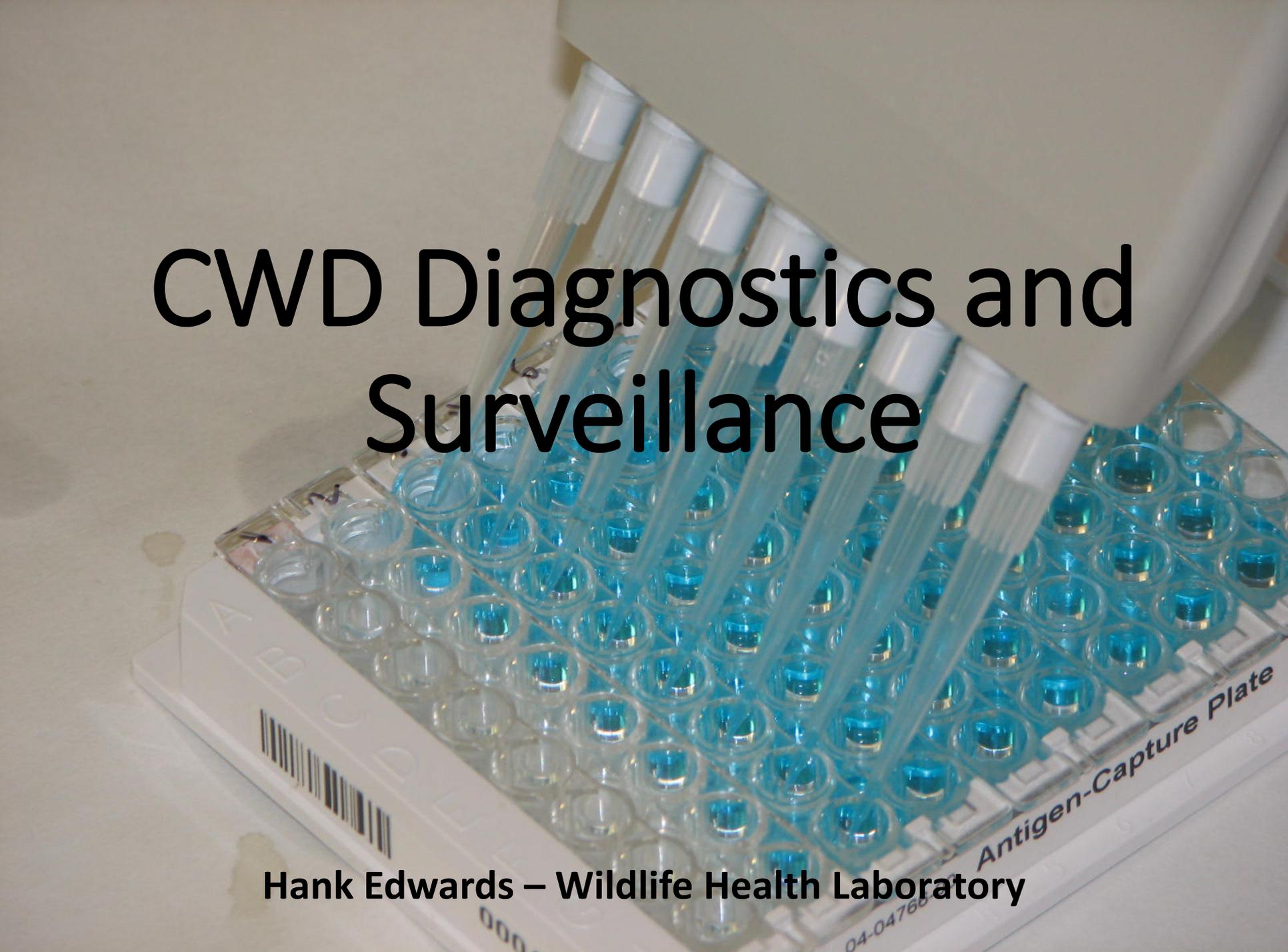


CWD Diagnostics and Surveillance

A close-up photograph of a laboratory setting. A white pipette is positioned over a clear 96-well antigen-capture plate. The plate is filled with a blue liquid, and the pipette is dispensing more of the liquid into one of the wells. The plate has a barcode and the text 'Antigen-Capture Plate' printed on it. The background is a plain, light-colored surface.

Hank Edwards – Wildlife Health Laboratory

Wildlife Health Laboratory

- Small laboratory located within the Wyoming State Veterinary Laboratory complex
- Wildlife disease diagnostics/surveillance
 - Statewide disease tracking/monitoring in all wildlife
 - Brucellosis surveillance and testing in elk and bison
 - Chronic wasting disease surveillance and testing
 - Respiratory disease in bighorn sheep
 - 9,000-10,000 samples/year



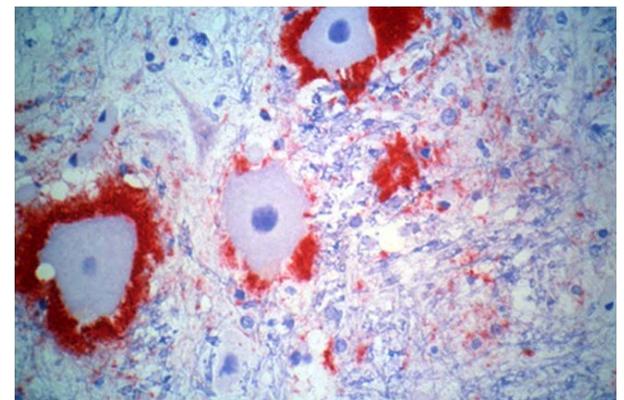
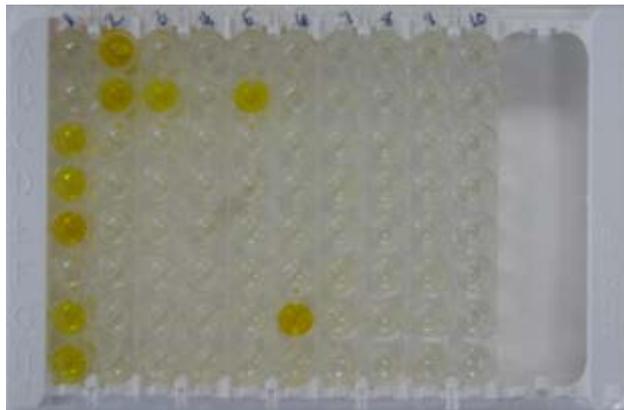
CWD Testing

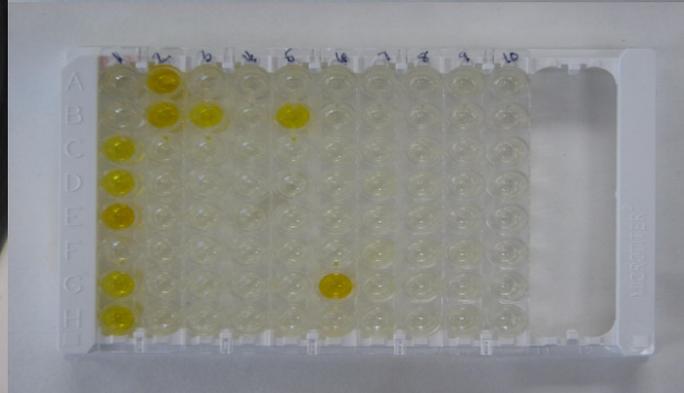
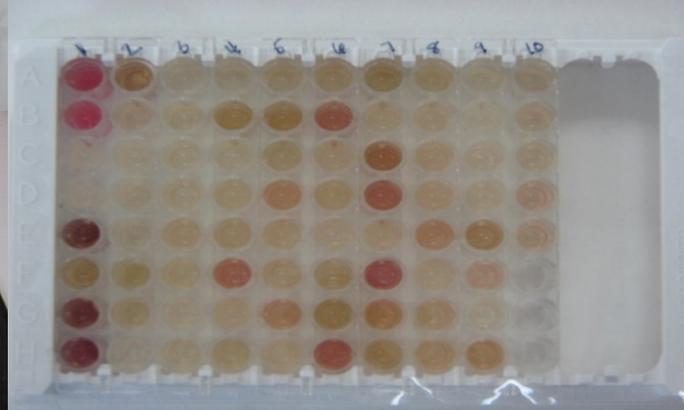
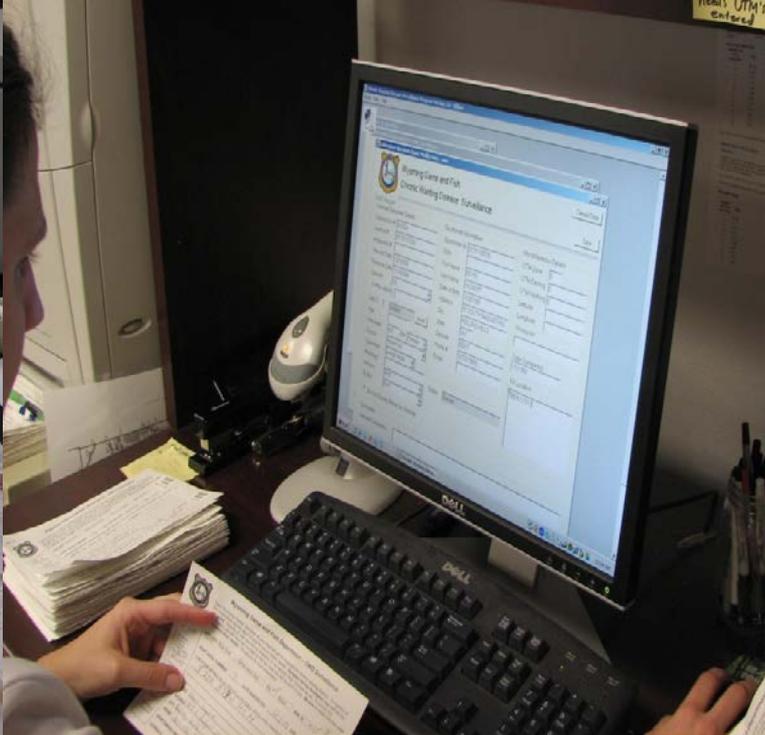
- Federally regulated (NAHLN)
 - USDA/APHIS approved laboratory
 - Approved test methods (ELISA and IHC)
 - Standardized testing and QA/QC procedures/policies
 - Field test unlikely
- Diagnostic tissues:
 - Retropharyngeal LN
 - Obex (brain stem)



Approved CWD Assays

- ELISA
 - Rapid (~6 hours for tissue processing and testing)
 - Capacity of 200-300/day (5 lab personnel)
 - \$30.93/sample (test, consumables, temporary help)
 - All samples tested at WGFD Wildlife Health Laboratory
- IHC
 - Confirmation on positives from nonendemic hunt areas
 - WSVL





CWD Testing

- Reporting

- Testing completed < 3 weeks from collection/submission
- Results available on website
- Notification letter sent to each hunter harvesting CWD positive animal

- Testing Capacity

- Currently limited to 8,000/year
- Expansion capacity to 15,000/year

Wyoming Game and Fish Department – CWD Surveillance

Samples of your deer/elk will be analyzed for chronic wasting disease, and completion of the information on this tag is crucial for you to obtain results. Samples having incomplete information will not be analyzed. Results of your test will be available on our website (<https://wgf.d.wyo.gov>) in approximately 3 weeks.

For internal use
Date Sampled: _____

Location: (processor or check station) _____

Sampled by: (GF# or name) _____

Hunterkill
Roadkill
Targeted
Other
(Targeted = CWD suspect, emaciated, neurologic)
Include case history

Sample Type
Lymph node
Obex
Tonsil

SPECIES: Mule Deer White-tailed Deer Elk Moose SEX: M F

HUNT AREA NUMBER _____ DATE HARVESTED _____ AGE _____

HARVEST LOCATION (BE AS SPECIFIC AS POSSIBLE; lat/long, UTM's, township/range/section, ranch name, etc.) _____

NAME _____

ADDRESS _____

CITY _____ STATE _____ ZIP _____

PHONE () _____ DATE OF BIRTH _____

LICENSE# _____

18-9186
Sample - ID

Data entered in Check Station Application or CWD Surveillance Program and uploaded?

CF-GF-20, v.1

CWD Surveillance

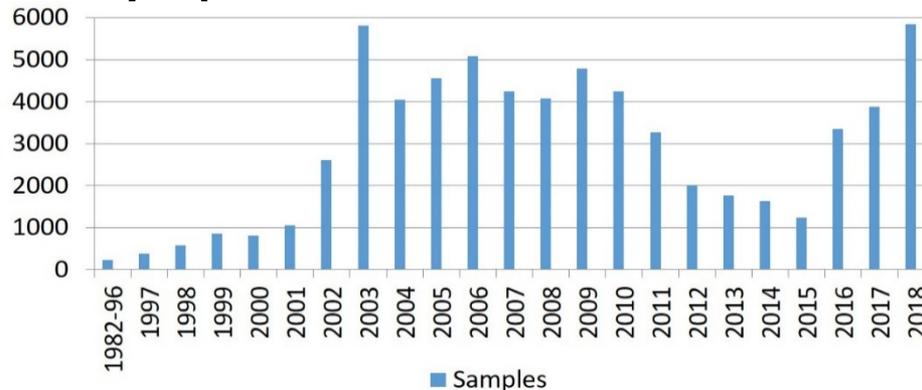


Rocket Miner Photo

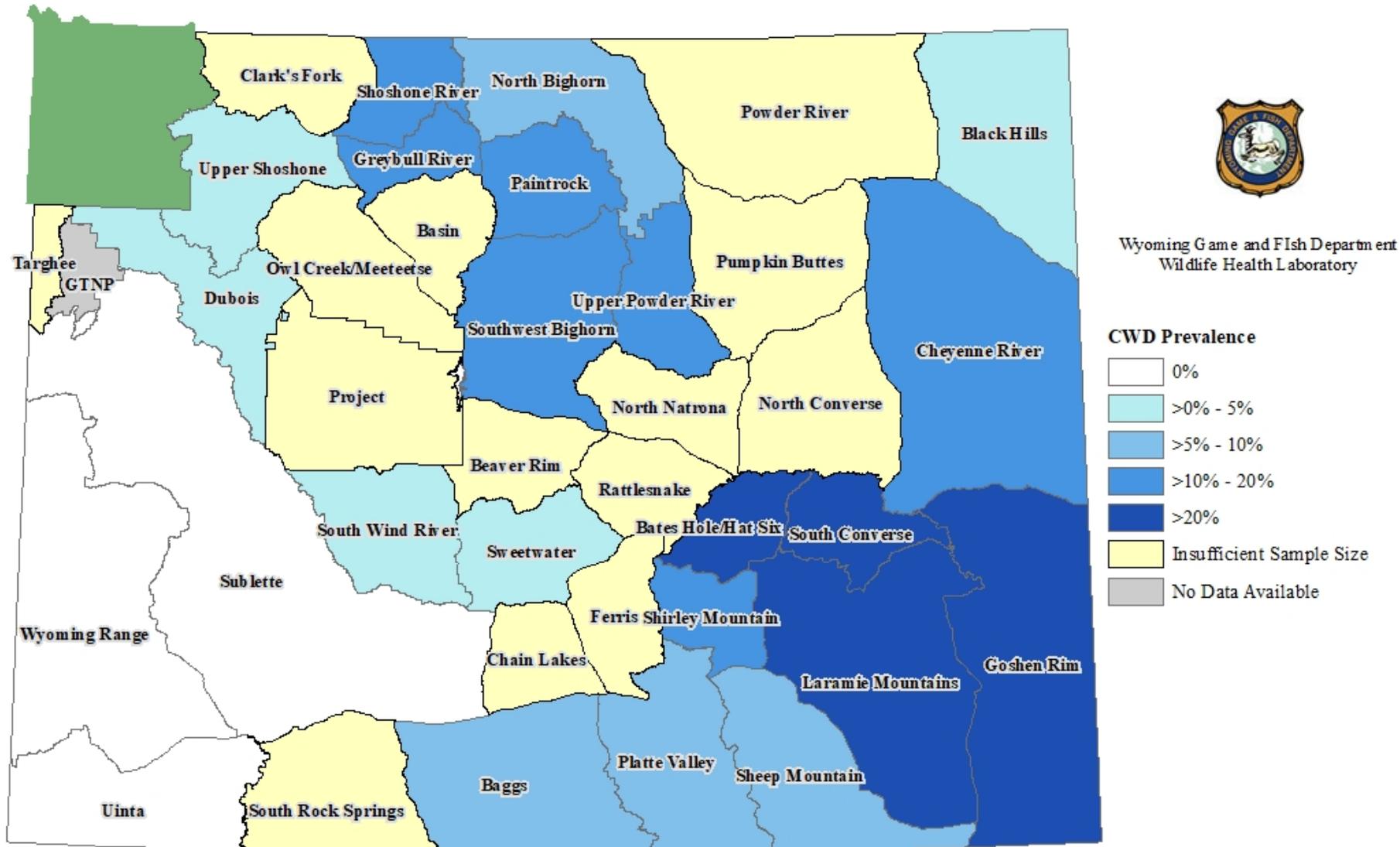
- Hunter-kill
 - Random sampling of harvested animals
 - Good for determining prevalence in a given area
 - ~90% Surveillance
- Road-kill
 - Biased towards CWD positive animals
 - Cost effective surveillance for detection in new areas
 - ~5% Surveillance
- Targeted
 - Animals showing signs of CWD (emaciation, excessive salivation, etc..)
 - Ideal detection method in new areas
 - ~5% Surveillance

CWD Surveillance

- Generally focused on disease detection in new areas and a few historic endemic hunt areas
- 65,399 total samples since 1997...
 - 40,477 Mule deer
 - 7,420 White-tailed deer
 - 16,381 Elk
 - 1,121 Moose
- Insufficient 5 yr prevalence data for most herd units



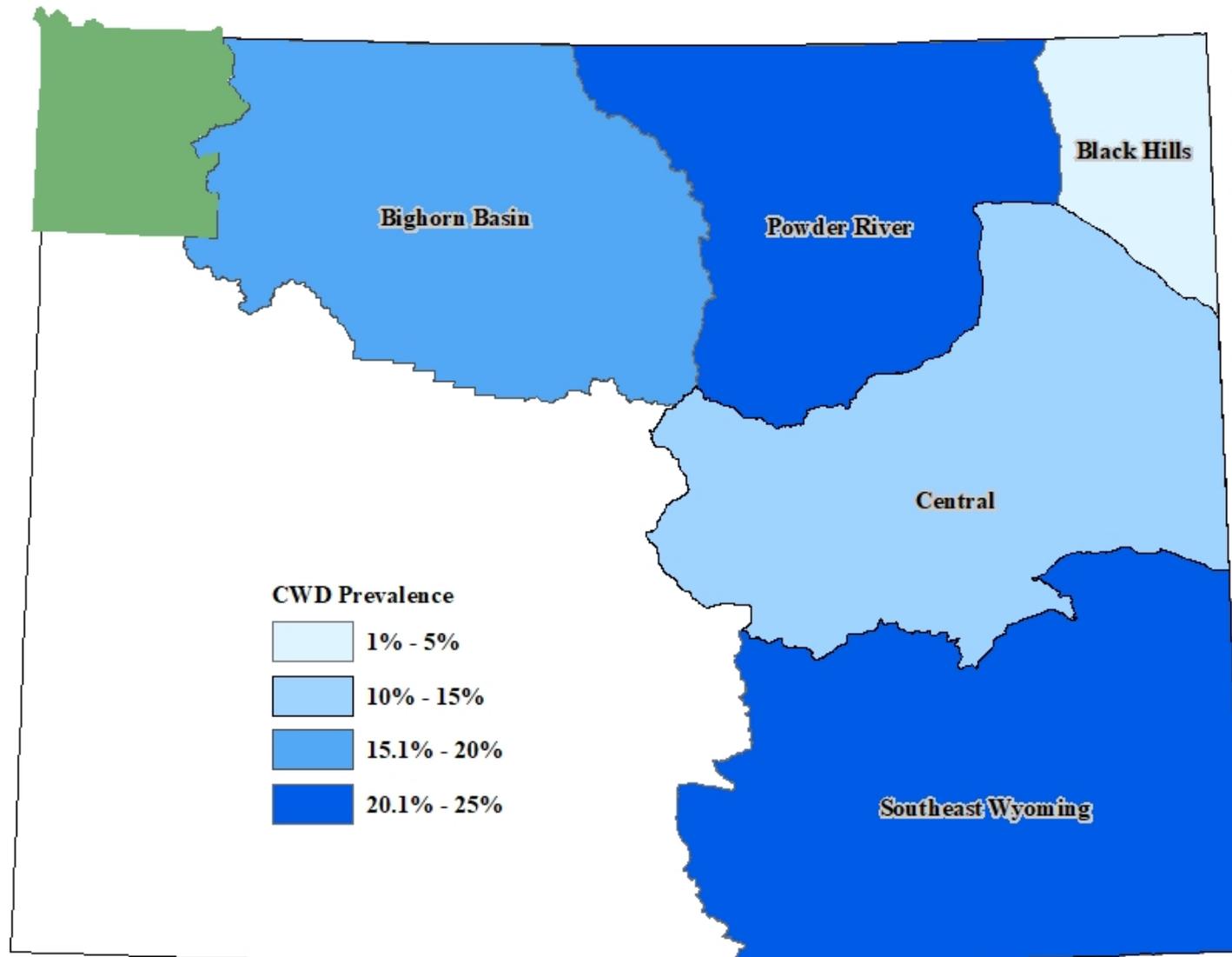
Chronic Wasting Disease (CWD) Prevalence in Hunter Harvested Adult Buck Mule Deer by Herd Unit 2014-2018



* Sample size is too low for estimation of prevalence

This map depicts prevalences calculated from 2014-2018 data only, see distribution map for statewide distribution of CWD

Chronic Wasting Disease (CWD) Prevalence in Hunter Harvested Adult Buck White-Tailed Deer by Herd Unit 2014-2018



Wyoming Game and Fish Department
Wildlife Health Laboratory



2019 CWD Surveillance

- Shift from detection to monitoring prevalence
 - Better understanding of population impacts and ability to evaluate future management actions
- Balance laboratory capacity with disease surveillance requirements
- 5 year rotational sampling strategy
 - Hunter-harvested animals only
 - Focus on adequate sample sizes
 - Goal of 200 samples/herd unit



Adequate Sample Sizes for CWD Surveillance

Confidence	1% Prevalence	2% Prevalence	5% Prevalence	10% Prevalence	20% Prevalence	50% Prevalence
98%	556	821	1584	2748	4670	7188
96%	139	206	396	687	1168	1797
90%	23	33	64	110	187	288
80%	6	9	16	28	47	72
60%	2	3	4	7	12	18

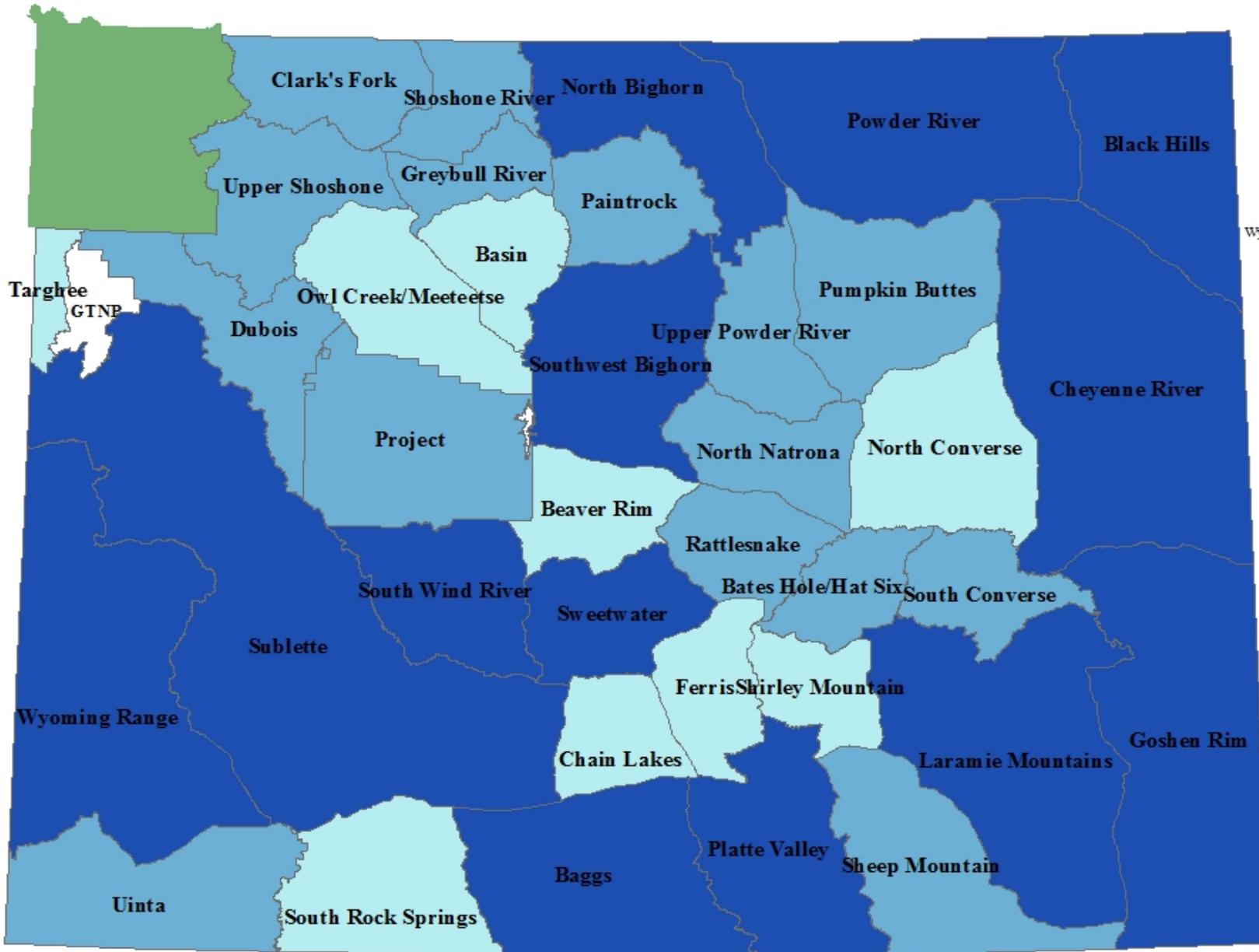
Humphry RW, Cameron A, Gunn GJ, 2004. A practical approach to calculate sample size for herd prevalence surveys. *Prev. Vet. Med.* 65: 173-188.

Based on 98% sensitivity, 99% specificity of the CWD ELISA

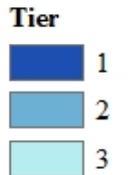
2019 CWD Surveillance

- Tiered approach to mule deer and elk herd units based on priority and sampling feasibility
 - Tier 1: 200 samples collected in one hunting season
 - Tier 2: 200 samples collected over 3 years
 - Tier 3: Opportunistic sampling
- Surveillance focused on adult male mule deer and adult elk
 - Focus on white-tailed deer in some areas
 - Opportunistic sampling of moose
- CWD sample collection available at Regional Offices for individual hunters requesting CWD testing

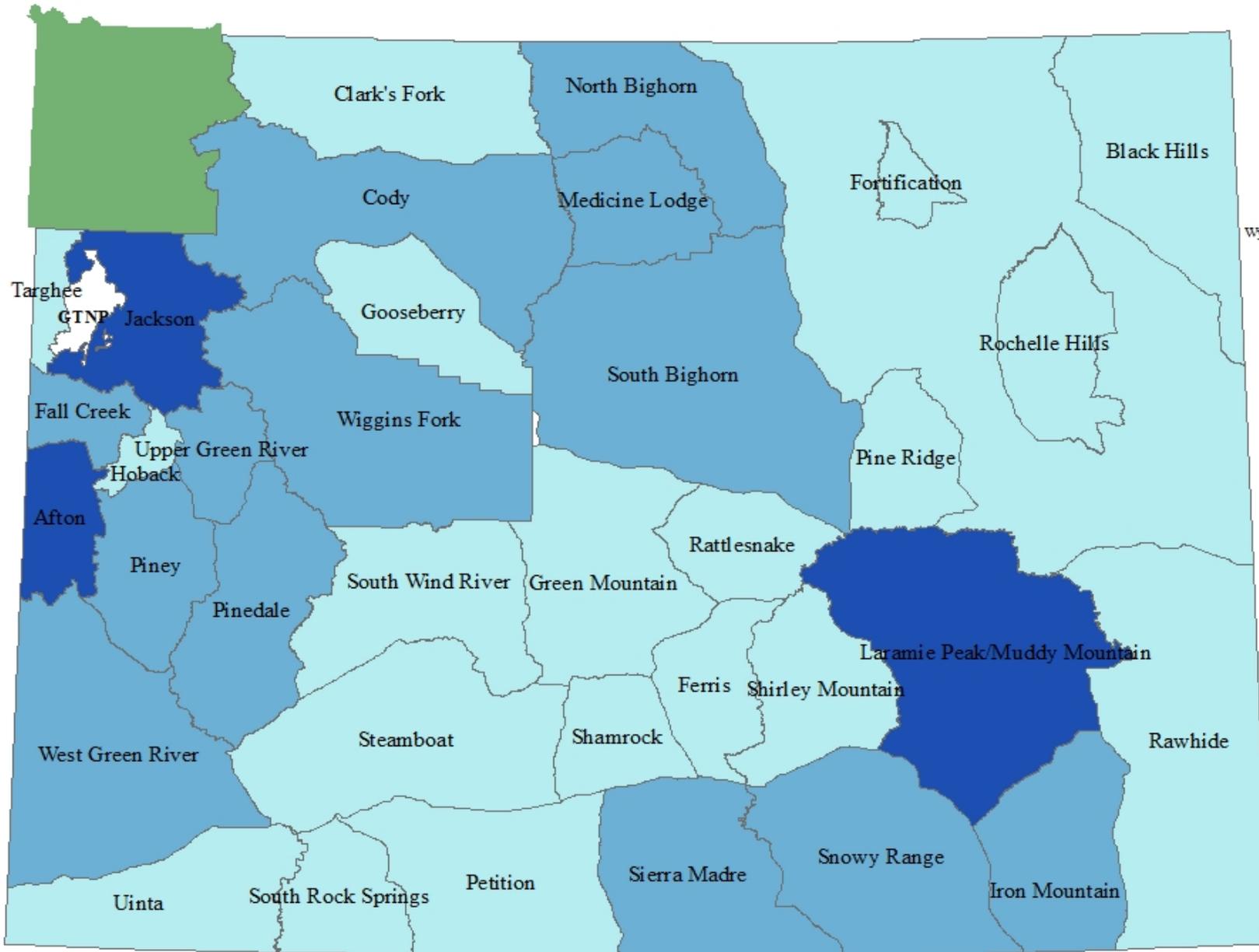
Mule Deer Herd Tier Classification for Chronic Wasting Disease (CWD) Sampling



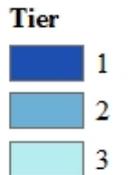
Wyoming Game and Fish Department
Wildlife Health Laboratory



Elk Herd Tier Classification for Chronic Wasting Disease (CWD) Sampling



Wyoming Game and Fish Department
Wildlife Health Laboratory



Weighted Surveillance in Nonendemic Areas

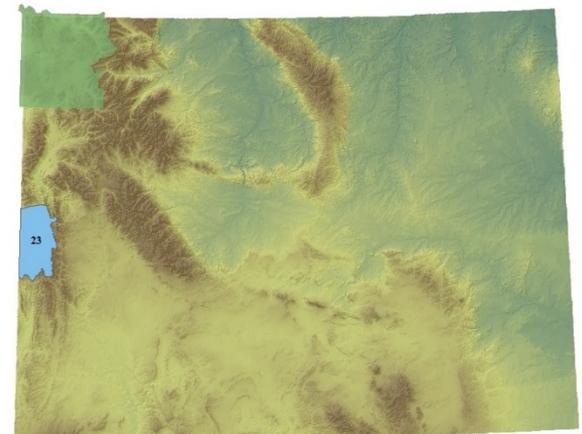
- Included in the 5-year surveillance rotation
- Outside rotation: Yearly focus on road-killed and targeted animals
- Surveillance based on point system: 230 points = 90% confidence / 300 points = 95%

Group	Weight/Points	
	Mule Deer	Elk
Targeted female	13.6	18.75
Targeted male	11.5	8.57
Road kill (male or female)	1.9	0.41
Other Mortality	1.9	0.41
Harvested adult male	1	1.16
Harvested adult female	0.56	1
Harvested yearling male	0.33	0.23
Harvested yearling female	0.19	0.23
Harvested fawns or calves	0.001	0

CWD Surveillance in Moose

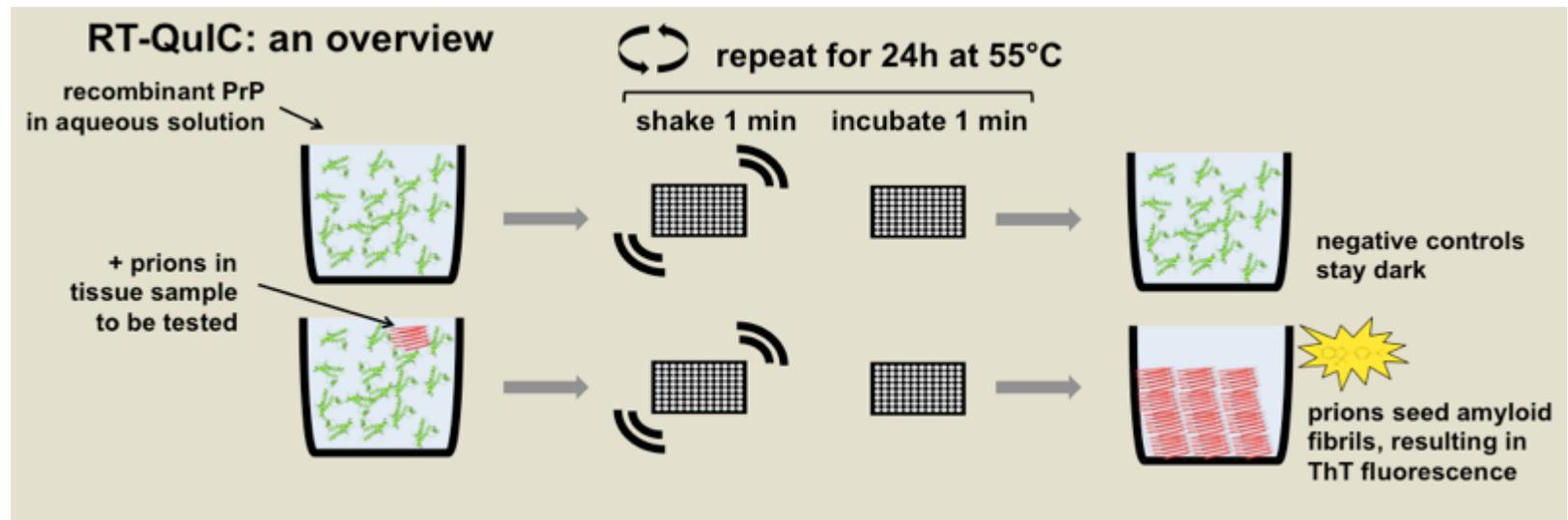
- 2003-2018: 1,121 tested statewide
 - 767 Hunter-killed
 - 149 Road-killed
 - 205 Targeted
- 5 year average harvest of 340/year
- 2008: Positive targeted animal near Bedford
 - 2009-18: 296 tested

Wyoming Chronic Wasting Disease - Positive Moose Hunt Areas



Other CWD Assays

- Primarily used in research
- PMCA – Protein misfolding cyclic amplification
- RT-QuIC – Real-time quaking-induced conversion
- Not performed at the Wildlife Health Laboratory



Questions?

