

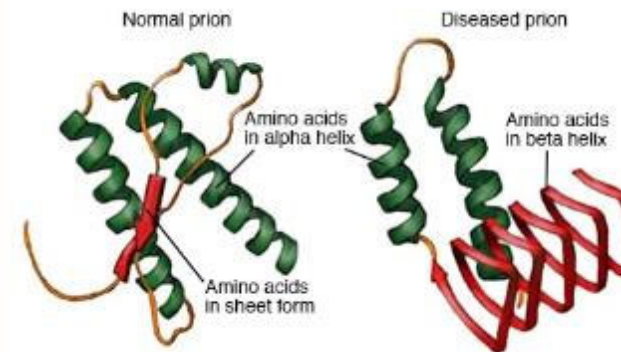
# Chronic Wasting Disease

Iga Stasiak, Wildlife Health Specialist  
Saskatchewan Ministry of Environment

March 13, 2019

# The Basics

- Fatal neurodegenerative disease of cervids (mule deer, white tailed deer, elk, moose, and caribou)
- TSE (prion) family of diseases (Scrapie, BSE, CJD)
- Lack of:
  - Valid live animal test
  - Vaccine
  - Treatment



Prion

# Is this deer sick?



Danita Delimont, Getty Images

# Game Farms

- Captive Game Farm industry was established in Saskatchewan in 1987 to diversify the agricultural industry
- **“An expanding and internationally competitive game farm industry...that is in harmony with management of sustainable wildlife populations”**
- Ministry of Agriculture has authority to manage captive cervids





# 2018-19 CWD Positive Results

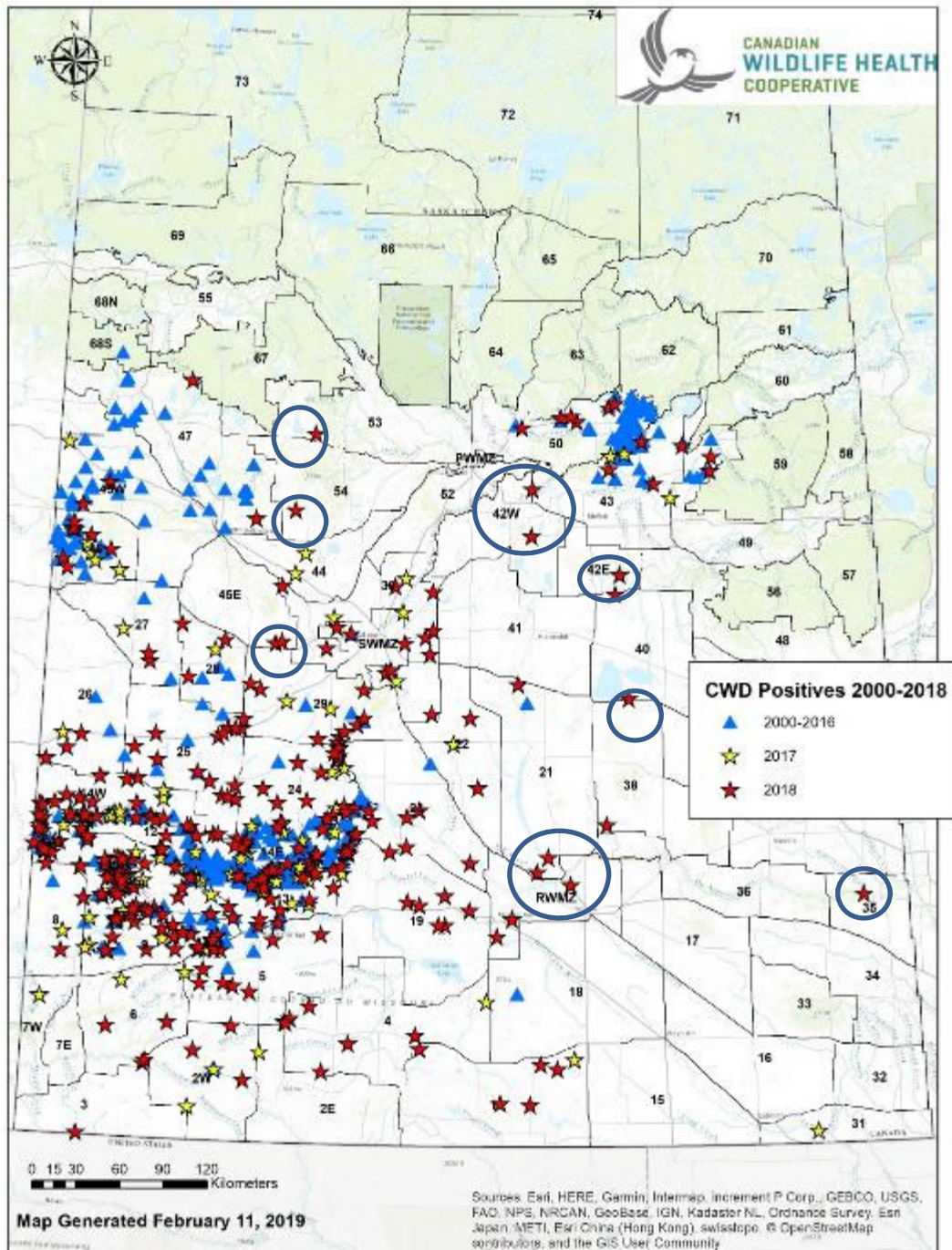
Number of positives (as of  
Feb 12, 2019): **349**

**(3 elk, 2 moose, 270 mule  
deer, 74 WTD)**

Hunter samples collected:  
**2070**

Clinical Cases: **198**

**NEW WMZs: 35, 38, 39, 40,  
42E, 42W, RWMZ, 45E, 53,  
54**



# Transmission

## Direct



Photo: Darren Warner

## Indirect



ashnell

08-07-2010 07:55:01

Deer at mineral lick



# Artificial Concentration



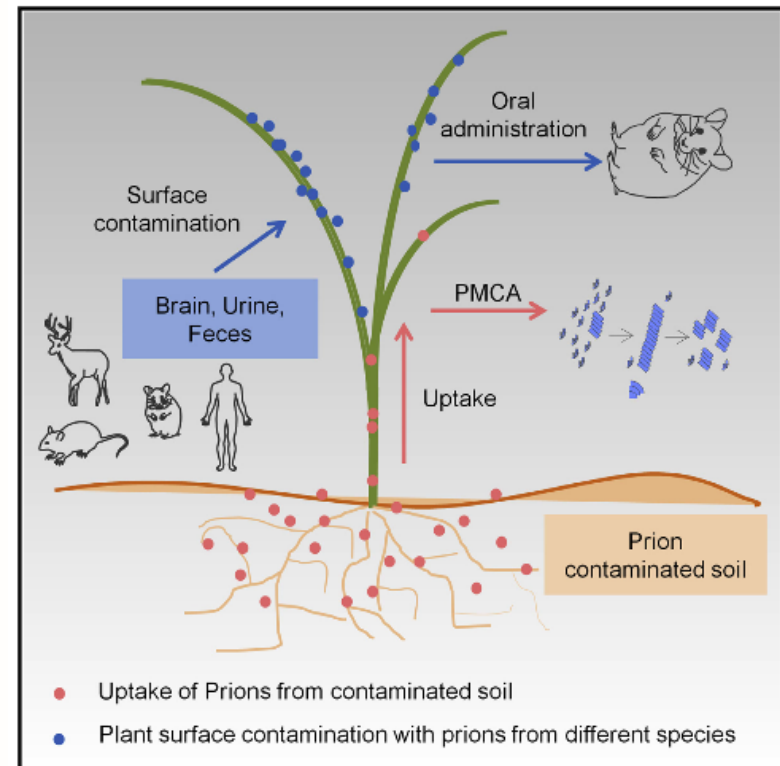
Deer over bait. Jeff Burleson.



Elk feeding on hay bales.  
Alberta Fish and Wildlife.

# Environmental Reservoirs


- ▶ Water source in Colorado (Nichols et al, 2009)
- ▶ Mineral licks in Southern Wisconsin (in water and soil) (Plummer et al, May 2018)
- ▶ Prions bind to soil (Johnson et al., 2006)
- ▶ Prions bound to clay in soil are more infectious (Johnson et al., 2007)



Prion uptake by plants. Pritzkow et al., 2015.



# Experimental Transmission of the Chronic Wasting Disease Agent to Swine after Oral or Intracranial Inoculation

S. Jo Moore,<sup>a,b</sup> M. Heather West Greenlee,<sup>c</sup> Naveen Kondru,<sup>c</sup> Sireesha Manne,<sup>c</sup>  
Jodi D. Smith,<sup>a\*</sup> Robert A. Kunkle,<sup>a</sup> Anumantha Kanthasamy,<sup>c</sup>  
 Justin J. Greenlee<sup>a</sup>



## Wild boar cause trouble on farms

There are many feral wild boar across the Prairies, but few of us will ever actually see them

There, licking minerals at his deer blind, were several wild boars.

Neighbouring farmers had suspected the pigs of eating their standing corn and ripping into a grain bag of CPS wheat.

Photo: Michael Hicks, Glaslyn, Saskatchewan  
[saskatchewan.ca](http://saskatchewan.ca)

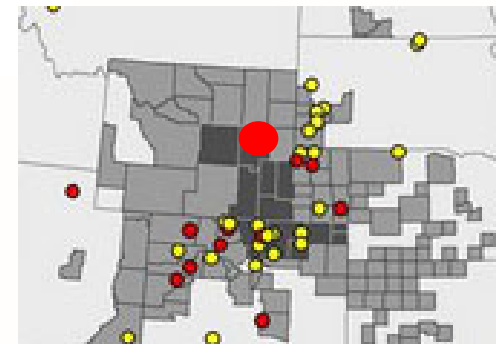
Saskatchewan!

RESEARCH ARTICLE

# Chronic Wasting Disease Drives Population Decline of White-Tailed Deer

David R. Edmunds<sup>1na\*</sup>, Matthew J. Kauffman<sup>2</sup>, Brant A. Schumaker<sup>1</sup>, Frederick G. Lindzey<sup>2nb</sup>, Walter E. Cook<sup>3nc</sup>, Terry J. Kreeger<sup>4nd</sup>, Ronald G. Grogan<sup>1ne</sup>, Todd E. Cornish<sup>1</sup>

- ▶ Southeastern Wyoming (2003-2010)
- ▶ Prevalence 42% in does, 29% in bucks
- ▶ CWD positive deer 4.5X as likely to die annually than CWD negative deer
- ▶ 10.4% annual decline



Wyoming

tality, with CWD-positive deer over-represented in harvest and total mortalities. Survival was significantly lower for CWD-positive deer and separately by sex; CWD-positive deer were 4.5 times more likely to die annually than CWD-negative deer while bucks were 1.7 times more likely to die than does. Population  $\lambda$  was 0.896 (0.859–0.980), which indicated a 10.4% annual decline. We show that a chronic disease that becomes endemic in wildlife populations has the potential to be population-limiting and the strong population-level effects of CWD suggest affected populations are not sustainable at high disease prevalence under current harvest levels.

# What about caribou?



# Norway

## Norway to kill 2,000 reindeer to eradicate disease

The herd is to be eradicated by 1 May 2018.

May 8th 2017, 9:40 PM 11,783 Views 18 Comments

Share 24 Tweet Email 5

### THE NORWEGIAN

GOVERNMENT has authorised the slaughter of a herd of around 2,000 reindeer in a bid to eradicate a brain-destroying disease, after several cases were detected in Norway for the first time in Europe.

In chronic-wasting disease (CWD), a cousin of mad-cow disease and already present in North America, deer brains turn spongy, causing the animal to lose weight and die.

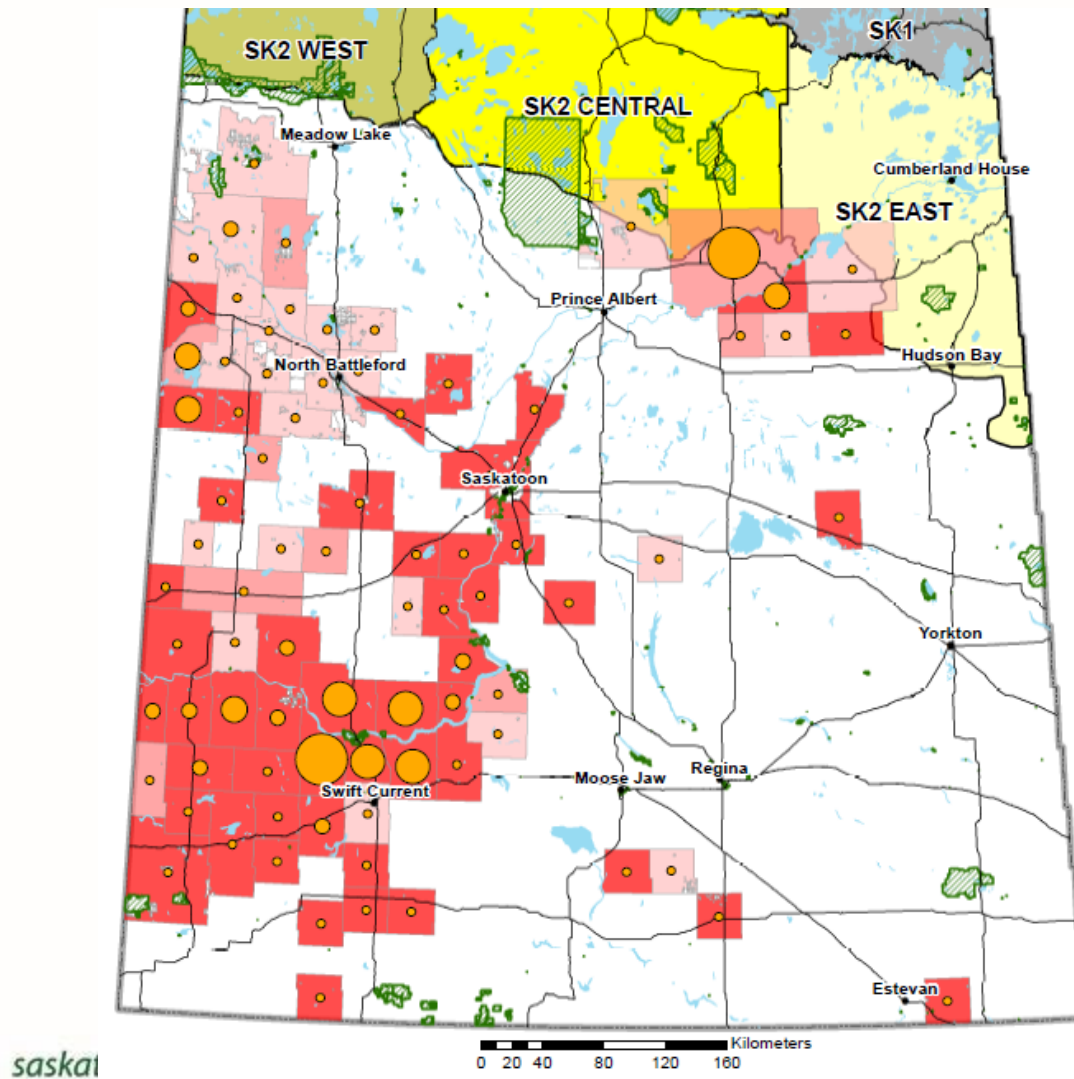


Image: Shutterstock/Jellis Vaes





# Boreal Caribou



Status: Threatened  
(Species at Risk Act)

# Is CWD transmissible to humans?

- **Risk likely low**
  - No known cervid to human transmission
- Non-human primates
  - Macaque monkeys
    - Susceptible – Alberta Prion Institute (Dr. Stefanie Czub, PRION 2017)
    - Not Susceptible – US National Institutes of Health
- Health Canada and the World Health Organization recommend that people not eat meat or other parts of a CWD-infected animal



# Human Dimensions: The Social Impacts of CWD

- Is my meat safe to eat? How is it affecting populations?
- >60% worried about CWD
- ~50% concerned about eating deer and elk
- >50% have poor knowledge of CWD
- Doing nothing not acceptable to most hunters



Caribou: A way of life

## P.A. food bank turns away wild game donations over disease concerns

Published Friday, February 22, 2019 4:23PM CST

Last Updated Friday, February 22, 2019 7:03PM CST



Saskatchewan Conservation officer Jaret Engle volunteers his time Tuesday morning with the delivery of wild game hamburger meat at the Saskatoon Food Bank, Dec. 1, 2015.



THURSDAY, OCTOBER 25, 2018

## Norway New additional requirements for imports of hay and straw for animal feed from countries outside the EEA due to CWD TSE Prion

Norway New additional requirements for imports of hay and straw for animal feed from countries outside the EEA due to CWD TSE Prion



years. The products must be accompanied by a certificate from the official veterinarian in the sender country that the product has been harvested from farms where no restrictions are imposed on contagious animal disease. **High and straw from the United States and Canada must also be accompanied by a certificate from a public veterinarian that the product has been harvested in states or provinces where no Chronic Wasting Disease has been detected in deer animals.** Always a risk of imported feed The background for the new additional requirements is the crop weight after the drought this summer. It meant that many farmers and others who keep pets need to supplement with purchased hay and straw. Purchasing coarse feed from abroad will always entail a risk of introducing unwanted contaminants and plants, which can cause a health hazard to humans, animals and plants.

# Threats of CWD Spread



Artificial Concentration



Carcass Movement

[saskatchewan.ca](http://saskatchewan.ca)



Deer Range Expansion



Laurie Seale

Infection in Game Farms

[saskatchewan.ca](http://saskatchewan.ca)

# What can we do?

- Managing disease where it has been detected
- Keeping the remainder of the province CWD free
- **Prevention, Prevention, Prevention**
  - Reduce transmission to new species and areas
  - Monitor for 'sparks' (aka Surveillance)

# Management Strategies

- Reducing Artificial Points of Concentration
  - Baiting and Feeding, mineral licks, grain bags
- Carcass Movement Restrictions
- Carcass Disposal
- Harvest Management
  - Increased harvest, targeting specific age/sex classes
- Minimize Disease Spillover from Game Farms
  - Farm location (endemic areas, caribou buffer zone, Manitoba border)
  - Fencing
  - Depopulation
  - Movement restrictions



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# Cost if we do nothing

- Population decline
  - Loss of older age classes/trophy bucks
- Decreased hunting participation/tourism
- Spillover into caribou, moose, boreal forest
- Impaired food safety and security for First Nations
- Loss of confidence in food supply chain/trade barriers

# What is needed

- Support on a provincial and national level to take actions to minimize CWD spread (baiting/feeding restriction, minimize wildlife access to grain bags/hay, control of risk from game farms, carcass disposal options)

“An environment that will sustain present and future generations.”



Photo Credit: Bruno Croft, ENR, GNWT



saskatchewan.ca

