



Hi Everyone,

Conservation is a guiding principle and ethical concept based on the best scientific knowledge of wilderness eco-systems. It is the foundation of well-conceived wildlife and wilderness management plans. No one person can know everything all the time so we must work together, and hope that everything goes as envisioned. If it does not, we assess, adjust, and try again. Through everything there is respect for each other, our roles, the critters and plants and the ecosystem in toto. There is also recognition that change is part of the whole.

We each have a role to play in the success of these management plans. The following is a rather simplistic view of a wilderness and wildlife management hierarchy. At the top are those who establish the goals and criteria. They are ultimately responsible for the welfare of the environment and the species that live there. They make these decisions after collecting the data and understanding the interrelationships between different aspects and members of the environment; including people.

Another group of people gather and analyze the data and observations as to the "state of the wilderness." These may be our scientists who seek to learn more about the status and relationships of an ecosystem's inhabitants or visitors and how to interpret what they learn.

A third part of the wilderness management team are the game wardens. They interpret and enforce the laws. If there are questions about the laws, they are our best resource. They are also observers of wildlife, people and how the networks within the ecosystems work. They may be the most important team member because they interact with people and critters every day. They may be the first to observe and document changes.

Another part of the team are members of the public. They are influenced by many sources and what they think and say may determine the direction of the wilderness and wildlife management plans. When people are guided by the best available science, there is a higher likelihood that a healthy, balanced system.

Perhaps the most important team members are hunters. Hunters may also be constituents in any of the previous categories. They understand that conservation is about maintaining balanced ecosystems where everyone has enough to eat without depleting the resource, even if it means eating other members of the ecosystem. There is a recognition that death is a part of life and is a necessity if the balance of the ecosystem is to be sustained. Hunters are the most versatile participant in that they may harvest more or less depending on the decisions made about length of seasons and take of each species of game animal. These rules can be changed yearly or as needed. If an animal is hunted, it is honored and valued and may find its way into more than one freezer. If an animal is not hunted, it will still die. That death may not be as swift as a hunter tries to make it and it may be accompanied by a lot more pain, depending on circumstances. What happens to the critter who is hit by a car and does not die immediately? It still needs to eat, get water and find shelter. This may not be easy or painless. When hunters are available to help maintain the ecological balance of ecosystems, the rest of the inhabitants are more likely to be

happy because their needs are being fulfilled and they do not have to suffer the stress of too much competition for limited resources, including territories.

**Poachers are not hunters.** They may use some of the same tools as a hunter, but they do not care about the sustainability and balance of the ecosystem or its critters. They appear to be motivated by greed and self-interest.

Poachers aren't the only environmental pirates. There are others who engage in illegal drug activity that poisons the ecosystems and may change watersheds by diverting streams, creeks and rivers. And still others who would cut holes in the web of life by stealing rare or necessary resources that may be critical links for ecosystem health for their own personal profit.

Hunters and game wardens are natural allies as they are both intimately involved with their environments and may see any degradations to it first and firsthand.

**Their goals are complementary:**

**Conserve the environment. Sustain the balance. Preserve the hunt.**

## Words

Words matter. Words have power. The words we use. The context we use them in, have the power to determine or change people's understanding and opinions of a concept or a belief. Words make laws and can change laws. Words can be made into forked-tongued lies or be beacons of truth. Words can instigate a mob or build a team based on science and compassion. The world we create and dwell in is determined by the words we use and how we choose to use them. What kind of world do you want to live in? You do not need to cast a spell or be a wizard to use words effectively.

The next article is from Safari Club International at <https://huntforever.org>.

## **SCI Opposes Wildlife Poaching Anywhere on Earth**

[By SCI](#)

Criminal poaching of wildlife resources negates the conservation efforts of Safari Club International members and other hunters to assure sustainable populations of wild things in wild places for now and into the future.

The ugly truth of poaching came to light in Alaska where a father and son pled guilty to poaching a mother black bear and her cubs in their den.

“We hunter-conservationists at Safari Club International abhor wildlife crime and poaching,” said SCI President Paul Babaz. “We fully support the apprehension, prosecution and conviction of wildlife criminals and lend our support to state and federal wildlife management agencies whenever possible.”

Babaz stressed that anti-hunters often deliberately confuse the non-hunting public by lumping trophy hunter-conservationists with criminal poachers. For example, the headline on a New York Times article about this poaching incident stated: “Alaska Hunter Who Killed Cubs in Bear Den Gets 3 Months in Jail.”



“Both poachers involved in the illegal killing of the bears are criminals, not hunters, as the headline states,” Babaz explained. “These sorts of criminals make legal ethical hunters look bad when the radical anti-hunting groups use their heinous acts to paint legal hunters with the same brush.”

The poaching crimes were recorded on a camera last year that was being used as part of a bear study.

Most of the mainstream media and social media have been relatively quiet in reporting this criminal poaching incident, yet they often light-up when legitimate hunters legally

harvest game as part of science-based game management efforts that assure healthy populations of wildlife in wild places.

“As both hunters and conservationists, we at SCI want to educate the public about the good things we do, as well as the hideousness of criminal poaching, which in some places of the world literally threatens some species,” Babaz explained. “Science-based conservation that includes trophy hunting as part of comprehensive management has been responsible for bringing some species back and is the best way to make sure that there are sustainable levels of wildlife for future generations. Poachers are the problem. Hunters are the solution.”

## Chronic Wasting Disease (CWD): Cervid Pestilence

One of the greatest challenges currently facing California hunters, wildlife managers, animal lovers and others who care about sustaining California ecosystems. CWD is extremely contagious and may not show its symptoms for a while. This could decimate a cervid herd and contaminate their environment. Once the prions infect the environment, they are all but impossible to eradicate.

The articles below are about CWD. They will elucidate the issues and their ramifications, what the science is, and what is being done to mitigate the damages this little misfolded prion may be inflicting on the environment and its victims.

So far, it does not appear that CWD mutates as easily as the flu. Variations tend to be species specific.

The first section is courtesy of the California Department of Fish & Wildlife. CDFW's research and regulations are some of the ways that they are trying to ensure that the ecological balance remains stable.

# Chronic Wasting Disease

## [General CWD Information](#)

Since Chronic Wasting Disease (CWD) was first identified in wild deer, it has been detected in 25 states, 2 Canadian provinces, South Korea, Norway, and Finland. **To date CWD has not been detected in California.** This is a disease of major concern for cervids and may negatively impact these prey populations where it occurs. Through legislation and geography, California is at relatively low risk for CWD; however, it has the potential to spread to California's deer and elk populations, and surveillance for the disease will remain a priority for CDFW. See the Q&A below to find out more about this devastating disease and what you can do to help.

## [What is chronic wasting disease?](#)

CWD is a fatal neurologic disease of cervids (e.g. deer, elk, moose, reindeer). It is caused by a misfolded form of a normal protein, known as a prion. The misfolded proteins aggregate in nervous tissues causing progressive damage to the brain of infected animals. CWD belongs to a group of human and animal diseases called transmissible spongiform encephalopathies (TSE). Examples of TSEs in animals include bovine spongiform encephalopathy (BSE) in cattle, also known as “mad cow disease,” and scrapie in sheep and goats, which has been known to veterinary medicine for over 200 years. Creutzfeldt-Jakob disease (CJD), a sporadic prion disease arising in 1:1,000,000 people, and variant Creutzfeldt-Jakob disease (vCJD), which has been linked to the consumption of infected cattle during the “mad cow disease” outbreak in Great Britain and Europe in the 1990s, are examples of TSEs in humans.

## [How is chronic wasting disease spread?](#)

The misfolded prion that causes CWD is infectious to other cervids and can be spread through direct contact with infected individuals or through an environment contaminated with infectious material. Infectious prion has been detected in the urine, feces, and saliva of infected animals. Carcasses and tissues of infected animals also contain infectious prions and may spread the disease if left out on the landscape. The prions are very stable and difficult to disinfect once in the environment.

## [Where is chronic wasting disease?](#)

Chronic wasting disease (CWD) was first described in mule deer at a captive facility in Colorado in 1967. Since then, CWD has been diagnosed in deer, elk, and moose populations in 24 states and two Canadian provinces. It has also been found in captive elk and Sika deer in South Korea and most recently in free-ranging moose and reindeer in Norway. For a [map of current known CWD infected populations in North America](#), please visit the United States Geological Survey (USGS) CWD page. A timeline of the spread of CWD can be found by visiting the [Chronic Wasting Disease Alliance website](#).

## [What are the symptoms of chronic wasting disease?](#)

The progression of chronic wasting disease (CWD) in an infected animal is very slow. It may take months or even years for clinical signs to appear. Infected animals gradually lose body condition, becoming emaciated or “wasted.” They may also show abnormal behaviors such as a wide stance, staggering gait, or inability to keep their head up.

## [What should I do if I see a sick deer or elk and am concerned it might be chronic wasting disease?](#)

To date, chronic wasting disease has not been detected in California, and it is important to note that many other conditions that affect deer in California can produce these clinical signs. However, the Department's Wildlife Investigations Laboratory investigates sick or dead wildlife and is particularly interested in deer and elk that display clinical signs consistent with CWD: emaciated or "wasted," abnormal behavior, staggering gait, head and ears lowered. Testing these animals for CWD is an integral part of ongoing CWD surveillance efforts in California, and we often rely on members of the public to report sick and dead animals. We ask that any deer exhibiting abnormal signs be reported via our [online mortality reporting form](#) or by contacting the CDFW [Wildlife Investigations Laboratory](#) directly at (916) 358-2790.

## [What is California doing?](#)

Currently, neither California nor any neighboring states has had a case of CWD. Legislation and regulatory actions taken by California since the 1990s help keep the risk of importing the disease to a minimum. These include limiting and regulating the importation of captive deer and elk (and other cervids) into California, limiting what hunters can bring in from out-of-state hunts (no skull, no backbone), and banning the feeding of wildlife to prevent artificially congregating susceptible animals.

Since 1999, California has tested 4500 deer and elk for CWD. The majority of these samples were obtained from hunter-harvested animals. To date, no CWD has been found. In 2017 the California Department of Fish and Wildlife tested 100 animals for CWD surveillance, this consisted of 96 deer and 4 elk. Samples were collected from a variety of sources including; hunter harvested animals (58), animals hit by car (27), and animals brought in to the Wildlife Investigations Laboratory for disease investigation (15). CWD prion was not detected in any of the 100 animals. Plans to continue and increase surveillance efforts in 2018 are currently in the works.

## [Can chronic wasting disease be spread to humans?](#)

There have been no documented cases of a human infected with CWD. However, CDFW and the Centers for Disease Control and Prevention (CDC) recommend that hunters do not eat meat from deer that test positive for CWD or otherwise appear sick. In addition, CDFW recommends that hunters wear latex or nitrile gloves when field-dressing and processing animals, and that hunters wash their hands and disinfect tools after processing.

## [What if I am hunting out-of-state?](#)

To prevent the accidental importation of CWD infected tissues into the state, the California Code of Regulations, Title 14, [Section 712 \(PDF\)](#) prohibits hunters from importing or possessing carcasses with a skull or backbone still attached. If you are hunting out of state, please make sure to review the [regulations \(PDF\)](#) related to CWD for that state. Also, if hunting in a CWD positive state, make sure to check with that state's wildlife agency for information about hunter check stations, possible mandatory testing, and getting your meat tested in the state it is harvested. If meat from an animal brought into California ends up testing positive, we ask that you contact the CDFW [Wildlife Investigations Laboratory](#) at (916) 358-2790 to let us know. CDFW may incinerate meat from a CWD infected animal upon request.

## [How is chronic wasting disease diagnosed?](#)

The only approved tests in free-ranging animals are post-mortem tests. These include directly testing lymph node and brainstem for the presence of the prion associated with CWD. For this reason, sampling hunter-harvested animals remains the most reliable method for obtaining sufficient numbers to test.

**From:** Burkholder, Brad@Wildlife [mailto:Brad.Burkholder@wildlife.ca.gov]

**Subject:** CWD updates

Folks,

As a follow up to discussion we had at the last Big Game Advisory Committee meeting, I wanted to share some recent developments on the CWD front. First, we wanted to thank those of you that really stepped up the messaging regarding the importance of doing everything we can to keep CWD out of California and our neighboring states. Your help in emphasizing the importance and critical need for extreme diligence of all of our hunters to comply is greatly appreciated.

What I wanted to share with you all are some recently developed guidelines for handling legally imported meat/tissue from CWD-positive animals harvested out-of-state. As you can imagine, it is not an unreasonable scenario for an individual to hunt out of state, submit a sample to that state for testing, and transport the quarters or processed meat home before receiving test results. Once home, their meat could be packaged and, in the freezer, or perhaps being processed by a local meat locker. As surveillance and testing has been ramped up in many states, it was time for us to develop some guidance for Californians on what to do in the event that legally imported meat was found to be CWD-positive. Please see the attached memo regarding information we are providing to California hunters. Additional information on CWD can also be found on our [webpage](#) for those that may not be aware of it.

Thanks again for all of your support and help on this very important issue. We wanted you to be aware of these recent development and ask you again for any assistance you can provide to help get this information. Your continued assistance with outreach and messaging to help minimize the potential spread of CWD is greatly appreciated. Please let me know if you have any questions.

Thanks,

Brad

**State of California  
Department of Fish and Wildlife**

## **Memo r a n d u m**

**Date:** December 18, 2018

**To:** David Bess, Chief  
Law Enforcement Division

Regional Managers

California Department of Fish and Wildlife

**From:** Kari Lewis, Chief

Wildlife Branch

California Department of Fish and Wildlife

**Subject: Handling legally imported meat/tissue from a CWD-positive animal harvested out-of-state**

Chronic Wasting Disease (CWD) has never been detected in deer or elk from California. However, Californians hunting out-of-state may legally harvest and import quarters or meat from an animal (deer, elk, moose) that is CWD-positive. The Centers for Disease Control recommends that meat from a CWD-positive animal not be consumed. The Wildlife Investigations Lab (WIL) recommends that all potentially CWD-contaminated tissues, including meat, be incinerated at one of the California Health and Food Safety (CAHFS) Laboratories under contract with the WIL.

Hunters have been advised to report any import or receipt of CWD-positive meat/tissues to their

local Fish and Wildlife Office. The WIL requests the following information from each report:

- Hunter's name, phone # and address.
- Where (City, County, State), when, and species harvested.
- Where it was tested for CWD.
- What parts were brought into CA.
- Were any parts taken to a Meat Processor or Taxidermist in California.
- What is the approximate weight to be destroyed?

Two options to facilitate safe transport of these tissues to a CAHFS lab for incineration:

1. The hunter can take bagged meat/tissues to a CAHFS facility themselves. A day and time should be arranged, and **WIL must be informed to provide a CAHFS submission form.**
2. Regions (e.g. Unit Biologist for the hunter's County of residence) can coordinate a CDFW employee (biologist, sci-aid, warden) or Natural Resource Volunteer to transport bagged meat to CAHFS. **A submission form provided by the WIL must accompany the meat.**

**CAHFS, Davis**

620 W. Health Sciences Dr  
Davis, CA 95616  
Gen. Info: (530) 752-8700  
FAX (530) 752-6253

**CAHFS, Turlock**

1550 N. Soderquist  
Turlock, CA 95381  
Gen. Info: (209) 634-5837  
FAX (209) 667-4261

**CAHFS, Tulare**

18830 Road 112  
Tulare, CA 93274  
Gen. Info: (559) 688-7543  
FAX (559) 686-4231

**CAHFS, San Bernardino**

105 West Central Avenue  
San Bernardino, CA 92408  
Gen. Info: (909) 383-4287  
FAX (909) 884-5980

If there are any questions, please contact Dr. Brandon Munk, [Brandon.Munk@wildlife.ca.gov](mailto:Brandon.Munk@wildlife.ca.gov), 916-261-2124; Nicholas Shirkey, [Nicholas.shirkey@wildlife.ca.gov](mailto:Nicholas.shirkey@wildlife.ca.gov), 916-358-1465; or Tina Moran, [Tina.Moran@wildlife.ca.gov](mailto:Tina.Moran@wildlife.ca.gov), 916-358-2970 at the Wildlife Investigations Laboratory.

## **A New CWD Test?**

The next article is from Minnesota Public Radio at [www.mpr.org](http://www.mpr.org) and discusses a possible new test that will provide tests for the presence of CWD quicker and with fewer steps. This would be a boon for everyone.

### **New test could speed up detection of fatal brain disease in deer**

St. Paul · Feb 1, 2019

By [John Enger](#), [Angela Davis](#)



Jeremy Schefers runs chronic waste disease testing at the University of Minnesota. The two-week, 40-step testing process starts with a severed deer head, in a lab in the university basement. This one is frozen solid and will have to thaw.

Scientists at the University of Minnesota have asked state lawmakers for almost \$2 million to create a new test for chronic wasting disease, or CWD.

Current testing methods for CWD — the always fatal infection recently found in the wild deer herds of southeastern Minnesota — is laborious. But the new testing methods could be a gamechanger: It would be much faster than the current one, and more crucially, it could be done on living deer.

Jeremy Schefers runs CWD testing at the University of Minnesota where the two-week, 40-step process begins in a basement lab.



Samples of deer brain and lymph nodes are soaked in formaldehyde, then dehydrated with alcohol, saturated with paraffin wax, and shaved into slivers just five microns thick. This machine runs the samples through a bath of red dye, which only sticks to the misfolded proteins, called prions, that cause chronic wasting disease. John Enger | MPR News

"This is the veterinary diagnostic lab," he says. "We get every species of animal, except humans.

Out in the middle of a concrete floor is a very large, very dead horse. It's being autopsied. This is totally normal, apparently. Schefers doesn't even mention the horse. Instead he pulls a pair of severed deer heads out of a black plastic bag.

"It is one of the coldest days of the year, and the heads are frozen," he said.

Once the heads thaw, in two or three days, he'll surgically remove pieces of the brain and lymph nodes.

"And they have to sit in formaldehyde for five days," he explained. "And you can't rush that process either."



The two-week testing process ends in Jeremy Schefers's office, where he squints through a microscope, looking for any sign of the disease. John Enger | MPR News

Then he'll dehydrate them with alcohol, saturate them with paraffin wax, and shave off slivers just five microns thick.

"That's the width of a red blood cell," he said.

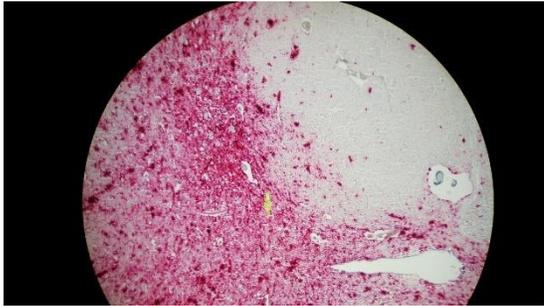
They'll be run through a bath of red dye, which only sticks to the misfolded proteins, called prions, that cause CWD.

And finally, two weeks after a deer head arrives at the U of M, Schefers squints through a microscope in his office for hour after hour, looking for traces of the disease.

Schefers admits to eyestrain — "and a chronic headache and lower backache."

But that's not his biggest concern.

"What I find even more maddening is I've been doing this for 10 years and all I've done is watch CWD march across North America, with kind of a helpless feeling," he said. "There's a better way to do this. This is just borderline ridiculous," he said.



Red dye used in the testing process only sticks to the misfolded proteins, called prions, that cause chronic wasting disease. John Enger | MPR News

And now, it seems, there really could be a better way. On the same campus, research professor Peter Larsen is assembling a team that hopes to create a totally new test — a faster one, which could put wildlife managers in a position to get ahead of the disease, instead of just reacting to it.

Larsen wants to ditch the formaldehyde and red dye and use a hand-held device called a flow cell.

"Think of an iPhone and on one end, you have the camera" he said. "With a flow cell, you would take your biological sample and you would put a drop of it on that camera lens. And then the device will take that drop and circulate it throughout the environment we are going to create, and by the time it gets to the other end of the phone you will have your answer."



Research professor Peter Larsen is assembling a team that hopes to create a totally new, faster chronic wasting disease test. He said it will be about as big as the DNA sequencer, resting here, in the palm of his hand. John Enger | MPR News

Flow cells are being used to research Alzheimer's and Parkinson's disease in humans. But a similar machine could be modified to incubate those misfolded CWD prions, then detect them using nanotechnology.

The test would take maybe an hour or two, instead of two weeks. And it wouldn't require pieces of brain. Just some urine, or saliva, or even deer droppings — all easy to collect from living deer.

The scientists' funding request has just gone to the Minnesota Legislature. If Larsen's team gets the money, he says it hopes to create a working prototype in about two years.

It's hard to oversell just how important this test could be. Right now, Larsen said, the Department of Natural Resources doesn't actually have a very good idea of where CWD is, geographically, because of the testing lag time and the reality that deer are always moving.

CWD containment efforts are often based on where infected animals have been shot during hunting season. Larson said that's for too inexact to be effective.

"They look at the nearest case that's confirmed. And they say, 'OK, that's where it is.' That's not where it is. That's where it was," Larsen said.

Deer can be infected for two years before the disease kills them. That whole time, they're shedding proteins that can infect others. Even if the DNR knows where a sick animal died, they don't know where it's been.

With the new test, Larsen said, DNR researchers could reasonably hike through vast swaths of land, taking hundreds of samples of deer droppings and even antler velvet, and test them on the spot.

"It can provide real time surveillance, and that's critical," Larsen said. "I call it the CWD battlefield, and anyone with a military background will tell you, you have to have an understanding of what that front line looks like. And right now, we don't know that."

## Grass as An Infectious Vector?

The next article is from Science Daily at [www.sciencedaily.com](http://www.sciencedaily.com). The source of this research is the University of Texas Health Science Center at Houston. We should not underestimate potential sources of contamination and transportation and transmission of infectious CWD prions. What if an infected deer was eating hay or corn or tomatoes and pooped in that area. Would the vegetation that gets touched or is nearby become potentially infectious? Is CWD transmissible from plants to animals? What kind of testing would this require? How does one "clean" misfolded prions from meat or plants that may have been exposed to CWD prions? Can How would one certify that no potentially infectious cervid was ever in with growing agricultural products? How viable are "wild" infectious prions, such as CWD? What other questions can you think of?

### **Grass plants can transport infectious prions**

Summary:

Grass plants can bind, uptake and transport infectious prions, according to researchers. Prions are the protein-based infectious agents responsible for a group of diseases called transmissible spongiform encephalopathy, which includes bovine spongiform encephalopathy (mad cow disease) in cattle, scrapie in sheep, variant Creutzfeldt-Jakob disease in humans and chronic wasting disease (CWD) in deer, elk and moose. All are fatal brain diseases with incubation periods that last years.

FULL STORY

Grass plants can bind, uptake and transport infectious prions, according to researchers at The University of Texas Health Science Center at Houston (UTHealth) at [www.uth.edu](http://www.uth.edu). The research was published online in the latest issue of *Cell Reports*.

Prions are the protein-based infectious agents responsible for a group of diseases called transmissible spongiform encephalopathy, which includes bovine spongiform encephalopathy (mad cow disease) in cattle, scrapie in sheep, variant Creutzfeldt-Jakob disease in humans and chronic wasting disease (CWD) in deer, elk and moose. All are fatal brain diseases with incubation periods that last years.

CWD, first diagnosed in mule deer in Colorado in the late 1960s, has spread across the country into 22 states, according to the Centers for Disease Control and Prevention (CDC), including the counties of El Paso and Hudspeth in Texas. In northeastern Colorado and southeastern Wyoming, the disease is endemic. Soto's team sought to find out why.

"There is no proof of transmission from wild animals and plants to humans," said lead author Claudio Soto, Ph.D., professor of neurology at UTHealth Medical School and director of the UTHealth George and Cynthia W. Mitchell Center for Alzheimer's Disease and Other Brain Related Illnesses. "But it's a possibility that needs to be explored and people need to be aware of it. Prions have a long incubation period."

Soto's team analyzed the retention of infectious prion protein and infectivity in wheat grass roots and leaves incubated with prion-contaminated brain material and discovered that even highly diluted amounts can bind to the roots and leaves. When the wheat grass was consumed by hamsters, the animals were infected with the disease. The team also learned that infectious prion proteins could be detected in plants exposed to urine and feces from prion-infected hamsters and deer.

Researchers also found that plants can uptake prions from contaminated soil and transport them to different parts of the plant, which can act as a carrier of infectivity. This suggests that plants may play an important role in environmental prion contamination and the horizontal transmission of the disease.

To minimize the risk of exposure to CWD, the CDC recommends that people avoid eating meat from deer and elk that look sick or test positive for CWD. Hunters who field-dress deer in an affected area should wear gloves and minimize handling of the brain and spinal cord tissues.

"This research was done in experimental conditions in the lab," Soto said of the next step. "We're moving the research into environmental contamination now."

## High Humic Acids in the Soil to the Rescue

The next article is from Science Daily at [www.sciencedaily.com](http://www.sciencedaily.com). The source for this article is PLOS at [www.plos.org](http://www.plos.org). There are indications that high levels of humic acid in the soil can mitigate some of the viability of the soil. Humic acid is in humus. Humus is the organic part of soil. Humus can be added to soil to act as a fertilizer. Dirt without humus is rock. If CWD prions were susceptible to the limiting effect of soil with a high humic acid composition that would give us another tool to control the cause of a very contagious malady.

### **Soil compound fights chronic wasting disease**

Summary:

A major compound in soil organic matter degrades chronic wasting disease prions and decreases infectivity in mice, according to a new study.

## FULL STORY

A major compound in soil organic matter degrades chronic wasting disease prions and decreases infectivity in mice, according to a study published November 29 in the open-access journal *PLOS Pathogens* by Judd Aiken of the University of Alberta, and colleagues.

Chronic wasting disease is an environmentally transmissible, fatal prion disease affecting free-ranging deer, moose, elk and reindeer. It is endemic in North America, present in South Korea and has recently been confirmed in northern Europe. Environmental prion contamination plays a major role in the increasing incidence of chronic wasting disease, with infectivity being released into the environment by decaying carcasses, or through shedding of biological fluids including urine, feces, and saliva. The transmission of chronic wasting disease involves soils as an environmental reservoir of infectivity. Different soil compounds can differentially bind prions and change their infective properties.

Aiken and colleagues tested the role of a major soil organic matter compound, humic acid, for its ability to bind chronic wasting disease prions and impact infectivity. The researchers examined a wide range of humic acid concentrations, representing the extensive spectrum of humic acid levels present in native soils. The findings suggest that soil organic material degrades chronic wasting disease prions. Incubation of chronic wasting disease prions with high concentrations of humic acids decreased both the chronic wasting disease prion signal and infectivity in mice, whereas lower levels of humic acids did not significantly impact protein stability or infectivity. According to the authors, the study provides new insights into soil-prion interactions, the persistence of prions in soil, and their bioavailability to grazing animals.

Aiken adds, "CWD is a significant emerging and fatal disease of deer, elk and moose. Given it is shed from infected animals into the environment where it can serve as a source of infection, it is essential that we understand the impact of soil and soil components on this unusual infectious agent."

## Prions – Not All Bad?

The next article is also from Science Daily at [www.sciencedaily.com](http://www.sciencedaily.com). This article explores the history and the roles prions play in our world. So far, the research has led to more questions. That is good thing. It is only through continuing research that we can learn about the most minute intricacies of this world. Wonder how people will use this information.

## **The bright side of an infectious protein**

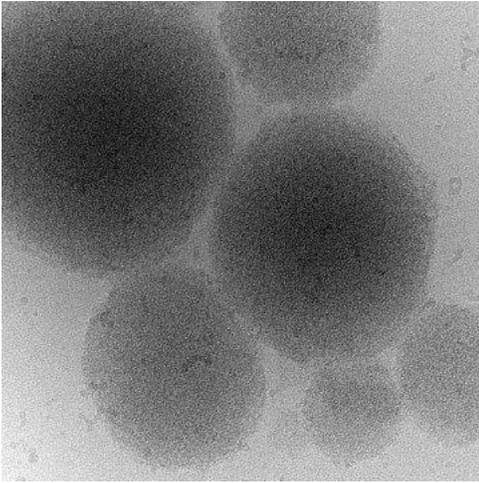
Stress sensors promote yeast cell survival

Source:

Max-Planck-Gesellschaft

Summary:

Prions are self-propagating protein aggregates that can be transmitted between cells. The aggregates are associated with human diseases. Indeed, pathological prions cause mad cow disease and in humans Creutzfeldt-Jakob disease. The aggregation of prion-like proteins is also associated with neurodegeneration as in ALS.



This is a cryo-electron microscopy image of a biomolecular condensate of a prion protein.

*Credit: MPI-CBG*

Prions are self-propagating protein aggregates that can be transmitted between cells. The aggregates are associated with human diseases. Indeed, pathological prions cause mad cow disease and in humans Creutzfeldt-Jakob disease. The aggregation of prion-like proteins is also associated with neurodegeneration as in ALS. The regions within prion-like proteins that are responsible for their aggregation were termed prion-like domains. Despite the important role of prion-like domains in human diseases, a physiological function has remained enigmatic.

Researchers at the Max Planck Institute of Molecular Cell Biology and Genetics (MPI-CBG), the Biotechnology Center of the TU Dresden (BIOTEC), and the Washington University in St. Louis, USA have now identified for the first time a benign, albeit biologically relevant function of prion domains as protein specific stress sensors that allow cells to adapt to and survive environmental stresses. Uncovering the physiological function is an essential first step towards closing a gap in understanding the biological role of prion domains and their transformation into a pathological disease-causing state. The discoveries were published in *Science*.

The aggregation of prion-like proteins is associated with human diseases. Their infectious behavior is comparable to the spread of a viral infection. This raises the question of why evolution has kept these proteins around: are these sequences good for anything? In their study, the team around research group leader Prof. Simon Alberti from the MPI-CBG focused on the yeast prion protein Sup35, which has a long-standing history as a role model for prion research. They found that the prion-domain of Sup35 acts like a stress sensor that triggers the formation of protective protein droplets and gels when cells are exposed to harsh conditions.

When cells are stressed, for example because they are starved of nutrients, their energy level drops. This leads to a decrease of the cytosolic pH value -- the cells acidify. In response, cell division stops, the metabolism shuts down and cells enter into stand-by mode. When the stress is over, cells must rapidly reprogram their metabolism and restart growth and division. Prof. Simon Alberti and his colleagues found out that the Sup35 prion domain is important for stress survival. "We found that cells lacking the prion domain show a growth defect when recovering from stress," summarizes Titus Franzmann, the first author of the study. The scientists discovered that the prion domain of Sup35 senses the acidic pH of the cytosol and then drives the formation of protein droplets that protect Sup35 from damage. "To store the protein the droplets can even advance into a gel-like structure," says co-author Marcus Jahnel from the biophysics group of Prof. Stephan Grill at the BIOTEC. These protein droplets -- that form in the cytoplasm similar to condensing water droplets -- can dissolve again, enabling the cell to reuse the Sup35 protein when it restarts growth. Additionally, colleagues from the Washington University in St. Louis predicted the sequences of the amino acids responsible for Sup35 sensing changes in the cytoplasmic pH value. In this context, Rohit Pappu, Edwin H. Murty Professor of Biomedical Engineering at Washington University, noted that: "Uncovering the molecular components that confer these adaptive abilities of Sup35 has also important implications for understanding cells on a molecular level and adopting these principles for building synthetic systems."

From an evolutionary standpoint, the Sup35 condensates are really interesting, since they are conserved among distantly related yeast that diverged almost 400 million years ago. This suggests that droplet and gel formation may be an ancestral function of the Sup35 prion domain. Titus Franzmann concludes: "The study suggests that

prion domains are protein-specific stress sensors that allow cells to respond to specific environmental conditions. In that way, we could show for the first time a positive function of a prion domain that has often only been associated with disease-causing aggregates. So maybe that's the reason why evolution has kept them for so long."

## Prions - Small & Scary

The last article in this section on CWD is from Social Health News at <https://www.socialhealthnews.com> is perhaps the longest article and the scariest. It draws a possible connection between contact with misfolded prion contaminated meat to Alzheimer's disease. Have not heard whether CWD has been detected, or is transmissible, to the cervid's natural predators or scavengers. This article provides the best argument to contain, treat and eliminate these pesky prion diseases. Do what you can to protect yourself, others and your favorite hunting areas and wildernesses. At least with rabies, a virus, there are vaccines and treatments. They may not always be successful, but it gives one a chance. Everyone needs to do their part to contain this biological threat with the potential to grow.

### **Prions Detected in Eyes of Patients with Brain Disease**

By [admin](#)

Creutzfeldt-Jakob disease (CJD) is a fatal brain disorder that destroys brain cells, causing tiny holes in the brain. Symptoms of CJD are ataxia, or difficulty controlling body movements, abnormal gait and speech, and dementia. The disease is always fatal and has no cure.<sup>1</sup>

CJD is one of several transmissible spongiform encephalopathies (TSEs). These are a family of progressive neurodegenerative disorders affecting animals and humans. Bovine spongiform encephalopathy (BSE), also known as mad cow disease, presents in much the same way as CJD.

The U.S. Food and Drug Administration (FDA) issued a regulation in 2009 banning specific proteins in feed to prevent the spread of BSE.<sup>2</sup> However, the regulation superficially addresses the issue. For instance, slaughterhouse waste products continue to be recycled into bone and blood meal as additives to livestock and pet foods.<sup>3</sup>

This increases the risk of livestock acquiring BSE as it has proven to be a foodborne-derived disease,<sup>4,5</sup> and eating [beef from cows](#) with BSE triggers a variant of CJD.<sup>6</sup>

CJD is difficult to diagnose, as taking a brain biopsy to rule out a disease is impractical. The National Institutes of Health have recently published work from colleagues at the University of California San Diego and San Francisco who have measured the distribution and levels of prions in the eye.<sup>7</sup>

#### [Prions in the Eyes May Indicate Brain Disease](#)

Prions are abnormal forms of proteins collecting in brain tissue and causing cells to die. This leaves sponge-like holes in the brain. BSE and CJD are the result of a prion infection that is untreatable and always fatal.

Byron Caughey, Ph.D., from the National Institute of Allergy and Infectious Diseases, collaborated with researchers from Nagasaki University and developed a method to test brain and spinal cord fluid for the presence of prions in an effort to improve diagnosis of CJD in a clinical setting.<sup>8</sup>

Dr. Christina J. Sigurdson, professor of pathology at UC San Diego and Davis was on the team, and commented on the problems associated with sporadic CJD (sCJD), a form appearing without known risk factors and accounting for nearly 85 percent of diagnosed cases:<sup>9,10</sup>

*“Almost half of sCJD patients develop visual disturbances, and we know that the disease can be unknowingly transmitted through corneal graft transplantation. But distribution and levels of prions in the eye were unknown.*

*We’ve answered some of these questions. Our findings have implications for both estimating the risk of sCJD transmission and for development of diagnostic tests for prion diseases before symptoms become apparent.”*

The technique, called real-time quaking-induced conversion (RT-QuIC) is currently in use. More recently, Caughey and colleagues attempted to use the same technique to measure the distribution and level of prions in the eye. They recruited 11 people with known CJD and six with other types of fatal diseases to serve as controls. All agreed to donate their eyes for post-mortem analysis.

The researchers found evidence of prions throughout the eyes of the 11 people with CJD but not in the six control patients. This discovery suggests eye tissue may be another avenue for early diagnosis of CJD and raises the question of whether prions may be transmitted through a clinical eye procedure if the instruments or transplanted tissues have been contaminated. Caughey comments:<sup>11</sup>

*“By testing various components of the eye with the RT-QuIC assay, we found that prions can collect throughout the eye — including the fluid inside the eye.*

*Our findings suggest that we may be able to develop methods of detecting prions in eye components even before symptoms develop, which may help prevent unwitting transmission of prions to others through contaminated medical instruments or through donor tissue.”*

## Prion Diseases Are Transmissible Between Animals and Humans

Some prion diseases are transmissible between humans and animals. [Chronic wasting disease](#) (CWD) is a form of BSE affecting deer, elk and moose. Infected animals may take up to one year to develop symptoms including drastic weight-loss, stumbling and other neurological symptoms, often dying within three years.

The Quality Deer Management Association<sup>12</sup> mapped out the number of hunters who killed whitetail deer in four Wisconsin counties with the highest incidence of CWD in the state. The organization believes hunters from 49 states killed deer in this Wisconsin CWD hotbed in the 2016-2017 deer season.

Of the 32,000 deer killed, 22,291 were tested, finding 17 percent positive. By extrapolating data, the researchers estimate approximately 5,000 of those untested were also positive.

Most deer with CWD appear healthy. Hunters transporting carcasses across state lines were breaking regulations in many states now banning the importation of specific animal parts to prevent CWD from entering their state.

The Centers for Disease Control and Prevention (CDC) and the World Health Organization (WHO) recommend testing all deer carcasses and waiting for the all-clear before you eat the venison. If the deer tests positive, it should be safely discarded.<sup>13</sup>

Previous research<sup>14</sup> noted a close similarity between human and rodent prion proteins shown to be protease resistant and infective. The researchers hypothesized that since rats and mice are known to be susceptible to prion diseases, ingestion of infected parts, potentially droppings, could be a mode of transmission of BSE to humans, resulting in CJD.

Eating beef infected with mad cow — which, again, is very similar to CWD — is known to cause CJD in humans. Symptoms are similar to Alzheimer's and include staggering, memory loss, impaired vision, dementia and, ultimately, death. Between 2002 and 2015, the prevalence of CJD rose by 85 percent across the U.S. In 2015, there were 481 cases.<sup>15</sup>

The first case of CWD was recently diagnosed in reindeer in Norway, which researchers theorized may have occurred when bottled North American deer urine was transported for use as a lure. In an effort to eradicate the disease before it spread, an advisory panel for the Norwegian Scientific Committee for Food Safety recommended the entire herd be culled.<sup>16</sup>

### Alzheimer's Disease Is on a Spectrum of Transmissible Prion Diseases

The age at which [Alzheimer's](#) may be diagnosed has been falling. Where in past decades it was found almost exclusively in those over 65, today it may be diagnosed in people as young as 51.<sup>17</sup>

The spectrum of transmissible spongiform encephalopathies includes Alzheimer's disease, Parkinson's and CJD. Since prions can be found in urine, feces, blood and other bodily fluids, the spread of these fluids may contribute to the spread of other prion disease mutations.

Alzheimer's disease is officially the sixth leading cause of death in the U.S., although more recent data suggests it may be the [third leading cause of death](#), right after heart disease and cancer.

As deaths from heart disease have declined nearly 11 percent from 2000 to 2015, deaths from Alzheimer's have increased 123 percent.<sup>18</sup> Nearly 33 percent of seniors will die with some form of dementia, killing more than breast cancer and prostate cancer combined.

The financial burden reaches \$232 billion. According to the Alzheimer's Association<sup>19</sup> an estimated 5.7 million Americans of all ages have Alzheimer's dementia, including nearly 200,000 under the age of 65.

These growing statistics may be related to both lifestyle factors and a potential infectious component. In one study,<sup>20</sup> researchers found when mice were injected with tissue from a human who had Alzheimer's, the mouse began to exhibit changes characteristic of the disease.<sup>21</sup>

Dr. Claudio Soto, professor of neurology at the University of Texas Medical School theorized these findings open the possibility some sporadic cases may arise from an [infectious process](#).<sup>22</sup>

Sotto warned that even if the data was corroborated it would still be important to avoid well-known risk factors for Alzheimer's, since these may accelerate the disease or increase the risk in cases where there is an infectious origin.<sup>23</sup>

## Autopsies Reveal a Potential Infectious Process

Subsequent research published in Nature<sup>24</sup> showed data from autopsy studies where individuals who had died from CJD appeared to have contracted the disease decades earlier from contaminated growth hormone extracted from human cadavers. In addition, six also harbored amyloid pathology associated with Alzheimer's disease.

Molecular neuroscientist John Hardy of the University College London believed this was the first evidence of real-world transmission of amyloid pathology and that it is particularly concerning. The researchers also determined none of the individuals carried genetic material predisposing them to early onset Alzheimer's or any other neurodegenerative diseases.

They believe the most plausible explanation for the amyloid pathology was it had been transmitted by human growth hormone extracts contaminated with beta amyloid seeds as well as the CJD prions.

In another study,<sup>25</sup> researchers performed autopsies on individuals who died of CJD, all of whom received surgical grafts of dura mater prepared from human cadavers contaminated with the prion protein known to cause CJD.

However, in addition to the damage from CJD, five of the seven brains displayed pathological signs associated with Alzheimer's disease, including plaques formed from beta amyloid protein. These individuals were 28 to 63 years old and considered unusually young to have these changes.

Data was compared against a set of 21 controls who had not received surgical grafts but died of sporadic CJD. They did not have the amyloid signature. The results of both studies are consistent, demonstrating the same pathology emerging after different medical procedures.<sup>26</sup>

The scientists emphasized neither study demonstrates the disease is transmitted through normal contact, and they stress cadaver derived preparations are no longer used. This does have important clinical implications for the sterilization of surgical instruments, however, since beta amyloid proteins are very sticky and may not routinely be removed during standard sterilization procedures.

## Eating Habits Increase Risk of Alzheimer's Disease

Unfortunately, misinformation and mismanagement may be contributing to a rising number of deaths from neurodegenerative diseases, which experts suggest may triple by 2050.<sup>27</sup> While these numbers are large, they may not be accurate.

The Alzheimer's Association believes physicians in the U.S. only inform 45 percent about their diagnosis and this suppression of information is most likely at work in other countries as well.<sup>28</sup> Lifestyle factors are also implicated in the development of Alzheimer's disease.

One of the most striking studies<sup>29</sup> on [carbohydrates and brain health](#) revealed a high-carbohydrate diet increased the risk of dementia by 89 percent, while high-fat diets lowered it by 44 percent.

Other studies have also strongly suggested Alzheimer's dementia is connected to insulin resistance<sup>30</sup> and even mild elevations may be associated with an elevated risk of dementia.<sup>31</sup> Diabetes and heart disease are known to elevate your risk, both of which are rooted in insulin resistance.

This interconnection between high-sugar diets and Alzheimer's was again highlighted in a longitudinal study<sup>32</sup> in which over 5,000 individuals participated. Over a decade's worth of data revealed the higher an individual's blood sugar was, the faster the rate of cognitive decline.

Increased blood sugar from consuming sugar and other carbohydrates can disrupt your brain function even when you're not diabetic or have other signs of dementia.

Using short- and long-term glucose markers, one study<sup>33</sup> evaluated healthy, nondiabetic, nondemented seniors. Memory tests and brain imaging revealed the higher the blood glucose measured, the greater the compromise in memory and structure of the hippocampus. In yet another study,<sup>34</sup> researchers found Type 2 diabetics lost more gray matter with age than expected and had earlier onset of dementia than nondiabetics.

### Lack of Sleep and Activity Also Increase Your Risk of Dementia

A lack of sleep has also been linked with beta-amyloid buildup found in Alzheimer's disease. Deep sleep is particularly important, as it is only during deep sleep that your brain's glymphatic system is activated, allowing it to flush away cellular waste.<sup>35</sup>

Persistent patterns of poor sleep may actually be an early indicator of amyloid buildup causing a subtle brain change well before the disease develops. Guidelines suggest most adults need seven to nine hours of sleep each night and children and teens need even more.

Long periods of [sitting](#) also impact memory in middle-aged and older adults. Research data<sup>36</sup> using high-resolution magnetic resonance imaging (MRI) on a group of 35 middle-aged and older adults found brain thinning in a region involved in the formation of new memory.

In addition to the MRIs, the participants assessed their physical activity level and average number of hours spent sitting. Comparing this data, the researchers found sitting for extended periods of time was closely associated with thinning in the medial temporal lobe of the brain.

### Preventive Strategies

It is often believed dementia is a condition that can't be controlled, but there are many factors you can influence to greatly reduce your risk. It is important to address several factors and not focus on only one or two.

That said, improving your cardiovascular fitness is an excellent place to start, as I discuss in my previous article, "[How to Decrease Your Risk for Dementia by 90 Percent](#)." When combined with other approaches to resolve mitochondrial dysfunction, it can be highly effective in preventing cognitive decline.

Other strategies to help you reduce your risk of Alzheimer's disease include eating a ketogenic diet, optimizing your vitamin D and omega-3 levels, eliminating gluten and processed foods, and intermittent fasting. See the lifestyle strategies I believe to be most helpful and important to reduce your risk of Alzheimer's disease in my previous article, "[Link Between Sugar and Alzheimer's Strengthens](#)."

To learn more about Alzheimer's and the tests that can help diagnose it early, see my [interview with Dr. Dale Bredeesen](#), author of "The End of Alzheimer's: The First Program to Prevent and Reverse Cognitive Decline."

## Public Lands = Valuable Resources That Should Be Protected

The next article is from the Theodore Roosevelt Conservation Partnership at [www.trcp.org](http://www.trcp.org). Perhaps our most valuable assets are our public lands. They should never be used as bargaining chips or left unprotected or without maintenance. Our public lands are repositories of our cultural heritage and the

shared values that we cherish. One generation bequeaths to the next the shared knowledge and experiences that can only happen in the wild lands. These encounters become more memorable as the years pass. Few can afford to own the diversity of environments that our public lands provide for us. Another thing that our public lands offer is the chance for serendipity. You never know who you may meet on the trail. It may be a future best friend or love. But without the opportunity and shared location, it would never happen. Our public lands are the gifts we give ourselves.

## 43 Hunting and Fishing Organizations Urge Senate Passage of Historic Public Lands Legislation

by: [Marnee Banks](#)

*TRCP leads effort to support permanent reauthorization of the Land and Water Conservation Fund.*

The Theodore Roosevelt Conservation Partnership and 42 other organizations are urging Senate leadership to immediately vote on a bipartisan agreement to permanently reauthorize the Land and Water Conservation Fund and improve outdoor recreation opportunities.

The group of hunting, fishing, wildlife conservation, and outdoor recreation organizations points to the overwhelmingly bipartisan support for this historic public lands legislation ([S.47](#)) in both the House and Senate.

“The momentum and support for this package remains widespread across a variety of public lands stakeholders, and urgent consideration of the package in the new Congress is well warranted,” the organizations wrote. “It is thoroughly bipartisan in nature and broad in scope, and passage of this package would be a historical step forward for public lands and conservation.”

U.S. Senators Lisa Murkowski (R-Alaska) and Maria Cantwell (D-Wash.) negotiated the legislation last Congress and received a commitment to bring the bill to the Senate floor for a vote in the 116th Congress.

The group notes passage of this bill is critical, “so that future generations of Americans can enjoy our public lands, waterways, and the wildlife that inhabit them for years to come.”



For Immediate Release – January 31, 2019    Contact: [Parker Williams](#) – (202) 834-0067

## LaMalfa Appointed Conservation and Forestry Ranking Member

(Washington, DC) – Congressman Doug LaMalfa (R-Richvale) issued the following statement after being appointed Ranking Member of the House Agriculture Committee’s Subcommittee on Conservation and Forestry.

LaMalfa said: “It’s a great honor to serve as Ranking Member on the Conservation and Forestry Subcommittee, and an assignment that is a tremendous opportunity for Northern California. Wildfires occur each year in the First District – the Carr Fire and Camp Fire represent the enormous devastation last year. On this Subcommittee, I will focus on working across the aisle in an effort to achieve meaningful forestry reforms that can help prevent future catastrophes, such as hazardous fuel reduction and streamlining forest management practices. These are issues that I am very passionate about, and I look forward to working with Subcommittee Chairwoman Abigail Spanberger to help improve the stewardship of our federal lands.”

“With farm bill implementation underway, our subcommittees will play an instrumental role in promoting and protecting policies that are important to rural America and our country’s farm and ranch families. I look forward to working with Doug and all of our Ranking Members who have a wide-range of knowledge and expertise in the ag industry,” said Ranking Member Michael Conaway.

*Congressman Doug LaMalfa is a lifelong farmer representing California’s First Congressional District, including Butte, Glenn, Lassen, Modoc, Nevada, Placer, Plumas, Shasta, Sierra, Siskiyou and Tehama Counties.*

## What’s in The New Farm Bill

The next article is from The Daily Republic at [www.mitchellrepublic.com](http://www.mitchellrepublic.com). The information below are a collection of some of the items in the new Farm Bill that supports conservation and traditional outdoor activities.

### **Conservation gets a boost: Inside the new farm bill**

By [Howard Vincent](#)

In South Dakota, where agriculture is the king of the economy and the ring-necked pheasant is the king of the outdoor scene, the Farm Bill has a deep effect on people's lives.

Pheasants are creatures of grasslands and farmlands. What happens in the Farm Bill is perhaps the biggest factor impacting birds on the landscape. Pheasants Forever worked hard in Washington, D.C. for Farm Bill provisions that would give agricultural producers good voluntary options for investing in soil health, water quality, sustainable production ... and upland wildlife.

Things were looking iffy toward the end of the year, but with just days left on the 2018 congressional calendar, the Farm Bill passed the Senate and House of Representatives and was signed by the president shortly before Christmas.

Despite budget constraints, the bill's conservation title saw improved funding and an increase in acres within the major conservation areas; this will result in more on-the-ground wildlife habitat in South Dakota. Key provisions include:

- A 27-million-acre Conservation Reserve Program (CRP), which is an increase of 3 million acres nationwide. Each state's allocation remains to be set, but there should be good availability for South Dakota producers who wish to put land into CRP. This is good for soil and water quality ... and good for pheasants, which is also good for South Dakota's economy.

- An expanded Voluntary Public Access and Habitat Incentive Program (VPA-HIP) that provides for habitat improvement on, and public hunting access to, private lands. South Dakota's vast public land base, including walk-in lands leased for public access, bring hunters into the state ... people who in turn spend millions of dollars on gas, hotels, food, shotgun shells, entertainment, and everything else surrounding a hunting adventure.
- Long-term funding for wetland, grassland and agricultural easements as earnest upland habitat improvements. Pheasants Forever continues to see high landowner demand for such programs. Most farmers want to take care of the land because it's the right thing to do, and it's the right thing for productivity and profitability long-term. Options for taking marginal lands out of production, but getting some return on those acres, are always in demand.

These were all programs that Pheasants Forever volunteers and staff pressed on Capitol Hill for many months to include in the final legislation. In case you're wondering what-all was included in the bill, here are some important details on the legislation's key conservation provisions.

### Conservation Reserve Program (CRP)

The 2018 Farm Bill increases CRP acreage from 24 million acres to 27 million acres. It calls for routinely scheduled signups with targeted state-to-state allocations, as well as prioritize 30 percent of acres into the Continuous CRP program that targets high-value habitat and resource concerns. There were adjustments to rental rates and caps on payment levels, but we feel that the rental rates and cost-share will be competitive, especially on environmentally-sensitive and lower quality farmland.

### Voluntary Public Access and Habitat Incentive Program (VPA-HIP)

The 2018 Farm Bill reauthorizes funding of \$50 million for VPA-HIP. This program helps state wildlife agencies such as South Dakota Game, Fish and Parks expand hunting and fishing opportunities and access on private lands through expanded and enhanced walk-in programs. This funding is also available to do habitat improvements on private lands open to the public.

### Agricultural Conservation Easement Program (ACEP)

This portion of the bill provides funding to boost ACEP funds to \$2.25 billion over the next 5 years. The demand for long term (30-year) and perpetual easements has always exceeded funding. This funding level is the highest since the programs were created in 1990. The program also protects grazing uses and related conservation values by conserving grassland, including rangeland, pastureland and shrubland.

### Environmental Quality Incentives Program (EQIP)

This program increases the percentage of funds for providing an estimated \$200 million per year (a nearly 4-fold increase) in funding directed for wildlife. A priority focus for wildlife-related EQIP funding is through the Working Lands for Wildlife Program; it was codified in the final language to focus efforts in priority landscapes for multiple species. This was a big win for wildlife.

### Soil Health and Income Protection Program (SHIPP)

This program authorizes 50,000 acres "to assist landowners with conserving and improving soil, water and wildlife resources" through 3 to 5-year contracts in the Prairie Pothole region. South Dakota will be a key beneficiary here. Since this is a new program, the final details on how implementation will take place are not yet refined.

## Regional Conservation Partnership Program (RCPP)

This program expanded to include \$1.5 billion of funding and will increase flexibility to leverage local, state and other non-federal funding sources. RCPP was created in the 2014 Farm Bill.

## Conservation Stewardship Program (CSP)

This program was reauthorized, but at a reduced funding level compared to the 2014 Bill. That said, with funding at between \$700 million and \$1 billion per year, there will be continued opportunities for projects to create high-quality wildlife habitat.

## Sodsaver and conservation compliance

These provisions remain strong and will continue to protect native habitats that include prairie, wetland and forest.

Pheasants Forever is committed to a working landscape for productive, profitable agriculture, as well as voluntary options for landowners to take marginal lands out of production for improving soil and water quality while giving upland wildlife a home.

While Pheasants Forever feels the 2018 Farm Bill could have been more robust for landowners interested in conservation practices on their land, in general the results are positive and a "win" for farmers, for wildlife, and for all South Dakotans.

If you are interested in learning more about any of the programs mentioned, visit your county's USDA Service Center and reach out to a Pheasants Forever Farm Bill Biologist.

## Bears, Bears and More Bears

*I received the following tale in a very welcome email. Glad to see that Momma bear and her family made it from one year to the next. It is a big job raising one cub, but 5?!!!! That is amazing! Additionally, Tom Sears the photographer was able to get pictures from two different years. Wish her and her cubs many more years of familial adventures.*

Wow – it is amazing that they all survived and look so healthy. What gorgeous coats they have!

### **Bear Quintuplets - once in a lifetime photo**

Black bears typically have two cubs; rarely, one or three. In northern New Hampshire, a black bear sow gave birth to five healthy young. There were two or three reports of sows with as many as 4 cubs, but five was, and is, very extraordinary. The photographer learned of them shortly after they emerged from their den and set a goal of photographing all five cubs with their mom - no matter how much time and effort was involved. He knew the trail they followed on a fairly regular basis, usually shortly before dark. After spending nearly four hours

a day, seven days a week, for more than six weeks, he had that once-in-a-lifetime opportunity and photographed them. He used the equivalent of a very fast film speed on his digital camera. The print is properly focused and well exposed, with all six bears posing as if they were in a studio for a family portrait.



The photographer stayed in touch with other people who saw the bears during the summer and into the fall hunting season. All six bears continued to thrive. As time for hibernation approached, he found still more folks who had seen them, and everything remained OK. The photographer stayed away from the bears because he was concerned that they might become habituated to him, or to people in general, and treat them as approachable friends. This could easily become dangerous for both man and animal.

After Halloween, no further reports and could only hope the bears survived until they hibernated. This spring, just before the snow disappeared, all six bears came out of their den and wandered all over the same familiar territory they trekked in the spring.

The photographer saw them before mid-April and dreamed nightly of taking another family portrait, a highly improbable second once-in-a-lifetime photograph.



On 25 April, he achieved his dream.

When something as magical as this happens between man and animal, Native Americans say, "We have walked together in the shadow of a rainbow." And so it is with humility and great pleasure that I share these exhilarating photos with you.

Do pass them on!

Remember to celebrate the love you share with your family, critters and others who are special to you. Archery and bowhunting seasons are near, so make sure your gear is in shape. Don't forget to explore those special places that are most alive in the pre-spring coolness and damp when the air smells as if it was heaven sent.

~May Your Arrows Always Find Their Mark~

Teri