

Chronic Wasting Disease



South Dakota GAME, FISH and PARKS

July 2018 Commission Meeting



Presentation Outline

- Disease overview
- CWD transmission
- Disease symptoms and impacts
- CWD distribution
- Results of CWD surveillance
- Department workgroup
- Objectives identified by workgroup
- Summary
- Questions



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

- 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 World Health Organization (WHO) and 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

- 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
- CWD prions can bind to a type of clay found in soil, suggesting that soils may facilitate CWD infectivity
- Certain plants uptake small levels of the prion from contaminated substrate, indicating the potential for susceptible animals to ingest the pathogen



Disease Symptoms

- 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
- The disease cannot be diagnosed by observation of physical symptoms because many big game diseases affect animals in similar ways
- Animals infected with CWD show progressive symptoms such as loss of weight and body condition, behavioral changes, excessive salivation, loss of muscle control and eventual death

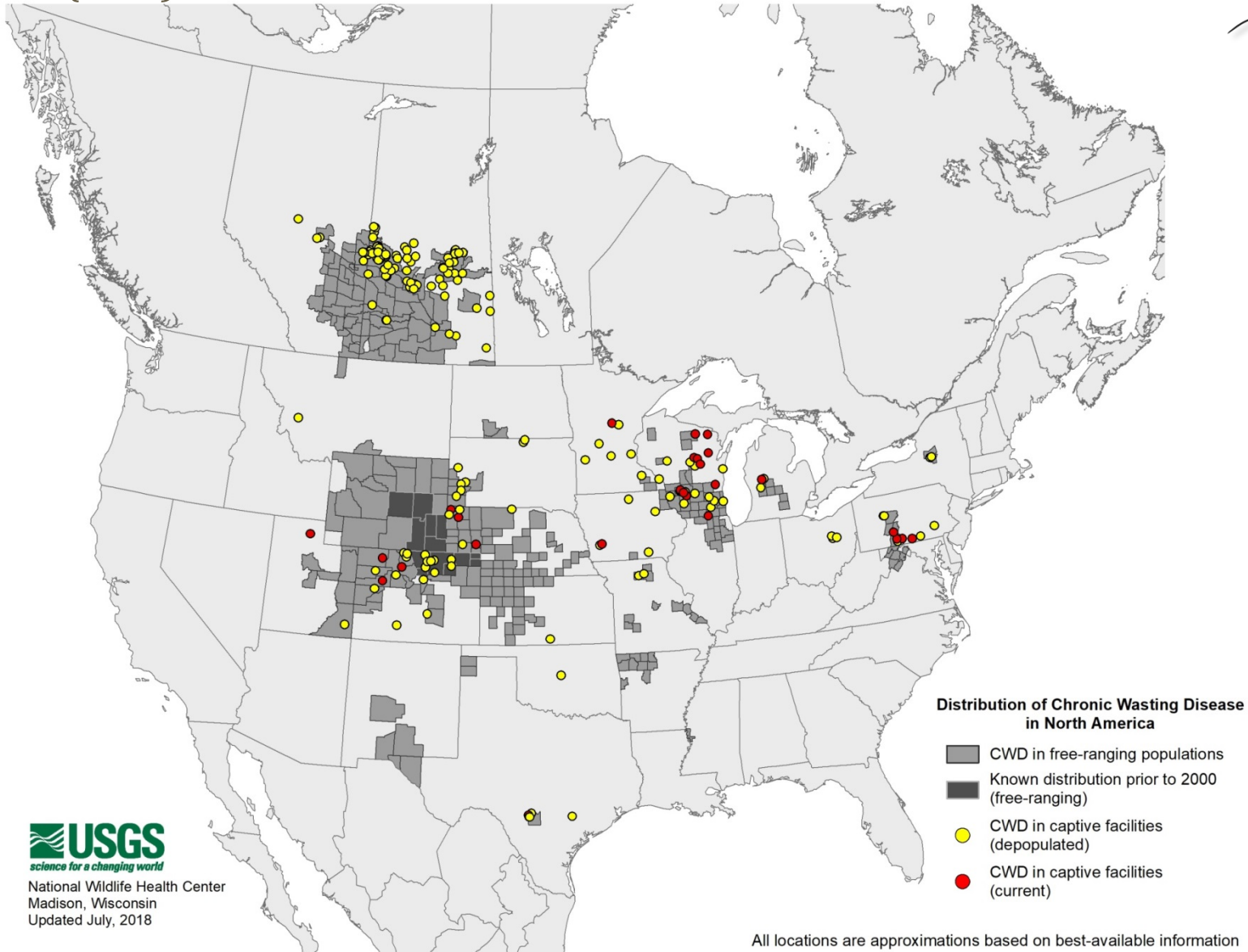


Disease Impacts

- Recent research has documented mortality and herd growth implications due to CWD. Examples:
 - Colorado, Mule deer, 25% prevalence rates (Miller et al. 2008)
 - Higher mortality rates; Population growth < 1 ; unhunted
 - Colorado, Elk. 13% prevalence rates (Monello et al. 2014)
 - 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

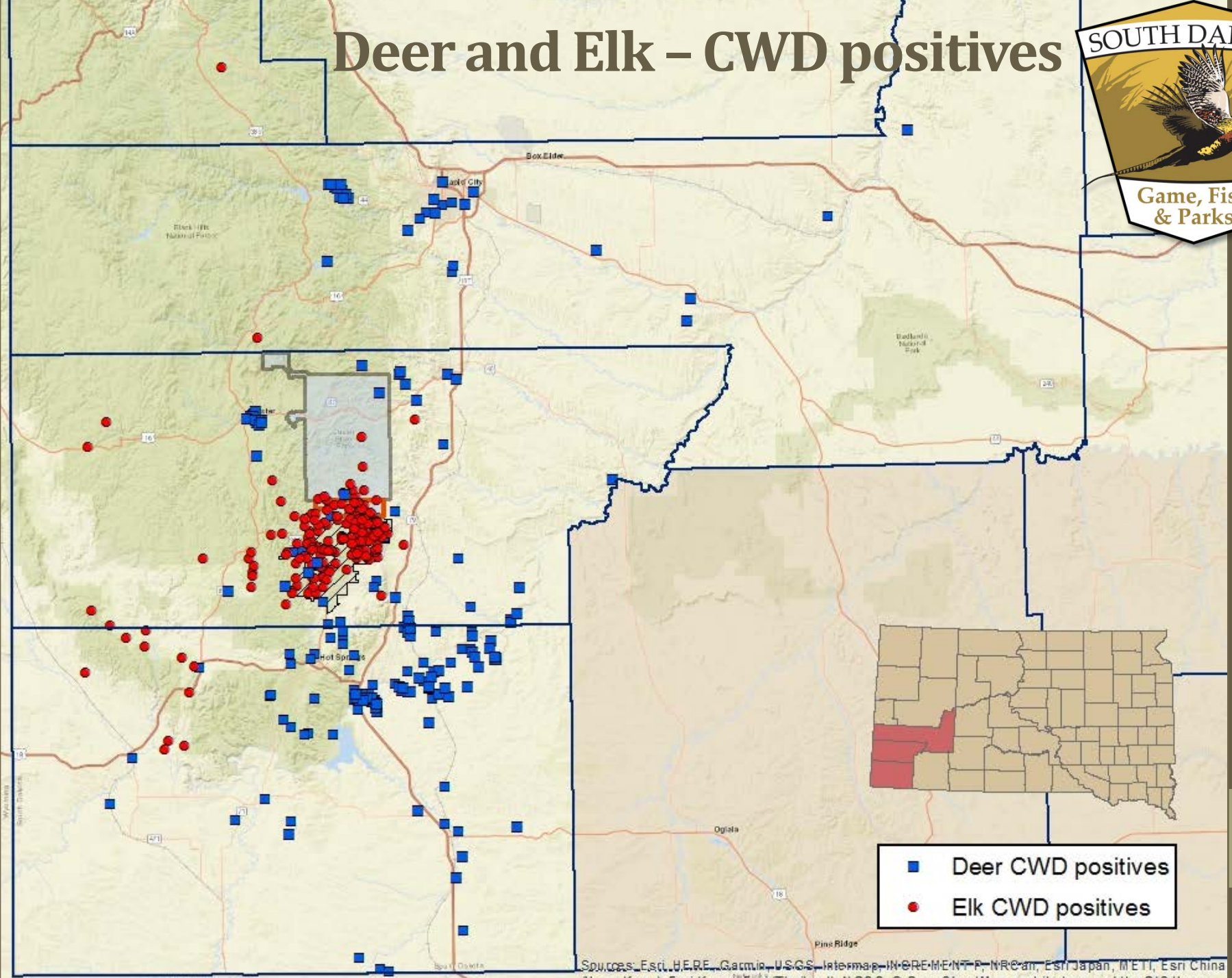
(2018)



National Wildlife Health Center
Madison, Wisconsin
Updated July, 2018

All locations are approximations based on best-available information

Deer and Elk – CWD positives



Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, © OpenStreetMap contributors, and the GIS User

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									



Mule Deer CWD Surveillance

MULE DEER												
CWD Prevalence Rates												
	Sick Surveillance				Hunter Harvest				Road kill/other			
	WICA	CSP	Black Hills	Prairie	WICA	CSP	Black Hills	Prairie	WICA	CSP	Black Hills	Prairie
2000/01--2012/13	0.0%	0.0%	6.7%	6.0%	0.0%	0.0%	0.1%	1.3%	7.2%		0.2%	1.1%
2013/14--2017/18			22.2%	22.6%			0.0%	20.0%	0.0%		0.0%	0.0%
current year 2017/18								0.0%			0.0%	0.0%
overall	0.0%	0.0%	9.3%	9.5%	0.0%	0.0%	0.1%	1.4%	7.1%		0.2%	1.1%
Sample sizes												
	Sick Surveillance				Hunter Harvest				Road kill/other			
	WICA	CSP	Black Hills	Prairie	WICA	CSP	Black Hills	Prairie	WICA	CSP	Black Hills	Prairie
2000/01--2012/13	5	2	45	116	3	2	964	3165	111	0	999	283
2013/14--2017/18	0	0	9	31	0	0	3	20	2	0	2	1
current year 2017/18	0	0	1	1	0	0	0	9	0	0	2	1
overall	5	2	54	147	3	2	967	3185	113	0	1001	284
updated 6/30/18												
*2018 fiscal year = 1 July 2017 - 30 June 2018												
Areas exclusive												

White-tailed Deer CWD Surveillance



WHITE-TAILED DEER

<i>CWD Prevalence Rates</i>												
	Sick Surveillance				Hunter Harvest				Road kill/other			
	WICA	CSP	Black Hills	Prairie	WICA	CSP	Black Hills	Prairie	WICA	CSP	Black Hills	Prairie
2000/01--2012/13	0.0%	0.0%	8.6%	3.6%		0.5%	0.1%	1.7%	3.1%	0.0%	0.5%	0.8%
2013/14--2017/18			43.8%	9.7%		11.1%	0.0%	16.3%	0.0%	0.0%	1.6%	0.0%
current year 2017/18			66.7%	40.0%		14.3%	0.0%	2.7%		0.0%	1.6%	0.0%
overall	0.0%	0.0%	14.4%	5.1%		0.9%	0.1%	2.1%	2.8%	0.0%	0.6%	0.7%
<i>Sample sizes</i>												
	Sick Surveillance				Hunter Harvest				Road kill/other			
	WICA	CSP	Black Hills	Prairie	WICA	CSP	Black Hills	Prairie	WICA	CSP	Black Hills	Prairie
2000/2001--2012/2013	1	2	81	225	0	219	5935	3085	65	6	2567	129
2013/2014--2017/2018	0	0	16	72	0	9	30	86	6	2	189	6
current year 2017/18	0	0	3	10	0	7	7	37	0	2	189	6
overall	1	2	97	297	0	228	5965	3171	71	8	2756	135
<i>updated 2/27/18</i>												
<i>*2018 fiscal year = 1 July 2017 - 30 June 2018</i>												
<i>Areas exclusive</i>												

Department Priority



The following was identified through the gap analysis and budgeting review process that took place in April at the Department strategic planning review session:

- *Enhance the department's efforts to manage Chronic Wasting Disease (CWD) in deer and elk across the state and launch a strategic communications plan to educate and inform public about the safety, risks and any new regulations.*

Department CWD Workgroup

Name	Position
Andy Lindbloom	Senior Big Game Biologist
Chad Lehman	Senior Wildlife Biologist
Chad Switzer	Wildlife Program Administrator
Emily Kiel	Communications Director
Jim McCormick	Regional Conservation Officer Supervisor
Joe Keeton	Conservation Officer
John Kanta	Regional Supervisor
Josh Delger	Regional Terrestrial Resources Supervisor
Kevin Robling	Special Projects Coordinator
Mark Hendrix	Custer State Park Resources Manager
Steve Griffin	Big Game Biologist
Tom Kirschenmann	Deputy Wildlife Director

GFP Commission representation and participation?

CWD Workgroup Activities



- Why now a priority?
 - New findings and suggested negative impact to population growth rates; updated prevalence rates; ensure viable populations of deer and elk; importance to hunters and their role in population management; etc.
- First meeting held June 20, 2018
- Discussed expectations and desired outcomes
- Identified five major objectives
 - Limit spread of CWD from known locations
 - Public Education
 - Determine CWD prevalence rates and thresholds for certain management actions
 - Determine presence/absence of CWD
 - Public involvement

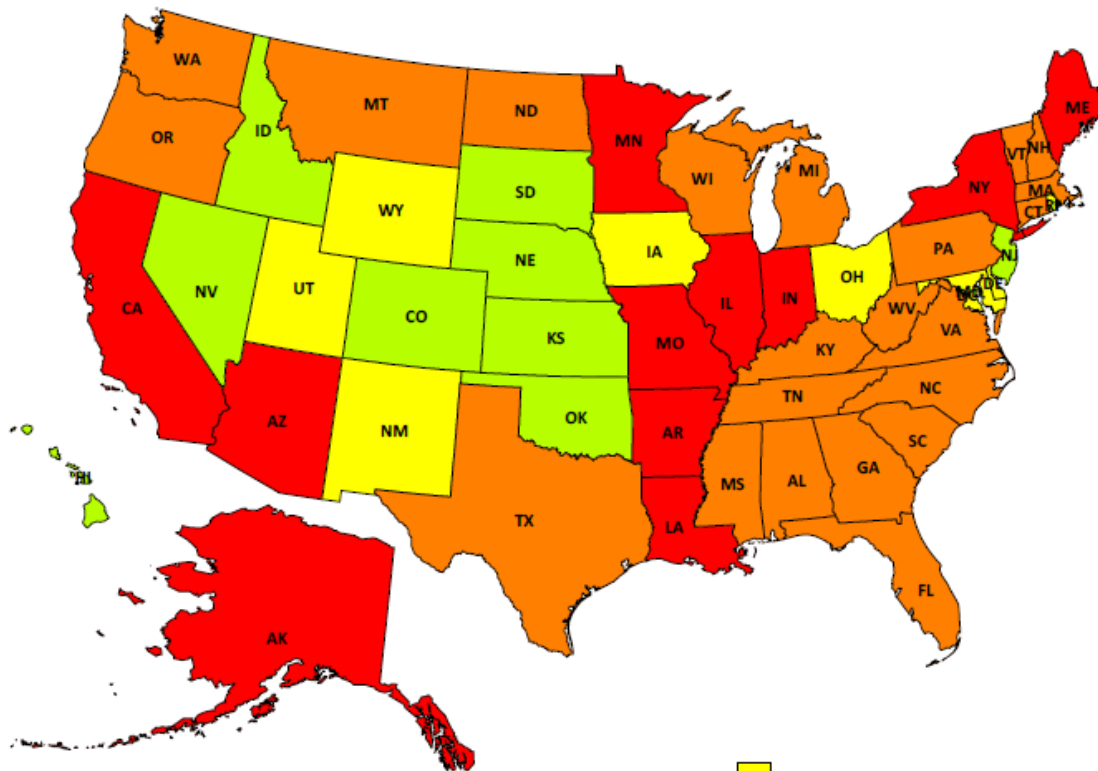
Limit Spread of CWD



- Interstate transportation rules
 - Several variations amongst states
 - Discussed limiting no high-risk parts, regardless of CWD status of exporting state. Travel through the state would be allowable.
- Intrastate transportation rules
 - Determine endemic areas
 - Find the proper balance between expectations on hunters and meaningful benefits of regulations to limit spread
 - Other: carcass disposal, landfills, taxidermists, etc.
- Baiting and feeding of wildlife
 - Review current laws/rules of other states
 - Educate public on the concentration of animals and potential risk of spreading disease
- Captive cervids
 - South Dakota Animal Industry Board
 - Increase collaboration and discussion on CWD concerns



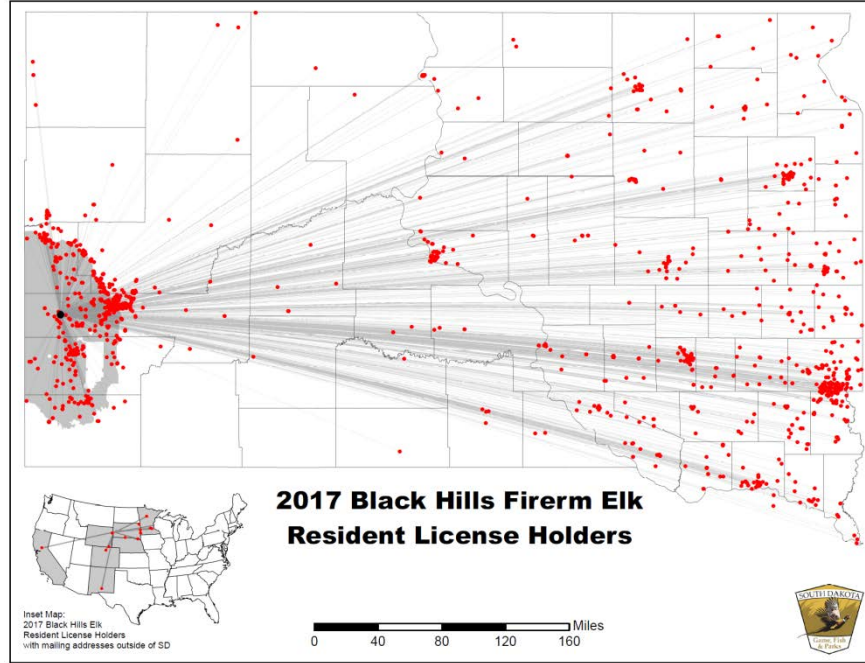
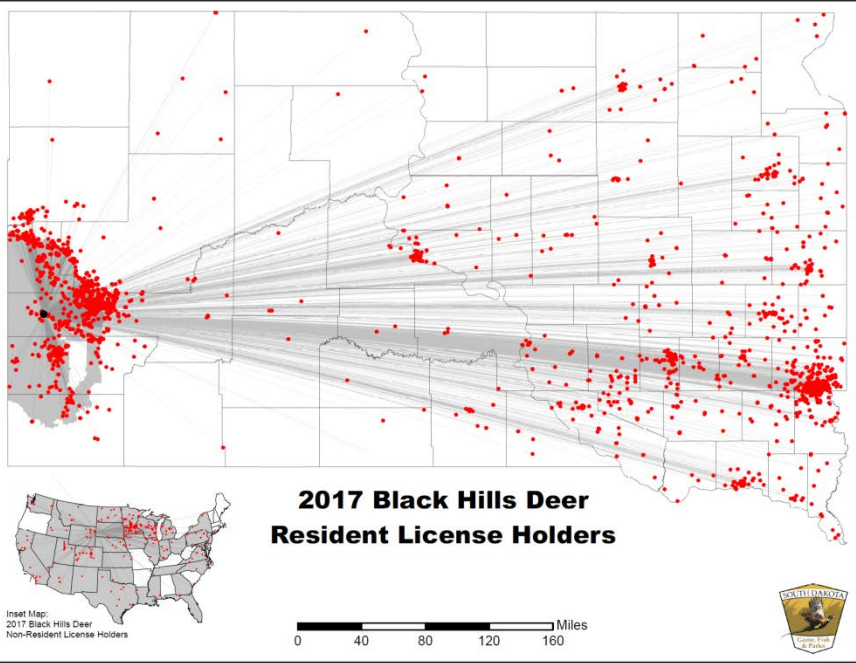
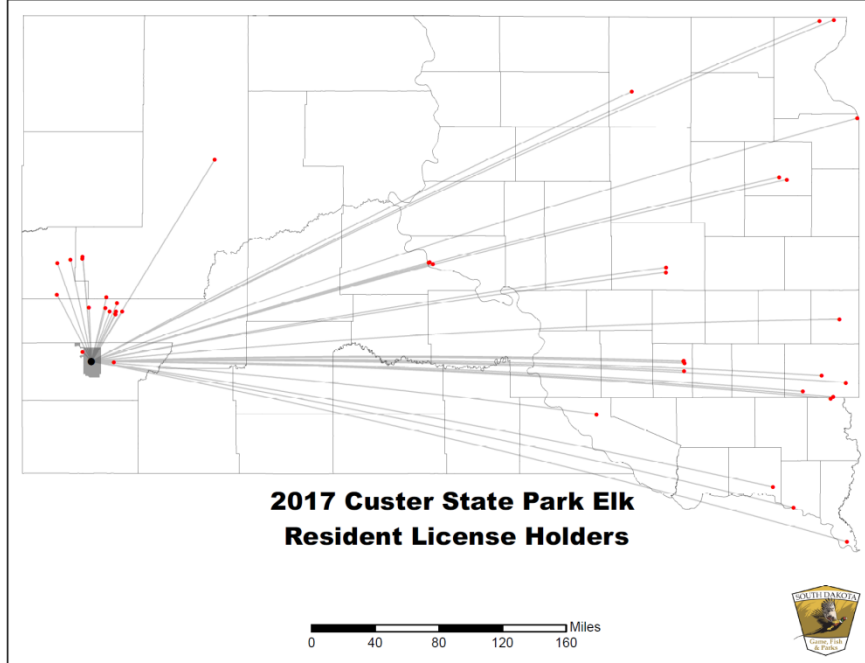
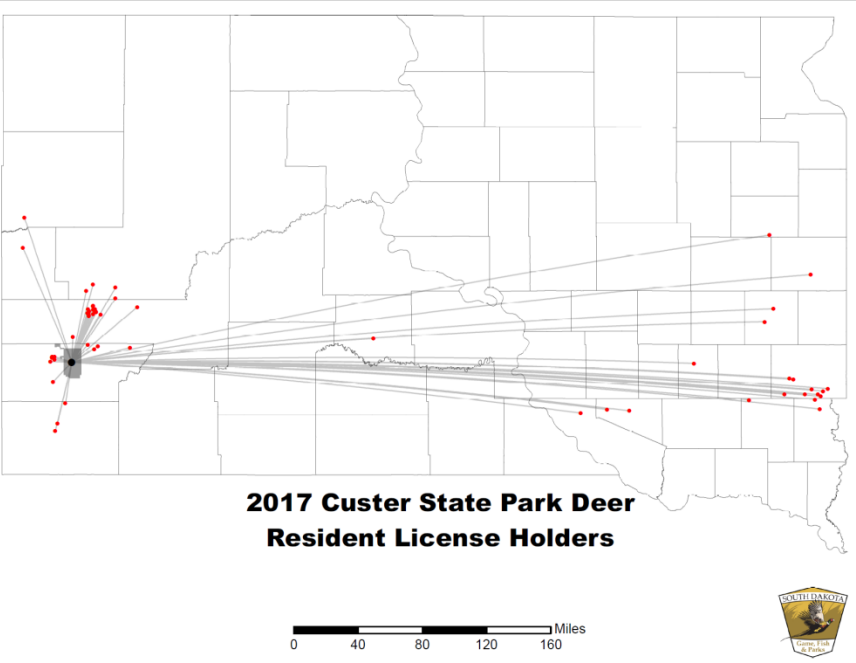
Rules Governing Interstate Transport of High-risk White-tailed Deer Carcass Parts^{1,2}

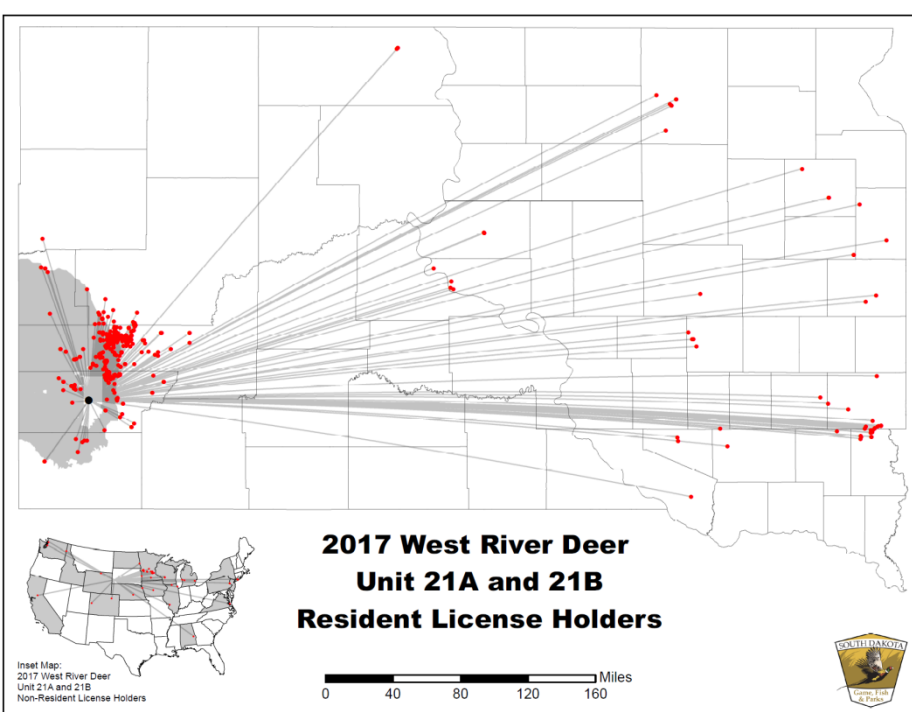


- No high-risk parts, regardless of CWD status of exporting state (11)
- Import rules apply to entire CWD-positive state, regardless of number or distribution of cases (22)
- Import rules apply to positive units only, not entire state (8)
- No rules restricting importation of high-risk parts (9)

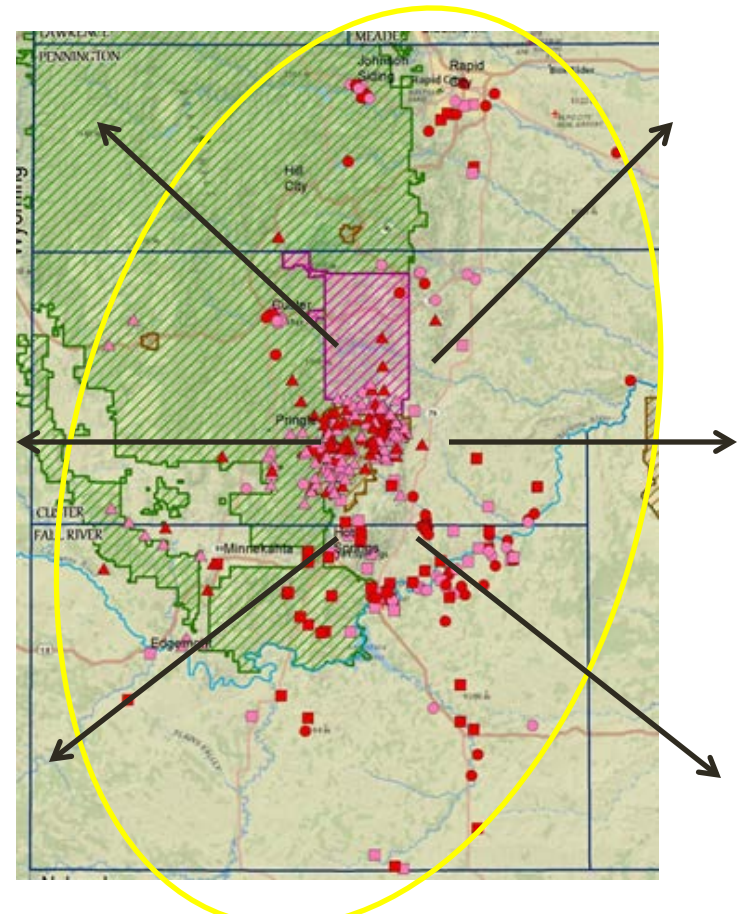
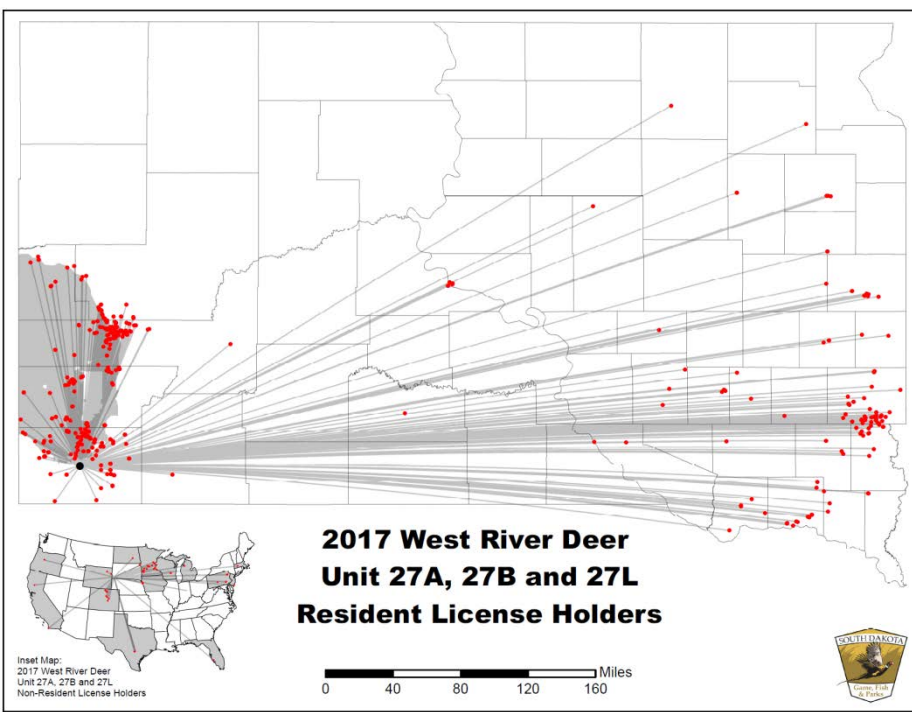
¹High risk carcass parts may include one or more of the following: head (brain, tonsils, eyes, lymph nodes), spinal cord, spleen, skull plate with attached antlers if visible brain or spinal cord is present, cape if visible brain or spinal cord is present, upper canine teeth if root structure or other soft material is present, any object or article containing visible brain or spinal cord material or brain-tanned hide.

²Consult state's website for complete rule details. Intended as a summary of general rules only.





In summary, there are thousands of deer and elk carcasses transported annually from known CWD areas to other parts of South Dakota and other states.



State/Province Rules & Regulations



- Currently reviewing the following information:
 - Agency jurisdiction over captive cervids
 - Standard state regulations
 - CWD regulations for captive cervids and wildlife
 - Status of new CWD regulations
 - CWD testing program for captive cervids and wildlife
 - Feeding and baiting regulations
 - Regulations on movement of animal parts
 - Locations of confirmed CWD positive captive cervids and free-ranging wildlife

Public Education



- An informed public is critical for the success of meeting desired outcomes of this disease management program
 - Similar to efforts related to aquatic invasive species (AIS) program
- Identified needs on GFP website to enhance and share information
- Develop a list of Frequently Asked Questions
- Need to explain what this disease means to the general public and hunters
- Inform our own department staff with a fact sheet and targeted email
- Work with meat processors, South Dakota Sportsmen Against Hunger, food pantries, etc.
- Use several outreach platforms share information, etc.

Determine CWD prevalence rates and thresholds for certain management actions



- Prevalence rates are desired to justify recommendations on management actions to GFP Commission and public
 - If the time and expense is put forth to obtain prevalence rates, Department should plan to do x, y, and z at certain thresholds.
- Determine sampling area: county vs. hunting unit vs. data analysis unit
- Determine sample size: use population model projections, review sampling protocols, etc. to help determine statistically valid sampling procedure
- How to obtain samples for testing?
 - Finalize approach for obtaining deer and elk samples from CSP seasons
 - Voluntary vs. mandatory
 - If mandatory, what are the repercussions for not complying?
 - Possibly coordinate with commercial meat processors and taxidermists to obtain additional samples



Determine presence/absence of CWD

- In those geographic areas where only sick surveillance has been completed, sample designated areas to determine presence/absence of CWD at a reliable level.
- Currently evaluating strategies, including sampling areas and sample size.
- Likely begin presence/absence surveillance in those areas adjacent to known areas with confirmed CWD.
- Once adjacent areas sampled at appropriate level, develop a sampling protocol for remainder of state.



Public Involvement

- CWD workgroup is using the Department's public involvement assessment tool to help guide level of public involvement.
- Department would welcome a couple of GFP Commissioners to attend future workgroup meetings.
- Will develop a formal communication and education plan.
- Aside from the general public and hunting community, other key players include:
 - SD Animal Industry Board, SD Dept. of Health, SD Dept. of Natural Resources, SD Dept. of Transportation, Conservation groups and organizations, SD Sportsmen Against Hunger and food pantries, taxidermists, commercial meat processors, Tribes, Governor's Office, and GFP Commission.



Summary

- Chronic wasting disease (CWD) is a fatal disease that could inhibit population growth of deer and elk in South Dakota.
- CWD cannot be eliminated, but we can take a proactive approach to limit its spread and possibly reduce prevalence rates.
- Management efforts will be more successful with an informed public and willingness to assist with surveillance efforts.
- Future management actions will benefit long-term health and sustainability of South Dakota's deer and elk populations.



Questions?