Chronic Wasting Disease

South Dakota

GAME, FISH and PARKS

November 2018 CWD Stakeholder Meeting

Presentation Outline

- Disease overview
- CWD transmission
- Disease impacts
- CWD distribution
- Results of CWD surveillance in South Dakota

Disease Overview

- Chronic wasting disease (CWD) is a fatal brain disease of cervids that is caused by an abnormal protein called a prion
  - Mule deer, white-tailed deer, elk, moose, reindeer
- Transmissible Spongiform Encephalopathy (TSE)
  - Scrapie – sheep and goats
  - BSE (Mad Cow Disease) – cattle
  - Transmissible mink encephalopathy
  - Creutzfeldt-Jakob disease (CJD) – humans
- Chronic wasting disease is always fatal
  - No vaccine, treatment, or medical cure currently exists

Disease Overview cont.

- No cases of human prion disease have been associated with Chronic Wasting Disease
- Other species have been infected by CWD (e.g., mice, non-human primates), but only under laboratory conditions
- The Centers for Disease Control and Prevention (CDC) makes recommendations on the side of caution
  - The risk appears low, but is not zero

Disease Transmission

- Contagious
- Uptake is believed to be mostly oral

- Direct Transmission
  - Animal to animal
  - Body fluids – saliva, urine, feces
  - Carcasses – infectious tissues

- Indirect Transmission
  - Animal to environment to animal
  - Contaminated environment - carcasses, saliva, urine, feces
  - Environmental reservoirs – mineral licks, feeding/baiting,…

Disease Transmission cont.

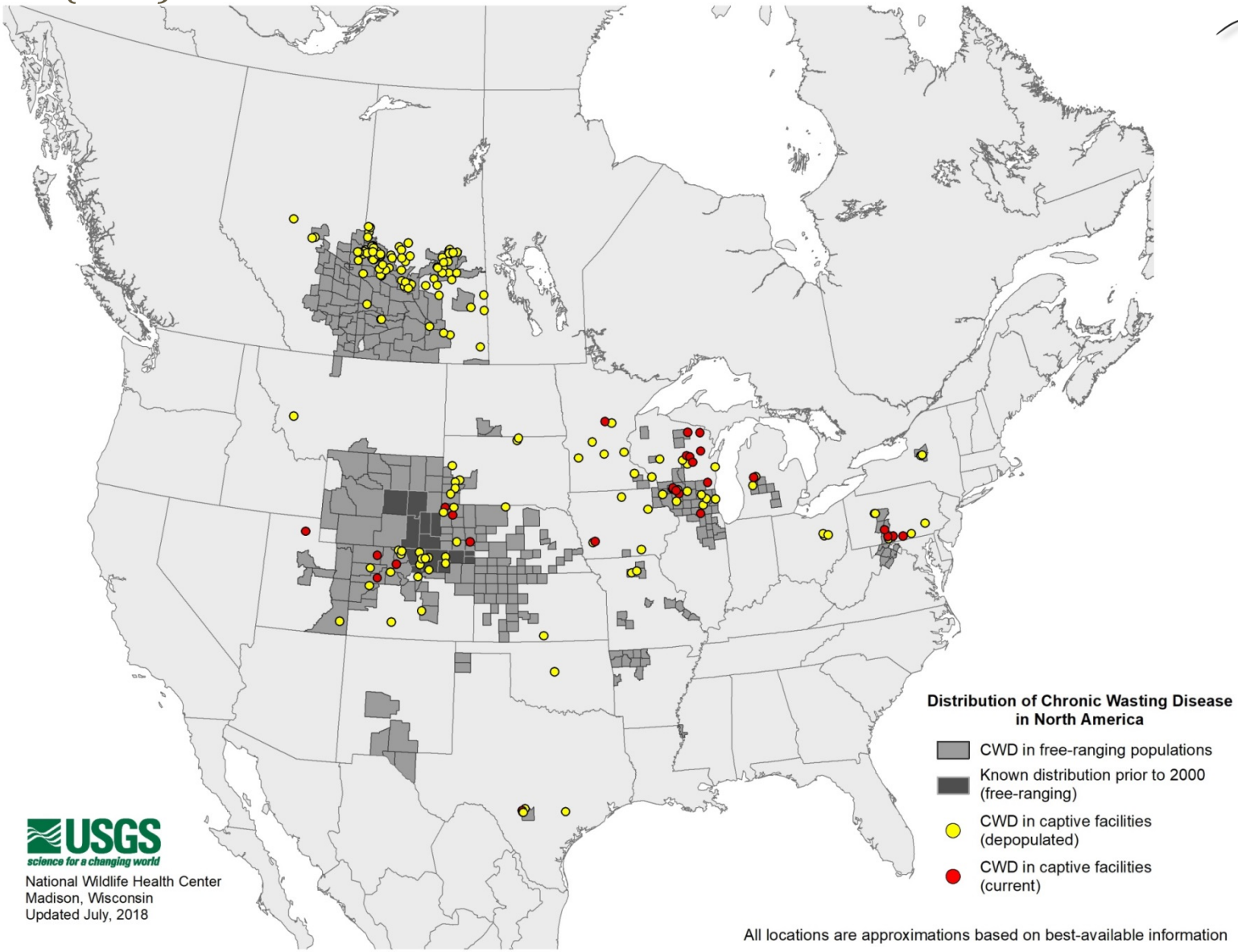
- Prions are virtually indestructible. They are resistant to many common disinfectants, heat, sunlight, and freezing, as well as other processes that typically kill pathogens
- Prions can persist in the environment for potentially decades and remain infectious to susceptible animals
- Certain plants uptake small levels of the prion from contaminated substrate, indicating the potential for susceptible animals to ingest the pathogen
- Long incubation period (months to years)
  - 16 months to 5 years or longer
  - Non-clinical animals are infectious
  - Some animal may be more resistant, but none immune

Disease Impacts

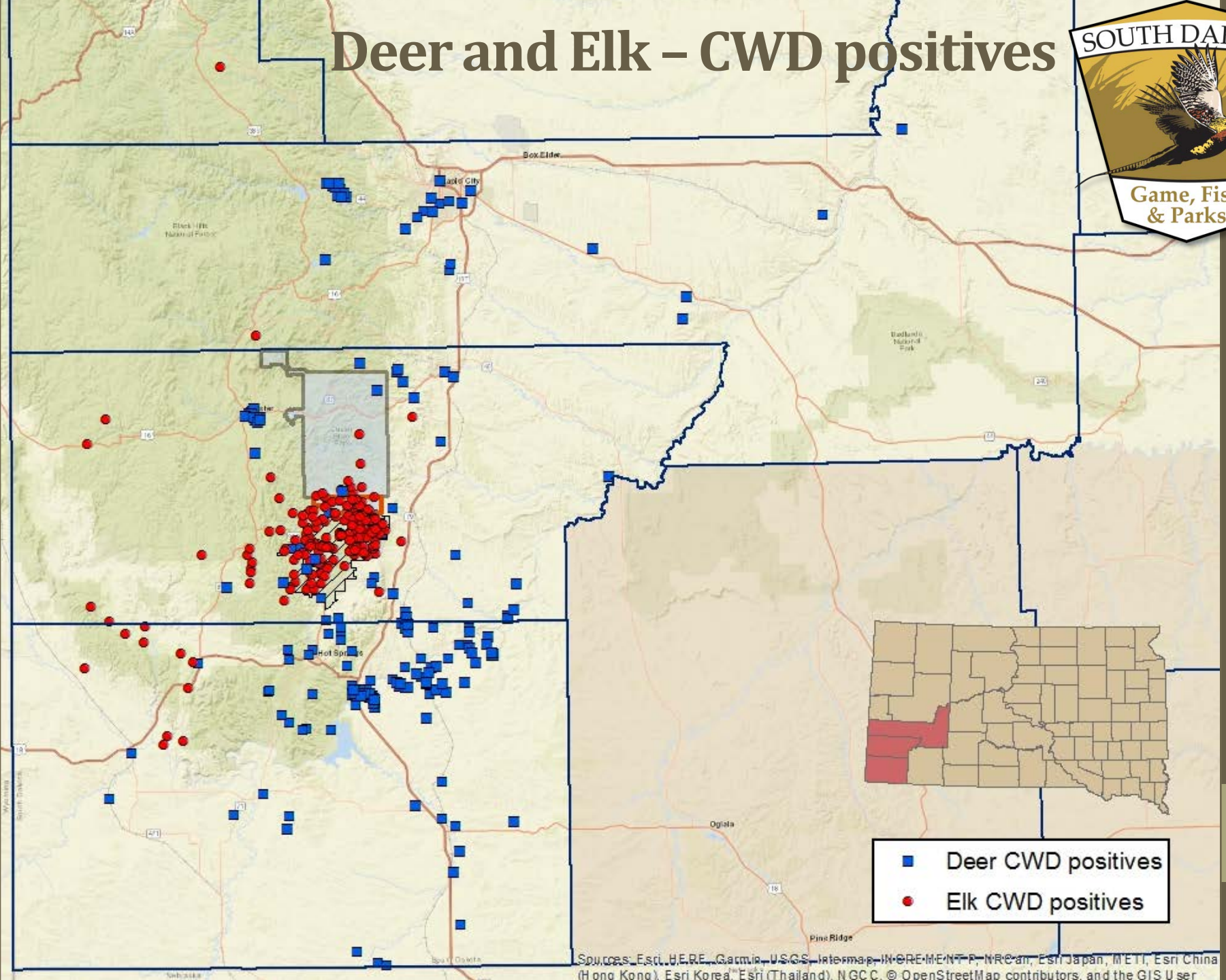
- Recent research has documented mortality and herd growth implications due to CWD. Examples:
  - Colorado, Mule deer (Miller et al. 2008)
    - 25% prevalence rates; unhunted population
    - Higher mortality rates; Population growth < 1
  - Colorado, Elk (Monello et al. 2014)
    - 13% prevalence rates
    - Higher mortality rates; Population growth < 1
  - Wyoming, White-tailed deer (Edmunds et al. 2016)
    - High prevalence rates, Males 29%, Females 42%
    - Mortality rates 4.5 times higher; Population growth .9
  - Wyoming, Mule deer (Devivo 2015)
    - Prevalence rates, 50% males, 30% females
    - Mortality rates 2.8 times higher; Population growth .74

CWD Distribution

(2018)



Deer and Elk – CWD positives



Adult Elk CWD Surveillance

ADULT ELK									
CWD Prevalence Rates									
	Sick Surveillance			**Hunter Harvest**			**Road kill/other**		
	WICA	**CSP**	**Black Hills**	**WICA**	**CSP**	**Black Hills**	**WICA**	**CSP**	**Black Hills**
2000/01--2012/13	68.3%	18.2%	4.3%	na	0.4%	0.5%	22.9%	0.0%	2.9%
2013/14--2017/18	55.1%	86.7%	19.0%	15.4%	11.1%	1.4%	10.4%	0.0%	0.0%
current year 2017/18	41.7%	100.0%	0.0%	32.0%	6.7%	1.8%	na	na	0.0%
overall	61.1%	57.7%	8.8%	15.4%	1.1%	0.6%	16.9%	0.0%	2.4%
Sample sizes									
	Sick Surveillance			**Hunter Harvest**			**Road kill/other**		
	WICA	**CSP**	**Black Hills**	**WICA**	**CSP**	**Black Hills**	**WICA**	**CSP**	**Black Hills**
2000/01--2012/13	41	11	47	0	785	4193	105	5	35
2013/14--2017/18	49	15	21	272	54	952	96	1	7
current year 2017/18	12	4	1	25	30	341	0	0	1
overall	90	26	68	272	839	5145	201	6	42
complete dataset									
updated 7/02/18									
Year = July 01 - June 30									
Areas exclusive									

CWD Surveillance cont.

- Mule Deer (overall)
  - Hunter Harvest Samples = ~3,200 Prairie; 1,000 Black Hills
  - Prevalence = 1.4% Prairie; 0.1% Black Hills

- White-tailed Deer (overall)
  - Hunter Harvest Samples = ~3,200 Prairie; 6,000 Black Hills; 230 CSP
  - Prevalence = 2.1% Prairie; 0.1% Black Hills; 0.9% CSP

Questions?