

CALIFORNIA ANIMAL HEALTH AND FOOD SAFETY LAB SYSTEM



Encephalitis in Black Bears

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Working Case Definition

- Young bears, usually yearlings
- May have emerged early from hibernation, no sow present
- Habituated or “dog-like” behaviors, often unwilling or unable to flee when hazed
- +/- head tilt, ataxia, circling, tremors, seizures

Neurologic signs can be very subtle

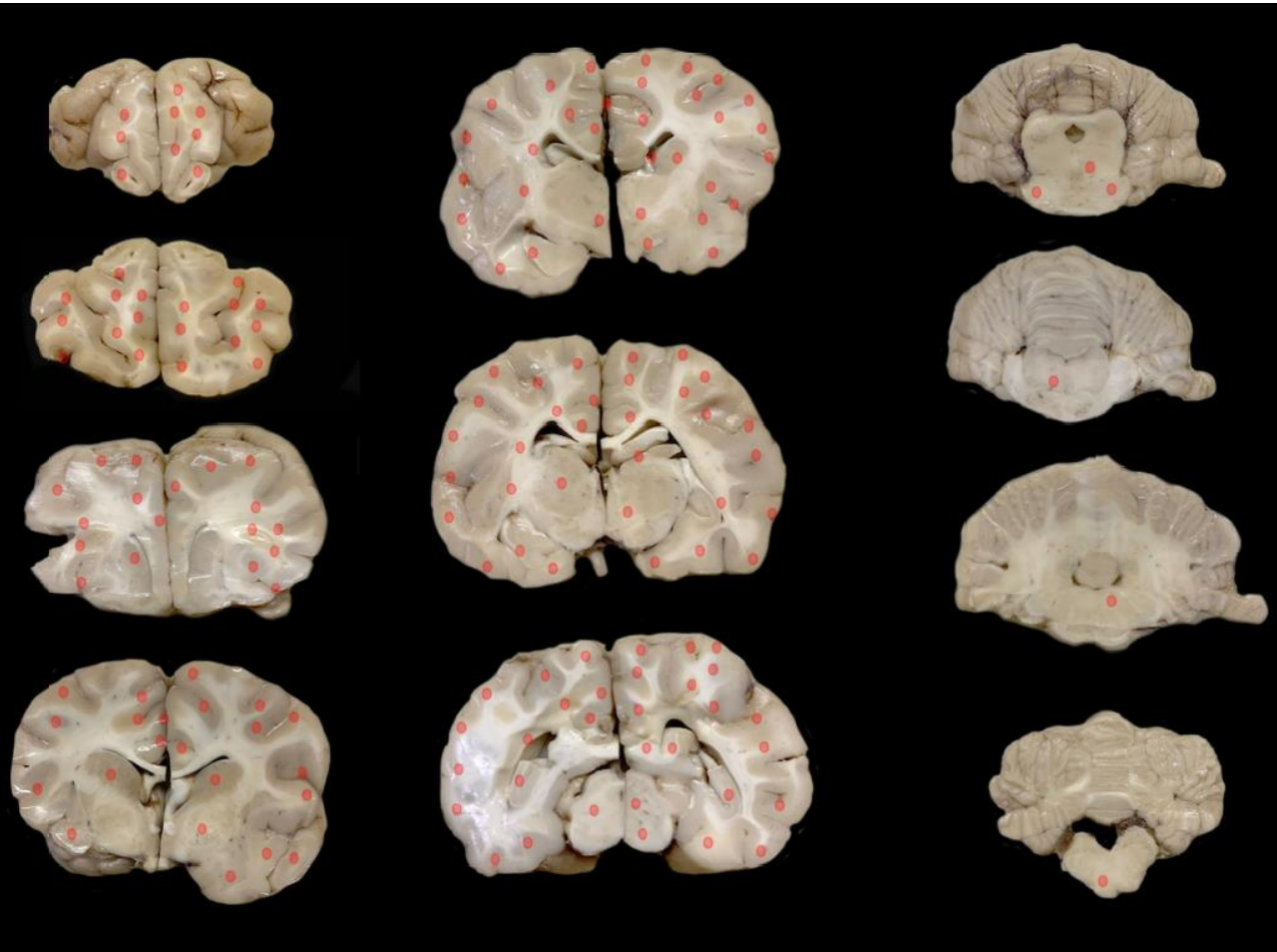


Two Distinct Patterns Emerged

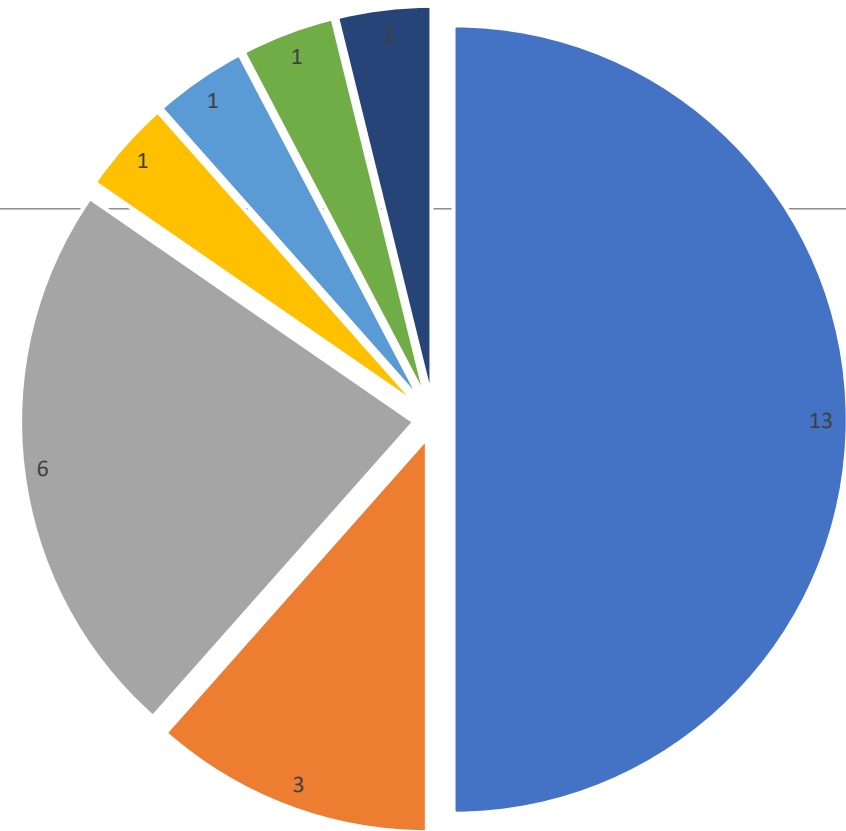


Photo Credit: Dr. Anibal Armien Medianero, California Animal Health and Food Safety Laboratory

¿Protozoal?



Bears with Encephalitis (n=26)



- Negative
- S. neurona
- S. felis
- T. gondii
- Cystoisospora-like sp.
- S. canis
- Sarcocystis sp.

Dr. Devinn Sinnott, UC Davis

¿Viral?

Identification of gammaherpesvirus infection in free-ranging black bears (*Ursus americanus*)

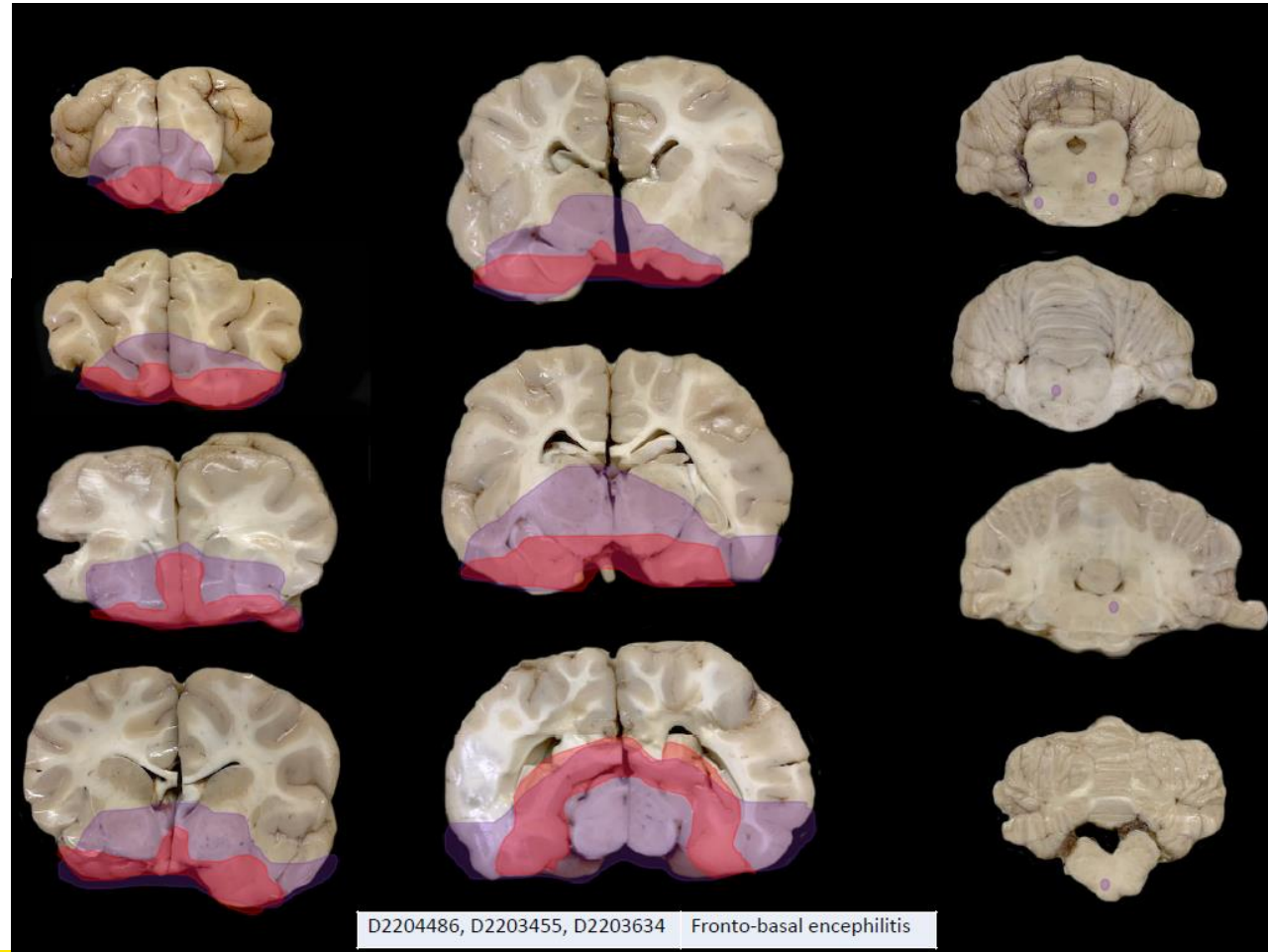
Wendy Black^a, Ryan M. Troyer^b, Jesse Coutu^c, Karsten Wong^a, Peregrine Wolff^d, Martin Gilbert^e, Junfa Yuan^a, Annabel G. Wise^f, Sunny Wang^a, Dan Xu^a, Matti Kiupel^f, Roger K. Maes^f, Rob Bildfell^a, Ling Jin^{a,c,*}

PLOS ONE

RESEARCH ARTICLE

Viruses in unexplained encephalitis cases in American black bears (*Ursus americanus*)

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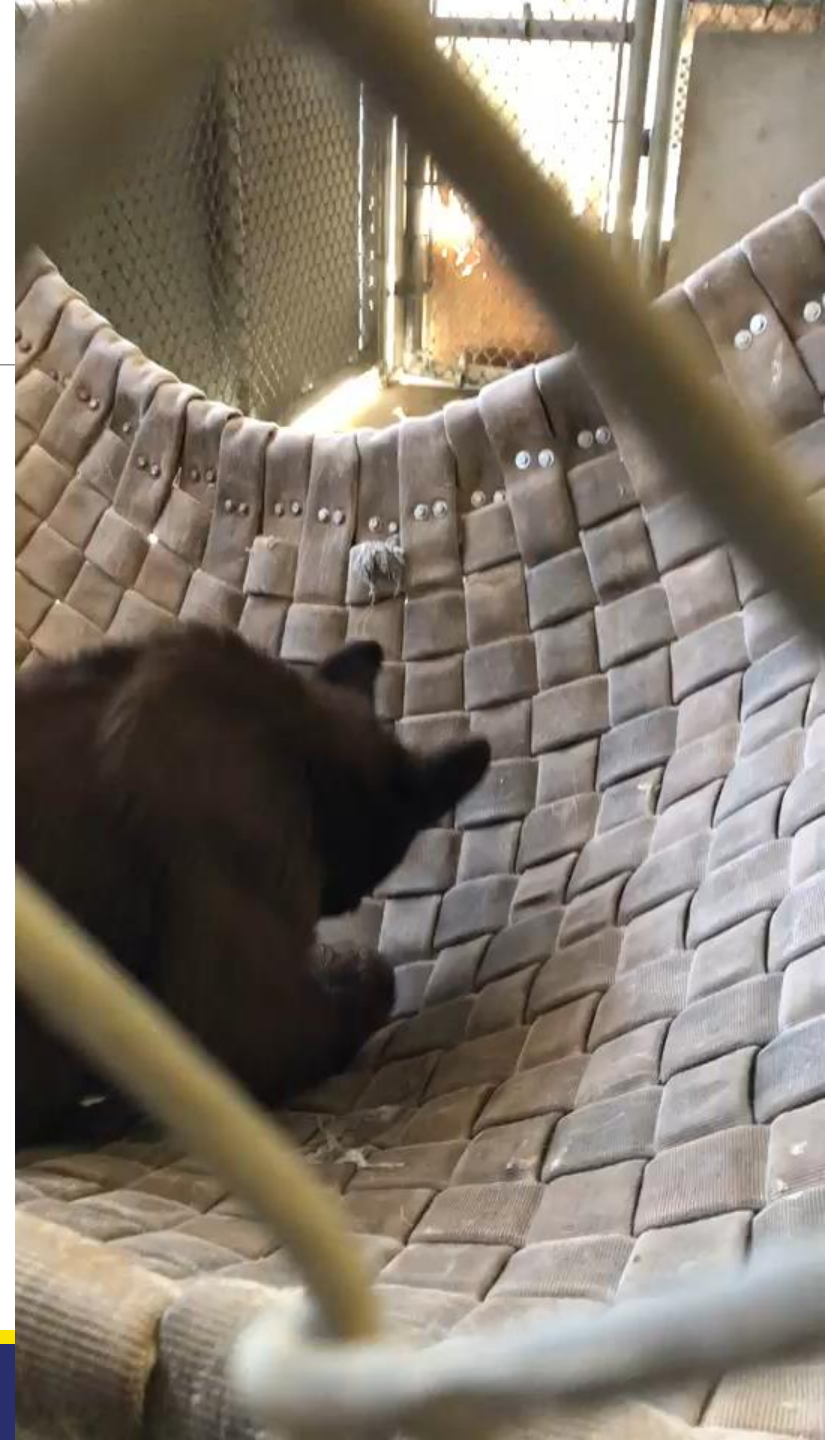
Management Implications

- Association with human-bear conflict, depredation?
- Public safety concerns?
- Population health impacts?



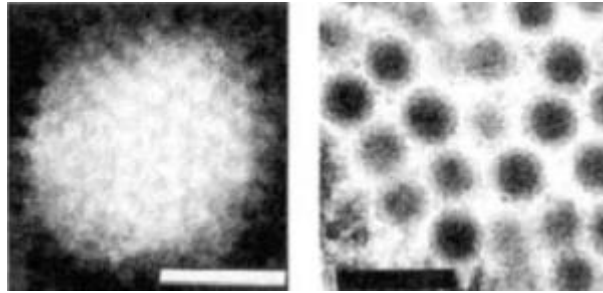
Animal Health Implications

- Currently no single cause identified or treatment available.
- CSF cytology, often see mild inflammation
- Clinical signs persist, can wax and wane, and can progress:
 - Persistent or waxing/waning behavioral abnormalities
 - “Dull” mentation
 - Seizures



Deer Viral Hemorrhagic Diseases (HD)

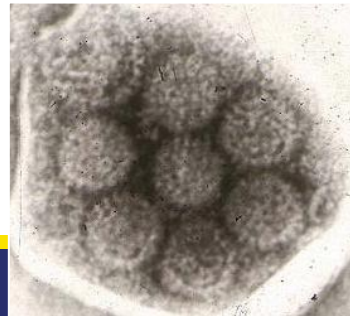
Deer Adenovirus (OdAdV-1)



- First described in 1993-94 CA epizootic
- Direct transmission, possibly other routes
- Primary virus causing HD epizootics in CA's deer

Bluetongue Virus (BTV)

Epizootic hemorrhagic disease virus (EHDV)



- Closely related orbiviruses
- Transmitted by biting midges, Culicoides
- Causes more localized outbreaks of HD in CA deer
- Common livestock disease, e.g.:
 - Bluetongue in sheep, other small ruminants
 - Inapparent to mild disease in cattle

How the Viruses Cause Disease

Viruses replicate in cells lining blood vessels

→ Damage to blood vessels



Hemorrhage



Edema

→ Coagulation system attempts repair

→ Clotting factors get used up

→ Worsening hemorrhage & edema

→ Death or recovery often with sequellae



Common clinical signs of HD

- Fever, cyanosis (e.g. blue tongue),
- hyperemia
- excessive drooling,
- swollen muzzle, edema in general
- diarrhea (sometimes bloody),
- regurgitation,
- seizures, inability to rise,
- Sudden Death** often found near water



Adenovirus vs. the Orbiviruses

DEER ADENOVIRUS

BtD > MD > WtD

Fawn > Yearling > Adults

Less seasonal, but difficult to interpret due to ages most susceptible.



ORBIVIRUSES

WtD > BtD/MD

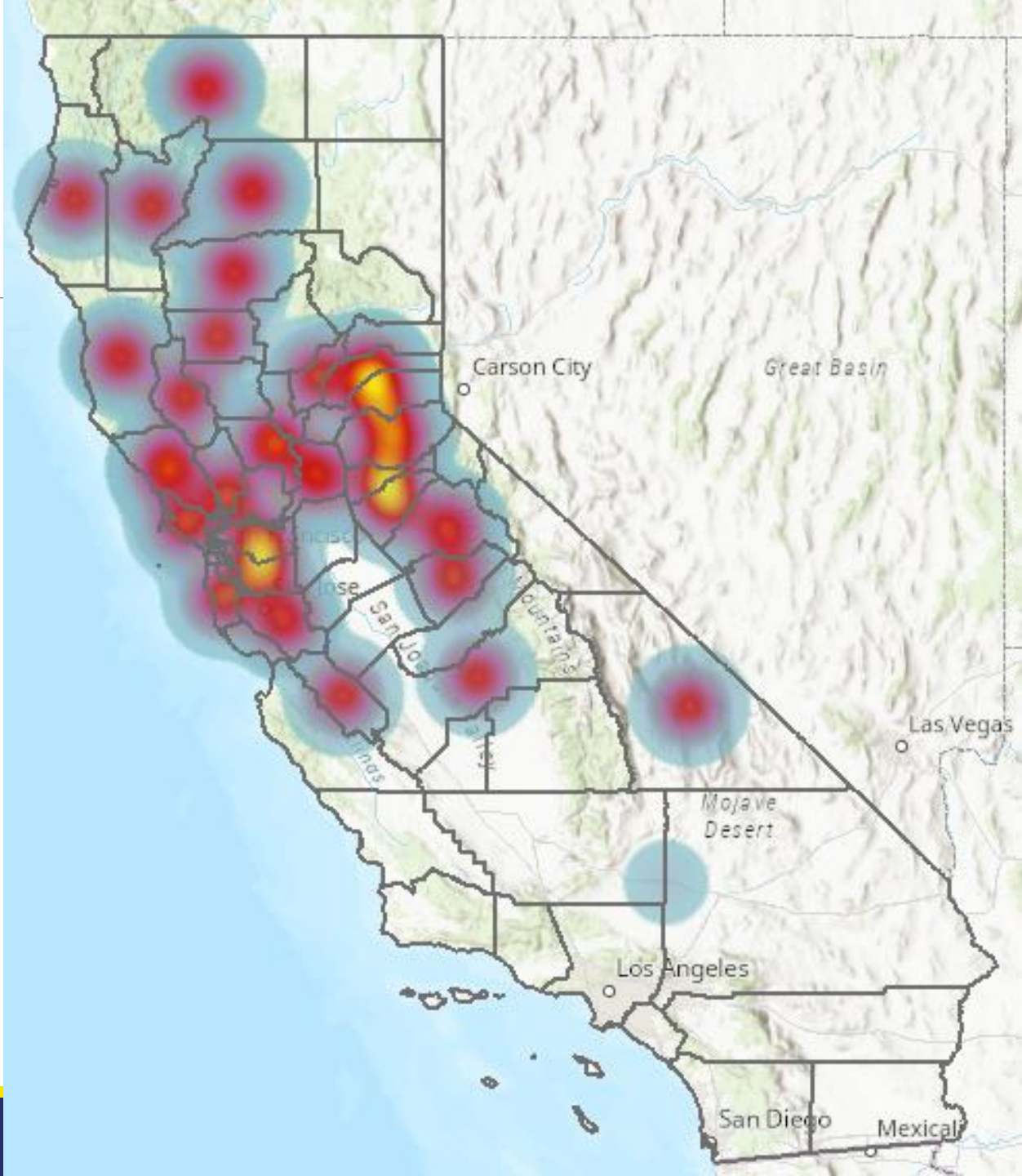
All age classes susceptible, large outbreaks due to waning herd immunity

Clear seasonal distribution associated with required midge vector



Confirmed OdAdV-1

- High exposure but little to no disease detected in SoCol
 - Don't know why
 - 2021, first detection in Tehachepi area
- Reports of suspected disease every year in some counties, but not confirmed
- **CDFW goals – confirm disease where suspected to fill in some of those gaps**

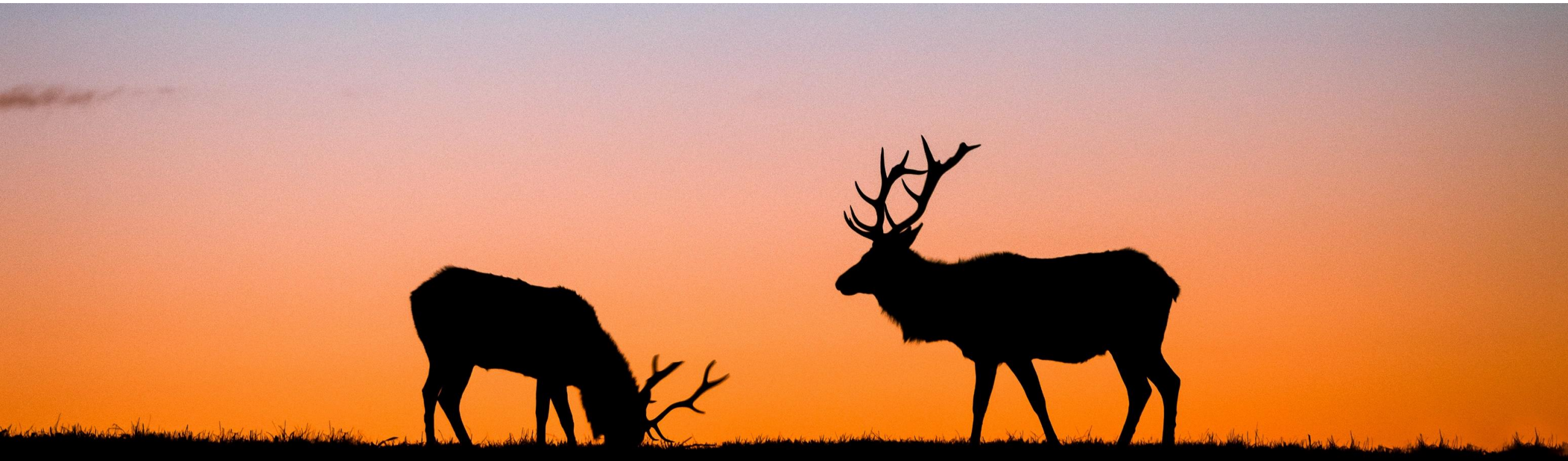




CWD Outreach campaign

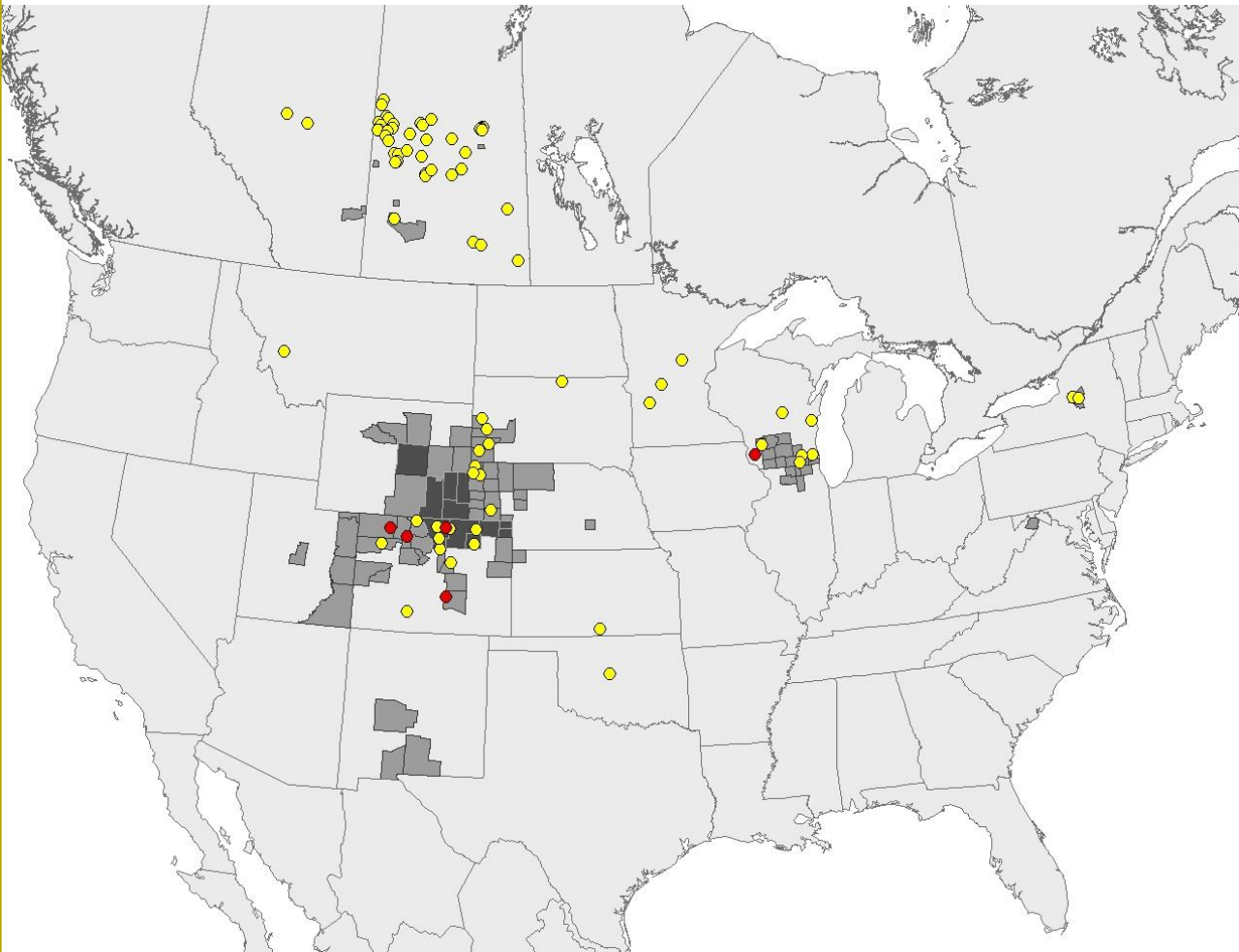
**NO TIME
TO WASTE**

KEEP CWD AWAY

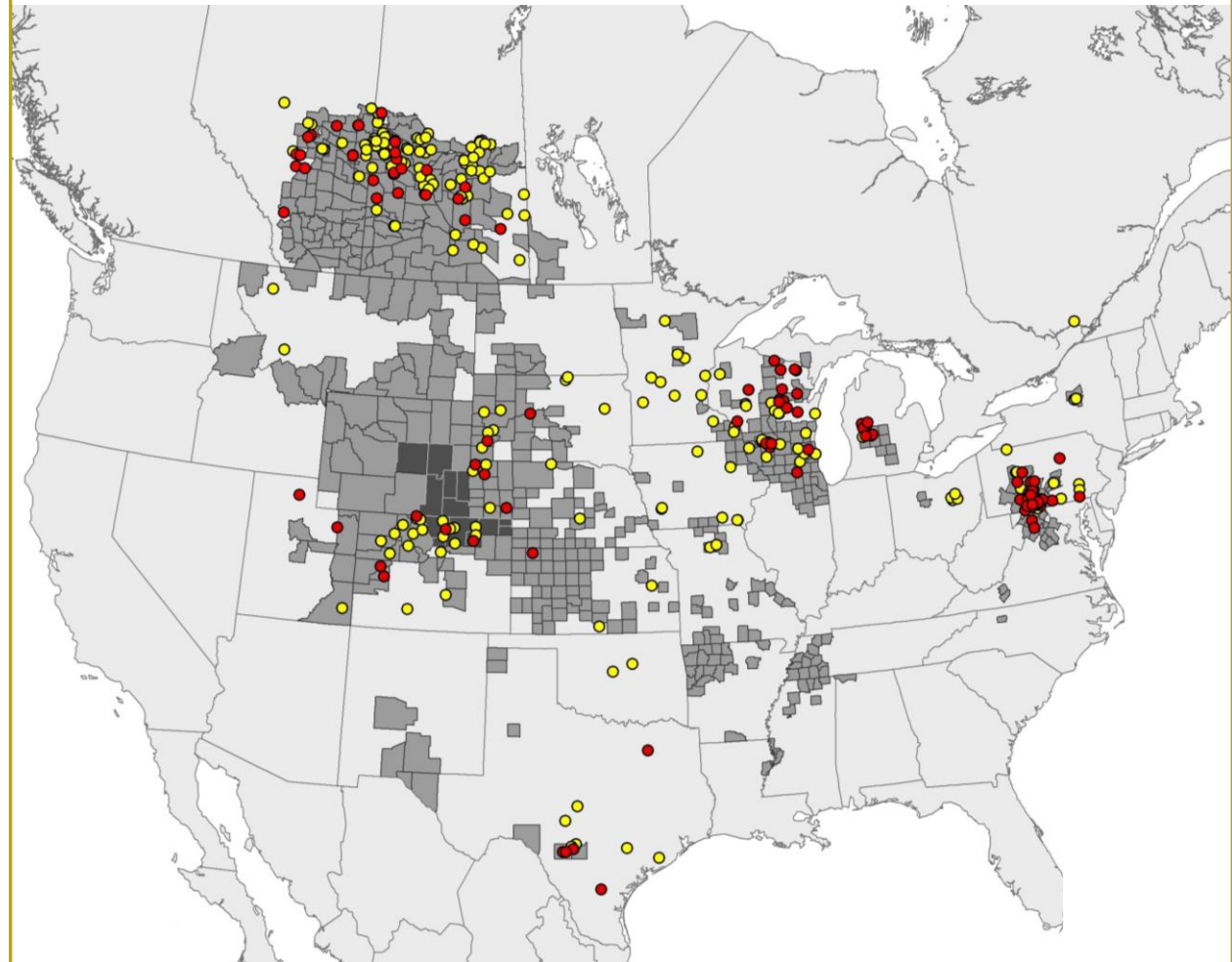


Unabated spread

November 2006



April 2022

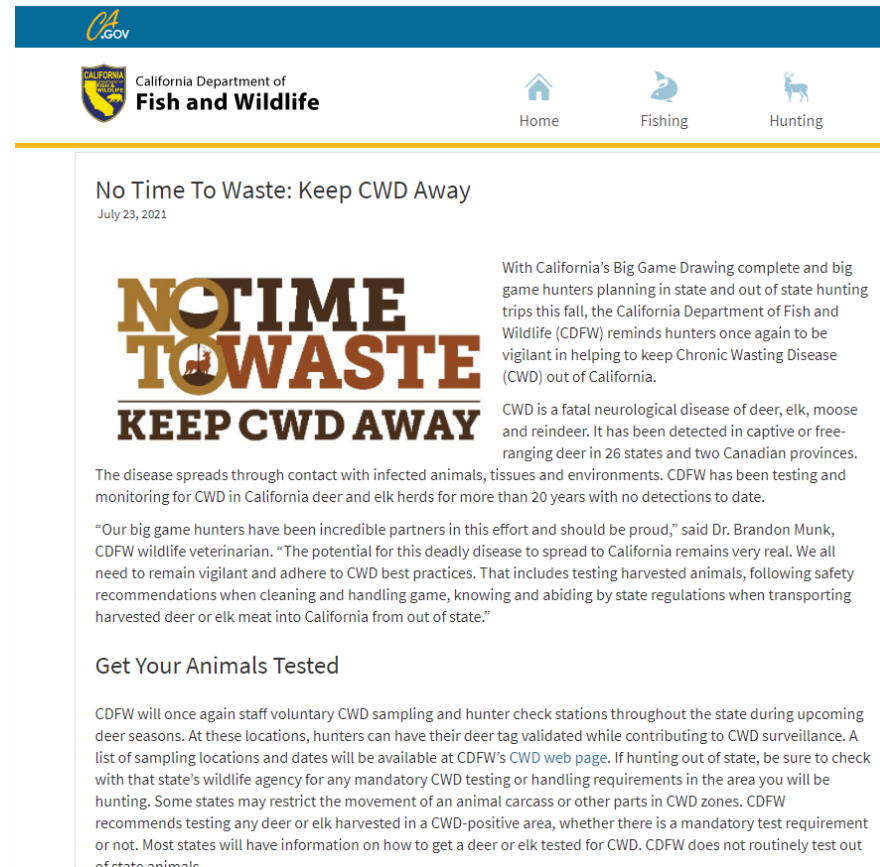


CWD OUTREACH CAMPAIGN



NO TIME TO WASTE
KEEP CWD AWAY

CHRONIC WASTING DISEASE, WHAT YOU SHOULD KNOW.



CA Gov
California Department of Fish and Wildlife

Home Fishing Hunting

No Time To Waste: Keep CWD Away

July 23, 2021

NO TIME TO WASTE
KEEP CWD AWAY

With California's Big Game Drawing complete and big game hunters planning in state and out of state hunting trips this fall, the California Department of Fish and Wildlife (CDFW) reminds hunters once again to be vigilant in helping to keep Chronic Wasting Disease (CWD) out of California.

CWD is a fatal neurological disease of deer, elk, moose and reindeer. It has been detected in captive or free-ranging deer in 26 states and two Canadian provinces. The disease spreads through contact with infected animals, tissues and environments. CDFW has been testing and monitoring for CWD in California deer and elk herds for more than 20 years with no detections to date.

"Our big game hunters have been incredible partners in this effort and should be proud," said Dr. Brandon Munk, CDFW wildlife veterinarian. "The potential for this deadly disease to spread to California remains very real. We all need to remain vigilant and adhere to CWD best practices. That includes testing harvested animals, following safety recommendations when cleaning and handling game, knowing and abiding by state regulations when transporting harvested deer or elk meat into California from out of state."

Get Your Animals Tested

CDFW will once again staff voluntary CWD sampling and hunter check stations throughout the state during upcoming deer seasons. At these locations, hunters can have their deer tag validated while contributing to CWD surveillance. A list of sampling locations and dates will be available at CDFW's [CWD web page](#). If hunting out of state, be sure to check with that state's wildlife agency for any mandatory CWD testing or handling requirements in the area you will be hunting. Some states may restrict the movement of an animal carcass or other parts in CWD zones. CDFW recommends testing any deer or elk harvested in a CWD-positive area, whether there is a mandatory test requirement or not. Most states will have information on how to get a deer or elk tested for CWD. CDFW does not routinely test out of state animals.

Chronic Wasting Disease (CWD)

What you need to know?

WHAT IS CWD?
CWD is a **fatal neurological disease** of cervids (i.e., deer, elk, moose and reindeer).



HOW DOES IT SPREAD?
CWD spreads to cervids through contact with infected animals, tissues and environments.



HOW CAN WE HELP PREVENT THE SPREAD OF CWD?
Testing deer samples helps us know if CWD is present and allows us to better respond and manage the disease.



WHICH U.S. STATES HAVE DETECTED CWD?
States with detected cases of CWD



Hunters will have to bring their whole deer or deer's head (with at least 2-4 inches of the neck attached) for lymph node collection. The lymph nodes, which are a dime to quarter-sized set of tissue, are located behind the jaw along the spine.



Sample Option 1



Sample Option 2

OUT-OF-STATE HUNTING & HARVEST IMPORT

The California Code of Regulations, Title 14, Section 712 governs the importation of hunter-harvested deer and elk (cervid) into California. Only some parts of a harvested deer or elk can be imported, and no portions of the brain or spinal cord may be imported. Visit [wildlife.ca.gov/CWD](#) to learn more.

For more information on keeping California's deer and elk herds safe and free from CWD, please visit CDFW's CWD web page: [wildlife.ca.gov/CWD](#)

NO TIME TO WASTE
KEEP CWD AWAY



<https://wildlife.ca.gov/CWD>

QUESTIONS



More
Information

cwd@wildlife.ca.gov

<https://wildlife.ca.gov/CWD>

<https://wildlife.ca.gov/Conservation/Laboratories/Wildlife-Health>