California Department of Fish and Wildlife Chronic Wasting Disease (CWD) Surveillance Technical Report: 2024

Historic Surveillance

The goal of California's CWD surveillance program is to detect CWD where it occurs, monitor disease prevalence, and inform management decisions. CDFW has tested over 8,500 California deer and elk for CWD since 2000. The first CWD detections in California were confirmed in May 2024. In response, the Fish and Game Commission adopted temporary amendments to the California Code of Regulations Title 14, Section 708.5 Deer tagging and Reporting Requirements that identified deer hunt zones D7, X9a, X9b, and X9c as CWD Management Zones (CMZs) and required all hunters who harvest a deer within these zones to provide the department with a CWD sample from their harvest (Figure 1). This significantly increased our CWD sampling. Indeed, nearly 20% of all California's CWD testing since 2000 were from samples collected in 2024. In 2024, the WHL received 1,823 samples for CWD testing, 1,687 of those were from deer or elk that died in 2024, and the remainder were from deer or elk that died in previous years but had not been submitted to the WHL in the year the animal died. Current and historic CWD testing and detection records can be found on the California Department of Fish and Wildlife's (CDFW) Where is CWD in California? Dashboard at wildlife.ca.gov/CWD. The primary focus of this analysis will be on samples from deer and elk that died in 2024, with supplemental discussions around detections in animals that died in 2023 (n = 1) and 2025 (n = 1).

California's CWD Detections

The first CWD detections in California were from two adult bucks, one was found dead from unknown causes on September 20, 2023, from Yosemite Lakes Park homeowners association in Madera County and the other from Bishop in Inyo County was found dead on February 6, 2024, after a vehicle collision. Samples from these animals were received at CDFW's Wildlife Health Lab (WHL) in February and March 2024, respectively, and sent to the Washington Animal Disease Diagnostic Laboratory (WADDL) for testing on April 4, 2024. Preliminary findings were reported by WADDL on April 29, 2024, and confirmatory testing completed at the National Veterinary Services Laboratories (NVSL) in Ames, Iowa on May 6, 2024. Two additional CWD detections were confirmed by WADDL on February 3, 2025, nine months and approximately 1,500 samples after the initial detections. Both were adult deer from the Bishop area, within 5 miles of the first detection in this area. One was a small adult buck found dead of unknown causes but was noted to be skinny and the other an adult female that was euthanized due to clinical signs suggestive of CWD (Figure 2).

2024 Surveillance Synopsis

In 2024, CDFW and partners sampled 1,687 California native deer and elk for CWD testing. Surveillance efforts focused on deer (n = 1,657), only 2% of CWD sampling came from elk. CWD samples were from hunter-harvests (76%), roadkill (12%), clinical suspects (1%), and all other mortality sources (11%). The majority (85%) were from bucks and adult age classes (75%); however, age was not recorded for about 15% of the samples (Table 1). Over half (n = 851) of the 2024 samples came from the four CMZs (Table 2). Of those, 71% were recorded as "Adult" but nearly 20% of age data collected was marked as "Unknown" or was not recorded. Age data is important to better understand disease risk factors and population dynamics. Moving forward, collecting the first incisor for cementum annuli aging will be a priority. Since deer harvest in California is 99% buck and the vast majority of samples from CMZs (>90%) were from hunter-harvested deer, 95% of samples from CMZ's were from bucks (Table 2).

Preferred CWD samples are retropharyngeal lymph nodes (RPLNs) from deer (preferred) and elk. For elk, the obex (a specific region of the brainstem) may also be included; however, we had sample handling issues with this tissue and many obex submitted were not testable. Once a sample is collected by a hunter, biologist, tribal partner, or participating meat processor and taxidermist, it must be sent to CDFW's Wildlife Health Lab to be processed. When samples arrive at WHL, data from the data card are recorded in our lab information management system (LIMS), samples are examined,

RPLNs bisected, and half of each RPLN shipped to the diagnostic laboratory for testing via enzyme-linked immunosorbent assay (ELISA) (Figure 3). Samples that were not testable or were non-negative via ELISA were subsequently tested via immunohistochemistry (IHC). During the hunting season, shipments to WHL and from WHL to the diagnostic lab were made weekly. The diagnostic lab, WADDL, had an average turnaround time of three weeks for results once they received samples from WHL (Figure 4).

We confirmed two CWD-positive deer that died and were sampled in 2024, both from the Bishop area. One was reported in May 2024 along with the CWD-positive deer from Yosemite Lakes Park that died in September 2023. A fourth CWD-positive deer died and was sampled in 2025. Enzyme-linked immunosorbent assay (ELISA) conducted on medial retropharyngeal lymph nodes (RPLN) is the preferred rapid test for CDFW's CWD surveillance. If a sample could not be tested via ELISA due to inappropriate or insufficient samples, these samples went on to immunohistochemistry (IHC) which allows a pathologist to microscopically determine tissue type and presence, or absence of the minimum required of lymphoid follicles to qualify as an official test. Out of 1,687 samples collected in 2024, 75% were "Not Detected" via ELISA, 23% were moved on to IHC testing, and 2% were "Not Tested" because no lymphoid tissue was present in the sample. Of the 390 samples that were not testable via ELISA but forwarded onto IHC testing, 302 were "Not Detected," 2 tested Positive for CWD, and 86 were unsuitable, unacceptable or had insufficient lymphoid follicle for testing. Thus, a total of two deer sampled in 2024 were CWD-positive and 118 (7%) were recorded as "Not Tested" (Table 3).

Summary and Discussion

Our surveillance targets are to test 300 deer per Deer Sampling Unit (Figure 5) per sampling period (i.e. calendar year). Annual testing targets were exceeded in the two DSUs that contained CMZs with mandatory sampling rules in place. Sampling goals were nearly met in DSU 3 (n = 297); however, half of those samples were collected around Fort Hunter Liggett (FHL) in A South (Table 4). Sampling efforts skewed heavily towards deer populations with tightly controlled hunts like FHL or where regulations required sampling of hunter-harvests. This clumped sampling, both within and between DSUs, may lead to gaps in our ability to detect CWD in new areas and monitor prevalence where CWD has been detected. For example, to date California's CWD detections have only occurred in roadkill and clinical suspect animals in residential areas (Table 2) yet 76% of our samples statewide and over 92% of our samples from CMZs were from hunter-harvested deer. This discrepancy in detections and sampling effort might make it difficult to detect CWD in residential deer at low prevalence and make it difficult to estimate a robust prevalence where CWD has been detected.

Hunter-harvested samples had the lowest proportion of "Not Tested" results at 4.52% whereas other sampling streams were between 9-15% due to poor sample quality or samples unidentifiable as lymph node (Table 1). This may be due to direction from the WHL that decomposing carcasses can be sampled and tested if an RPLN is identifiable. Where CWD occurs, analyses suggests that deer with clinical signs of CWD and deer killed by vehicle strike are more likely to be CWD positive than the average hunter harvested deer. Thus, these are high value samples for detecting CWD and, despite the increased likelihood of a "Not Tested" result due to sample quality, should still be sampled if a RPLN can be identified.

Current surveillance suggests that detections are likely localized and prevalence in these areas is low. However, when examining the distribution of known harvests tested, the number of samples collected in each hunt zone, and whether any samples were collected in a hunt zone, it becomes clear that many areas remain under sampled. In these areas it is difficult to know the CWD status of deer and elk herds with certainty. This is why it's important to not only vigilantly sample effected areas to assess prevalence but also sample areas where CWD has not yet been detected, ensuring greater confidence that the disease is absent from those regions as well.

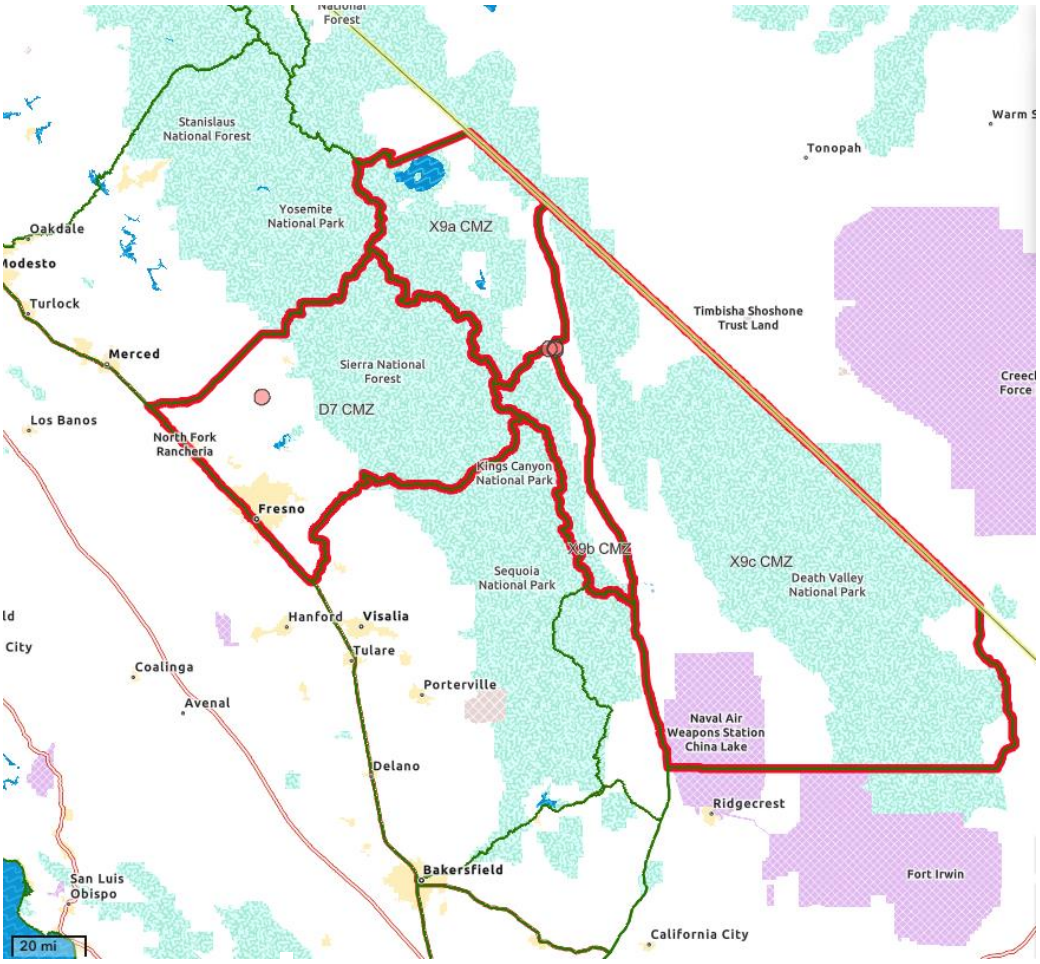

Figure 1: *Location of CMZ's in California, the surrounding adjacent hunt zones, and the location of the 4 confirmed detections of CWD.*

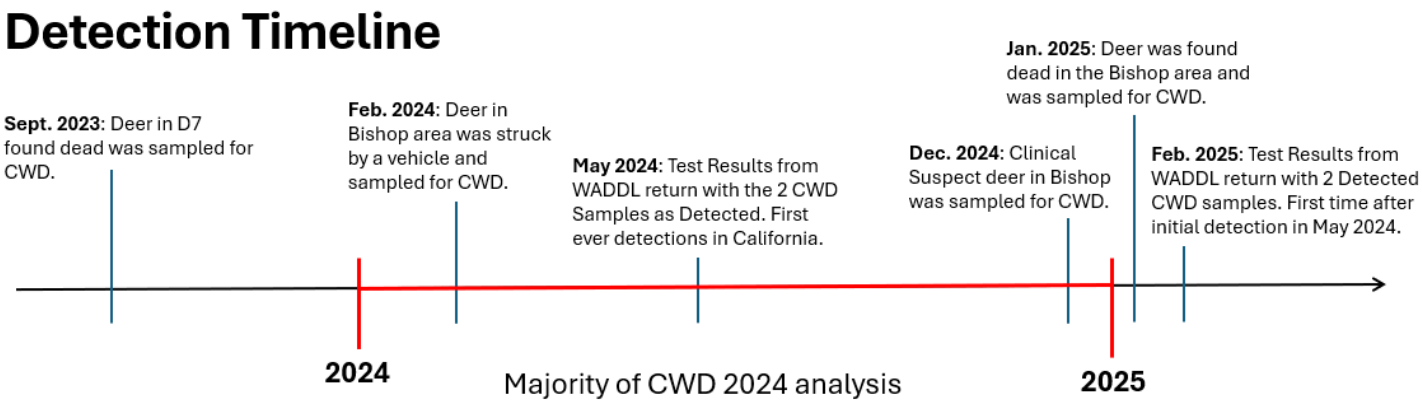

Figure 2: *Detection Timeline of CWD Outbreak in California depicting when the 4 CWD detected samples were sampled and when the result came back from the diagnostic lab across 2023-2025. The red highlights 2024's sampling and testing effort in the context of the detection timeline and is the sampling timeframe for which this analysis is focused.*

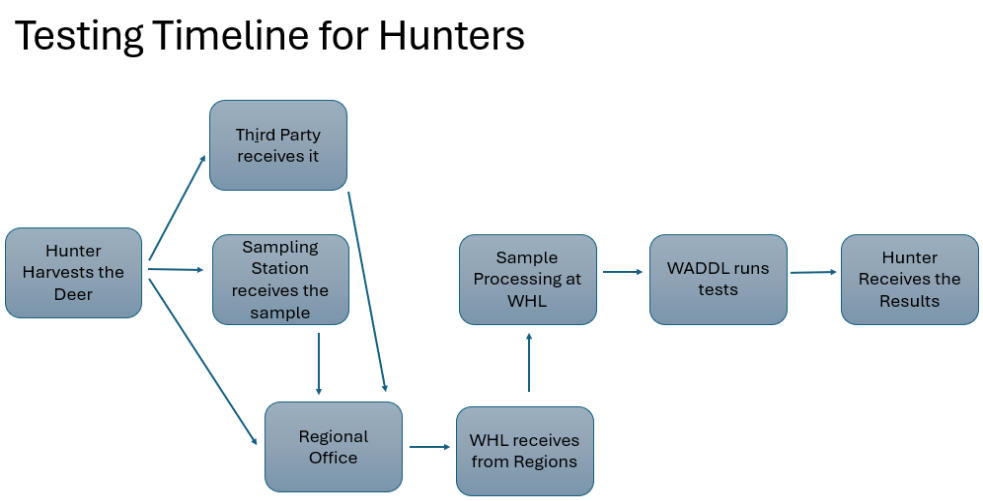

Figure 3: *Diagram of journey a sample must take to be collected, transported, processed, and submitted for testing so a hunter can receive their result.*

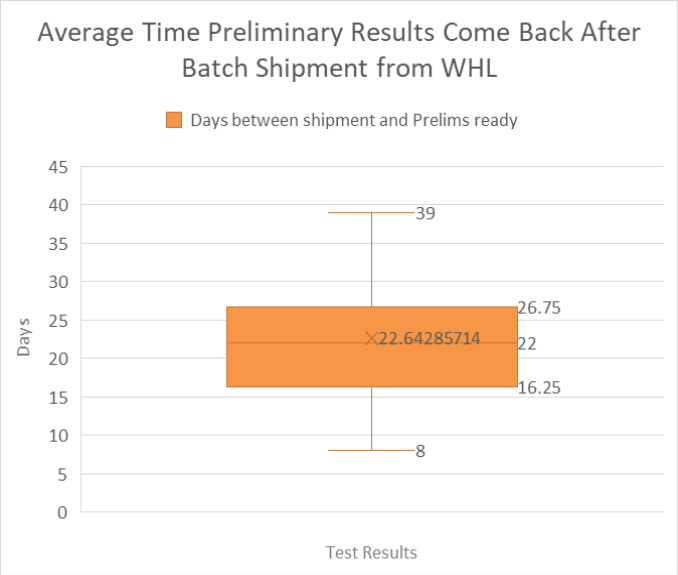

Figure 4: *Box plot showing a median and interquartile range of how long it takes for results to return to the lab after shipping a batch to WADDL.*

Figure 5*: California's deer Disease Sampling Units (DSU).*

	Statewide 2024	Hunter Harvest	Roadkill	Clinical Suspect	Other	Totals
Species	Native Deer	1,263	205	11	178	1,657
	Native Elk	21	2	0	7	30
						1,687
Sex	Male	1,250	78	7	91	1,426
	Female	18	112	3	66	199
	Not Recorded	16	17	1	28	62
						1,687
Age	Adult	1,019	133	4	101	1,257
	Sub-Adult	82	55	5	43	185
	Not Recorded	183	19	2	41	245
						1,687
Test Result	Not Detected	1,226	175	9	157	1,567
	Detected	0	0	1	1	2
	Not Testable	58	32	1	27	118
	Total	1,284	207	11	185	1,687

Table 1: *Statewide sampling by sampling streams (Hunter Harvest, Roadkill, Clinical Suspect, and Other Mortalities) stratified into other variables such as species, sex, age, and test result.*

	CMZ	D7	X9a	X9b	X9c	Totals
Species	Native Deer	588	178	45	39	850
	Native Elk	0	1	0	0	1
						851
Sex	Male	580	142	45	38	805
	Female	3	25	0	0	28
	Not Recorded	5	12	0	1	18
						851
Age	Adult	393	142	36	31	602
	Sub-Adult	56	15	6	4	81
	Not Recorded	139	22	3	4	168
						851
Test Result	Not Detected	555	164	40	36	795
	Detected	0*	2	0*	0*	2
	Not Testable	33	13	5	3	54
	Total	588	179	45	39	851

Table 2: *CMZ's (D7, X9a, X9b, and X9c) are categorized and broken down into variables species, sex, age, and test result.*
**The 0 indicates that although no detection was found there in 2024, there is still a detection sampled in 2023 in D7 (n=1) and another was sampled in the Bishop area intersecting X9a, X9b, and X9c in 2025 (n=1). The 2024 detections were sanctioned into X9a for simplicity.*

Test Type	"Not Detected" or "Detected" Result established	No Result/ Insufficient samples that moved to IHC	Did not move on to IHC/ Not Tested due to improper sample	Total
ELISA	1,265	390	32	1,687
IHC	304	86		390

Table 3: *Samples first run through ELISA and depending on the outcome, they may move to IHC for either further confirmation on a result, to get a result on the poorer quality samples, or to confirm a sample result.*

Hunt Zone	ALL Sampled 2024	Hunter Harvest Sampled 2024	Roadkill Sampled 2024	Clinical Suspect 2024	All Other Methods Sampled 2024	Proportion of Samples from Hunter Harvest	Deer	Elk	Male	Female	Sex - Not Recorded	Positives Sampled in 2024	All Positives Recorded in California
B1	23	21	1	0	1	91.30%	22	1	21	0	2	0	0
B2	34	25	3	0	6	73.53%	34	0	25	2	7	0	0
B3	1	0	1	0	0	0%	1	0	1	0	0	0	0
B5	10	3	1	0	6	30%	10	0	9	1	0	0	0
B6	51	20	19	2	10	39.22%	50	1	30	18	3	0	0
DSU 1	**119**	**69**	**25**	**2**	**23**	**57.98%**	**117**	**2**	**86**	**21**	**12**	**0**	**0**
C1	11	7	2	0	2	63.64%%	11	0	9	2	0	0	0
C2	5	5	0	0	0	100%	5	0	5	0	0	0	0
C3	6	3	0	1	2	50%	6	0	4	1	1	0	0
C4	21	15	2	0	4	71.43%	21	0	13	6	2	0	0
X1	9	3	4	0	2	33.33%	9	0	8	1	0	0	0
X2	7	0	7	0	0	0%	7	0	2	5	0	0	0
X3a	16	6	10	0	0	37.5%	16	0	10	6	0	0	0
X3b	14	7	7	0	0	50%	14	0	8	5	1	0	0
X4	7	6	1	0	1	75%	7	0	6	1	0	0	0
X5a	0	0	0	0	0	-	0	0	0	0	0	0	0
X5b	1	0	1	0	0	0%	1	0	0	1	0	0	0
X6a	28	10	16	0	2	35.71%	28	0	23	3	2	0	0
X6b	5	3	2	0	0	60%	5	0	3	2	0	0	0
X7a	2	1	0	0	1	50%	2	0	1	1	0	0	0
X7b	1	1	0	0	0	100%	1	0	1	0	0	0	0
X8	2	2	0	0	0	100%	2	0	2	0	0	0	0
DSU 2	**135**	**69**	**52**	**1**	**14**	**51.11%**	**135**	**0**	**95**	**34**	**6**	**0**	**0**
A North	46	33	5	0	8	71.74%	45	1	35	6	5	0	0
A South	239	165	26	4	46	69.04%	214	25	187	44	8	0	0
B4	6	5	0	0	1	83.33%	6	0	6	0	0	0	0
D13	6	2	2	0	2	33.33%	6	0	5	1	0	0	0
DSU 3	**297**	**205**	**33**	**4**	**57**	**69.02%**	**271**	**26**	**233**	**51**	**13**	**0**	**0**
D3	22	18	0	0	4	81.81%	22	0	21	1	0	0	0
D4	11	3	0	0	8	27.27%	11	0	8	2	1	0	0
D5	38	20	6	1	11	52.63%	38	0	30	8	0	0	0
D6	41	24	6	0	11	58.54%	41	0	32	9	0	0	0
D7*	588	565	9	0	14	96.09%	588	0	580	3	5	0	1
DSU 4	**700**	**630**	**21**	**1**	**48**	**90.00%**	**700**	**0**	**671**	**23**	**6**	**0**	**1**
D8	36	34	1	0	1	94.44%	36	0	35	0	1	0	0
D9	6	5	0	0	1	83.33%	6	0	6	0	0	0	0
D10	16	8	0	0	8	50%	16	0	12	4	0	0	0
D11	4	0	2	0	2	0%	4	0	3	1	0	0	0
D12	1	1	0	0	0	100%	1	0	1	0	0	0	0
D14	12	5	3	0	4	41.67%	12	0	7	5	0	0	0
D15	33	14	6	1	12	42.42%	33	0	19	14	0	0	0
D16	2	2	0	0	0	100%	2	0	2	0	0	0	0
D17	3	2	0	0	1	66.67%	3	0	2	1	0	0	0
D19	0	0	0	0	0	-	0	0	0	0	0	0	0
X9a*	179	137	37	2	3	76.54%	178	1	142	25	12	2	2▲
X9b*	45	44	0	0	1	97.78%	45	0	45	0	0	0	1
X9c*	39	37	1	0	1	94.87%	39	0	38	0	1	0	0
X10	3	3	0	0	0	100%	3	0	3	0	0	0	0
X12	37	12	24	0	1	32.43%	37	0	19	18	0	0	0
DSU 5	**416**	**304**	**74**	**3**	**35**	**73.08%**	**415**	**1**	**334**	**68**	**14**	**2**	**3**
Unknown or Out of State	**20**	**7**	**2**	**0**	**11**	**35.00%**	**19**	**1**	**7**	**2**	**11**	**0**	**0**
Totals	**1,687**	**1,284**	**207**	**11**	**188**	**76.11%**	**1,657**	**30**	**1,426**	**199**	**62**	**2**	**4**

Table 4: *Sampling streams, such as hunter harvests, are recorded to understand the origins of the samples. Hunter harvest is typically the most effective stream for CWD sample collection and is compared with reported harvest data in the ALDS to identify opportunities for improving future sample collection.*

** Hunt zones that belong in a CMZ and required hunters to comply with mandatory sampling in the 2024 hunt season.*

▲ The detection in Bishop overlaps with three hunt zones and is fitted to the nearest hunt zone border.