

MISSISSIPPI
**CHRONIC
WASTING
DISEASE**

**FIVE-YEAR SURVEILLANCE
& MANAGEMENT REPORT**
2018-2022 HUNTING SEASONS





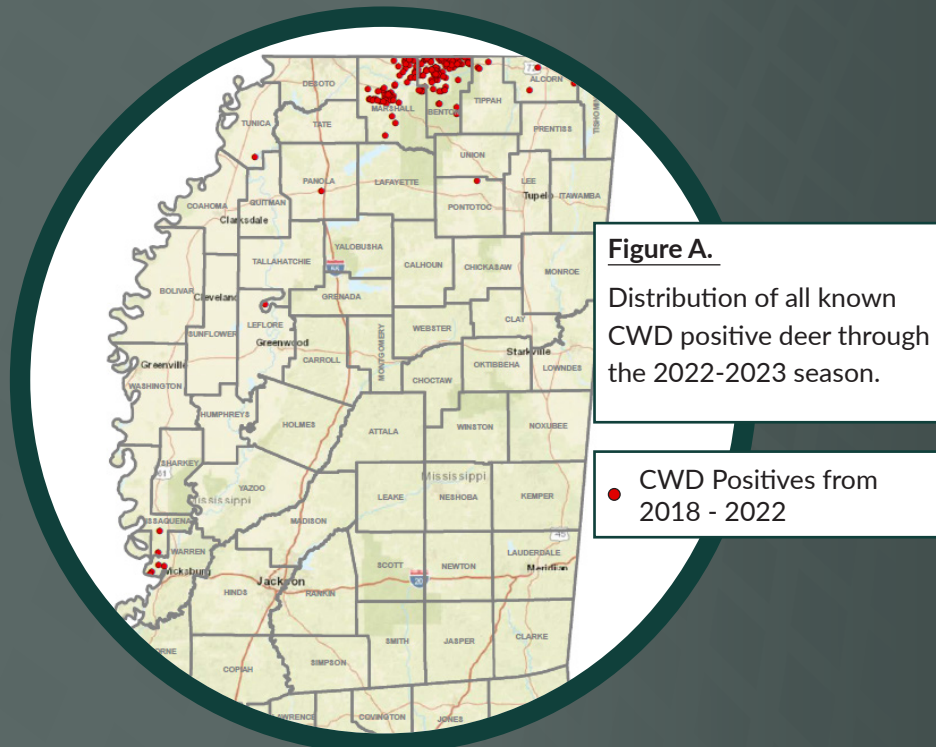
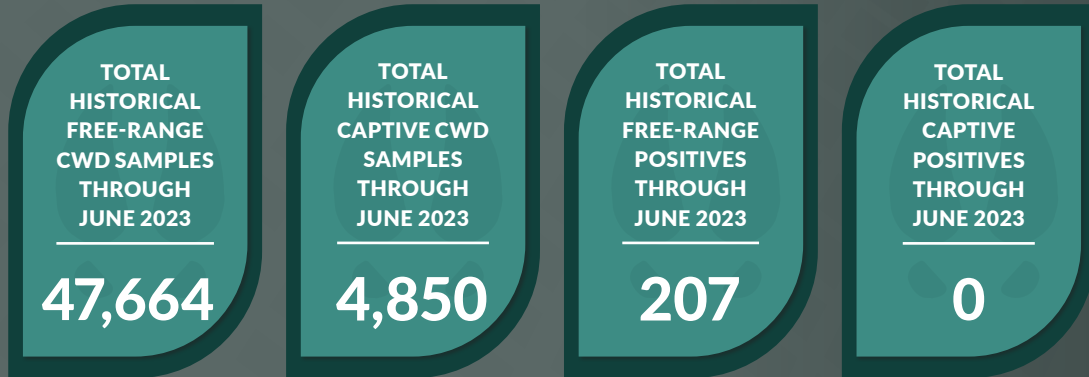
Overview and Mission Statement for CWD Management

Chronic wasting disease was first detected in Mississippi in February 2018. Mississippi had 207 detections in 10 different counties as of July 2023. Surveillance is conducted annually using multiple strategies to collect samples from across the state, including free testing of hunter-harvested deer. CWD management has forced a paradigm shift in deer management in Mississippi. MDWFP participates in numerous CWD research projects and continues to recommend sound management techniques based on current science.

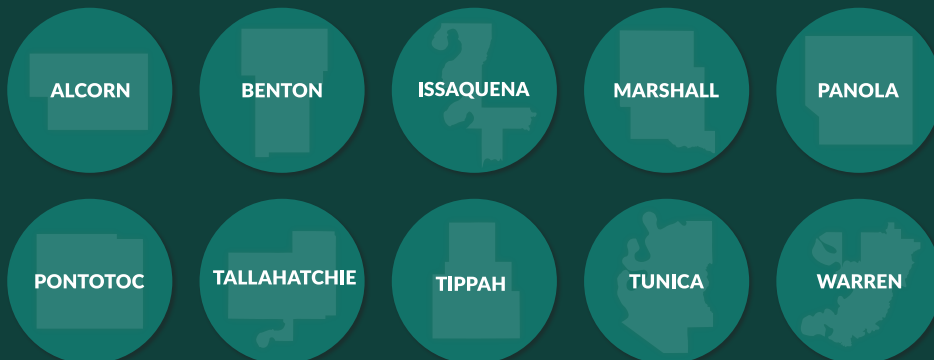
Chronic Wasting Disease Mission Statement

The mission of the Mississippi Department of Wildlife, Fisheries, and Parks (MDWFP) is to conserve and enhance Mississippi's wildlife, fisheries, and parks, provide quality outdoor recreation, and engage the public in natural resource conservation. Therefore, the mission of Chronic Wasting Disease (CWD) management in Mississippi is to strive toward the prevention, regulation and elimination of CWD, a disease that threatens the conservation and enhancement of white-tailed deer as a natural resource in the state. The MDWFP must make every effort to reduce the transmission of the disease, both the distribution across the landscape and prevalence within the herd. The future of Mississippi's deer hunting heritage depends on today's CWD management intensity as well as the cooperation and support of Mississippi's hunters and managers. Successful CWD management mandates a long-term and wide-sweeping approach.

Reporting at a glance



10 TOTAL CWD POSITIVE COUNTIES



General Distribution in Mississippi

The affected area in square miles by Minimum Convex Polygon (MCP) is 9,211 square miles. Benton and Marshall Counties demonstrate an increasing trend in detections with positive detections each of the last five seasons. Benton County has the greatest number of detections and the highest prevalence rate (across all sample sources) at 128 and 8.6%, respectively, since the 2018 season. Prevalence is defined as the percent of positive detections among all sample sources, ages, and genders. The remaining eight counties (Alcorn, Issaquena, Panola, Pontotoc, Tallahatchie, Tippah, Tunica, Warren) each have four or less positives across all five seasons with no more than two positives per season.

A CWD positive was detected for the first time in Tunica County in the 2022-2023 season. This marks the third consecutive hunting season a positive was detected in a new county.

On average, 41 positives have been detected per year since the 2018-2019 season. The average annual increase in total positives is 14.2. Of the 207 positive deer, 79.7% are male and 20.3% are female. From the 2018-2019 season through the 2022-2023 season, males have accounted for 63% of the total samples. From 2018-2019 season to the 2022-2023 season, the percent of samples from mature (2+ years) deer has increased from 79% to 89%. This is due to the increase in samples from participating taxidermists.

From the 2018-2019 season through the 2022-2023 season, 78 of 82 counties have collected less than 1,000 total samples. Additionally, 39 counties collected less than 300 total samples during this time. The cumulative average, median, maximum, and minimum per county was 417, 346, 1,844, and 38, respectively. Sample numbers in these counties either limit the ability to monitor disease prevalence or limit the confidence of detection in currently unknown areas of the state where CWD may be present. *(For a table of total samples collected per county from the 2018-2019 season through the 2022-2023 season, See Appendix 1. Pg. 20-22)*

Any changes to CWD prevalence and the population demographics that characterize the positive deer should be considered alongside the changes in the sources of the samples. Both a taxidermy program and a 3-mile tag program were instituted and have grown in the last 3 years. The increase in taxidermy samples alone influences the percent of male samples, the average age of the samples, and the distribution of where the samples originate.

Regional CWD Status as of June 2023

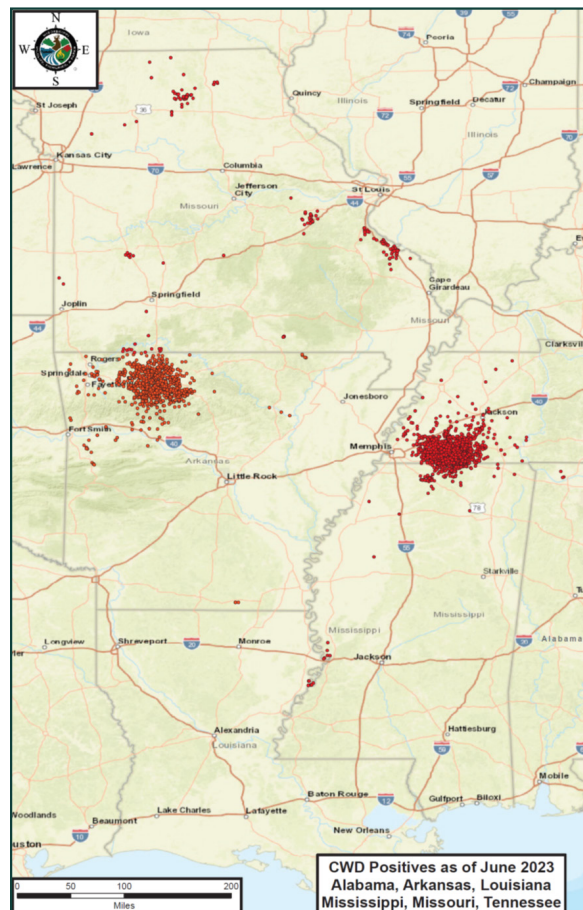
CWD has been detected in all states bordering Mississippi.

- Louisiana discovered CWD in the 2021-2022 season and has recorded 12 CWD-positive deer, all in Tensas Parish. All of the positives were west of the main Mississippi River channel and all were within seven miles of the east bank of the Mississippi River.
- Arkansas discovered CWD in the 2015-2016 season and has 1,533 positives. The closest Arkansas positive to Mississippi is 53 miles.
- Tennessee discovered CWD in the 2018-2019 season and has over 2,500 CWD positives (all white-tailed deer) as of the 2022-2023 season. Fayette and Hardeman Counties (which border Mississippi) remain their most CWD prevalent counties.
- Alabama detected CWD in 2021-2022 and has three total positives, all in Lauderdale County. Lauderdale County borders Mississippi's Tishomingo County to the east.
- Florida, while not adjacent to Mississippi, detected a CWD positive in the panhandle of Florida in June 2023. This was Florida's first CWD detection.

The MDWFP and surrounding states share CWD location information to monitor and manage the disease at the regional level. *(Please see Figure B for regional CWD locations.)*

Figure B.

All known CWD detections in Mississippi and bordering states as of June 2023.



CWD Surveillance

Sampling History

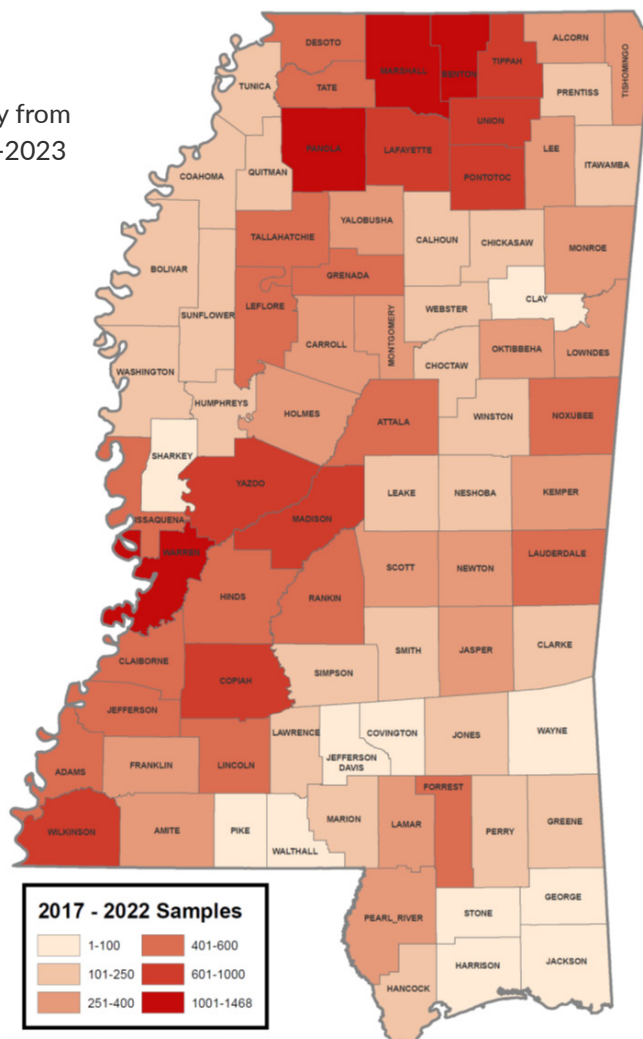
The Mississippi Department of Wildlife, Fisheries, and Parks began testing white-tailed deer for CWD in 2002, when CWD was detected east of the Mississippi River and federal funding became available for CWD testing. This was 16 years prior to the first detection in Mississippi. Mississippi began testing captive deer in 2008 when captive facility regulations were implemented.

Testing

Since 2018, the majority (>99%) of CWD samples are sent to the Mississippi Veterinary Research and Diagnostic Laboratory System for enzyme-linked immunosorbent assay (ELISA) testing. All free-range ELISA suspect positives that would alter CWD Management Zone boundaries are also sent to the Wisconsin Veterinary Diagnostic Laboratory or National Veterinary Services Laboratories (NVSL) for Immunohistochemistry (IHC) testing for confirmation. Retropharyngeal lymph nodes are used for both testing methods. Any captive suspect positive will be confirmed at the National Veterinary Services Laboratories (NVSL).

Figure C.

Total CWD Samples Collected Per County from 2017-2018 to 2022-2023 Hunting Season.



Hunter-Harvested Deer

Hunter-harvested deer constitute 96.3% (2022-2023 season) of free-range samples (6,976/7,241). The Taxidermy Partnership was the main source of hunter-harvested samples. The balance of CWD samples were collected via the statewide Drop-off Freezer Program and through participating hunting clubs.

Taxidermist Partnership

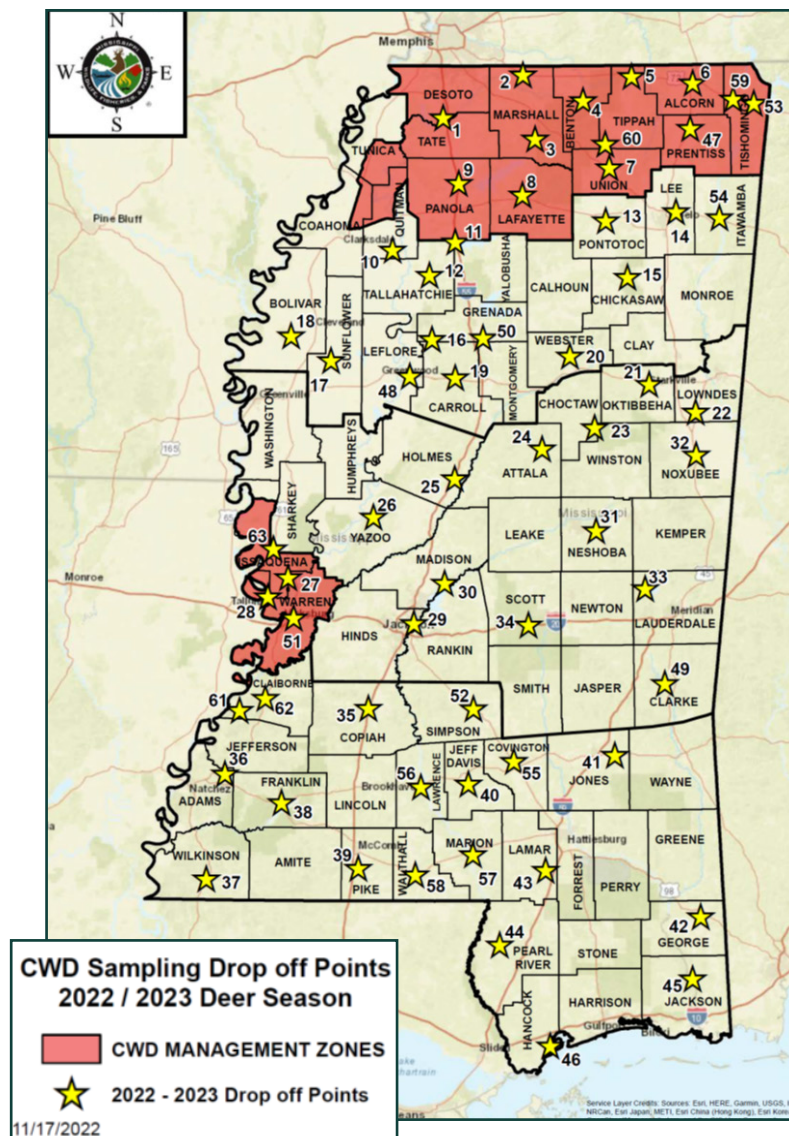
The MDWFP has worked with several taxidermists for over 15 years to collect CWD samples or save heads for CWD testing. After detection of CWD in the 2017-2018 season, efforts were increased to partner with more taxidermists. In the 2021-2022 season, the MDWFP contacted all participating taxidermists about CWD management and how they could participate. Taxidermists who participated were trained to collect the samples and record vital information. Hunters taking deer to participating taxidermists were allowed to remove the deer head (otherwise against the carcass transport regulations) out of a CWD zone directly to the participating taxidermist. The hunter had to call the taxidermist in advance and obtain the sample number and had five days to get the sample to the taxidermist. Sample cards provided to each taxidermist were recorded for cross reference. Additionally, in the 2021-2022 the MDWFP began paying participating taxidermists \$10 per viable buck sample. The paid taxidermists were paired with an agency biologist to make periodic collections. The 2022-2023 season had 63 participating taxidermists and 33 paid taxidermists. The paid taxidermists collected 698 samples in the 2020-2021, 3,325 in the 2021-2022, and 4,146 samples were collected in the 2022-2023 season. That is a 476% increase in taxidermy samples from the 2020-2021 to 2021-2022 season and a 593% increase from the 2020-2021 to the 2022-2023 season.

Drop-Off Freezer Program

The MDWFP first used drop-off freezers in the 2016-2017 season after a tornado damaged a captive facility in Lamar County. The captive facility was convicted of importing live deer from another state into Mississippi. The tornado damage occurred before any CWD sampling could be conducted within the captive facility. After the 2017-2018 season, the agency expanded to freezer locations statewide. The number of freezers expanded from 21 to 62 from the 2018-2019 to the 2022-2023 season. Counties with at least one freezer increased from 20 to 55 over the same period. Over 1,625 samples were collected from drop-off freezers in the 2022-2023 season. A goal was to provide a freezer location in, or directly adjacent to, every county. Freezer participation ranged from 2 to 177 heads per freezer for the 2022-2023 season. MDWFP personnel checked freezers at the beginning of each week, thawed heads and collected sample tissues mid-week, and delivered samples to the lab by Thursday mornings. The majority of heads were sampled at a central location for each regional CWD team. The MDWFP used incineration, deep burial and certified landfills for carcass disposal.

Figure E.

Public drop-off freezer locations 2022-2023 hunting season.



Mandatory CWD Sampling

Mandatory CWD sampling weekends were conducted during the 2019-2020 deer season with limited success. There were three mandatory sampling weekends that targeted the peak hunting times for three regions of the state. Multiple check stations were manned in each region in addition to the drop off freezer locations. Some weekends saw fewer than 20 samples collected for the entire region. Mississippi hunters are not accustomed to reporting harvests due to the lack of any mandatory harvest reporting or tagging program. Additionally, Mississippi offers over 100 days of deer hunting opportunity when reporting or CWD testing is not mandatory. These likely contributed to the low compliance for these weekends and hunter's willingness to avoid harvest during mandatory sampling weekends. Mandatory CWD sampling was implemented again during the 2022-2023 season with the debut of the September archery season.

Surveillance by Other Agencies or Authorized Individuals

Select USDA –APHIS partners and the US Army National Guard voluntarily provided CWD samples from airport and military installation population control measures. Some private individuals with Animal Control Permits (for crop depredation, etc.) also provided CWD samples. All deer mortalities during wildlife research projects, through Mississippi State University, were sampled. Multiple partners have assisted with CWD sampling activities ranging from sample collection to sampling access to locating samples to collect. The MDWFP has only payed participating permitted taxidermists, and processors who also practice taxidermy, to collect CWD samples. The MDWFP has not mandated any partner to collect CWD samples. *(For a list of CWD collection partners see Appendix II, Pg. 22)*

Suspect (“target”) Deer Surveillance

The MDWFP staff respond to and collect CWD samples from all deer that exhibit clinical signs/symptoms consistent with CWD. MDWFP has collected 143 target deer with clinical symptoms of CWD from 2018 to 2023. Seven of these tested positive for CWD. Additionally, hunters have harvested and submitted five other deer that were clinical.

Road-Kill Surveillance

The MDWFP has reduced the focus on collecting CWD samples from road-killed deer since the 2018-2019 season. Following initial detection in spring 2018, multiple road-killed survey routes were established and conducted weekly through the fall of 2019. Staff also collected samples from road-killed deer as safety permitted. As research suggested a low value on road-killed samples, the number of these samples has declined. As of the 2022-2023 season, road-killed deer are primarily sampled in regions of the state where samples from other sample sources are inadequate. Road kill samples have fallen from 1,184 in the 2018-2019 season to 100 in the 2022-2023 season.

Sharpshooting

The MDWFP does not practice sharpshooting to reduce deer densities surrounding positive detections near the perimeter of the known CWD areas. From February through June 2018, following the initial detection of CWD, the MDWFP collected a few hundred samples on Army Corp of Engineers land and private land where farmers were issued animal control permits for crop depredation. All samples were collected with landowner permission. The effort was to assess the distribution and prevalence of CWD after the initial detection in Mississippi.

Herd Health Evaluations

MDWFP conducted the first herd health evaluation (HHE) in Mississippi in 1973. Since, there have been 666 HHEs conducted through the 2022-2023 season and 6,567 does 1-year-old and older were sampled. HHEs are conducted to monitor herd health. CWD samples have been collected since 2002 on all HHEs as part of the sample collection process. Over 2,700 deer have been tested through these evaluations and none have tested positive for CWD. *(See Table 1, Pg. 9)*

Table 1. HERD HEALTH EVALUATIONS (PER YEAR WITH NUMBER OF DOES 1.5 AND OLDER)			Table 1. HERD HEALTH EVALUATIONS (PER YEAR WITH NUMBER OF DOES 1.5 AND OLDER)		
YEAR	# HHE's	Does 1.5+	YEAR	# HHE's	Does 1.5+
FY1973	1	3	FY1999	35	351
FY1974	0	0	FY2000	35	423
FY1975	0	0	FY2001	34	364
FY1976	0	0	FY2002	36	375
FY1977	0	0	FY2003	31	267
FY1978	4	16	FY2004	38	386
FY1979	4	15	FY2005	1	13
FY1980	0	0	FY2006	1	2
FY1981	0	0	FY2007	26	252
FY1982	0	0	FY2008	19	171
FY1983	2	13	FY2009	21	198
FY1984	0	0	FY2010	18	155
FY1985	1	15	FY2011	14	144
FY1986	0	0	FY2012	11	96
FY1987	4	32	FY2013	18	169
FY1988	5	34	FY2014	14	132
FY1989	1	6	FY2015	7	58
FY1990	7	51	FY2016	12	100
FY1991	28	299	FY2017	4	25
FY1992	12	104	FY2018	2	19
FY1993	20	168	FY2019	0	0
FY1994	32	348	FY2020	0	0
FY1995	28	325	FY2021	2	21
FY1996	42	445	FY2022	7	60
FY1997	47	432	FY2023	9	102
FY1998	33	378	TOTAL	666	6567

CMAP

The MDWFP initiated a 3-mile tag program called the Chronic Wasting Disease Management Assistance Program (CMAP) for the 2020-2021 season. The program provided hunters on private land within 3 miles of a known CWD positive the ability to apply for CMAP tags. The tags allowed the hunter to use a weapon of choice from the first day of archery season. The tags did not count toward the hunters daily or seasonal bag limit. Additionally, one CMAP tag was issued to each hunter who received positive test results prior to season's end. All deer harvested with a CMAP tag were required to be submitted for CWD testing (usually via a participating taxidermist or a drop-off freezer). 331,882 acres of private land were eligible for 3-mile tags in the 2022-2023 season. Comparatively, 19,806 acres (37 properties) were enrolled in the program for the 2021-2022 season. Tags were issued to 6% of eligible private land. In the 2022-2023 season, 328 tags were issued to the CMAP properties and 53 CMAP tags were sent to hunters who harvested a CWD-positive deer. The program has issued 1,334 tags and has had 318 tags used since the 2020-2021 season.

The number of tags used per season has declined from 156 in the 2020-2021 season to 73 in the 2022-2023 season. CMAP tags have produced 30 positive deer, or about 10% of the tags used, making it a successful program for removing positive deer from the landscape. The CMAP Program was designed to substitute sharpshooting efforts around targeted areas and provide hunters with increased opportunity.

Figure D.
 CMAP Boundaries for
 2018-2023 Hunting
 Season.

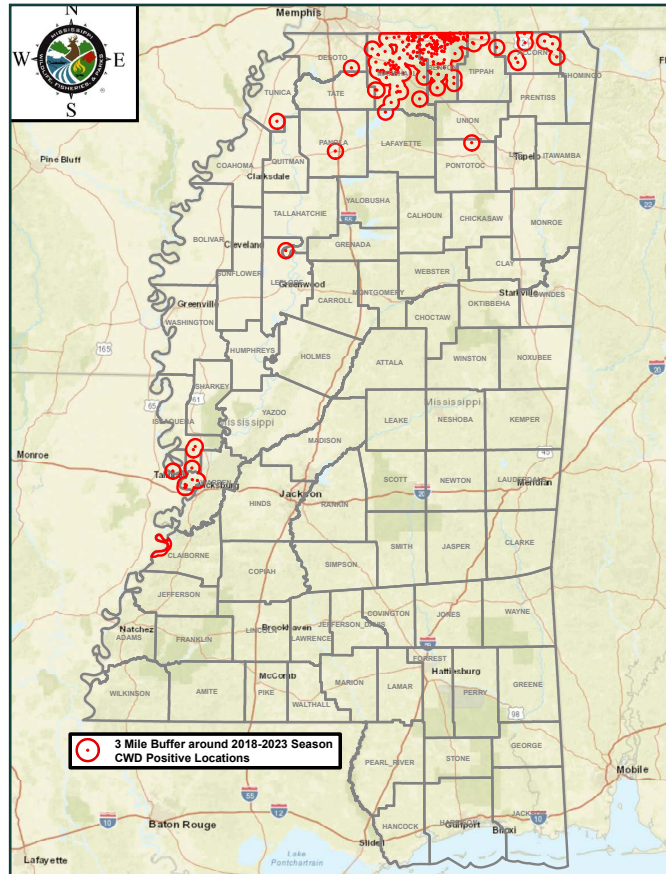


TABLE 2. POSITIVE CWD SAMPLES BY SOURCE							
2017-2018 THROUGH 2022-2023 HUNTING SEASONS							
SAMPLE SOURCE	17-18	18-19	19-20	20-21	21-22	22-23	TOTAL
Suspect/Clinical	1	3	1	3	1	3	12
Hunter Harvest	0	15	35	27	49	72	197
Road Kill	0	1	0	0	0	0	1
CWD Tag	0	0	0	10	12	9	31
Taxidermist	0	0	10	14	27	58	109
Captive	0	0	0	0	0	0	0
HHE	0	0	0	0	0	0	0
Confiscated	0	0	0	0	1	0	1
TOTAL POSITIVE	1	18	35	29	51	73	207

Captive Facilities

Authority

MDWFP has plenary authority over matters related to white-tailed deer in captive facilities and Mississippi Board of Animal Health has authority over all other captive cervids. The buy and sale of live white-tailed deer is illegal in Mississippi. There is currently a moratorium of all live deer movement in Mississippi due to the discovery of CWD. Importation of live white-tailed deer has been banned in Mississippi since 2002. Any facility convicted of unlawful importation of live white-tailed deer shall be placed under quarantine for a minimum of 10 years.

CWD Sampling Requirements

The number of permitted captive facilities per year has declined from 126 in the 2017-2018 season to 84 in the 2021-2022 season. Approximately 127 contained white-tailed deer, but not all had current approved permits (40). Eight contained permitted breeding pen facilities and six contained deer in the 2021-2022 season. State statute 49-7-58.6 requires all mortalities in breeding pens to be reported and tested for CWD. Additionally, as of the 2021- 2022 season each captive facility must sample one deer per 200 acres, or part thereof, annually. Captive facilities can submit deer heads through the drop-off freezer program or submit pulled samples to law enforcement during annual inspections. Per Statute 49-7-58.2, if a deer tests positive from a captive facility, a CWD Management Zone will not be created within 5 miles of the enclosure until a positive deer is detected outside the facility. *(For a timeline of captive facility CWD sampling-related regulations, see Appendix III, Pg. 23)*

TABLE 3. CAPTIVE FACILITY CWD SAMPLES*
SUBMITTED OR COLLECTED THROUGH MAY 2023

SEASON	2018	2019	2020	2021	2022
Permitted Captive Facilities	126	117	116	112	84
Captive Facilities Submitting Sample(s)	66	88	99	95	69
CWD Samples	436	837	1265	727	379*
CWD Positives	0	0	0	0	0

* This table should not be used as a complete measure of compliance because CWD samples could have been collected after the turn of the fiscal year and the permitted status may not be up to date.

History of CWD Management Regulations

Regulations pertaining to CWD were proposed and/or implemented prior to the first detection in MS. Multiple regulation changes have occurred since the first detection and additional regulation changes are needed to manage this dynamic disease.

CWD Response Plans

The MDWFP developed a CWD response plan in 2008. The plan addressed the disease background, statewide sampling history, sampling priorities, and stance on management. Following the detection of CWD in Arkansas in February 2016, MDWFP created and approved a revised CWD Response Plan in November 2017. The CWD response plan included the general response to a confirmed positive, surveillance history, regulation pertaining to CWD, zone specific regulations and templates for communication. Soon after, in February 2018, Mississippi detected its first CWD positive deer. When CWD was detected in multiple counties, MDWFP acknowledged the need for a plan that addressed long-term CWD management in Mississippi. The CWD Response Plan was converted to the current CWD Management Plan in 2021 with input from multiple state and federal agencies. Since approved, the Commission has modified the CWD Management Plan three times to redefine the criteria for establishing and removing areas from a CWD Management Zone. The changes relate to the political/physical boundaries used to delineate boundaries, rivers as barriers that separate positives from Mississippi soil, and adding years-since-detection as a metric to allow removal from a zone. *(For a timeline of CWD management zone and regulation changes see Appendix V, Pg. 25)*

Collaboration and Research

Collaboration with other Government Agencies

Numerous government partners have assisted with CWD sample collection efforts ranging from sample collection on government properties, to reporting road killed deer, to hosting sample drop-off locations. *(For a list of partners, see Appendix II, Pg. 22)*

Research

The MDWFP has participated in numerous research projects to advance the understanding of CWD transmission, improve surveillance techniques, provide outreach and education to stakeholders, monitor public opinion toward CWD management, quantify risks associated with deer management practices, and increase efficiency of CWD management. MDWFP participation has been physical and/or financial pending the scope and location of each project. *(For a list of projects MDWFP has contributed to since the 2018-2019 season, see Appendix III, Pg. 23)*

RT-QuIC

An example of CWD research in Mississippi is the testing of a new CWD detection method. While testing techniques are being evaluated and implemented by numerous state agencies and research universities as part of CWD surveillance programs, MDWFP has used, in partnership with Mississippi State University, real time quaking induced conversion or RT-QuIC. RT-QuIC is an amplification test that is more sensitive to prion detection than ELISA or IHC and allows multiple substrates (biological or environmental) to be tested. RT-QuIC testing of scrapes and licking branches, in Mississippi, has detected prions in 50% of tests in the North CWD Management Zone, has detected prions 18 miles beyond a known positive deer in the south delta, and has detected prions in Claiborne County, east of the Mississippi River after the county was removed from the CWD Management Zone.

2022/23 SEASON REVIEW

CWD Surveillance Results the 2022-2023 Season

Total number of samples collected statewide: during the 2022-2023 season, a total of 7,805 deer were sampled for CWD. This includes 7,426 free-range samples and 438 captive facility samples. (Not all captive CWD samples were submitted by June 30.) The most heavily sampled regions were the North-Central counties and Big Black River Corridor. Hunter-harvested deer constituted the majority of samples, with only 100 road killed samples and 39 suspect deer. No suspect deer or mortalities were reported inside cervid captive facilities or breeding pens, respectively, in the 2022-2023 season.

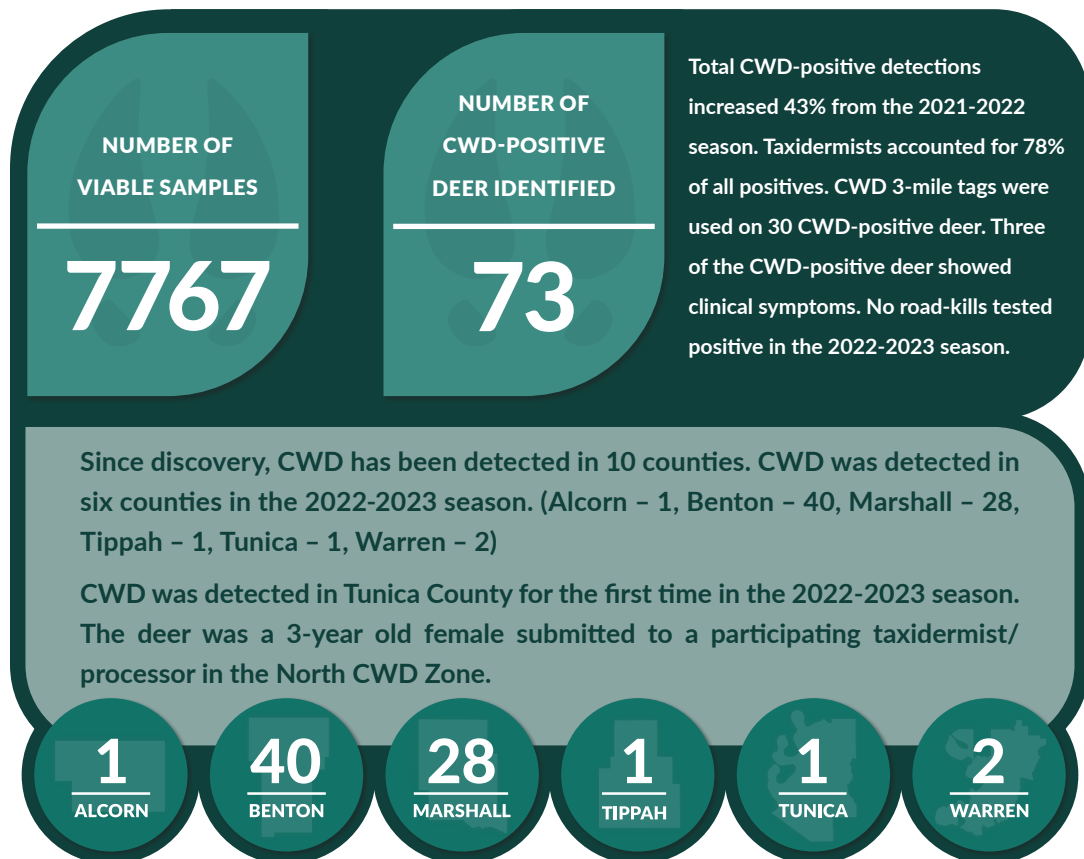
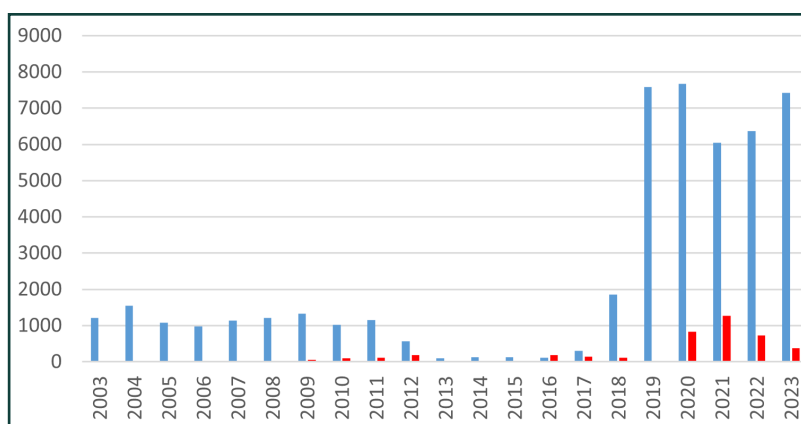


Figure F.

Historical free-range and captive CWD samples by year.



Prevalence for Known CWD Areas

CWD prevalence varies across the state. Among the known CWD areas, CWD prevalence at the county level for the 2022-2023 season ranged from 0.6% in Warren County to 14.7% in Benton County. This prevalence is based on the number of 1.5 and older, hunter-harvested deer. It excludes target deer, road-killed deer, and fawns. Prevalence also appears to vary within some counties; however, sample size is too low to measure variation in prevalence within a county. There are individual landowners who have > 60% prevalence from the 2020-2021 season to the 2022-2023 season. The disease is not evenly distributed across the landscape. It is possible and likely that CWD exists in low to moderate prevalence in regions of the state where it has yet to be detected. This is because of the non-random distribution of the disease and the non-random distribution of sample locations. Low sample numbers in some counties exacerbates this.

CWD POSITIVE DETECTIONS BY COUNTY SINCE THE 2017-2018 SEASON							
County	2018	2019	2020	2021	2022	2023	TOTAL
Alcorn	—	—	—	1	2	1	4
Benton	—	7	26	23	31	40	127
Issaquena	1	1	—	—	—	—	2
Marshall	—	7	9	4	15	28	63
Panola	—	1	—	—	—	—	1
Pontotoc	—	1	—	—	—	—	1
Tallahatchie	—	1	—	—	—	—	1
Tippah	—	—	—	1	1	1	3
Tunica	—	—	—	—	—	1	1
Warren	—	—	—	—	2	2	4
TOTAL	1	18	35	29	51	73	207

Changes to CWD Management Zones in 2022

2022-2023 Season CWD Zones

Claiborne, Lafayette, Prentiss, and Tishomingo Counties were added to the CWD Zones in July 2022 after positives were detected within 10 miles of the counties. Claiborne County was removed from the South Delta CWD Zone in November 2022 after the Commission voted to remove the county, determining the Mississippi River to be a barrier to deer movement and therefore disease transmission. Additionally, the Commission voted to amend the CWD Management Plan to remove any county with no CWD detections in the last 3 years. This removed Leflore, Pontotoc, Sharkey and Tallahatchie counties.

Hunting Seasons

Hunting season dates varied by region with the Delta, East Central, Northeast, North Central, and Southwest Deer Management Units all having the same structure. The Southeast Deer Management Unit followed a similar, but delayed schedule. The 2022-2023 season deer season structure had 52 days of archery-only statewide except for the Southeast DMU which had 38. All zones had 14 days of youth rifle and 46 days of rifle. All DMUs, except the Southeast, had 33 days of primitive weapon season. These units could use a weapon of choice on private land for 22 of these days. The SE DMU had 37 days of primitive weapon season, all of which allowed a weapon of choice on private lands

Bag Limits

Antlered Bucks

The statewide bag limit on antlered buck deer was one (1) buck per day and three (3) per annual season. One (1) of these three (3) may have had hardened antlers that do not meet the unit legal antler requirements on private land and Holly Springs National Forest. For youth hunters fifteen (15) years of age and younger, hunting on private land and authorized state and federal lands, all three (3) of the three (3) buck bag limit may have been any antlered deer. Antlered buck bag limit in the North Central Deer Management Unit (DMU) was one (1) buck per day and four (4) per annual season. No antler restrictions applied to this DMU. All four bucks may have had any sized hardened antlers.

Antlerless Deer

--Private lands--

The statewide annual bag limit on antlerless deer was five (5). The antlerless bag limit for private lands in the North Central DMU was ten (10) antlerless deer per season. Antlerless deer were male or female deer which did not have hardened antler above the natural hairline. Only two (2) antlerless deer allowed from the Southeast Unit. There was no daily bag limit on antlerless deer in the Northeast, North Central, East Central, Southwest, and Delta units. Only one (1) antlerless deer per day allowed in the Southeast DMU.

--U.S. Forest Service National Forests--

The bag limit was one (1) per day, not to exceed five (5) per annual season except in the Southeast Unit, which was two (2) per annual season.

Antler Criteria

Legal buck criteria for all DMUs, except the Delta DMU, was a 10-inch inside spread or a 13-inch main beam. The Delta DMU required a 12-inch inside spread or a 15-inch main beam. All DMUs except the North Central DMU, allowed one buck to be any antlered buck. North Central DMU allowed all bucks to be any antlered buck.

Season Notes

The number of participating taxidermists and the number of samples from taxidermists has increased. This increase has also increased the percent of bucks sampled, the age structure of bucks sampled, and the dispersion of samples across the state. The number of CMAP tags used declined from 89 to 73 from the 2021-2022 to the 2022-2023 season. Deer harvest increased slightly from 268,242 to 273,694 deer from the 2021-2022 to the 2022-2023. The average number of deer harvested per hunter increased from 1.4 to 1.6 deer, while the number of deer hunters decreased from 195,380 to 170,832 over the same time. The 2022-2023 season saw the first September archery season with mandatory CWD sampling and harvest reporting. Hunters submitted 197 samples during this season.

Population surveys

The MDWFP has not conducted statewide population surveys for white-tailed deer. Some spotlight counts have been conducted on U.S. Forest Service WMAs to monitor deer density following doe harvest regulation changes in the 2017-18 hunting season. In February 2023, the MDWFP conducted a thermal survey for deer on the Natchez Trace. The survey revealed the highest relative abundance west of Interstate 55, with the greatest relative abundance immediately adjacent to the Louisiana positives in Tensas Parish and RT-QuIC positive results in Claiborne County.

Mississippi is the only state in the nation without mandatory tagging or harvest reporting for white-tailed deer. This limits the ability to gauge deer abundance at the county level.

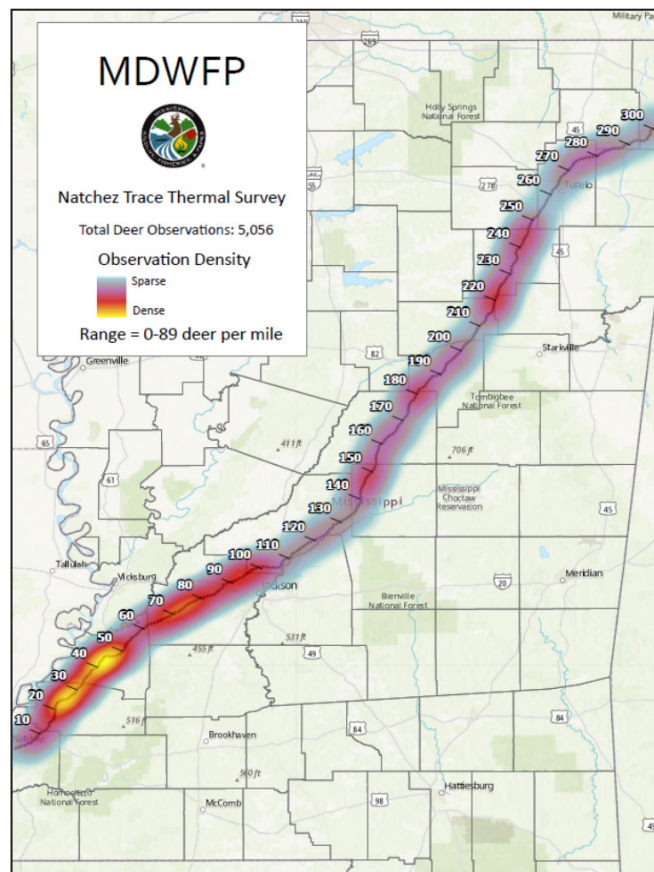


Figure G.

Thermal Survey for white-tailed deer along the Natchez Trace in February 2023.

Public Outreach

The MDWFP staff has strived to provide current valuable CWD information to the public. The efforts include over 100 speaking engagements by request at national, state, regional, county, and community levels. Efforts to communicate include multiple seminars, public meetings where new cases were discovered, multiple publications in newsletters and magazines, online media and social media.

Discussion

The detection of CWD in Mississippi required a paradigm shift in the way the MDWFP and public manage white-tailed deer in the state as a natural resource. CWD is a disease with potential catastrophic statewide impacts on the state's number one game animal. The impacts of CWD are diverse, far-reaching, and severe. Not all are direct or immediately obvious. Some effects will take place over time as hunter opinion and behavior adapt to the disease. The trajectory of the deer population and CWD status across Mississippi will depend on the continuation of hunters and decision makers to support CWD management and the ability for the agency to implement sound scientifically-proven measures to manage the disease as the science and the disease advance.

The MDWFP made many changes to deer management in the state in response to CWD. These changes include restricting carcass import prior to CWD detection in Mississippi, banning use of supplemental feed inside CWD Zones, banning use of non-ATA approved natural deer urine, increasing bag limits in the North CWD Management Zone, limiting transport of carcasses leaving CWD Management Zones, mandatory reporting during the September velvet deer season, and permitting the use of rifles to harvest deer near CWD positive locations during archery season. Other time-limited activities were also utilized including an extended season in February 2020 shortly after discovery of CWD in the North CWD Zone, as well as mandatory sampling during prominent harvest weekends in 2020-2021 rifle season.

The MDWFP also made an effort to limit unnecessary burdens on hunters. In some cases, regulations have been relaxed. These changes have included collaborating with taxidermists to allow hunters to transport heads out of CWD Management Zones to participating taxidermists, allowing bone-in leg quarters to leave CWD Management Zones, and placing CWD drop-off freezers in every county or an adjacent county.

Not all programs and regulations have had equal success. The 3-mile tag program has been one of the most successful programs for removing CWD-positive deer from the landscape. Expanded use of this program to include more hunters and properties as well as increased use of the tags, could increase the state's ability to limit spread and prevalence in already known CWD areas. Another successful program is the taxidermist partnership. Participating taxidermists can receive intact deer heads, by permit, from CWD Management Zones and are eligible for payment for each sample collected. This program has grown to account for over 50% of all CWD samples collected and 79% of positive cases in the 2022-2023 season.

The success of the taxidermy partnership has made it the dragnet for CWD surveillance across the state. As a result, the drop-off freezers across the state have shifted in use from the primary source for random statewide surveillance to a service providing the public easy and accessible testing of harvested deer.

However, these successes are not without criticism and non-compliance from the public in other aspects of disease management. Members of the public have questioned the science and politics of CWD regulations as they pertain to supplemental feeding. Beyond the expressed concern caused by feeding ban regulations, aerial surveys in January 2023 indicated a continuance of supplemental feeding in CWD management Zones where all feeding is prohibited. The aerial surveys were part of a statewide research project conducted by Mississippi State University investigating the potential risk of CWD transmission at feed sites.

The socio-political challenges of CWD management are real. The MDWFP and partner agencies and organizations in the conservation arena must continue to follow sound science, provide transparent disease management information to the public, and maintain public trust. The public and more specifically, licensed hunters must be able to make educated decisions about harvest, CWD testing, and compliance with disease management regulations. A proper understanding of the insidious nature of the disease as well as long-term consequences of taking no proactive management actions will influence decisions made by these hunters.

Other states managing CWD have demonstrated that as the disease advances spatially and numerically, deer harvest and license sales decline. This decline usually occurs prior to visible population level impacts caused by the disease. With reduced hunter effort and reduced herd management, the disease expands exponentially. In CWD endemic areas, CWD has suppressed deer populations to levels where bucks cannot reach maturity and the herd cannot support hunter harvest. The proven trajectory of disease progression in the absence of management action, elevates the necessity to take measures that limit and delay the progression. Chronic Wasting Disease and the management of the deer herd in Mississippi have the potential to impact deer health, deer abundance, agricultural damage, deer-vehicle collision rates, and wildlife habitat for other game and non-game species. The disease also has the potential to impact food safety, recreational property value, numerous outdoors related businesses, as well as the hunting culture and traditions of Mississippi. Hunting, as a billion-dollar industry in Mississippi, with deer being a primary focus among hunters (94%), has potential to impact license sales which contribute to wildlife conservation as a whole in the state.

Studies have shown that when CWD crosses a threshold of acceptable prevalence, hunters reduce or discontinue harvesting deer and/or cease purchasing a license to hunt deer. If hunters do not maintain support of CWD related management and disease prevention strategies, the disease itself will ultimately prevail reducing deer survival. With the resulting lower population density and increased diseased prevalence, populations may not be able to support harvest or even withstand disease related mortality. Studies in endemic CWD areas across the country have demonstrated declining populations in the absence of harvest. This phase of CWD management will require the agency to determine if actions should be taken

to sustain deer on the landscape, such as limiting harvest in endemic areas.

Research has indicated that the potential for CWD to transmit to humans is possible, despite having never been documented. If or when CWD is proven to cross the species barrier into humans, the goal of CWD management will be to maintain the lowest possible prevalence rate in the herd and likewise reduce and limit environmental contamination. Clearly, efforts made today toward that goal will ultimately prove irreplaceable. Management objectives and decisions must weigh the long-term benefits of proactive management strategies and regulations against the ramifications of taking minimal measures.

Aside from the financial contribution of license sales to conservation, hunters in Mississippi harvest about 13 million pounds of venison per year. This is greater than the combined production of all other red meat in Mississippi. Changes to deer abundance or changes to the safety or perception of safety of this food source could impact a primary source of sustenance for Mississippi families.

In order to increase the success of CWD management in Mississippi, the MDWFP must focus on preventative management and policy, early detection, effective management strategies, and public outreach and education. CWD is an insidious disease that often goes unnoticed for years. The resulting sick/dead deer related to CWD, lower deer densities, and loss of older age class bucks, are not easily visible or apparent to the average observer causing doubt and hesitation among hunters and decision makers.

Current decisions by hunters, managers, and policy makers will determine the fate of deer management in Mississippi. Successful deer management must consider disease risk and disease transmission as a foundational guide for decision-making. CWD is here to stay. Management objectives must consider the long-term implications and ramifications of management strategies and actions. The preservation of the resource for the next generation is at stake.

APPENDIX I. CWD Samples Per County

2018/19 - 2022/23 SEASONS

COUNTY	FY2019	FY2020	FY2021	FY2022	FY2023	FY19-23
Adams	83	96	74	66	86	405
Alcorn	59	81	81	70	92	383
Amite	54	37	77	86	109	363
Attala	127	135	92	124	113	591
Benton	122	336	391	233	286	1368
Bolivar	78	44	53	51	31	257
Calhoun	78	57	39	22	31	227
Carroll	66	163	126	43	42	440
Chickasaw	89	60	48	24	30	251
Choctaw	78	35	41	28	29	211
Claiborne	164	116	93	109	215	697
Clarke	24	26	68	118	38	274
Clay	49	32	27	14	13	135
Coahoma	30	29	7	30	59	155
Copiah	213	175	61	171	224	844
Covington	27	22	14	4	9	76
DeSoto	81	216	128	100	97	622
Forrest	98	47	164	20	24	353
Franklin	88	39	94	83	50	354
George	6	12	4	3	13	38
Greene	27	28	16	5	9	85
Grenada	87	176	103	79	65	510
Hancock	19	35	22	27	17	120
Harrison	18	13	11	5	29	76
Hinds	155	107	104	208	314	888
Holmes	83	69	54	86	113	405
Humphreys	36	34	20	33	48	171
Issaquena	285	45	85	108	235	758
Itawamba	89	57	31	21	324	522
Jackson	42	18	9	3	29	101
Jasper	75	66	55	96	48	340
Jefferson	131	78	62	70	85	426
Jefferson Davis	19	18	22	10	9	78
Jones	29	28	33	16	10	116
Kemper	55	64	60	75	63	317
Lafayette	176	259	144	84	117	780
Lamar	64	38	35	27	20	184
Lauderdale	101	97	115	122	76	511
Lawrence	37	49	22	30	25	163
Leake	67	35	42	36	36	216
Lee	84	116	43	20	34	297

APPENDIX I. CWD Samples Per County

2018/19 - 2022/23 SEASONS

COUNTY	FY2019	FY2020	FY2021	FY2022	FY2023	FY19-23
Leflore	108	124	82	46	83	443
Lincoln	64	87	77	108	106	442
Lowndes	96	69	35	39	44	283
Madison	191	166	112	151	246	866
Marion	29	25	20	23	22	119
Marshall	254	524	360	333	373	1844
Monroe	134	105	71	55	54	419
Montgomery	67	92	74	71	52	356
Neshoba	33	27	28	69	50	207
Newton	76	70	91	154	102	493
Noxubee	78	66	105	99	53	401
Oktibbeha	105	78	92	63	53	391
Panola	117	446	174	460	491	1688
Pearl River	33	34	8	13	15	103
Perry	30	38	32	17	26	143
Pike	14	17	12	16	10	69
Pontotoc	400	224	107	66	33	830
Prentiss	30	50	26	9	17	132
Quitman	32	123	35	60	126	376
Rankin	106	81	53	107	121	468
Scott	85	72	33	42	49	281
Sharkey	48	9	19	23	45	144
Simpson	59	40	21	62	62	244
Smith	56	66	18	20	24	184
Stone	8	12	17	7	19	63
Sunflower	28	22	13	48	12	123
Tallahatchie	91	191	71	136	142	631
Tate	87	198	87	100	80	552
Tippah	123	220	186	133	186	848
Tishomingo	66	63	83	57	167	436
Tunica	16	40	39	43	24	162
Union	250	248	166	123	117	904
Walthall	11	20	18	13	19	81
Warren	672	194	211	336	309	1722
Washington	45	34	14	27	73	193
Wayne	7	11	19	12	12	61
Webster	47	45	57	54	42	245
Wilkinson	115	80	81	70	101	447
Winston	70	73	40	57	26	266
Yalobusha	95	166	62	56	115	494
Yazoo	193	119	117	221	243	893

Appendix II. CWD Collection Government Partners and Contributors

Mississippi Department of Transportation

Mississippi Forestry Commission

Mississippi State University

Mississippi State University Extension Service

United States Army National Guard

United States Department of Agriculture Animal and Plant Inspection Service/ Wildlife Services

United States Fish and Wildlife Service

United States Forest Service

United States Navy

Board of Supervisors and other county officials from Warren, Issaquena, Lamar, Pontotoc, Benton, Marshall, Panola, and Tallahatchie Counties.

Appendix III. Captive Facility CWD Regulations Timeline

2002

Importation of live white-tailed deer banned in Mississippi. Any facility convicted of unlawful importation of live white-tailed deer shall be placed under quarantine for a minimum of 10 years.

2008

Commission enacted regulations requiring all enclosures to be permitted and inspected annually. This regulation required all target white-tailed deer within high fenced enclosures to be tested for CWD. Target deer were defined as deer exhibiting clinical symptoms. All enclosures were encouraged to submit samples from harvested deer. Enclosures are required to report breaches and escapes within 24 hours. No escapes have been reported, however, tagged deer from enclosures have been reported and harvested in the free-range.

2018

Commission enacted moratorium of live cervid movement within Mississippi. Commission enacted regulation requiring enclosures to submit all 1.5 year old or older white-tailed deer that die of natural causes within breeding pens for CWD testing. All target white-tailed deer within a high-fenced enclosure or breeding pen must be tested for CWD. Target deer are deer exhibiting clinical symptoms. Additionally, up to ten (10) adult deer harvested in an enclosure annually must be tested for CWD. If no samples are submitted from harvested deer, MDWFP will coordinate the sampling of required deer with the enclosure owner. This rule was in effect for the 2018-2019 and 2019-2020 seasons. Compliance from enclosures submitting at least one CWD sample in these seasons was 55% and 71%, respectively.

2020

Mississippi legislature passed a bill requiring all white-tailed deer harvested inside enclosures to be tested for CWD. 91 enclosures submitted at least on sample. Just over 20 enclosures reported harvesting 0 deer.

2021

Mississippi legislature passed a bill that changed the CWD sampling requirements for enclosures. Beginning in the 2021 season, enclosures were required to submit 1 CWD sample per 200 enclosed acres. Additionally, the Commission ruled that one sample was required per 200 acres or part thereof. Twenty enclosures did not provide a CWD sample during the 2021 season. As of May 2023, 50 enclosures have not provided a sample for the 2022 season. Also, the Mississippi legislature also passed a bill prohibiting the creation of a CWD management zone within a 5-mile radius of an enclosure unless CWD is detected outside the fence.

Appendix IV. Research Projects

MDWFP has participated in the following CWD-related research projects:

- A Novel Genetic Resource to Inform White-tailed Deer and Disease Management
- Surveillance Optimization Project for Chronic Wasting Disease (SOP4CWD)
- CWD Strain Typing with University of Alberta
- Development & Validation of Real-Time Quaking-Induced Conversion (RT-QuIC) as Confirmatory Testing for CWD
- Environmental Monitoring as Early Sentinel Warning for Presence of CWD
- Assessing White-Tailed Deer Populations in Relation to Chronic Wasting Disease and Long-Duration Floods
- Economic Impacts of CWD in North Mississippi and SW Tennessee
- Improving CWD Educational Outreach via Social Media Platforms
- Prion contamination of deer feeders
- Feeding compliance via aerial surveys

Appendix V. CWD Management Zone and Regulations Timeline

Regulations pertaining to CWD were proposed and/or implemented prior to the first detection in MS. Multiple regulation changes have occurred since the first detection and additional regulation changes are needed to manage this dynamic disease.

First Detection

2017-18

CWD was detected for the first time in Mississippi in February 2018. The positive individual was a clinical 4-year-old male from Issaquena County. A Containment, High Risk, and Buffer Zone were established at 5, 10, and 25 miles from the positive detection. MDWFP collected 1,253 samples from detection to June 30th. Floodwater covered the location of the initial detection within 2 weeks after detection. Specifically, water covered greater than 75% of the entire high-risk zone for months following CWD detection. This displaced deer to nearby levees or hills miles from their home range. While sampling in each zone was possible, sampling was not random and collection location was likely different from the normal home range of the sampled deer. Sampling occurred on levees, government owned land and private land with landowner permission. No additional positives were detected in the spring of 2018.

Immediately following detection, the Mississippi CWD Response Plan was implemented and a CWD Management Zone was created that included all counties which were partially within the 25-mile buffer zone. This included Claiborne, Hinds, Issaquena, Sharkey, Warren, and Yazoo Counties. A feeding ban was implemented in the entire zone. (*See Figure a, Pg. 28*)

2018-19

In September of 2018, the CWD Management Zone was all of Claiborne, Hinds, and Yazoo counties, as well as the northern portions of Issaquena and Sharkey counties, were removed from the CWD management zone. Following the reduction, the zone included all of Warren County and those portions of Issaquena and Sharkey counties east of the MS River, south of highways 14 and 16, and west of the Yazoo River. This zone is currently known as the Issaquena CWD Management Zone. (*See Figure b, Pg. 28*)

One additional positive was detected in Issaquena County on Mahannah Wildlife Management Area 7 miles north of the original detection in November 2018. This positive was a hunter-harvested 2-year-old female.

The Commission for the MDWFP passed several wildlife rules related to CWD in 2018. Zone specific regulations for the 2018 hunting season included a carcass transportation ban out of the zone and a feeding and mineral ban in the zone. Additional statewide regulation changes included a carcass importation ban from all CWD positive states, a natural urine ban, and mandatory sampling for white-tailed deer in captive facilities.

CWD was detected in 5 additional counties: Benton, Marshall, Panola, Pontotoc, and Tallahatchie. These deer represented hunter-harvested, roadkill, and clinical suspect individuals. (See Table 1a, Below, for sample type of first detections). Also in the 2018-2019 hunting season, Tennessee discovered CWD in Fayette and Hardeman counties. These two counties border Marshall and Benton counties in Mississippi.

Following the 2018-2019 season, changes were made to harvest regulations. The antlerless bag limit was increased from 3-5 statewide except for the southeast zone. Antler criteria was eliminated for one of the three-buck bag limit allowing all hunters a buck of choice. This regulation was implemented on private land and on Holly Springs National Forest. In the South Delta Zone, total season was shortened, and antlerless and antlered bag limits were reduced to two antlerless deer and two antlered deer due to public concern due to flood induced stress and mortality of the deer herd.

2019-20

Multiple positive CWD deer were discovered in Benton and Marshall Counties, but no positives were detected outside these two counties (See Figure b, Pg. 28) In. At the end of the 2019-2020 season, all or part of 22 counties were in CWD management zones. The northern 10 miles of Benton County 29% of hunter-harvested bucks 2-years-old and older tested positive and 23% of all hunter-harvested deer 1- year-old or older tested positive for CWD.

Table 1a.			
County	Month / Year of Initial Detection	Sample Type of Initial Positive Detection	Total Positives per County
Issaquena	February 2018	Clinical	2
Pontotoc	October 2018	Clinical	1
Marshall	December 2018	Road-kill	63
Benton	December 2018	Hunter-harvest	127
Panola	February 2019	Clinical	1
Tallahatchie	February 2019	Hunter-harvest	1
Alcorn	December 2020	Hunter-harvest	4
Tippah	December 2020	Hunter-harvest	3
Warren	December 2021	Clinical	4
Tunica	January 2023	Hunter-harvest	1

2020-21

For the 2020-2021 season, tags were available to hunters with property within three miles of any known positive. These DMAP CWD management tags were either sex tags that allowed the hunter to use a weapon of choice beginning October 1st and extending the full duration of deer season. All deer harvested with these tags must be tested for CWD. The reduced bag limits in the Issaquena CWD Zone continued for the 2020-2021 season. In an effort to increase surveillance, mandatory CWD sampling was implemented for 3 weekends in 3 regions of the state. These weekends represented the CWD-MZ's (Chronic Wasting Disease-Management Zone) and two regions of the state with historically low CWD sampling.

2021-22

Claiborne County was added to the CWD Zone after a CWD positive deer was detected in Louisiana 0.2 miles from Claiborne County and less than 5.8 miles from the portion of Claiborne County that lies east of the Mississippi River. (See Figure e, Pg. 30) In November 2022, the Commission voted to amend the CWD response plan to only include counties in a CWD zone if the positive detection is on the same side of the Mississippi River. The portion of Claiborne County east of the Mississippi River was removed from the zone. During the remainder of the 2021-2022 and 2022-2023 deer seasons, 9 additional positives were detected in Tensas Parish Louisiana, the closest being 1.6 miles from the east side of the river. In August 2021, the CWD Management Plan was revised to include all counties within 10 miles of a confirmed positive (decrease from 25 miles); Eight counties were removed from the North MS CWD Management Zone. (See figure c, Pg. 29)

In June 2022 MDWFP Commission voted to change CWD Management Plan; removing counties after 3 years if no new CWD positive is detected inside or within 10 miles of a county regardless of number of samples; this removed Leflore, Pontotoc, Sharkey, and Tallahatchie counties (4 removed, 4 added). (See Figure d, Pg. 29)

2022-23

In November 2022, MDWFP Commission ruled that the MS River serves as a barrier to CWD spread and removed Claiborne County from the South Delta CWD Zone. (See Figure f, Pg. 30)

CWD was detected in Tunica County at the end of the 2022-2023 deer season. The positive was also within 10 miles of Coahoma and Quitman counties. During the time the commission adjusted the criteria in the CWD management plan by which CWD zone boundaries are defined. The change allowed CWD zones to be delineated using roads and highways at or close to 10 miles from the positive in addition to county lines. The resulting addition to the CWD Zone included areas 9 miles east, 15 miles south, 6 miles west, and 10 miles north of the CWD positive. (See Figure g, Pg. 30)

Figure a.
25 mile CWD management zone around initial detection in February 2018.

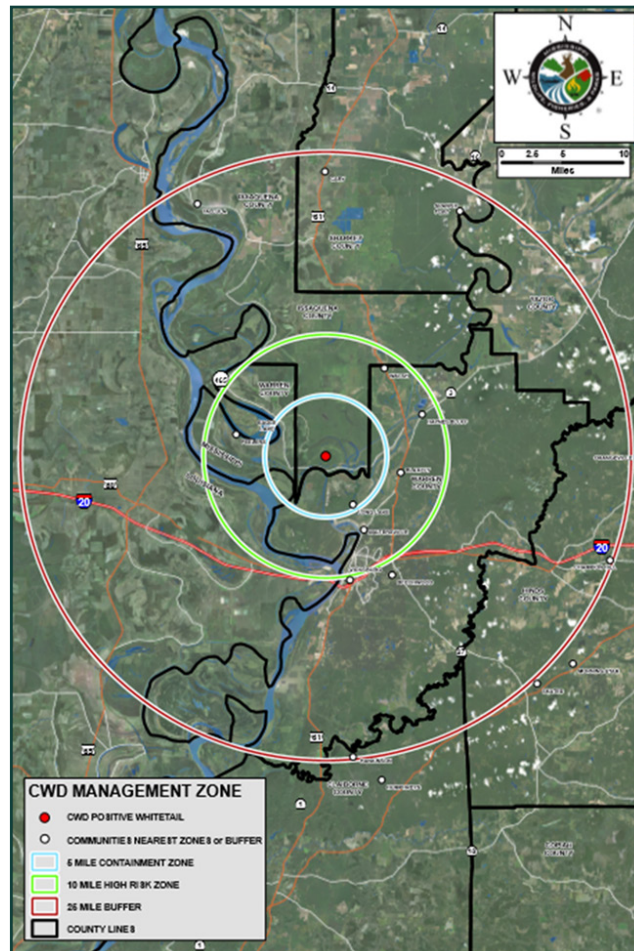
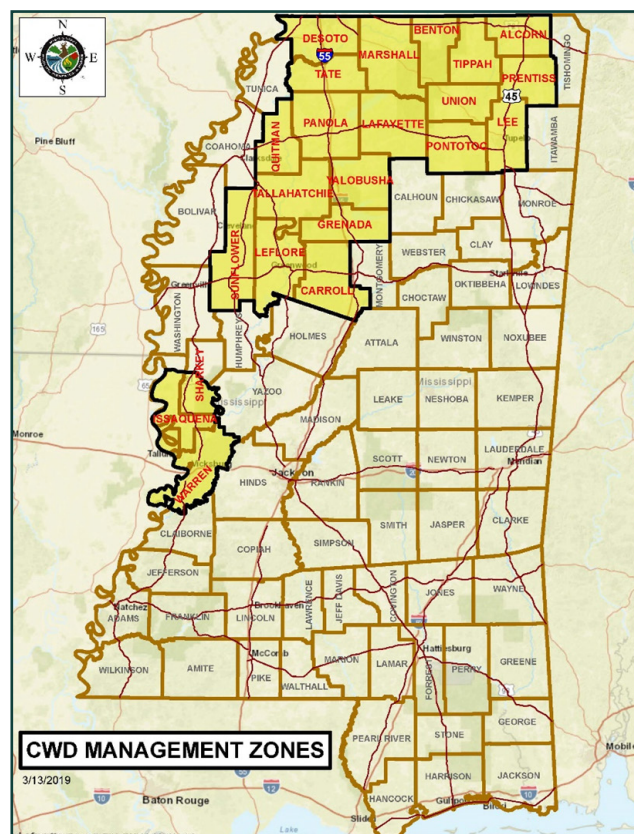


Figure b.
CWD management zones as of 2019-2020 season.



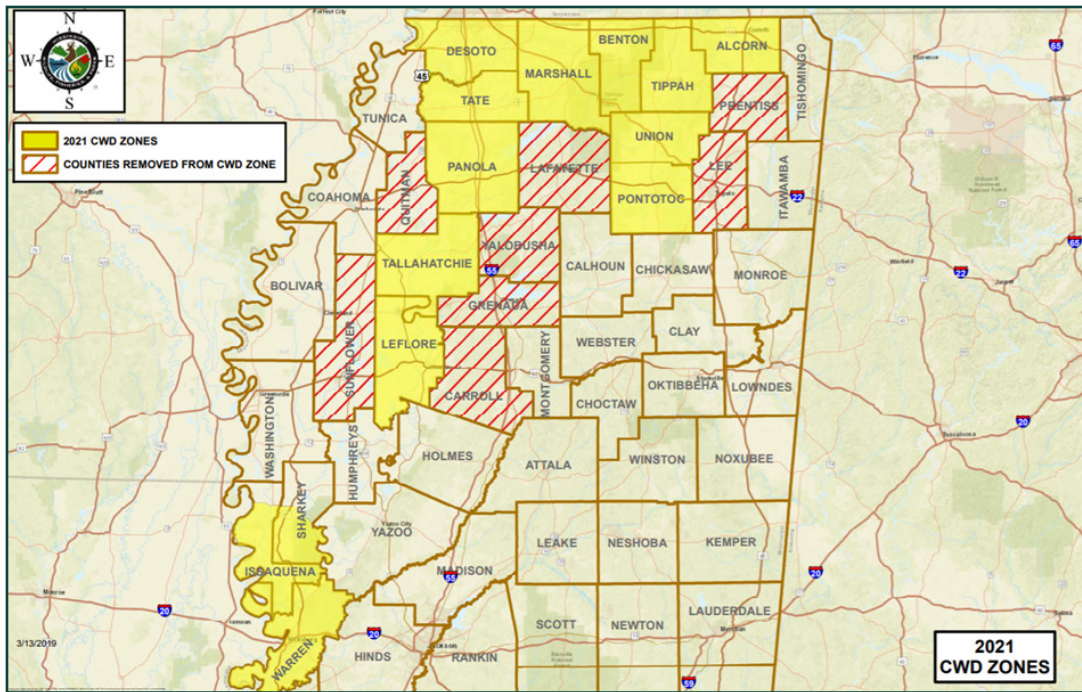


Figure c. CWD management zone reduction prior to 2021-2022 season.

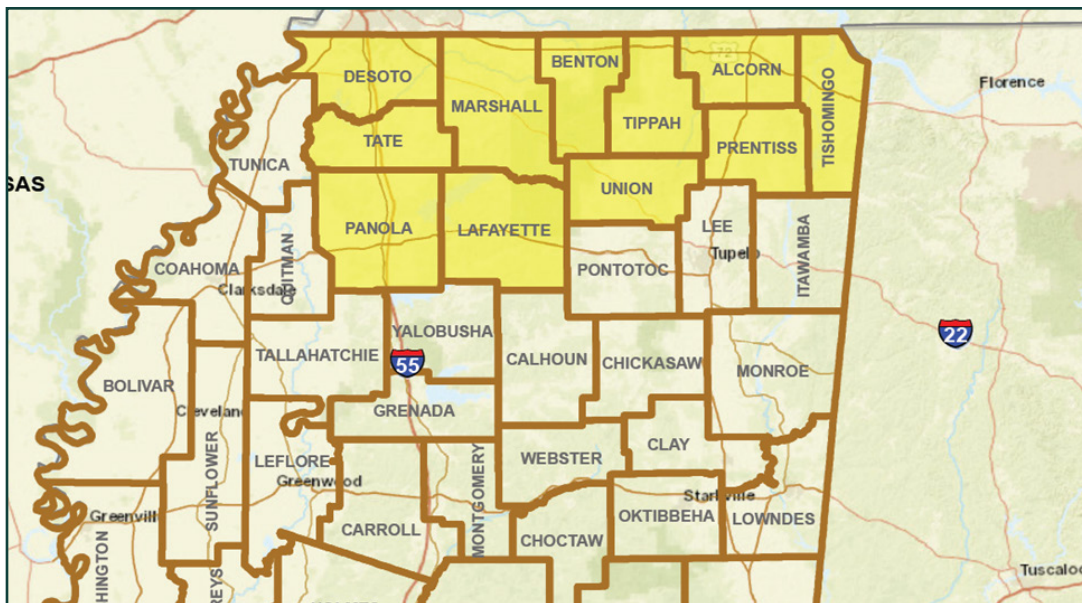


Figure d. North CWD management zone for 2022-2023 season.

Figure e.

South CWD management zone at beginning of 2022-2023 season.

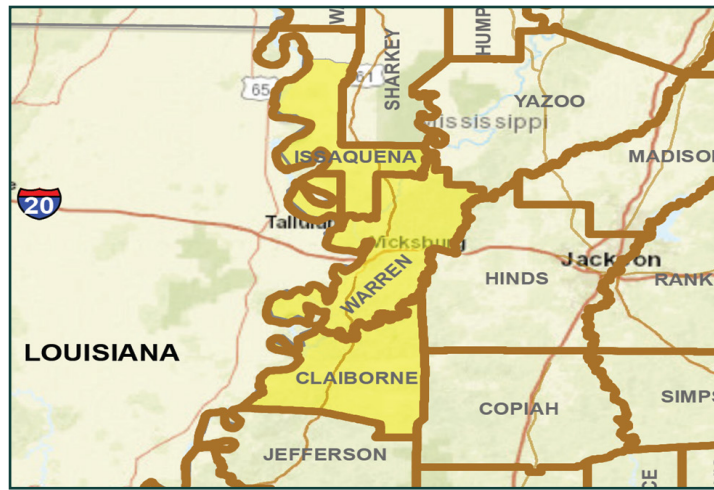


Figure f.

CWD management zones as of November 2022.

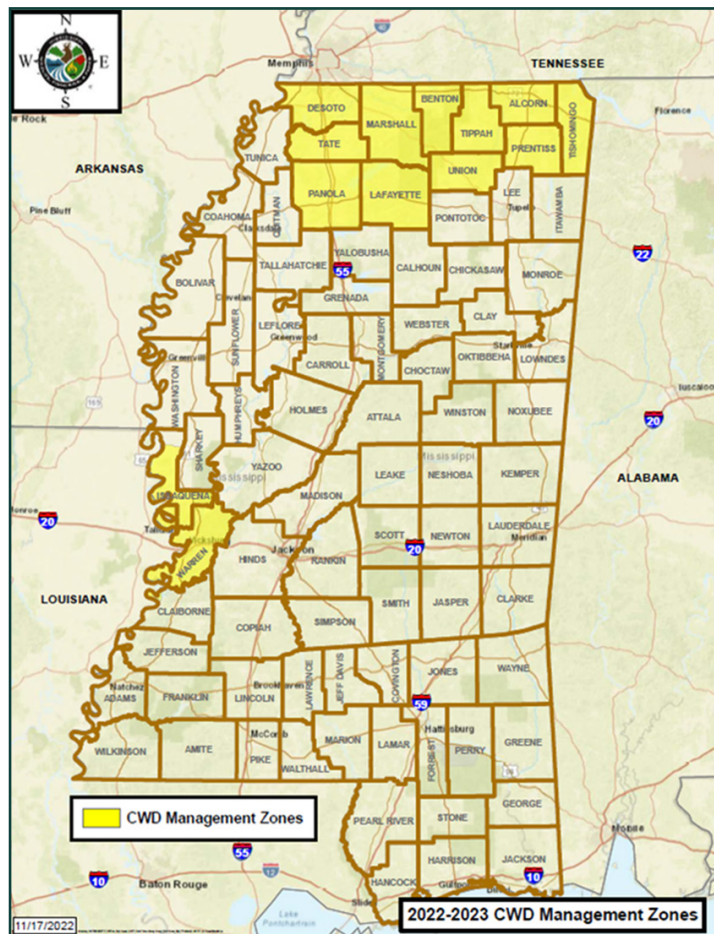
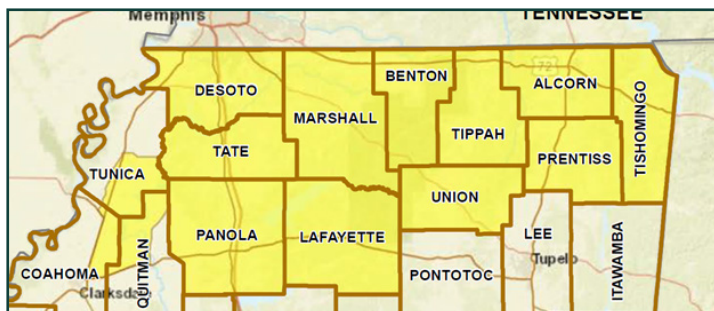


Figure g.

North CWD zone as of July 2023.





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