TESTIMONY OF BROCK WAHL
NORTH DAKOTA BACKCOUNTRY HUNTERS AND ANGLERS
SENATE BILL 2137
HOUSE ENERGY AND NATURAL RESOURCE COMMITTEE
January 17, 2025

The North Dakota Chapter of Backcountry Hunters and Anglers recommends a **Do Not Pass** on Senate Bill 2137 of the 69th legislative assembly. This bill would strip authority from the North Dakota Game and Fish to implement their CWD Management Plan by prohibiting the Game and Fish from banning baiting practices. Just like the 2023 baiting bill (HB1151) we view this as ballot box biology.
While our chapter does not have a stance on baiting ethics, we do have a stance on legislation or ballot initiatives that seek to restrict or control the ability of the wildlife professionals to fulfill their statutory and constitutional duties. Duties that require them to manage for sustainable populations of wildlife for current and future generations, and as stated in Article XI, Section 27 of the North Dakota Constitution,
"**Hunting, trapping, and fishing and the taking of game and fish are a valued part of our heritage and will be forever preserved for the people and managed by law and regulation for the public good**."

The public trust doctrine, supported by over a century of federal case law, makes it clear that all North Dakotans own the wildlife. This is codified in North Dakota Century code Section 20.1-03-03,
"The ownership of and title to all wildlife within this state is in the state for the purpose of regulating the enjoyment, use, possession, disposition, and conservation thereof, and for maintaining action for damages as herein provided." and **"The state has a property interest in all protected wildlife. This interest supports a civil action for damages for the unlawful destruction of wildlife by willful or grossly negligent act or omission."**

Our fellow North Dakotans at the Game and Fish act as our trustees and it is their responsibility to manage the public's trust assets (the wildlife), for the benefit of the trust corpus and all beneficiaries, both alive and unborn. With that in mind, this is not a private property rights issue; this is about publicly owned wildlife, making this a public property rights issue. And the hunting practices of a single user group do not outweigh what is beneficial for the entire public resource or the beneficiaries. Allowing baiting practices to continue in the face of a contagious and 100% fatal disease is not responsible care of our wildlife assets. We believe it is not only responsible, but necessary for the department to ban baiting practices where chronic wasting disease is found.
This bill would effectively undo over 15 years of management by the North Dakota Game and Fish to slow the spread of CWD. Since the first CWD positive deer was found in 2009, the department has spent 6 million dollars on 500 hay yard projects for landowners, to help keep animals from congregating on silage piles, hay yards, and other alternative food sources.

There is no doubt that baiting practices contribute to the spread of chronic wasting disease. Infectious prions can be found in man placed mineral licks, in the soil around those mineral licks, on feeders, and in bait piles. Research efforts have repeatedly demonstrated horizontal and environmental transmission in animals that have prolonged and repeated contact with infectious materials. Research in Saskatchewan, Michigan, and Mississippi has found that man placed food sources represent by far, the largest aggregation of cervids and leads to the most focal contact with their environment. In other words, there is no activity that congregates deer more, putting them in direct contact with other deer and potentially contaminated environments, than artificial food sources. More than natural winter herding, natural food sources, bedding, and even breeding behaviors. Additionally, there are no examples of high prevalence rates of CWD within a deer herd not having negative impacts to that population. Some are less significant, others more severe and dramatic, but all impacts are negative. This is backed up by multiple population studies GPS collaring thousands of deer.

While we sympathize with the hunters this change affects, and we understand changing long held practices can be difficult, the resource must come first. With over half the states in the nation having banned baiting and feeding of wildlife, we are confident that North Dakota hunters will adapt and overcome to be successful in the field just like the other states. We understand that baiting bans alone will not stop CWD, that deer do naturally congregate, and some of those natural occurrences will never be a variable managers can control in wild animals. But we also believe it is disingenuous to suggest that hundreds of bait piles and feeders on the landscape, being replenished repeatedly throughout the year, does not directly exacerbate the spread of CWD.

While we were disappointed to see the Department's concessions over the 2023 baiting bill, we understand their desire to try and work with hunters as best they can. While the ND Game and Fish department cannot ban feeding, unless for purposes of hunting, we agree that banning baiting where CWD is found removes the incentive to feed and will also lead to a reduction in feeding. It is our stance that the department does have the legal authority to ban feeding, and we would support joining a majority of the states in the nation and implementing a feeding ban in the units that are under baiting restrictions.

This bill is not in the best interest of the deer held in public trust, or the North Dakota public hunters who are beneficiaries of that trust. The North Dakota Chapter of Backcountry Hunters and Anglers finds S.B. 2137 to be in direct violation of the North Dakota constitution, the North Dakota century code, the North American Model of Wildlife Conservation, the mission of the North Dakota Game and Fish, and a breach of the public trust doctrine.

We strongly oppose S.B. 2137

Board of Directors
North Dakota Chapter of Backcountry Hunters and Anglers
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Non-infectious vs infectious Prions

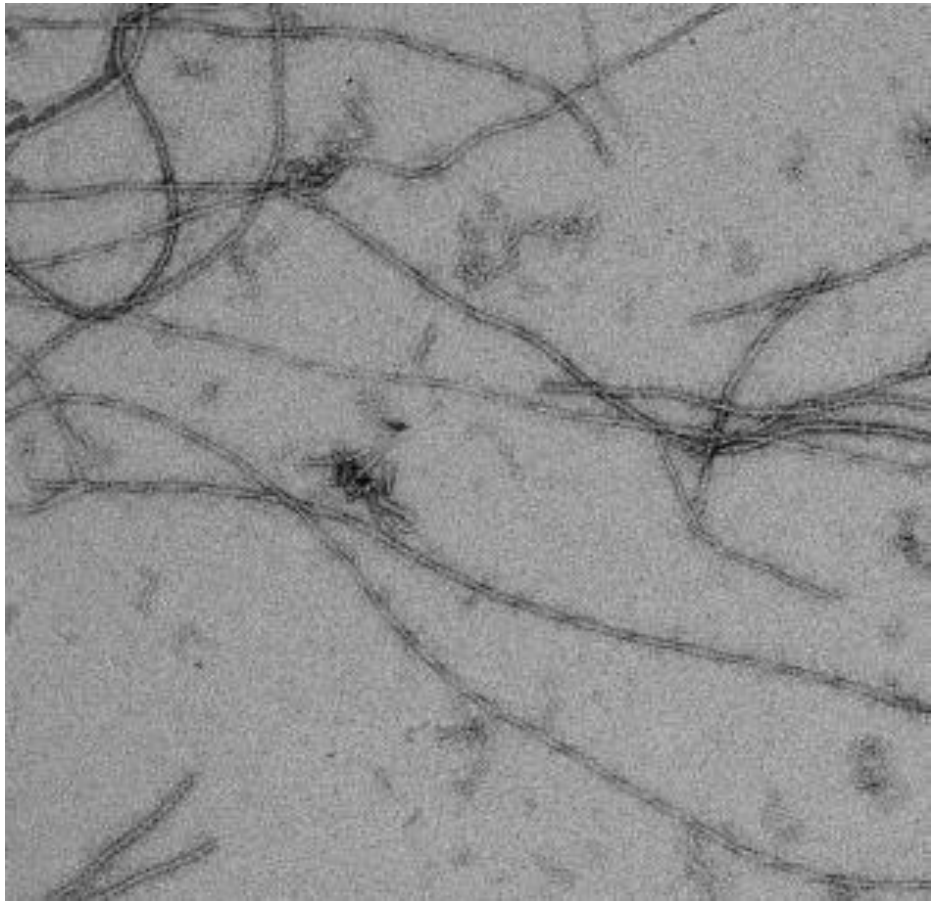
No human or animal has ever recovered from, or survived, a prion disease. Ever.

Case Western Formal Paper click link

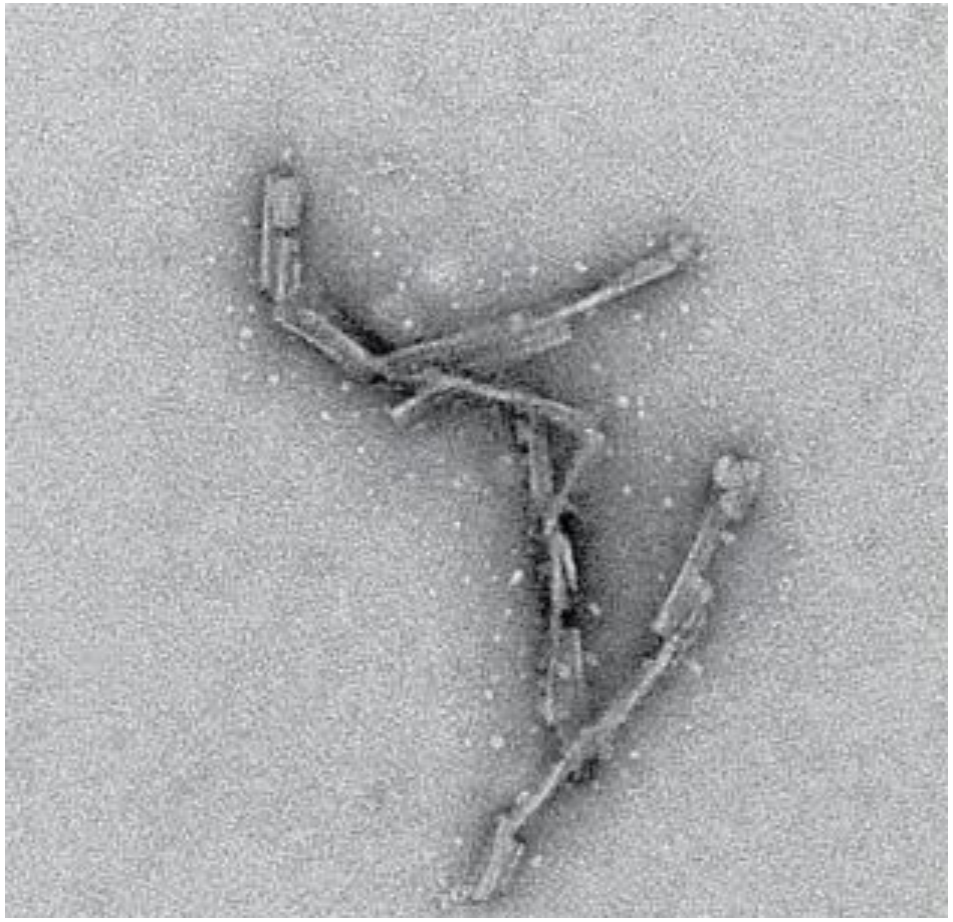
Case Western Atomic imaging of Prion click link

Non-infectious vs Infectious Protein Click link

Non-infectious Cellular Prion Protein (Required for prion infection) converted by infectious proteins.



Infectious Prion Protein



Wisconsin GPS Collar Research Project

- Doe
- Captured on 1/09/2017, 6 ½ years at capture
- CWD- at capture
- 165 lbs at capture, body condition score 5/10
- Recaptured on 2/04/2019
- CWD+ at recapture
- 164 lbs at capture, body condition score 7/10
- Died on 3/25/2019
- 90 lbs at death
- Lost 74lb, 45% body weight in 49 days
- 1.5 lbs per day
- CWD+ at death
- Lab necropsy
  - Severe emaciation, pneumonia

Wisconsin GPS Collar Research Project

- Doe
- Captured on 2/27/2017
- CWD+ at capture
- Est. 170 lbs at capture, body condition score 7/10
- Died on 5/29/2017
- Fell down hill
- 4 years of age at death
- 106 lbs at death
- Lab necropsy
  - Severe emaciation, pneumonia
  - Mummified fetus

Wisconsin GPS Collar Research Project

- Doe
- Collared 12/28/2017 ~3 ½ years of age
- CWD negative at capture
- 118 lbs at capture, body condition score of 0/10
- Died 02/14/2018
- CWD-positive at death
- Lab necropsy:
  - Severe emaciation
  - "The rumen contains a large amount of feed material…"
  - "Severe emaciation with adequate feed intake."
- 78 lbs at death
- Loss of 40 lbs, ~33% body weight

- Doe
- Captured on 3/13/2017
- CWD+ at capture
- Died on 8/12/2017
- Carcass consumed

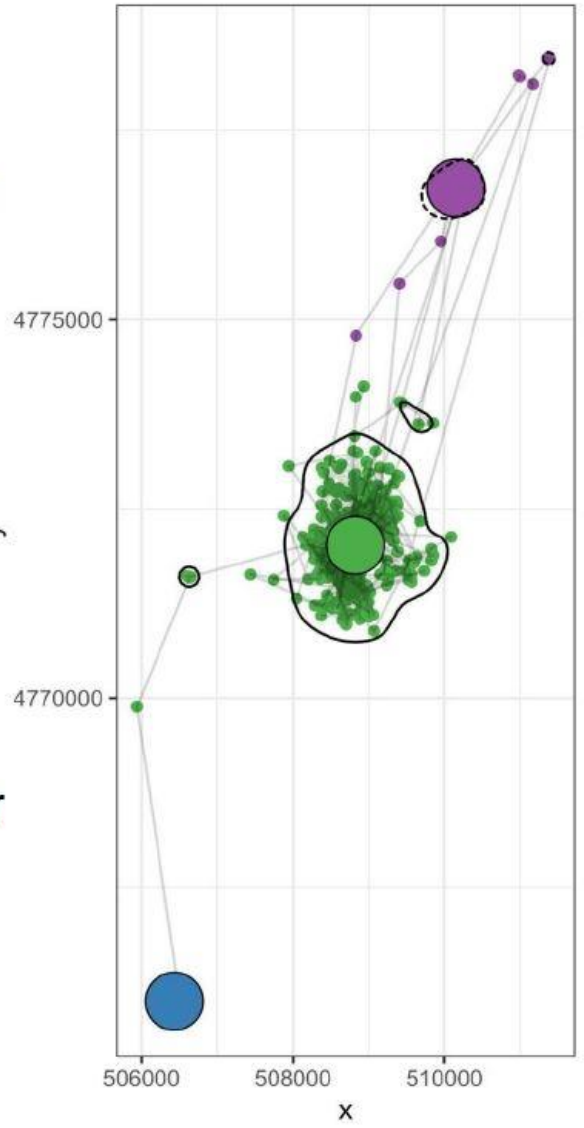
Wisconsin GPS Collar Research Project

Wisconsin GPS Collar Research Project

- Doe
- Collared 12/19/2019 as ~20 months old
- 129 lbs at capture, body condition score of 10/10
- CWD-negative at capture
- Died 7/06/2022
- 50 yards from house; Landowner saw “extremely skinny and sick looking” days prior to death
- 76 lbs at death
- 53 lb, 41% loss
- CWD-positive at death
- Lab necropsy:
  - Severe emaciation
  - Mild pneumonia

Wisconsin GPS Collar Research Project

- Born spring 2018
- Collared January 2020 as ~20 months old (20mo age class)
- CWD-positive at capture
- Died 9/29/2020
- Emaciated
- CWD-positive at death
- No necropsy as landowner did not want carcass removed



Wisconsin GPS Collar Research Project – CWD positive doe

Hunter reported end stage white tailed deer

Arkansas end stage 2 yr old elk

Arkansas end stage doe

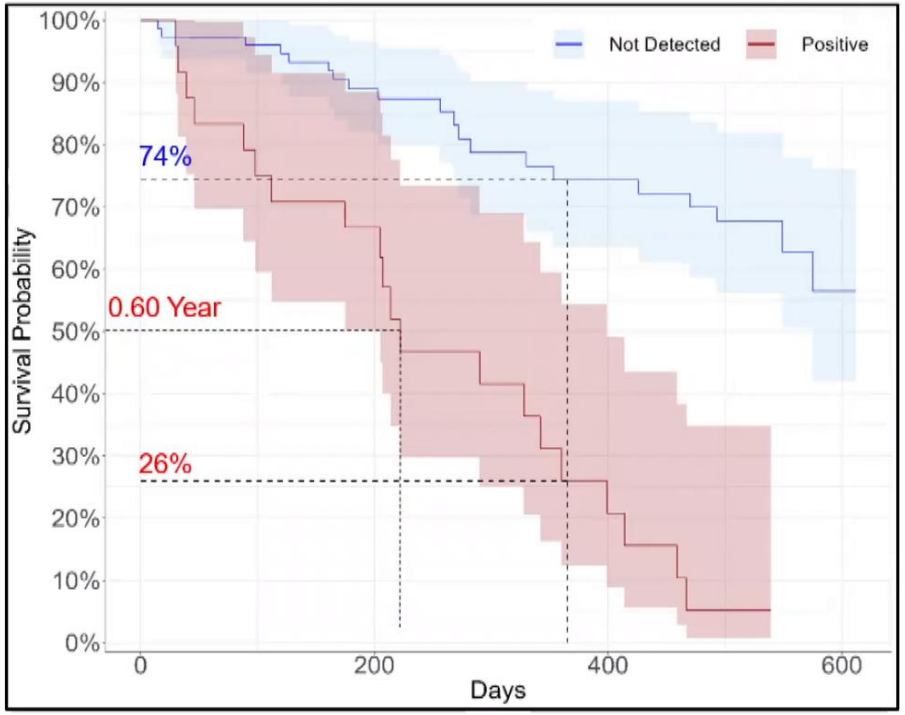
Arkansas end stage doe

Arkansas Research – GPS Collared Deer

"34% of positive animals dying of no other cause other than late stage CWD."

-Dr. Jenn Ballard, Arkansas Veterinarian

Survival



At 1 year, positive animals are half as likely to be alive, with a 26% chance of survival.

By 500 days, ~5% chance of survival for positive animals vs negative animals at ~70%

CWD-Cause-Specific

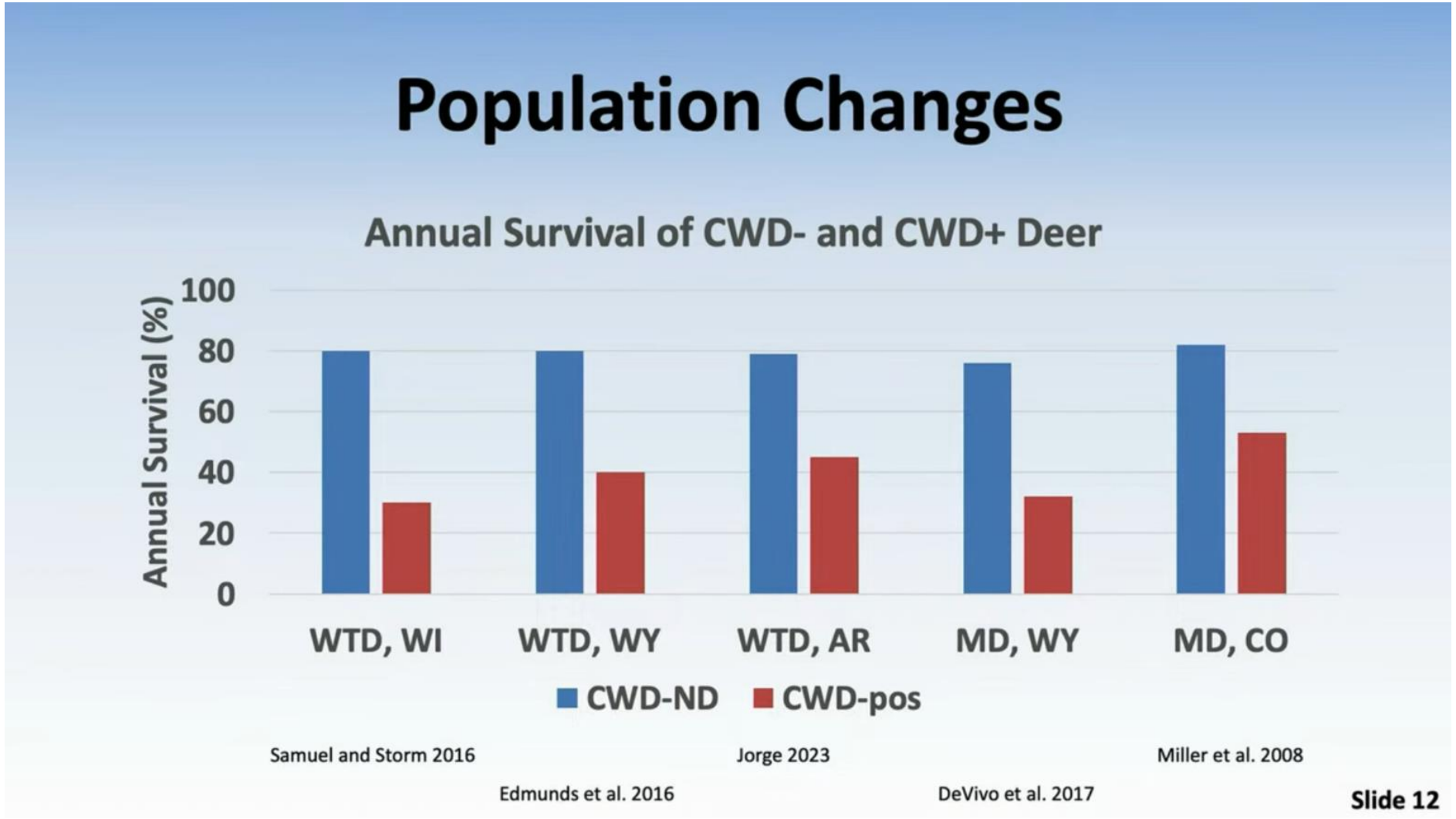
CWD	Coyote	Bobcat	Bear	Harvest	CWD	Disease	Abnormal	Other
Positive	13%	7%	0%	24%	34%	4%	10%	7%
Not Detected	28%	10%	3%	28%	0%	10%	0%	21%

= 100%

= 100%

Population impacts

Negative impacts to populations at high prevalence…. ALWAYS!



Wyoming Outfitter gives up on Deer outfitting due to CWD

Riverton-area outfitter Ken Metzler in September 2022. (Mike Koshmrl/WyoFile)

"Based on hunter observation, landowner observation and [Game and Fish] personnel observation," Gregory said, "we're not seeing the deer that we used to."

Ken Metzler had a front-row seat to the crash. When WyoFile first discussed CWD's impacts with the Riverton-area outfitter in late 2021, he estimated that his deer hunting operation had fallen off by 80%. Virtually every animal his paid hunters killed on leased agricultural hunting grounds — 98%, he estimated — tested positive for the disease.

Nearly three years later, Metzler reported that he's given up on his commercial deer hunting operation altogether.

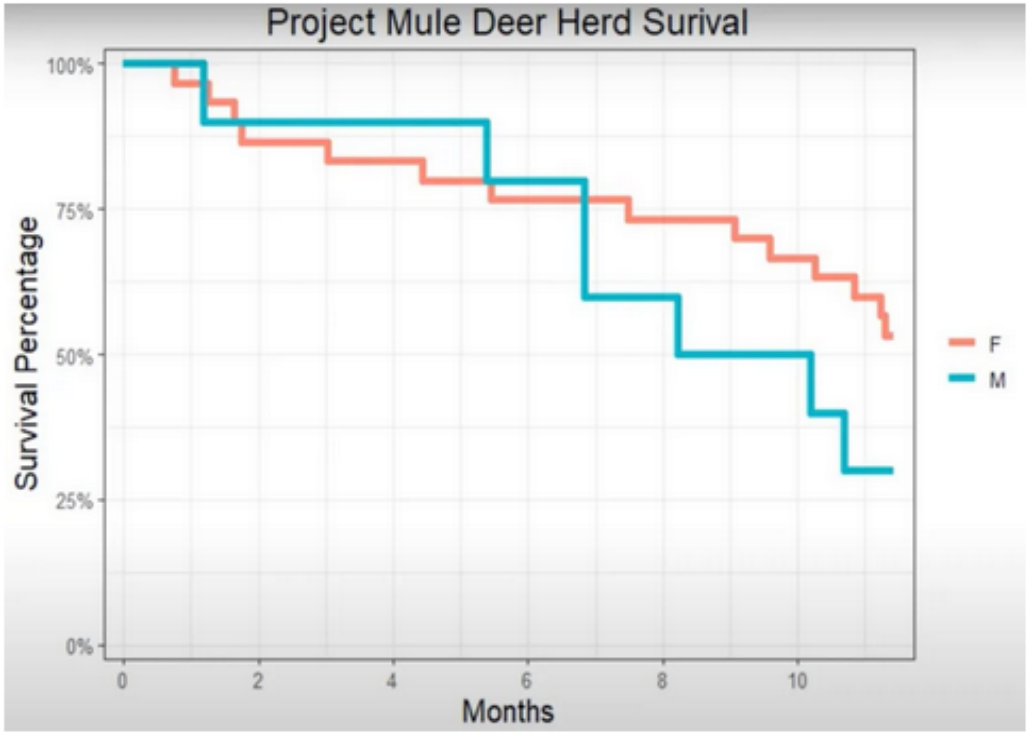
"We're pretty well shut down," he said. "I'm not booking any deer hunters. I can't promise something that isn't there."

The 67-year-old outfitter has witnessed the Project Herd cycle in the past, and he retains some hope that it'll bounce back.

"It's getting worse right now, but it'll turn around a little bit," Metzler said. "If it comes back, it comes back — but it's not looking too good right now, that's for sure."

Wyoming Outfitter gives up on Deer outfitting because of CWD cont…

horrendous rates that threaten to wipe out the herd. Typically, adult doe mule deer have about an 85% chance of surviving any given year. In the Project Herd, however, only half of the first cohort of 30 GPS-collared does lived through their first 12 months as a research deer. The bucks, more prone to CWD, fared worse. Three out of the 10 tracked males were still breathing after one year, but by the time WyoFile rendezvoused with Russell some 15 months into the study, 90% were dead. A single buck remained.



(Wyoming Game and Fish Department)

At 12 months

15 out of 30 does dead from
3 out of 10 collared bucks dead

At 15 months

9 out of 10 bucks dead

Infectious Prions in the Saliva and Blood of Deer with Chronic Wasting Disease

Article *in* Science · November 2006
DOI: 10.1126/science.1132661 · Source: PubMed

Prions in Saliva

Animal cohort	*n*	Inoculum	Route (*n*)	Amount	No. of inoculations
1	3	Blood	IV (1), IP (2)	250 ml	1
2	3	Saliva	PO (3)	50 ml	3
3	3	Urine and feces	PO (3)	50 ml + 50 g	3 to 14
4	4	Brain	IC (2), PO (2)	1 g (IC), 10 g (PO)	1 (IC), 3 (PO)
5	2	All of the above	PO (2)	All of the above	1 to 14

Table 1. CWD prion bioassay inoculation cohorts. Cohort 1 fawns received either a single intraperitoneal (IP) inoculation of 250 ml of frozen citrated blood ($n = 2$) or an intravenous (IV) transfusion with 250 ml fresh citrated whole blood ($n = 1$) each from a single CWD+ donor. Cohort 2 fawns received a total of 50 ml saliva, each from a different CWD+ donor, orally (PO) in three doses over a 3-day period. Cohort 3 fawns received a total of 50 ml urine and 50 g of feces PO, each from a different CWD+ donor, in divided doses over a 3- to 14-day period. As positive controls, cohort 4 fawns were inoculated with a 10% brain homogenate from a CWD+ donor deer through either a single intracranial (IC) injection of 1 g equivalent of brain ($n = 2$) or PO with a total of 10 g equivalents of brain ($n = 2$) divided over a 3-day period. Cohort 5 fawns ($n = 2$) were inoculated with equivalent amounts of each of the above materials from a single CWD-negative donor deer to serve as negative controls for the study.

Table 2. PrP^{CWD} detection by longitudinal tonsil biopsy and necropsy of deer exposed to body fluids or excreta from CWD+ deer. PrP^{CWD} assay results for tonsil (T), brain (B) (medulla oblongata at obex), and retropharyngeal lymph node (RLN) are shown. The number of deer in which PrP^{CWD} was detected (*8*) is shown over the total number of deer in the cohort. One of the three original animals inoculated with urine and feces was euthanized prematurely 61 days pi due to a bacterial infection. The deer in cohorts 1, 2, and 3 were terminated at 18 months (mo.) pi. Two of the four cohort 4 deer were terminated at 20 and 21 months pi. The two cohort 5 deer were terminated at 22 months pi.

Animal cohort	Inoculum	Biopsy collection			Termination		
		3 mo. (T)	6 mo. (T)	12 mo. (T)	T	B	RLN
1	Blood	0/3	0/3	2/3	3/3	2/3	3/3
2	Saliva	0/3	0/3	2/3	3/3	2/3	3/3
3	Urine and feces	0/2	0/2	0/2	0/2	0/2	0/2
4	Brain	1/4	2/4	4/4	2/2	2/2	2/2
5	Negative samples	0/2	0/2	0/2	0/2	0/2	0/2

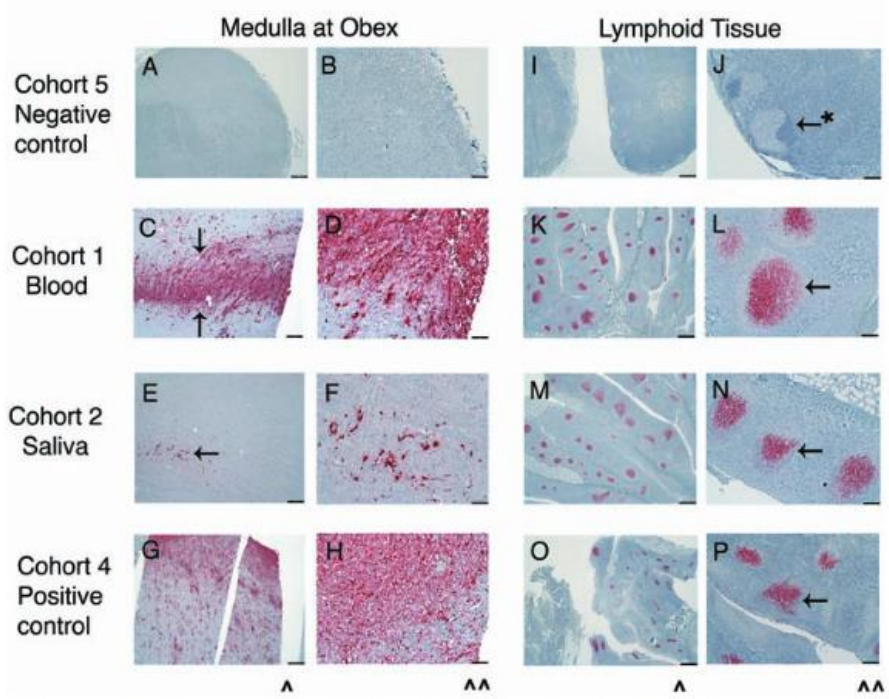


Fig. 1. PrP^{CWD} demonstrated by immunohistochemistry in tonsil, brain (medulla oblongata at obex), and retropharyngeal lymph node of deer receiving saliva or blood from CWD-infected donors. CWD immunohistochemistry is shown in the medulla at obex (**A** to **H**) and either tonsil or retropharyngeal lymph node (**I** to **P**) (*8*). Arrows indicate PrP^{CWD} staining (red) within brain and lymphoid follicles. Arrow with asterisk indicates lymphoid follicle negative for PrP^{CWD}. ^, scale bar = 550 μm; ^^, scale bar = 110 μm.

Very low oral exposure to prions of brain or saliva origin can transmit chronic wasting disease

Nathaniel D. Denkers[1], Clare E. Hoover[2], Kristen A. Davenport[3], Davin M. Henderson[1], Erin E. McNulty[1], Amy V. Nalls[1], Candace K. Mathiason[1], Edward A. Hoover[1]*

Dosage Dependent Prolonged and repeated Exposure to infect deer

- **Study done on white-tailed deer**
- **Cohort 4,5,6 – Saliva inocula**
  - **Cohort 4** – **3 X 10ml** dose of Saliva from a Positive Animals
    - Approx. 1 shot glass divided into 3 doses
  - **Cohort 5** – **10 X 1.65 ml** doses of saliva
    - **½ Shot glass divided into 10 doses**
  - **Cohort 6** – **One concentrated 16.5 ml** dose
  - **Cohort 7** – Negative control (Negative brain or saliva)

Cohort 4 (n = 4): 300 ng brain pool equivalent saliva (SP1+), administered as 3, 100 ng doses in 3 consecutive weeks. Each dose was contained in 10 ml of pooled saliva (total dose = 300 ng contained in 30 ml).

Cohort 5 (n = 4): 300 ng brain pool equivalent saliva (SP2+), administered as 10, 30 ng doses over 12 weeks. 30 ng doses were given once a week for 5 consecutive weeks, followed by a 4-week interval to ensure anesthesia safety, then resumed as weekly 30 ng doses for 5 consecutive weeks. Each dose was contained in 1.65 ml of pooled saliva (total dose = 300 ng contained in 16.5 ml).

Cohort 6 (n = 4): 300 ng brain pool equivalent saliva (SP2+), administered as a single 16.5 ml dose (total dose = 300 ng contained in 16.5 ml)

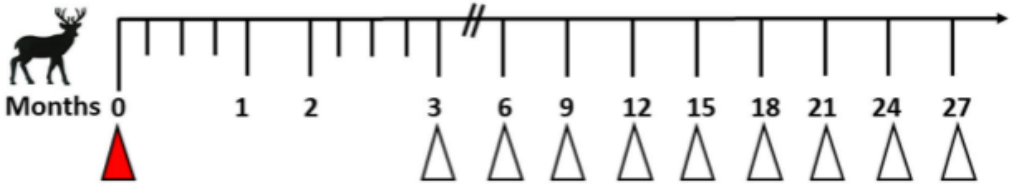
Cohort 7 (n = 2): 300 ng CWD-negative brain and 300 ng CWD-negative saliva, administered together as 10, 60 ng doses (30 ng each) over 12 weeks. 60 ng doses were given once a week for 5 consecutive weeks, followed by a 4-week interval to ensure anesthesia safety, then resumed as weekly 60 ng doses for 5 consecutive weeks. Each dose contained 30 ng CWD-negative brain contained in 3 ml - 1XPBS and 30 ng negative saliva contained in 1.65 ml (total dose = 600 ng contained in 46.5 ml).

Very low oral exposure to prions of brain or saliva origin can transmit chronic wasting disease

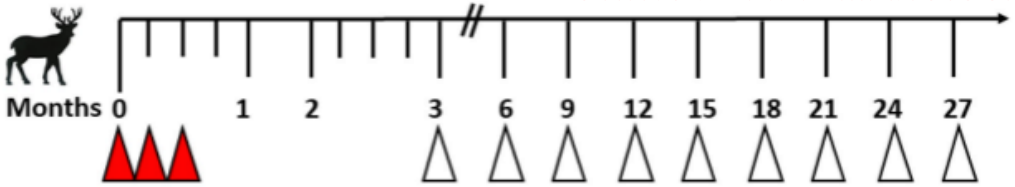
Nathaniel D. Denkers[1☯], Clare E. Hoover[2☯], Kristen A. Davenport[3], Davin M. Henderson[1], Erin E. McNulty[1], Amy V. Nalls[1], Candace K. Mathiason[1], Edward A. Hoover[1*]

Dosage Dependent Prolonged and repeated Exposure to infect deer

Cohort 1: 1 mg brain (CBP6)
Cohort 6: 300 ng saliva equivalent (SP2+) **Cohort 6 = 1 x 30ml doses saliva**



Cohort 2: 3 x 100 ng brain (CBP6)
Cohort 4: 3 x 100 ng saliva equivalent (SP1+) **Cohort 4 = 3 x 10 ml doses saliva**



Cohort 3: 10 x 30 ng brain (CBP6)
Cohort 5: 10 x 30 ng saliva equivalent (SP2+) **Cohort 5 = 10 x 1.65 ml doses saliva**
Cohort 7: 10 x 30 ng (-) brain/saliva equivalent (SP3-)

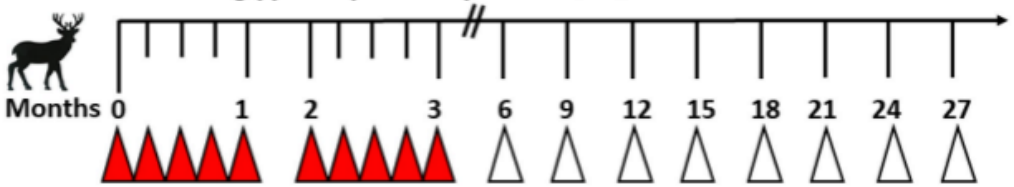


Fig 2. **Experimental design of the current cohorts in this study.** Solid triangles represent inoculation timepoints (0–12 weeks); open triangles represent longitudinal tissue biopsy collections to monitor for CWD (3–27 months).

Cohort (Source)	Dose (Regimen)	Months Post Exposure (MPE): 3 6 9 12 15 18 21 24 27
1 (Brain)	1 mg (single)	
2 (Brain)	300 ng (100 ng x 3)	
3 (Brain)	300 ng (30 ng x 10)	
4 (Saliva)	300 ng (100 ng x 3)	
5 (Saliva)	300 ng (30 ng x 10)	
6 (Saliva)	300ng (single)	
7 (Brain/Saliva)	300 ng each (60 ng x 10)	

= IHC (-) = IHC (+) = Deceased

Fig 3. Longitudinal profile of tonsil biopsy results indicating when each deer in all 7 cohorts became IHC+ (purple box) or deceased (black box).

Cohort 3,5,7 small doses - All remain negative

Infectious Prions in Pre-Clinical Deer and Transmission of Chronic Wasting Disease Solely by Environmental Exposure

Candace K. Mathiason[1], Sheila A. Hays[1], Jenny Powers[2], Jeanette Hayes-Klug[1], Julia Langenberg[3], Sallie J. Dahmes[4], David A. Osborn[5], Karl V. Miller[5], Robert J. Warren[5], Gary L. Mason[1], Edward A. Hoover[1]*

Saliva (cohort 2). Each of the 3 deer in this cohort received saliva from pre-clinical CWD+ donors that were 6 to 13 months pi (Tables 1, 2). PrP^{CWD} was detected in tonsil of 1 of the 3 inoculated deer at 12 months pi, but not at earlier time points. By 19 months pi, study termination, a second animal was CWD+, by detection of PrP^{CWD} in brain and lymphoid tissue. The remaining deer was of necessity terminated at 16 months pi due to unmanageable aggressive behavior. This animal was CWD negative as determined by extensive western blot and IHC analysis (Figs. 1, 2).

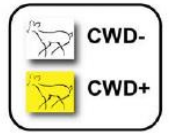
Environmental exposure (cohort 4). The two animals in this cohort were exposed to daily introductions of feed buckets, water, and bedding removed from pens housing deer transitioning from pre-clinical to clinical phases of the disease (Table 1, 2). One of 2 exposed deer became tonsil biopsy PrP^{CWD}-positive at 15 months pi. At study termination, 19 months pi, both animals were CWD+ (Figs. 1, 2).

Table 1. CWD bioassay inoculation cohorts.

Animal cohort	*n*	Inoculum	Route of inoculation	Dosage (total volume)	No. of inoculations
1	3	Whole blood	IV	1 (225 ml)	1
2	3	Saliva	PO	10 ml/day for 5 days (50 ml)	5
3	3	Urine and Feces	PO	90 daily doses (85 ml+112.5 gr)	90
4	2	Environmental contact[a]	PO	19 mos. continuous exposure	Refreshed daily for 570 days (19 mos.)
5	4	Brain	PO	1 gr/day for 5 days (5 gr)	5

[a]Water, feed buckets and bedding from CWD+ deer suites.

doi:10.1371/journal.pone.0005916.t001



Cohort	3 mo.	6 mo.	T^e 12 mo.	T^eB^f RLN^g Terminal[h]	n+/ total n
Blood (cohort 1)	0/3	0/3	2/3	3/3	3/3
Saliva (cohort 2)	0/3	0/3	1/3	2/3	2/3
Urine/Feces (cohort 3)	0/3	0/3	0/3	0/3	0/3
Environment only (cohort 4)	0/2	0/2	0/2	2/2	2/2
Pos. control (cohort 5)	0/4	2/4	4/4	4/4	4/4

T^e=tonsil, B^f=Brain at obex, RLN^g=Retropharyngeal lymph node, [h]= euthanasia dependent upon clinical disease progression or space availability, X= animal euthanized for reason other than CWD.

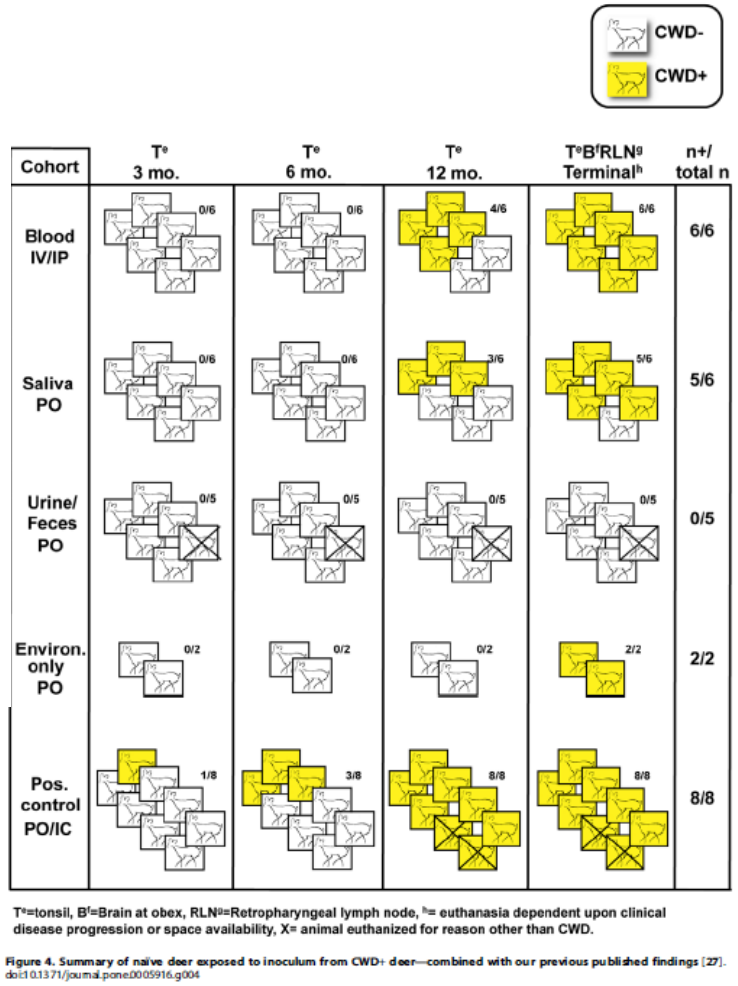
Infectious Prions in Pre-Clinical Deer and Transmission of Chronic Wasting Disease Solely by Environmental Exposure (cont.)

In summary, the results reported here reconfirm that blood and saliva are sources of infectious CWD prions, consistent with previous findings [27], and further support a mechanism for efficient CWD transmission in nature. We also show that infectious prions shed into the environment by CWD+ deer are sufficient to transmit the disease to naïve deer in the absence of direct animal-to-animal contact. These observations reinforce the exposure risk associated with body fluids, excreta, and all tissues from CWD+ cervids and suggest that similar dynamics may exist in other prion infections.

two years. The presence of infectious CWD prions in the environment therefore strongly suggests that natural prion infection occurs by routes additional to direct animal-to-animal contact. Based on the present and our previous findings [27], we speculate that saliva may harbor the greatest concentration of CWD prions available for horizontal transmission and environmental contamination, but recognize that other routes of excretion at lower concentration and greater volume still remain plausible.

Environmental sources of CWD infection

Previous studies have confirmed direct animal-to-animal contact—horizontal transmission—as an efficient mode for prion disease transmission [9,66]. Moreover, Miller and colleagues [9,67,68] have provided substantial evidence for environmental contamination as a source of CWD infection. Our bioassay study inocula doses (50 ml saliva/deer), while efficient in establishing the infectious nature of saliva, are likely unrealistic doses to be acquired in a natural setting. To emulate a more feasible natural environment-associated dose, while negating direct animal-to-animal contact, we exposed naïve deer to repeated exposures to fomites from the suites of CWD-infected deer. The study design was meant to mirror the daily habits and movements of a deer in its natural setting in which it may return to an area contaminated with small amounts of infectious prions over time. Here we provide the first report that under controlled indoor conditions CWD-naïve deer can acquire infection by exposure to fomites from the environment of CWD-infected deer, supporting the



T^e=tonsil, B^f=Brain at obex, RLN^g=Retropharyngeal lymph node, ^h= euthanasia dependent upon clinical disease progression or space availability, X= animal euthanized for reason other than CWD.

Figure 4. Summary of naïve deer exposed to inoculum from CWD+ deer—combined with our previous published findings [27].
doi:10.1371/journal.pone.0005916.g004

Prolonged and repeated exposure to infect deer

Deer are not becoming positive in brief or short term encounters

This is why bait piles are high risk. Daily exposure = prolonged and repeated exposure

Environmental Sources of Prion Transmission in Mule Deer

Michael W. Miller,* Elizabeth S. Williams,† N. Thompson Hobbs,‡ and Lisa L. Wolfe*

Materials and Methods

We conducted a replicated experiment to compare CWD transmission from three infection sources: naturally infected captive mule deer (one infected deer/paddock), carcasses from naturally infected captive mule deer that had decomposed in situ ≈1.8 years earlier (one carcass/paddock), or undisturbed paddock environments where infected mule deer had last resided 2.2 years earlier. Each exposure source was replicated in three separate paddocks; two clean paddocks served as unexposed controls. Control paddocks and paddocks where live infected deer were

Prolonged and repeated exposure to infect deer

Deer are not becoming positive in brief or short term encounters

This is why bait piles are high risk. Daily exposure = prolonged and repeated exposure

Table. Chronic wasting disease arising in mule deer exposed to environments contaminated by residual excreta, carcasses, or other infected deer

	Exposure source			
Replicate	Infected deer	Infected carcass	Residual excreta	Unexposed
1	1/4[a]	0/3	1/3	0/2
2	0/2	2/4	0/3	0/2
3	1/4	1/5	0/3	NA[b]
Total	2/10	3/12	1/9	0/4

[a]Number positive/number exposed (not including infected source deer).
[b]Not applicable; controls included only two replicate paddocks.

1 year of exposure minimal positive animals

Chronic wasting disease model of genetic selection favoring prolonged survival in Rocky Mountain elk (*Cervus elaphus*)

A. L. Williams,[1,†] T. J. Kreeger,[2,3] and B. A. Schumaker[1]

NO animals were artificially inoculated.
No injections, no transfusions, no brain homogenate, no forced saliva intake.
Prolonged eating and drinking out of the same containers that CWD+ elk did.

CWD inoculation studies have been conducted there. The TWWRU has eight, 0.2-ha elk holding pens, all of which held CWD-infected elk previous to and during this study. Elk were rotated randomly among all eight pens annually to maximize PrP^{CWD} exposure, but were never intermingled with non-study, CWD-infected elk. Captive elk were fed alfalfa hay supplemented with a pelleted ration and provided water and a trace mineral block ad libitum. Husbandry, care, diagnostic techniques, and method of euthanasia

annually for PrP by rectal mucosa biopsy using ELISA (Spraker et al. 2009). During the analysis, 37 of 39 elk died, all of which were positive for CWD. Of those that had been examined for PrP^{CWD} by rectal mucosa biopsy

all elk were 27 M/M_{132} (69.2%), 11 M/L_{132} (28.2%), and 1 L/L_{132} (2.6%). The genotypes of the last surviving elk were M/L_{132} (which died in 2012) and L/L_{132}. In 2014, the L/L_{132} is still alive and has remained negative for PrP^{CWD} by rectal

The previously cited infectivity and dosage research clearly shows its large unnatural doses OR prolonged and repeated exposure that make animals positive. Deer aren't becoming positive from brief encounters or single small exposures.

Winter herding is temporary, baiting and the incentive to hunt over bait, leads to year round bait sites that bring deer into contact with those same exact sites every day, sometimes multiple times a day. Prolonged and Repeated exposure.

The more infected deer using a bait site, the larger the accumulation of prions at the site will be and the larger the contact dose will become.

Winter Herding

We CAN stop this….

We can't stop this…but they are obviously not the same.

This is not the same…

As this…

or this…

RESEARCH ARTICLE

Mineral licks as environmental reservoirs of chronic wasting disease prions

Ian H. Plummer[1], Chad J. Johnson[2], Alexandra R. Chesney[3], Joel A. Pedersen[4]*, Michael D. Samuel[1]*

Here, we test the hypothesis that mineral licks used by deer harbor CWD prions, thus serving as potential environmental reservoirs for these infectious agents. During 2012–2015 we collected soil and water samples from 11 mineral licks (10 man-made and one natural) frequented by free-ranging white-tailed deer in a large CWD enzootic zone west of Madison, Wisconsin, USA [6] (Fig 2). We adapted a 96-well microplate variant of PMCA that

likely due in part to co-extracted inhibitors of the PMCA reaction and incomplete extraction from soil particles. The detection of prions at 9 of 11 sites sampled, however, demonstrates widespread contamination of mineral licks in the CWD outbreak zone. The generally higher

At the mineral lick site with the highest detection of CWD prions in environmental samples (Site 6), we opportunistically sampled white-tailed deer fecal pellets. We detected CWD prions in six of the 10 fecal samples after three rounds of amplification by mb-PMCA. Of eight

Discussion

Our results demonstrate that CWD-infected white-tailed deer deposit prions at mineral licks they visit. Although the mechanism of prion deposition is unknown, we suspect deposition of saliva by infected deer during ingestion of soil and water at mineral licks has the highest potential to facilitate indirect transmission to susceptible deer. Saliva from white-tailed deer infected with CWD contains on the order of 1–5 infectious doses (ID_{50}) per 10 mL as quantified by real-time quaking-induced conversion, where an ID_{50} is the dose of CWD prions capable of infecting half of the transgenic mice expressing cervid prion protein [48]. Frequent visitation by infected cervids could allow mineral licks to become potential "hot spots" for indirect trans-

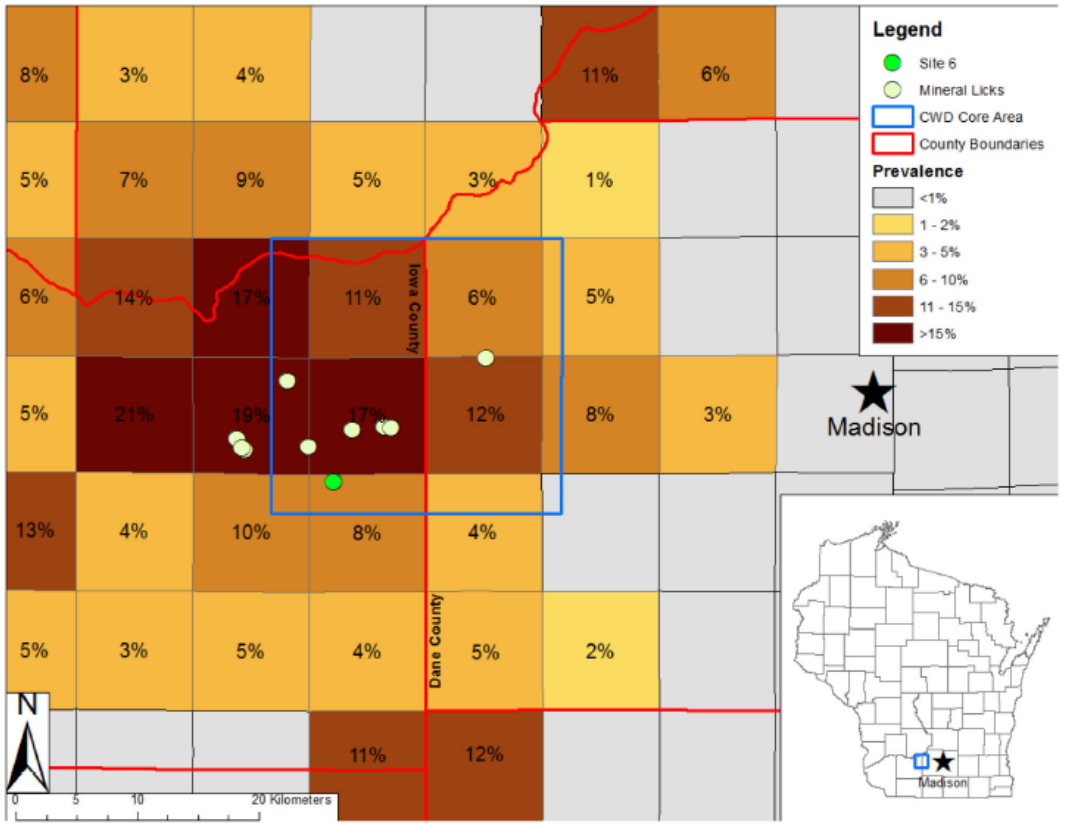
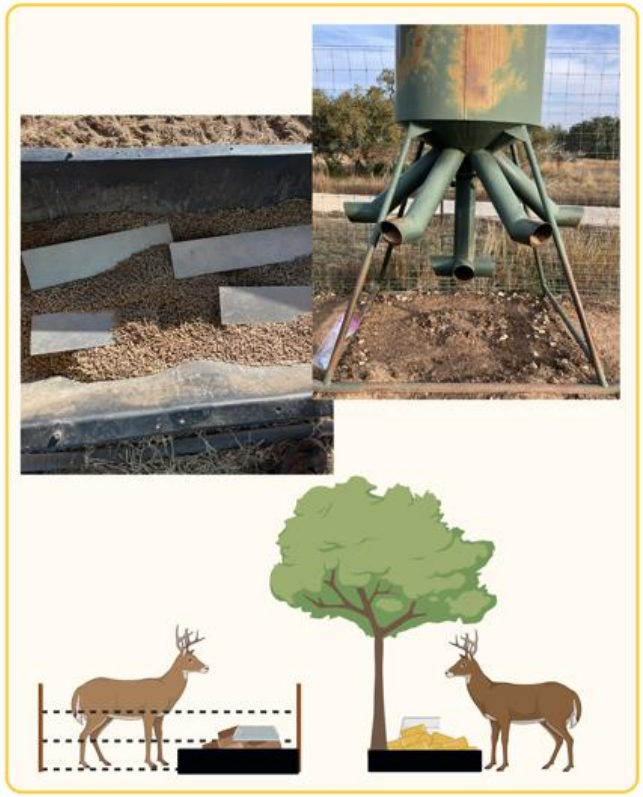


Fig 2. Mineral licks and chronic wasting disease prevalence. Locations of sampled mineral licks and prevalence of chronic wasting disease (CWD) in hunter-harvested white-tailed deer from 2010–2013 in south-central Wisconsin, USA. Squares are townships of 9.66 km per side. Inset shows state of Wisconsin, USA. Site 6 denotes the mineral lick with CWD-positive fecal samples.

CWD Sentinels: detecting environmental prion protein (ePrP) via surfaces for the early discovery of CWD

Marc D. Schwabenlander[1], Catalina Picasso-Risso[1], Gage Rowden[1], Qi Yuan[2], Erik Hildebrand[3], Patrick Hagen[3], Shannon L. Bartelt-Hunt[4], Jason C. Bartz[2], Tiffany M. Wolf[5], and Peter A. Larsen[1]



INFECTIOUS PRIONS FOUND IN BAIT AND ON FEEDERS

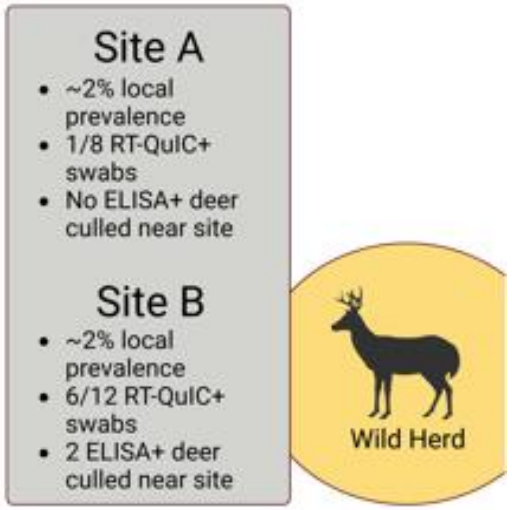


Figure 1. A. Sentinel surfaces placed for one week in captive deer facilities and areas with wild deer feeders/baits. **B.** Sentinels collected/swabbed. **C.** Swabs tested via RT-QuIC for CWD.

Laboratory controls of clean/unused surfaces and feed/bait components were analyzed via RT-QuIC (negative controls). Some locations had additional samples collected (e.g., water tank swabs, feeder swabs, oral swabs). Locations had variable levels of CWD prevalence.

INTRODUCTION

Scientists are developing highly sensitive chronic wasting disease (CWD) detection methodologies that utilize non-tissue samples.

Real-time quaking-induced conversion (RT-QuIC) is one such assay proven to be a more sensitive tool for CWD prion detection than current antibody-based methods (e.g., ELISA and IHC).

Similar to environmental DNA (eDNA) detection methods in aquatic and terrestrial environments, we investigated a rapid method for extracting prions from swabs of environmental surfaces to detect CWD when paired with RT-QuIC.

Laboratory investigation demonstrated that RT-QuIC detection of CWD prions recovered from surfaces (e.g., stainless steel, glass) via swabs was similar to the original CWD prion load applied to the surface.[1]

AIM

We deployed surfaces shown to effectively bind misfolded prions as environmental prion protein (ePrP) sentinels in food sources of captive and free-ranging herds.

METHODS

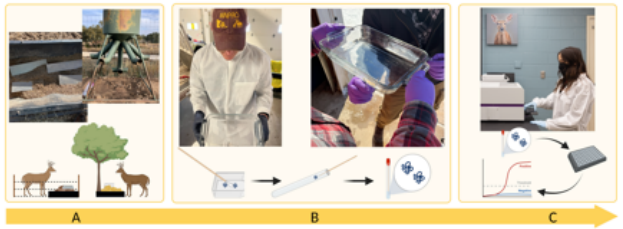


Figure 1. A. Sentinel surfaces placed for one week in captive deer facilities and areas with wild deer feeders/baits. **B.** Sentinels collected/swabbed. **C.** Swabs tested via RT-QuIC for CWD.

Laboratory controls of clean/unused surfaces and feed/bait components were analyzed via RT-QuIC (negative controls). Some locations had additional samples collected (e.g., water tank swabs, feeder swabs, oral swabs). Locations had variable levels of CWD prevalence.

All data are being analyzed for detection performance (e.g., run time, sample dilution) and association between environmental sample detection and CWD prevalence.

RESULTS

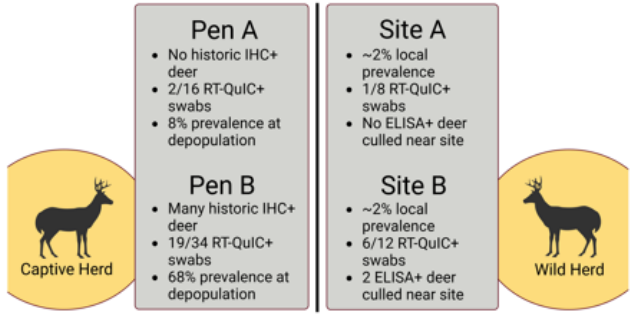


Figure 2. Representative pens and sites demonstrating the preliminary assessment of the relationships between CWD results from sentinal swabs via RT-QuIC and associated deer tissues via ELISA and/or IHC.

DISCUSSION

- Data collection and analysis are still in progress for all locations.
- Captive facility swab results have generally aligned with location/pen prevalence.
- Wild herd sentinel swab results and CWD positive culled deer near bait sites have been less clearly aligned, likely due to seasonal local migration patterns in the wild herd, potential for infected deer visiting multiple sites, and culling processes.
- Research indicates that low levels of prions are excreted in saliva from CWD positive deer.[2] Therefore, even with promising prion recovery based on the seminal laboratory swabbing method development[1], it is likely in deer with early CWD infection, detection via sentinels may be limited. Additionally, deer may not test positive via IHC or ELISA on tissues but may be excreting prions in saliva at some level detectable via sentinel swabs.

CONCLUSIONS

- ePrP detection through non-invasive methods may be used for surveillance and discovery of CWD, informing management.
- Surface sentinel surveillance may be an applicable practice for other prion and prion-like diseases in settings such as meat processing facilities and hospitals.
- Environmental factors, such as feed type, may affect results.

ACKNOWLEDGMENTS

We thank the facility owners and regulatory bodies for access to the research locations, collection of sentinels, and providing official CWD testing results. Figures 1 and 2 and this poster were created with BioRender.com.

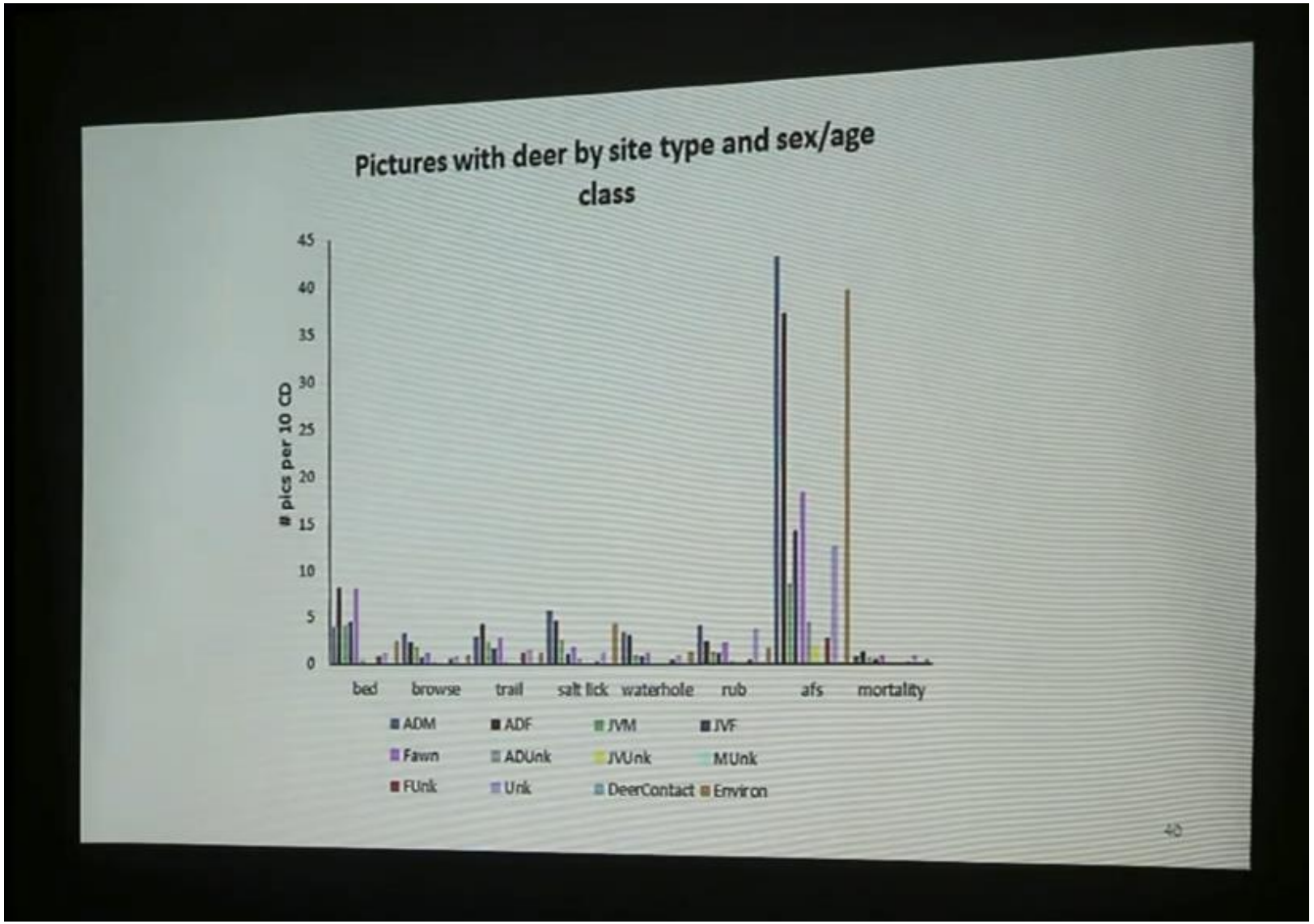
ENVIRONMENT AND NATURAL RESOURCES TRUST FUND

LITERATURE CITED

1. Yuan Q, Rowden G, Wolf TM, Schwabenlander MD, Larsen PA, Bartelt-Hunt SL, Bartz JC. Sensitive detection of chronic wasting disease prions recovered from environmentally relevant surfaces, Environment International, Volume 166, 2022.
2. Henderson DM, Manca M, Haley NJ, Denkers ND, Nalls AV, Mathiason CK, et al. (2013) Rapid Antemortem Detection of CWD Prions in Deer Saliva. PLoS ONE 8(9): e74377.

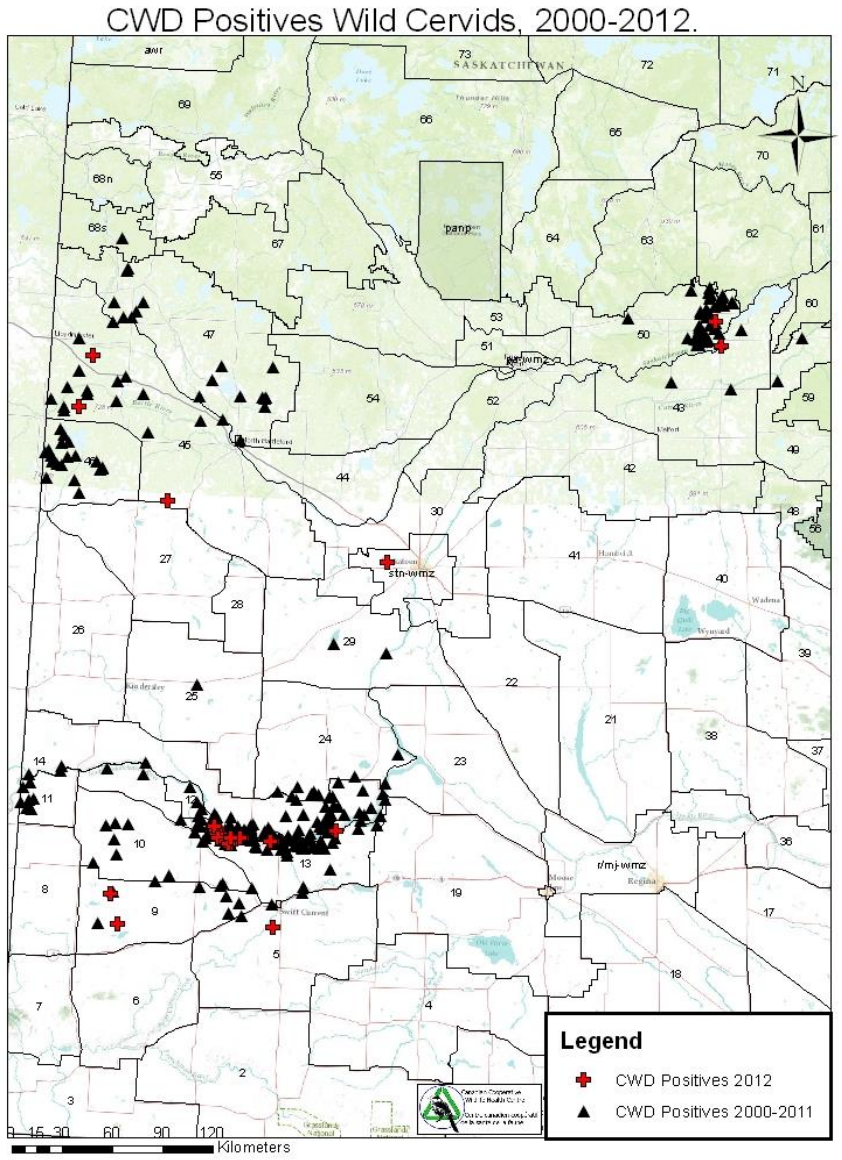
Alternative Food sources are highest incident rate for contact with other deer and environmental sites.

Even higher than natural winter herding.



Saskatchewan vs North Dakota

Same number of years with disease



Saskatchewan – 2000-2012

<u>Did not</u> follow best management practices (i.e. baiting bans)

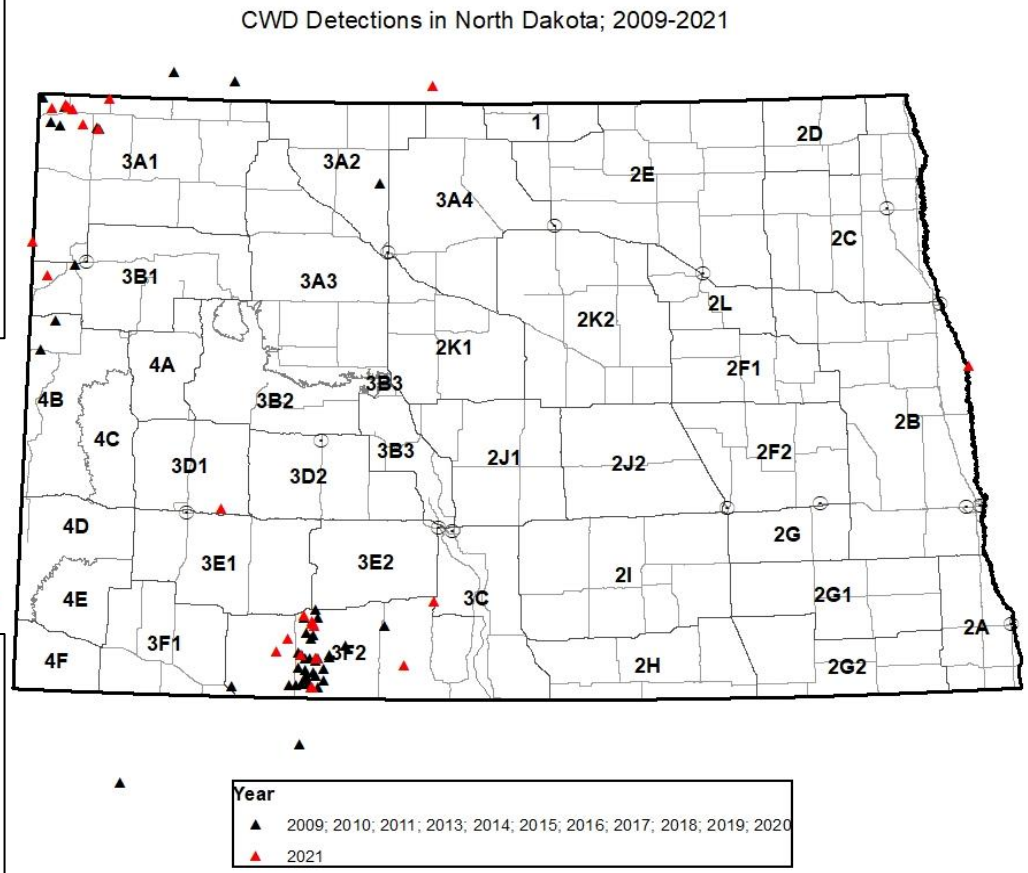
TOTAL CWD positives = 397

Significantly more Geographic Spread with larger and denser hot spots

North Dakota – 2009-2021

Followed best management practices (i.e. baiting bans) and spent hundreds of thousands of dollars spent on depredation measures

TOTAL CWD positives = 70



Saskatchewan vs North Dakota

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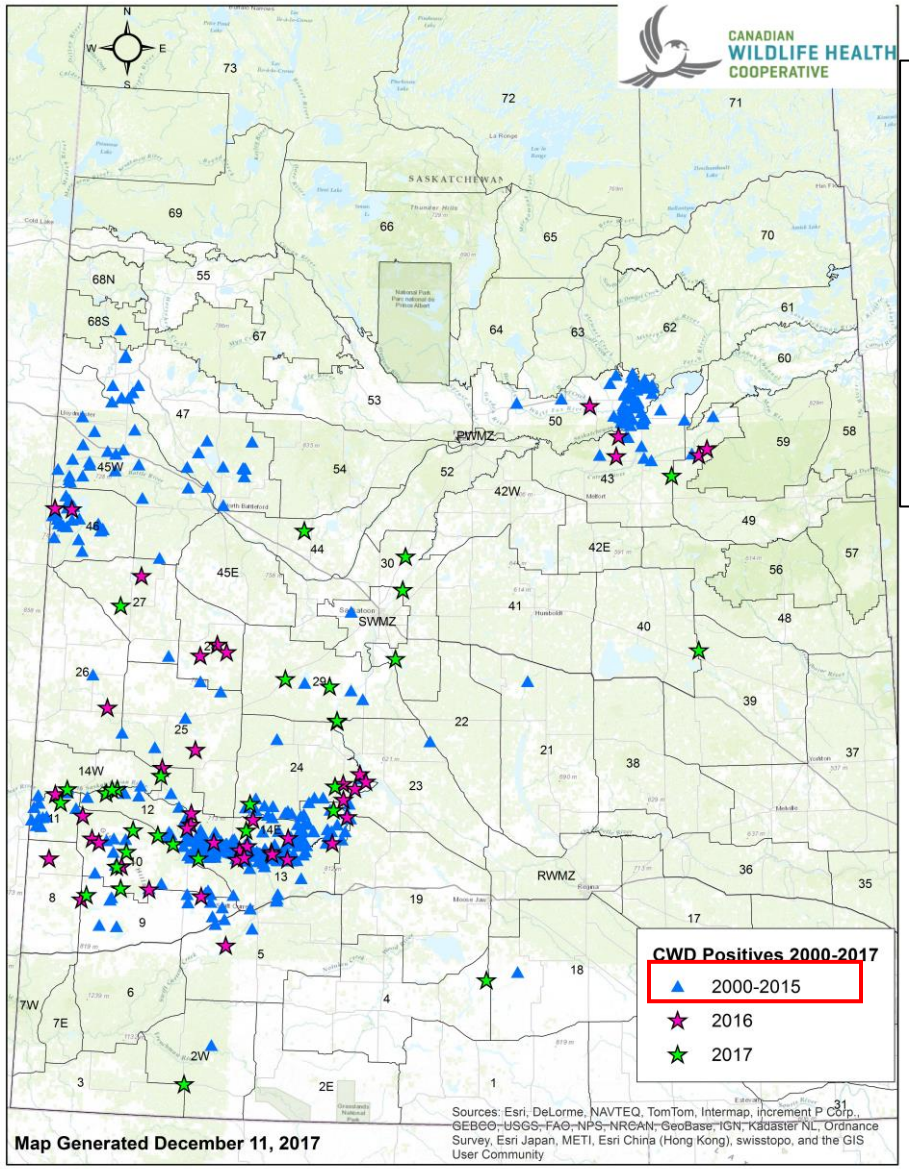


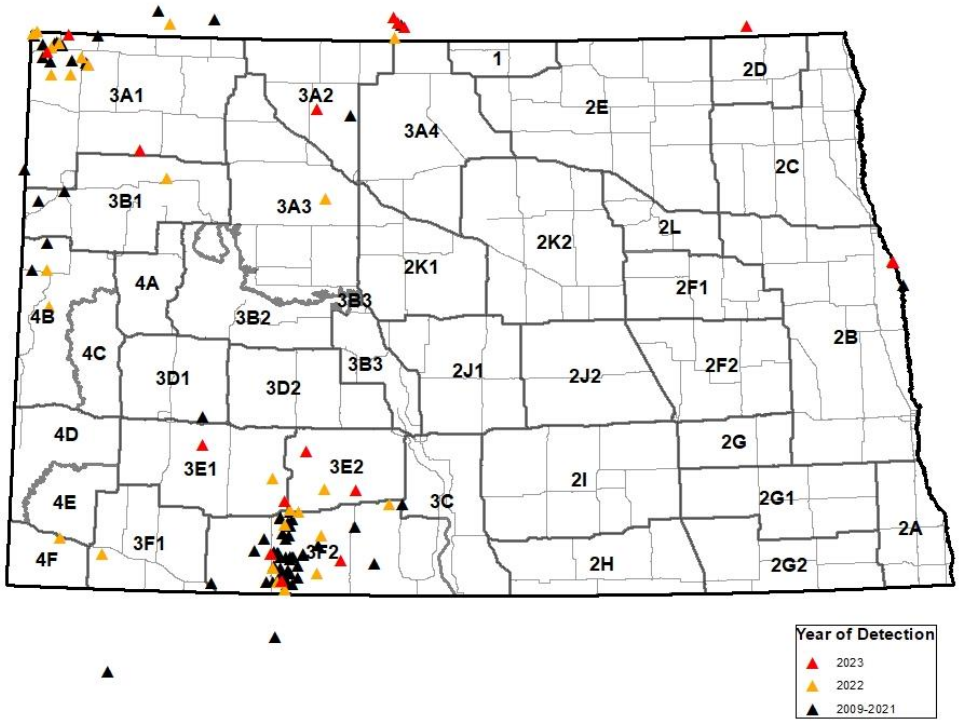
Saskatchewan – 2000-2015

<u>Did not</u> follow best management practices (i.e. baiting bans)

TOTAL CWD positives = 458 even with multi-year gap In Surveillance funding (2010-2016)

145 miles of linear distance in Southern Saskatchewan outbreak

CWD Detections in North Dakota; 2009-2023



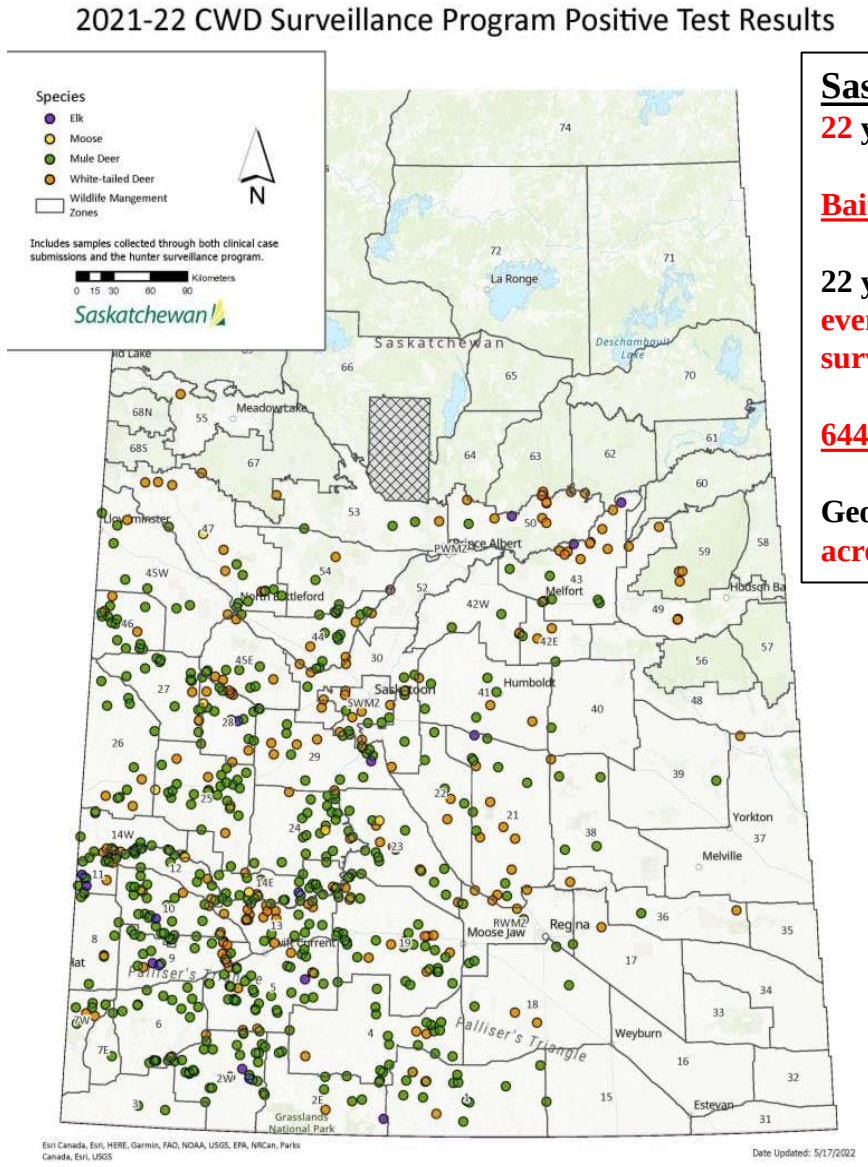
North Dakota – 2009-2023

Followed best management practices (i.e. baiting bans) and spent hundreds of thousands of dollars spent on depredation measures

TOTAL CWD positives = 105

37 miles of linear distance in southern ND outbreak

Saskatchewan vs South Dakota



Saskatchewan – 2000 – 2021
22 years with CWD

Baiting is legal and widely popular

22 yr TOTAL CWD positives = 2,599 even with multi-year gap in surveillance

644 Positives just 2021/22 report

Geographic Spread over ~ 70 million acres (higher density across range)

South Dakota – 2001 - 2021
21 years with CWD

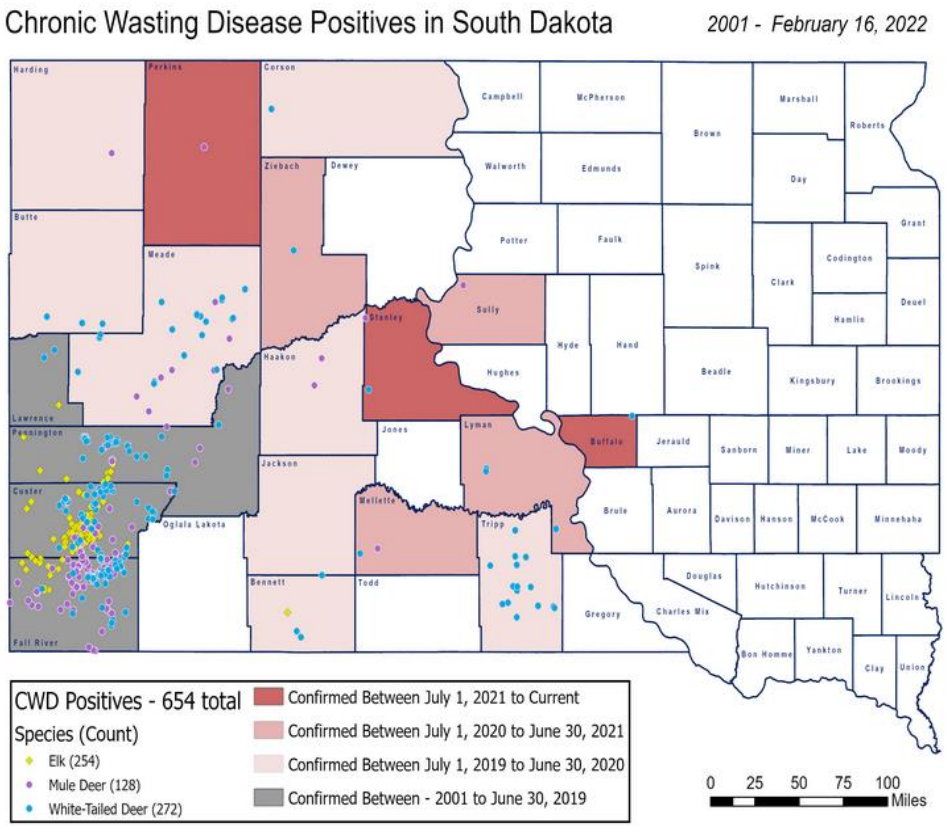
No Baiting

21 yr TOTAL CWD positives = 438 in wild deer

282 captive elk in Wind Cave NP

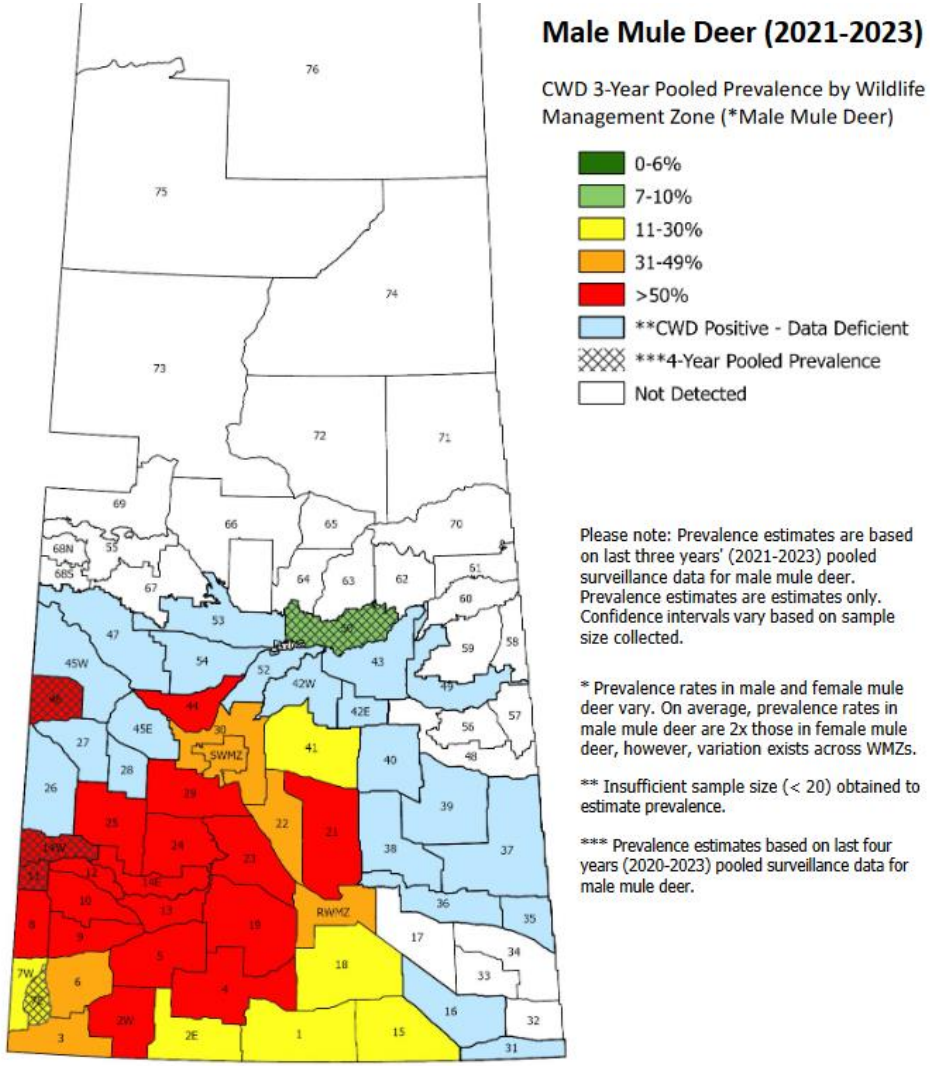
54 Positives just in 2021/22 report

Confined to west half of the state ~ 23 million acres

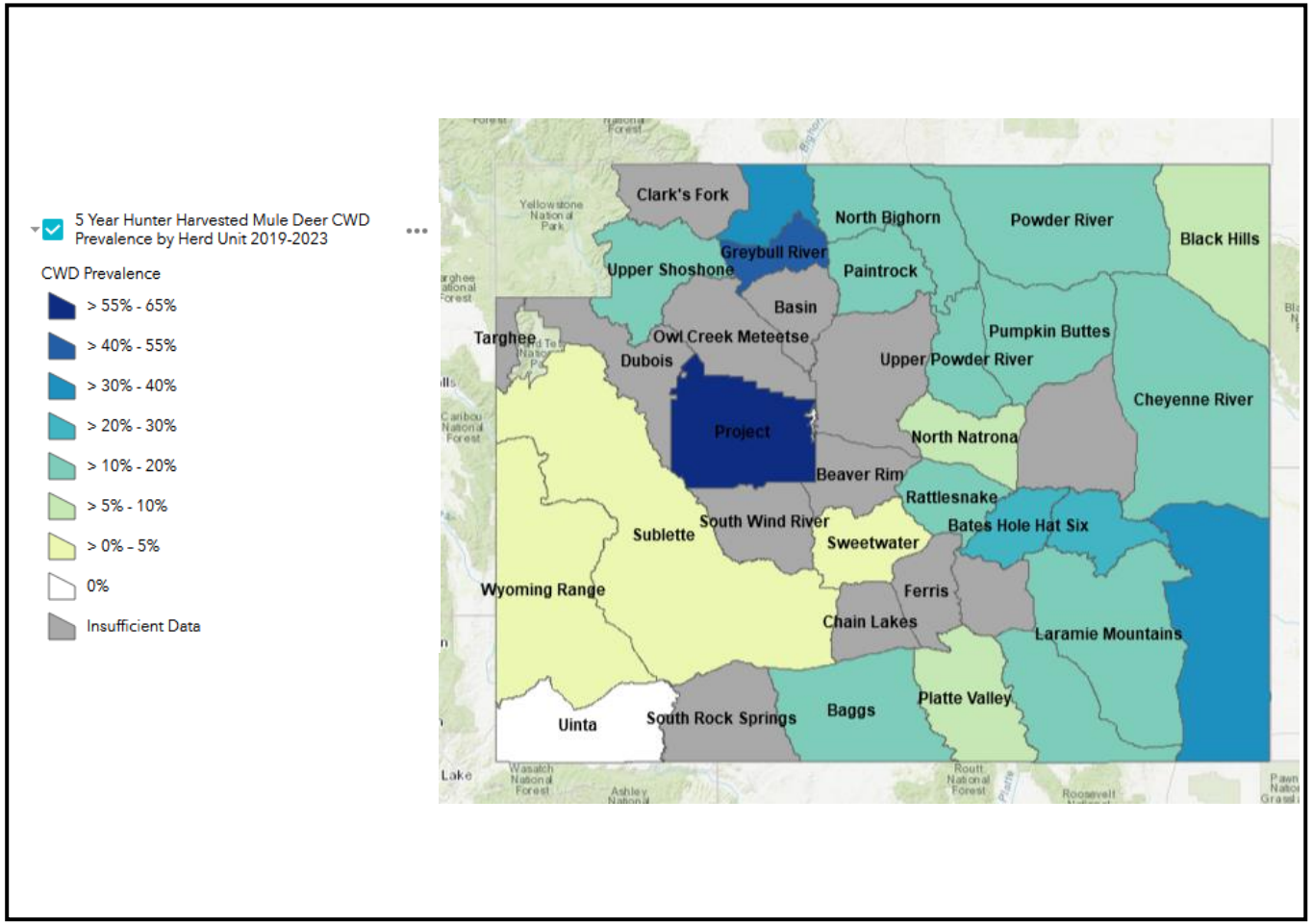


Baiting in Saskatchewan vs no baiting in Wyoming

Recent Prevalence Estimates after 24 years
~74.4 Million acres of geographic spread
18 units with over 75% prevalence



Recent Prevalence Estimates after 39 years with disease
~55.5 million acres of geographic spread
2 units over 50% prevalence



Saskatchewan vs Colorado Prevalence

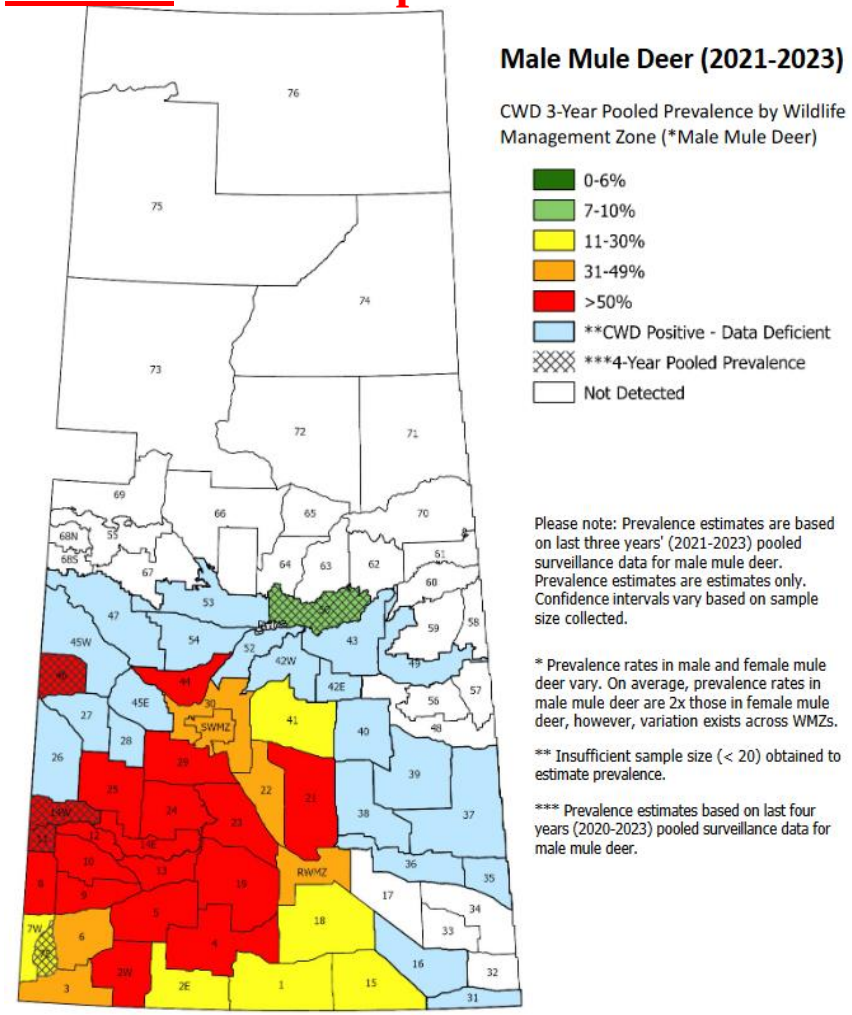
Recent Prevalence Estimates after 24 years

First detection in the wild – 2000

Baiting has always been allowed

~74.4 Million acres of geographic spread

18 Units over 75% prevalence



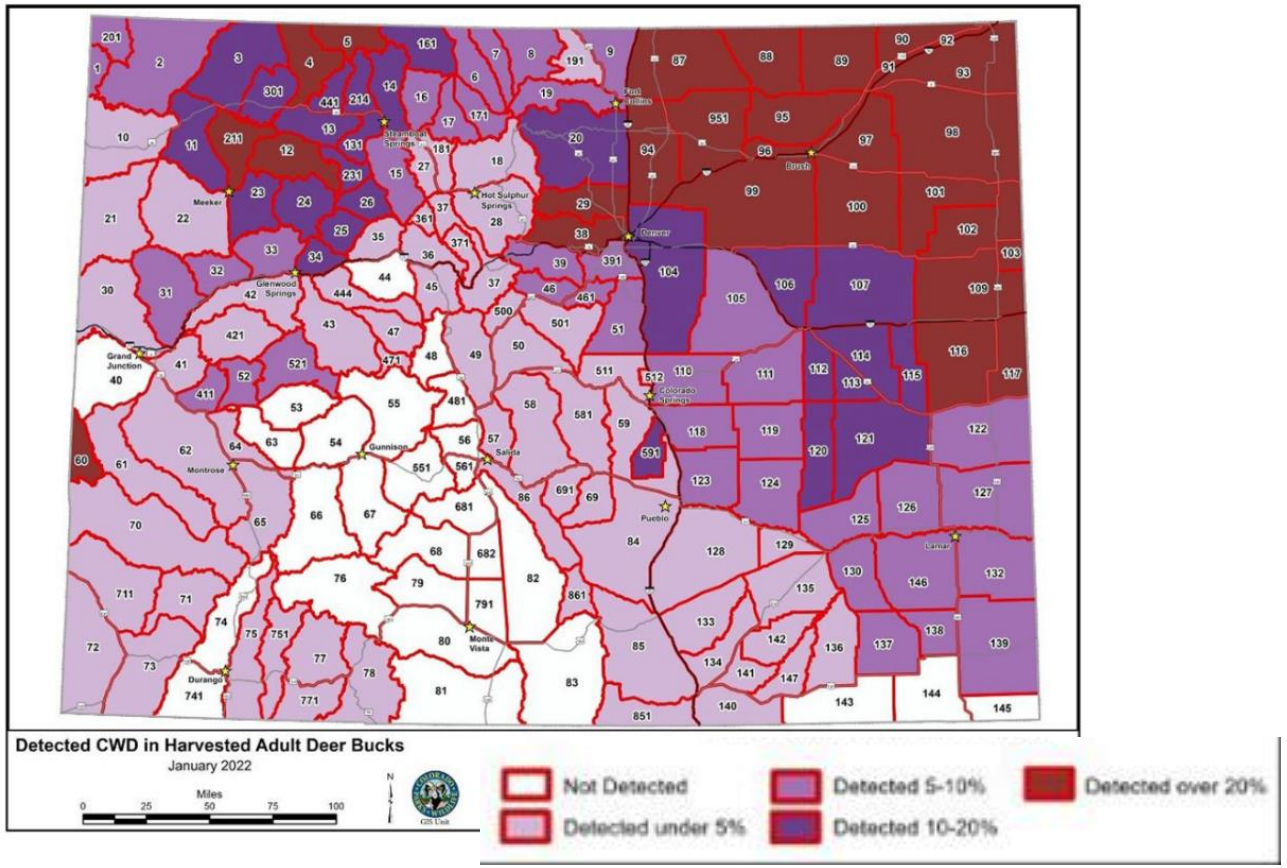
Recent Prevalence Estimates after 43 years with disease

First detection in the wild – 1981

Baiting was never allowed

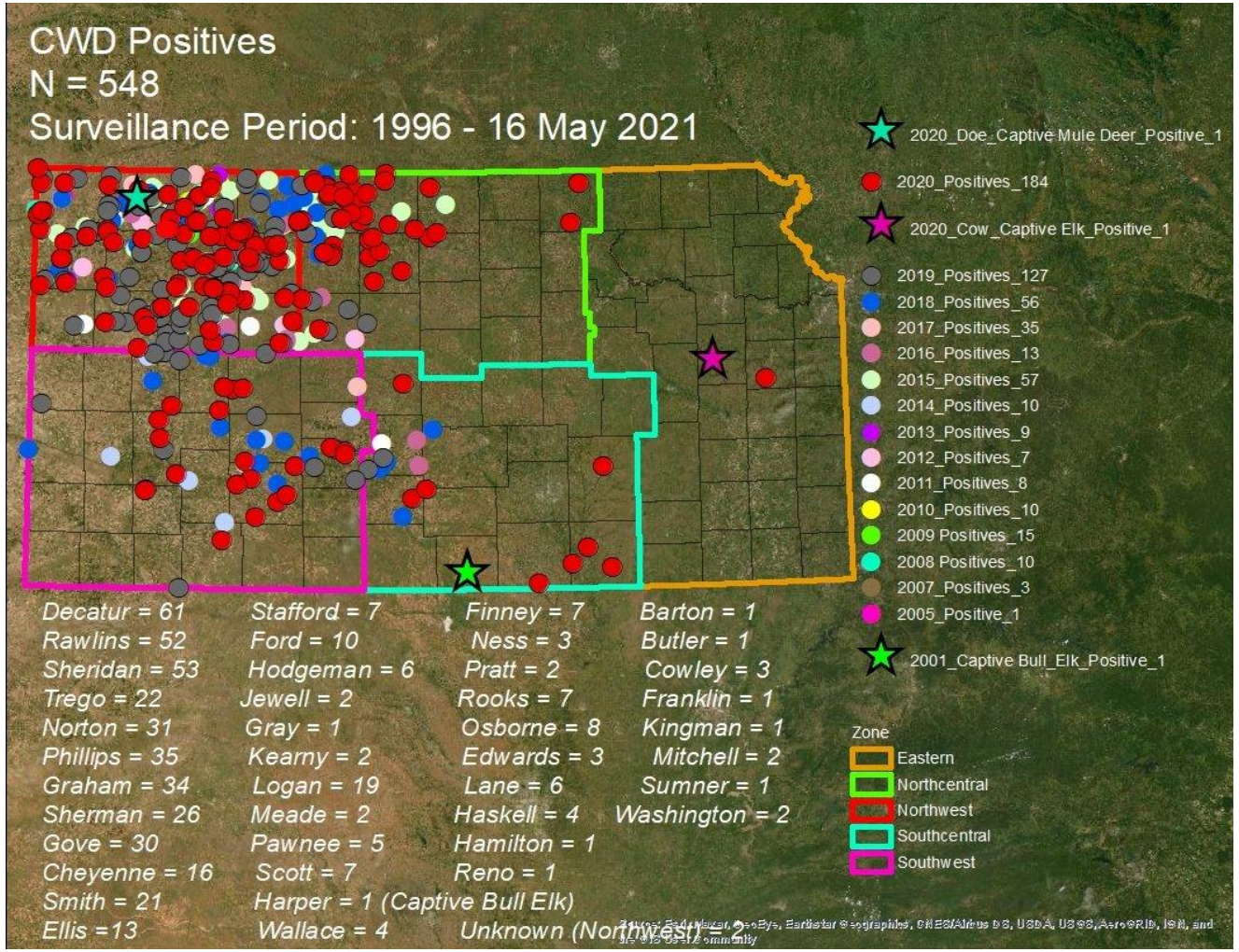
~56.5 million acres of geographic spread

NO UNITS over 30% prevalance

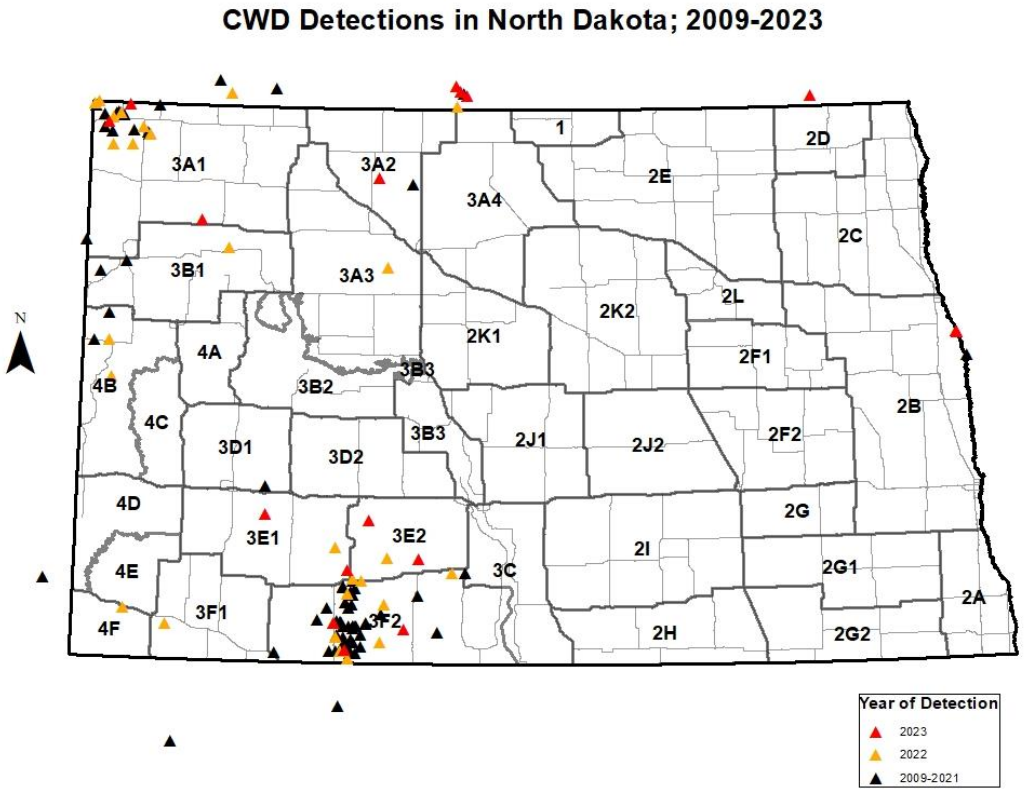


Kansas (2005-2021) vs North Dakota (2009-2023)

First detection in the wild- 2005
Continues to allow baiting
16 years with disease – 548 positives

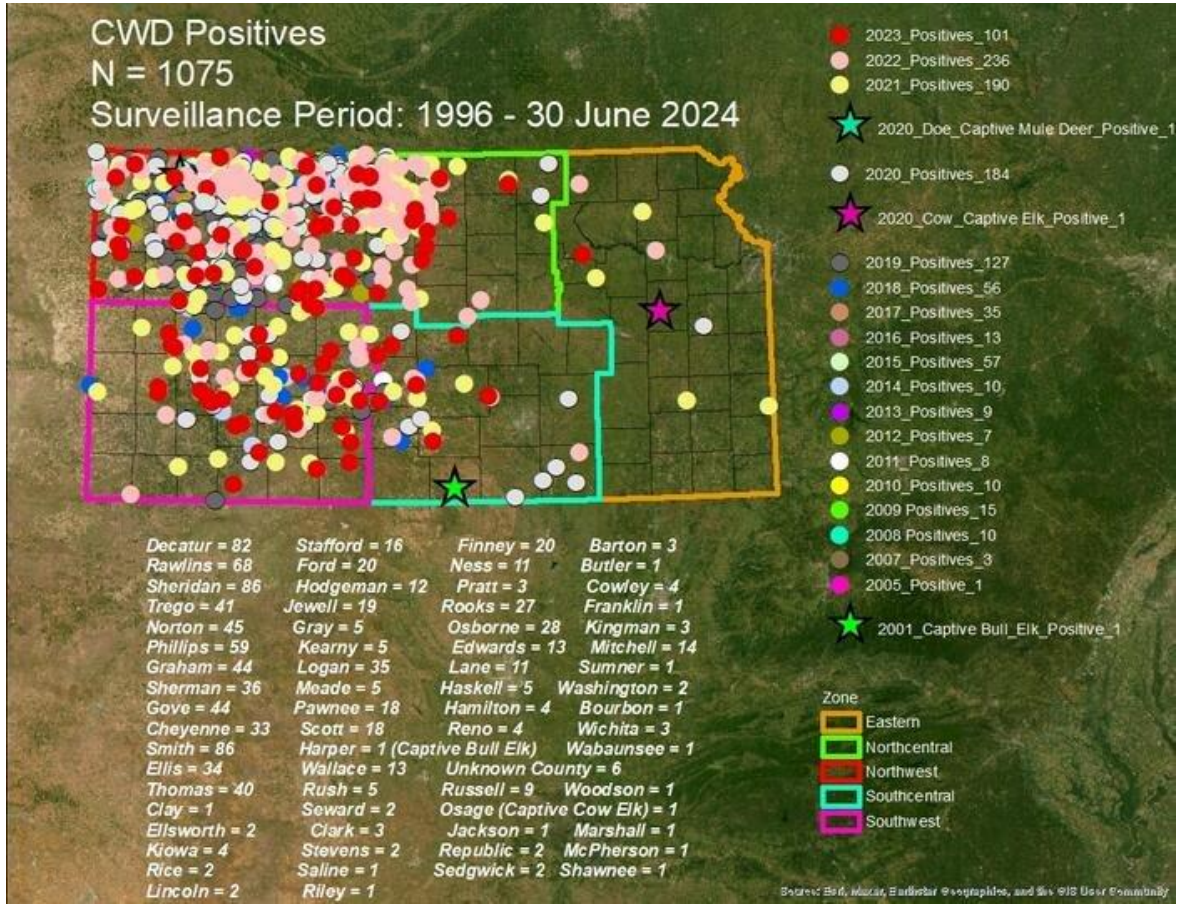


First detection in the wild – 2009
Baiting Bans
14 years with the disease – 105 Positives



Kansas after 2024, now over 1,200 cases

First detection in the wild- 2005
Baiting is legal and widely popular
19 years with disease – 1,075 positives in the wild
Finding sick deer is relatively common



South Dakota -First detection in the wild – 2001
Baiting is not legal
23 years with the disease – 438 wild deer and elk positives
Single digit prevalence outside of Wind Cave NP
282 captive elk positive in Wind Cave NP)

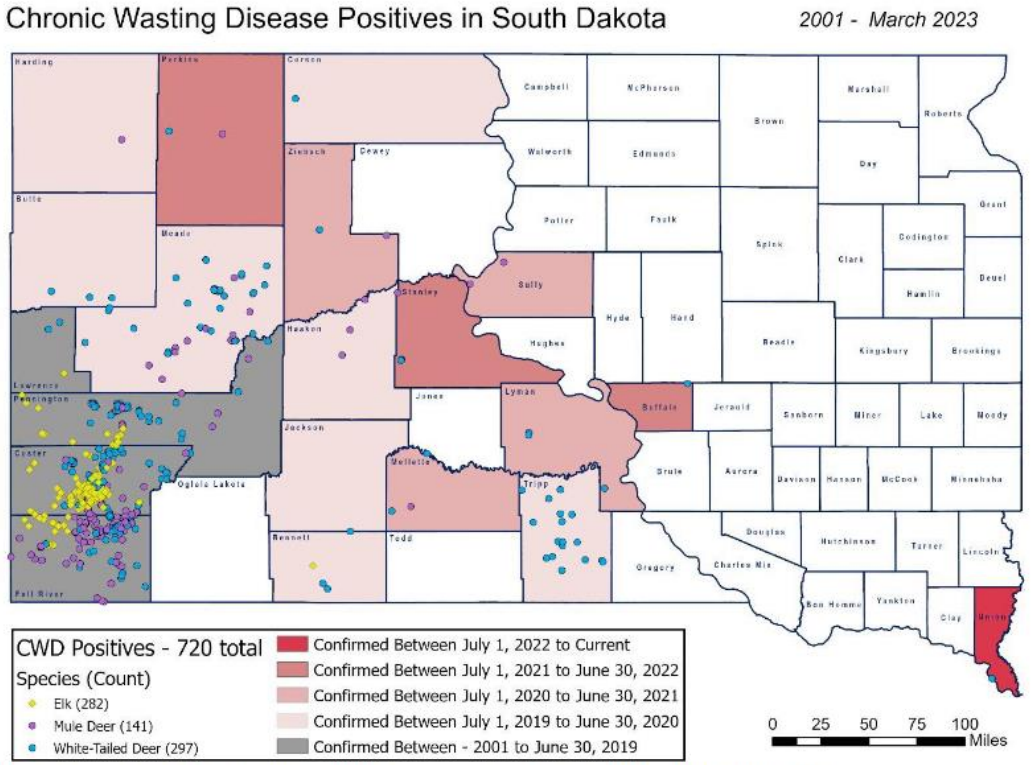
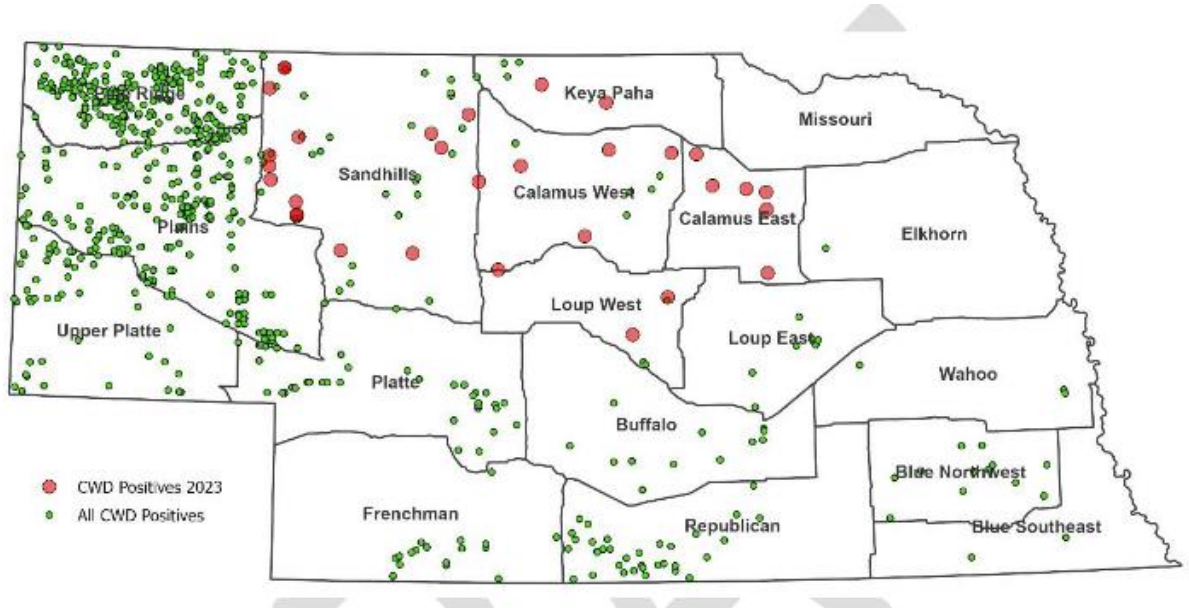


Figure 1. Locations of CWD infected free-ranging cervids in South Dakota, 2001-2023.

Nebraska vs South Dakota

- **CWD first discovered in 2000**
- **Baiting allowed on Private Lands**
- **24 years with disease**
  - **1,269 positive wild deer**
  - **19 positive elk**



First detection in the wild – 2001

No baiting

23 years with the disease – 438 wild deer and elk positives

282 captive elk positive in Wind Cave NP

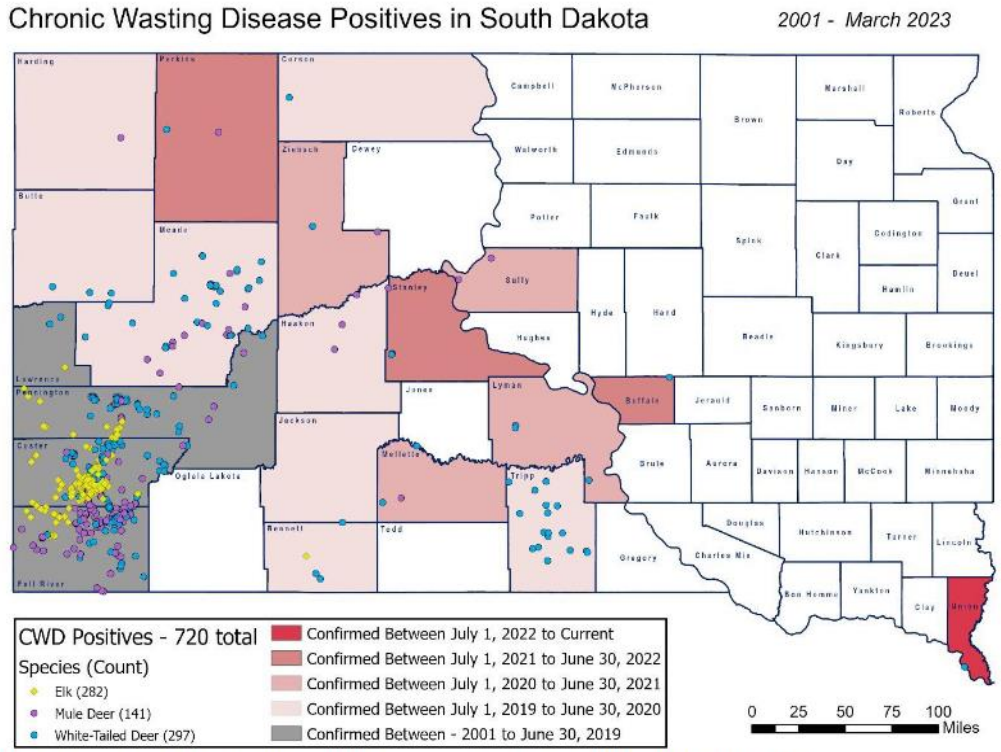


Figure 1. Locations of CWD infected free-ranging cervids in South Dakota, 2001-2023.

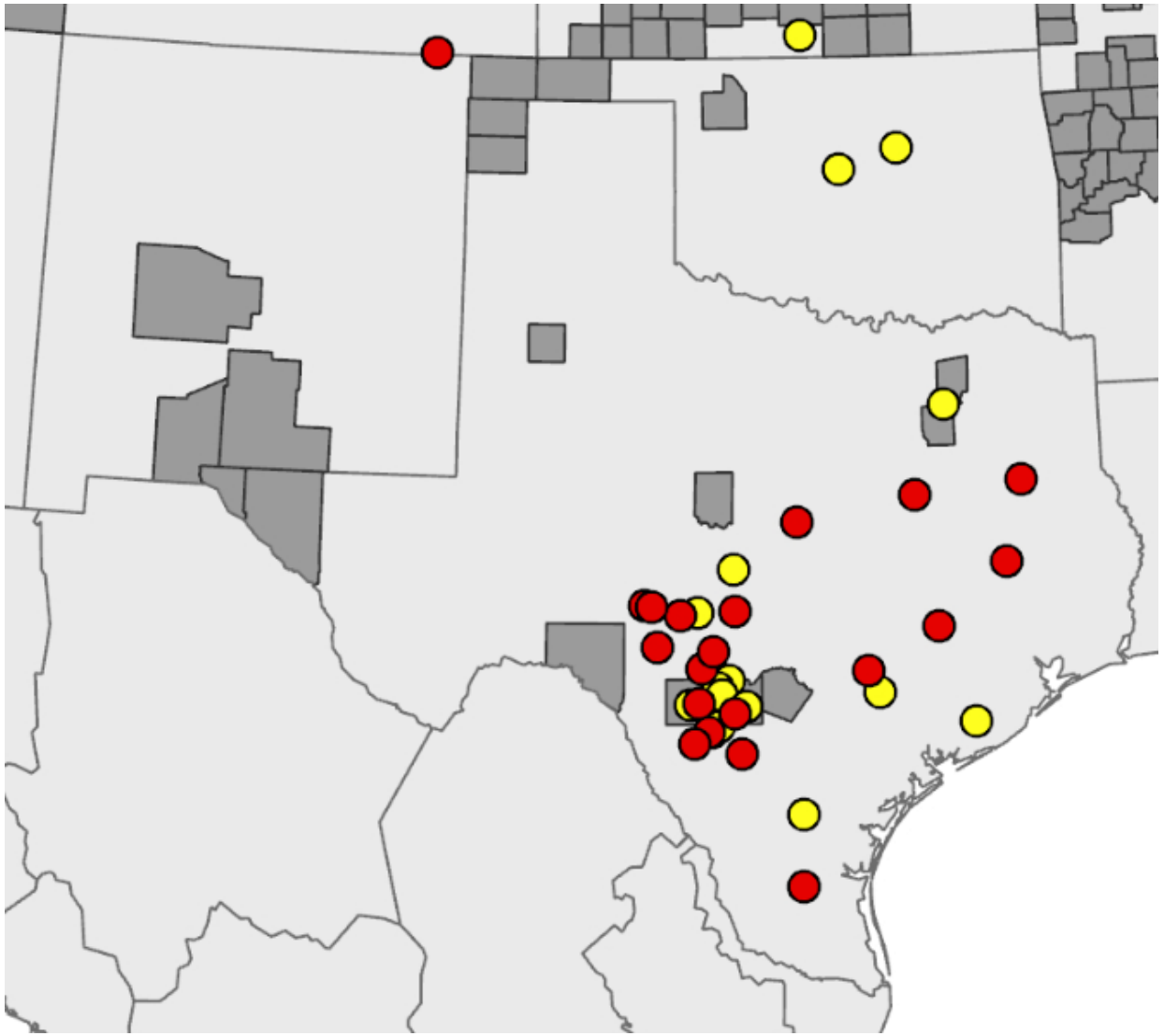
Texas vs New Mexico

New Mexico – 2002 - 2023
First detected in 2002

<u>No baiting</u>

<u>TOTAL CWD+</u> = 59

Confined to 3 counties



Texas – 2012-2024
First detected in 2012

<u>TOTAL CWD positives</u> = 1,019 as of November 2024

Texas has blurred the lines with captive and wild deer. Captive deer can still be considered wild, and thousands of captive deer are "released" into the wild every year in Texas.

Significantly more Geographic Spread.

Investments in fighting CWD and Winter Transmission

Biennium	License $$ Spent Landowner on depredation
2009-11	$1,068,000
2011-13	$851,000
2013-15	$253,000
2015-17	$276,935
2017-19	$689,339
2019-21	$471,910
2021-23	$699,528
2023-25	$1,761,269

Total $ $6,070,981 = 498 Hay yard projects from 2009 – Fall 2024

Baiting Mule Deer

Former Utah Wildlife Board member among 7 charged in illegal hunting scheme

By Carter Williams, KSL.com | Posted - Aug. 23, 2024 at 7:03 p.m.

Utah Wildlife Board member Wade Heaton, left, speaks during a meeting on Jan. 4, 2022. Heaton, who resigned from the board last year, faces 11 charges tied to an illegal baiting scheme, according to court documents. (Utah Department of Natural Resources)

A Lucrative Hunting Business

Clients of Heaton's company told investigators they paid from $3,000 to $40,000 to hunt deer with his guides, often in Southern Utah's Paunsaugunt hunting unit. The clients were assigned specific deer to hunt, along with photos to recognize them. The targeted animals were also given nicknames by Heaton and his guides, including Belly Dump, Cialis, and Tokyo Drift.

Most importantly to investigators, Heaton worked with his guides to lure the deer to specific locations using corn feed, court documents said. They even cut down tree limbs to improve the line of sight from deer blinds. Investigators frequently cited WhatsApp text messages from Heaton as evidence of his intentions.

"Let's all carry 1-2 keylicks of feed and feed whatever we drive by," Heaton allegedly wrote in a text message from August 2023. "Put what you feed on this text."

"A reminder of our decision about feed ... We are going to keep the hunters as removed from it as possible," according to a text from Heaton in August 2021. "No feeding with a hunter in the truck. Keeping the feed out of sight of the public."

Heaton did not respond to requests for comment.

Former Utah Wildlife Official Charged in Illegal Hunting Scheme

Wade Heaton is one of seven men charged with baiting game animals, a practice Utah lawmakers made illegal in 2021.

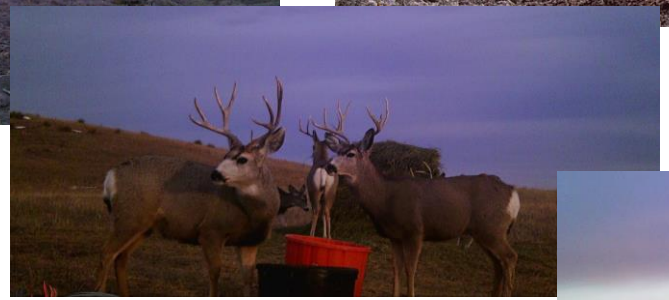
Written by Andrew McLemore Aug 29, 2024 12:14 p.m. ET

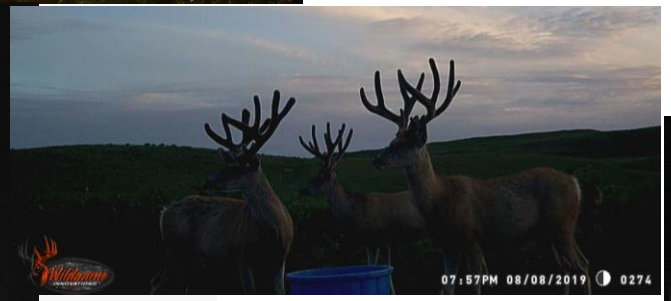
Support us! GearJunkie may earn a small commission from affiliate links in this article. Learn More

A former member of the Utah Wildlife Board faces nearly a dozen charges for baiting game animals through his hunting guide business.

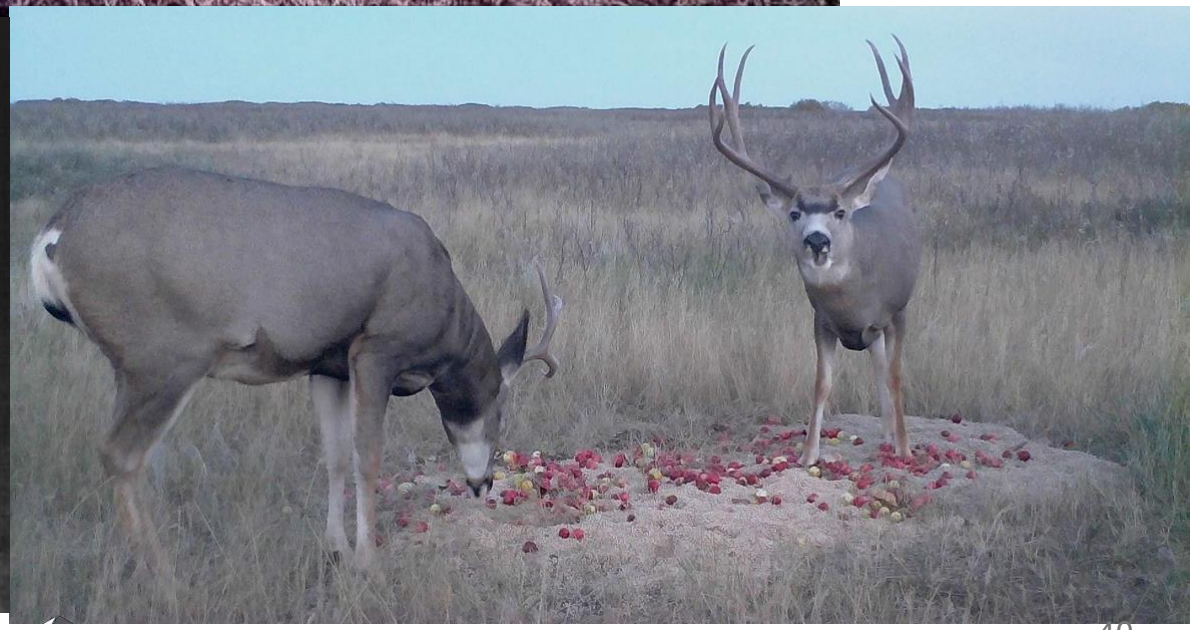
Two close-up shots of trophy mule deer bucks that were posted to Color Country Outfitter's Facebook page in 2023. Photos via Facebook

Baiting Mule Deer





Baiting Mule Deer



Wildlife is managed for all of the people of North Dakota, for the PUBLIC GOOD.

Article XI Section 27 of the North Dakota Constitution

Section 27. Hunting, trapping, and fishing and the taking of game and fish are a valued part of our heritage and will be forever preserved for the people and managed by law and regulation for the public good.

ND Century Code

20.1-01-03. Ownership and control of wildlife is in the state - Damages - Schedule of monetary values - Civil penalty.
The ownership of and title to all wildlife within this state is in the state for the purpose of regulating the enjoyment, use, possession, disposition, and conservation thereof, and for maintaining action for damages as herein provided. Any person catching, killing, taking, trapping, or possessing any wildlife protected by law at any time or in any manner is deemed to have consented that the title thereto remains in this state for the purpose of regulating the taking, use, possession, and disposition thereof. The state, through the office of attorney general, may institute and maintain any action for damages against any person who unlawfully causes, or has caused within this state, the death, destruction, or injury of wildlife, except as may be authorized by law. The state has a property interest in all protected wildlife. This interest supports a civil action for damages for the unlawful destruction of wildlife by willful or grossly negligent act or omission.

ND Game and Fish Mission Statement

Insight from Theodore Roosevelt

"Defenders of the short-sighted men who in their greed and selfishness will, if permitted, rob our country of half its charm by their reckless extermination of all useful and beautiful wild things, sometimes seek to champion them by saying the 'the game belongs to the people.' So, it does; and not merely to the people now alive, but to the unborn people. The 'greatest good for the greatest number' applies to the number within the womb of time, compared to which those now alive form but an insignificant fraction. Our duty to the whole, including the unborn generations, bids us restrain an unprincipled present-day minority from wasting the heritage of these unborn generations. The movement for the conservation of wild life and the larger movement for the conservation of all our natural resources are essentially democratic in spirit, purpose, and method."