that addressing this problem using diverse teams comprised of members with varied skill sets is the most productive.

My judgment is that this is no different at the national level, and the complexity and breadth of this problem requires formalizing this type of approach, as is outlined in this discussion draft before you today.

Important outcomes of a national CWD task force could include improved information sharing on the best practices and pooling of resources to find the most important, but very expensive CWD research. Additionally, bringing together the most brilliant and well-versed scientific minds gives our Nation the best chance to find effective and meaningful solutions.

Cross-State coordination relative to carcass movement and disposal is also important, requiring planning and deliberate action at the regional and national level, and would undoubtedly be a focus of a CWD task force.

As you have seen in my written testimony, there have been national efforts initiated in the past and Federal assets allocated to this problem. In the absence of information indicating direct effects on wildlife at the population level and a lack of scientific links to human health, funding support waned in 2012. Federal funds were redirected to other high-priority needs, and consequently, work on this disease at the national and State level declined.

Unfortunately, funding for CWD research diminished before potential strategies for controlling and managing the disease could be tested and evaluated. Taking a new look into the allocation of Federal resources in the face of new information is wise, and this discussion draft establishes the framework for this new look.

Again, I thank you for your leadership on this issue, and I look forward to answering your questions.

[The prepared statement of Mr. Nesvik follows:]



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TESTIMONY OF BRIAN R. NESVIK DIRECTOR WYOMING GAME AND FISH DEPARTMENT

BEFORE THE SENATE COMMITTEE ON ENVIRONMENT AND PUBLIC WORKS ON A DISCUSSION DRAFT BILL TO CREATE A UNITED STATES FISH AND WILDLIFE SERVICE CHRONIC WASTING DISEASE TASK FORCE

DECEMBER 4, 2019

Thank you for the opportunity to testify before you today as you consider the Discussion Draft Bill to Create a United States Fish and Wildlife Service Chronic Wasting Disease Task Force (Discussion Draft). I am Brian Nesvik and I have the privilege to serve as the Director of the Wyoming Game and Fish Department (Department). I have over 24 years of service to the citizens and wildlife of Wyoming in my role as a wildlife manager. My testimony is premised in my experiences while serving in various positions within the Department including Game Warden, Regional Wildlife Supervisor and Chief Game Warden/Chief of the Wildlife Division. I have served as the Director for the past 10 months and in this role I am the chief administrative head of the Department with general leadership, supervision and control of all activities, functions and employees of the Department. I report to the Governor of Wyoming and work closely with the Governor appointed Wyoming Game and Fish Commission. I am honored to work with and lead an extremely talented and dedicated team as we work together to manage Wyoming's vast and diverse wildlife and the places they live for those who enjoy them today and will enjoy the tomorrow. I earned a Bachelor of Science Degree in Fish and Wildlife Biology and Management from the University of Wyoming and a Master's of Science Degree in Strategic Studies from the U.S. Army War College. I serve on many state, regional and national organizations and committees including the Western Association of Fish and Wildlife Agencies, the Association of Fish and Wildlife Agencies (AFWA) and the Board of Directors for the Intermountain West Joint Venture.

As you will read in the comprehensive testimony below, only recently has Chronic Wasting Disease (CWD) been considered a threat to deer, elk and moose populations. Prior to research from the past 5-10 years, most wildlife managers and members of the public recognized the disease, but took the view that impacts were minimal. We now know that with high prevalence levels the disease can limit and even reduce the health and viability of certain wildlife populations.

While I speak to you from a Wyoming wildlife manager perspective, this disease is a national problem. CWD continues to spread across our country and its impacts continue to increase commensurate with changes in distribution. This disease has been documented in 26 U.S. States

and 3 Canadian Provinces. Aside from wildlife health problems, this disease has economic affects and indirectly impacts the work state agencies are able to conduct on other high conservation priorities. AFWA estimates states will spend \$84 million on testing and surveillance over the next 5 years. Infrastructure at the federal level that facilitates cross-state and interagency coordination, planning and synchronization is needed and the ideas in the Discussion Draft you are considering today provides it. This is a national problem that requires the collective thought, wisdom and experience of members of the government, academia, non-governmental organizations and elected leaders. Your consideration of this Discussion Draft is important and I applaud your commitment to consider its provisions.

In Wyoming we have re-doubled our efforts in the recent past to explore new options and change the way we think about attacking this problem. We recently convened a statewide citizen group made up of 31 members and charged them with studying the disease and making recommendations for future management. Additionally, we established a committee comprised of senior leaders from many Wyoming state agencies to specifically look for solutions to deal with carcass disposal. The Wyoming legislature's Travel, Recreation and Wildlife Committee took this issue up for interim study and, like you, has received testimony regarding the disease, resources required to deal with it and future plans to enhance our efforts.

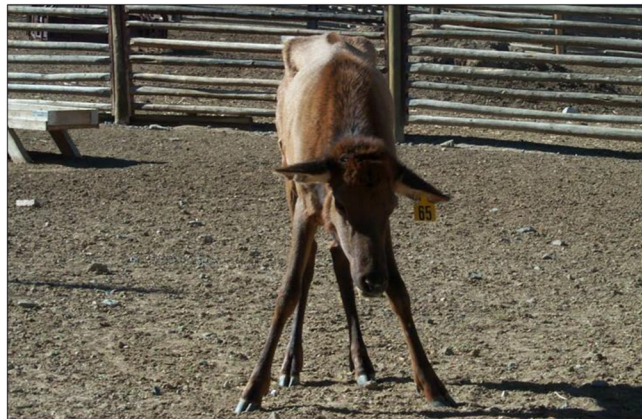
As explained below, there have been national efforts initiated and federal assets allocated to this problem in the past. In the absence of information indicating direct affects on wildlife at the population level and the lack of scientific links to human health, funding support waned in 2012. Federal funds were redirected to other high priority needs, and consequently, work on the disease at the national and state level declined. Unfortunately, funding for CWD research diminished before potential tactics and strategies for controlling and managing the disease could be tested and evaluated. Taking a new look into the allocation of federal resources in the face of new information is wise and this Discussion Draft outlines important concepts necessary to establish the framework for a new look. The Discussion Draft provides funding and ideas to move CWD research forward in a cooperative, interagency and comprehensive way.

Portions of this written testimony were developed by Mr. Paul Johansen, West Virginia Division of Natural Resources, Wildlife Resources Section. Mr. Johansen testified before the Subcommittee on Interior, Environment and Related Agencies of the House Committee on Appropriations on behalf of AFWA on October 17, 2019 regarding resources and funding for this nationwide problem.

What is Chronic Wasting Disease?

Chronic wasting disease is a chronic, fatal disease affecting the central nervous system of members of the deer family (*Cervidae*). In the United States, CWD affects mule deer (*Odocoileus hemionus*), white-tailed deer (*Odocoileus virginianus*), elk (*Cervus canadensis*), and moose (*Alces americanus*). This disease belongs to the group of rare diseases called transmissible spongiform encephalopathies (TSEs). These diseases are caused by abnormal proteins called “prions,” which are proteins devoid of nucleic acid. Prions have similar amino acid sequences compared to normal cellular proteins, but in a different conformation. Prions cause a conformational change in the normal cellular protein structure, and disease is induced when the normal cellular protein is converted into the abnormal prion protein. The accumulation of prions leads to central nervous system cell death (Forloni et al. 1993). The disease progresses as more nervous system cells are lost, ultimately ending in the death of the animal. There is currently no cure for CWD or other prion diseases, partly because the immune system of an infected animal does not recognize prions as a source of infection. Therefore, there is no immune response, making the development of a vaccine or other treatments very difficult.

Early in the course of CWD, animals show no clinical signs. As the disease advances, affected animals show weight loss, reluctance to move, excessive salivation, droopy ears, increased drinking and urinating, and lethargy.



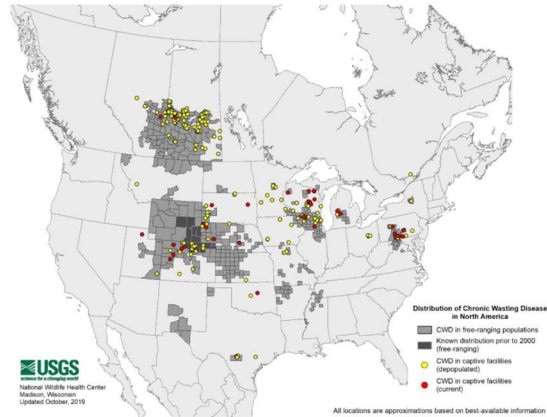
An elk at the very late stages of CWD - The majority of all CWD positive animals appear completely normal until they get in the late advanced stages of the disease. Wyoming Game and Fish Department photo.

No immunity, recovery, or absolute resistance to CWD has been documented. This disease is always fatal, and most animals die from the disease within about 2.5 years of infection (Miller et al. 2012, Miller et al. 2008). However, natural genetic variation in host species can extend

survival time following infection. Infected animals do not typically exhibit clinical signs until late in the incubation period, resulting in the majority of hunter-harvested animals that test positive for CWD appearing to be in normal body condition. Infection can be detected in carcasses as well as in live animals, and diagnostic tests become increasingly reliable as CWD progresses (Miller and Fischer 2016). Chronic wasting disease is infectious, and prions are shed from several routes during most of the disease course, exposing other cervids either directly or through environmental contamination. Prions can persist for years in the environment, and their binding to soil elements (e.g., clay) enhances persistence and infectivity (Johnson et al. 2007). The environmental persistence of prions complicates disease management and control, especially once prevalence is high (Miller and Fischer 2016).

Initial modeling efforts predicted CWD would drive affected cervid populations to extinction (Gross and Miller 2001). More recent projections suggest CWD may have significant population-level impacts in Rocky Mountain National Park elk (Monello 2013, Monello 2014), Wyoming white-tailed deer (Edmunds et al. 2016), and Wyoming mule deer (DeVivo 2017). Other research suggests certain populations may be able to survive, bolstered by genetic selection and some level of hunting season restrictions (Robinson 2012, Williams 2014). Regardless, endemic CWD will likely depress some cervid populations at an unknown but potentially significant level. As such, management efforts designed to reduce the spread and prevalence of CWD are warranted.

Captive elk exported from Saskatchewan to South Korea marked the first detection of the disease outside of North America (Williams et al. 2002). Recently, two forms of apparent CWD have also been discovered in reindeer (*Rangifer tarandus*) and moose in Norway (Benestad et al. 2016) and in Finland, but these cases have not been linked to North America. CWD continues to spread across North America, likely through movement of infectious animals or materials, either naturally in migrating/dispersing wild populations, or through anthropogenic movement of infectious live animals, carcasses, or other materials. Over the past 50 years, CWD has been detected in captive and/or wild cervids in 26 states and the three Canadian provinces of Alberta, Saskatchewan, and Quebec. Most recently, a bull moose near Troy, Montana has tested positive for chronic wasting disease, which is the first known case in that species in Montana and is of great concern, again demonstrating the need for inter-state and international work on CWD management and research.



Depopulation of an entire wild or captive herd would not eradicate the disease because of untreatable and widespread persistence of infectious CWD prions in the environment. Subsequent reintroduction of susceptible animals can and likely will result in new infections. No vaccine, treatment, or medical cure for CWD currently exists. Although live animal tests have been used in research applications, in captive cervid operations as a whole-herd test, and for some interstate publicly owned, free-ranging interstate cervid translocations, no practical or validated live animal test for individual animals is available. The tests that are available are for detection of disease in cervids and should not be regarded as food safety tests. The minimum infectious dose of CWD prions is unknown, so determination of the level or degree of infectivity is unknown. Species in the family *Cervidae* appear to be the only animals naturally infected with CWD, although infection in other species outside this family has been demonstrated with varying success in experimental inoculation studies. To date, no human CWD infections have been reported, although humans undoubtedly consume CWD-infected animals. Public health authorities (Center for Disease Control and World Health Organization) recommend that animals that test positive for CWD should not be consumed, nor should any animal that appears unhealthy.

A new species of concern regarding CWD is feral swine. Since the range and habitats of feral swine and cervids in the United States overlap in many regions this raises concerns of whether feral swine are susceptible to the disease and if so, what role they could play in the spread and management of CWD. In 2017, a study conducted by Moore et al. found that domestic hogs were susceptible to CWD through oral exposure. This gave rise to the question of whether feral swine living in CWD endemic regions could become infected with CWD following consumption of infected cervid carcasses and sharing a contaminated environment. In 2018, the National Feral Swine Damage Management Program and the National Wildlife Disease Program partnered with universities and state and federal agencies to evaluate feral swine for evidence of interspecies CWD infection. By working with the Arkansas Wildlife Services Program, 102

samples were collected from feral swine in a CWD-endemic region. An additional 27 samples were obtained from a region of Oklahoma believed to be free of CWD to serve as negative controls. Since there is a limited understanding of naturally acquired prion disease in pigs, it is essential for this study to utilize a range of assays to produce meaningful data. Two amplification assays were identified to screen feral swine tissues for small amounts of CWD prions. To date, two feral swine samples have come back as suspect positives by both amplification assays. There is very limited information about prions and CWD in pigs and more analysis needs to be conducted to understand the findings.

Chronic Wasting Disease Outside of Wyoming

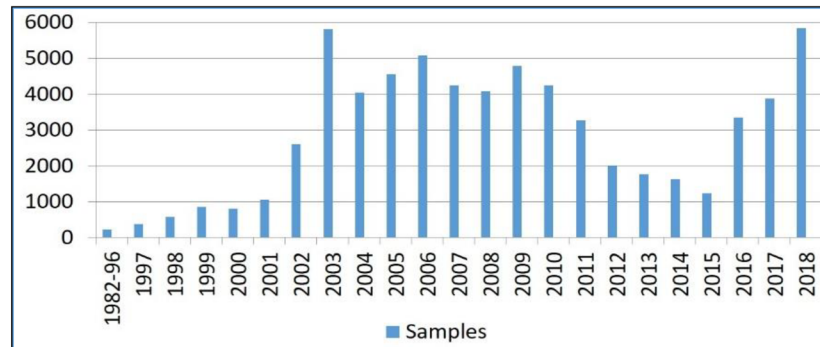
Chronic Wasting Disease continues to spread throughout Wyoming, North America, and in some European and Asian countries. To date, CWD has been documented in captive and/or free-ranging cervids in 26 U.S. states, three Canadian provinces, Norway, Sweden, Finland, and South Korea. See the United States Geological Survey (USGS) National Wildlife Health Center website for a map of current CWD distribution in North America (<https://www.usgs.gov/media/images/distribution-chronic-wasting-disease-north-america-0>).

Chronic Wasting Disease in Wyoming

Chronic wasting disease was first recognized in 1967 in captive mule deer in a facility near Fort Collins, Colorado (Williams and Young 1980), and was later recognized in Wyoming in the 1970s at the Department's Tom Thorne/Beth Williams Wildlife Research Center north of Laramie. Initially, CWD was thought to be related to nutrition but was later identified as a TSE by Dr. E.S. Williams in 1978 (Williams and Young 1980). The timing of the introduction of CWD into Wyoming, as well as its origin, remains unknown. In Wyoming, this disease was first identified in free-ranging mule deer in 1985, elk in 1986, white-tailed deer in 1990, and moose in 2008.

Prior to 2000, CWD was poorly understood and of little interest at the national level. Starting in the late 1990s and early 2000s, concern over CWD rapidly increased as more jurisdictions began to detect the disease and questions about human health arose. In 1996, bovine spongiform encephalopathy (BSE) was linked to variant Creutzfeldt-Jakob disease (vCJD) in people in the United Kingdom (Bruce 1997). The similarities of CWD and BSE led to human health fears over the consumption of CWD-positive cervids. From 2002 to 2012, human health concerns resulted in federal funding for CWD surveillance across the nation. This funding enabled Wyoming to greatly increase surveillance, although efforts waned after funding declined in 2010. Decreasing public and agency interest in CWD, from both a wildlife and human health perspective, led to further decline in disease surveillance efforts (Figure 1). That trend was reversed when emerging research identified the potential negative effects of CWD on western deer and elk populations (Geremia et al. 2015, Edmunds et al. 2016, DeVivo et al. 2017, Monello et al. 2014). Concern also increased within the Department when sharp increases in prevalence were detected in deer herds outside of what was then considered to be Wyoming's core endemic area (southeastern Wyoming), such as in the Bighorn Basin and along the eastern slope of the Bighorn Mountains.

Figure 1. Total CWD samples tested by year in Wyoming (1982-2018).



Since the discovery of CWD in 1985 in a free-ranging mule deer in southeastern Wyoming, this disease has slowly spread throughout much of the state. As of November 2019, CWD had been identified in 31 of 37 (84%) of the state's mule deer herds (Figure 2), in 9 of 36 (25%) of the state's elk herds (Figure 3), and generally wherever white-tailed deer occur in Wyoming (white-tailed deer herd units are loosely defined in Wyoming outside of the Black Hills). In contrast, CWD remains very rare in moose and has only been detected in one targeted moose in 2008, with over 1,120 moose tested to date. Prevalence estimates vary between herds, although deer herds generally exhibit significantly higher prevalence than sympatric elk herds (Table 1). In the majority of mule deer herd units where statistically significant sample sizes have been obtained, prevalence has steadily increased since its initial discovery within that herd unit. However, in some southeastern Wyoming mule deer herds where the disease has long been established, CWD prevalence has either somewhat declined from peak levels and/or has remained relatively static, albeit at levels high enough to likely impact population performance. Overall, prevalence tends to be higher in southeastern Wyoming, where the disease has long been established, but is quickly becoming more common and widespread in much of the state.

Figure 2. CWD Distribution in Wyoming Mule Deer (2019).

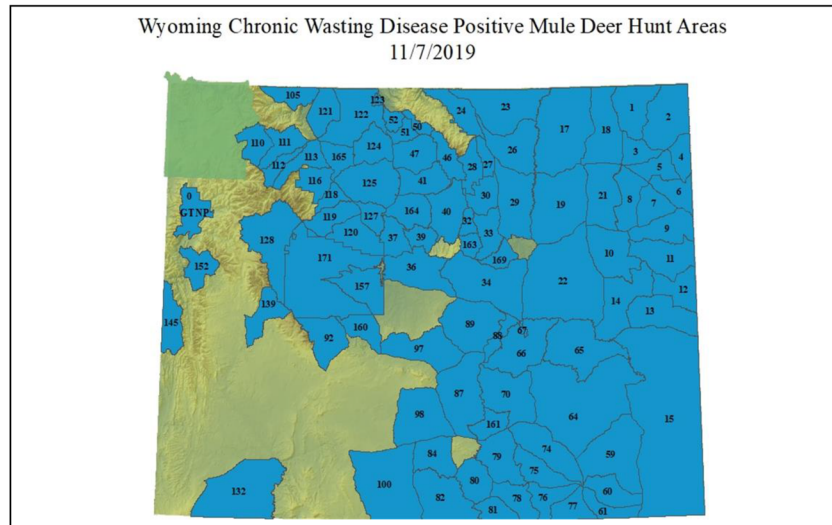
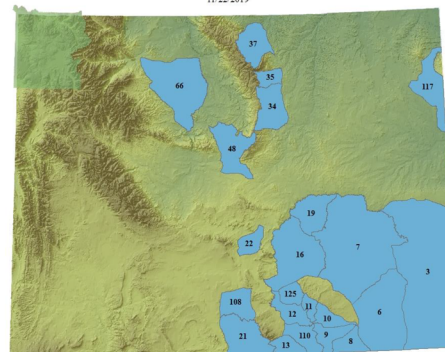


Figure 3 CWD Distribution in Wyoming Elk (2019)

Wyoming Chronic Wasting Disease (CWD) Positive Elk Hunt Areas
11/22/2019



Wyoming Game and Fish Department
Wildlife Health Laboratory

Table 1. CWD prevalence in sympatric Wyoming mule deer and elk herd units based on adult mule deer bucks and adult male and female elk (2016-2018).

Species and Herd Unit	Sample Size	Prevalence	95% C.I.
Mule Deer - Platte Valley	222	8%	4.2% - 12%
Mule Deer - Laramie Mountains	415	23%	15.6% - 27.7%
Mule Deer - Bates Hole/Hat Six	199	28%	16.9% - 34.9%
Mule Deer - South Converse	105	40%	21.1% - 48.2%
Elk - Snowy Range (compare to Platte Valley mule deer)	271	2%	0.6% - 4.3%
Elk - Laramie Peak / Muddy Mountain (compare to Laramie Mountains, Bates Hole / Hat Six & South Converse mule deer)	441	7%	4.5% - 9.8%
Elk - Iron Mountain (compare to Laramie Mountains mule deer)	168	14%	7.9% - 18.4%

Chronic wasting disease prevalence in mule deer is based on adult males (≥ 2 years old), a standard metric that allows for comparisons of disease demographics across North American jurisdictions. The selection of males is based on surveillance data that demonstrates prevalence in adult males is significantly higher than adult females within the same herd. Moreover, infection is less common in yearlings, and relatively rare in fawns. In addition, because female mule deer harvest is limited in Wyoming, sampling hunter-harvested adult males provides larger sample sizes for assessment of long-term trends in prevalence. Although the focus is on adult males, assessment of yearling male and adult female prevalence is also monitored in those herds where harvest is sufficient to achieve meaningful sample sizes.

For CWD surveillance in white-tailed deer, prevalence can be measured in adult males for cross-jurisdictional comparisons, but can also be adequately measured in females in many areas in Wyoming due to liberal harvest strategies. However, white-tailed deer populations are not well defined at the herd unit level in Wyoming as they are a lower priority for population demographic data collection in most of the state. In elk, CWD prevalence is also measured in adults of both sexes due to the significant level of male and female harvest attained within many of Wyoming's elk herds.

From January 1- November 8, 2019, the Department has collected and tested 3,414 deer, elk and moose CWD samples (at \$32/sample) from hunter kills, road kills and targeted animals resulting in 353 CWD positive animals, with 285 being hunter harvests. The majority of samples are hunter-harvested male mule deer, followed by elk and moose. This effort resulted CWD being newly detected in Deer Hunt Areas 50, 105 and 152. While we have no data on the final outcome of the 285 CWD positive hunter harvested animals, we have strong indication that the

vast majority of these animals are not consumed, due to human health concerns, but are disposed of in a landfill at a cost (e.g. Cheyenne landfill charges \$35 for a deer carcass).

Between January 1 - October 31, 2019, Department employees have spent 11,604 man-hours, driven 65,869 miles resulting in the Department spending at least \$650,610 on CWD work, paid for by sportsperson's license dollars. These CWD expenses have a direct negative impact to the available funding for other wildlife conservation efforts. These expenses will only increase as CWD expands and management action and public testing demands increase.

Wyoming's CWD Public Collaborative Process and Revised Management Plan

Wyoming's wildlife are public resources highly valued by our citizens and it is in this spirit that the Department launched a robust collaborative CWD Working Group made up of diverse members of the public. Public meetings were hosted and public comment collected before and after the group did their work to ensure the Department's pending revised CWD Management Plan (Plan) considers a wide range of ideas. Management recommendations were considered in developing a revised CWD management plan. Recommendations were based on the newest science as well as ideas from the public. The time and commitment the Department and the CWD Working Group dedicated to the development of the Plan was substantial.

The next steps in managing CWD in Wyoming will include implementing new and modified management actions and adapting the Plan in the future based on evaluation of outcomes associated with the new approach. This Plan outlines immediate actions to curb this disease, but many of the strategies listed are long-term efforts that may take over a decade to see through to completion. Many components of the plan will be executed by Wyoming's wildlife managers, but other actions will require the scientific/research community, other states and international governments and publics.

As part of the pre-Plan development, an extensive CWD survey of Wyoming's 2018 Wyoming deer hunters was conducted. Three thousand (1,500 resident and 1,500 nonresident) deer hunters were surveyed on their knowledge, concerns, opinions and management of CWD. The response rate was 40.65%, with the following key results:

- Hunters want the Department to do something about CWD.
- Hunters want the Department to prioritize a balance between herd health and hunting opportunity with a greater emphasis on herd health.
- As prevalence increases, hunters are more likely to hunt in different areas.
- Management strategies focused on harvest are preferred – particularly if it does not reduce populations.
- Most carcasses are disposed of at the site of kill or through a processor.

Colorado did a very similar survey and the results of the both surveys are being analyzed with a tentative publish date of sometime in 2020.

Past CWD Management Efforts and Funding

In the early 2000s, there were significant federal efforts to assist states with the management of CWD. The Department of the Interior launched a CWD Task Force in conjunction with the US Department of Agriculture (USDA) and developed a work plan to help the states manage CWD. Select Cooperative Fish and Wildlife Research Units (CRUs) within the US Geological Service (USGS), the USGS National Wildlife Health Center, the Animal and Plant Inspection Service (APHIS) Wildlife Services, the National Wildlife Research Center, the US Forest Service Research and Development, other academic institutions and Colleges of Veterinary Medicine cooperatively initiated CWD research. Their purpose and goals aimed to garner more insight into the disease epidemiology and to look for management solutions. After a few years, federal interest in CWD waned, the federal CWD work plan was outcompeted for resources and attention, and subsequent funding declined. Unfortunately, funding for CWD research diminished before potential tactics and strategies for controlling and managing the disease could be tested and evaluated. State agencies and our CWD colleagues and researchers have continued to do some research, but it has declined commensurate with declining federal resources.

From 2002–2012, federal funding was available to states for surveillance, monitoring, and management of CWD in wild and captive cervids, and to the captive cervid industry for indemnity payments to owners/managers if their herds became infected and required depopulation. To control movement of the disease in the captive cervid industry within the United States, APHIS's National Herd Certification Program (HCP) was fully implemented in 2012 (Code of Federal Regulations: 9 CFR Part 55 <https://www.law.cornell.edu/cfr/text/9/part-55>) to regulate interstate shipment of live cervids. Participation in the HCP is voluntarily; however, only animals from HCP-certified herds may be shipped interstate. Prior to implementation of this federal program, individual states regulated the movement of captive cervids. The national HCP certifies herds in approved state CWD programs as being at low risk for having CWD after five years of disease-free monitoring. However, there is no "CWD-free" certification of captive cervid herds. Individual states may implement regulations more stringent than the national HCP and their regulations preempt the Federal requirements with one exception: states must allow transit of captive cervids through the state, even if they do not allow captive cervid operations within the state.

The federal HCP has not prevented the continued spread of CWD or eliminated CWD in captive herds enrolled in the program. Since implementation of the HCP in 2012, CWD has been detected in additional captive cervid herds, including HCP-certified herds. Intra- and interstate movement of animals from HCP-certified herds later found to be infected is well documented and has resulted in infection of linked herds within the same state as well as at one Wisconsin herd that received an infected deer from a certified Pennsylvania herd. According to information provided by officials in affected states, all certified herds had been monitored for more than the five years required by the HCP before CWD was detected. Similar situations have been documented in Saskatchewan. Until there is a highly-sensitive ante mortem test for CWD, live animal movements remain a significant risk for the spread of the disease. Evidence for long-term persistence of prion proteins in the environment, combined with the long incubation periods

observed in many prion diseases, suggests that the current five-year monitoring period may be inadequate. Regulators need to be aware the HCP (US) and Voluntary HCP (Canada) may create a false sense of security among the public and industry that CWD cannot be spread through movement of live animals from certified herds. The fact that CWD continues to be detected in HCP-certified captive herds after more than five years of monitoring suggests the certification program may not be as effective as desired.

Since 2012, no federal funding for state surveillance, monitoring, and management of CWD in wild deer has been available. The growing economic burden has fallen solely on the states, and those impacts are now affecting other wildlife conservation efforts, federal agencies, and interests well beyond the scope of the agriculture appropriations that were available in the early 2000s. This is one of the reasons we are testifying before you today. Chronic wasting disease and its management challenges continue to spread and are now affecting federal agencies and their budgets and capacities within the jurisdiction of this Subcommittee such as the USGS, the US Fish and Wildlife Service, the US Forest Service, the Environmental Protection Agency, and the National Park Service.

State Resources and Expenditures: The Exponential Increase

Wyoming is not unique in spending significant resources to detect and manage CWD. AFWA surveyed state agencies in 2017 and again in 2019 to identify actual and anticipated expenditures by state on the surveillance, monitoring, prevention, and management of this disease. In 2017, the average expenditure by states on surveillance and monitoring activities alone was \$437,440, while in 2019 the average expenditure by states on surveillance and monitoring activities had jumped to \$511,844. Total expenditures on surveillance and monitoring activities jumped from \$12.6 million to \$13.3 million between 2017 and 2019. This increase is due in large part to increased demand from the hunting public for CWD testing of hunter-harvested animals, which is also encouraged by state agencies. In 2017, the CDC recommended that hunters have their deer tested for CWD if the animal was harvested in an area where the disease is known to occur. These recommendations are having a profound impact on the overall demand for CWD testing: state agencies reported to AFWA in 2019 that they anticipate an average increase of 32% in the number of animals tested between the current fiscal year and the next fiscal year. On average, individual states are testing 5,698 deer or other cervids this year, and some states are testing far more: Michigan expects to test over 40,000 animals this year, Missouri expects to test 32,500 animals, Wisconsin expects to test 17,000 animals, and Texas expects to test 10,000. The state agencies expect to test collectively an estimated total of over 159,000 wild cervids during the 2019-2020 hunting season. This increase in testing comes with a steep price tag -- over the next five years, the states currently battling CWD anticipate spending over \$84 million on surveillance and monitoring alone, an average of over \$3 million per state in which the disease has been confirmed in wild animals. To exacerbate the problem, the number of active hunters and the associated revenue they generate through hunting licenses, permits, and Wildlife Restoration Program funding is declining, providing fewer financial resources to the state agencies at a time when the costs associated with CWD continues to climb.

I would like to thank you and the House of Representatives for passing FY2020 appropriations legislation that proposes to increase federal funding for CWD research, surveillance, and monitoring to states. As you can see, these funds are desperately needed by the state agencies, and we appreciate your strong support to help manage this disease. We support adoption of the House provisions related to CWD funding in the FY2020 conference committee negotiations.

State agencies also are expending significant resources on the prevention and management of CWD. According to the 2019 Association survey, these expenditures are roughly equivalent to expenditures on surveillance and monitoring, totaling over \$13 million in the current fiscal year alone. Nearly every state has developed or is developing a CWD response plan, a document which contains detailed recommendations for surveillance, monitoring, and management of the disease should it be found to occur in wild deer, elk, or moose herds within the state. In practice, these plans often need to be revised once CWD is actually detected within a state in order to address the particular conditions of the wildlife herd and the specific management context for the exact location and geography where the disease is detected. States also coordinate extensively with other agencies and organizations to assist them with all aspects of CWD surveillance, prevention, and management. Some of these agencies include the USGS's National Wildlife Health Center, the Southeastern Cooperative Wildlife Disease Study at the University of Georgia, the Northeast Wildlife Disease Cooperative at the University of Pennsylvania, the USGS's Cooperative Fish and Wildlife Research Unit Program, the individual institutions in the land grant university system, the APHIS Wildlife Services, and other diagnostic laboratories and research institutions.

State agencies are also actively implementing regulations to improve our ability to manage the spread of this disease. At this time, 41 states have implemented some form of restrictions on the movement of harvested cervid carcasses, and state agencies are also actively exploring other management approaches such as restrictions on feeding and baiting for wild cervids as well as supplemental harvest opportunities to reduce disease prevalence. Changes in state regulations and the implementation of management actions to combat the disease and help wild cervids are received with mixed reactions from hunters and ongoing frustration and misunderstanding about why management is needed as well as the severity and importance of controlling the disease. Often new regulations mean hunters will need to adjust their hunting habits and traditions, which can be difficult and create resistance to change. Engaging the public early and having them be part of the management decision discussion, process, and action implementation is critical.

State agencies spend significant time and resources communicating with hunters and the general public about the seriousness of this disease and the threat that it poses to wild cervid populations. Many of the management tools which have been specifically recommended by the scientific research community to reduce the spread of CWD also have the potential to impact the hunting public. Examples include actions to restrict feeding and baiting, restrictions on natural scent lures, reduction of overall herd size to reduce disease prevalence, antler point restrictions, or targeted removal of animals from a disease focal area. It is a challenge for state agencies to communicate effectively to hunters and the hunting public about these management options, many of which run counter to longstanding practices and traditions in the hunting community, even when the practices are clearly supported by the best available science.

Further exacerbating state agencies' communication challenges with hunters and the public is the fact that "public relations" are explicitly prohibited under the Pittman-Robertson Wildlife Restoration Act (Section 8a; 16 U.S.C. 669g), a primary source of funding for most state agencies to combat CWD. State agencies are having limited success using Hunter Education programs as the only means of explaining to hunters and the public about CWD, its impacts, and why management and adherence to regulations are important. If Congress passes HR 877, the *"Modernizing the Pittman-Robertson Fund for Tomorrow's Needs Act,"* states will have the same communication, education, and outreach flexibilities for hunters as they already have for anglers and boaters under the Dingell-Johnson Sport Fish Restoration Act. HR 877 does not include provisions for raising federal taxes.

Research Needs to Manage the Disease

The Department, as with all state fish and wildlife agencies, is acutely aware of the need for additional investments in scientific research to investigate CWD. Priority research topics that have been identified by AFWA's Wildlife Health Committee in their 2018 "Best Management Practices for Prevention, Surveillance, and Management of Chronic Wasting Disease" include:

1. Prion detection and diagnostics. Research has led to significant advances in diagnostic testing (e.g., enzyme-linked immunosorbent assay (ELISA)), prion detection in some substrates (e.g., protein misfolding cyclic amplification (PMCA)), Real-Time Quaking-Induced Conversion (RT-QuIC), and antemortem diagnostics (tonsil and recto-anal mucosa-associated lymphoid tissues (RAMALT) biopsy). Additional advances in CWD detection will likely follow on the coat-tails of other prion diseases. Of particular need are more sensitive tests for live animals, including a rapid throughput test for surveillance and to facilitate test-and-cull management, and the ability to reliably detect prions in environmental samples, such as soil, water, and urine.
2. Disease biology and pathogenesis. Research has led to significant advances in understanding routes of prion shedding, transmission, species susceptibility, and genetic contributions to susceptibility. Next steps include applying these advances to continue modeling and understanding disease ecology, such as sources of new loci of infection and impacts of genetic resistance and selection, and filling knowledge gaps about strains of CWD and species barriers, particularly for humans, remain important needs. Developing prophylactic or treatment measures are needed, even if the time horizon for completion is long.
3. Management and Ecology of the Disease and the Host. Short-term studies have been performed to fill some knowledge gaps on the role of cervid ecology on CWD transmission, identify the role of soil and plants in prion availability, and model disease dynamics and predict management effectiveness. Significant needs remain in this area, particularly long-term, broad scale, multi-jurisdictional studies to evaluate the effectiveness of management treatments such as density reduction and targeted removals. Identification of techniques to reduce infectious load in the environment would be

beneficial for captive, and potentially for free-ranging cervids as well. A greater understanding is needed of the role of plant uptake (and other environmental sources) for CWD transmission, prion translocation, and exposure of humans, livestock, and other wildlife species to prions. Further research is also needed on the role of soils and lichens in the possible binding, transport, or degradation of infectious prions in the natural environment.

4. Human dimensions. Place-based inquiries on perceptions of CWD and impacts on hunting and risk evaluations have been conducted on a limited scale. Significant knowledge gaps remain that will influence managers' ability to successfully address CWD, particularly public attitudes on the need for management and acceptance of proposed management actions. Additional needs include understanding differences in attitudes and beliefs in different geographic locations, understanding concern about risk to human health, public acceptance of risk from CWD including human assisted movement of cervids, and evaluating communication preferences between geographic regions, stakeholder groups, and other demographics.

Identification of the relative contributions of the various disease transmission pathways towards the overall spread of CWD in wild and captive cervid populations has been identified as a research priority by the state agencies and is one of the focus areas in the bipartisan "*Chronic Wasting Disease Transmission in Cervidae Study Act*" (HR 837), reintroduced this Congress by Representative Ralph Abraham (R-LA) and the House leadership of the Congressional Sportsmen's Caucus. This bill proposes an independent, expert review by the National Academies of Sciences of the predominate CWD transmission pathways, actions needed to reduce transmissions, a list of identified research needs in priority order, and review and evaluation of best management practices and the HCP as well as ways they should be improved, among other high priority CWD-related issues. Further, the bipartisan "*Chronic Wasting Disease Management Act*" (HR 1550), was reintroduced in the 116th Congress by Mr. Kind (WI) and Mr. Sensenbrenner (WI) to provide funding to support state, provincial, and Tribal efforts to develop and implement management strategies to address CWD among deer, elk, and moose populations and to support applied research regarding the causes of CWD and methods to control the further spread of the disease. If enacted, this bill would provide \$15 million for some of the much-needed research described above.

To address the above research priorities more effectively, a group of 46 researchers representing 25 different research institutions, agencies, or organizations joined together to form the CWD Research Consortium in September 2019, in order to coordinate and collaborate on CWD research across multiple disciplines and thematic areas. This meeting had the specific goal of informing current and future research efforts with needs specific to state and provincial CWD managers. This meeting also served as the first business meeting of the active NCDC234 multistate project led by University of Wisconsin-Madison and Michigan State University. Objectives for this meeting included:

1. Identify common research themes for coordinated action across the interdisciplinary team;

2. Identify avenues to improve communication between research and management within and among states throughout the region;
3. Identify sources and means to garner funding to support more diverse and effective research and management efforts; and
4. Develop a coordinated outreach approach for disseminating research results across states and agencies.

The 46 participants at the inaugural meeting of the CWD Research Consortium represented 14 universities, seven state agencies, one Canadian province, one nongovernmental organization, and three federal agencies, including the USGS's National Wildlife Health Center and CRU Program. Participants felt this was a *critical* effort that needs to continue due to the important role research is having on CWD and the need to communicate knowledge across disciplines and jurisdictions. The diversity of perspectives, balanced with a focused and facilitated process and small group size, was highly effective. Participants identified implementation and communication plans for specific research thematic areas. The group also agreed to move forward as a formal organization through the multistate project with the USDA State Agricultural Experiment Stations (SAES). The CWD Research Consortium plans to meet annually for a facilitated working meeting among partners.

Consortium participants successfully united multidisciplinary teams of researchers and partner agencies to develop new research proposals with disease management needs and impacts in mind. Five thematic research areas were prioritized and further developed over the course of the meeting. These were:

1. Develop an amplification assay using improved sourcing for substrate and implementation of RT-QuIC;
2. Develop a multistate adaptive management approach for CWD to evaluate management strategies;
3. Establish and support human dimensions research to better understand values, attitudes, and motivations regarding CWD management;
4. Establish a national CWD tissue database and repository for transmission and pathogenesis research; and
5. Conduct controlled CWD research using depopulated cervid facilities where CWD has been detected.

For each of these research areas, a working group has been established with identified research leads and a clear plan of action for next steps towards implementation. Crucially, these projects will invest in the infrastructure that will be needed in order to support long-term scientific

research and investigations into the biology, transmission, and management of CWD. Such long-term studies are critically important if we are to understand the pathways of disease transmission between wild cervids and to critically evaluate the effectiveness of particular management strategies on wild cervid populations.

Specific and immediate federal funding needs which have been identified by members of the CWD Research Consortium include:

1. Support for USGS National Wildlife Health Center - \$1,370,000, to include:
 - \$500,000 for study of disease epidemiology and transmission, using captive deer facilities infected by CWD prions;
 - \$250,000 for support for the Southeastern Cooperative Wildlife Disease Study at the University of Georgia, which needs an additional \$250,000 to ramp up CWD testing capabilities (RT-QuIC machine) and support staff;
 - \$120,000 to establish a national database of CWD testing samples and other research-grade materials from tested deer; and
 - \$500,000 to continue development of rapid testing approaches using sensitive testing methods (e.g. RT-QuIC).
2. Support for USGS Cooperative Fish and Wildlife Research Unit Program - \$740,000, to include:
 - \$120,000 for human dimensions research investigating impacts and attitudes towards CWD among hunters and the general public;
 - \$500,000 for collaborative research with the public health sector on CWD and potential impacts to human and wildlife health; and
 - \$120,000 for research on adaptive management approaches for CWD at multi-state and regional levels.
3. Support for USGS Ecosystems at USGS Headquarters - \$220,000
 - \$140,000 for support of the National Fish and Wildlife Health Initiative and the CWD Research Consortium;
 - \$30,000 to support the 2020 National Fish and Wildlife Health Forum, to be hosted by USGS Ecosystems in Fort Collins, Colorado; and
 - \$50,000 to support the 2020 International CWD Symposium, to be held at the annual conference of the Wildlife Disease Association.

The consortium believes that these research investments, delivered through an existing group of scientists and researchers working through the land grant university system, will yield significant returns on investments in terms of basic knowledge and improved understanding of CWD and

will directly benefit state fish and wildlife agencies in their struggles to manage this challenging disease.

At the same time, the consortium notes that certain highly desirable research products such as animal-side testing and vaccines or treatments for live animals once infected present extremely difficult challenges for the scientific research community at present. While investment in this type of research is risky and may not yield desired results, it still needs to remain a part of the discussion for the long term handling of this problem. One example of recent research that didn't yield desired results occurred at our wildlife research facility. We conducted a trial of an experimental CWD vaccine and it failed. Ultimately, the vaccinated animals developed the disease faster than those control animals which had not been vaccinated. We have been cautioned by members of the research community that some of these desirable products could easily consume all of the available funding for CWD research without any clear hope of achieving a desired research outcome in the near term. Such projects could be funded through challenge grants or incentivized through innovation awards. Accordingly, we recommend investments in the priority research topics identified above by the CWD Research Consortium through a collaborative process involving prion biologists, wildlife disease experts, and state and federal wildlife managers.

Proper and legal cervid carcass disposal is becoming a challenge (due to state/federal regulations and/or budgetary restraints) as a growing number of landfills prohibit such action or have closed. This leaves the hunter and others lacking viable and affordable options on proper carcass disposal. In addition to the current and traditional carcass disposal burial method, other disposal methods to include composting, incineration and alkaline hydrolysis needs to be researched, expanded and developed into a cost-effective carcass disposal method.

The ability for hunters to transport and dispose of their harvested deer, elk or moose within the boundaries of the harvest state or to/from another state is key, but must be done in compliance with carcass transportation and disposal regulations. Wyoming like many other states regulates the transportation and disposal of carcasses within the state as well as those that are exported or imported to minimize the spread of CWD. Interstate coordination on this issue is critical to the short and long term management of this disease.

Infrastructure Needs to Manage the Disease

Chronic wasting disease activities such as surveillance, management, and regulations are contingent on results from testing. Hunters are demanding increased ability to test their harvested animal with faster turn-around times. State wildlife agencies are spending millions on CWD testing alone each year, whether or not they have detected the disease. These increased demands put pressure on the 27 approved state veterinary diagnostic labs. The overwhelming majority of samples are collected during the hunting season, so state agency and laboratory staff are pulled away from other duties as these samples must be collected and processed by trained individuals. In states with high demand, literally tens of thousands of samples may be collected during a few weeks.

Laboratories conduct testing approved by the USDA through the National Animal Laboratory Health Network (NALHN). These laboratories run one or both of the two currently approved types of test for CWD [immunohistochemistry (IHC) and enzyme-linked immunosorbent assay (ELISA)]. Both tests involve multiple types of highly specialized equipment and several steps before a result can be read.

Staff from the Cornell College of Veterinary Medicine conducted a survey of these laboratories in 2019 which identified numerous deficiencies and unmet needs. In the past year, there have been two serious shortages that added weeks to months to testing turn-around times, including lack of available reagents and test kits. Ten laboratories were left struggling to complete their IHC testing after a company (Biocare) decided to no longer support their equipment. There is only one company (BioRad) approved for use to run the ELISA test, which is the fastest testing currently available. This company is not updating their software, supporting repair of aging equipment, making replacements available, or using the same test kits that are available for use in Europe. The US is lagging behind other countries, such as Norway, who only discovered CWD in 2016 but has already built a massive infrastructure around laboratory capacity and reducing the wait times for results. A multi-state, interagency approach that could be facilitated by the task force contemplated in this Discussion Draft appears reasonable and timely.

Ideally, a hunter would be able to collect a sample in the field and have an easy submission process that would provide results in a few days, before his or her animal is processed into food. However, current approved tests can only be run on a specific portion of the brainstem or the lymph nodes, both of which cannot be identified by the average hunter. Hunters that want their deer tested may encounter problems if they do not live in a state where the state agency will pay for the testing, such as in Arkansas or Michigan, or offers fee-for-service testing at the laboratory. Cost to the hunter for testing ranges from \$25-80 per sample. Unfortunately, there is currently no research available that points to a “field ready” test kit anytime in the foreseeable future.

However, there are more sensitive amplification assays in use for human medical diagnoses and have been used in CWD research but have not been approved for CWD testing. RT-QuIC looks promising for use in diagnostic laboratories, but must first go through a validation process by the USDA. Currently, there is no funding to accelerate this process, which could take years with the current processes. Your passage of bill similar to what is proposed in the Discussion Draft will provide infra-structure to facilitate and prioritize this type of research and the USDA validation process for RT-QuIC to be used in CWD testing.

Ongoing concern with other TSE diseases, such as scrapie and bovine spongiform encephalopathy, led to increased support and funding which enabled diagnostic laboratories to purchase equipment and support staffing required to operate the equipment. Because comparable and commensurate funding has not been available for CWD since FY2011, much of the infrastructure around CWD testing is declining. As more states detect CWD and because of increased concern by the CDC, demand for testing is overwhelming current laboratory capacity. As noted above, state fish and wildlife agencies are on track to test over 159,000 deer and other cervids this year. In contrast, only 21,584 farmed cervids were reported to be tested by the

USDA CWD HCP last year. More states would increase their CWD testing if additional federal funding was provided to supplement costs.

Reducing the wait time for results is critical for both hunters and state agencies. However, aging equipment, lack of staffing, and availability of necessary reagents are limiting laboratory capacity. Immediate funding is necessary to support and grow current laboratory infrastructure and testing capacity, as well as bring online newer, more sensitive assays.

As Congress contemplates the possibility of a comprehensive infrastructure package, we respectfully encourage you to include as part of any package that may move forward considerations for maintenance, much needed upgrades, and expansions to research facilities as well as increasing laboratory testing capacity with the necessary biosecurity requirements to address these CWD challenges and limitations. An investment in such infrastructure will enhance our nation's ability to compete globally and solve not just these problems we have today, but those yet to come.

Current CWD Coordination and Cooperation

Under the US Constitution, state fish and wildlife agencies have primary management authority for most wildlife species within their borders, including deer, elk, moose, and other wild species of the family Cervidae. AFWA is the professional organization that unites all state fish and wildlife agencies on a national level. AFWA has a long history of involvement in the management of wildlife diseases, beginning with the founding of its Fish and Wildlife Health Committee (Committee) in the late 1980s. Since CWD was first detected in Wisconsin in 2002, this disease has become a major focus of the Committee, and the meetings of this Committee have served as an important forum for nearly twenty years for state agency biologists, veterinarians, wildlife managers, and policy leaders to discuss new developments regarding CWD and its management. The Committee meets four times annually, and monthly calls are held with state wildlife veterinarians and wildlife disease program managers to discuss specific resource needs and improve regional and national coordination around CWD and other diseases.

In 2017, the Committee initiated the development of the first-ever set of "Best Management Practices for the Prevention, Surveillance, and Management of Chronic Wasting Disease." Committee staff and leadership pulled together an all-star expert panel of over thirty individuals with expert knowledge of all aspects of wildlife disease management from state and federal agencies, academia, and other research institutions, and non-governmental agencies. The report produced by these experts was submitted to a robust external peer review process involving all 50 state fish and wildlife agencies as well as federal and academic partners with specific expertise in the management of CWD. The final version of these Best Management Practices was officially adopted by AFWA's Committee at their meeting in September 2018 and was subsequently endorsed by the Directors of the 50 state fish and wildlife agencies at AFWA's Business Meeting in 2018. The Boone and Crockett Club also endorsed these Best Management Practices in December 2018. In 2019, the Committee developed and endorsed four additional Best Management Practices covering additional aspects of CWD management by state agencies.

These four additional Best Management Practices were officially endorsed by the Directors of the 50 state fish and wildlife agencies at the AFWA Annual Meeting in September, 2019.

- The AFWA CWD Best Management Practices can be found here: https://www.fishwildlife.org/application/files/5215/3729/1805/AFWA_CWD_BMPS_12_September_2018_FINAL.pdf
- The accompanying 111 page technical report which provides background information, more detailed justification regarding specific practices, details on certain alternative practices that also may reduce the risk of disease transmission, and citations to the scientific and technical literature can be found here: https://www.fishwildlife.org/application/files/9615/3729/1513/AFWA_Technical_Report_on_CWD_BMPs_FINAL.pdf
- And the 2019 Best Management Practices supplement can be found here: https://www.fishwildlife.org/application/files/1315/7054/8052/AFWA_CWD_BMP_First_Supplement_FINAL.pdf

Since the endorsement of these Best Management Practices, AFWA's Committee has begun the important process of working with the state agencies to implement such practices as are appropriate for the specific management context and needs of each of the individual states. Many states have already been proactive in adopting some of these practices. For example, 41 states currently have some form of restrictions in place regarding the movement of deer carcasses, while other states are attempting to prevent unnatural concentrations of cervids by either prohibiting or restricting practices such as feeding, baiting, and the use of urine-based deer attractants. The Committee is currently reviewing existing state regulations and management practices to provide states with examples of additional tools that could be deployed by state governments to manage CWD more effectively.

As a state fish and wildlife agency director, I am particularly heartened to see the increased attention being paid to CWD by our colleagues at the Department of the Interior (DOI) under the leadership of Secretary David Bernhardt and his Science Advisor Dr. William Werkheiser. I wish to commend Secretary Bernhardt and Dr. Werkheiser for convening meetings of an internal coordinating group in order to develop a better understanding of current efforts to combat this disease and to improve coordination across bureaus. Although the state agencies have primary management responsibility for cervids (deer, elk, moose, and other species of the family *Cervidae*), there is still much that the DOI can do to assist state agencies and their partners in responding to this disease.

We recognize and applaud the significant research on CWD that has been conducted and continues by scientists at the DOI particularly in the USGS's Ecosystems Division. Specific programs at USGS Ecosystems that have made major contributions towards our understanding of the disease and its management include the National Wildlife Health Center, the Cooperative Fish and Wildlife Research Unit Program, and the regional USGS research stations. We also recognize the pivotal role played by USGS Ecosystems Headquarters staff, particularly Ms.

Anne Kinsinger and Dr. Camille Hopkins, in coordinating wildlife disease research efforts across the USGS and also with state agencies.

We also note the important role that federal land managers at the DOI have played in understanding and helping to manage the spread of this disease. Dr. Samantha Gibbs at the US Fish and Wildlife Services Division of Refuges, who coordinates closely with state agencies on the surveillance and monitoring of CWD for cervids harvested on units of the National Wildlife Refuge System, has provided important support for CWD monitoring. Dr. Margaret Wild and Dr. Jenny Powers of the National Park Service have conducted seminal research on the dynamics of CWD in elk and mule deer populations in and around Rocky Mountain National Park. These are two examples where federal land managers have helped to advance our understanding of this disease and support prevention, surveillance, and management efforts led by the state agencies.

Further Work and Focus on This Problem Must Continue

As a wildlife professional for the past 24 years, I have witnessed and dealt first-hand with the effects and threats CWD has on our wildlife populations, hunters, businesses and the public. The stakes are high and it is important that decision makers make this issue a priority. Many communities in Wyoming and others states depend upon healthy wildlife populations and wildlife-associated recreation for their economic health and well-being. Although state and provincial fish and wildlife agencies support and contribute to citizen recreation in many ways, the majority of funding for most fish and wildlife agencies is derived from hunting and fishing license sales. This funding supports the broader mission of the state fish and wildlife agencies beyond just the management of a single fish or wildlife species. From creating accessible wildlife areas to habitat improvement and supporting hunter education programs to everyday office expenditures, license sales often form the backbone of many state agency budgets. However, as state agency costs for managing CWD continue to grow, resources continue to diminish for the conservation of other birds and mammals.

The sale of licenses for mule deer, white-tailed deer, moose and elk hunting accounts for the highest proportion of these funding dollars in many states. The US expenditures directly related to deer hunting account for nearly half of all hunting related expenditures and are estimated to range from about \$12 to over \$18 billion dollars per year since 2001 (US Fish & Wildlife Service 2011; US Fish & Wildlife Service 2017). The total annual economic contribution of deer hunting to the US economy is over \$67.7 billion/year with over \$3.3 and \$5.5 billion respectively per year going to state and local and federal tax revenue (Southwick Associates 2018). These economic contributions are vital to the health of our nation's GDP, rural economies, and are at substantial risk as CWD continues to increase and spread across the nation.

CWD is a costly endeavor and to effectively and efficiently fight the disease while maintaining other healthy wildlife populations and habitats and our rural economies, we must unite our state, federal, academic, and nongovernmental strengths, capacities, and resources. We must make it a priority to more cooperatively and collaboratively fight CWD and dedicate the resources necessary to expedite progress with this disease.

As stated previously, CWD was first discovered in Wyoming more than three decades ago. Since that time, the Department has strived to gain a better understanding of the disease through research and on the ground monitoring. We have spent years working in cooperation with other researchers evaluating vaccines, considering genetics, and searching for diagnostic test options, all while gathering over 30 years of prevalence data.

Wyoming and many other states and countries are still learning about this disease and its effects on deer, elk and moose populations, but there is clear evidence that CWD is adversely affecting the overall health and viability of some herds. As wildlife managers, it is our duty and responsibility to tackle this difficult issue, but we can't do it alone. It is key that an Act is developed and enacted containing the important ideas, framework and funding as are contemplated in this Discussion Draft. We will continue to conserve wildlife and serve people in the face of this challenging disease.

Thank you for holding this important hearing and for the opportunity to testify on Chronic Wasting Disease before you today. We look forward to working with you in the future as we tackle this important issue.

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Senate Committee on Environment and Public Works
Hearing entitled, "Legislative Hearing on a bill to create a U.S. Fish and Wildlife Service
Chronic Wasting Disease Task Force"
December 4, 2019
Questions for the Record for Mr. Nesvik

Chairman Barrasso:

1. The Centers for Disease Control and Prevention states on its website "CWD is fatal to animals and there are no treatments or vaccines."
 - a. Can you help us understand why Chronic Wasting Disease is different from so many other diseases?

Chronic wasting disease (CWD) falls into the category of transmissible spongiform encephalopathies (TSE), similar to scrapie and bovine spongiform encephalopathy. Although there are numerous differences between CWD and other diseases, one of the fundamental differences is that, unlike diseases caused by bacteria or viruses, the causative agents for TSEs (including CWD) are a type of molecule called a **prion**. Prions are *abnormally folded, self-replicating* proteins devoid of nucleic acid, that are transmissible from one animal to another. Prions have similar amino acid sequences to normal proteins, but are in a different conformation.

Prion diseases like CWD are distinguished by long incubation periods, characteristic spongiform changes associated with neuronal loss, and a failure to induce inflammatory response. Prion diseases are always fatal.

- b. Can you explain why no vaccine or treatment has been successfully developed?

There is currently no treatment for any TSEs, however a number of attempts over the years have been made by different researchers to develop a vaccine for them including CWD. One of the principal difficulties in creating a CWD vaccine/treatment lies with how the pathogen and the animal's immune system function. Effective vaccines operate by "priming" the animal's immune system by allowing it to identify and attack future infection. For CWD and other TSEs, the animal's immune system does not recognize prions as a source of infection, therefore prions in a body do not typically trigger an immune response.

2. Chronic Wasting Disease has been confirmed in at least 26 States and several Canadian provinces. That number continues to grow each year. Can you confirm if the spread of this disease is accelerating?

Unfortunately, most states are only beginning to earnestly look for chronic wasting disease in their free ranging deer and elk populations, so determining rate of spread is not possible given the data that is currently available. This disease is known to persist undetected, at very low incidences within populations for many years. Because surveillance for this

disease is expensive in both labor and testing, most states don't have the resources for surveillance to acquire adequate sample sizes to detect this disease at 1% prevalence in their deer and elk populations. At this point, it is safe to say that only our knowledge of the distribution of this disease is accelerating.

Senator BARRASSO. Thanks so much for your testimony. Mr. Leonhardt.

**STATEMENT OF KENT LEONHARDT, COMMISSIONER,
WEST VIRGINIA DEPARTMENT OF AGRICULTURE**

Mr. LEONHARDT. Thank you Chairman Barrasso, Ranking Member Carper. Thank you, Senator Capito, for the kind introduction, and members of the committee, the opportunity to talk about chronic wasting disease with you today.

As the Commissioner of Agriculture of the State of West Virginia, I believe the establishment of a CWD task force is a measure that is long overdue. I am one of 12 statewide elected commissioners of agriculture; and as such, I report directly to the citizens of my State. There is a lot of concern surrounding CWD, especially from our many sportsmen, as well as our captive cervid farmers.

I am elected, I have the unique opportunity to help shape legislation and policy surrounding issues like CWD. What my staff and I have found is that many of our colleagues from other States operate under laws and regulations much different than our own.

I would also like to point out to the members of this committee that every State department of agriculture has different responsibilities. In West Virginia, deer farms are regulated by my department. Deer farms in West Virginia raise white-tailed deer, elk, plus exotic reindeer and fallow deer. Wild white-tailed deer and elk populations are regulated by the West Virginia Department of Natural Resources under the Commerce Department and the Governor. While the Department of Agriculture and DNR work closely together on many projects, we sometimes disagree on legislation and rules because the uncertainty of CWD data does not help that at all.

There are various groups and agencies performing some form of research to better understand this slow spreading, yet potentially devastating disease. In February 2019, I asked USDA's Animal, Plant, and Health Inspection Service to undertake more research concerning CWD. There was pressure being placed on legislators to make and enforce laws that were not based on science, but a feeling that something must be done.

My position has always been that we must legislate from the application of sound science. Farmers are already subject to uncertain weather and uncertain market conditions. Successful farm businesses must have certainty in regulations. This includes the production and interstate transportation of agricultural products, which does include deer, venison, deer embryos, and deer urine, et cetera.

APHIS responded with an initial literature review, which I have attached to this testimony. It is clear from the current State of research we do not have certainty in the science of CWD and the ability to make sound judgments that may affect the livelihood of many farmers and hunting related businesses.

I am encouraged that research is ongoing, but more is needed, and it does need to be better coordinated to maximize limited research dollars.

Deer farming in West Virginia is a growing industry. Deer farming has been growing nationally, with the sale of deer urine alone

reaching \$16 million in 2016. For West Virginia, deer farming is an opportunity to diversify our economy and potentially use land that is no longer viable under modern agricultural practices, or even restore value to our abandoned mine lands.

Although found in limited areas in West Virginia, to date in West Virginia we have never had a farm deer test positive for CWD. We test all animals going to slaughter for meat and 10 percent of the animals harvested in hunting operations.

West Virginia has long supported the cooperative CWD Voluntary Herd Certification Program between West Virginia deer farms, State animal health and wildlife officials, and APHIS-Veterinary Services. Currently, 30 of the 36 West Virginia deer farms participate with 28 certified with the program standards. Two newer farms do not have 5 years of negative results at this time. Six licensed hunting preserves do not participate, as they do not relocate deer.

It is important to point out that any additional studies on the prion-related diseases will add value to prion disease research for known human diseases and other domesticated livestock. Deer farms should be part of this research, especially if we are a Nation that wants to develop immunotherapies for domesticated herd protection and eventual suppression and eradication of diseases in the wild.

Therefore, my opinion is that the spread of CWD is mostly carried by scavengers. You will see that in some of the studies I provided. An infected deer that dies from any cause, left unattended, will soon be consumed by scavengers, most commonly, a winged variety. The viable prion living in the lymphatic system or nervous tissue is then consumed, and the prion passes through the digestive track and eventually deposited miles away. This could explain why the disease has appeared in very tightly closed and monitored herds or in areas not adjacent to known infected areas.

Therefore, I believe a close study of infected carcasses and scavengers would yield tremendous insight. We know the prion survives on vegetation outside an animal for a long time. It may be a while before we are confident with a live test for the disease. We may be taking baby steps and slowing the spread, but it must be based on sound science.

I looked at the proposed legislation, and I have three recommendations. At least, if we could, at least have one of the non-governmental positions on the task force be an experienced and respected deer farmer; that the bill clarifies the funding and need for coordination and education information campaign between State agencies, agriculture groups, and the hunting public; and that any legislation resulting from this task force be specific and not left up to interpretation.

Thank you very much for this opportunity. I look forward to your questions.

[The prepared statement of Mr. Leonhardt follows:]

West Virginia Department of Agriculture
 Kent A. Leonhardt, Commissioner
 Joseph L. Hatton, Deputy Commissioner



U.S. Senate Testimony

Committee on Environment and Public Works

12/4/2019

Thank you, Chairman Barrasso, Ranking Member Carper, and members of the committee for the opportunity to discuss with you today a very serious issue facing our nation, Chronic Wasting Disease.

As the Commissioner of the West Virginia Department of Agriculture (WVDA), I believe the establishment of a CWD Task Force is a measure that is long overdue. I will note, I am one of 12 statewide elected Commissioners of Agriculture and as such, I report directly to the citizens of my state. There is a lot of concern surrounding the CWD, especially from our many sportsmen, as well as our captive cervid farmers. Because I am elected, I have the unique opportunity to help shape legislation and policy surrounding issues like CWD. What my staff and I have found is that many of our colleagues from other states operate under laws and regulations much different than our own.

I would also like to point out to the members of this committee that every state Department of Agriculture has different responsibilities. In West Virginia, deer farms are regulated by my Department (WVDA). Deer farms in WV raise whitetail deer and elk, plus exotic reindeer and fallow deer. Wild whitetail deer and elk populations are regulated by the West Virginia Department of Natural Resources (DNR) under the Commerce Department and the Governor. Deer farming regulations originated within the DNR, and authority over deer farms was moved by legislation passed in 2015 to the WVDA. While the WVDA and DNR work closely together on many projects, we sometimes disagree on legislation and rules; the uncertainty of CWD data does not help.

There are various groups and agencies performing some form of research to better understand this slow spreading yet potentially devastating disease. In February of 2019, I asked USDA's Animal and Plant Health Inspection Services (APHIS) to undertake more research concerning Chronic Wasting Disease (CWD). I was concerned there was pressure being placed on legislators to make and enforce laws that were not based on science but a feeling that something must be done. My position has always been that we must legislate from the application of sound science. Farmers are already subject to uncertain weather and uncertain market conditions. Successful farm businesses must have certainty in regulations. This includes the production and interstate transportation of agricultural products, which does include deer, venison, deer embryos, and deer urine, etc.

APHIS responded with an initial literature review which I have attached to this testimony. It is clear from the current state of research we do not have certainty in the science of CWD and the ability to make sound judgments that may affect the livelihood of many farmers and hunting related businesses. I am encouraged that research is ongoing, but more is needed, and it does need to be better coordinated to maximize limited research dollars.

Currently, West Virginia has 36 deer farms up from when I took office in 2017. Deer farming is a growing industry in West Virginia. Deer farming has been growing nationally with the sale of deer urine alone reaching \$16 million in 2016. Arby's restaurants have been testing sales of venison in their stores. For West Virginia, deer farming is an opportunity to diversify our economy and potentially use land that is no longer viable under modern agricultural practices, including our beautiful forests and rolling fields, or even restore value to abandoned mine lands.

To date in West Virginia we have never had a farmed deer test positive for CWD, and we test all animals going to slaughter for meat and 10% of animals harvested in hunting operations. Even though researchers have not been able to replicate the only documented case of the transmission of CWD to a non-human primate via contaminated meat, the Center for Disease Control recommends not eating deer meat from known CWD-positive deer, sick animals, or brain/nervous/lymph tissue from an animal.

West Virginia has long supported the cooperative CWD Voluntary Herd Certification Program between WV deer farms, state animal health and wildlife officials, and APHIS-Veterinary Services. Currently, 30 of 36 WVDA licensed deer farms participate with 28 certified by complying with program standards. Two newer deer farms do not have five years of negative

results at this time. Six licensed hunting preserves are not required to participate as they do not relocate deer. Program goals are to reduce the spread of the disease and decrease risk to farmed deer, improve confidence for trade of farmed deer and deer products, and reduce the risk of transmission and environmental contamination from CWD herds. Program requirements include animal identification, containment fencing, and CWD testing of deer over 12 months of age that die for any reason. Participating deer farms with no positive CWD test become certified as being low-risk after completing five years of negative CWD testing. Interstate movement of farmed deer depends on program participation, compliance with program requirements, and herd certification status.

It is important to point out that any additional studies on this prion-related disease will add value to prion disease research for known human diseases and other domesticated livestock. Deer farms should be a part of this research especially if we as a nation want to develop immunotherapies for domesticated herd protection and eventual suppression and eradication of the disease in the wild.

My opinion is that the spread of CWD is mostly carried out by scavengers. An infected deer that dies by any cause, the disease itself or even being hit by a car, left unattended will soon be consumed by a scavenger most commonly a winged variety, crow or vulture. The viable prion living in the lymphatic system or nervous tissue is then consumed and the prion passes through the digestive tract and eventually deposited miles away. This could explain why the disease has appeared in very tightly closed and monitored herds, or in areas not adjacent to a known infected area.

Therefore, I believe a closed study of infected carcasses and scavengers would yield tremendous insight. Does the prion survive the digestive tract of a predator? We know the prion survives on vegetation outside an animal for a long time. The feces, blood or urine of the host animal may not contain the prion as the animal's natural filter systems block it, so researchers are looking for markers related to prions. It may be awhile before we are confident with a live test for the disease. We may be taking baby steps in slowing the spread, but it must be based on sound science.

In the meantime, as the research is conducted, we can use potentially simple techniques to slow the spread. Akin to what we have done with the "Slow the Spread" program for Gypsy Moth. This takes a properly funded education and communications program. There is simply too much speculation and non-science interpretation of research affecting the business of disease control. This hurts agriculture and sporting businesses.

An example of this are actions I have taken in West Virginia. As I became more convinced scavengers were a primary vector for the spread of the disease, I strongly suggested to the WV Deer Farmers Association at their annual meeting they insist all members make sure all deer carcasses are buried too deep for scavengers to reach. I then made a request to the Department of Highways that they make a more concerted effort to quickly retrieve and bury the road kills within the DNR declared containment area.

In reviewing the proposed legislation, I have three recommendations for improvement:

- 1) At least one of the non-governmental positions on the task force be an experienced and respected deer farm owner/manager
- 2) That the bill clarifies the funding and need for a coordinated education and information campaign between the state agencies, agriculture groups, and the hunting public
- 3) That recommended legislation, if any, resulting from this task force be specific and not left up to interpretation

Thank you once again for this opportunity. I will gladly answer any questions the committee may have.

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In accordance with federal and state laws, the West Virginia Department of Agriculture is prohibited from discrimination in its programs and services on the basis of race, color, religion, sex, age, national origin or ancestry, disability (including blindness), medical condition, marital status, veteran status, and political affiliation.

Kent Leonhardt is a longtime farmer who began his passion for the agriculture at a very young age and fostered that passion into a business operation while still serving in the United States Marine Corps. Towards the end of his military career, Kent bought a farm near Blacksville, WV that had sat abandoned for over 40 years. The farm, where he still lives today, was purchased in 1982, and started cultivating crops and raising livestock in 1997. For twenty years, Kent, with the help of his wife Shirley, raised sheep, cattle and goats and sold hay when there was a surplus available.

Kent received his formal education from University of Missouri, earning a bachelor's degree in Wildlife Management. During his studies, he took a variety of courses covering issues pertinent to agriculture as well as natural resources and environmental protection. Kent furthered his education by earning a Master's in Business Management from Central Michigan University while still on active duty.

After twenty years in the United States Marine Corps, Kent retired from the military in 1996 at the rank of Lieutenant Colonel. During that time, he served on multiple joint service assignments leading men and women during war and peace. Throughout his service, Kent received a variety of decorations including: Legion of Merit, Combat Action Ribbon and eight other personal decorations.

In 2014, Kent was elected to the West Virginia State Senate to serve the people of the Second Senatorial District. The district, at the time, was one of the largest and most rural in West Virginia. It contained parts of or all of the following counties: Marshall, Wetzel, Gilmer, Marion, Monongalia, Tyler, Doddridge, Calhoun, and Ritchie. In 2017, he resigned from his position in the WV State Senate after being elected as the West Virginia Commissioner of Agriculture. He has held that position from 2017.

Together, Kent and Shirley have three sons and six grandchildren. Kent is a member of the Monongalia County Farm Bureau.

Biography for West Virginia Commissioner of Agriculture Kent A. Leonhardt

Current Position: Jan 2017 to present

WV State Senator District 2 - 2015 to 2017

1976 to 1996 United States Marine Corps, Lieutenant Colonel, Retired

Company Commander, Fort Meade, Maryland

Analyst and Watch Officer, NSA Fort Meade

Deputy G-2 (Intelligence), 7th Marine Expeditionary Brigade

Desert Shield/Desert Storm 1990-1991, Led a 68 Marines intelligence unit

Executive Officer 2nd Radio Battalion, Camp Lejeune, NC

USMC Liaison Officer, National Security Agency

Special Intelligence Collection Manager, US Central Command

1996 to present a WV Farmer - Wife and Commissioner restored and grew an abandoned WV Farm.

Education including Military Schools:

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Prion Remains Infectious after Passage through Digestive System of American Crows (*Corvus brachyrhynchos*)

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Abstract

Avian scavengers, such as American crows (*Corvus brachyrhynchos*), have potential to translocate infectious agents (prions) of transmissible spongiform encephalopathy (TSE) diseases including chronic wasting disease, scrapie, and bovine spongiform encephalopathy. We inoculated mice with fecal extracts obtained from 20 American crows that were force-fed material infected with RML-strain scrapie prions. These mice all evinced severe neurological dysfunction 196–231 d postinoculation ($\bar{x}$ = 198; 95% CI: 210–216) and tested positive for prion disease. Our results suggest a large proportion of crows that consume prion-positive tissue are capable of passing infectious prions in their feces (p = 1.0; 95% CI: 0.8–1.0). Therefore, this common, migratory North American scavenger could play a role in the geographic spread of TSE diseases.

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Introduction

Transmissible spongiform encephalopathies (TSE) are most likely caused by pathogenic isoforms (PrP^{Res}) of prion proteins [1] that naturally occur across many classes of animals, including mammals and birds [2]. A number of livestock and wildlife species in North America are susceptible to TSE diseases. Mule deer (*Odocoileus hemionus*), white-tailed deer (*O. virginianus*), elk (*Cervus elaphus*), and moose (*Alces alces*) are susceptible to chronic wasting disease (CWD); domestic sheep and goats are susceptible to scrapie; and domestic cattle are susceptible to bovine spongiform encephalopathy (BSE) (although this disease is rare in North America [3]). These TSE diseases are always fatal to infected animals, and upon death, carcasses allowed to remain in the environment can be scavenged by an array of avian and mammalian scavengers [4].

Mechanisms for the spread of TSE in wild and domestic ungulates are incompletely understood. We hypothesized that avian scavengers have potential to translocate PrP^{Res} in their feces. American crows (*Corvus brachyrhynchos*) are significant avian scavengers of deer carcasses [4], they are migratory, and their overall range [5] includes most areas where TSE diseases occur in North America [6]. Crows forage in groups, traveling up to 80 km/d from communal roosts [5]. Thus, crows have opportunity to encounter PrP^{Res}-infected carcasses, consume infected tissue, and move long distances before depositing feces. Once in the soil, PrP^{Res} may persist >2 years [7,8], potentially enabling increased site contamination over time. For example, residual

contamination of soil with PrP^{Res} caused recurrence of CWD in confined mule deer in Colorado [7] and lateral transmission via environmental contamination is likely an important route of infection [9].

Insects [10,11], poultry [12], and scavengers, including crows [4], have been suggested as passive carriers or dispersers of infectious prions. We found no studies that evaluated passage of PrP^{Res} through avian digestive systems, though several studies have evaluated resistance of PrP^{Res} to mammalian digestive fluids. Ruminant digestive fluids used during in-vitro trials have shown substantial [13,14] to no reduction [15] in Western blot signal after incubation periods of approximately 13–24 h. Shorter incubation times (15–210 min) resulted in intermediate levels of Western blot signal loss [16]. Studies that investigated effects on PrP^{Res} from full passage through rodent digestive systems found scrapie and BSE PrP^{Res} present in mouse feces [17] and scrapie PrP^{Res} in hamster feces (ca. 5% of original dose excreted 24 h postinoculation) [18]. Thus, it appears that mammalian digestive fluids and processes can reduce PrP^{Res} concentration but are unlikely to eliminate it.

Proteolysis occurs in the avian digestive system due to the presence of hydrochloric acid (HCl) and the proteolytic enzymes pepsin, trypsin, chymotrypsin and various peptidases [19,20]. Although experimentally induced hypoacidity was associated with reduced scrapie infection rates in mice [21], it is unlikely that gastric HCl would fully degrade PrP^{Res} in the crow digestive system given extreme temperature and concentration required

[22] and mild conditions present in the avian gut [19,23]. Although early investigations suggested that trypsin reduced scrapie titer under certain circumstances [1,24], subsequent studies found pepsin and trypsin were not effective for reducing infectivity of scrapie and BSE. PrP^{Res} [25] or variant Creutzfeldt-Jakob disease PrP^{Res} [26]. Thus, there is little evidence to suggest that the crow digestive system would eliminate PrP^{Res} infectivity prior to excretion of feces. Similar arguments can be made for nonruminant mammals because of similarities in endogenous enzymes in vertebrate digestive systems [27], yet PrP^{Res} was substantially reduced by passage through hamster digestive systems [18].

Little is known about effects of avian digestive systems on infectivity of PrP^{Res}. As a first step in understanding the potential role of avian scavengers in TSE transmission, we tested the hypothesis that readily available mouse-adapted scrapie PrP^{Res} can remain infectious after passage through the digestive tract of crows. Results of our study support this hypothesis.

Materials and Methods

We evaluated infectivity of the RML Chandler strain (RML) of mouse-adapted scrapie [28] (obtained from Rocky Mountain Laboratories, Hamilton, MT) after passage through digestive systems of crows. Crows were captured during winter in central Oklahoma, USA. We used mouse-brain source material from uninfected (normal) and terminally ill RML-infected C57BL/6 mice (Hilltop Lab Animals, Scottsdale, PA; this strain used throughout study). We separately pooled and homogenized infected and normal mouse brains and diluted portions of each homogenate 1:10 w/v in sterile phosphate-buffered saline (SPBS). We estimated passage time through the alimentary canal by gavaging 1 crow (not part of the experimental group) with 5 ml of whole egg mixed with blue dye; by 4 h postgavage all stained feces had been excreted. We withdrew feed (but not water) from study crows approximately 17 h pre-gavage. We randomly allocated 25 crows to treatment groups and gavaged each crow with 5 ml of either PrP^{Res}-infected (n=20) or normal (n=5) mouse-brain homogenate diluted 1:10 w/v in SPBS (Table 1). We then transferred each crow to an individual single-use cage. At 4 h postgavage, we collected and pooled all feces within each cage. We homogenized crow-specific pooled feces and gamma irradiated them at 24,000 Gy to destroy viruses and microbes. For each crow, we then diluted a 500 μ l sample of fecal homogenate in SPBS to a total volume of 10 ml, centrifuged it for 15 min at 13,730 m/s^2 , and extracted the supernatant for use as inoculum for mice. We removed solids to minimize risk of toxicity to mice from uric acid contained in bird feces. Crows were not held or examined after collection of fecal samples.

We randomly allocated 5 mice/crow to treatment groups (Table 1). Mice received crow-specific fecal supernatant from PrP^{Res} or control crows (CF+ and CF- groups, respectively), or PrP^{Res}-infected or normal mouse brain homogenate diluted to 1:100 w/v in SPBS (MB+ and MB- groups, respectively). We intraperitoneally inoculated each mouse with 1 ml of either crow fecal supernatant or diluted mouse brain homogenate.

All 5 mice/crow, or 5 mice/MB treatment group, were caged together under biosafety level 2 conditions. We monitored mice daily until all those in PrP^{Res} treatment groups expressed clinical symptoms of mouse scrapie and were thereafter euthanized. Remaining mice were monitored every 2 d until study termination at 365 d postinoculation (dpi). We scored mice for each of 6 clinical symptoms of mouse scrapie (kyphosis, ataxia, stiff tail, lack of grooming, emaciation, and lethargy), where 0 = none visible, 1 = moderate, and 2 = severe. We euthanized mice when total

Table 1. Experimental design used to estimate proportion of crows able to pass infectious RML scrapie prion (PrP^{Res}) in feces (numbers of animals).

Treatment group ^a	Crows	Mice ^b
CF+	20	100
CF-	5	25
MB+	0	10
MB-	0	5

^aMice intraperitoneally inoculated with gamma-irradiated crow fecal (CF) extract from crows gavaged with PrP^{Res} (+) or control (-) mouse brain homogenate; additional control mice were inoculated with mouse-brain homogenate with (MB+) or without (MB-) PrP^{Res}.

^bFive mice were randomly allocated to each crow and housed together in 1 cage postinoculation. Additional control mice were allocated randomly to MB treatment groups and 5 mice/treatment group were housed together in 1 cage postinoculation.

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daily scores reached ≥ 6 for 1 d, ≥ 6 continuously for 3 d, or at 365 dpi. Brains were immediately harvested and stored at -70°C for analysis. Samples from harvested brains (1:10 w/v homogenate) were tested at Colorado State University's Veterinary Diagnostic Laboratory for PrP^{Res} using the ELISA-based Bio-Rad TeSeE BSE rapid assay (Bio-Rad Laboratories, Hercules, CA, USA) to confirm scrapie diagnosis.

We used exact methods [29] to estimate a 95% confidence interval (CI) on the proportion of crows able to excrete infectious prions in feces (SAS PROC FREQ [30]). We used Fisher's exact test, due to low count (i.e., 2) in 1 cell of the 2 $\times$ 2 contingency table, to evaluate whether early death (≤ 3 dpi) was associated with source of CF inoculum (PrP^{Res} or control). We estimated means and 95% CI for incubation time or time-to-death (contingent on surviving >3 dpi) for CF+ and MB+ mice using general linear mixed modeling [31], where cage was a random effect to account for clustering of mice within cages (SAS PROC GLIMMIX [30]). Traditional time-to-event (or survival) analyses were not required for CF+ and MB+ mice because none were censored >3 dpi. As most CF- mice were censored at study termination, we tested for equality of survival functions between CF+ and CF- using the log-rank test (SAS PROC LIFETEST [30]).

Ethics Statement

The Institutional Animal Care and Use Committee of the United States Department of Agriculture, Animal and Plant Health Inspection Service, Wildlife Services, National Wildlife Research Center approved all procedures used in this study (QA-1406).

Results

All 20 crows gavaged with scrapie-infected mouse brain transmitted PrP^{Res} to mice via fecal inoculum (estimated proportion: $\hat{p}=1.00$, CI: 0.83–1.00). Sixteen mice from CF+ and 2 from CF- groups died ≤ 3 d postinoculation (likely from residual uric acid toxicity; Table 2). No early deaths occurred in MB groups and estimated probabilities of early death were not statistically different between CF+ ($\hat{p}=0.16$) and CF- ($\hat{p}=0.08$) mice (Fisher's exact $P=0.524$). After these early deaths, 2 crows were represented by only 1 mouse/crow and all other crows were represented by 3–5 mice/crow. Surviving mice appeared healthy until onset of clinical symptoms of mouse scrapie. Based on scoring for multiple clinical symptoms, we euthanized mice in MB+ and

CF+ groups 181–231 dpi (Fig. 1). These mice subsequently tested positive for PrP^{Res} (Table 2). On average, MB+ mice had shorter incubation times (by 15 d) than CF+ mice (Fig. 1). We observed no clinical symptoms in MB– or CF– control mice. All MB– mice lived to study termination at 365 dpi, though 3 CF– mice died at 251–303 dpi. Time to death was significantly longer for CF– than for CF+ mice ($\chi^2_1 = 71.0$, $p < 0.0001$). One of these CF– mice (251 dpi) tested positive for PrP^{Res}. This unexpectedly positive mouse was inoculated directly after 5 MB+ mice and may have been inadvertently exposed to PrP^{Res}-positive material.

Discussion

We tested the hypothesis that PrP^{Res} would remain infectious after passage through the digestive tract of crows. After inoculation with fecal supernatant from crows gavaged with PrP^{Res}-infected material, we observed clinical disease and obtained positive results from ELISA in all 84 CF+ mice that survived >3 dpi. Thus, we confirmed passage of infectious PrP^{Res} through all 20 crows gavaged with infected material. We conclude that 83–100% of crows from the population we sampled can excrete infectious RML PrP^{Res} in feces under conditions similar to those in our study.

The MB+ mice developed clinical scrapie 15 d earlier than CF+ mice indicating inoculated dose of PrP^{Res} infectivity was likely lower for CF+ mice. We inoculated MB+ and MB– mice to demonstrate that brain source materials were infectious or not infectious, respectively, not to serve as standards for titer assessment. However, comparison with unpublished titration results from intraperitoneal inoculation of RML mouse scrapie into C57BL/10 mice (Ann Ward and Sue Priola, Rocky Mountain Laboratories, personal communication) suggest MB+ mice re-

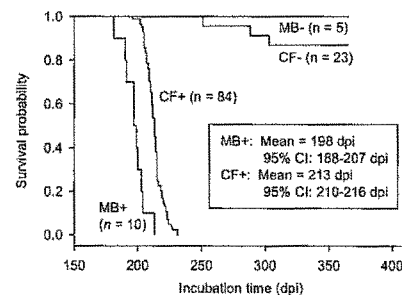


Figure 1. Survival functions for treatment groups of mice. Twenty-five crows were fed infected (PrP^{Res}) or normal (control) mouse brain homogenate. Five mice/crow were subsequently inoculated with crow fecal extract from PrP^{Res} (CF+) or control (CF–) crows. Additional control mice were inoculated with mouse-brain homogenate with or without PrP^{Res} (MB+ and MB–, respectively). Sample sizes reflect early deaths of 16 mice ≤ 3 d postinoculation (dpi). Mean and interval estimates of survival time for MB+ and CF+ groups showed these groups were significantly different, indicating different dose levels of PrP^{Res} in crow fecal extracts compared to mouse brain homogenate. Time to death was significantly longer for CF– than for CF+ mice ($\chi^2_1 = 71.0$, $p < 0.0001$). Because all mice exposed to CF– extracts died of transmissible spongiform encephalopathy (given survival >3 dpi), all 20 crows gavaged with PrP^{Res}-infected mouse brain homogenate passed infectious doses of PrP^{Res} to mice via fecal extracts. doi:10.1371/journal.pone.0045774.g001

Table 2. Numbers of mice by treatment group that suffered early inoculation-related death, exhibited clinical symptoms of prion disease, and tested positive for scrapie prion (PrP^{Res}) by ELISA^A.

Treatment group ^B	Early death ^C	Clinical disease ^D	PrP ^{Res} detected
CF+	16 (100)	84 (84)	84 (84)
CF–	2 (25)	0 (23)	1 (23)
MB+	0 (10)	10 (10)	9 (9)
MB–	0 (5)	0 (5)	0 (4)

^ANumbers in parentheses indicate sample size.

^BMice intraperitoneally inoculated with gamma-irradiated crow fecal (CF) extract from crows gavaged with PrP^{Res} (+) or control (–) mouse brain homogenate; additional control mice were inoculated with mouse-brain homogenate with (MB+) or without (MB–) PrP^{Res}.

^CMice that died ≤ 3 d postinoculation, presumably from fecal uric acid toxicity. These mice were removed from the data set.

^DMice that achieved a minimum threshold score, based on multiple symptoms such as kyphosis, ataxia, stiff tail, lack of grooming, emaciation, and lethargy, demonstrating strong clinical evidence of prion disease.

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ceived approximately 10-times more infectivity than CF+ mice. Dilutions of brain and fecal material with SPBS (see Methods) indicate that the amount of infectivity inoculated into MB+ mice would have been about double that of CF+ mice, assuming no influence on concentration of infectivity due to passage or centrifuge processing. It is reasonable to expect some loss of infectivity after removing solids from diluted crow feces by centrifugation. It is also possible that some degradation or absorption of infectivity occurred during passage through crow alimentary tracts.

Our study clearly shows that RML PrP^{Res} can persist after passage through the crow alimentary tract. As there is variability in resistance of different strains of PrP^{Res} to degradation [32–36], we cannot definitively state that passage of strains of concern would occur. However, RML PrP^{Res} has been shown more sensitive to degradation than TSE field isolates after 4 h exposure to enzymatic digestion [36]. Therefore, results of our study likely understate potential for prion passage through the alimentary canal of crows. Further experimental trials involving TSE prions obtained from ovine, bovine, and cervine carcasses would be required to definitively evaluate passage of natural TSEs through digestive systems of scavengers and predators. Other additional research topics could include in-vitro evaluation of PrP^{Res} degradation in crow digestive fluids; effects of solid, semisolid, and liquid delivery of infective materials on passage rate and residual infectivity in feces; postexcretion continued enzymatic and bacterial degradation of infectivity in feces; infectivity of feces excreted >4 h postgavage; susceptibility of crows to TSE disease and potential for postinfection shedding of PrP^{Res} in feces.

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Author Contributions

Conceived and designed the experiments: KV PN. Performed the experiments: JF JP KV PN. Analyzed the data: GP. Wrote the paper: GP KV.

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Cervids: CWD Voluntary Herd Certification Program



The **CWD Herd Certification Program (HCP)** is a cooperative effort between the Animal and Plant Health Inspection Service (APHIS), State animal health and wildlife agencies, and farmed cervid owners. APHIS coordinates with these State agencies to encourage cervid owners to certify their herds and comply with the CWD Herd Certification Program Standards.

The goal of the HCP is to provide a consistent, national approach to control the incidence of CWD in farmed cervids and prevent the interstate spread of

CWD. Achieving this goal will ultimately result in several important long-term outcomes, including:

- Healthy cervids (both farmed and wild populations) with a reduced risk of CWD.
- Increased confidence that HCP-certified herds are low risk for CWD infection.
- Strong trade of cervid animals and products (increased market confidence).
- Reduced risk of transmission from, and environmental contamination by, CWD-positive herds.

This goal is accomplished through the establishment of the national CWD herd certification program and interstate movement requirements for CWD-susceptible cervids found in title 9 of the Code of Federal Regulations (CFR) parts 55 and 81. These regulations are written as performance-based regulations that describe the legally required outcomes.

National CWD HCP requirements for all enrolled herd owners include fencing, individual animal ID's, regular inventories, and testing of all animals over 12 months that die for any reason. With each year of successful surveillance, participating herds will advance in status until reaching five years with no evidence of CWD, at which time herds are certified as being low risk for CWD. Interstate movement of animals from herds will depend on participation in the program, compliance with program requirements, and herd certification status.

Twenty-eight (28) states are currently participating in the program as of December 2017. States interested to join the National CWD HCP must submit an application and supporting documents to APHIS. To find out more about the application process, please see link below.

<https://www.aphis.usda.gov/aphis/ourfocus/animalhealth/animal-disease-information/cervi...> 12/2/2019

- List of Approved State CWD Herd Certification Programs (HCP)
- Application Document for States
- VS Form 11-2

The CWD Herd Certification Program Standards

The **CWD Herd Certification Program Standards** provide detailed descriptions of acceptable methods for complying with the legal requirements in 9 CFR parts 55 and 81, which are performance-based regulations that describe the legally required outcomes. The Program Standards also provide guidance for sample collection, biosecurity, and disposal:

Part A, Herd Certification Program, describes acceptable methods to meet the minimum requirements to certify farmed cervid herds for interstate movement.

Part B, Guidance on Response to CWD, describes acceptable methods to meet the minimum requirements to respond to the finding of CWD in farmed cervid herds. The methods in these Program Standards have been approved by the APHIS Administrator. Alternatively, States may propose other methods/approaches to meet the regulatory requirements. These alternative proposals should be submitted in writing to APHIS for approval. States may also have additional or stricter requirements that exceed the minimum requirements described in the CWD regulations.

The Program Standards will be reviewed regularly by APHIS and, as appropriate, representatives of the cervid industry and State and Federal agencies. A notice will be published in the Federal Register to inform stakeholders of any revisions APHIS plans to the Program Standards.

- CWD Herd Certification Program Standards, May 2019
- CWD Program Standards Review Working Group Summary Document, 2016
- Regulatory Sample Collection

Interstate Movement of Cervids

NOTICE: No farmed or captive deer, elk or moose may be moved interstate unless it meets the requirements listed in Part 81 of the Code of Federal Regulations (CFR).

- ADT/Traceability Fact sheet for interstate transport of cervids
- Requirements for Interstate Transport of Wild Caught Cervids
- Surveillance and Testing Requirements for Interstate Transport of Wild Caught Cervids

Related Links

<https://www.aphis.usda.gov/aphis/ourfocus/animalhealth/animal-disease-information/cervi...> 12/2/2019

- CWD Rule
- CWD Status of Captive Herds
- Revised Program Standards: Overview of Changes: Presentation
- 2018 Revised CWD Program Standards: What You Need to Know- for Cervid Producers
- 2018 Revised CWD Program Standards: What You Need to Know- for Accredited Veterinarians and Sample Collectors

The Chronic Wasting Disease Transmission in Cervidae Study Act

ISSUE SUMMARY

Chronic Wasting Disease (CWD) is a contagious neurological disease affecting deer, elk, and moose (cervids). Like Bovine Spongiform Encephalopathy, commonly known as “mad cow disease”, CWD is a form of transmissible spongiform encephalopathy (TSE) and is likely transmitted by prions. These prions affect brain function and for some TSEs, are linked to degenerative conditions in humans.

Recent findings from studies regarding transmissibility of CWD to non-cervid species conflict in their conclusions. In 2017, Canadian researchers published findings detailing the first documented transmission of CWD through consumption of contaminated meat in non-human primates. Subsequent investigations were not able to reproduce the results; nevertheless, the Centers for Disease Control [continues to recommend](#) that hunters should “strongly consider having the deer or elk tested for CWD before you eat the meat”, prevent mixing of product during processing, and avoiding consumption of meat from animals that test positive for CWD.

LEGISLATIVE NEED

CWD has been documented to affect both captive and live herds in 26 states and recently was [identified in a 4th Canadian province](#) (see [attached map](#)). In the United States, state fish and wildlife agencies have primacy over wildlife management. Accordingly, state agencies have largely been responsible for conducting research, and for developing and implementing best management practices (BMPs).

Despite the widespread prevalence of CWD, very little is known about common vectors for transmission. BMPs vary significantly among states; the Association for Fish and Wildlife Agencies (AFWA) [recently adopted new BMPs](#) for CWD at their September 2018 AFWA Fish and Wildlife Health Committee Meeting. AFWA identified the need for additional research to identify:

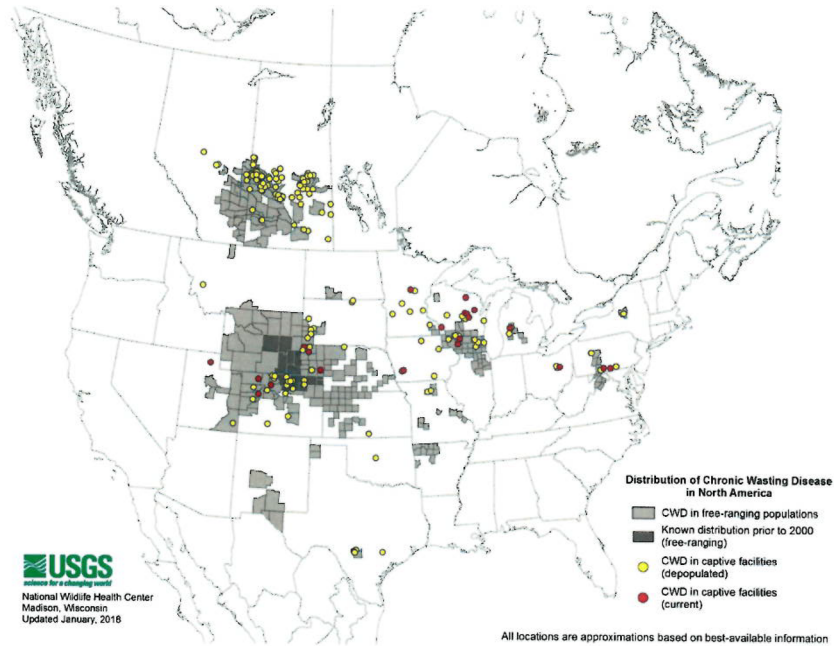
1. The most effective techniques for prevention, surveillance, and management; prion detection and diagnostics; and disease epidemiology.
2. Human dimensions issues such as the impact of CWD on hunting practices and on hunting-related expenditures.
3. The cost of CWD to state and provincial economies.
4. The costs of CWD to wildlife agencies to facilitate budget planning and to landowners, hunters, and other stakeholders.
5. Other sources of funding for CWD prevention, surveillance, and management

The U.S Department of Agriculture (USDA) Animal and Plant Health Inspection Service (APHIS) operates a [CWD Herd Certification Program](#) for farmed cervids. Captive herds must participate in the program and be certified to move animals interstate. The program is reactive, rather than proactive. Given the existing risk to wildlife health, economic impact of wildlife loss, and the potential risk to human health, more data is needed. This data can be used to inform a more comprehensive future approach to CWD prevention.

SUMMARY

The Chronic Wasting Disease Transmission in Cervidae Study Act addresses the needs identified by state agencies through AFWA. The bill requires the USDA Secretary to enter into an arrangement with the National Academies of Sciences to review current data and BMPs from the CWD Herd Certification Program and state agencies regarding:

1. Pathways and mechanisms for CWD transmission
2. Areas at risk and geographical patterns of CWD transmission
3. Gaps in current scientific knowledge regarding transmission to prioritize research to address gaps



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[Kansas](#)
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Gothard, Robin

From: Forbes, John T - APHIS <John.Forbes@aphis.usda.gov>
Sent: Monday, March 04, 2019 4:04 PM
To: Leonhardt, Kent
Cc: Hatton, Joseph
Subject: CWD
Attachments: Nichols Coyote Passage of Prion.pdf; VerCauteren Prion thru Crows.pdf

Commissioner Leonhardt,

You mentioned during our meeting in January that you were curious about the potential role of predators in spreading CWD so I checked into it and there's already been some research in the area. Attached are two papers – one that studied crows and the other that studied coyotes – which show it is possible to have prions pass through these two species based on their study methodology.

Please let me know if you have any questions or if there's anything we can help you with.

John

John Forbes
 State Director
 USDA, APHIS, Wildlife Services
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 Elkins, WV 26241
 (304) 636-1785
 John.Forbes@aphis.usda.gov

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**CWD Prions Remain Infectious after Passage Through the Digestive System of Coyotes
(*Canis latrans*)**

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Keywords

Chronic Wasting Disease, Coyotes, Environmental Contamination, Feces, Prions, Transmission, Scavengers

Abstract

Chronic wasting disease (CWD) is a geographically expanding prion disease of wild and captive cervids in North America. Disease can be transmitted directly, animal to animal, or indirectly via the environment. CWD contamination can occur residually in the environment via soil, water, and forage following deposition of bodily fluids such as urine, saliva, and feces, or by the decomposition of carcasses. Recent work has indicated that plants may even take up prions into

the stems and leaves. When a carcass or gut pile is present in the environment, a large number of avian and mammalian species visit and consume the carrion. Additionally, predators like coyotes, likely select for disease-compromised cervids. Natural cross-species CWD transmission has not been documented, however, passage of infectious prion material has been observed in the feces of crows. In this study we evaluated the ability of CWD-infected brain material to pass through the gastrointestinal tract of coyotes (*Canis latrans*) following oral ingestion, and be infectious in a cervidized transgenic mouse model. Results from this study indicate that coyotes can pass infectious prions via their feces for at least three days post ingestion, demonstrating that mammalian scavengers could contribute to the translocation and contamination of CWD in the environment.

Introduction

Chronic wasting disease (CWD) is a transmissible spongiform encephalopathy, or prion disease, of deer (*Odocoileus virginianus* and *O. hemionus*), elk (*Cervus elaphus*) and moose (*Alces alces*). First identified in 1967 in a wildlife research center in Colorado, CWD is the only prion disease enzootic to wild animals.¹ Transmission of CWD can occur directly, animal to animal², or indirectly through the environment.³ Contamination of the environment can occur by deposition of bodily fluids⁴⁻⁶ or by decay of infected carcasses.³ Ingestion or inhalation of contaminated soil particles can also lead to disease transmission.^{7,8}

Each year the number of states reporting incidences of CWD in captive or wild cervid populations increases. Currently, 21 states have been affected. (<http://www.cwd-info.org/index.php/fuseaction/about.map>). In some regions the spread has been contiguous, such as that seen in Colorado, Wyoming, and Nebraska. Other incidences are far removed from known CWD-positive foci. The mechanisms for this expansion are unclear, and likely vary by circumstance. Several human behaviors, such as movement of captive cervids⁹ and the dumping of CWD-positive carcasses from hunter kills in CWD-negative regions¹⁰, have likely contributed to the expansion, but may not explain all incidences.

The role scavengers play in the spread of the disease has been evaluated primarily from a cross-species transmission aspect.^{11,12} A wide variety of avian and mammalian scavenger species have been documented to feed upon deer carcasses and gut piles.¹² The array of tissues that contain CWD include brain, eyes, lymph nodes, neural tissue, heart, spleen, and muscle¹³⁻¹⁷, and are all readily accessible in both carcasses and gut piles. Common scavengers from CWD-enzootic areas (raccoons (*Procyon lotor*), opossums (*Didelphis virginiana*) and coyotes (*Canis latrans*)) have been evaluated for the presence of CWD in their tissues, but no evidence of CWD

was detected, suggesting that they do not play a direct role in transmission or become infected.¹¹ They may, however, play a more indirect role. Recent work demonstrated that infectious mouse-adapted scrapie prions could be viably passed in the feces of crows (*Corvus brachyrhynchos*) after ingestion.¹⁰ Deposition of infectious feces from scavengers could then be another unexplored mode for environmental contamination. Mammalian scavengers, such as coyotes, are of particular interest in western states such as Colorado and Wyoming, where there are both a high number of CWD-infected deer and elk, and coyotes.

Coyotes are opportunistic and widespread carnivores found throughout much of North America and everywhere CWD is enzootic in the wild.¹⁸ Their diet is composed primarily of rodents and lagomorphs, however, diet composition can vary seasonally and by geographical location and include ungulates.^{19, 20} For example, coyotes in the Black Hills of South Dakota feed preferentially on white-tailed deer (*Odocoileus virginianus*) throughout the year, with the highest consumption occurring (72%) in the winter.²¹ In addition to predation, coyotes will opportunistically forage on carcasses and entrails left by human hunters.²²⁻²⁴ Both predation and scavenging exposes coyotes to CWD in affected regions.

Little is known about the degradation of CWD-infected tissue and infectivity after passage through the gastrointestinal tract of mammalian scavengers. In this study we investigated the potential for coyotes to translocate infectious CWD prions, via feces, after oral consumption of CWD-infected elk brain, utilizing a cervidized transgenic mouse bioassay.

Methods and Materials

Coyotes

All procedures involving animals were approved by the Institutional Animal Care and Use Committee at the USDA National Wildlife Research Center in accordance with the USDA Animal Welfare Act Regulation, CFR, title 9, chapter 1, subchapter A, parts 1-4. Six coyotes, two males and four females, were transported from the National Wildlife Research Center (NWRC) field station in Logan, Utah to the NWRC headquarters in Fort Collins, Colorado. Upon arrival, coyotes were individually housed in outdoor kennels with den boxes for three weeks to allow time for acclimation. During this time, feces were collected from each coyote for pre-exposure controls and frozen at -80°C . Coyotes were given water *ad libitum* and were fed dry dog food once a day. Prior to initiation of the study, coyotes were given a small amount of CWD-negative elk brain homogenate to test for palatability. The coyotes readily ate the homogenate when housed in their outdoor enclosures. Two coyotes were placed in the control group and remained in their outdoor kennels, while the remaining four were transported to indoor wire runs (Table 1). After DPI 5 fecal collection, coyotes were sedated intramuscularly with ketamine and xylazine, then euthanized intravenously with euthanasia solution. Complete necropsies were conducted, and the brain and lymph nodes placed in 10% buffered formalin.

Inoculum Preparation

CWD-negative and positive 10% elk brain homogenates (wt/vol) were prepared using 1X phosphate buffered saline (PBS) (Invitrogen) in a blender, then aliquoted into 50 ml volumes and stored at -80°C until needed. The CWD-negative elk brain was an archived sample from a captive cull and the CWD-positive elk brain was an archived sample from a terminally ill captive elk. The CWD status of the elk brains was verified by Western blot as previously described.⁸

CWD-negative brain was prepared first in a new blender, then the CWD-positive inoculum was prepared.

Oral Inoculation

After being moved indoors for biosecurity reasons, treatment coyotes were given an acclimation period of two days before the start of the experiment. Dry diet was removed 12 hours prior to introduction of brain homogenate inoculum. A 50 ml aliquot of elk brain homogenate (normal or infected) was thawed for each coyote and placed in a clean bowl and mixed with approximately 1 g of red glitter to help visualize passage time through the alimentary canal. Relocation from outdoor to indoor kennels affected the coyotes' willingness to eat the brain homogenate. The addition of a small amount of diced raw chicken, or in one case, wet fish-flavored cat food was required to get them to eat. The afternoon after ingestion of the brain homogenate, they received dry dog food.

Feces Collection

Feces from all coyotes was collected the morning following elk brain homogenate consumption and at six time points: one day prior to the initiation of the study, and for five consecutive days following inoculum ingestion. After collection, fecal samples were frozen at -80° C.

Feces Protein Misfolding Cyclic Amplification (PMCA)

A 10% fecal homogenate was generated with 200 mg of feces placed into a 1.5 ml tube with 2.5 mm glass beads (BioSpec), and 1 ml of PMCA buffer (150 mM NaCl, 4 mM EDTA, in 1X PBS), then homogenized in a Blue Bullet homogenizer (Next Advance) for 2-4 min. Once homogenized, samples were centrifuged at 12,000 rpm for 20 sec, then 600 µl of supernatant was removed and mixed with 600 µl of the above PMCA buffer with 2% triton-X (Sigma Aldrich) added. Samples were mixed well and shaken on a heat block at 37° C for 20 min at 800 rpm,

then centrifuged for 5 min at 2000 rpm. Supernatant was removed and stored at -80° C. To help develop an appropriate bioassay design, fecal samples were assessed for proteinase K resistance, a marker for infectivity, by PMCA as previously described by Pulford, *et al.*⁵ Amplified samples were visualized by western blot as previously described.²⁵

Coyote Immunohistochemistry

At necropsy, retropharyngeal and mesenteric lymph nodes were preserved in 10% buffered formalin. One week after collection, tissues were placed in plastic cassettes and allowed to fix for an additional two days. Tissue slices 5 µm thick were mounted on positively charged glass slides (Fisher Scientific) for visualization and evaluation.²⁶ Antigen retrieval with formic acid and hydrated autoclaving was performed prior to visualization of PrP^{CWD}, a biomarker for CWD, by staining with F99/97.6.1 antibody. Following antibody, slides were by incubated with alkaline phosphatase-conjugated anti-mouse IgG secondary antibody and visualized using an automated immunostainer and an alkaline phosphatase red kit (Ventana). Slides were counterstained for four minutes with hematoxylin at 37° C. PrP^{CWD} was visualized as brownish granular staining.

TG12 transgenic mice

To test the infectivity of the coyote feces, a transgenic mouse bioassay was conducted in which 77 transgenic cervidized TG12 mice of both sexes, between two and five months of age, were inoculated intracerebrally with coyote feces homogenate at four time points: 1- prior to ingestion of inoculum, 2- one day after ingestion, 3- two days after ingestion, 4- three days after ingestion (Table 2). TG12 transgenic mice were generated as previously described²⁷, and express the elk prion protein at twice the level of mouse prion protein in the FVB background strain.

Feces preparation and inoculation of transgenic mice

A 10% fecal homogenate (wt/vol) was generated in the same fashion as the brain homogenate with the exception of utilizing DI water instead of PMCA buffer, with 100 units/mL penicillin and 100 µg/mL streptomycin (Invitrogen) added. Inoculum was allowed to incubate at room temperature for 30 minutes, then inoculum was sonicated in a 3000MP water bath sonicator (Misonix) for 30 seconds at power 70 prior to intracerebral inoculation. Mice were anesthetized with isoflurane gas until unresponsive to toe pinch. An insulin syringe was employed to intracerebrally inoculate 30 µl of the feces inoculum, 3 mm deep through the coronal suture, 3-5 mm lateral of the sagittal suture.

When mice presented with severe ataxia or reached 405 DPI they were euthanized.

Results

Coyotes

Both control coyotes, and coyote #135 readily ate the brain homogenate. Two others consumed the homogenate after mixing it with a small amount of diced raw chicken and the fourth after mixing the homogenate with a tablespoon of fish-flavored wet cat food.

Treatment coyote #137 did not defecate on days post inoculation (DPI) 2, therefore the data reflects feces from DPI 3 and 4. Red glitter was utilized to give a general idea of the passage time from ingestion to defecation and was observable in feces on DPI 1 and 2.

Protein Misfolding Cyclic Amplification (PMCA)

To ascertain the appropriate number of days of feces collection to test in the transgenic mouse bioassay, PMCA was conducted to amplify minute levels of PK-resistant prions from the coyotes feces from each of the six collection time points. All fecal samples collected prior to ingestion were negative after six rounds of PMCA, as were all of the samples from coyotes in the control group (data not shown). The four coyotes fed CWD-positive brain homogenate had prion

amplification on DPI 1, and only one coyote, #137, had amplification on DPI 2. No signal was detected in DPI3-5 (data not shown). Based on this information, the bioassay was designed to assess feces from DPI 1-3.

Coyote Immunohistochemistry

Immunohistochemistry for protease-resistant prions was conducted on head and mesenteric lymph nodes from the study coyotes to look for residual inoculum, and no evidence of CWD prions was detected in the tissues (Fig 1).

Transgenic mouse bioassay

The transgenic mouse bioassay revealed that feces from coyotes fed infectious brain material could pass infectivity for at least three days after ingestion. Mice were euthanized at the presentation of severe ataxia, and disease was confirmed by western blot (data not shown). Several mice proved to be transgenic knockouts when their genetics were rechecked at the end of the study. As a results, these mice were excluded from results as they do not become sick in the absence of the prion protein. No mice became sick after being inoculated with pre-exposure feces. Half of the four coyotes fed infectious elk brain homogenate passed infectivity on DPI 1, 2 and 3. It is interesting to note that passage of infectivity varied greatly between animals, with one animals passing disease on only DPI 1, while one only began to pass infectivity on DPI 2 and 3, one coyote passed infectivity on all three days, however, this animals did not defecate on DPI 2 and feces collected represents three and four days after ingestion. And finally, one coyote, did not pass infectivity on any of the days (Table 2, Figure 2).

No significant difference was seen in mouse survival times between DPI 1, 2, and 3 (one way ANOVA, $p = 0.1212$), however, the study mice lived significantly longer (Student's T-test, $p = <0.0001$) than the documented time after IC inoculation with a 1:100 dilution of infected elk

brain (118 ± 6 DPI), suggesting a lower infectious dose present in the fecal samples.²⁷ The study mice lived an average of 214 days, with a large variability in survival days (± 87 days).

Discussion

The continued spread of CWD is of concern to the health of both wild and captive cervid populations. Indirect transmission through the environment has been demonstrated in captive animals living in paddocks where CWD-positive animals had lived³, and is a particular challenge due to the long persistence of CWD within the environment.^{7,28} Infectious material can be deposited in the environment by the decay of infected carcasses, from urine, feces, and saliva^{5, 6, 29}, and the spread of infected material may be aided by scavengers and predators. In this study we illustrated the ability of coyotes to pass infectivity in their feces after the ingestion of CWD-infected brain homogenate.

Coyotes have the ability to travel significant distances. This distance, however, is based upon social structure, which is generally placed in two categories; resident or transient.³⁰ Resident animals are those that utilize a specific territory and are comprised of a mated pair and sometimes pups from a previous year, while transient animals are individuals that are nomadic, more commonly male, and have no affinity for a specific territory.³⁰ In a study evaluating the range of coyotes in southern Colorado, transient animals, which represented 22% of the population, ranged over 106.5 ± 27 km², versus resident groups which ranged over 11.3 ± 5.8 km.^{2 30} Transient coyotes are therefore provided an opportunity to translocate disease to previously CWD-negative localities.

Control coyotes readily consumed the homogenized elk brain. Of the treatment coyotes, which were moved indoors two days prior to the initiation of the study, only one (#135) immediately

ate the brain homogenate. The other coyotes required supplementation with diced, raw chicken, or fish-flavored soft cat food. Although the numbers are too small to come to any definitive conclusions, it is interesting to note that the coyote that ingested the brain homogenate without chicken or cat food supplementation did not appear to transfer infectivity to any of the mice in the bioassay. Neither age nor sex appeared to have any effect on fecal shedding. However, it is possible that individual variation within the stomach environment, such as pH and flora could have influenced the passage of the infectious prions through the gastrointestinal tract.

Our experimental design was based on detection of CWD in coyote feces by PMCA prior to initiation of the bioassay. PMCA was able to repeatedly detect the presence of proteinase K-resistant prions signal in feces from DPI 1, so the bioassay was designed to evaluate feces for two days following, to account for any uncertainty in prion detection in feces. Results from the bioassay showed transmission of disease to 2/4 mouse groups in DPI 3, suggesting that infectivity may continue to be present in the feces more than three days after ingestion. We were unable to go back and increase the bioassay to include DPI 4 and 5, due to logistical reasons.

The 50 mL oral dose ingested by coyotes in this study was comprised solely of infected brain tissue and represented a high dose. In the wild, coyotes would opportunistically consume a wide variety of tissues from a kill or scavenged deer or elk carcass, likely making their actual ingested infective dose much smaller. This study was not designed to mimic a naturally consumed dose of CWD, but rather as a proof of concept to determine if infectivity could pass into coyote feces.

The passage of disease in feces is a common route of translocation for many viral, bacterial and parasitic diseases.

The results of this bioassay indicate that infectious CWD prions are able to be passed in the feces of coyotes fed infected elk brain homogenate for at least three DPI, making them a potential vector for CWD prion transport and contamination within the environment.

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Table 1. Coyote number, sex, age and treatment group.

Coyote Number	Sex	Age (yrs)	Treatment Group
132	Male	6	CWD Negative Brain
134	Female	10	CWD Negative Brain
133	Male	10	CWD Positive Brain
135	Female	2	CWD Positive Brain
136	Female	6	CWD Positive Brain
137	Female	2	CWD Positive Brain

Table 2. Transgenic mouse bioassay results. The number of mice that died from CWD/total number of mice intracerebrally inoculated per group with coyote feces. Pre-ingestion indicates fecal samples collected prior to oral ingestion of CWD-positive elk brain homogenate, and days 1, 2, and 3 after ingestion. Day 1 post-ingestion resulted in 23% of the mice becoming terminally ill, day 2, 38% and day 3, 38%.

Coyote Number	CWD Status	Pre-Ingestion	Day 1 Post Ingestion	Day 2 Post Ingestion	Day 3 Post Ingestion
132	Control	0/3	0/3	0/3	0/3
134	Control	0/3	0/3	0/3	0/3
133	CWD	0/3	1/3	0/4	0/4
135	CWD	0/3	0/4	0/4	0/4
136	CWD	0/3	0/3	3/4	3/3
137	CWD	0/3	2/2	3/4	2/2

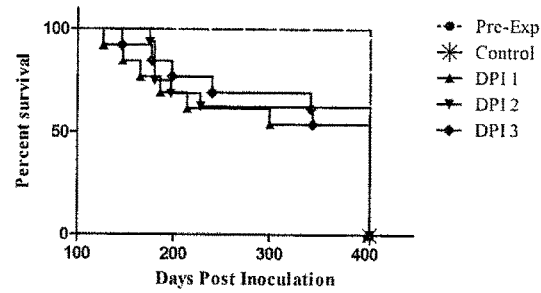


Figure 1. Coyote lymph node immunohistochemistry. Images are a representation of findings. A. CWD-positive control elk retropharyngeal lymph node. Control coyote B, and treatment coyote C, retropharyngeal lymph node. 20X magnification.

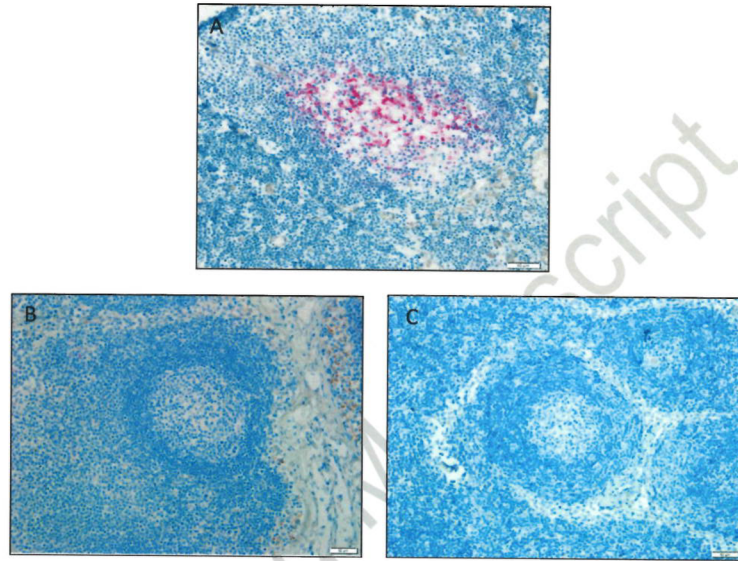


Figure 2. Transgenic mouse bioassay of coyote feces. All control mice and mice inoculated with feces collected prior to ingestion of CWD-positive elk brain remained disease-free for the duration of the study. Deaths occurred in all of the DPI tested, however, disease penetrance was incomplete. Mice inoculated with DPI 3 feces lived slightly longer than DPI 1 and 2. Each DPI group represented above combines survival times of mice from each of the study coyotes.

Senate Committee on Environment and Public Works
Hearing entitled, "Legislative Hearing on a bill to create a U.S. Fish and Wildlife Service
Chronic Wasting Disease Task Force"
December 4, 2019
Questions for the Record for Commissioner Leonhardt

Chairman Barrasso:

1. There have been no reported cases of transmission of Chronic Wasting Disease to humans through infected meat. Nonetheless, the Centers for Disease Control and Prevention takes the risk of human infection seriously. The agency developed a list of things people can do to reduce their risk of consuming meat from an infected animal but one of the biggest challenges in addressing Chronic Wasting Disease is sharing basic data.

West Virginia has state recommendations for people who plan to consume deer or elk meat. Can you each explain how you share information with your Departments of Agriculture and Natural Resources to develop consistent recommendations for meat consumption?

Commissioner Leonhardt response:

West Virginia Department of Agriculture (WVDA) and West Virginia Division of Natural Resources (WV DNR) share information on an ongoing basis via a variety of mechanisms including multi-agency WV One Health meetings, Dangerous Wild Animal Board meetings, WV Feral Swine Working Group meetings, and other ongoing associations. Our agencies have routinely contacted one another during my administration to notify and discuss for issues surrounding deer farms, upland game bird importation, elk importation and reintroduction, invasive and exotic species, and zoonotic and reportable disease surveillance, testing, and reporting. Despite disparate core missions, one geared towards for agriculture and one for wildlife resources, our agencies have a good working relationship.

Specific to consumption of deer meat related to CWD, no WV deer farm to date has been found positive for CWD despite licensed breeding farms are required to test all adult deer that die on their farms. At this time CWD has only been identified in WV's free-ranging white-tailed deer population in the Eastern Panhandle. Both the WVDA and WV DNR follow CDC published guidelines regarding CWD and consumption of harvested deer. WV DNR recommends via their website and published hunting regulations that meat from any sick animal should not be consumed.

USDA's CWD Program Standards (see page 47 on attached reference) requires CDC's current recommendations regarding potential human exposure to CWD be included in herd plans required for deer farms that have positive CWD findings and resultant response actions. WVDA is currently working with WV deer farm stakeholders to develop a CWD response plan which will include recommendations for deer meat consumption consistent with OIE, CDC, and WV DNR recommendations. Since 1997, the World Health Organization has recommended the importance of keeping all known prion diseases from entering the human food chain.

Following links are references that provide more detailed information:

<http://www.cdc.gov/prions/cwd/index.html>

<https://www.cdc.gov/prions/cwd/transmission.html>

<https://www.aphis.usda.gov/aphis/ourfocus/animalhealth/animal-disease-information/cervid/cervids-cwd/cervid-cwd>

<https://www.oie.int/en/animal-health-in-the-world/animal-diseases/Bovine-spongiform-encephalopathy/>

http://www.wvdnr.gov/hunting/Regs1920/19-20_CWD.pdf

https://www.aphis.usda.gov/animal_health/animal_diseases/cwd/downloads/cwd-program-standards.pdf

Senator BARRASSO. Thank you very much for your thoughtful testimony. Mr. Fosburgh.

STATEMENT OF WHIT FOSBURGH, PRESIDENT AND CHIEF EXECUTIVE OFFICE, THEODORE ROOSEVELT CONSERVATION PARTNERSHIP

Mr. FOSBURGH. Thank you, Chairman Barrasso, Ranking Member Carper, and the rest of the committee to have the ability to testify today on chronic wasting disease.

Simply put, CWD is the greatest threat to hunting and conservation in America today. To reiterate some key facts, CWD is 100 percent fatal, and impacts all species of North America's wild deer: white tails, mule deer, elk, moose. There is no vaccine; there is no cure.

CWD has spread from Colorado, where it was found in a captive deer facility in 1967, to 26 States today. It can spread slowly in the wild. It spreads quickly when live or dead animals are moved by people. CWD infects an area; once it happens, it is almost impossible to eradicate. While CWD has never been documented from jumping from deer to humans, the CDC recommends against eating any CWD-positive meat.

The prions that cause CWD can be taken up in plant matter, including alfalfa and corn. Norway, which is trying to battle an outbreak of CWD in a reindeer population now bans importation of any agricultural products from CWD-positive areas.

You can not cook your way out of CWD. The prions remain viable to 1700 degrees Fahrenheit. Smart and aggressive management can greatly slow the spread of CWD and keep it at background levels.

Apart from some limited research funding, the Federal Government has not been involved in the CWD fight for wild deer in a significant way. It is time for that to change.

With the addition of the legislation before the committee today, there are now at least five bills in the Senate dealing directly with CWD. All are a step in the right direction, but none, frankly, are aggressive or visionary enough to truly address the problem.

It is important to note that the single most important thing Congress can do to stop the spread of CWD is to give the States the resources they need to track and fight the disease in the wild. Congress provided strong and consistent funding to the State wildlife agencies through 2011, but that funding ended, and the States were forced to take those funds from other sources to deal with the disease. Some States simply stopped looking for it.

The 2020 House Agricultural Appropriations Bill reestablishes Federal funding for CWD by providing \$15 million to State wildlife agencies for CWD surveillance and testing. That bill is currently in conference with the Senate, which provides a measly \$2.5 million for wild deer in its bill.

If the members of the committee care about stopping CWD, I would urge you to reach out to your colleagues on the Appropriations Committee and ask them to support the House level of \$15 million in the Agricultural Appropriations Bill.

Coordinating and expediting the Federal response to CWD is also important, and the task force proposed by this committee could

help do this. Today, the Department of Agriculture has primary jurisdiction over CWD. Part of the reason we are in the situation we are today is the department's abject failure to control the disease in captive deer populations.

APHIS, the Animal and Plant Health Inspection Services Herd Certification Program has proven utterly ineffective, allowing CWD-positive deer to move across State lines and CWD-positive deer to persist on the landscape. The Department of the Interior, charged with maintaining viable populations of wild animals on public lands, has been far more aggressive in raising the alarm about CWD, largely thanks to Secretary David Bernhardt's leadership, but Interior needs a partner at USDA and a strong relationship with the CDC.

Deer hunting in America is a \$40 billion a year industry, and 80 percent of America's 11.5 million hunters consider themselves deer hunters. While the overall hunting numbers have been declining, there has been growth in the "field to table" food movement, where new hunters are attracted to the idea of locally sourced, organic protein they can harvest themselves.

Collectively, hunters pay the freight for the vast majority of the on-the-ground wildlife conservation work in this Country. Through the purchase of licenses, conservation stamps, firearms and ammunition, hunters contribute billions of dollars to wildlife habitat conservation every year, work that directly benefits non-hunters as well.

As questions persist about who to believe and what to believe about CWD, many hunters may find it easier and simpler just to stop hunting, which could have dire consequences to conservation funding in this Country.

CWD is a symptom of systematic failure to invest in conservation. That is why it matters, because hunters and anglers ask this committee to help address the CWD crisis, as well as move legislation that reauthorizes the North American Wildlife Conservation Act and authorizes the Pittman Robertson Modernization Act and the National Fish Habitat Conservation Act. These bipartisan, non-controversial bills are waiting for passage through this committee and then on to the Senate floor. Together, they comprise a considerable segment of the sportsmen's legislative agenda for Congress.

As noted before, CWD has forced many State agencies to divert funds from wetlands or fish habitat conservation to help meet the challenge posed by the disease, so it is altogether relevant and appropriate to move all these packages together.

Again, thank you, Chairman Barrasso, Ranking Member Carper, for elevating the profile of CWD crisis in the Senate. I would ask you to be aggressive in dealing with the response.

I look forward to your questions.

[The prepared statement of Mr. Fosburgh follows:]

Statement of

Whit Fosburgh
President and Chief Executive Officer
Theodore Roosevelt Conservation Partnership

Legislative Hearing on a bill to create a U.S. Fish and Wildlife Service Chronic Wasting Disease Task Force

Environment and Public Works Committee
United States Senate

December 4, 2019

Chairman Barrasso, Ranking Member Carper, members of the Committee, thank you for the opportunity to testify today on one of the most critical issues facing America's wild deer, deer hunters, and the future of conservation funding, Chronic Wasting Disease. And what's more, thank you for bringing CWD to the attention both of this committee and the United States Senate. Now is certainly the time for legislative action.

Simply put, CWD is the single greatest threat to hunting and conservation in America today. It has now been detected in 26 states, is 100% fatal, and impacts all species of North America's wild deer: whitetails, mule deer, elk, and moose, collectively the most popular, and most economically important, game animals in the United States. The disease creates holes in the brain of infected deer, and while there has never been a documented human case of CWD, the Centers for Disease Control (CDC) recommends that people not consume meat from CWD positive animals.

The disease has sent state wildlife agencies scrambling to respond and has America's 11.5 million deer hunters scouring for accurate information. Apart from some limited research funding, the federal government has not been involved in the fight against CWD in wild deer in a meaningful way, and given the scope of this interstate, and indeed international problem, it is time for that to change.

With the addition of the legislation before the committee today, there are now at least five bills in the United States Senate dealing directly with Chronic Wasting Disease. All are a step in the right direction, but none of them are aggressive or visionary enough to truly address this problem. Sportsmen and women saved America's deer from the brink of extinction more than a century ago, and we stand ready to work with all interested legislators to build out a truly comprehensive proposal that does the job again.

It is important to note that the single most important thing Congress can do to stop the spread of CWD is to give the states the resources they need to track and fight the disease in the wild. The states face significant challenges as they sit on the front lines of CWD response, including re-establishing and staffing physical check-in stations, addressing the issue of lab capacity that slows testing results, enforcing proper carcass transportation and disposal regulations, monitoring and evaluating herd health, and implementing rapid response plans to address new and existing outbreaks. And of course, there is tremendous need for hunter education, to ensure that hunters understand the threat of CWD, can differentiate between the facts and the myths of the disease, and can be part of the solution in controlling CWD.

Congress provided strong and consistent federal funding to assist the state wildlife agencies in responding to CWD through 2011 but when the funding ended, states were forced to take funds from other sources to deal with the disease. Some states simply stopped looking for it. The 2020 House Agriculture Appropriations bill reestablishes federal funding for CWD by providing \$15 million to state wildlife agencies for CWD surveillance and testing. That bill is currently in conference with the Senate, which provides just \$2.5 million for wild deer in its bill. If members of this committee care about stopping CWD, I urge you to reach out to your colleagues on the Appropriations Committee and ask them to support the House level of \$15 million in the Agriculture Appropriations bill.

Coordinating and expediting the federal response to CWD is also important, and the task force proposed by this committee could help do this. Today the Department of Agriculture has primary federal jurisdiction over CWD, and part of the reason we are in the situation we are today is the Department's

abject failure to control the disease in the captive deer population. The Animal and Plant Health Inspection Service (APHIS) CWD Herd Certification Program has proven utterly ineffective, allowing CWD positive captive deer to be moved across state lines, and CWD positive deer to persist on the landscape. The Department of the Interior, charged with maintaining viable populations of wild animals on public lands, has been far more aggressive in raising the alarm about CWD, thanks largely to Secretary Bernhardt's leadership. But Interior needs a partner at USDA and a strong relationship with the CDC.

I noted at the beginning of my statement that CWD poses a huge threat to conservation in America, and that is why non-hunters as well as hunters should care about stopping the disease's spread. Eighty percent of America's hunters are deer hunters. And deer hunting is now the entry point for most new hunters, who can take to the field without the need for expensive decoys, calls, dogs, boats, and other gear. A successful deer hunt requires little more than a hunting license, an accurate firearm, and a place to go. And while overall hunting numbers have been declining, there has been growth in a "field to table" food movement, where new hunters are attracted to the idea of locally-sourced, organic protein that they can harvest themselves and few game animals fit the bill of table fare better than America's deer.

Collectively, hunters pay the freight for the vast majority of on-the-ground wildlife conservation work. Through the purchase of licenses, conservation stamps, firearms, and ammunition, hunters contribute billions of dollars to wildlife habitat conservation every year, work that clearly benefits the non-hunting public. Deer hunters, who comprise about 80% of all hunters, lead the way. As questions persist about what and who to believe about CWD, many hunters may find it easier and safer to stop hunting, with dire consequences for state wildlife conservation budgets, and America's public wildlife resources. America cannot afford to lose more hunters.

Chronic Wasting Disease is a symptom of a systematic failure to invest in conservation. That is why America's hunters and anglers so fervently hope that this Committee will help address the CWD crisis, as well as move legislation that reauthorizes the North American Wetlands Conservation Act and authorizes the Pittman Robertson Modernization Act and the National Fish Habitat Conservation Act.

These bipartisan and non-controversial bills are waiting for passage through this committee and on to the Senate floor, and together they comprise a considerable segment of the universe of sportsmen's legislative priorities for this Congress. As noted before, CWD has forced many state wildlife agencies to divert funds from wetland and fish habitat conservation programs to help meet the challenges presented by the disease. It is altogether relevant and appropriate that the Committee move these bills forward as quickly as possible.

What's more, quick action on S. 2092, the Pittman Robertson Modernization Act, which the leadership of this committee tried to have included in the public lands package passed earlier this year, would help clear the way for states to spend trust fund dollars to educate hunters about hunting and CWD, including the proper handling of harvested deer. This will help hunters to understand that CWD does not have to mean the end of safe deer hunting.

Thank you again, Chairman Barrasso and Ranking Member Carper, for elevating the profile of Chronic Wasting Disease in the United States Senate. It is a good time to have that conversation, and I would close by asking that Congressional thinking about how we tackle CWD matches the scope and scale of the problem. I look forward to your questions.

Senator BARRASSO. Thank you, all of you. We will start with rounds of questions of 5 minutes each.

Let me start with a question for both Brian Nesvik, as well as Kent Leonhardt. A couple of things.

In October, we had Steve Guertin here, Deputy Director of policy and Fish and Wildlife. He testified on wildlife health issues before the committee. He emphasized the need for "high level coordination and collaboration between Federal agencies, State agencies, among others, to address this growing threat."

To both of you, do you agree that better cross-jurisdictional collaboration is required, and if so, how can a task force really enable that kind of collaboration?

Mr. NESVIK. Thank you, Mr. Chairman. First, the short answer to your question is yes. I will elaborate a little bit.

First of all, I will tell you that there are many entities out there that are passionate and focused and understand the magnitude of this problem. You have the Association of Fish and Wildlife Agencies, basically comprised of State wildlife management agencies from across the Country.

As was mentioned by one of the witnesses here today, we have, the Federal agencies have taken an interest and have enacted several regulations as well as some other programs to address CWD. There is a science consortium that just occurred in September with 46 leading experts on this. That is a separate entity.

Then you have non-governmental organizations that are also very interested in it, as we have heard from one of our witnesses here today.

I think what this type of infrastructure, this type of task force that is contemplated in this discussion draft would do, is provide a venue for all of those entities to come together, provide, I will use a military term, a unity of effort that would gain some efficiencies in the way that our Country attacks this problem.

I would also say that I think that there is a scientific side of this, as well as a policy side of this. Bringing those type of both the scientific experts as well as elected leaders and other folks that represent elected leaders together, you have an opportunity to address both the science and the policy.

I think, also, it provides an emphasis on not just research, but applied research, research you can actually take out on the ground and use to manage the problem. That would be my thoughts.

Senator BARRASSO. Mr. Leonhardt, anything you want to add to that?

Mr. LEONHARDT. Obviously, Senator, I do agree with this legislation and I do not have much more to add. We also have to remember, normally, I am a small State guy, States' rights, things of that nature, but when you have a disease that is spreading, obviously, to other States, it is time for the Federal Government to step in and take a little bit of a lead on that and coordinate those efforts.

We also need a central clearing ground, as I mentioned earlier, for information. Sometimes, information gets out there, and if we do not have a place to go to and actually get the facts, a lot of States will act on emotion, and we could actually hurt our sporting and our agricultural activities if we are going off of emotion and not going off of actual sound science.

I support this legislation and I hope we can move forward with this.

Senator BARRASSO. Brian, you mentioned in your written testimony that additional research is needed to inform future decisions. As the research needs evolve over time, how do we best target the research to address the highest priorities?

Mr. NESVIK. Thank you, Mr. Chairman. Excellent question. I would say first that our Wildlife Health Committee of the Association of Fish and Wildlife Agencies to spend some time and put a little bit of brain sweat into this, thinking about what those priorities might be. They have identified four priorities, and I would start there.

First of all, with prion detection and diagnostics. Basically, to summarize that, it is developing new ways to live test animals, which is really important with this particular disease, to be able to know if they are carrying the disease while they are still on the hoof.

Second, disease biology and pathogenesis is another priority that has been identified. Really, the short story there is looking at transmission. We still, as you pointed out, Mr. Chairman, do not know how this disease is spread. We know some, we know a little bit about that, but we do not know everything we need to know right now.

I think management and ecology of the disease would be a third priority, specifically as it relates to the host or the carrier. We need to know what the role of soil and plants is in how this disease is carried and transmitted.

I also think that the human dimensions aspect of this is really important. Folks, when we are talking about management actions like we are with CWD, some of those are pretty hard decisions, and it means that people have to be willing to allow non-traditional management applications that are sometimes not very popular. There is a human element of this to be able to make sure folks understand.

The second part I would say there, Mr. Chairman, is that this research consortium that I talked about that met in September, they too have also identified very specifically and in the weeds some ideas for research priorities. They have got pretty specific. I think relying on the priorities from AFWA as well as the ideas that were developed by this research consortium would be a great place for this task force to start, if it were to be formed.

Senator BARRASSO. Senator Carper.

Senator CARPER. Thank you all. Really exceptional testimony, very, very good. I am impressed.

I think I will start with a question, first, for Mr. Fosburgh, and then I will have some questions for everybody. We appreciate each of you for your leadership and your testimony. I want to ask you, Mr. Fosburgh, if you would, just to elaborate on why chronic wasting disease is an issue that everyone should care about, including the 24 States that are not affected directly by it.

How might the disease impact broader species and habitat conservation efforts across the Nation, including those other 24 States?

Mr. FOSBURGH. Great question, Senator. As I mentioned, deer hunting is a \$40 billion a year industry and generates about \$5.5

billion in taxes, many of which go back to the States for fish and wildlife conservation. As Brian knows very well, even though that money is paid for by hunters, a lot of the work they do is on non-game species. There is no dedicated funding source right now for non-game species.

The hunters dollars we use to protect butterflies and reptiles and amphibians and other things like that, as necessary. We get that, and we understand that, and we support that. We also want more money for it.

If the number of hunters goes down, and the decline is pretty precipitous right now, it is only going to get worse in the face of CWD if people think they can not eat the meat, then that is a huge crisis in terms of funding those States to do everything, not just manage white-tailed deer populations. I think that is really the threat we see moving forward.

Senator CARPER. All right, good. Thank you.

Maybe a question for Mr. Nesvik. What kind of name is that? Where are you from? Where is your family from?

Mr. NESVIK. It is Norwegian.

Senator CARPER. Good. As spending on chronic wasting disease has increased in Wyoming, how has that impacted your agency's ability to manage other wildlife species? The second half to that question would be, what impact has chronic wasting disease had on your State's budget in Wyoming, on budget and staff resources?

Mr. NESVIK. Excellent question. Thank you, Ranking Member Carper and Mr. Chairman. I would say that first, there is many second and third order effects of this particular disease. Actually, in Western Wyoming, this disease goes head-on with another disease, namely brucellosis, where we have a situation where we feed elk on feed grounds. One of them is the National Elk Refuge, established over a hundred years ago.

The purpose of those feed grounds is to separate cattle and elk during the winter when brucellosis can be transmitted. Our elk carry brucellosis, and that is a significant issue if you are a live-stock producer.

We also know that concentrating animals in the winter can, at least if once CWD arrives, can increase the spread or can more rapidly allow the spread of the disease. Elk naturally get in large groups in the wintertime anyway, but concentrating them on the same piece of ground over a long period of time can enhance that.

It has other wildlife management effects. The actual budgetary effects are pretty hard to quantify because of that. We do spend a significant amount of our own money to monitor the disease. We conduct, we do testing now on, I think last year, we had about 7,000 deer and elk and moose that we tested, and that costs money. We hire folks to go out and actually collect those samples throughout the year.

There are definitely budgetary impacts and those dollars, they are sportsmen dollars that are spent on monitoring this disease and trying to develop research for the disease, do take away from other conservation priorities. We have many of them in Wyoming because we have a tremendous wildlife resource.

Senator CARPER. Thanks.

Back to you, Mr. Fosburgh, if I could, for my third question. Would you elaborate on, I think you mentioned two pieces of legislation, North American Wildlife Conservation Act as well as National Fish Habitat Conservation Act. We would appreciate if you would just elaborate a bit on the importance of these two pieces of legislation that you have touched on. In addition to these reauthorizations, do you believe the government should be investing more than it currently does in conservation and habitat restoration?

Mr. FOSBURGH. Thank you, Senator. The North American Wildlife Conservation Act has a long history of basically investing in wetland restoration and protection around the Country. It is been a critical for the resurgence in waterfowl populations since the lows back in the 1930's.

The National Fish Habitat Conservation Act is something very similar that would be on the fish side. It is in existence now, but it is not been ever authorized by Congress, essentially voluntary. What it really represents is that commitment of resources to wetlands, to waterfowl, to fish, to streams, to watershed health that is really in everybody's interest. We think those are a critical part of the conservation funding equation that Congress needs to think about when it thinks about CWD.

I also mentioned in my testimony the Pittman Robertson Modernization Act, which would allow the State agencies to use some of those excise dollars to really get the word out to sportsmen about hunting, about CWD, about proper care. They can not do that right now the way the legislation is written. They can do it on the fish side, the Take Me Fishing campaign you have heard of, that was what was done on the fish side. That is been incredibly impactful in terms of turning around the trend of declining fishing participation.

I think all this, we see it together as components of the conservation funding equation that are critically important for sportsmen and the Nation.

Senator CARPER. Good. Take Me Fishing, I like that.

Mr. FOSBURGH. Anytime.

Senator CARPER. Thank you.

Senator BARRASSO. Senator Inhofe.

Senator INHOFE. Thank you, Mr. Chairman. I am sure it is evident to the three of you by this time that you three are experts and there are no experts on this panel.

[Laughter.]

Senator INHOFE. The questions we would ask and be curious, the notions that we have probably seem pretty basic to you. We are in a learning situation.

I did not know until we were preparing for this hearing that we are doing a good job in Oklahoma. It is my understanding, for the benefit of my colleagues, we are talking about two different areas of animals, whether we are talking about deer or elk. Those who would be in captivity, and then others in the wild.

If you look, I have a map here that came out of the CDC talking about the prevalence of this. I look at my State of Oklahoma, and I am not saying this in a braggadocio, I did not even know it until yesterday, that we are doing a great job. If you look at our surrounding States, this is only in the wild, now, these figures. You

have in Colorado 27 counties that have had this incident. My neighboring State of Arkansas, 12 cases, my neighboring State of Kansas, 35 cases; in Oklahoma, zero. We have not had any.

We have had two cases in the last 21 years that are in captivity. What could be the difference here, when we are talking about the same geographic areas, about the same numbers of deer populations there, that we do not have any, and the only one we do have are the two that were in 1998 and then this year? We are going to start with your side. Maybe we are doing something right that no one else knows about.

[Laughter.]

Mr. NESVIK. Well, that is a great question, Senator. The first thing that I would question, if I was going to try to figure out and get to the bottom of what your question is, is the amount of surveillance and the amount of testing that is going on. Certainly, we have been testing at a very high level for a long time in Wyoming, so we have detected, we have been able to follow the spread of the disease as it is moved across our State.

Our neighbor to the north has had CWD on both sides. Montana has had it to the north, in Canada, and also to the south, in Wyoming. It is been only very recently in the last several years where they have actually detected it in wild herds, but they were far, far, far behind Wyoming.

The way that this disease moves and the way that it spread is one of those research challenges, and one of the reasons I think that we need to learn more about this disease, so we can explain things like what you just explained in your question.

Senator INHOFE. Anyone else have a thought on that?

Mr. FOSBURGH. I think probably that Oklahoma may be doing things great, but I would just suggest that it probably has to do with surveillance and testing, because when the moneys were dried up, a lot of the States stopped looking as hard, particularly if they did not think they had it.

I think that even if they do not have it now, if you are surrounded by it, you are going to get it. You had better put some systems in place that either prevent in from coming in or deal with it once it arrives in your State.

Senator INHOFE. Mr. Leonhardt, you mentioned in your verbal testimony that you want to be sure that we should be specific and not left up to interpretation. What did you have in mind when you talked about that?

Mr. LEONHARDT. There is a lot of discussion out there on how the disease is transmitted, whether it is nose to nose, whether the captive farms have to have a double fencing, whether it is transmitted. They have tried to outlaw the deer urine side of things.

To me, if we had a live test, obviously, we would know whether the animal is infected or not, but if you could find chronic wasting disease in the urine, then we would already have a live test. There is legislation in my own State, they have tried to take the collection of urine, which is a business for some of our deer farms, tried to eliminate that source of revenue stream for the deer farm because people believe that is found in the urine, even though it is not necessarily. If it was found in the urine, we would have a live test.

Senator INHOFE. I see. All right, that makes sense.

Mr. Fosburgh, I was relieved when you said that there are no cases that have been identified where eating the meat is going to be transferred. Do you all agree with that?

That is a relief to know. We are a big deer-hunting family, and I almost had something new to worry about.

[Laughter.]

Senator INHOFE. The last thing I would ask you do you all agree, also, I was not aware of the deer hunting decline that is taking place. I think you said that in your testimony. Do you know what that is attributed to?

Mr. FOSBURGH. I think there are a variety of issues at play with the decline of hunting. It is socioeconomic. Less kids in the wild, rural parts of this Country than there used to be. It is much harder to get out in the places to hunt if you are in an urban area. Places that used to be available just to walk in and hunt are now subdivisions in a lot of places.

It is just harder to access; it is harder. The hunting education requirements are tough for a kid who is in high school and balancing a bunch of sports teams and studying. I think there are a host of reasons, but I know one of them that is not helping us is this notion that CWD has now spread to 26 States, so people are scared.

Senator INHOFE. I would say so. Thank you, Mr. Chairman.

Senator BARRASSO. Thank you. Senator Cardin.

Senator CARDIN. Let me thank all of our witnesses and thank the Chair for this hearing.

As Ranking Member Carper pointed out, the State of Maryland is one of those States where we have discovered CWD in the western part of our State. We believe is it a regional issue in the western part of Maryland, including West Virginia and Pennsylvania. It is not limited to our State. Our State is taking what they believe is appropriate action.

I think I have a fundamental question. I appreciate the leadership of the Chairman on trying to increase capacity here through getting the facts out. I also appreciate all the work that our different States are doing. It seems to me that CWD will not be the last case of a mysterious disease appearing in our wildlife. We should have the capacity to try to stay at least even with the curve, if not ahead of the curve, in understanding these types of diseases that affect our livestock and affect the wildlife.

We have already pointed out the economic impact; there is a public health impact but also the economic impact. What do we need to do as far as building the type of infrastructure that would give us the information we need, so rather than trying to contain the problem, we can eliminate the problem? What suggestions do you have?

Mr. FOSBURGH. Well, I will jump in first, but I think the others probably have more thoughtful comments. I think it is a great question. Prion disease in particular is pretty scary; you do not know where the next one is going to pop up. Part of the funding that is currently going through the Interior Appropriations Bill would provide an extra \$1.7 million to the USGS and to basically the prion centers around the Country to look into this.

I think that we need to maintain that capacity, because if it is another prion disease that pops up and we have mad cow disease,

we have scrapie, so they manifest themselves in different animals in different ways. We need to have that capacity in place.

Second, the part of the money that is coming through the Ag Appropriations Bill are really from the State agencies to provide, for example, do testing. Right now, a lot of States are limiting factors. If you are a hunter, and you shoot an animal, and you want to send it in to get tested, it may take two or 3 weeks to get those results back. That is because of just the lack of testing facilities allowed in the States.

Part of that money that the States would get would allow them to expand that capacity, and it may be CWD today, it may be another disease, but we have that testing capacity and those labs up and running in the States. I think we can much more quickly respond to anything that does crop up.

Senator CARDIN. Thank you. Yes, sir.

Mr. LEONHARDT. Thank you for the question, Senator. I agree with Mr. Fosburgh on his comments about the labs.

West Virginia has one of those laboratories that does, within my department of agriculture, do development of testing for other USDA projects. Some of our chemists and microbiologists will go out and teach other laboratories around the Nation. That type of network continues.

If we could get more funding at the Federal level, that is all a part of this whole study group. Obviously, I would advocate for it to come into my State, but we would love to be able to do that type of research.

We are lucky. We border Maryland, and that is where our CWD is found in the wild, near where we border Maryland. We are lucky that we have not had any in the captive cervids, but that is also a measure of, we are testing very heavily on the captive cervids. I know we are testing a lot of animals in the wild. Our DNR is doing that. We need to have that testing from the top down.

The information sharing, because some of this, the Centers for Disease Control on the human side has put out the warnings on, do not consume an animal that looks infected, debone your meat to make sure you are not going in and eating the lymphatic or the nervous tissue.

There is a concern on the cross side with human, which is affecting the hunting, but we also have to look at what are those going to cost to our health care costs on down the road, should this disease make a jump. We do have unknown diseases that crop up from time to time. I think we should always have that ever present in our mind, what is this going to do to the human cost, as well as what it is doing to our wildlife cost.

Importance, funding this properly, because of that connection and I think, is very important.

Senator CARDIN. Yes, sir.

Mr. NESVIK. Senator, excellent question. I have a couple additional thoughts, and I would agree with my colleagues here on what they just testified to.

I would also add that, specifically, with this particular disease, as the Chairman pointed out in the beginning of the hearing, it is so much different than other types of diseases that we are familiar with. Literally, if this disease, because of the recommendations

that come from the Centers for Disease Control and the World Health Organization about not consuming meat that comes from an infected animal, it has the potential to affect the way we manage wildlife across the entire United States.

Right now, hunting is at the core of our model for being able to fund wildlife management, and also be able to manage those herds. If that is threatened by diseases like this prion disease that we know so much less about than we do like a bacteria or a virus, it really brings to the highest priority a prion disease as a focus for what is contemplated in this bill. I believe that because of that, we should put our focus here and not on any other diseases right now. This has to be the priority, from my perspective.

Senator CARDIN. Thank you. Thank you, Mr. Chairman.

Senator BARRASSO. Thank you very much. Senator Capito.

Senator CAPITO. Thank you, Mr. Chairman, and thank the witnesses here. I have learned a lot about something I did not know a whole lot about. I really appreciate it, as Senator Inhofe said.

Commissioner Leonhardt, let me ask you, in your testimony you talked about how you have the captive and the wild and your area of expertise, or where you are in charge, is in the captive deer, and that you test every captive deer for meat for CWD. Is that correct?

Mr. LEONHARDT. Yes, Senator. Every deer that goes to slaughter for meat, we take a sample before the meat can be consumed. That sample is tested to make sure it is safe for human consumption. On the hunting side, we only test 10 percent.

Senator CAPITO. Right. OK. How do they determine what those 10 percent are? Do you know?

Mr. LEONHARDT. It is random.

Senator CAPITO. Is it random, or voluntary?

Mr. LEONHARDT. Yes, it is random. It is voluntary.

Senator CAPITO. Does it take two to 3 weeks for the test to come back?

Mr. LEONHARDT. No.

Senator CAPITO. No. Can you get it done in a couple days?

Mr. LEONHARDT. I believe that is the case.

Senator CAPITO. Is that a unique model to West Virginia, or do other States like Wyoming and others have a bifurcated system depending on how they oversee their herds?

Mr. LEONHARDT. I really do not have a good answer. I can get that information for you, Senator.

Senator CAPITO. Thank you.

Mr. LEONHARDT. I will say that West Virginia is actually looking to other States that have captive herds, and we are starting to develop our emergency action plan should we find a case of CWD within a captive herd. Just like we do whether it be avian influenza for our poultry, or whether another disease comes into our livestock industry, we are developing an emergency action plan for chronic wasting disease in captive cervids. Then we will tabletop that exercise to make sure all agencies are involved.

Senator CAPITO. Thank you. I know that you have worked a lot to try to modernize the lab at the State agricultural lab, and we also have a Federal USDA lab in the eastern panhandle, as well. I think West Virginia could play a big role in better research and development, such as what is desired in this bill.

Let me ask you, in terms of the hunting issue, the public perceptions, and Mr. Fosburgh sort of got into this a little bit. Honestly, I can not even think in West Virginia that I have actually seen a public service announcement or some kind of warning or a whole lot of talk. We are a big hunting State.

Are these kinds of things going on, or is it just sort of left to the DNR and to the Ag to inform the hunter or the domestic deer owner population? How does that information get out?

Mr. LEONHARDT. I believe the DNR publishes it in their hunting regs, so when somebody goes to look up the deer hunting regs for this year, they will see a blurb on chronic wasting disease in there.

Senator CAPITO. Mr. Fosburgh, do you have something to add on that?

Mr. FOSBURGH. Yes, I think most of the States do give that same warning in their regs on CWD, particularly the ones that have it. There is also a fine line between raising awareness about it and panicking people.

Senator CAPITO. Right.

Mr. FOSBURGH. You will see a bunch of these articles about zombie deer and things like that, and I get scared. I eat a lot of deer. I think that what we are trying to do is have a responsible approach to have people understand what it is; there is a way we can fight it; it is not the end of the world right now. It is also, we have got to take this seriously.

Senator CAPITO. Yes. Mr. Nesvik, do you have a different perspective on that from your State?

Mr. NESVIK. No, I share that, I think Mr. Fosburgh outlined that very well as far as the concern and not overreacting to the way that this is messaged to the public. We do the similar efforts. We message this, and that is been the focus, as I mentioned in my oral testimony, this citizen working group that we formed recently was to increase awareness across the State just so folks understand what it is and what the potential implications are.

In response to one of your questions to the Commissioner, we do a three-pronged approach to testing. We have our agency folks target and surveillance specific animals. If they see an animal that looks like it is exhibiting clinical symptoms of the disease, they will remove that animal so it can be tested. Then we also, hunters can voluntarily submit their sample, if they wish to have it tested, and that typically, the turnaround is about 2 weeks. Then we also set up surveillance check stations where we ask hunters to let us take a sample as they are leaving the field with their harvested animals.

Senator CAPITO. I would really encourage the more professionalization as we look at this, we are realizing that it has been, like Senator Inhofe, I did not realize it has been around as long as it has. You can see the spread of it. I am sure Oklahoma, like we said, if it does not have it, it is going to get it. It is almost an inevitability, especially if you are close regionally.

What I think is really interesting from the CDC's perspective and from the perspective of the animal health, a lot of these research entities, there is cross-pollination of information. We may learn something as we do a deeper dive into chronic wasting disease that could actually help us with other diseases that are

human-borne diseases. I think the support at the Federal level for that type of sharing of information and research is exceedingly important, so thank you for what you are doing. Thanks again, Commissioner, for being here.

Senator BARRASSO. Thank you, Senator Capito. Senator Braun. Senator BRAUN. Thank you, Mr. Chair.

Listening to the testimony, I was trying to see if there was anything optimistic or any good news within what we are dealing with. It sounds like a disease from hell. Sixteen years of viability, 1,700 degrees to kill it through heat.

I did see one thing that caught my attention. That would be that, of course, in Wyoming you have got mule deer, elk, white-tailed deer, and moose. In Indiana, we just have white-tailed deer. When it comes to the economic consequences, we have mentioned all the fees and of course tourism, the motels, all the economy that is generated.

There is another aspect. I have managed forest ground for probably 35 years. Twenty, 25 years ago, hunters actually leased ground, and it is the only cash-flow you have outside of the timber harvest to maintain your woods between harvests. That is a significant market. It used to be, I would never believe anybody would pay you to hunt, but it is up to \$25 an acre in places like Indiana, so it is a big deal.

The other thing that caught my attention was that the fact that it was only found in one moose out of 1,120 tests. There was also an observation that it has been static and maybe slightly declining. I think you have had it in Wyoming for 35 years or so.

I would like to know more about, to me, the most empirical piece of evidence would be what are your deer herd populations doing in the midst of this. We track that down to the number harvested each year in Indiana. What are you seeing in harvest numbers and herd numbers in general?

Mr. NESVIK. Yes, thank you, Senator, excellent question. I would just say that, first, we have seen in certain parts of the State the prevalence where the number of deer as a proportion of the population that have the disease has flattened, and in some cases, it has even declined a little bit. The other side of that is, is that the distribution in the State has continued to move every year. Every year we have several new deer hunt areas in the State where the deer have CWD.

Has this created directly a decline in deer populations? We only know of a couple of places where that potentially happened directly related to CWD. There are a lot of other factors that contribute. We do think, though, in places where we already have other stressors in the environment, like habitat conditions or predation, that CWD can be a contributor that can actually exacerbate a problem that already exists.

I will tell you, on the bright side of things, as you mentioned, really, we do not see this in moose commonly at all. We have only had one. They just had in Montana the first ever this fall. They detected it in a moose here a couple months ago.

In an elk, only about 25 percent of our State's elk herds have CWD in them. Typically, in elk, it runs in a much lower prevalence level, even in the endemic area where it started in our State. Usu-

ally, it is 6 percent to 12 percent is the prevalence rate, whereas deer in the same exact area will sometimes run as high as 50 percent.

It is less in elk, more in mule deer, and that is what we have seen. I can not say that we have seen a direct impact to license sales because of CWD, but it is certainly a concern of ours for the future.

Senator BRAUN. Well, that tempers it a bit. I think the fact that it would always be that fear or concern of transmissibility from animals to human beings. That would be a thing that would cascade everything into a catastrophe.

It sounds like, though, from what you have observed over 35 years, it does have some self-regulation to it, to where it does not wipe out. Like in Indiana, we deal with, Senator Cardin mentioned it earlier, I think this whole, when we see hunting trends in general starting to go down, that it is going to be, and this legislation to me makes sense because I think that if we keep it out there to where we can authoritatively say that it is never going to be transmissible.

I do not know, are there other diseases through prions that have affected human beings? Is there anything? I saw feral swine is a possibility. Could you comment on that?

Mr. FOSBURGH. Mad cow disease. The outbreak happened in England. It is another prion-based disease.

Senator BRAUN. That is the only one where it is gone from an animal to a human being?

Mr. FOSBURGH. Well, Creutzfeldt-Jakob Disease is the one that is in humans, but these are all variations of the same thing. I am not sure if scrapie has ever jumped to humans. Not that I know of.

Mr. LEONHARDT. We do not know that scrapie has.

Senator BRAUN. Very good. Glad we are doing the hearing on this, and I look forward to seeing what we can do here, because I think we are catching it at a point in time to where hopefully we can at least build some confidence out there among hunters that we know more about what is going on. Thank you.

Senator BARRASSO. Senator Boozman.

Senator BOOZMAN. Thank you, Mr. Chairman. I agree with the Senator from Indiana. We appreciate our leadership on both sides having this really important hearing that affects the entire Country in so many different ways.

Mr. Nesvik, a new survey by U.S. Fish and Wildlife says that presently, 5 percent of Americans 16 years or older hunt. Fifty years ago, it was twice that. They are telling us also that in the next decade or so, the numbers are continuing to really plummet.

Certainly, with chronic wasting disease being a major problem in Arkansas, this is not helping the situation. As you guys know better than anybody, you couple that with declining fishing and the other outdoor activities, it really means a lot less dollars to be able to have to use for the programs that are so, so very important that affect our outdoor life.

I guess the real question, one of the things we are talking about is Senator Barrasso's legislation. He has another bill, also, the Chronic Wasting Disease and Transmission in Cervidae Study Act.

Again, if we were able to get these things legislated, how is that going to affect you? Is that going to make a dent in this? Is it going to be a good thing or a bad thing or a great thing?

Mr. NESVIK. Well, I can tell you, Senator, that I think that No. 1, we have to do something. This is a serious enough national problem that has the potential to affect our model for managing wildlife that we have to do something. Failing to address it because it is complicated is just not the way we roll in this Country.

I think this is an opportunity for this committee and for everybody involved to lead and to provide some opportunities to look at solutions to this thing. I agree with you that there is definitely concern. Even if we did not have this disease, there would be concern with participation in hunting. I can tell you that addressing this is very important, I think, to that future.

I think also that we are very fortunate in Wyoming. We are a State that hunting and fishing is part of our culture, and we have not seen those declines like we have nationally, but we are concerned about that as well. One of the things that I am very passionate about is that we, I think that the best thing we can do today to ensure that we continue to have people that care about wildlife in the future and that are willing to participate, is to inspire a kid, and it is for life. That is something that we believe strongly in our State, and we are promoting heavily right now because I think that is the best thing that we can do.

Senator BOOZMAN. The draft legislation would establish a taskforce which would be charged with submitting an interstate action plan within 1 year after appointment of its members. The interstate action plan would detail how the States and Federal Government can work together to achieve consistent management, public education, and research practices relating to CWD.

The report must describe the progress on the implementation of actions identified in the interstate action plan, updated resource requirements needed to reduce and eliminate CWD in the United States, any relevant updates to the recommended best management practices included in the interstate action plan, new research findings and emerging research needs and any other relevant information.

How would that help you if you had that kind of information, going forward and coping with something like this? Maybe even a great template as these things are going to come up in the future.

Mr. NESVIK. Certainly. I think, Senator, to answer your question, what that does is it provides a framework so that all these different efforts that are going on right now, all of these different entities that I mentioned earlier, States, Federal Government, non-governmental organizations, scientists, are brought together in a unity of effort so that we can be more efficient with resources.

I think that if this was to pass and we were to provide that report with a suspense, I really like that. It forces action in a short amount of time. It does not allow bureaucratic drag; you have to do this in 1 year. I think putting that kind of emphasis on it like is outlined in the draft bill gives those that are going to have to deal with this and make decisions on it framework, focus, and priority, in order to get this done in a short amount of time. I think that is how it helps.

Senator BOOZMAN. Thank you, Mr. Chairman. Thank you.

Senator BARRASSO. Thank you, Senator. Senator Gillibrand.

Senator GILLIBRAND. Mr. Nesvik, to date there is only been one occurrence of chronic wasting disease in New York in Oneida County in 2005. No new cases have occurred in New York since. However, the disease remains a serious threat to our white-tailed deer population, particularly given recent detection of the disease in Pennsylvania, our neighboring State to the south.

What are the most likely pathways for the spread of chronic wasting disease into areas where it currently does not occur, and what more could States be doing to prevent the spread of chronic wasting disease into our State through those pathways? Are there best practices that can be employed?

Mr. NESVIK. Senator, there are probably two pathways that are known to most wildlife managers. One is through the spread of just animal to animal contact. We do not know a lot about the mechanics of how the disease is transmitted from one animal to the other, but we do believe it happens from animal to animal contact, or because it is persistent in the environment somehow. Contact with concentrations of the prion in the environment exposes animals to it and allows an animal to become infected.

The second way is through anthropogenic methods where deer are moved, deer or elk are moved from one State to another through commercial operations. Those are the two pathways that I think most wildlife managers would agree are the primary transmission modes.

Senator GILLIBRAND. In the animal to animal transmission, is that through contact? Is it airborne? Is it through feces? What is the transmission?

Mr. NESVIK. Senator, there is not any good information that indicates it is airborne, but nose to nose contact, through breeding, potentially through exposure to waste on the ground are probably where most scientists would look toward now with the current evidence that we have.

Senator GILLIBRAND. Mr. Fosburgh, given the large number of wildlife management issues facing our States, from threatened and endangered species protection, to other wildlife diseases, do States have the financial resources and technical expertise to adequately prevent and address outbreaks of chronic wasting disease, and what are the impacts on a local and regional ecosystems and environments when an outbreak of chronic wasting disease occurs in wildlife populations?

Mr. FOSBURGH. I will tackle the first question first, which is, do they have the resources to deal with this, and the answer is an unequivocal no. There was steady funding coming from the Federal Government through 2011, then it dried up, about \$15 million a year that went to State wildlife agencies for surveillance and testing.

Since that time, as the disease has spread, the States have had to divert resources from habitat restoration programs, reinforcement programs, from research, to dealing with the CWD crisis, which is why we have \$15 million in the House Ag Appropriations Bill that has come over to the Senate right now. We hope the Senate will agree to that number from the House, as opposed to the

\$2.5 million it has provided because I think that money to the States is critical.

Second, in terms of the impacts on the ecosystem when the disease arrives, there is not much visible impact that you can see, but what needs to happen is you have to reduce deer herd pretty significantly. A State like Illinois, which got it and had a very aggressive response, went out and basically killed a lot of deer and had hunters as part of the solution, it has really kept the disease at background levels, less than 1 percent. Whereas other States are taking a more laissez-faire approach and seeing it blossom to 50 percent prevalence in certain counties, like Wisconsin.

Senator GILLIBRAND. It reminds of mad cow disease. Has there been any correlative research done?

Mr. FOSBURGH. Yes. They are both prion-based diseases, so we mentioned scrapie.

Senator GILLIBRAND. Is prion a bacteria?

Mr. FOSBURGH. Prion is not a bacteria.

Senator GILLIBRAND. What is it?

Mr. FOSBURGH. I will ask the doctor at the front of the room. It is a mal-folded protein, is that correct, Senator?

Senator BARRASSO. Yes.

Mr. FOSBURGH. It is one of these weird things, scary things, that people do not really understand very much about. You have Creutzfeldt-Jakob Disease in humans, mad cow disease in bovines and then humans, scrapie in sheep, and now chronic wasting disease in deer, all very similar. There is a prion research center at Case Western University that is digging into this, and a few other places as well. There is still a lot of research that needs to be done.

In that Interior Appropriations Bill, that \$1.72 million is being provided to USGS to expand the research into this prion-based disease, including how it is transmitted, so we will know a lot more if we get more money into the facilities that are doing this work.

Senator GILLIBRAND. Mad cow disease was linked to the feed that they were being fed inappropriate proteins.

Mr. FOSBURGH. Yes, they were basically turning cows into carnivores, and essentially, they were eating more cows.

Senator GILLIBRAND. That does not give us any insights into wild deer.

Mr. FOSBURGH. No, it does not, and again, I will to defer to somebody who actually has a science degree, to opine more on this.

Senator GILLIBRAND. Is there any evidence that it is bacteria-related, and that it could be tick-borne?

Mr. FOSBURGH. No. There is none. In fact, that is been pretty widely debunked, if I am correct.

Senator GILLIBRAND. They do not believe it is a tick-borne illness?

Mr. FOSBURGH. No.

Senator GILLIBRAND. Thank you. Thank you, Mr. Chairman.

Senator BARRASSO. Thank you, Senator Gillibrand. Senator Carper.

Senator CARPER. Again, this has really turned out to be an even more interesting hearing than I would have expected. Mr. Chairman, I think we have some exceptional witnesses here. Again, we thank you for joining us.

I have two questions. One deals with public education. I think I will start with our friend from West Virginia, Commissioner. The question is, what is the role of public education in addressing chronic wasting disease? How might a Federal task force help with public education, and what else could the Federal Government do to better inform the public about the risks of chronic wasting disease and its spread?

Mr. LEONHARDT. That is a great question, sir. It is hard. Like we talked about earlier, how far do you alert the public in education and how far back do you create the alarm? Obviously, the people that are out pursuing the wild game, we want to make sure that they are protected, but we do not want to necessarily alert the public and make everybody think, there is this big problem going on, and there is a deer in my backyard, and I am going to get chronic wasting disease because the deer walked through my backyard.

We have to be careful on that public education side of things. The most important thing I think we can do on the education side is use some of our land grant institutions to do some of the research, particularly through the departments of agriculture.

Senator CARPER. Could one of those be in Morgantown?

Mr. LEONHARDT. One of those could be in Morgantown. There also could be one in Charleston, too, because we have two in West Virginia. West Virginia State University, we can not leave them out.

We actually, what we need to do is we need to make sure that more importantly, on the public education side is the warnings for those that are out pursuing within the containment areas, like in West Virginia, they have a containment area, and it is designated in the department regulations. Not my regulations, the DNR regulation.

Then the hunters are more aware, if they are hunting in that area, to be on the lookout for an animal that just does not look right. If you call the game warden, they will even come out and look at it, and they will even give you a new tag if that deer is picked up.

I also sent a letter recently to our Department of Highways asking them to make sure within the deer containment area, the DNR-designated containment area, to make sure that they do roadkill disposal more promptly and more properly. My discussion with the Secretary of Transportation the other day, he said, yes, we are going to make an effort. We are going to pick those deer up off the road quicker.

His biggest problem is getting them buried deep enough to keep the scavengers away from them. I believe scavengers is one of the more prevalent ways that the disease is being passed.

It is just like we talked about the mad cow disease, and the Senator was talking about the feedstuff. They were not heating the feed high enough to the 1,700 degrees to kill the prion to be used in the feed. They changed the whole process in the way the feed of animal refuse was being used to create the protein to feed the animals, so the heat processor was not up there. I guess it was a cost-effective thing, and that is how the disease ended up spreading.

What we need to make sure that we do is, and you know, we have had other diseases in other areas of the world, like the gypsy moth. We have a Slow the Spread program that USDA funds, and we do a spraying program, and that is an education to the public in the area where our oak trees were in trouble.

That is the type of education outreach. As we do the research, we are going to learn more and more, and then we can do slow baby steps based on the sound science as we learn. It is very important that we do this research. It is very important that this gets off the ground so that we can make those baby steps to slowing the spread.

Senator CARPER. Thank you. Let me just ask Mr. Nesvik and Mr. Fosburgh, do you agree with anything that our Marine friend has said? Do you agree with all of it, or most of it? Want to add anything very briefly?

Mr. NESVIK. Ranking Member Carper, I would agree with what the Commissioner said. The one thing I guess I would add is that the World Health Organization and the CDC have both said if you know it is infected, you should not eat it.

I will tell you that in Wyoming, we know that there is been a lot of Chronic Wasting Disease infected deer and elk that have been eaten by people. Luckily, nobody has been infected. That does not mean that anybody should not heed the recommendations of those two organizations, but I think that is an important point for people to know. That is part of the education process.

Senator CARPER. That is a good point. Thank you.

Mr. FOSBURGH. I would just say that one of our frustrations is there is a naysayer community out there, led by some B-level celebrities who claim that this is all a hoax, that we do not have to worry about it, that this is a hoax perpetuated by the insurance companies to try to reduce deer numbers.

Our bottom line is, when we get something defended out of Congress, like the National Academy of the Sciences that really talks about this disease and what we need to do, we put to bed a lot of that crazy talk that is really confusing hunters and moving us backward in some places.

Senator CARPER. Speaking of B-level celebrities, I want to close on a lighter note. The Chairman and I enjoy music and sometimes have a little fun with music lyrics. When we have folks who testify before us and they point to the need for more funding for a particular cause, in many cases worthy, I recall a great song. It turned out, I just found out, it written by Berry Gordy of Motown Records, and the name of the song is Money, That is What I Want, a Whole Lot Of, Money, That is What I Want. That is a recurring theme in this hearing room, and frankly, other hearing rooms as well.

The version of the song that is most popular, is best known, was recorded by a British group, four British lads, I think they are the Beatles. The last group to record that song that I am aware of, in terms of wildlife conservation, was a group called The Flying Lizards.

On that note, we will say thank you for being here. I asked my staff to look up the term virtuous circle, or virtuous cycle, you have probably heard that term before. Virtuous circle refers to a circle

that has favorable results. There is another term, vicious cycle, and vicious circle, it is just the opposite.

I think what we have going here is the threat of a vicious circle. There are concerns about the deer and with the deadly disease, but precedence of hunting is dropping, apparently, for deer. As the incidence of hunting that goes down, there is less revenue collected, at a time when we have a shortfall of funding. Less revenue is collected from a number of excise taxes, including from firearms, ammunition, even hunting and camping equipment, stuff like that.

It actually gets to be a vicious circle, a vicious cycle. All the more important for us to try to do something more about it and more effectively about it. Thank you very, very much for an interesting hearing and one that is timely. Thanks so much.

Senator BARRASSO. Let me just close with, to Brian, today's USA Today, Money Section, they do the 50 States, what is going on in each State. For Wyoming today, it says, Cheyenne, the State Game and Fish Department says the number of hunting and fishing licenses sold to women has seen a marked increase in the past decade, even as those for men has declined a bit.

I am just going to ask, because you talked about the impact and the economies, can you talk a little bit about what you are seeing at home?

Mr. NESVIK. Yes, I do not know that I can explain exactly why, but I can tell you that it is a very positive trend. We are glad to have new women, we support that, and we spend a lot of time trying to help certain events and certain types of programs that encourage women to get more involved in the outdoors, and it is a good thing.

Senator BARRASSO. I appreciate that, and I am going to show you a picture of a deer that my daughter Hadley shot on Thanksgiving Day in Wyoming. I will get you that in a few seconds. I have been sharing with the members up here in the committee, and they are all very envious, and I think they all want to come to Wyoming hunting, because of what the wildlife is like.

If there are no more questions, members may also submit questions for the record, so the hearing record is going to stay open for 2 weeks.

I want to thank all the witnesses for their time and their testimony today. The hearing is adjourned.

[Whereupon, at 11:29 a.m., the hearing was adjourned.]



National Cattlemen's
Beef Association



December 3, 2019

The Honorable John Barrasso, MD
Chairman
Committee on Environment and Public Works
United States Senate
410 Dirksen Senate Office Building
Washington, DC 20510

The Honorable Thomas R. Carper
Ranking Member
Committee on Environment and Public Works
United States Senate
410 Dirksen Senate Office Building
Washington, DC 20510

Dear Chairman Barrasso and Ranking Member Carper:

The Public Lands Council (PLC), National Cattlemen's Beef Association (NCBA), and American Sheep Industry Association (ASI) support the discussion draft of legislation which would create the U.S. Fish and Wildlife Service Chronic Wasting Disease Task Force. PLC is the only national organization dedicated solely to representing the roughly 22,000 ranchers who hold federal grazing permits and operate on federal lands. NCBA is the beef industry's largest and oldest national marketing and trade association, representing American cattlemen and women who provide much of the nation's supply of food and own or manage a large portion of America's private property. ASI is a federation of forty-five state sheep associations representing a diverse industry since 1865 and has been the national trade organization representing the interests of the 100,000 sheep ranchers located throughout the country who produce America's lamb and wool.

Transmissible Spongiform Encephalopathy, more commonly known as Chronic Wasting Disease (CWD), is very concerning to ranchers—particularly those who operate on federal grazing allotments. This draft legislation represents a major step forward in addressing the issue of CWD in wild Cervidae nationwide. The proposed task force's leadership will be instrumental in determining the appropriate national response to stop the spread of CWD, ensure the pathology of this disease is adequately studied and understood, and share ideas between a broad array of wildlife management agencies.

While our organizations support the legislation as currently written, we respectfully suggest that the task force include representatives from states currently not affected by CWD. In many cases, state wildlife and/or game departments have taken proactive steps to avoid the spread of CWD into their respective jurisdictions. This information would be highly valuable as the task force seeks to stop the spread of this disease. Furthermore, we believe that at least one representative should be a licensed veterinarian. As the science surrounding CWD continues to evolve, the veterinary perspective will prove to be incredibly useful to this entity.

PLC, NCBA, and ASI appreciate the opportunity to provide our input on behalf of our members – the nation's food and fiber producers. We urge support for a CWD Task Force at the U.S. Fish and Wildlife Service.

Sincerely,

Ethan L. Lane
Vice President, Government Affairs
National Cattlemen's Beef Assn.

Tanner J. Beymer
Associate Director
Public Lands Council

Chase Adams
Sr. Policy & Information Director
American Sheep Industry Assn.



DOUG BURGUM
GOVERNOR OF NORTH DAKOTA
CHAIR

KATE BROWN
GOVERNOR OF OREGON
VICE CHAIR

JAMES D. OGSBURY
EXECUTIVE DIRECTOR

December 4, 2019

The Honorable John Barrasso
Chairman
Committee on Environment & Public Works
United States Senate
410 Dirksen Senate Office Building
Washington, DC 20510

The Honorable Thomas R. Carper
Ranking Member
Committee on Environment & Public Works
United States Senate
456 Dirksen Senate Office Building
Washington, DC 20510

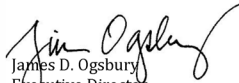
Dear Chairman Barrasso and Ranking Member Carper:

Thank you for holding your December 4 hearing, "legislative hearing on a bill to create a U.S. Fish and Wildlife Service Chronic Wasting Disease Task Force." To inform the Committee's consideration of this important topic, I request that the Committee include the Western Governors' Association's November 14, 2019 letter to Congressional leadership on Chronic Wasting Disease in the permanent record of the hearing.

Western Governors support the efforts of the Committee to raise awareness of, and provide funding for, research and management of CWD. CWD is a contagious and 100 percent fatal disease affecting deer, elk, moose, reindeer and other cervid species. State agencies are on the front lines combating CWD, and additional funding to support state efforts to research the disease and monitor, manage and contain the spread is critical.

Thank you for your leadership on this important subject and your consideration of this request.

Respectfully,


James D. Ogsbury
Executive Director

Attachment



DOUG BURGUM
GOVERNOR OF NORTH DAKOTA
CHAIR

KATE BROWN
GOVERNOR OF OREGON
VICE CHAIR

JAMES D. OGSBURY
EXECUTIVE DIRECTOR

November 14, 2019

The Honorable Mitch McConnell
Majority Leader
United States Senate
S-230 The Capitol
Washington, DC 20510

The Honorable Charles Schumer
Minority Leader
United States Senate
S-221 The Capitol
Washington, DC 20510

The Honorable Nancy Pelosi
Speaker
House of Representatives
H-232 The Capitol
Washington, DC 20515

The Honorable Kevin McCarthy
Minority Leader
House of Representatives
H-204 The Capitol
Washington, DC 20515

Dear Majority Leader McConnell, Minority Leader Schumer, Speaker Pelosi, and Minority Leader McCarthy:

The Western Governors' Association (WGA) appreciates the efforts of Congressional leaders to raise awareness of, and provide funding for, research and management of Chronic Wasting Disease (CWD). On behalf of Western Governors, I am writing in support of expanded funding to state fish and wildlife agencies for research, testing, monitoring, prevention and management of CWD in wildlife populations.

CWD is a contagious and 100 percent fatal disease affecting deer, elk, moose, reindeer and other cervid species. The disease currently exists in at least 24 states (including several in the West), and the economic burdens of monitoring and managing CWD in wild populations falls largely on state agencies. Under the Pittman-Robertson Act, state fish and wildlife agencies derive a large portion of their funding from hunting and fishing license sales and federal excise taxes on hunting and fishing equipment. As the disease spreads, license and hunting equipment sales may decline as a result of increased complications and concerns associated with hunting in areas where CWD is present. This creates a situation where funding to state fish and wildlife agencies responsible for fighting CWD is gradually eroded, as the costs of combating CWD continue to rise along with its incidence.

WGA commends Congressional leaders who have prioritized funding and support to state fish and wildlife agencies to help monitor, manage and contain the spread of CWD in wild cervid populations. Beyond support to state agencies on the front lines combatting CWD, funding for scientific research to better understand and manage CWD is critical. Advances in diagnostic testing – in particular the development of an effective test for live animals – will enable state wildlife managers to more rapidly detect and respond to the disease.

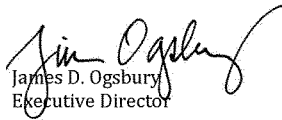
As Congress considers means of funding research on CWD, I direct your attention to the [Special Report](#) of WGA's *Biosecurity and Invasive Species Initiative*, which highlights the importance of research in controlling wildlife diseases, including CWD. The report recommends that institutions researching wildlife diseases look for opportunities to pool funding resources and exchange information across administrative lines. Wildlife diseases such as CWD present significant threats to western resources and would benefit from the use of pooled resources and collaborative

The Honorable Mitch McConnell
The Honorable Charles Schumer
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November 14, 2019
Page 2

research efforts. By pooling resources, state, federal and private researchers can decrease redundancy and increase the efficiency of research funding.

Western Governors look forward to working with you to identify and promote legislative efforts to support state wildlife management agencies in their fight against CWD and other forms of wildlife disease.

Sincerely,


James D. Ogsbury
Executive Director

