



2023 NEBRASKA MOSQUITO-BORNE DISEASE REPORT

NEBRASKA DEPARTMENT OF HEALTH
AND HUMAN SERVICES (NDHHS)

VECTOR-BORNE DISEASE PROGRAM

MMWR WEEK 45

(Week Ending 11/11/2023)

****All Data is Provisional****

Report Highlights



- Mosquito-Borne Disease Cases
 - 148 West Nile virus (WNV) human cases have been reported
 - 42 WNV human blood donors have been reported
 - 9 WNV associated deaths have been reported
 - 13 WNV equine case have been reported
 - 3 WNV bird cases have been reported
- Mosquito Surveillance
 - Mosquito surveillance has now ended for the 2023 season.
 - 38,042 *Culex* mosquitoes (in 1568 pools) have been tested.
 - 224 WNV positive (14.3%) mosquito pools have been detected.
 - 1 St. Louis Encephalitis (SLE) virus positive (0.06%) mosquito pools has been detected.
 - 6 of 6 vector surveillance regions have reported at least 1 WNV positive pool this season.
 - Average statewide WNV risk* is **LOW**.
 - 0 regions are categorized as **VERY HIGH** WNV risk
 - 0 regions are categorized as **HIGH** WNV risk.
 - 0 regions (Southeast) are categorized as **MODERATE** WNV risk
 - 6 regions (North, Metro, Panhandle, South Central, Southeast, and West Central) are categorized as **LOW** WNV risk.
 - Remember LOW risk **does not equal** NO risk.

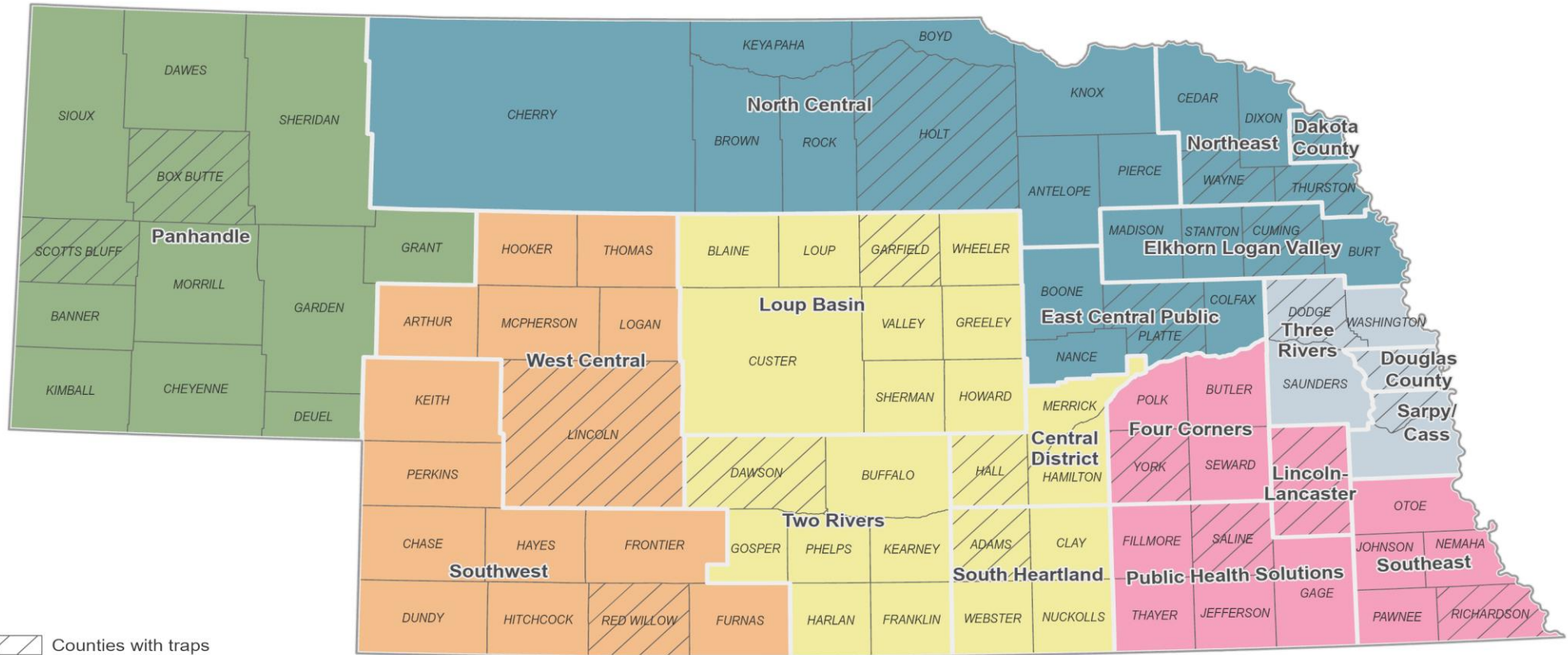
Credit: CDC NCEZID-DVBD

*WNV risk assessment is calculated using the previous 2 weeks average temperature data, *Culex* mosquito abundance data, and WNV mosquito infection rates

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2023 Mosquito Surveillance Trapping Regions



-  Counties with traps
-  Counties without traps
-  Local Health Department Boundary
-  Central Vector Surveillance Region
-  Metro Vector Surveillance Region
-  North Vector Surveillance Region
-  Panhandle Vector Surveillance Region
-  Southeast Vector Surveillance Region
-  West Central Vector Surveillance Region





NEBRASKA HUMAN MOSQUITO-BORNE DISEASE SURVEILLANCE

Credit: CDC, NCEZID-DVBD

Human Mosquito-Borne Disease Surveillance

Nebraska Mosquito-Borne Disease Cases, 2023 & 2022

Condition	2023	2022
Chikungunya*	0	0
Dengue*	2	4
Malaria*	11	12
West Nile Clinical Cases	148	64
West Nile Blood Donors	42	24
Zika*	0	0
Total	203	104

- 2023 statewide number of mosquito-borne disease cases reported to the Nebraska Department of Health and Human Services (NDHHS) through MMWR week #45 (week ending 11/12/2023).
 - All data is preliminary and subject to change as more information is gathered.
 - Reported cases only include confirmed and probable cases meeting CSTE/CDC case definition and approved by NDHHS.

*Reported cases have all been acquired during overseas travel to endemic areas.

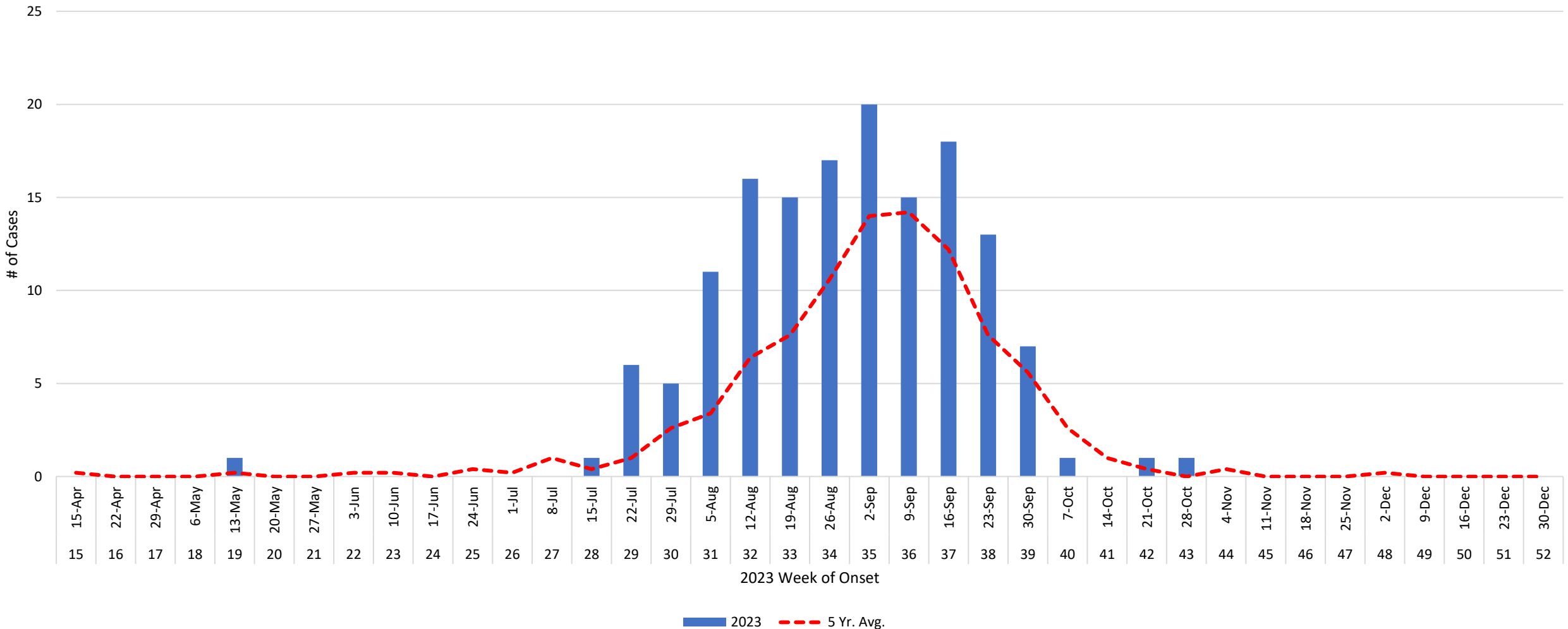
Human West Nile Virus Disease Clinical Information

Nebraska West Nile Virus Disease Case Clinical Information, 2023

Age Range	#
0-13	2
14-25	7
26-50	36
51-64	45
65+	58
Sex	#
Male	92
Female	56
Diagnosis	#
WNV Neuroinvasive	90
WNV Non-Neuroinvasive	58
Hospitalized	76
Death	9

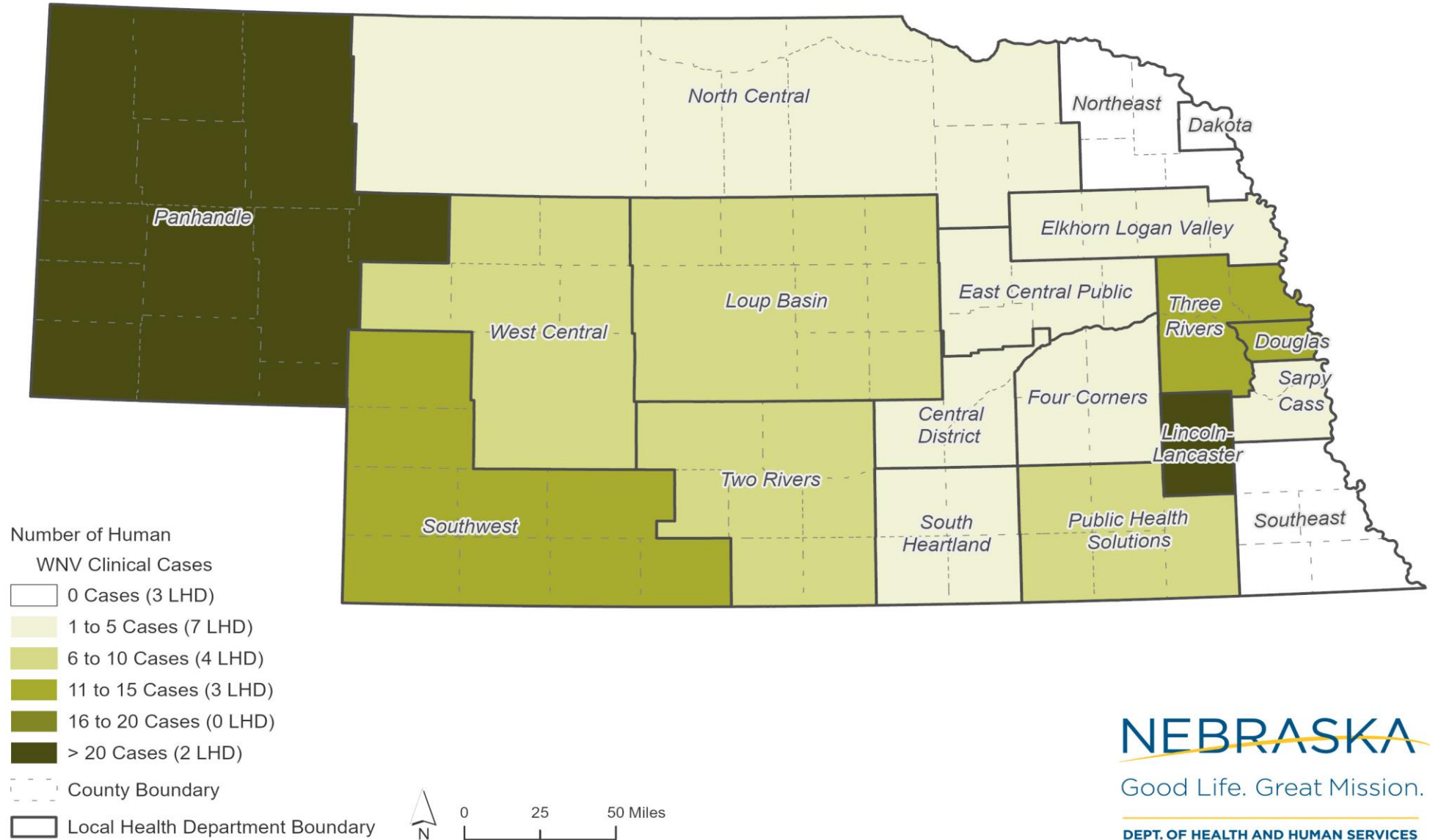
2023 Human West Nile Virus Disease Cases Week of Onset

Human Clinical Cases (n = 148) by Week of Onset in Nebraska, 2023



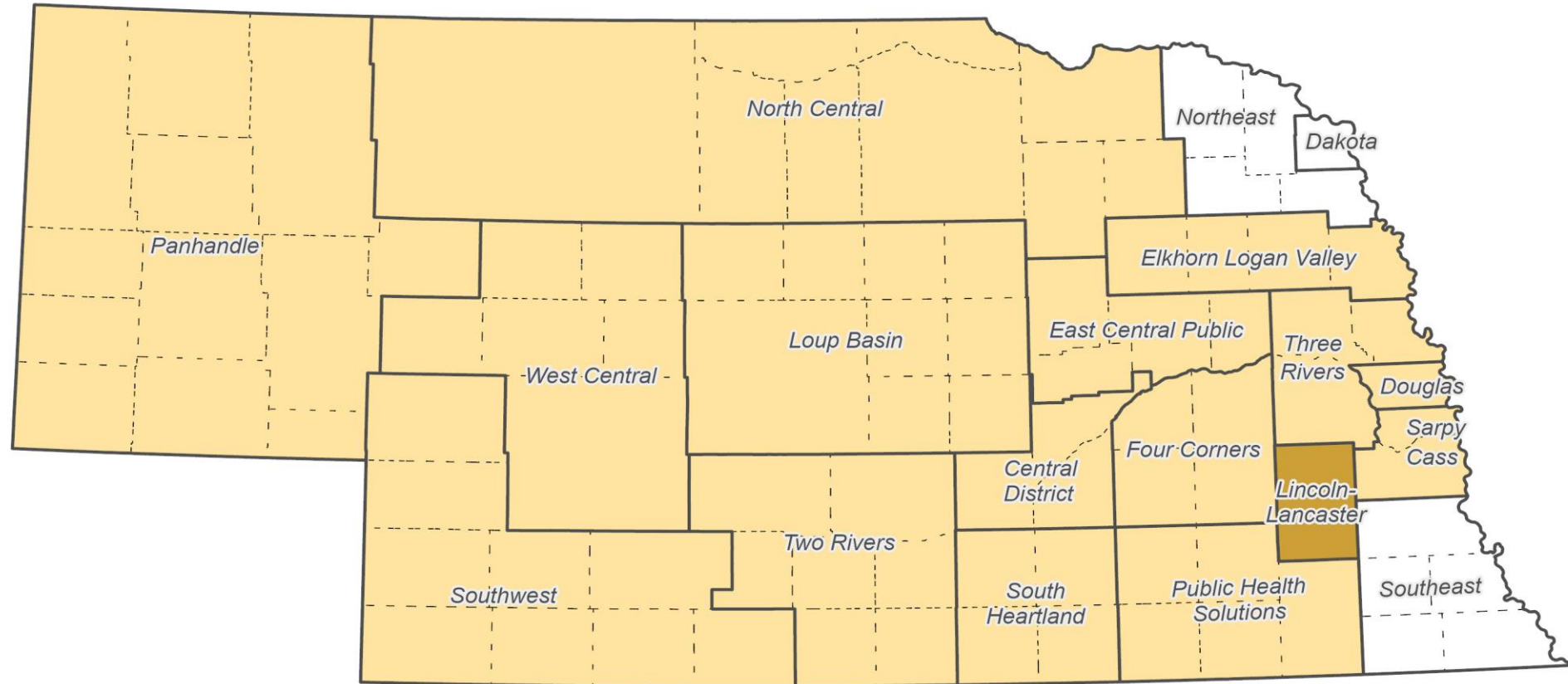
2023 West Nile Virus Human Clinical Cases (n=148)

by Local Health Department, Updated 15 November 2023



2023 West Nile Virus Blood Donation Cases (n=42)

by Local Health Department, Updated 15 November 2023



Number of Human WNV Blood Donor Cases

- 0 Cases (3 LHD)
- ≤ 5 Cases (15 LHD)
- 6 to 10 Cases (0 LHD)
- >10 Cases (1 LHD)

- County Boundary
- Local Health Department Boundary





NEBRASKA MOSQUITO SURVEILLANCE AND PATHOGEN TESTING PROGRAM

Credit: Credit: CDC, NCEZID-DVBD

Mosquito Surveillance and Testing



- NDHHS uses mosquito surveillance and pathogen testing of mosquitoes to help determine WNV risk in the state.
 - Mosquitoes are collected from across the state through partnerships with the local public health departments.
 - Collected mosquito samples are sent to the NDHHS Medical Entomology Lab located at the Environmental Public Health Laboratory in Lincoln.
 - At the lab, mosquito samples are identified, counted, and *Culex* species mosquitoes (primary WNV vectors) are pooled for pathogen testing.
 - Pooled *Culex* mosquito samples are tested by the Nebraska Public Health Laboratory (NPHL) for 3 viruses
 - West Nile Virus (WNV)
 - St. Louis Encephalitis Virus (SLE)
 - Western Equine Encephalitis Virus (WEE)

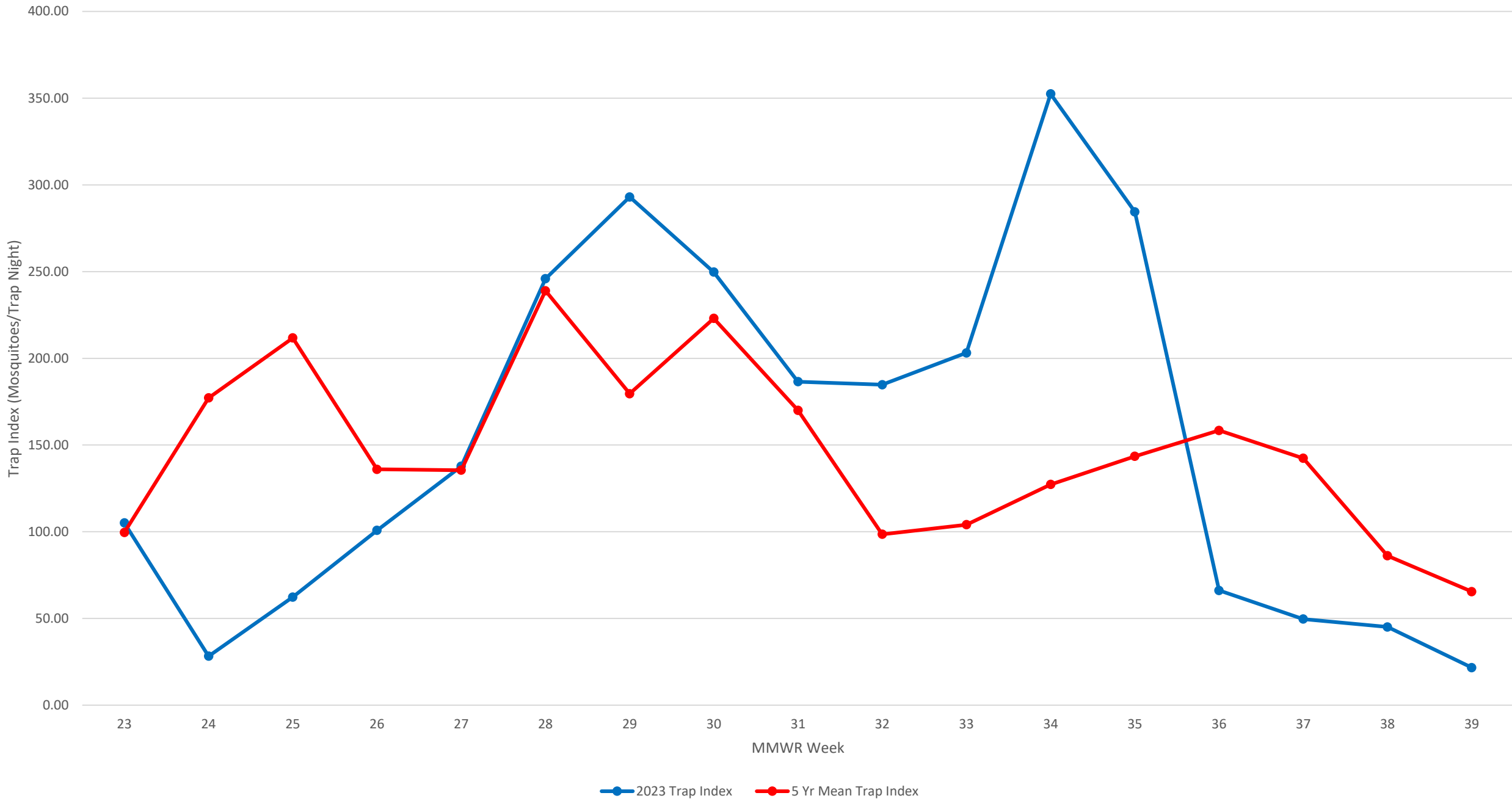


2023 Mosquito Surveillance and Testing Summary

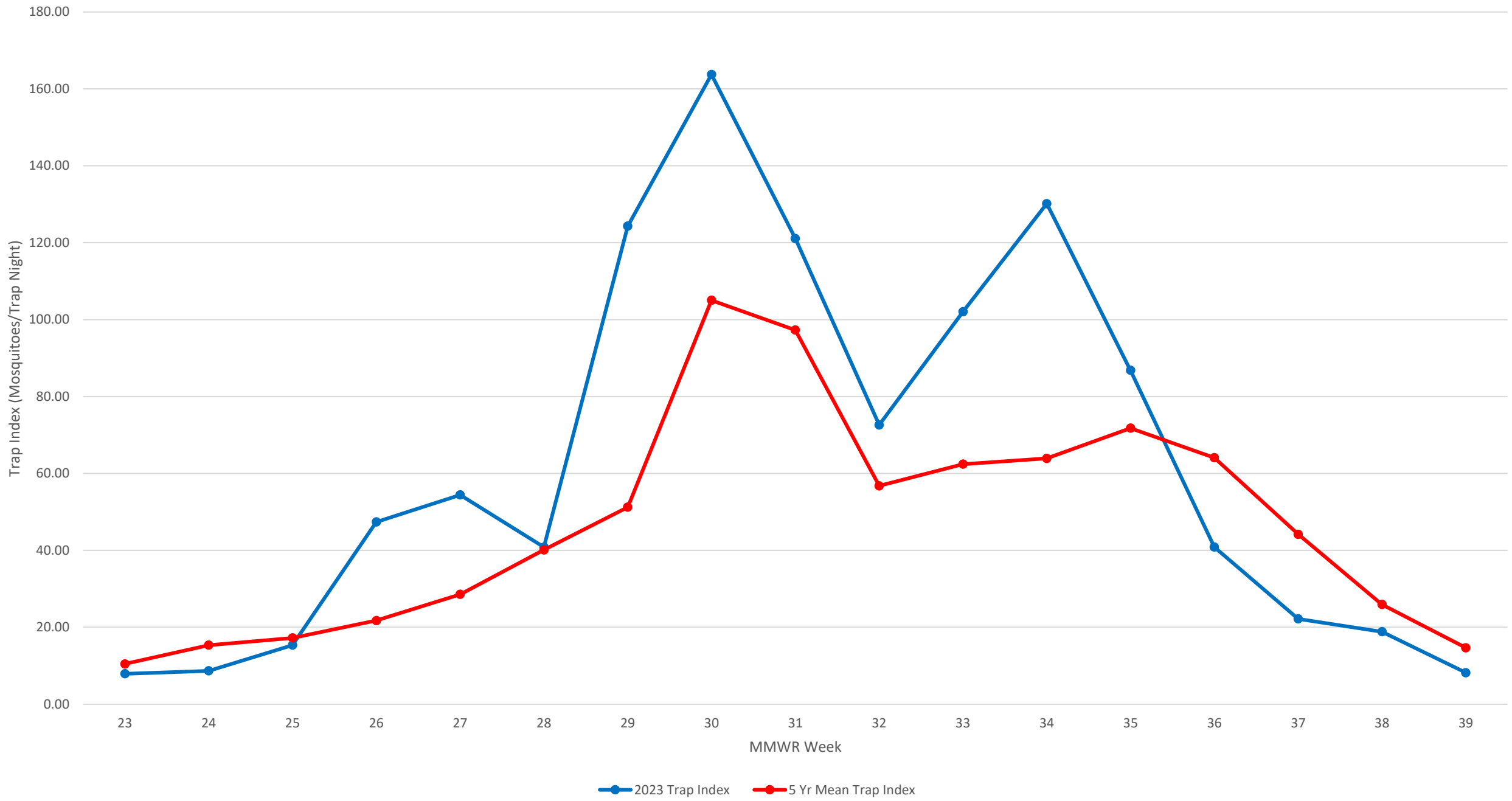


- Mosquito Surveillance
 - 90,287 total mosquitoes collected this season.
 - This is 2.8x more mosquitoes collected than in all of 2022
 - 42.4% (n = 38,284) of the collections have been *Culex* vector mosquitoes.
 - Current Statewide Total Mosquito Trap Index (mosquitoes collected per trap night).
 - Mosquito surveillance has finished for the 2023 season.
 - Current Statewide *Culex* Trap Index.
 - Mosquito surveillance has finished for the 2023 season.
- Mosquito Testing
 - 38,042 *Culex* tested (in 1568 pools) on the season.
 - 224 positive (14.3%) WNV positive pools detected.
 - 1 positive (0.06%) SLE positive pool detected.
 - 6 of 6 vector surveillance regions have detected ≥ 1 positive pool.
 - Current Statewide WNV Mosquito Infection Rate (MIR) Index
 - Mosquito surveillance has finished for the 2023 season.

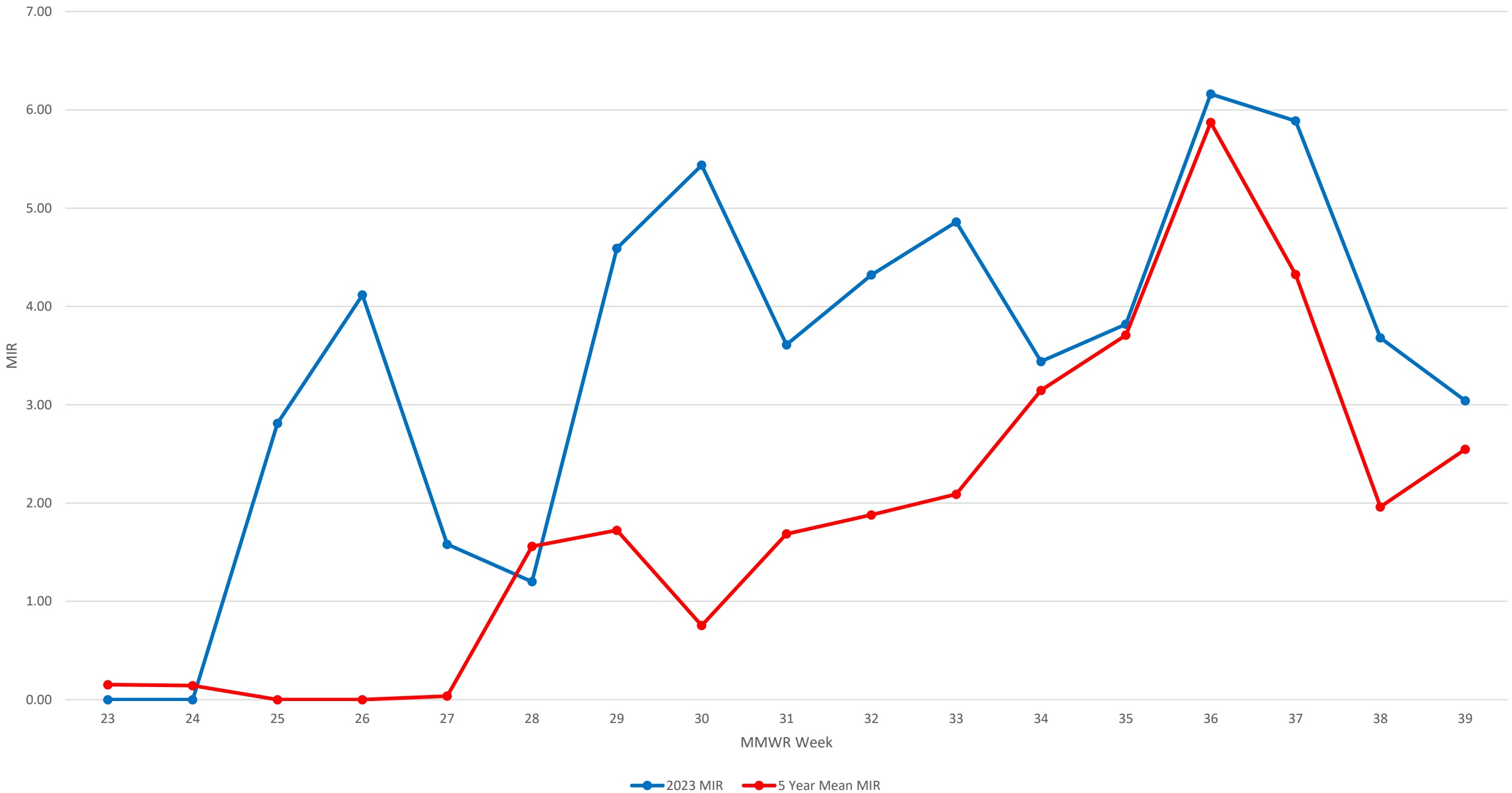
Total Mosquito Trap Index Nebraska Statewide, 2023



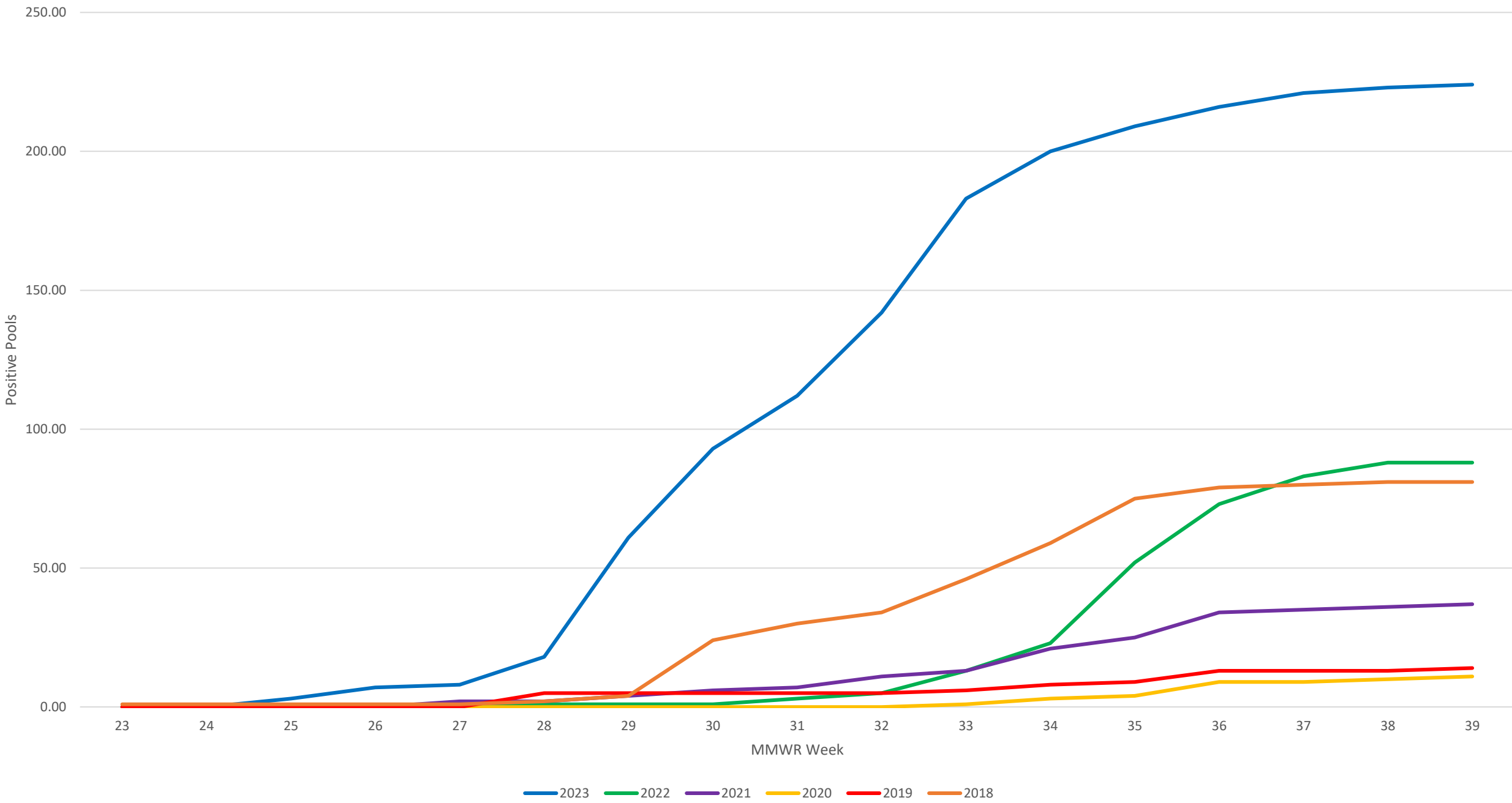
Culex Mosquito Trap Index Nebraska Statewide, 2023



WNV Minimum Infection Rate Nebraska Statewide, 2023

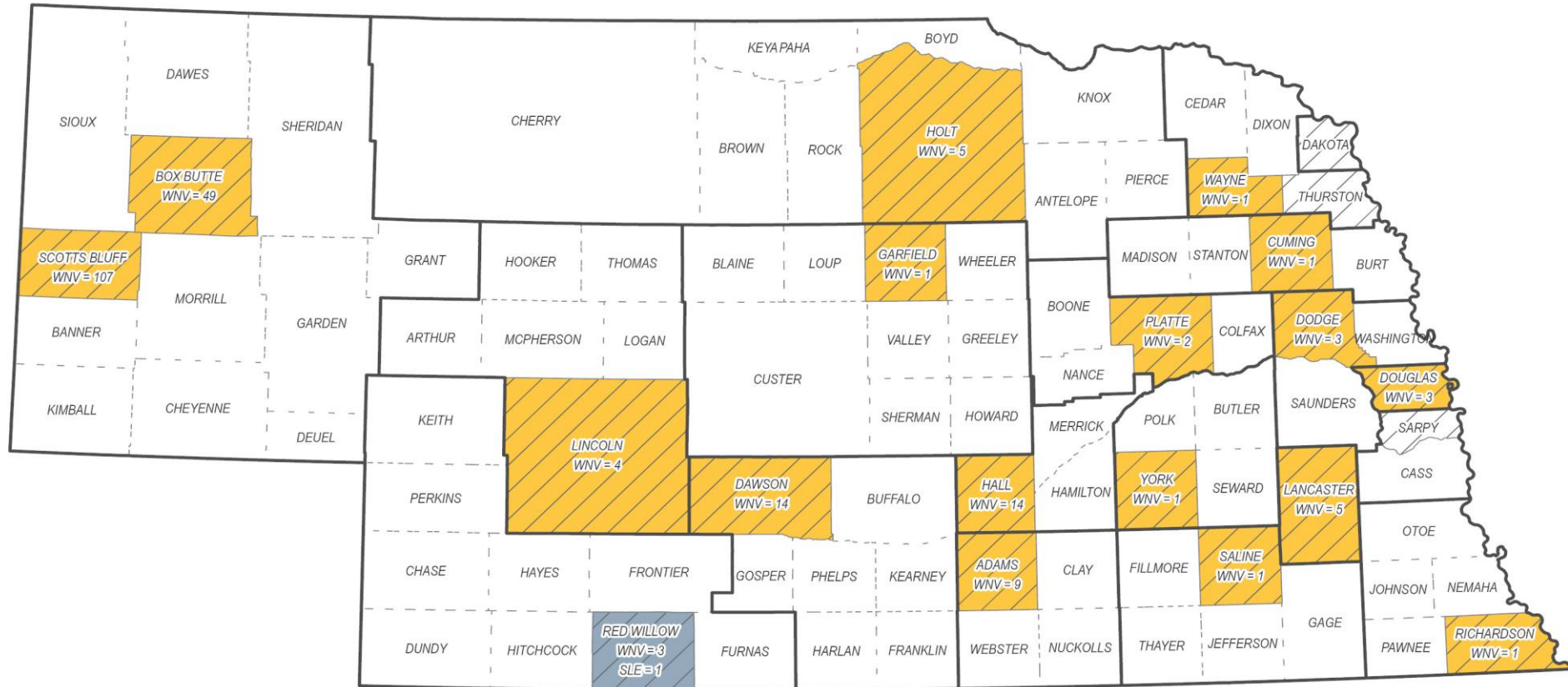


WNV Cumulative Positive Pools Nebraska Statewide, 2018-2023



2023 CDC Light Trap Mosquito Surveillance

Final Map Update, 4 October 2023



Total Pools Tested: 1568

- Positive WNV Pool
- Positive WNV and SLE Pool
- Counties with Traps
- Counties without Traps
- Local Health Department Boundary

West Nile Virus (WNV)
Positive Pools: 224
Counties with Positive Pools: 18

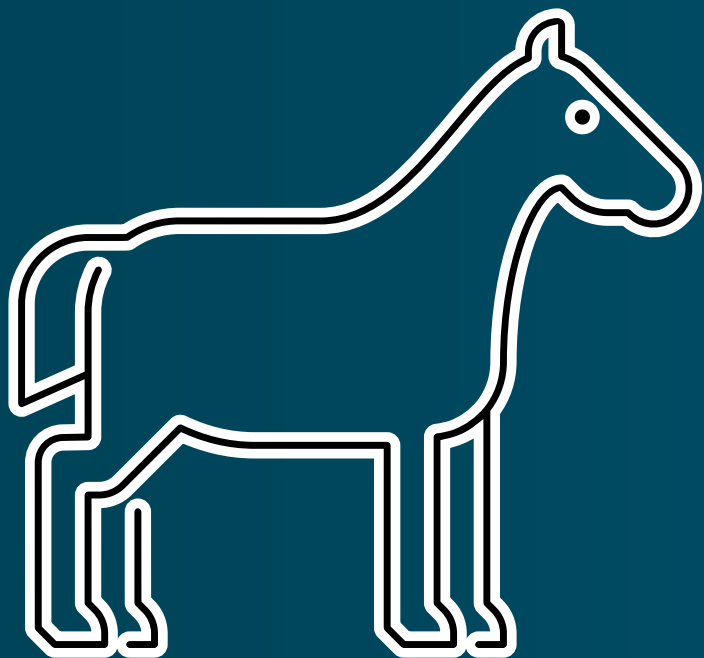
St. Louis Encephalitis (SLE)
Positive Pools: 1
Counties with Positive Pools: 1

There are 21 counties with mosquito surveillance traps in 2023.



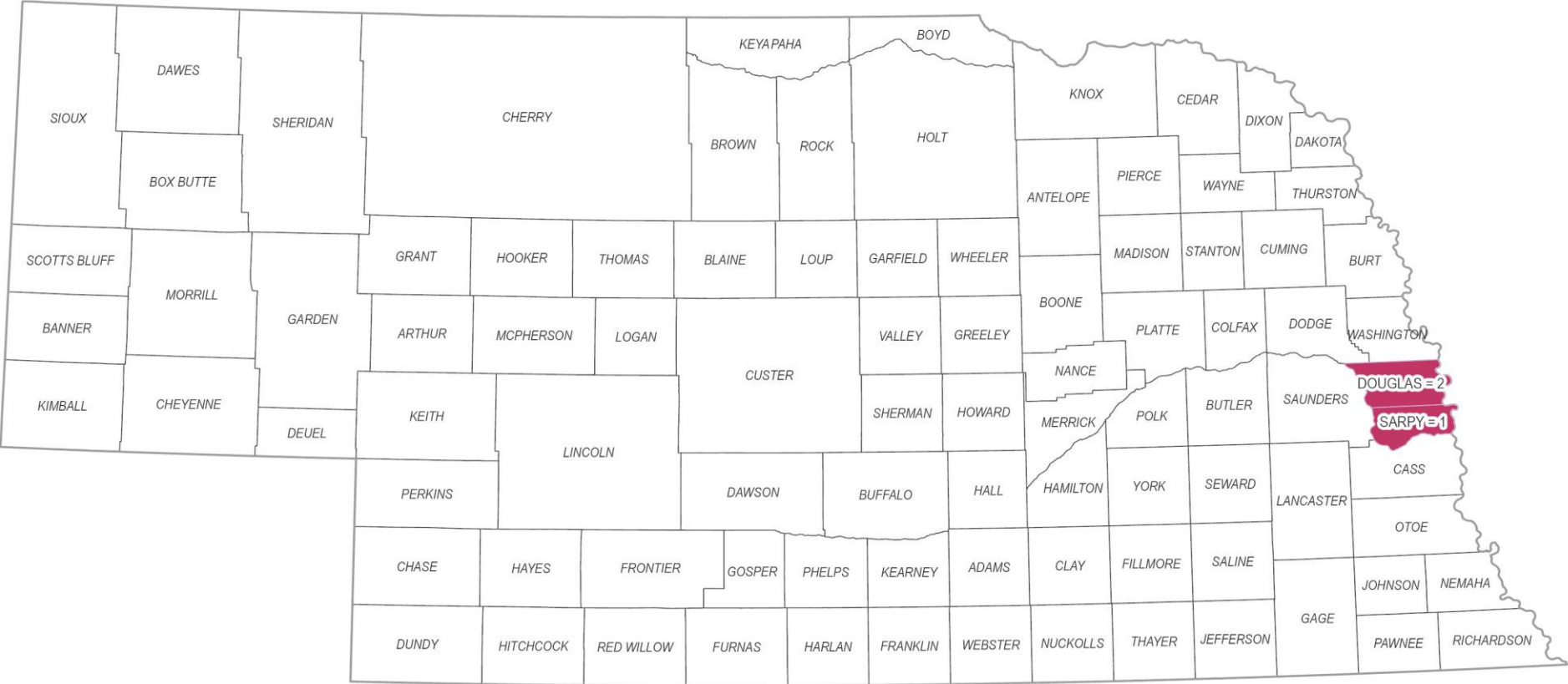


**BIRD AND EQUINE
WNV POSITIVE
REPORTS**



2023 Bird West Nile Virus Surveillance (n=3)

Updated 15 November 2023



Positive Bird WNV Case
County Boundary

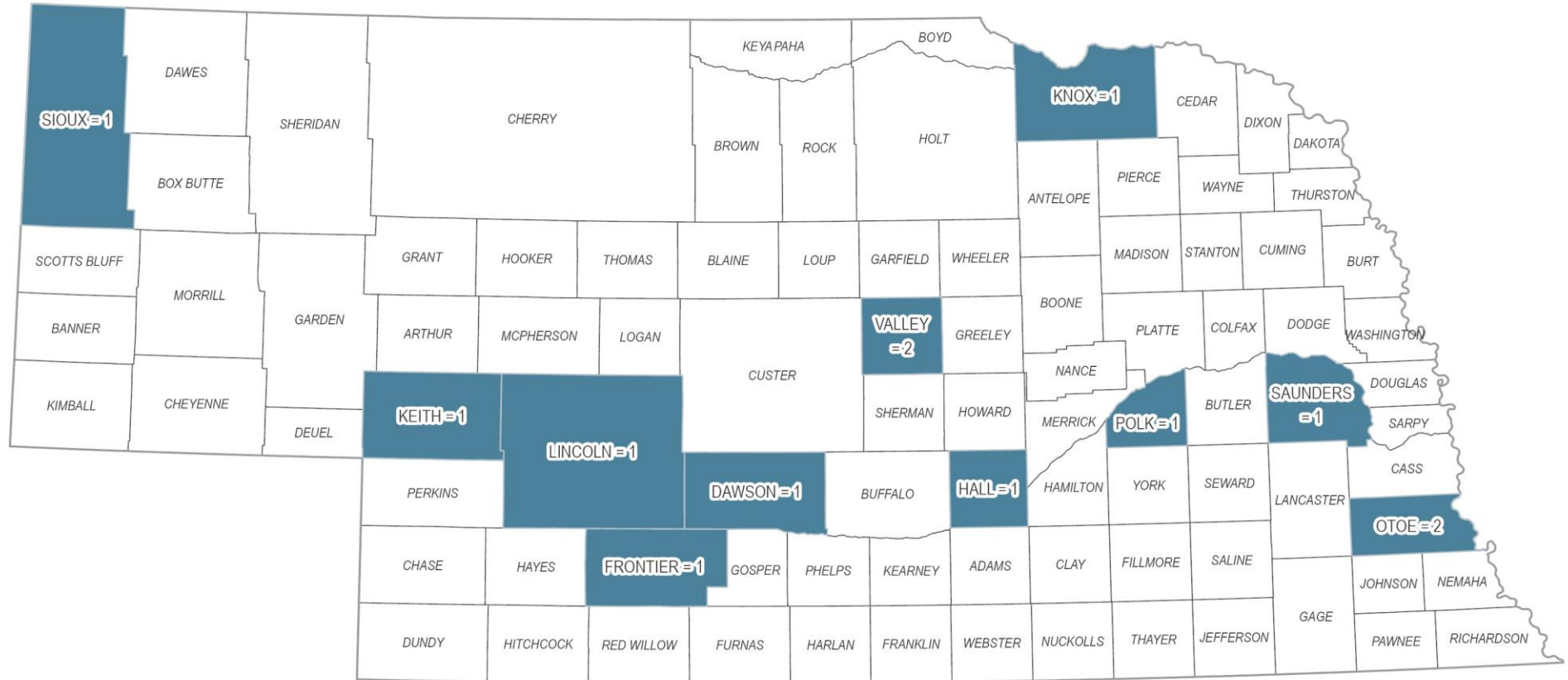


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DIVISION OF PUBLIC HEALTH

2023 Equine West Nile Virus Surveillance (n=13)

Updated 15 November 2023



Positive Equine WNV Case
County Boundary



2023 EPI WEEK CALENDAR

Months shown in **RED** are potential “Vector” months

JANUARY

EPI Week #	Sun	Mon	Tue	Wed	Thu	Fri	Sat
1	1	2	3	4	5	6	7
2	8	9	10	11	12	13	14
3	15	16	17	18	19	20	21
4	22	23	24	25	26	27	28
5	29	30	31				

FEBRUARY

EPI Week #	Sun	Mon	Tue	Wed	Thu	Fri	Sat
5				1	2	3	4
6	5	6	7	8	9	10	11
7	12	13	14	15	16	17	18
8	19	20	21	22	23	24	25
9	26	27	28				

MARCH

EPI Week #	Sun	Mon	Tue	Wed	Thu	Fri	Sat
9				1	2	3	4
10	5	6	7	8	9	10	11
11	12	13	14	15	16	17	18
12	19	20	21	22	23	24	25
13	26	27	28	29	30	31	

APRIL

EPI Week #	Sun	Mon	Tue	Wed	Thu	Fri	Sat
13							1
14	2	3	4	5	6	7	8
15	9	10	11	12	13	14	15
16	16	17	18	19	20	21	22
17	23	24	25	26	27	28	29
18	30						

MAY

EPI Week #	Sun	Mon	Tue	Wed	Thu	Fri	Sat
18		1	2	3	4	5	6
19	7	8	9	10	11	12	13
20	14	15	16	17	18	19	20
21	21	22	23	24	25	26	27
22	28	29	30	31			

JUNE

EPI Week #	Sun	Mon	Tue	Wed	Thu	Fri	Sat
22					1	2	3
23	4	5	6	7	8	9	10
24	11	12	13	14	15	16	17
25	18	19	20	21	22	23	24
26	25	26	27	28	29	30	

JULY

EPI Week #	Sun	Mon	Tue	Wed	Thu	Fri	Sat
26							1
27	2	3	4	5	6	7	8
28	9	10	11	12	13	14	15
29	16	17	18	19	20	21	22
30	23	24	25	26	27	28	29
31	30	31					

AUGUST

EPI Week #	Sun	Mon	Tue	Wed	Thu	Fri	Sat
31			1	2	3	4	5
32	6	7	8	9	10	11	12
33	13	14	15	16	17	18	19
34	20	21	22	23	24	25	26
35	27	28	29	30	31		

SEPTEMBER

EPI Week #	Sun	Mon	Tue	Wed	Thu	Fri	Sat
35						1	2
36	3	4	5	6	7	8	9
37	10	11	12	13	14	15	16
38	17	18	19	20	21	22	23
39	24	25	26	27	28	29	30

OCTOBER

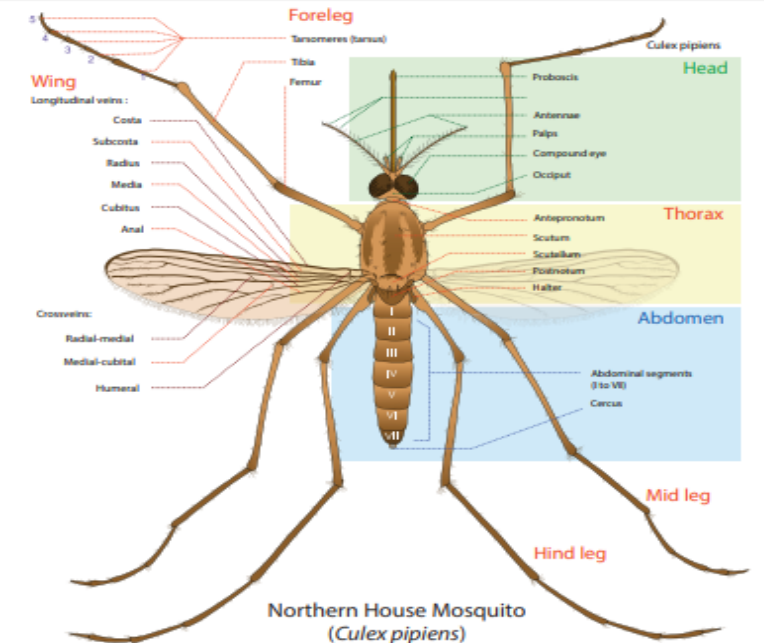
EPI Week #	Sun	Mon	Tue	Wed	Thu	Fri	Sat
40	1	2	3	4	5	6	7
41	8	9	10	11	12	13	14
42	15	16	17	18	19	20	21
43	22	23	24	25	26	27	28
44	29	30	31				

NOVEMBER

EPI Week #	Sun	Mon	Tue	Wed	Thu	Fri	Sat
44				1	2	3	4
45	5	6	7	8	9	10	11
46	12	13	14	15	16	17	18
47	19	20	21	22	23	24	25
48	26	27	28	29	30		

DECEMBER

EPI Week #	Sun	Mon	Tue	Wed	Thu	Fri	Sat
48						1	2
49	3	4	5	6	7	8	9
50	10	11	12	13	14	15	16
51	17	18	19	20	21	22	23
52	24	25	26	27	28	29	30
1	31						



Credit: Central Massachusetts Mosquito Control Project: <https://www.cmmcp.org/>

Resources

- CDC Prevent Mosquito Bites Page:
<https://www.cdc.gov/ncezid/dvbd/media/stopmosquitoes.html>
- CDC West Nile Virus Page:
<https://www.cdc.gov/westnile/index.html>
- Nebraska Department of Agriculture WNV Page:
<https://nda.nebraska.gov/animal/diseases/westnile/index.html>
- U.S. EPA Insect Repellent Page:
<https://www.epa.gov/insect-repellents>
- Nebraska Mosquito and Vector Control Association:
<https://www.nemosquito.org/>
- Nebraska Department of Health and Human Services Vector-Borne Disease Page:
<https://dhhs.ne.gov/Pages/Vector-borne-Disease.aspx>

