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Chronic Wasting Disease in Deer and Elk Herds in Arkansas

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CHRONIC WASTING DISEASE AND ITS EFFECTS ON DEER AND ELK HERDS IN ARKANSAS

By Baker Kendrick



THE BASICS

- A neurodegenerative disease found in cervids (mainly deer and elk) that causes a “wasting away” of the brain and a loss of cognitive function
- 100% death rate
- Highly contagious
- Spreading across Arkansas as we speak
- Infection rates range from 10%-25% in diseased areas

SYMPTOMS

- Drastic weight loss (wasting)
- Stumbling
- Lack of coordination
- Listlessness (lack of energy or enthusiasm)
- Drooling
- Excessive thirst or urination
- Drooping ears
- Lack of fear of people

- *Incubation period of up to 1 year



HISTORY

- 1967, mule deer, Colorado research facility
- Confirmed in 1970
- Identified in wild Colorado elk by 1981
- First identified in white-tailed deer in 2001
- Since then, the disease has spread outward from the source
- NW Arkansas, 2016



HOST RANGE



North American Elk



Red Deer



Mule Deer



Black-Tailed Deer



White-Tailed Deer



Sika Deer



Reindeer (Caribou)



Moose

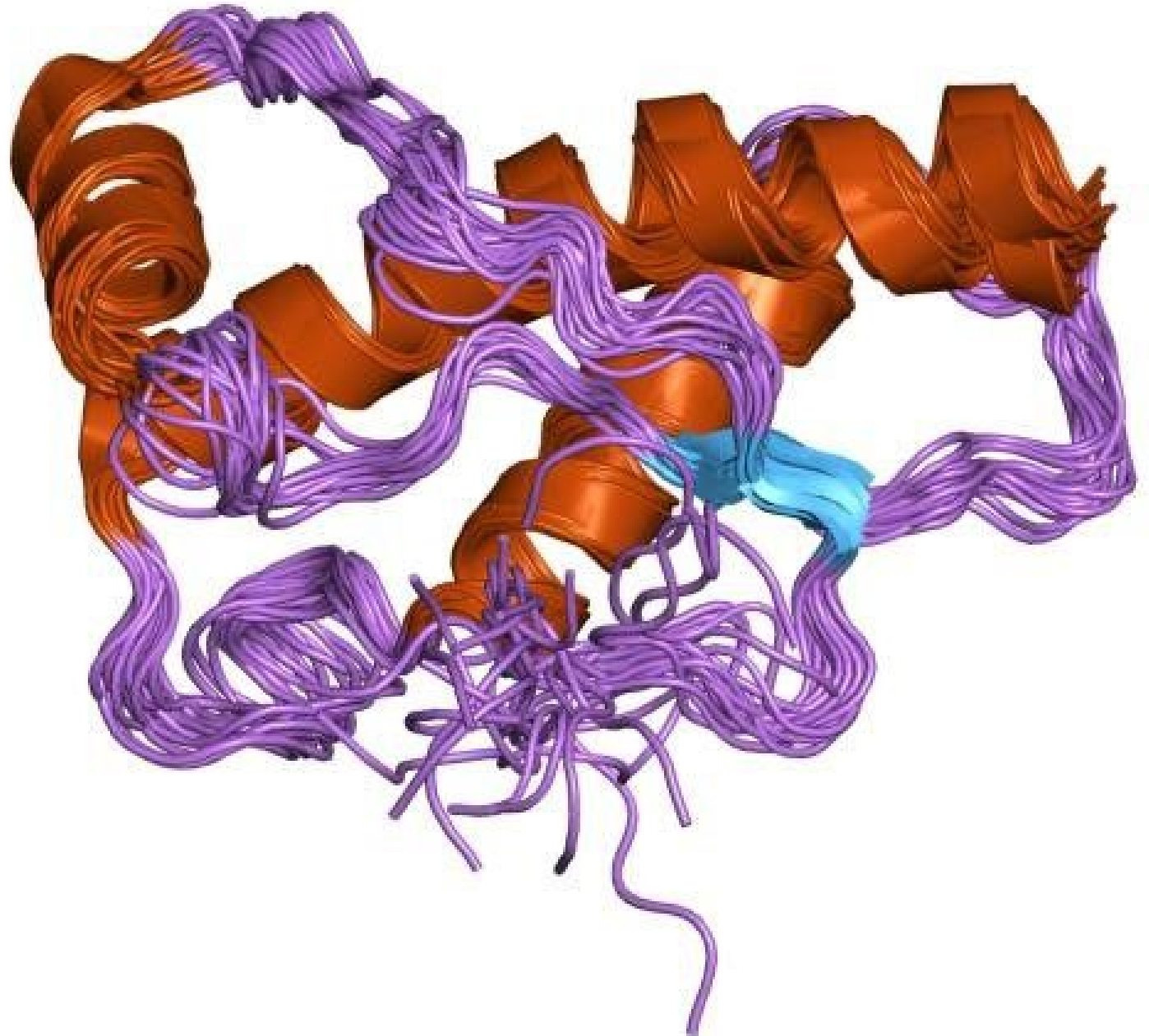
HUNTING

- Slow proliferation in deer and elk populations
- More difficult trophy hunting
- Less hunting in general
- \$300 million industry in Arkansas
 - 4% of Arkansas gross revenue
 - Jobs
 - Retail
 - Motor fuel
 - Licenses
 - Taxes
- 5% decrease in permit demand in infected areas



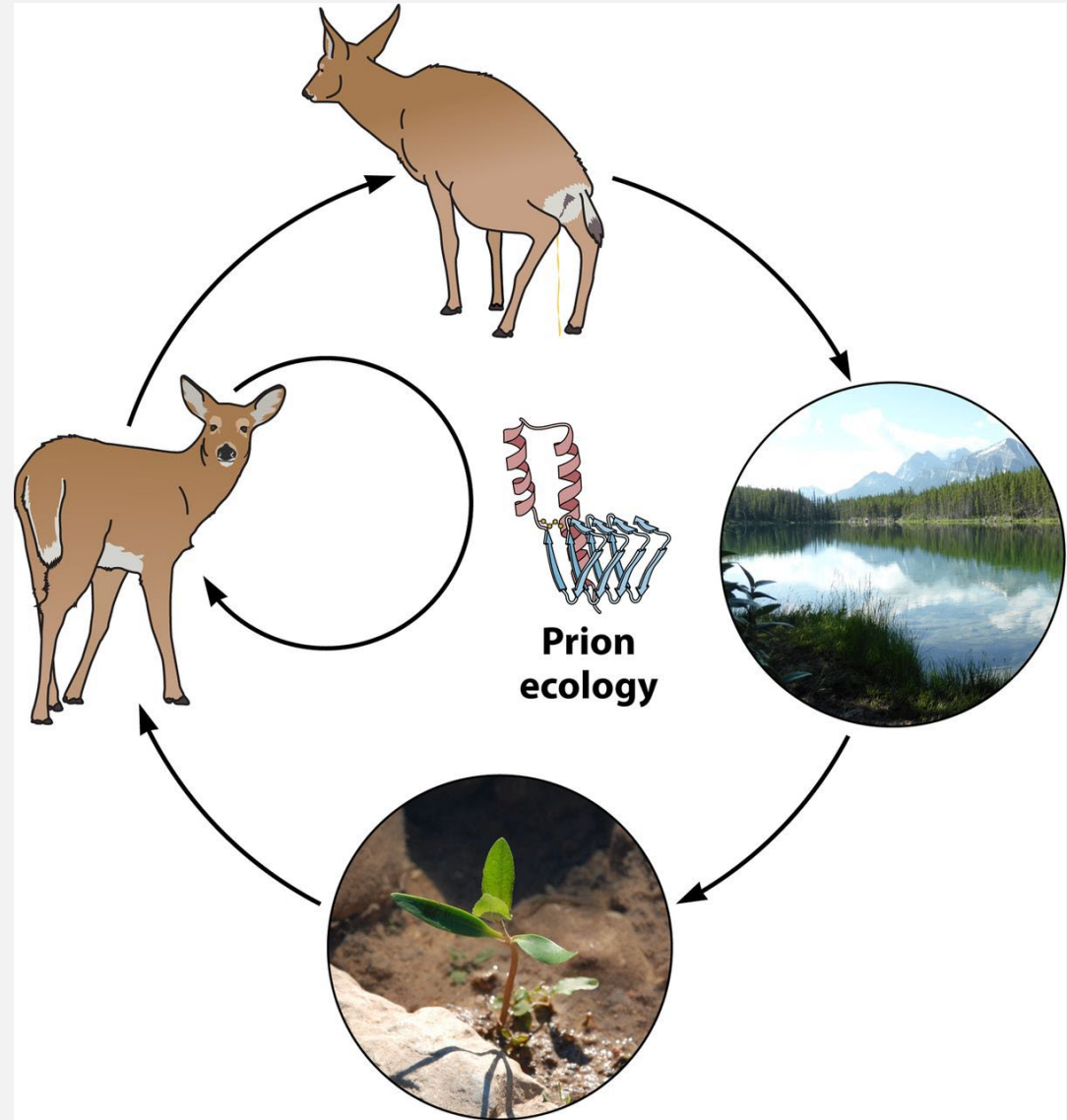
HOW IT WORKS

- Transmissible Spongiform Encephalopathy (TSE)
- Protein
- Prion- an agent capable of causing the misfolding of a normal protein in the brain
- PrP^C → PrP^{Sc} - transmembrane signaling protein
- Exposed hydrophobic regions
- Misfolding cascade
- Accumulation in central nervous system and lymphatic system



TRANSMISSION

- Through bodily fluids (blood, feces, urine, saliva)
- Spreads quickly, and can remain in the environment for a long time
- 2-year effectiveness on surfaces
- Different soil conditions, weather, and substances able to bind to the prion
- Plant uptake
- Scavenging birds traveling
- Inhaling infected dust

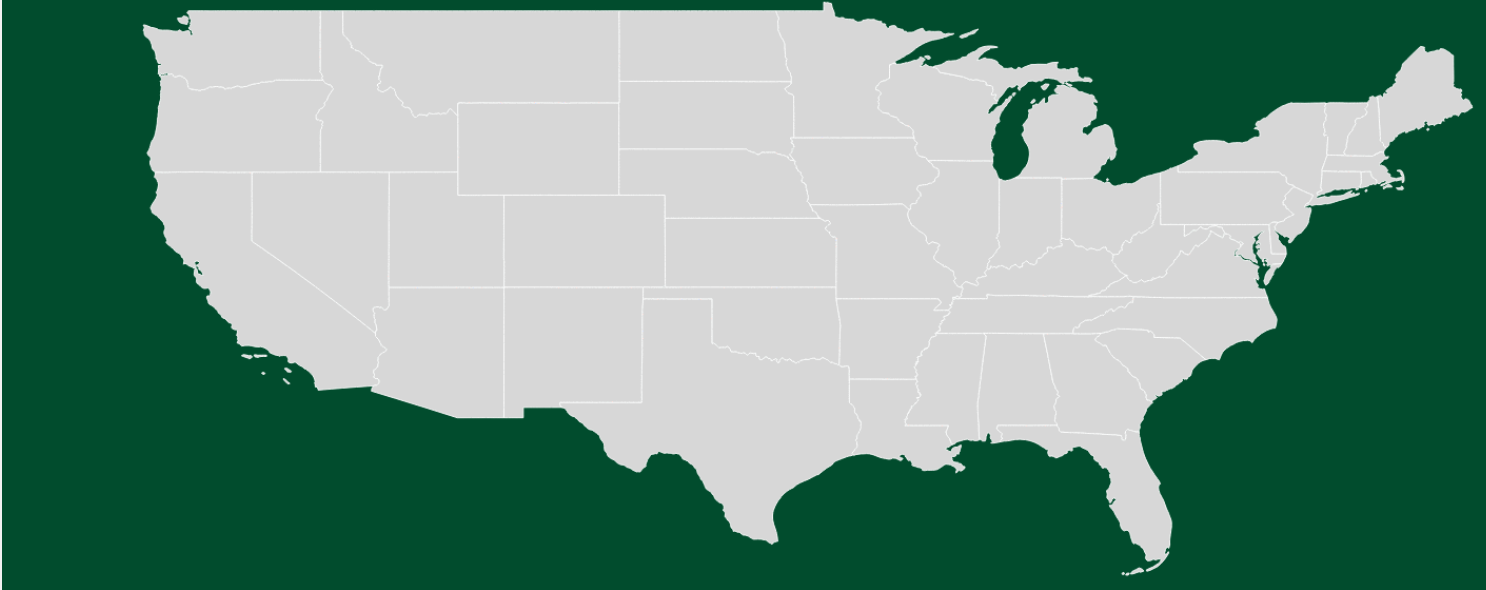


TREATMENTS

- None
 - Prion diseases are protein-linked, not nucleic acid-linked, so the only means of killing it would be to use protein-killing agents
- No cure or vaccine
- Heat denaturation is not practical
 - Evidence shows boiling will not denature the prion
- Prion diseases in humans are usually met with supportive care and fluids

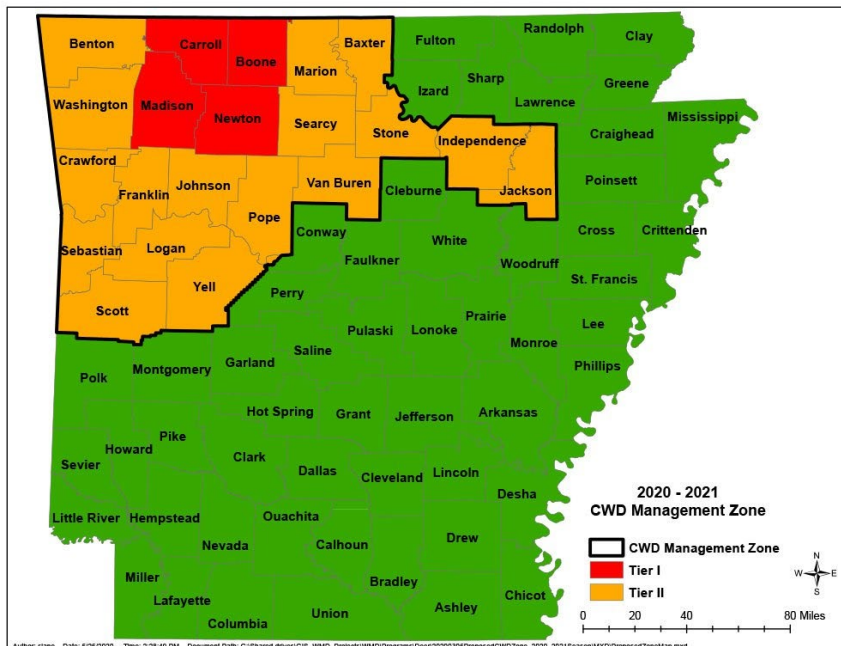


1966



GEOGRAPHY

- Centralized in Midwestern states
- Concentrated pocket in Pennsylvania & West Virginia
- Canada, Norway, Sweden, Finland, and South Korea
- Spread to Arkansas through southern Missouri or eastern Oklahoma
- Union County



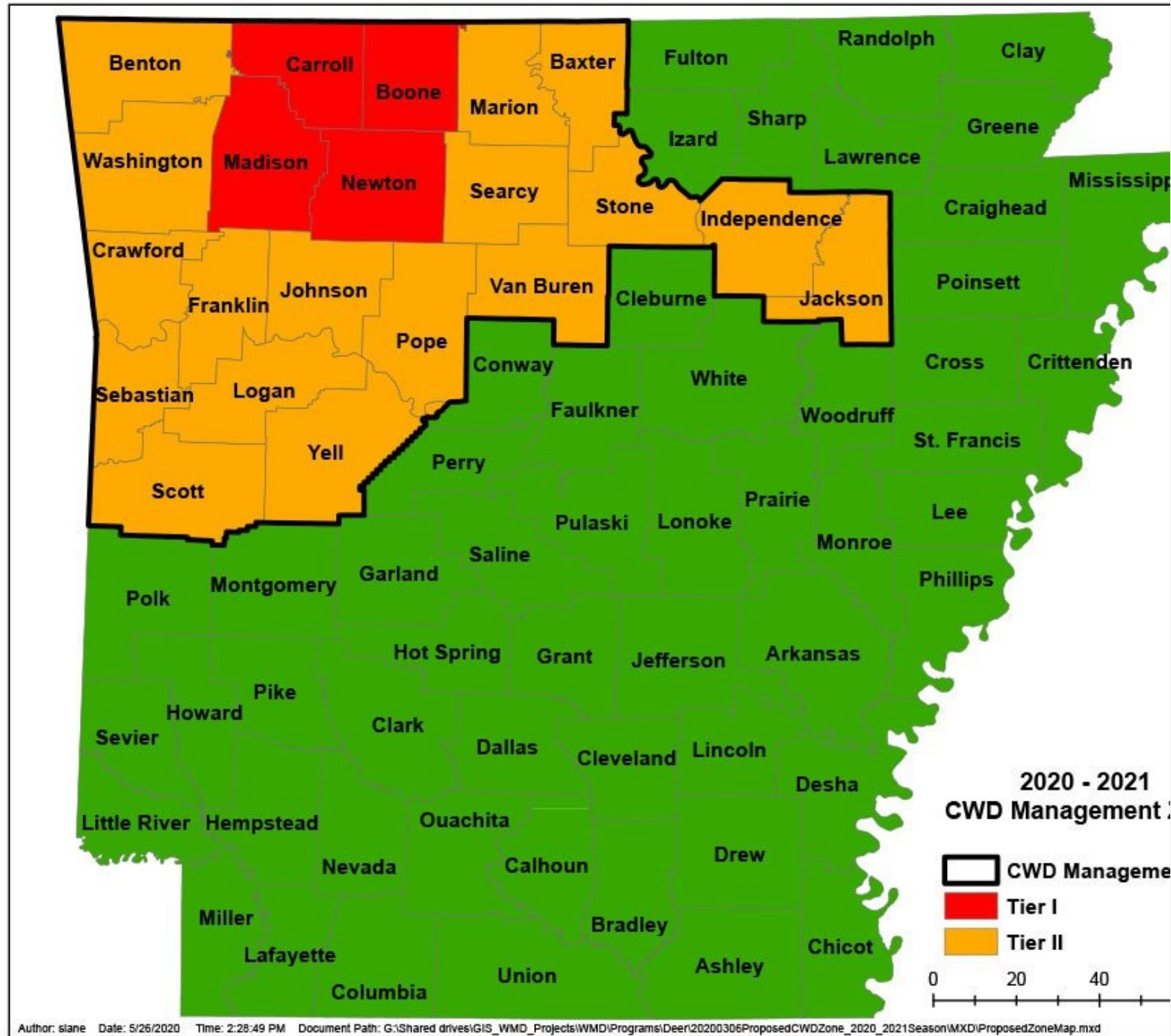
RESEARCH

- The National Wildlife Research Center (NWRC)
 - >100 studies
 - Advises legislation
- Rectal biopsy test
- Topical enzyme treatment
 - Prionzyme
- Transmission
 - Cervids
 - Squirrel monkeys, lab mice, Macaque monkeys
 - No human cases



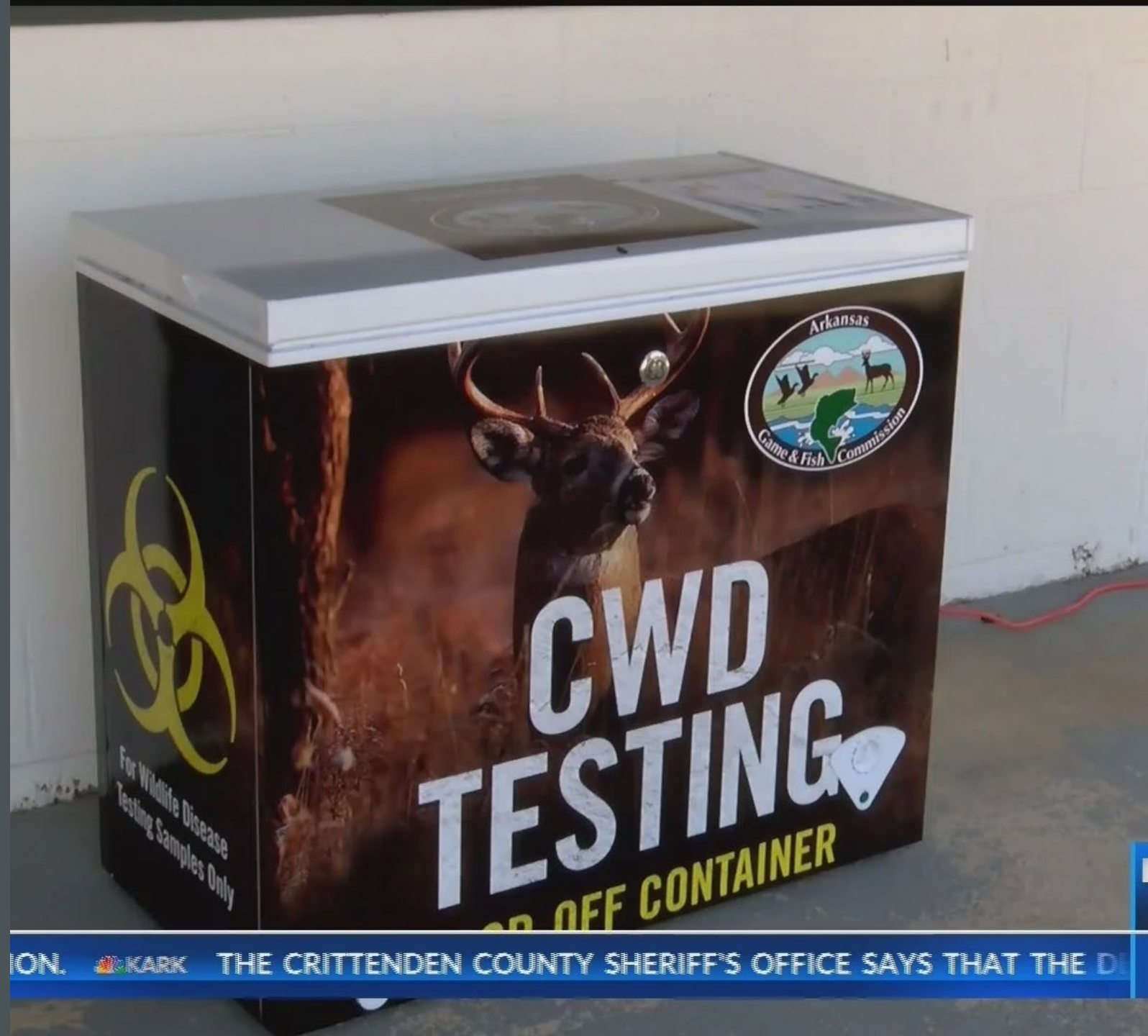
MANAGEMENT / REGULATION

- Arkansas Game & Fish Commission (AGFC)
- Regulations on deer and elk transport across zone borders
- Required testing for harvested elk
- Recommended precautions
 - Sick deer
 - How to safely clean them
- Updated harvest laws in CWD management zones
 - Possible bonus tags
 - Outlawed deer rehabilitation
 - Removal of antler criteria



HOW WE CAN HELP

- Donate! (AGFC)
- Testing sites?
 - Testing sites exist in every Arkansas county
 - Test deer/elk
- Handling harvested deer
 - Call AGFC if you see a deer that appears sick
 - Latex gloves
 - Debone meat
 - Transport across management zone borders
 - Test deer before consuming meat



ANY QUESTIONS?

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