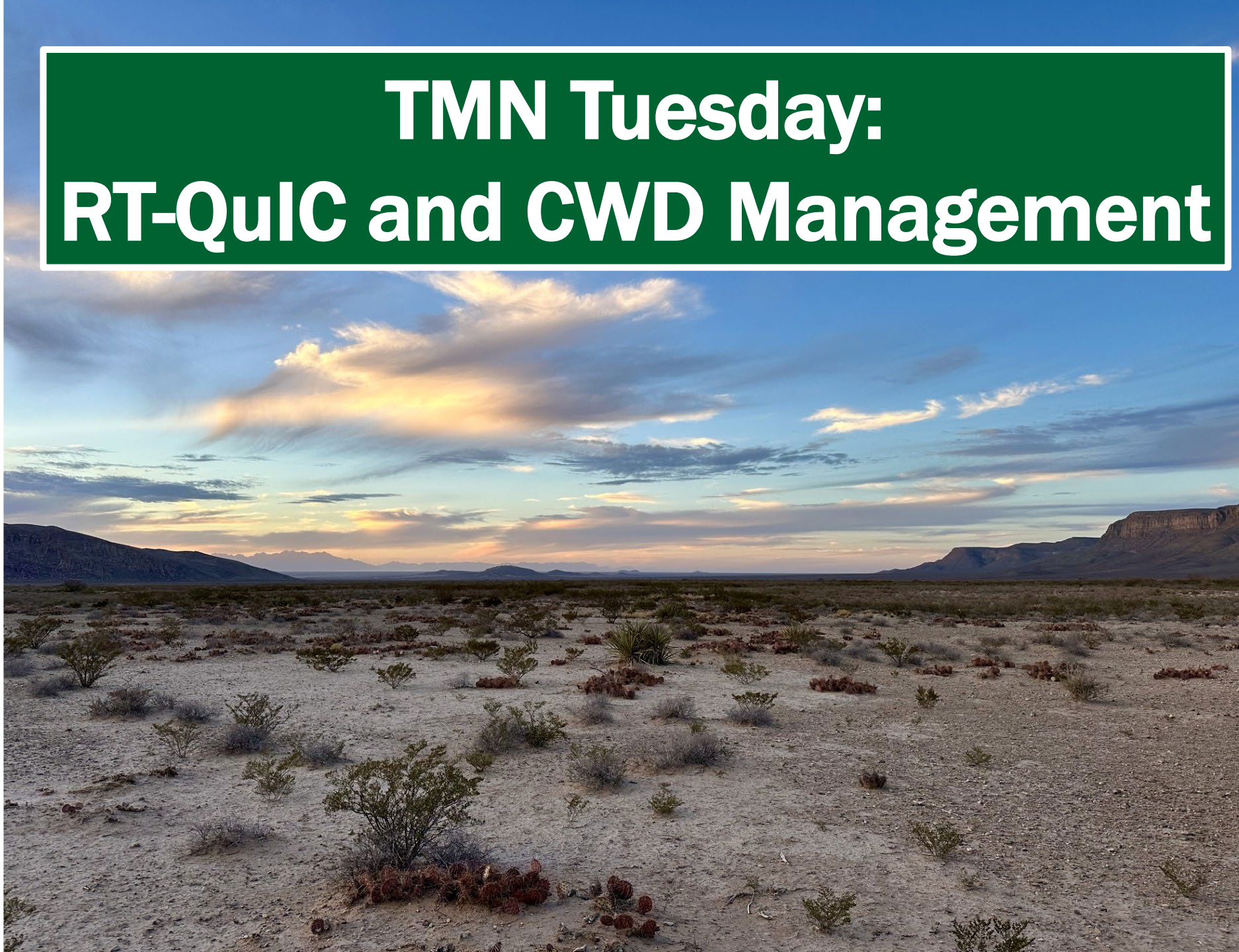
TEXAS PARKS & WILDLIFE

TMN Tuesday: RT-QuIC and CWD Management



Presented by:
Dr. J Hunter Reed
DVM, MPH

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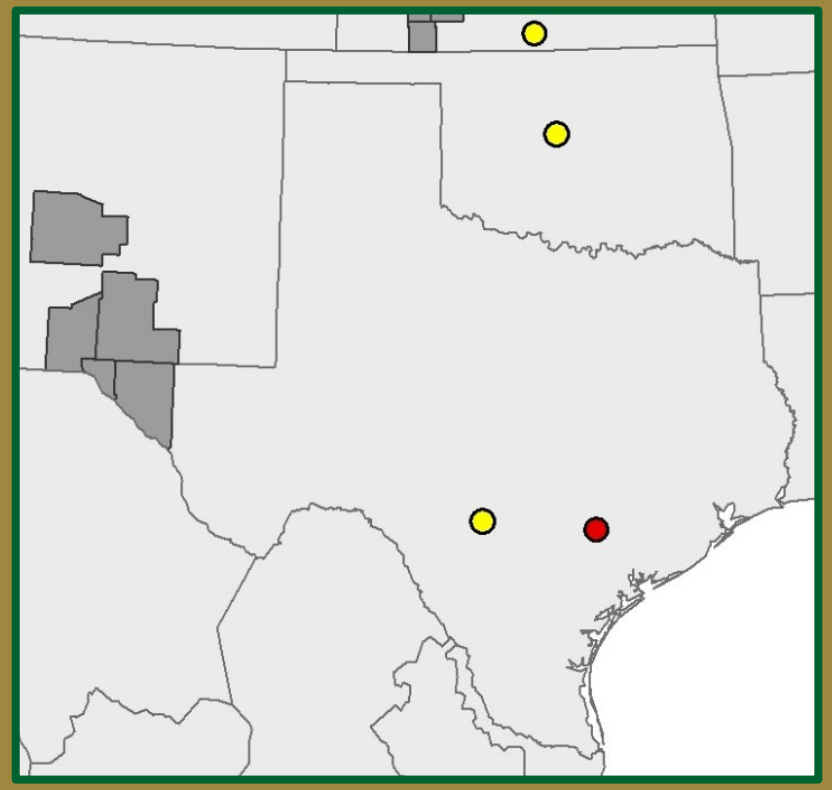
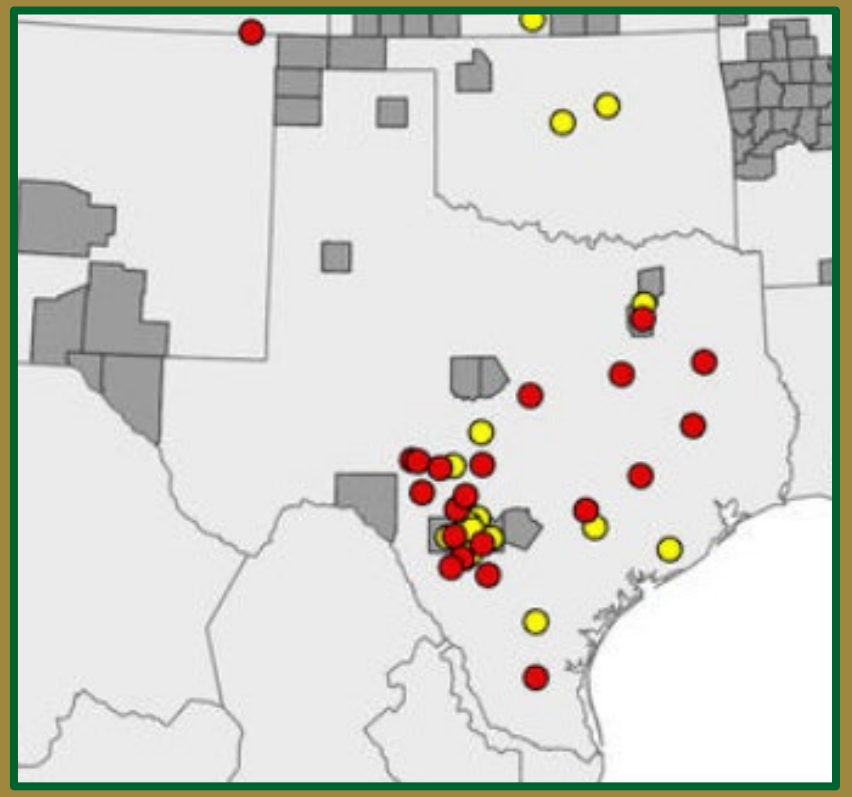
CWD in Texas

2015



2025



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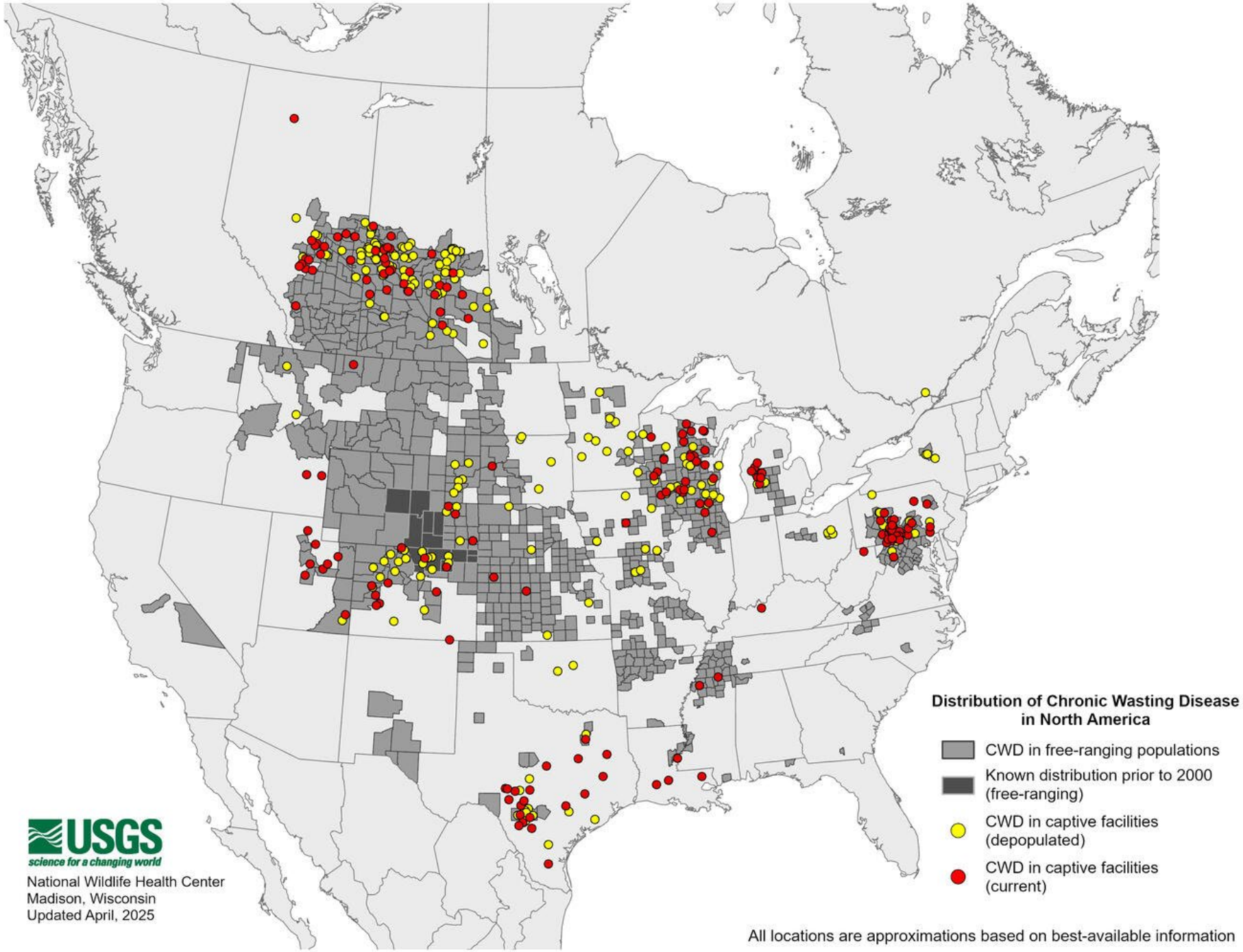

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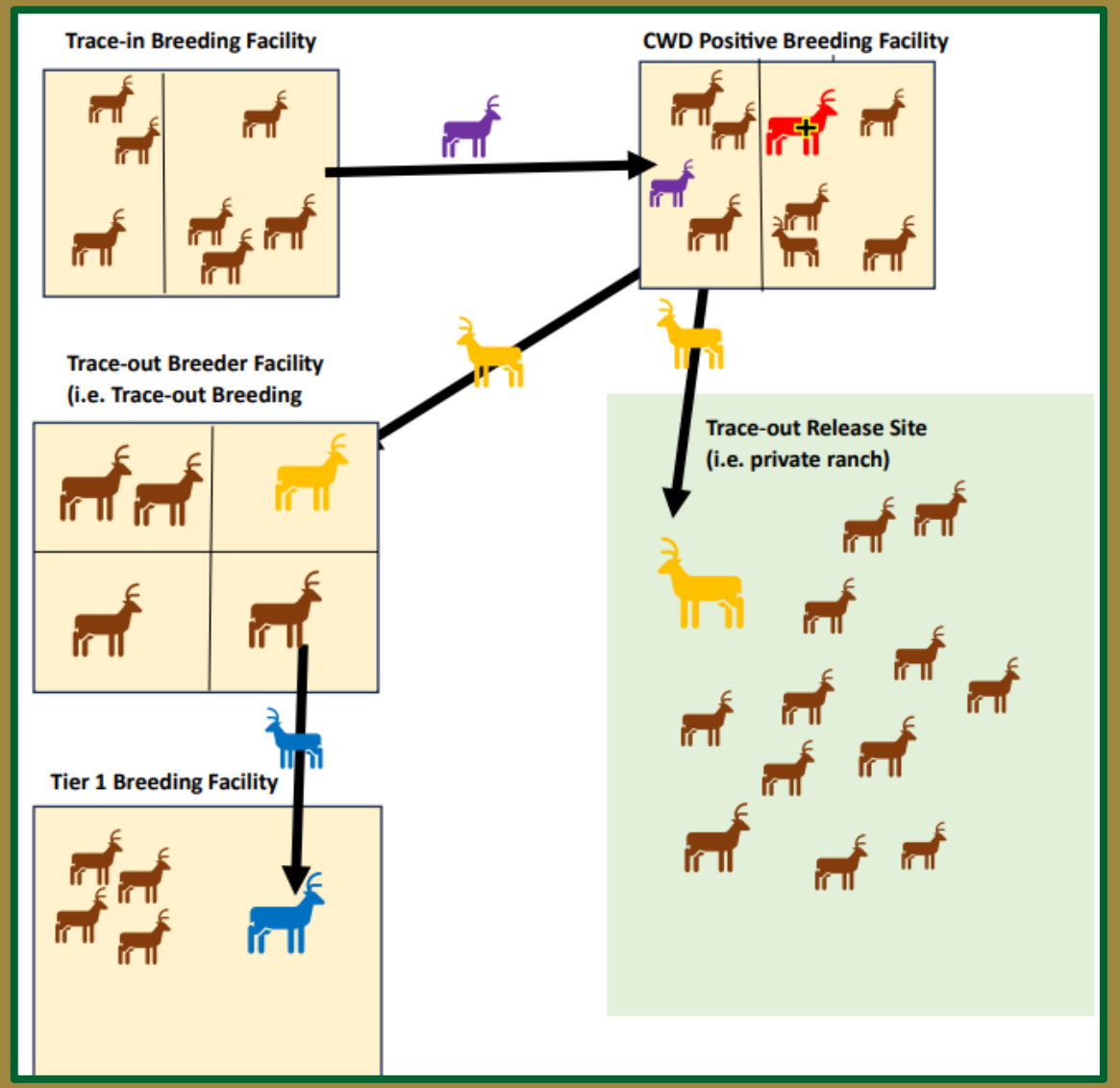
Captive Deer – Movement

Legend:

- CWD positive deer
- Trace-in deer, a deer that was sent to a CWD+ breeding facility from another breeder facility within 5 years of detection.
- Trace-out deer, a deer that was in a CWD+ breeding facility and sent to another facility (breeder pens, release site, etc.).
- Tier 1 deer, a deer that came from a trace-out breeding facility but was not the trace-out deer that came from the CWD positive facility.



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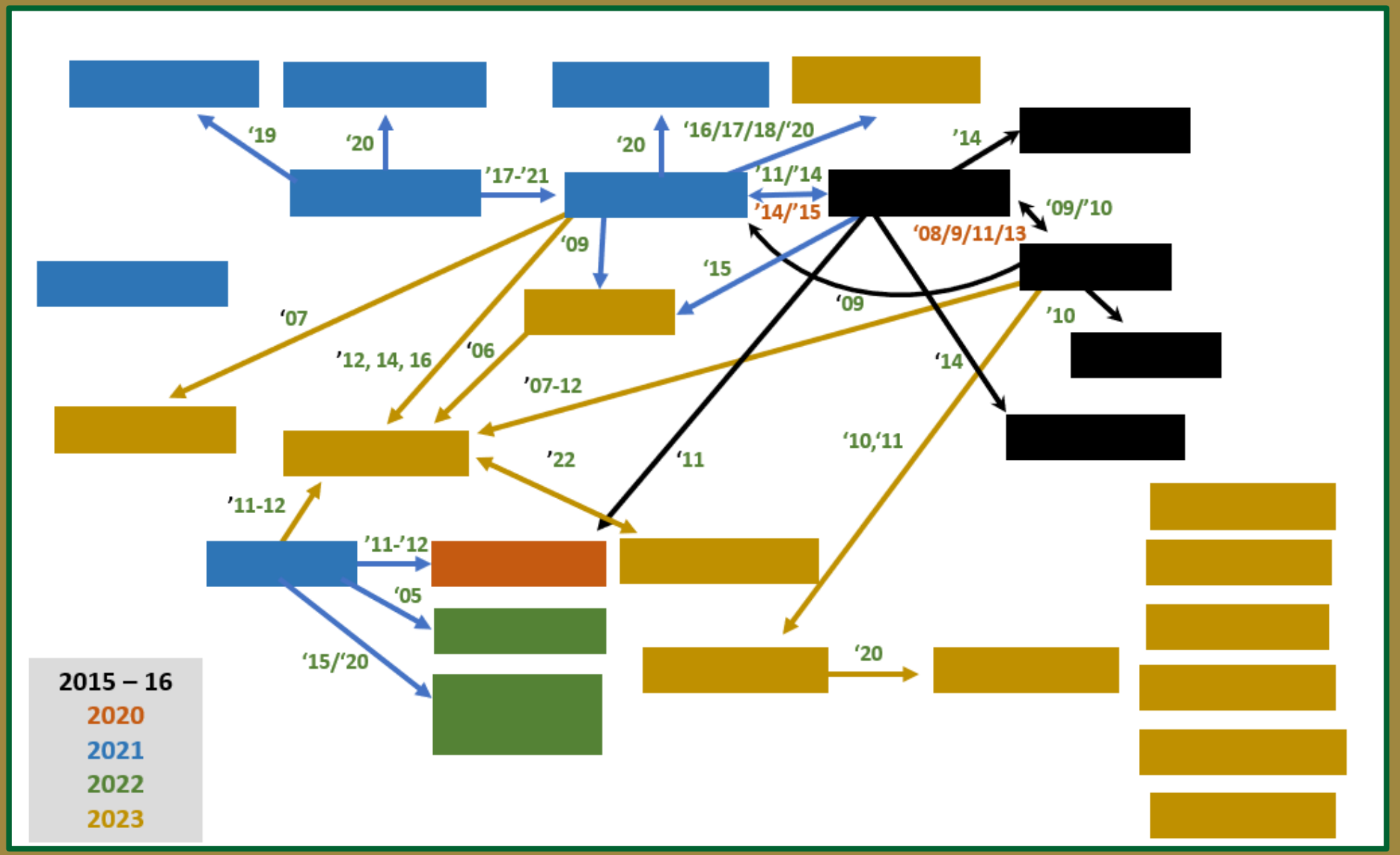
Captive Deer - Movement



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Captive Deer - Movement

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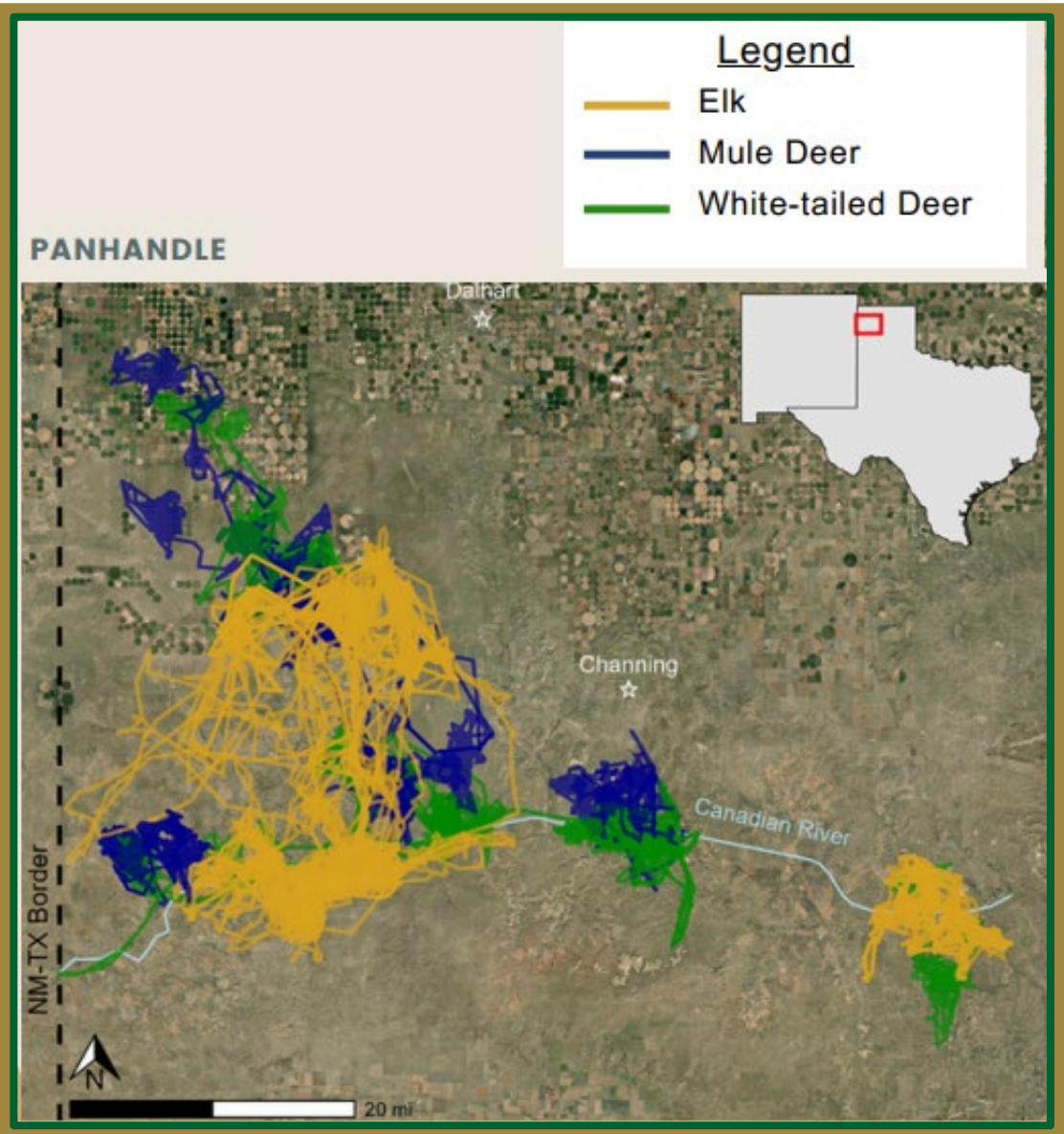
Free-ranging Deer - Movement

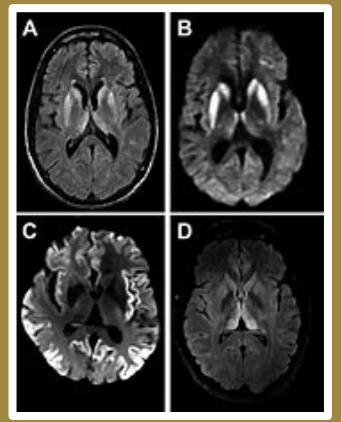


Why do anything?

Biological

Economic

Human-related



Captive Deer – Rule Changes

Mortalities

Purchases

100% with "Not Detected" AM test
- Within last 8 months at same facility
- Animal is 6 months or older
- Taken by authorized vet
- Submitted to TVMDL in 7 days

Captive Breeder Herd

Releases

100% with "Not Detected" AM test
- Within last 8 months at same facility
- Animal is 6 months or older
- Taken by authorized vet
- Submitted to TVMDL in 7 days

Mortalities

100% - 12 months and older
- LN and Obex
- Authorized vet or collector
- Submitted to TVMDL in 7 days

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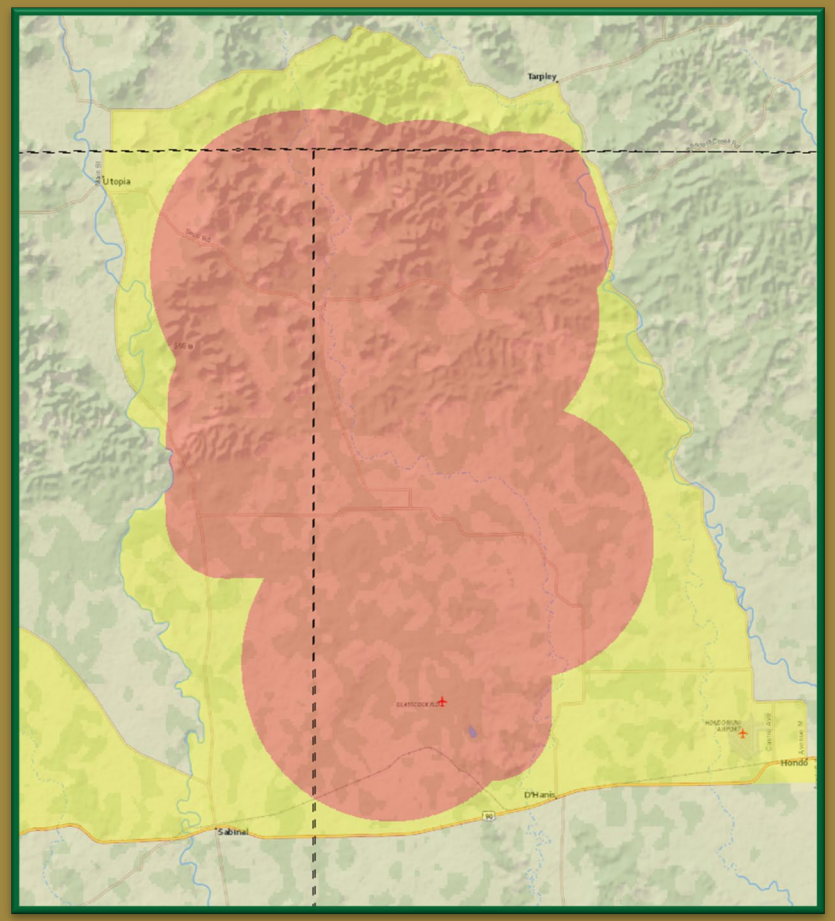
Free-ranging Deer – Rule Changes



PREFERRED DISPOSAL METHOD »

Leave unused carcass parts at the property of harvest.

This greatly reduces the chance of spreading CWD to other parts of the state.
Hunters are allowed to debone a carcass at any location, provided that:

- Meat is processed no further than whole muscles and may not be ground, chopped, or sliced.
- Meat from multiple deer must remain in separate bags or containers while transported.
- Proof of sex and tagging requirements remain with the meat until reaching a final destination.

IF THE CARCASS IS TRANSPORTED away from the property of harvest, unused parts must be:

Disposed of in a commercial trash service

OR

Returned to the property where the animal was harvested

OR

Buried at least 3 feet below the ground and covered with at least 3 feet of earthen material

Harvested deer or deer heads can be taken to a commercial processor or taxidermist and the commercial processor or taxidermist must properly dispose of unused parts.

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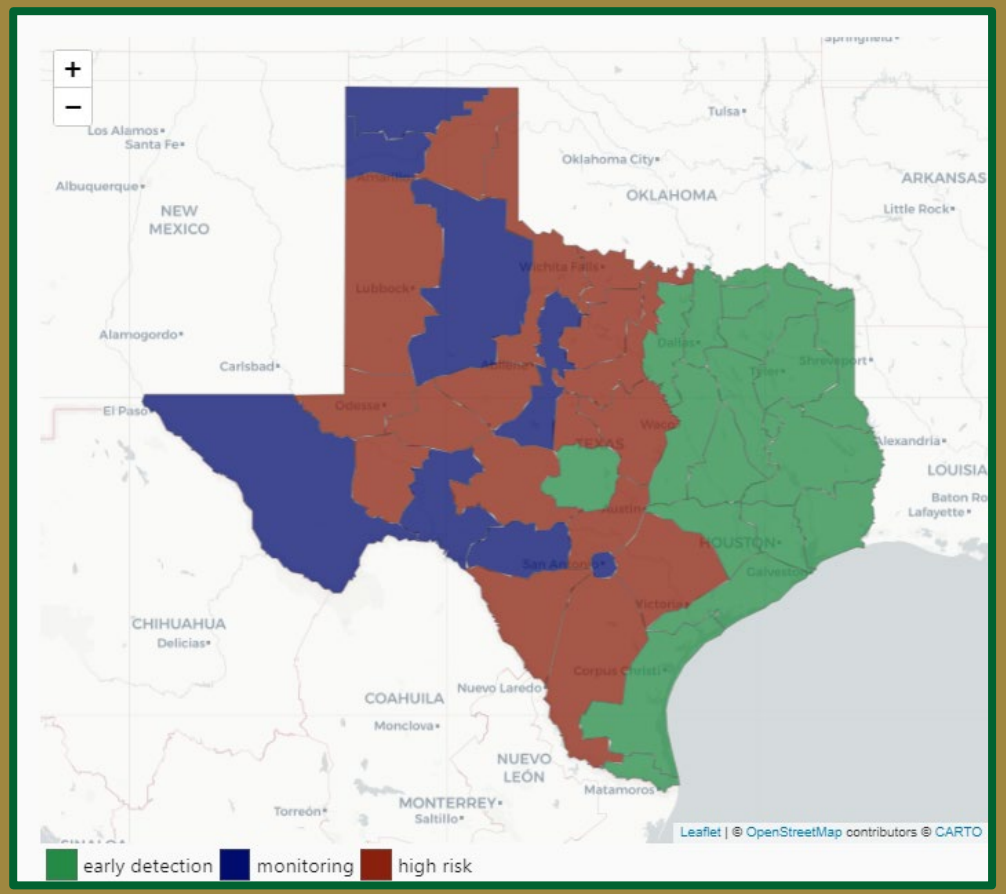
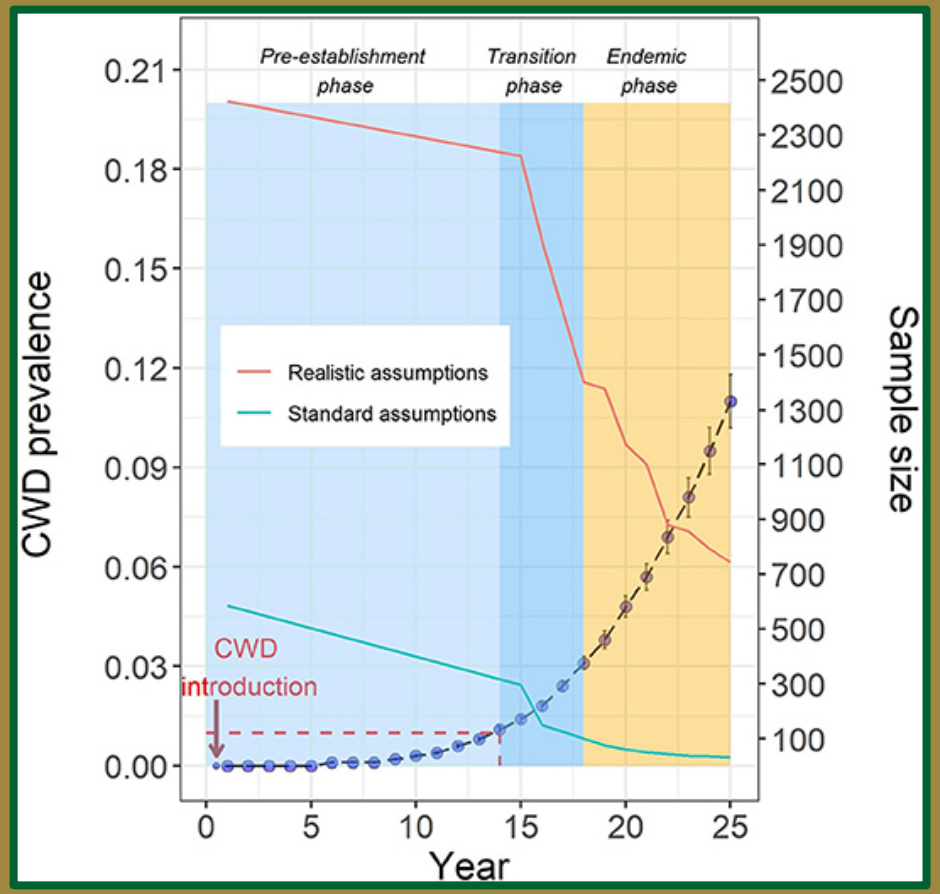
Free-ranging Deer - Surveillance





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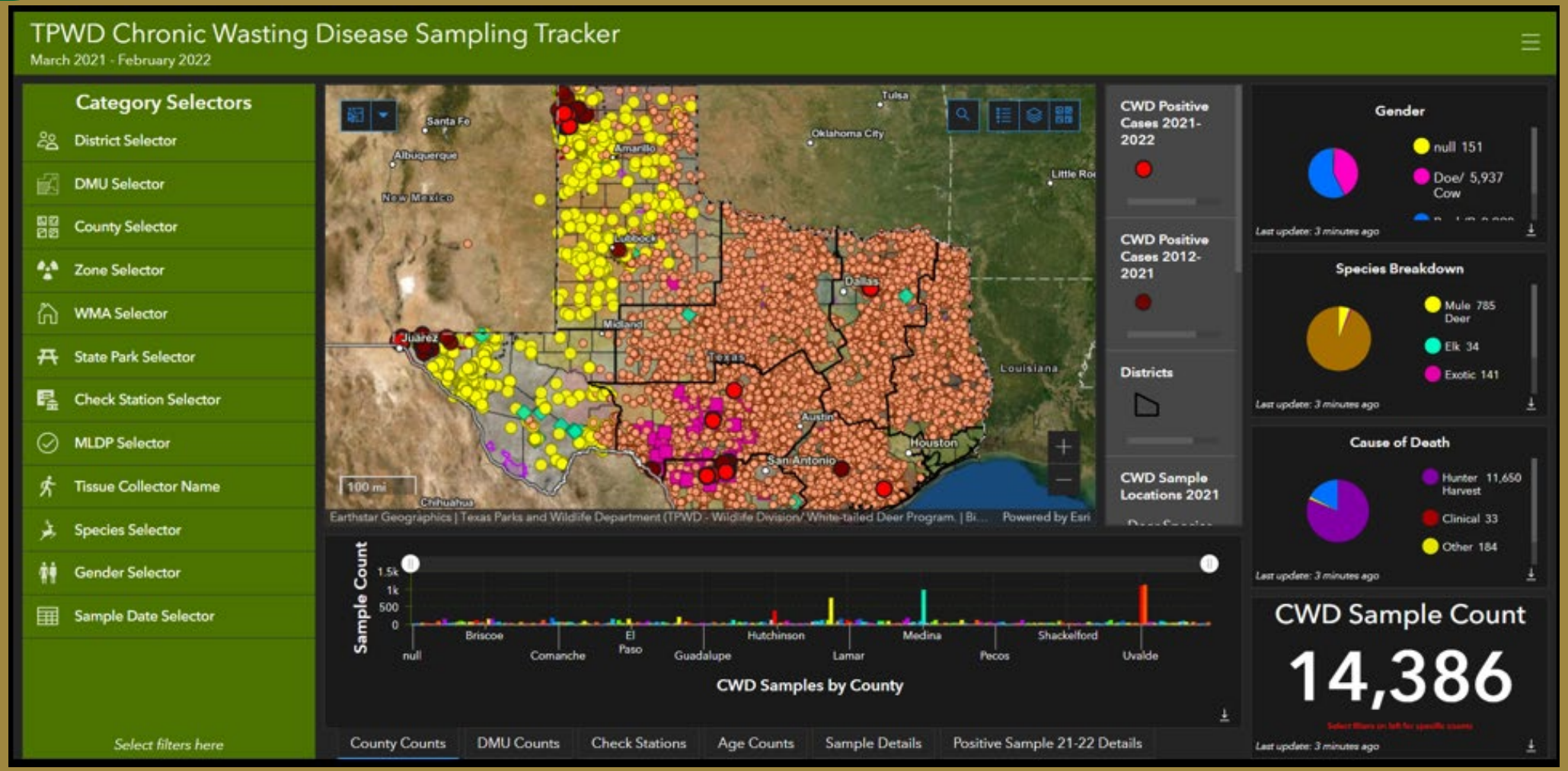
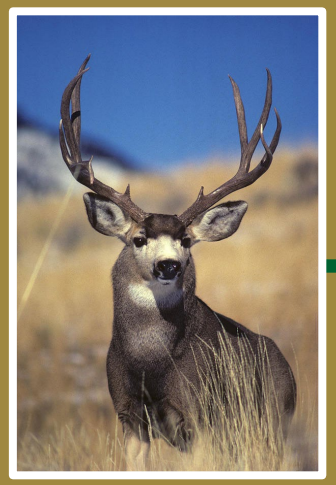
Free-ranging Deer - Surveillance



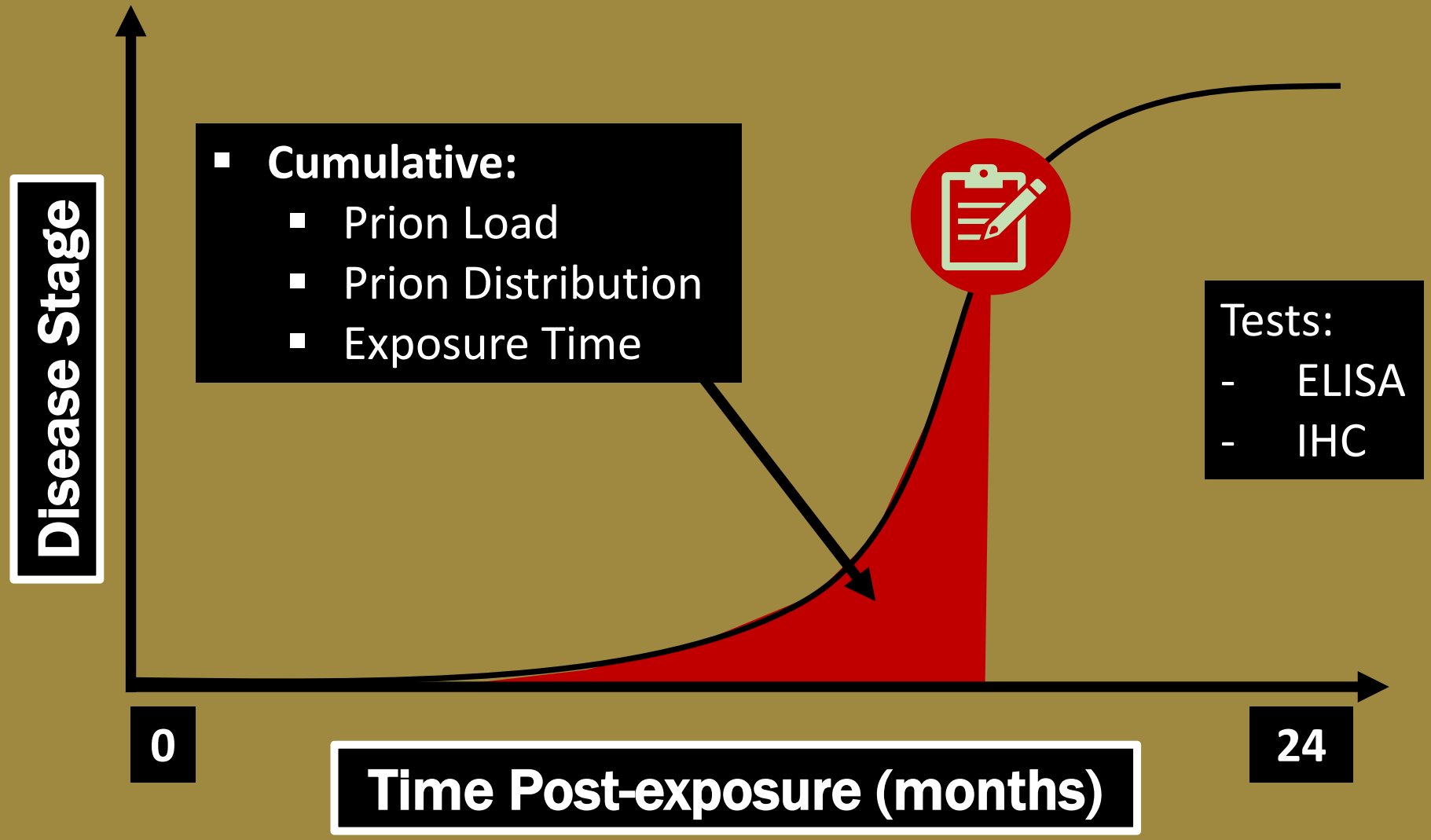
Research Area: Diagnostics



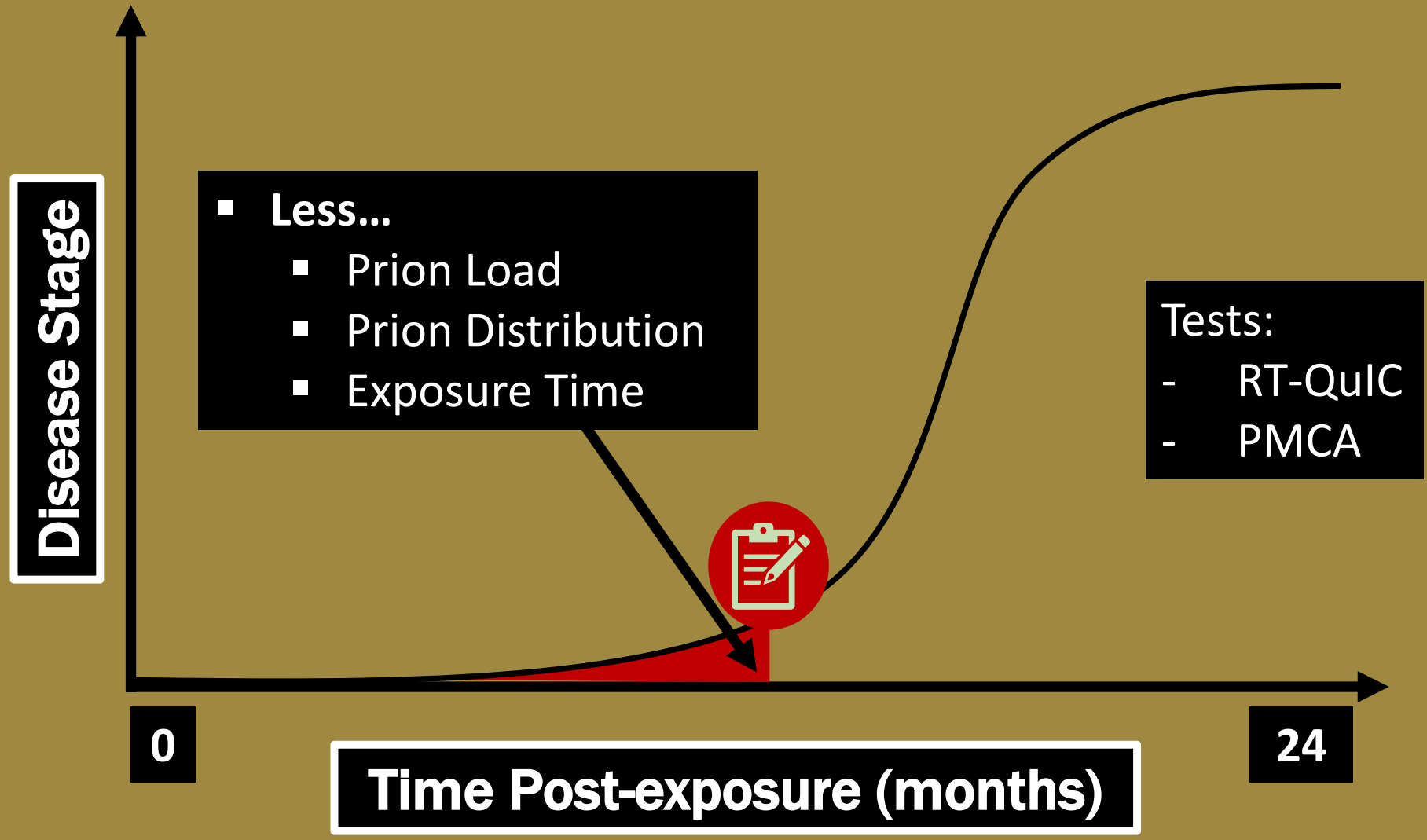
ELISA + IHC

RT-QuIC and PMCA

Research Area: Diagnostics



Research Area: Diagnostics



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TPWD Affiliated RT-QuIC Projects

Forensics

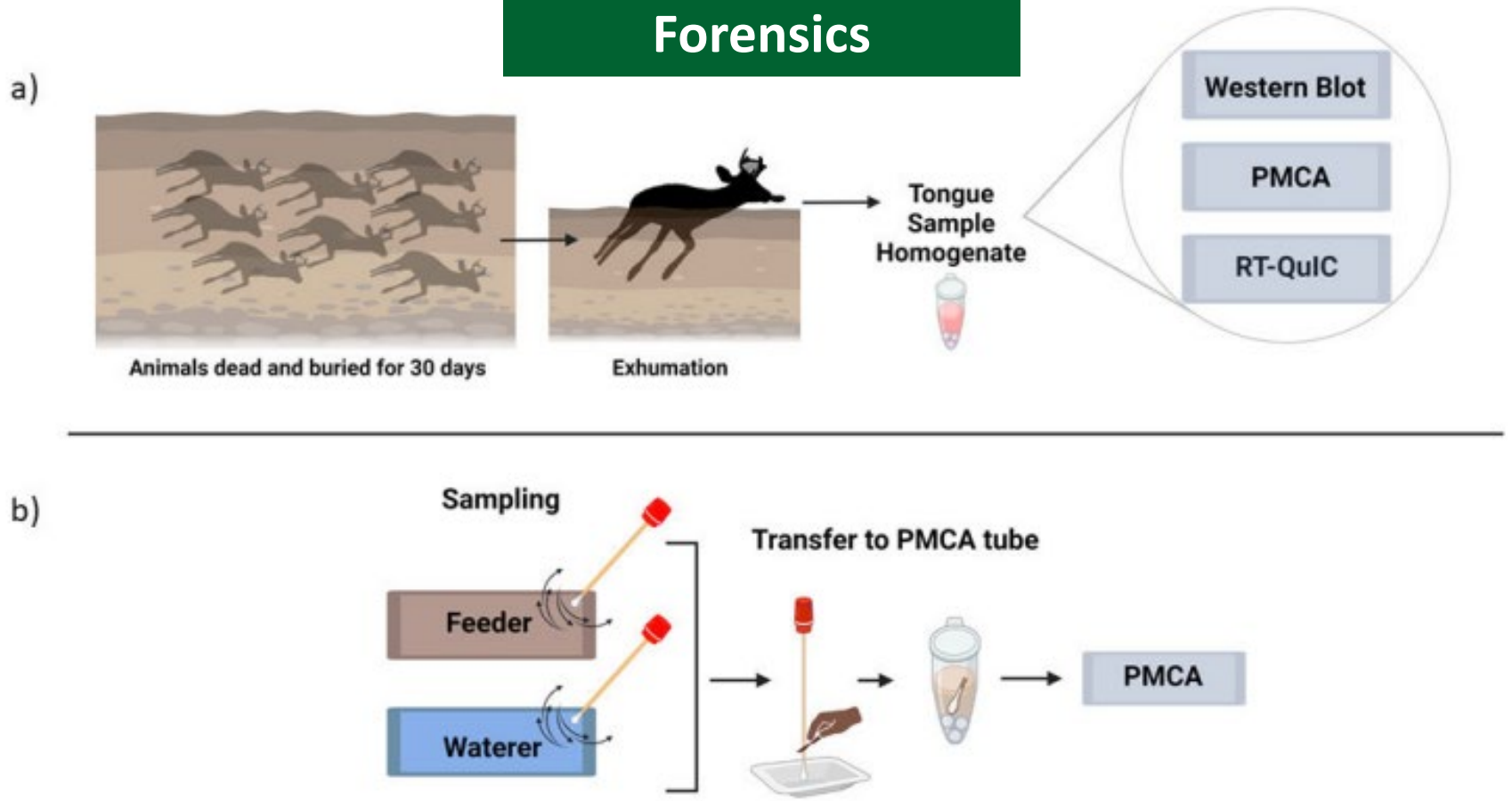
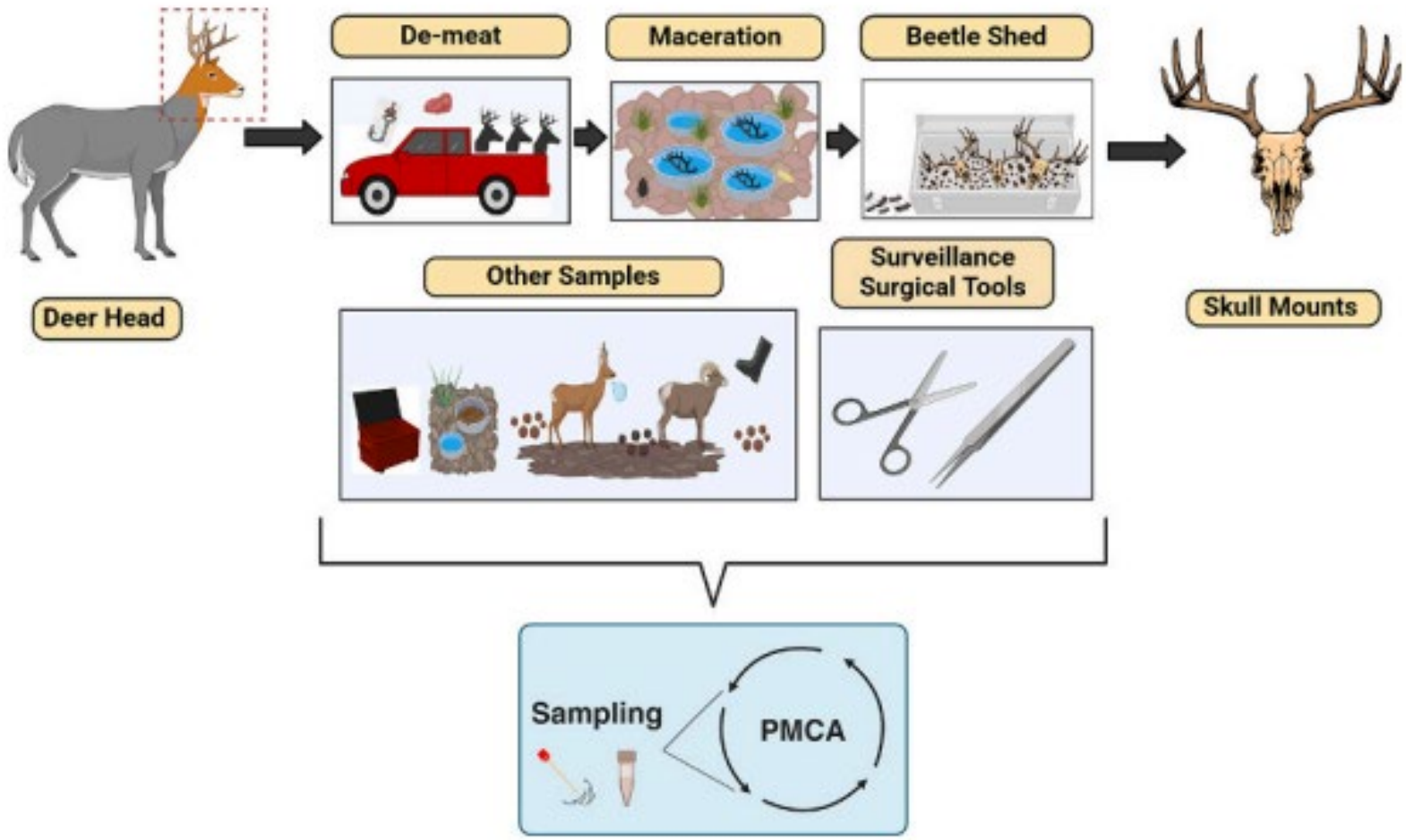


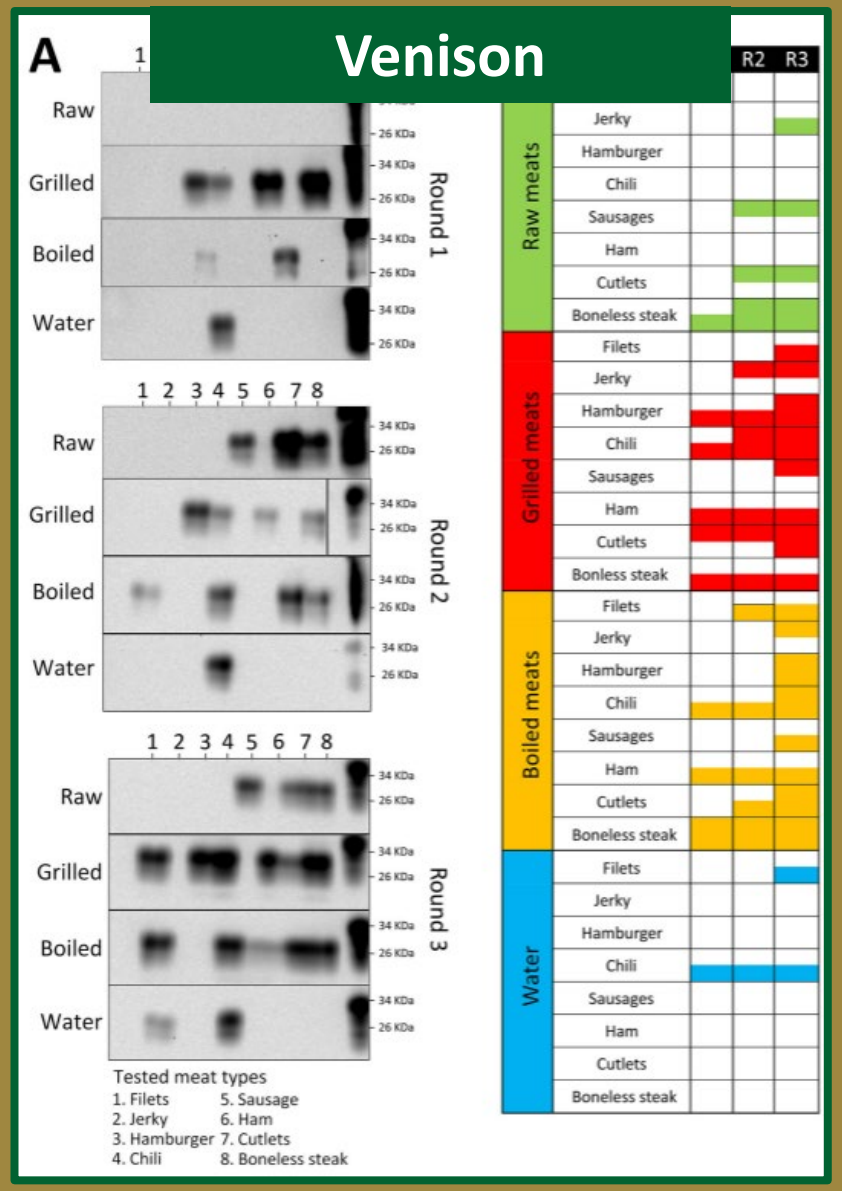
FIG 1 Schematic representation of sample collection and analyses. (a) Ninety-five white-tailed deer carcasses were exhumed 30 days after burial and tongue specimens were collected. These samples were shipped to UTHealth-Houston for further analyses including western blotting, PMCA, and RT-QuIC. (b) Feeders and waterers in contact with deer were swabbed and tested by PMCA. The full description of these procedures can be found in the Supplementary Information linked to this article. Figure created with BioRender.com.

TPWD Affiliated RT-QuIC Projects

Taxidermy

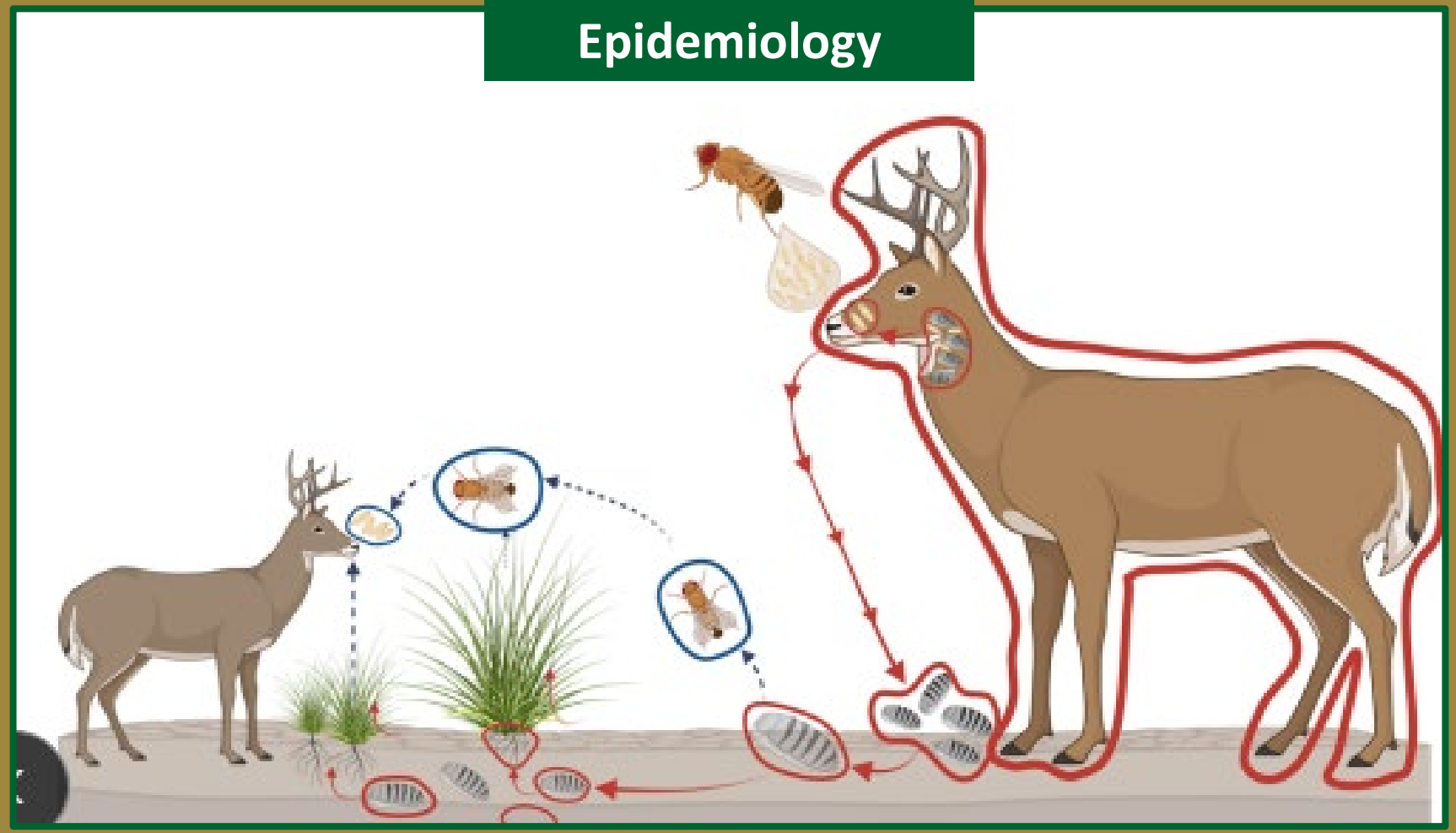


TPWD Affiliated RT-QuIC Projects



TPWD Affiliated RT-QuIC Projects

Epidemiology



TPWD Affiliated RT-QuIC Projects

Transmission

	Tissue type	ssues and fluids analyzed
Fetal organs	Brain	
	Lungs	2/3
	Kidney	2/5
	Liver	4/5
	Popliteal lymph node	0/2
	Thymus	1/2
	Submandibular lymph node	2/3
	Spleen	4/5
	Subscapular lymph node	2/2
	Parotid	1/5
	Testis	3/4
	Uterus	1/1
	Peripheral nerves	2/4
Gestational tissues/fluids	Amniotic fluid	0/5
	Umbilical cord	2/5
	Amniotic sac	3/4
	Placenta	1/1
	Cotyledon (fetal side)	2/2
	Cotyledon (maternal side)	2/2

Table 2. Summary of PMCA screening in fetal and gestational tissues and fluids collected from two pregnant white-tailed deer does.

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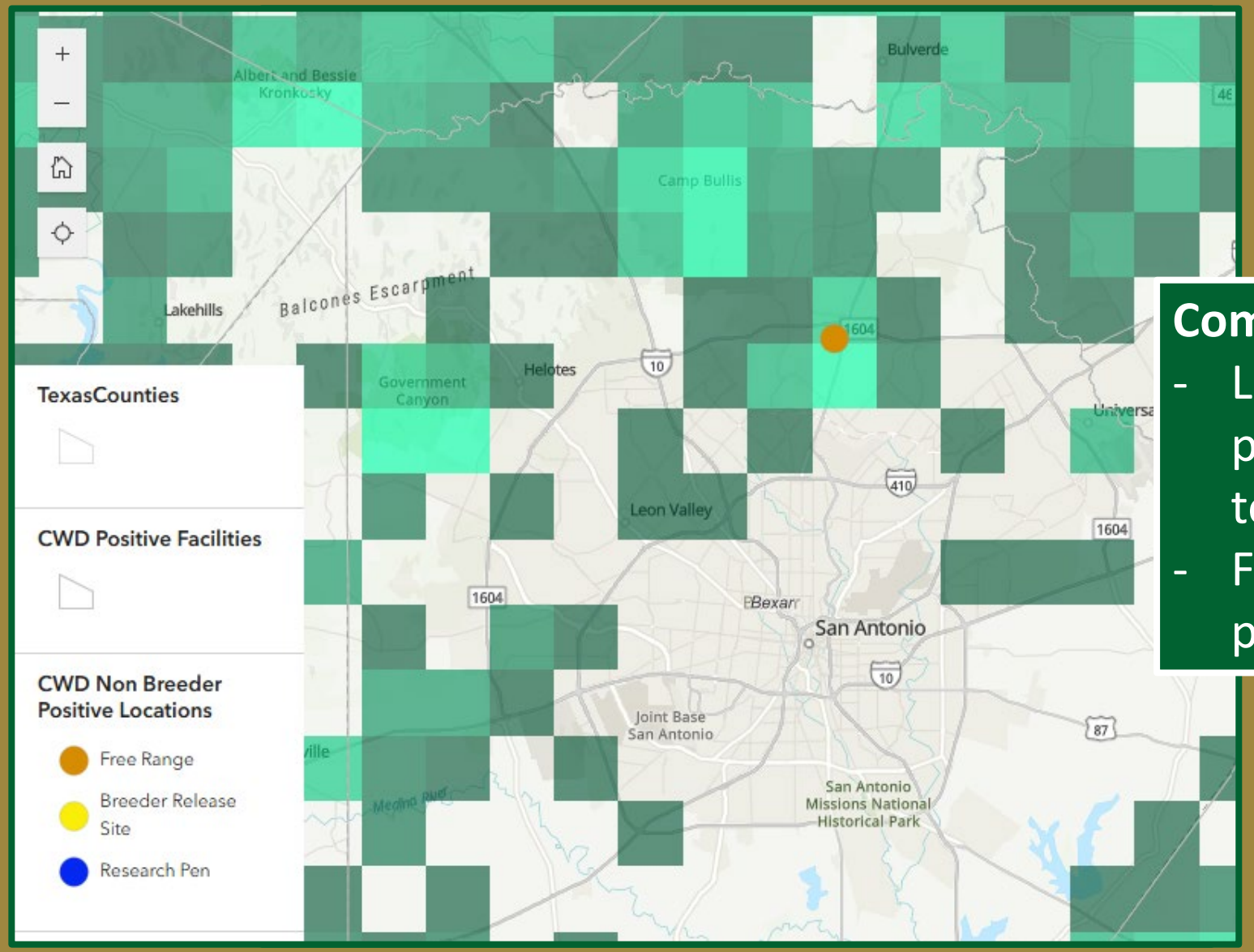
Role for Citizen Science?



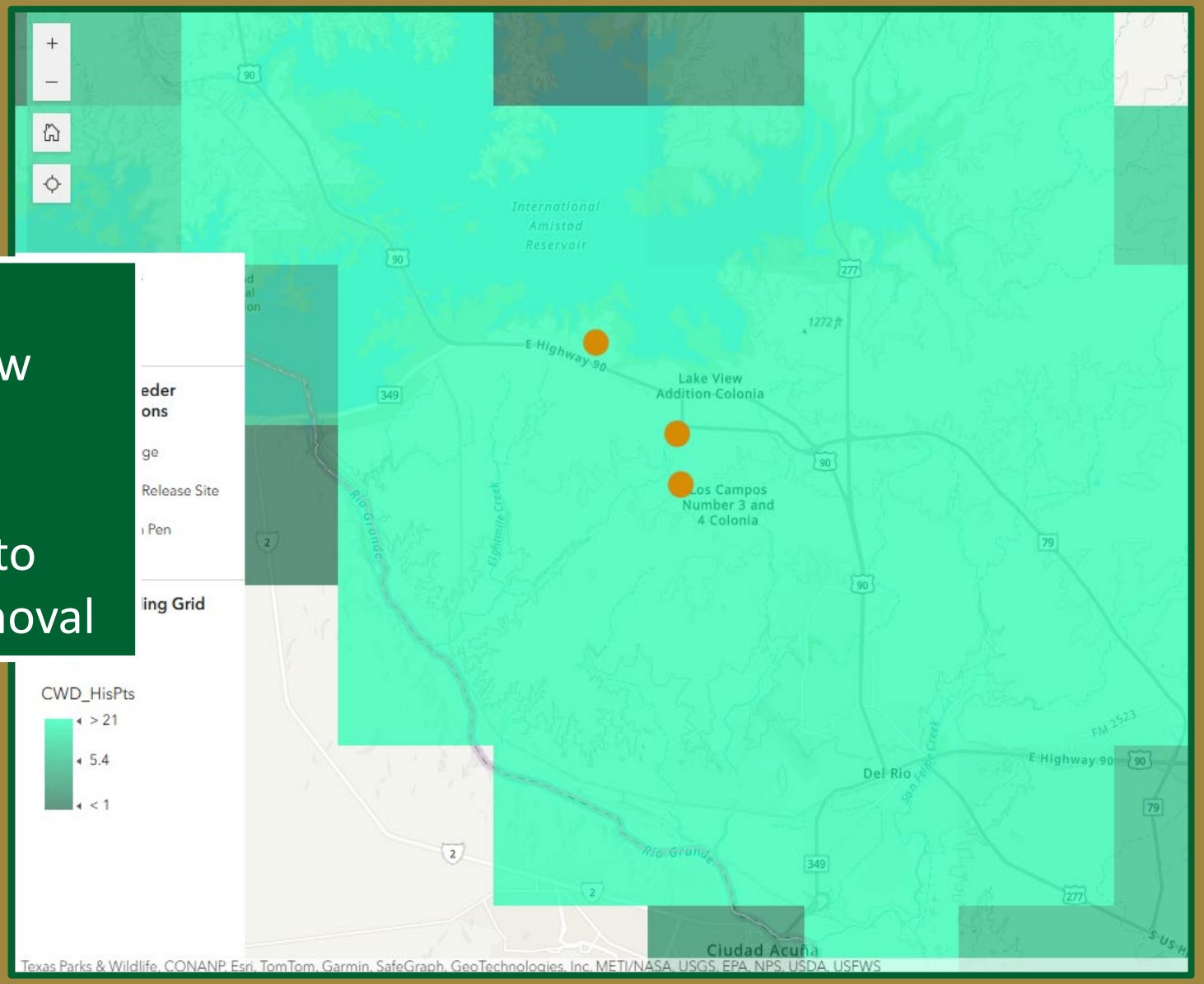
Complications:

- Little to no postmortem testing
- Fragmented populations

Role for Citizen Science?

Complications:

- Extremely low prevalence
- Looking for alternatives to targeted removal



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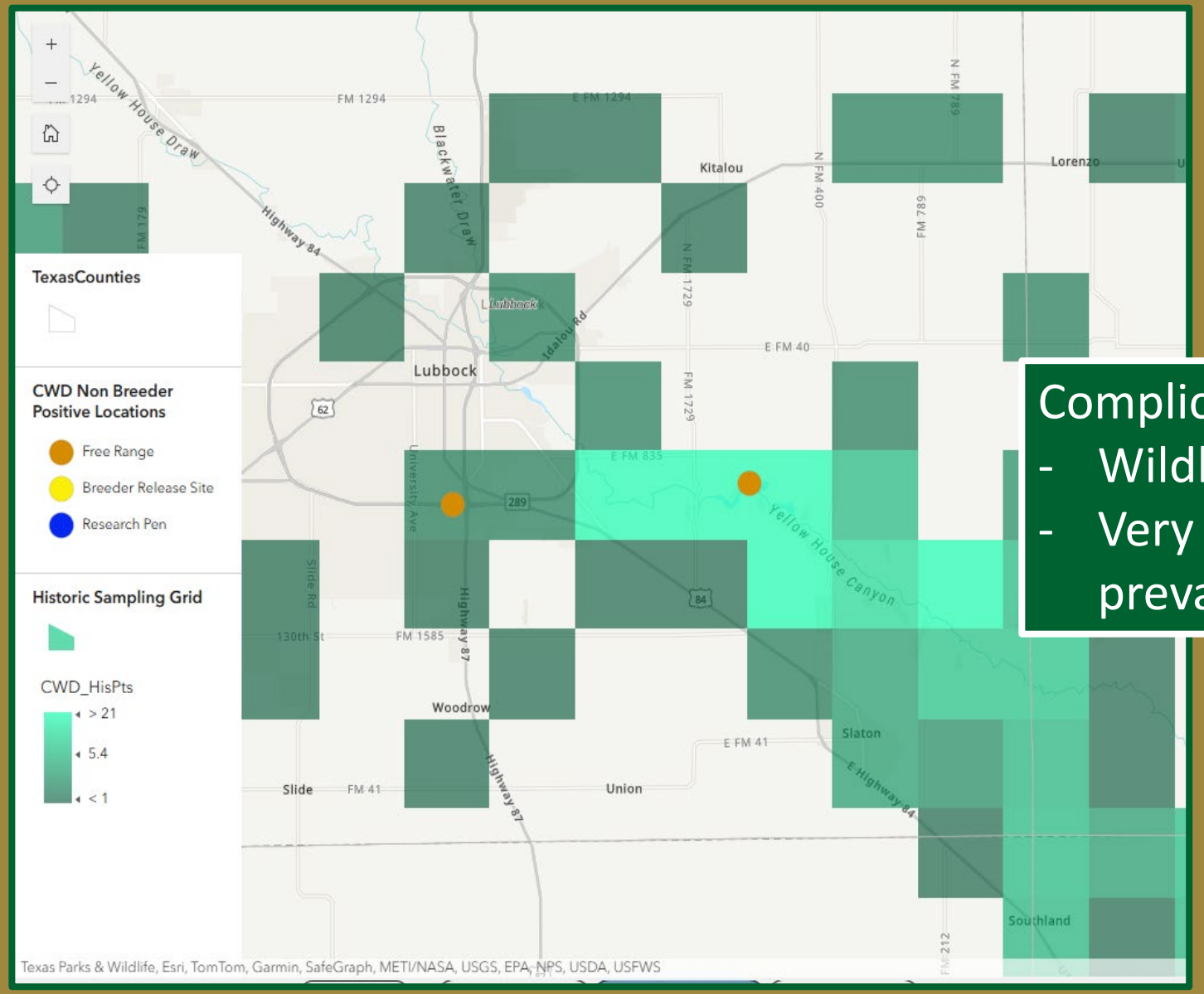
Role for Citizen Science?



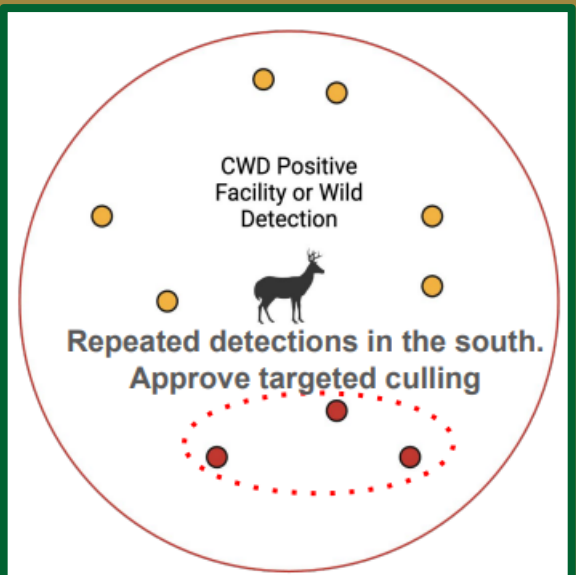
Complications:

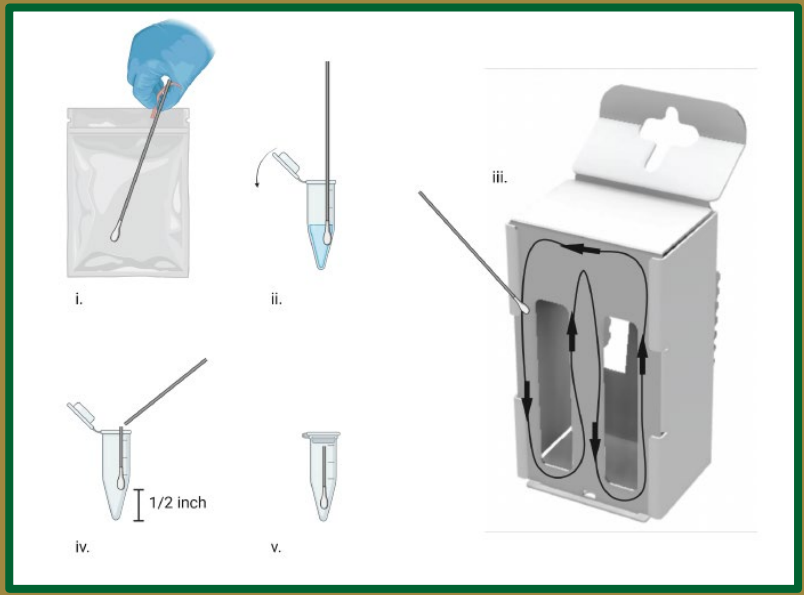
- Wildlife corridors
- Very low prevalence

Role for Citizen Science?

Primary Benefits:
- Non-lethal
- Efficient
- Sensitive
- Adaptable

Overarching Goals:
- Increase detectability
- Monitor spread
- Increase sampling efficiency
- Refocus effort in areas of greater concern





Main Points

1. CWD is relatively new to Texas, but it has expanded its range to many localized areas across the state.

2. Animal movement has played a major role in CWD transmission.

3. CWD's impacts on Texans has led to substantial rule development and changes.

4. RT-QuIC can greatly improve CWD surveillance detectability and efficiency, especially in hard to sample and/or low prevalence settings.

Thank You!

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Questions?

Email: jhunter.reed@tpwd.texas.gov