

NEBRASKA ARBOVIRUS SURVEILLANCE AND MOSQUITO MONITORING PROGRAM 2018 UPDATE #7

Date: 07/27/2018. Please note that mosquito collection data covers dates 07/08/2018 to 07/21/2018 (CDC Weeks 28 and 29). Bird, human, and equine surveillance may include data from beyond these dates. All data is provisional and may change.

SUMMARY

- **Climate:** Over the past 30 days (dates 06/22/2018 to 07/21/2018), precipitation has been above normal over most of the state with some areas seeing >200% of normal precipitation. Areas in southeast Nebraska and parts of the southwest and western portions of the state saw below normal moisture amounts. Cumulative rainfall during this timeframe ranged from 1.0 to ≥8.0 inches across the state. The heavier amounts were located primarily in north central and northeastern Nebraska. Average temperatures for the last 30 days (date ending 07/21/2018) were near normal over most of the state. Per the United States Drought Monitor, abnormally dry conditions began to move back in to portions of southeastern Nebraska. Additionally, a small area in far southeastern Nebraska remains with moderate drought conditions.
- **Three Month Forecast:** For August 2018 to October 2018, the NOAA outlook is predicting an elevated probability of above normal temperatures across Nebraska and equal chances of above or below normal precipitation over most of the state.
- **Mosquito Numbers- Eastern Nebraska:** Individual county collections for the reported two weeks of sampling ranged from “moderate” to “extremely high” based on historical county data. Overall in the east region, mosquito numbers decreased but are still “high” based on historical data from regional traps. *Aedes vexans* (Inland floodwater mosquito) was again the most abundantly collected mosquito from CDC light traps (42.2%) in the region. *Culex* mosquito (primary vectors of West Nile virus) counts again increased by 2-fold and are now “high” based upon historical regional data with individual county collections ranging from “low” to “extremely high”. *Culex tarsalis* was the second most collected species (and most collected *Culex* species, 88.4%) during this two week sampling period accounting for 33.1% of total collections. Twenty-three invasive *Aedes albopictus* (Asian tiger mosquito) were collected from the region. All specimens were collected from Richardson County at trap sites that have produced *Aedes albopictus* historically.
- **Mosquito Numbers- Central Nebraska:** Individual county collections for the reported two weeks of collecting ranged from “low” to “extremely high” based on historical data. Overall mosquito numbers decreased compared to the previous update, however counts are still considered “very high”. *Aedes*

vexans was the most collected mosquito (84.0%) from region traps. *Culex* mosquito counts decreased slightly but are still “moderate” based upon historical regional data, with counts ranging from “low” to “very high” based upon their historical data. *Culex tarsalis* made up the majority of the collected *Culex*, accounting for 92.3% of collections over the sampling period. No invasive *Aedes albopictus* were collected from the region.

- **Mosquito Numbers- Western Nebraska:** Individual county collections for the reported two weeks ranged from “low” to “extremely high” compared to their historical data. Overall mosquito activity from regional traps followed what was seen in the other two regions with decreases in mosquito numbers but were still considered “high”. *Aedes vexans* was the most abundant mosquito collected in CDC light traps (67.9%) during the two week period. *Culex* mosquito counts continued to increase and are still “moderate” based upon historical regional data. Individual *Culex* counts across counties in the west region ranged from “low” to “extremely high” based upon their historical data. *Culex tarsalis* was the second most collected mosquito (and most collected *Culex* species, 92.9%) overall making up 19.1% of collected mosquitoes. No invasive *Aedes albopictus* were collected from the region.
- **Arboviral Detections:** Over the two weeks of mosquito surveillance covered in this report, **four new positive West Nile virus (WNV) *Culex* mosquito pools were detected** from mosquito samples. Positive mosquito pools demonstrate that WNV is circulating in the environment among mosquitoes. To date 823 *Culex* pools have been tested with **six WNV positives detected to date**. The current WNV cumulative statewide minimum mosquito infection rate increased (0.47/1,000 *Culex*) but is still below the 10-year median (0.76/1,000 *Culex*) for this time of year. No positive pools for St. Louis Encephalitis (SLE) or Western Equine Encephalitis (WEE) viruses were detected over the two weeks and zero have been detected for the season.
- **Dead Bird Surveillance:** To date 106 birds have been reported. Of the 106 birds reported, 11 have been a corvid bird (bird group most heavily impacted by WNV and includes: blue jays, crows, and magpies). Four birds reported have met criteria for testing of WNV with three negative and one bird unsuitable for testing.
- **Equine Surveillance:** Currently no equine cases of WNV have been reported for the season.
- **Human Mosquito-borne Disease Cases:** **Two human clinical WNV cases** have currently been reported in a Nebraska residents. The **first asymptomatic human blood donor** has also been reported. Additionally, a total of four travel-related mosquito-borne disease have occurred in state residents: three malaria cases and one dengue case.

Comment: *Two human clinical (symptomatic) WNV cases have been reported in Nebraska residents to date. Additionally, the first asymptomatic human blood donor in a Nebraska resident has been reported. Furthermore, six WNV mosquito pools have been detected from mosquito samples. Individuals should take proper mosquito prevention activities to reduce mosquito bites as we come into the historically, highest risk month of the season (August). Additionally, four travel-related mosquito-borne illness cases, three malaria and one dengue case, have been reported in Nebraska residents returning from overseas travel. Individuals are strongly encouraged to practice proper mosquito prevention anytime mosquitoes are present or likely to be present no matter where they are to decrease their chances of acquiring a mosquito-borne illness.* Statewide, mosquito collections from CDC light traps saw a decrease in mosquito numbers with the statewide average seeing “high” counts when compared to historical data, averaging 297.31 total mosquitoes per trap night. The most abundant mosquito collected over the two week sampling period was Nebraska’s most common mosquito, *Aedes vexans*, accounting for 69.4% of trap collections. *Culex* mosquito counts statewide also continued to increase, and were considered “moderate” based on historical data, averaging 52.49 *Culex* per trap night. *Culex tarsalis* (primary WNV vector in Nebraska), was the second most collected mosquito overall accounting for 16.0% of total trap collections during the two week period.

ENVIRONMENTAL CONDITIONS

Environmental and climate conditions can impact mosquito-borne diseases by influencing mosquito numbers and mosquito infection prevalence. For example, drought has been identified as a primary driver of WNV epidemics. This is why rainfall, temperature, and drought conditions are monitored closely during the mosquito surveillance season.

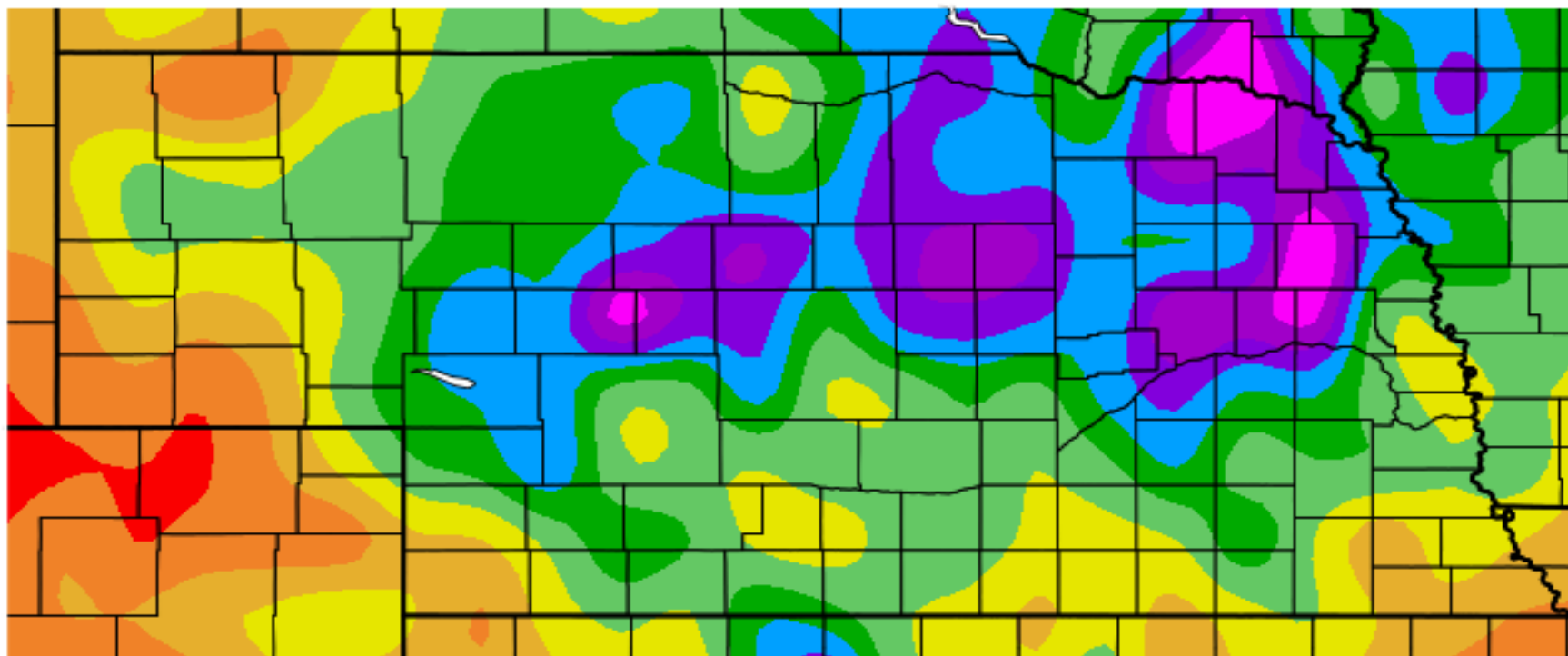
Rainfall and Temperature

Rainfall across Nebraska over the last 30 days (06/22/2018 to 07/21/2018) ranged from 1.0 to ≥ 8.0 inches (pg. 4) across the state. The heavier amounts were located in north central and northeastern Nebraska. For the last 30 days (date ending 07/21/2018), rainfall was well above normal over a large area of Nebraska and below normal in some areas of southwest and western Nebraska (pg.5). Average temperatures (pg. 6) for the last 30 days were near normal over most of the state. The long range outlook (next 8 to 14 days), is predicting an increased probability of below normal temperatures for most of the state, while precipitation is predicted to have an elevated probability of below normal precipitation over most of Nebraska. More climate and forecast information can be found at:

High Plains Regional Climate Center at: <https://hprcc.unl.edu/index.php>

National Weather Service 8 to 14 day outlooks: <http://www.cpc.ncep.noaa.gov/products/predictions/814day/index.php>

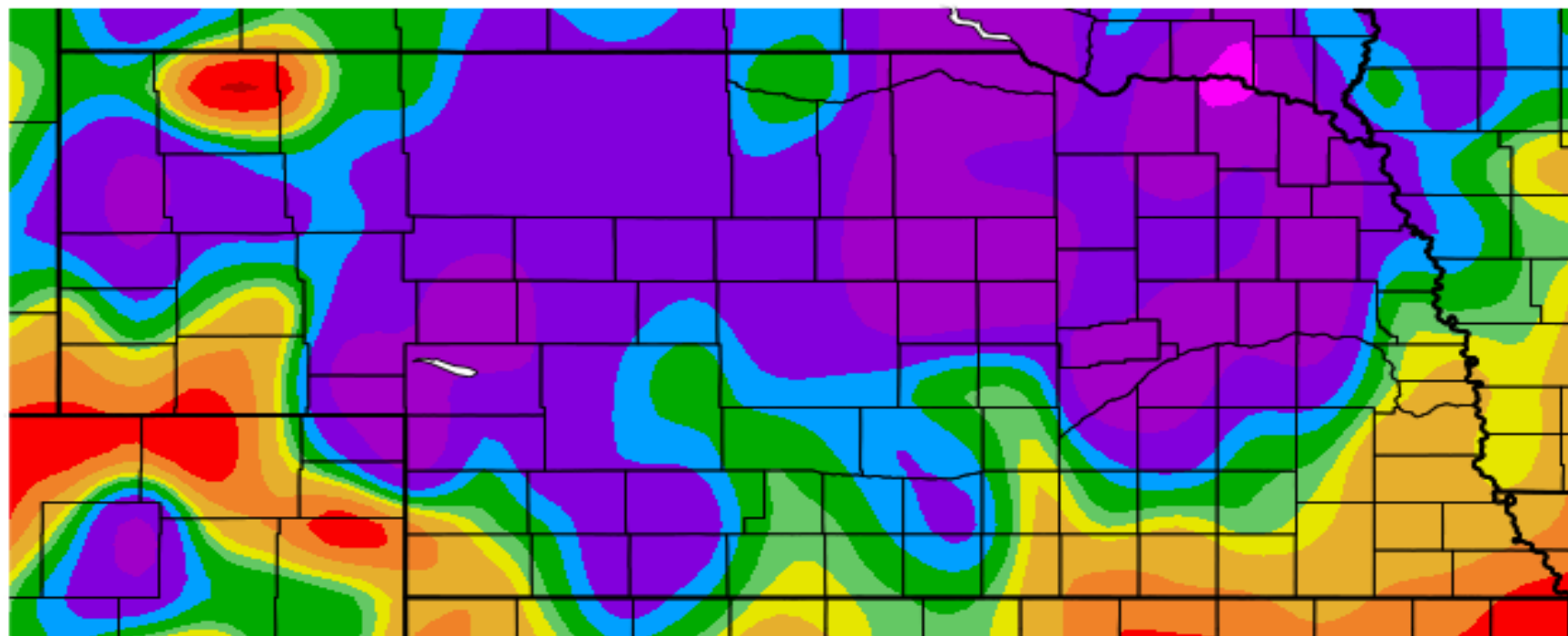
Precipitation (in)
6/22/2018 – 7/21/2018



Generated 7/22/2018 at HPRCC using provisional data.

NOAA Regional Climate Centers

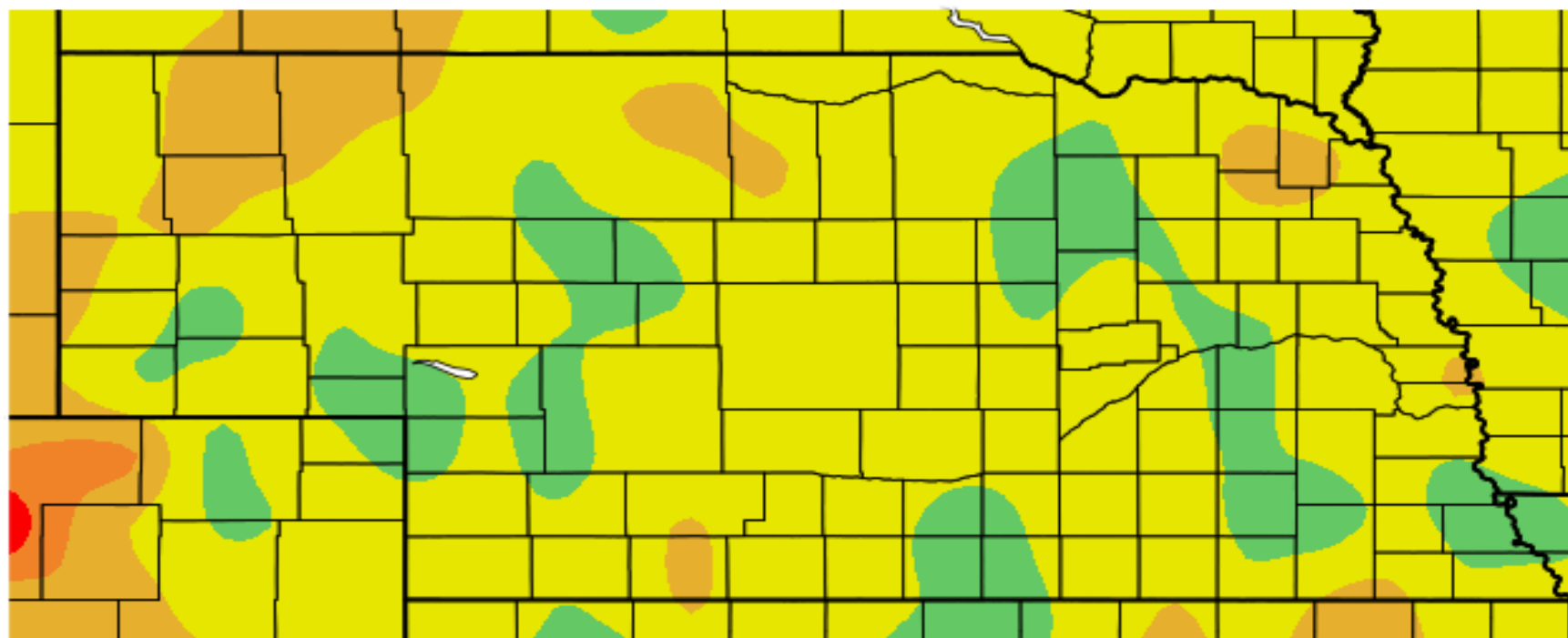
Percent of Normal Precipitation (%)
6/22/2018 – 7/21/2018



Generated 7/22/2018 at HPRCC using provisional data.

NOAA Regional Climate Centers

Departure from Normal Temperature (F) 6/22/2018 – 7/21/2018



Generated 7/22/2018 at HPRCC using provisional data.

NOAA Regional Climate Centers

Three Month Temperature and Rainfall Forecast

For August 2018 to October 2018, forecast predictions for Nebraska are for an elevated probability of above normal temperature over most of the state and equal chances for above and below normal precipitation. Links for the pages containing graphics of the long-term outlook can be found here:

http://www.cpc.ncep.noaa.gov/products/predictions/long_range/seasonal.php?lead=1 (Temperature and Rainfall Outlook).

Drought Outlook

The current drought monitor on page eight (through 07/24/2018) showed abnormally dry conditions move back in to southeast Nebraska. Approximately 94.88% of the state is being reported with no drought or abnormally dry conditions, a decrease compared to last week. Currently the land area in the state encompassing abnormal dryness is approximately 4.27% (increase from last week) and moderate drought around 0.84% (no change from last week) of the state area. Last year at this time, 13.90% of the state area reported no drought or abnormally dry conditions per the drought monitor. The current monthly drought outlook for July can be found on page nine. For more information please visit the links below:

<http://droughtmonitor.unl.edu/> (U.S. Drought Monitor).

http://www.cpc.ncep.noaa.gov/products/expert_assessment/mdo_summary.php (U.S. Monthly Drought Outlook).

U.S. Drought Monitor Nebraska

July 24, 2018
(Released Thursday, Jul. 26, 2018)
Valid 8 a.m. EDT

Drought Conditions (Percent Area)

	None	D0	D1	D2	D3	D4
Current	94.88	4.27	0.84	0.00	0.00	0.00
Last Week 07-17-2018	98.73	0.43	0.84	0.00	0.00	0.00
3 Months Ago 04-24-2018	79.71	18.97	1.32	0.00	0.00	0.00
Start of Calendar Year 01-02-2018	9.32	88.65	2.03	0.00	0.00	0.00
Start of Water Year 09-26-2017	82.67	13.32	4.01	0.00	0.00	0.00
One Year Ago 07-25-2017	13.90	44.20	35.62	6.28	0.00	0.00

Intensity:

D0 Abnormally Dry
 D3 Extreme Drought
 D1 Moderate Drought
 D4 Exceptional Drought
 D2 Severe Drought

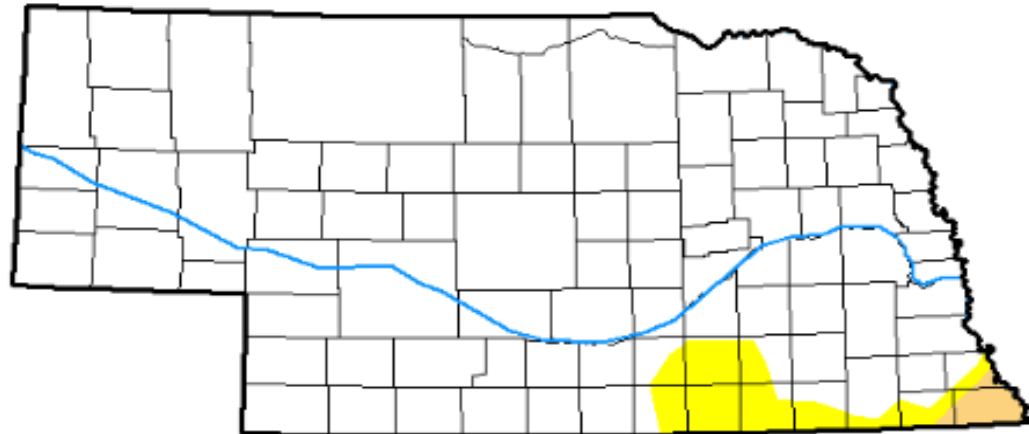
The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.

Author:

Chris Fenimore
NCEI/NESDIS/NOAA



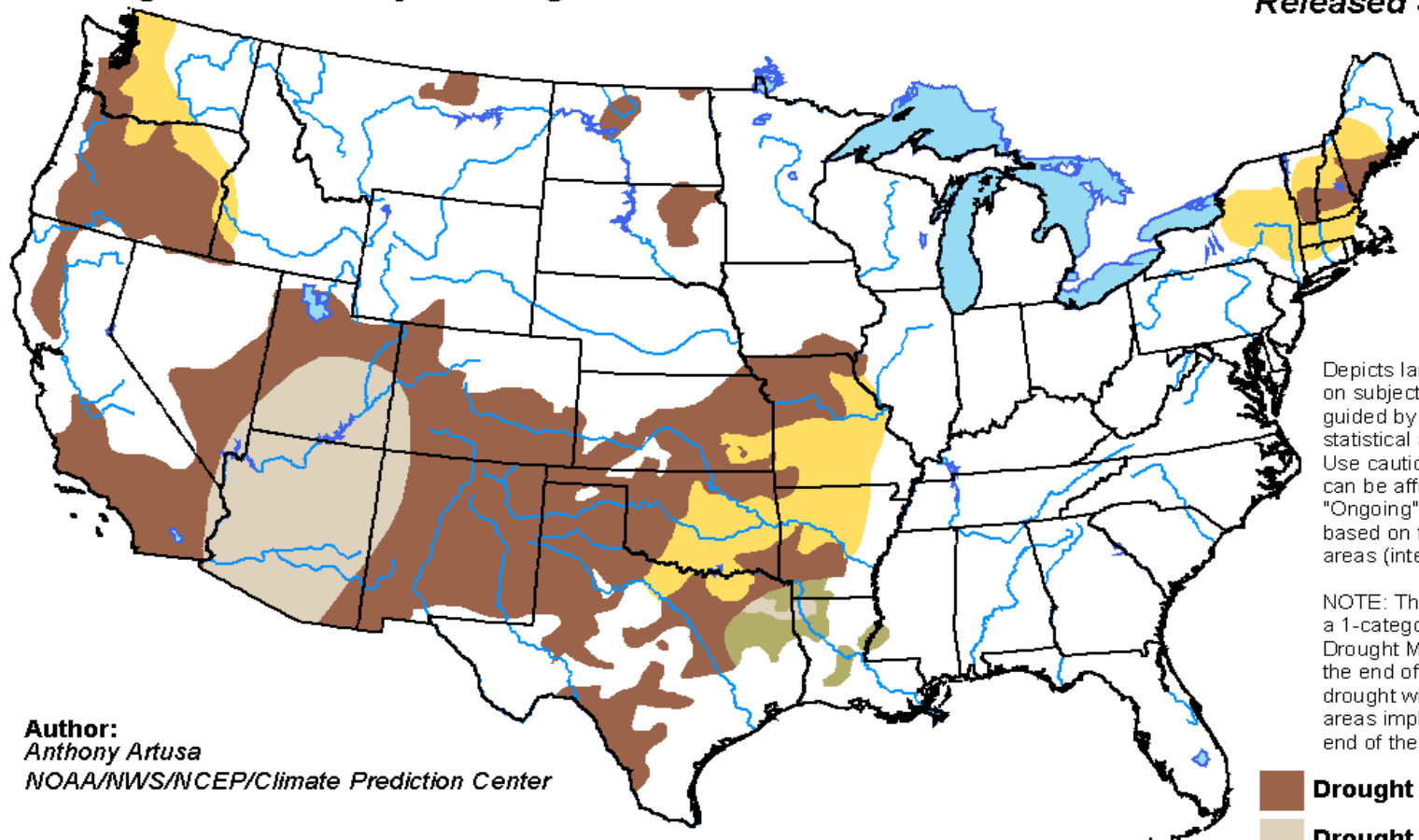
<http://droughtmonitor.unl.edu/>



U.S. Monthly Drought Outlook

Drought Tendency During the Valid Period





Valid for July 2018
Released June 30, 2018

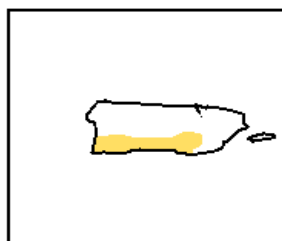
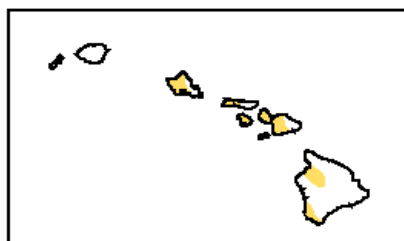
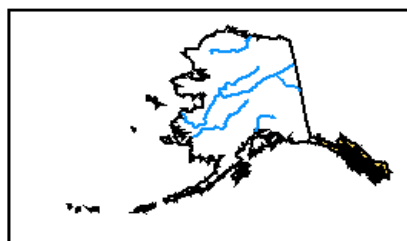


Author:
Anthony Artusa
NOAA/NWS/NCEP/Climate Prediction Center

Depicts large-scale trends based on subjectively derived probabilities guided by short- and long-range statistical and dynamical forecasts. Use caution for applications that can be affected by short lived events. "Ongoing" drought areas are based on the U.S. Drought Monitor areas (intensities of D1 to D4).

NOTE: The tan areas imply at least a 1-category improvement in the Drought Monitor intensity levels by the end of the period, although drought will remain. The green areas imply drought removal by the end of the period (D0 or none).

-  **Drought persists**
-  **Drought remains but improves**
-  **Drought removal likely**
-  **Drought development likely**



<http://go.usa.gov/3eZGd>

ARBOVIRAL DETECTIONS

To date, there has been two positive arbovirus positive mosquito pools detected in two different counties. The statewide WNV cumulative mosquito minimum infection rate (MIR) per 1,000 *Culex* increased to 0.47 which is low overall and below the 10-year median of 0.76 for this time of year.

Table 1. Arboviral Detections

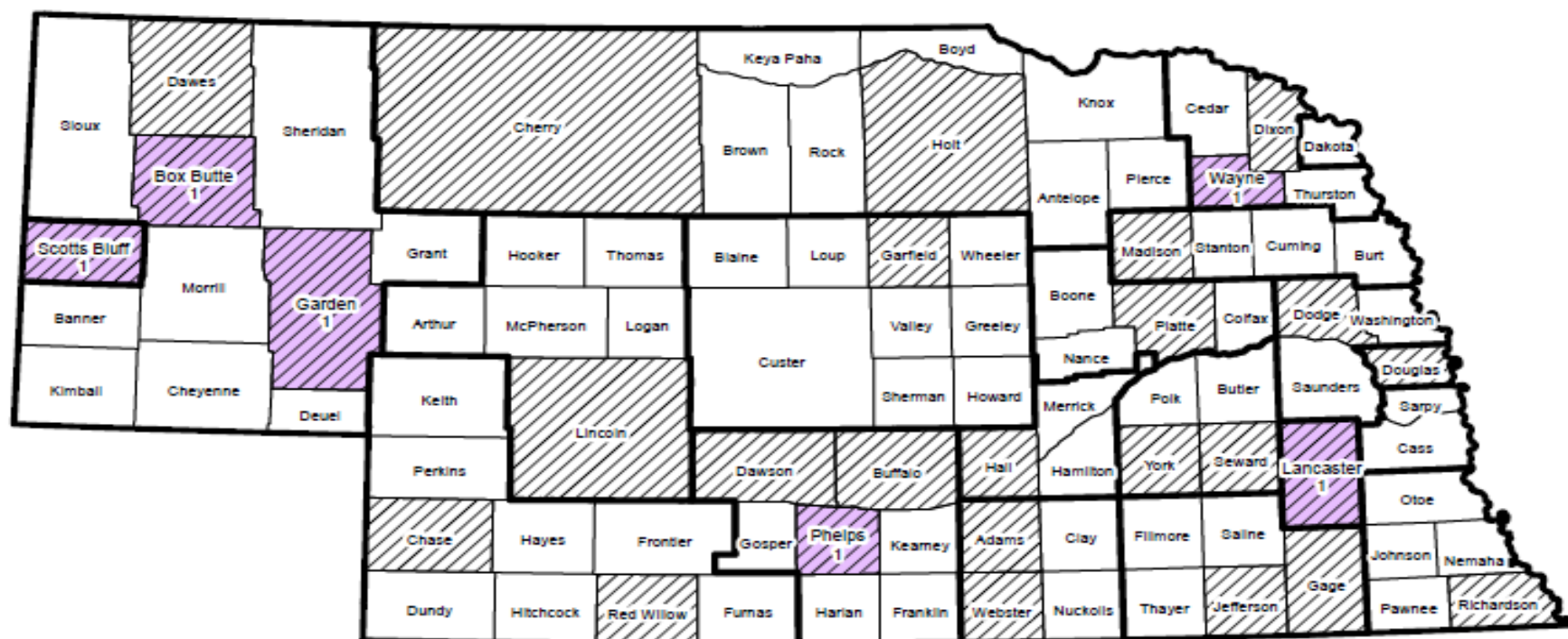
Date Collected	County	Mosquito Species	Virus
7/17/2018	Garden	<i>Culex tarsalis</i>	WNV
7/17/2018	Scotts Bluff	<i>Culex tarsalis</i>	WNV
7/17/2018	Wayne	<i>Culex tarsalis</i>	WNV
7/10/2018	Box Butte	<i>Culex tarsalis</i>	WNV
6/7/2018	Lancaster	<i>Culex pipiens</i>	WNV
6/6/2018	Phelps	<i>Culex tarsalis</i>	WNV

Table 2. Arboviral Detections Summary Table.

Date Collected	County	Mosquito Species	Virus			
			WNV	SLE	WEE	Total
7/17/2018	Garden	<i>Culex tarsalis</i>	1	0	0	1
7/17/2018	Scotts Bluff	<i>Culex tarsalis</i>	1	0	0	1
7/17/2018	Wayne	<i>Culex tarsalis</i>	1	0	0	1
7/10/2018	Box Butte	<i>Culex tarsalis</i>	1	0	0	1
6/7/2018	Lancaster	<i>Culex pipiens</i>	1	0	0	1
6/6/2018	Phelps	<i>Culex tarsalis</i>	1	0	0	1
Total			6	0	0	6

Mosquito Surveillance Nebraska CDC Light Trap Network, 2018

As of July 27



Legend

- West Nile Positive (WNV)
- Routine Trapping Sites (28)
- Surveillance Regions

SLE Positive / Tested Totals

Mosquito Pools: 0 / 823

Counties: 0 / 28

WNV Positive / Tested Totals

Mosquito Pools: 6 / 823

Counties: 6 / 28

Figure 1. Positive mosquito pools in the Nebraska CDC light trap network, 2018.

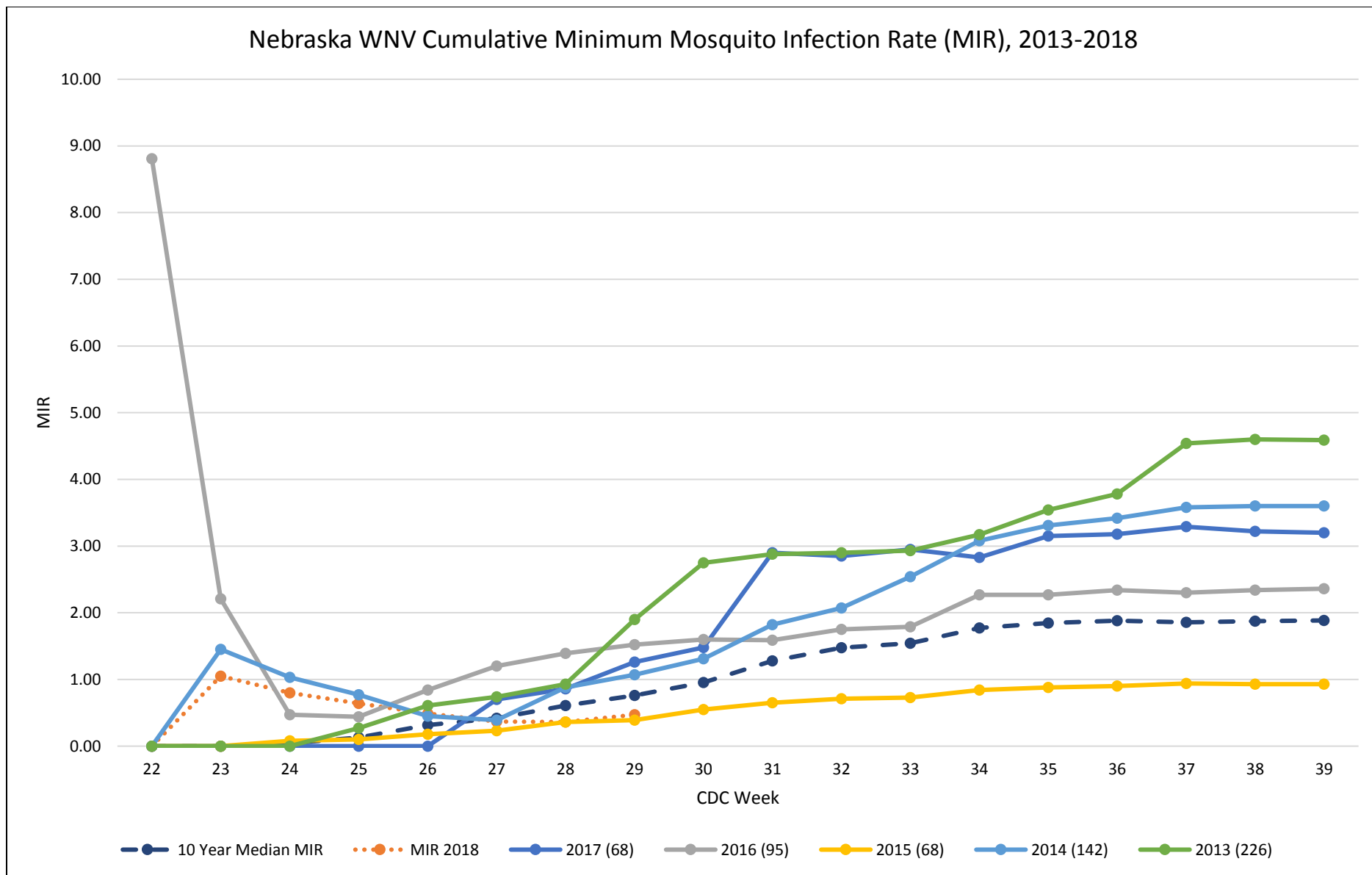


Figure 2. Weekly Nebraska WNV Mosquito Cumulative Mosquito Minimum Infection Rate, 2013-2018. At the state level, the calculated statewide MIR is strongly correlated with the number of human clinical WNV cases. As such, comparisons during the season of the weekly cumulative MIR with previous seasons' cumulative MIRs may give an indication as to how severe a WNV season might be. Please note 2018 data is shown as a dotted line and the 10-year median as a dashed line. Numbers in parentheses next to years indicate the number of human WNV clinical cases reported that year.

HUMAN MOSQUITO-BORNE DISEASE CASES

Weekly reported cases (confirmed and probable) of human clinical mosquito-borne disease infections in Nebraska residents is summarized in the table below (pg. 13 and 14). It includes human infections of West Nile virus (WNV), St. Louis Encephalitis virus (SLE), Western Equine Encephalitis virus (WEE), chikungunya (CHIKV), dengue (DENV), Zika, and malaria. Please note that cases are by earliest report date of infection not necessarily by date of onset. Table only includes reported cases that had exposure or onset of disease in 2018. All data is preliminary and may change as more information is received.

Table 3. Reports of Mosquito-Borne Disease in Nebraska, 2018

CDC Week	Week Ending Date	WNV^ (Clinical Cases)	WNV^ (Asymptomatic Blood Donors)	SLE^	WEE^	CHIKV*	DENV*	ZIKA*	Malaria*	Total
1	6-Jan-18	0	0	0	0	0	0	0	0	0
2	13-Jan-18	0	0	0	0	0	0	0	0	0
3	20-Jan-18	0	0	0	0	0	0	0	0	0
4	27-Jan-18	0	0	0	0	0	0	0	0	0
5	3-Feb-18	0	0	0	0	0	0	0	1	1
6	10-Feb-18	0	0	0	0	0	0	0	0	0
7	17-Feb-18	0	0	0	0	0	0	0	0	0
8	24-Feb-18	0	0	0	0	0	0	0	0	0
9	3-Mar-18	0	0	0	0	0	0	0	0	0
10	10-Mar-18	0	0	0	0	0	0	0	0	0
11	17-Mar-18	0	0	0	0	0	0	0	0	0
12	24-Mar-18	0	0	0	0	0	0	0	0	0
13	31-Mar-18	0	0	0	0	0	0	0	0	0
14	7-Apr-18	0	0	0	0	0	0	0	1	1
15	14-Apr-18	0	0	0	0	0	0	0	0	0
16	21-Apr-18	0	0	0	0	0	0	0	0	0

17	28-Apr-18	0	0	0	0	0	0	0	0	0
18	5-May-18	0	0	0	0	0	0	0	0	0
19	12-May-18	0	0	0	0	0	0	0	0	0
20	19-May-18	0	0	0	0	0	0	0	0	0
21	26-May-18	0	0	0	0	0	0	0	0	0
22	2-Jun-18	0	0	0	0	0	0	0	0	0
23	9-Jun-18	0	0	0	0	0	0	0	0	0
24	16-Jun-18	0	0	0	0	0	0	0	1	1
25	23-Jun-18	0	0	0	0	0	0	0	0	0
26	30-Jun-18	0	0	0	0	0	0	0	0	0
27	7-Jul-18	1	0	0	0	0	1	0	0	2
28	14-Jul-18	1	0	0	0	0	0	0	0	1
29	21-Jul-18	0	1	0	0	0	0	0	0	1
30	28-Jul-18	0	0	0	0	0	0	0	0	0
	Total	2	1	0	0	0	1	0	3	7

^These are endemic viruses that have been historically transmitted by mosquitoes in Nebraska and maybe acquired within the state. It should be noted that reports are for Nebraska residents and that infection may have been acquired elsewhere. *These diseases are typically acquired via travel overseas to areas where the virus or parasite is endemic. Currently, Nebraska does not have local transmission via mosquitoes of these organisms and the probability of local transmission by local mosquitoes is thought to be very low and not expected. However, to further lower and prevent the chance of local transmission of these “travel-related” diseases, returning travelers or visitors from these areas should prevent mosquito bites for at least three weeks upon arrival to Nebraska. Additionally, although cases of CHIKV, DENV, and ZIKA are most often acquired via overseas travel, small areas of transmission and small, local outbreaks within the U.S. have occurred and may occur in the future. Examples of states that have seen local transmission include: Florida, (DENV, CHIKV, and ZIKA), Hawaii (DENV), and Texas (DENV, CHIKV, and ZIKA).

Table 4. Human WNV Clinical Case Information, Nebraska 2018

Age Range	Number
0 to 10	0
11 to 20	0
21 to 30	0
31 to 40	0
41 to 50	0
51 to 60	1
61 to 70	1
71+	0
Gender	
Male	2
Female	0
Diagnosis	
WNV Neuroinvasive Disease	1
WNV Non-Neuroinvasive Disease	1
Hospitalized	0
Death	0

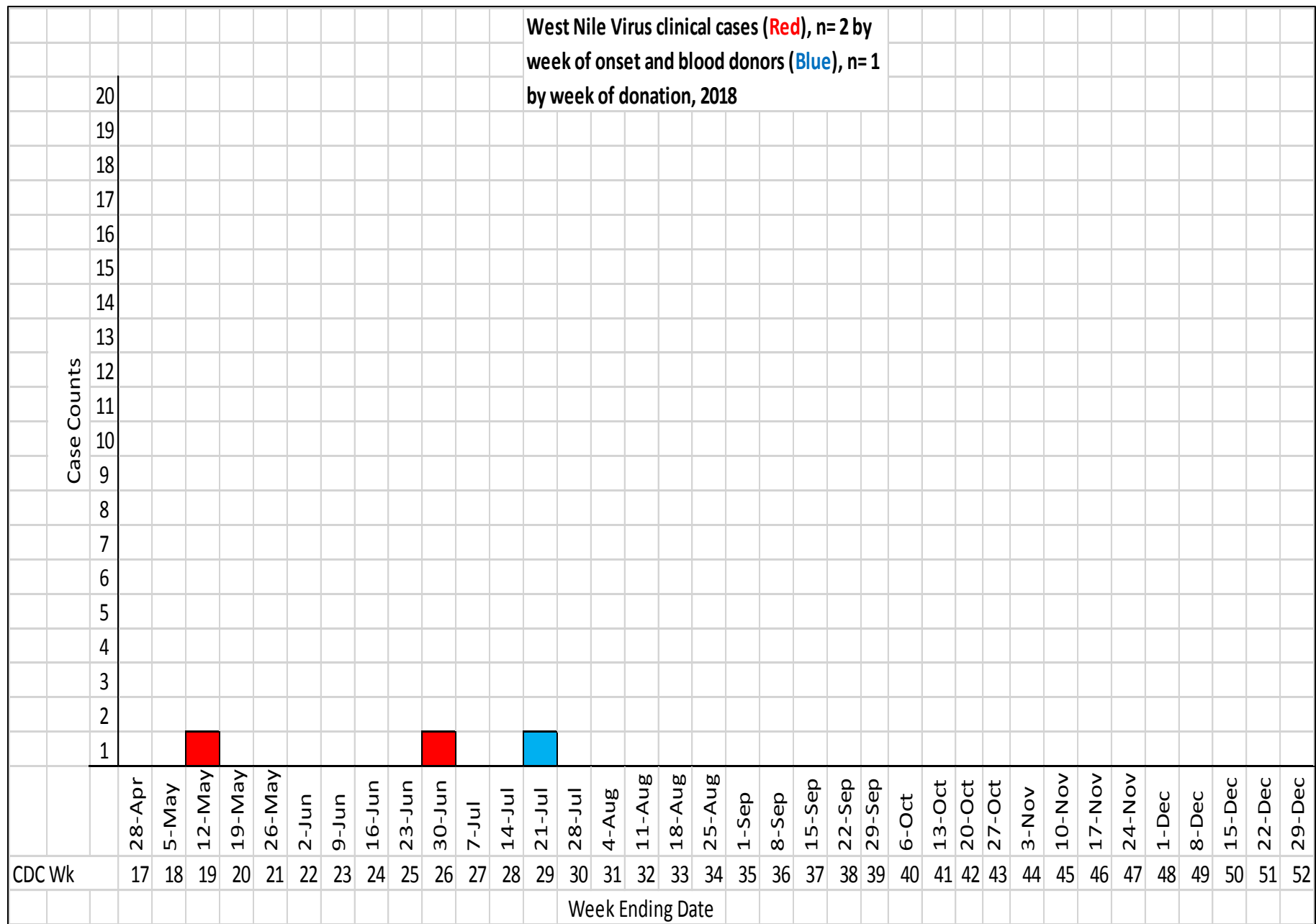


Figure 3. Epi-curve of human WNV infections (clinical and asymptomatic blood donors) by onset date, Nebraska 2018.

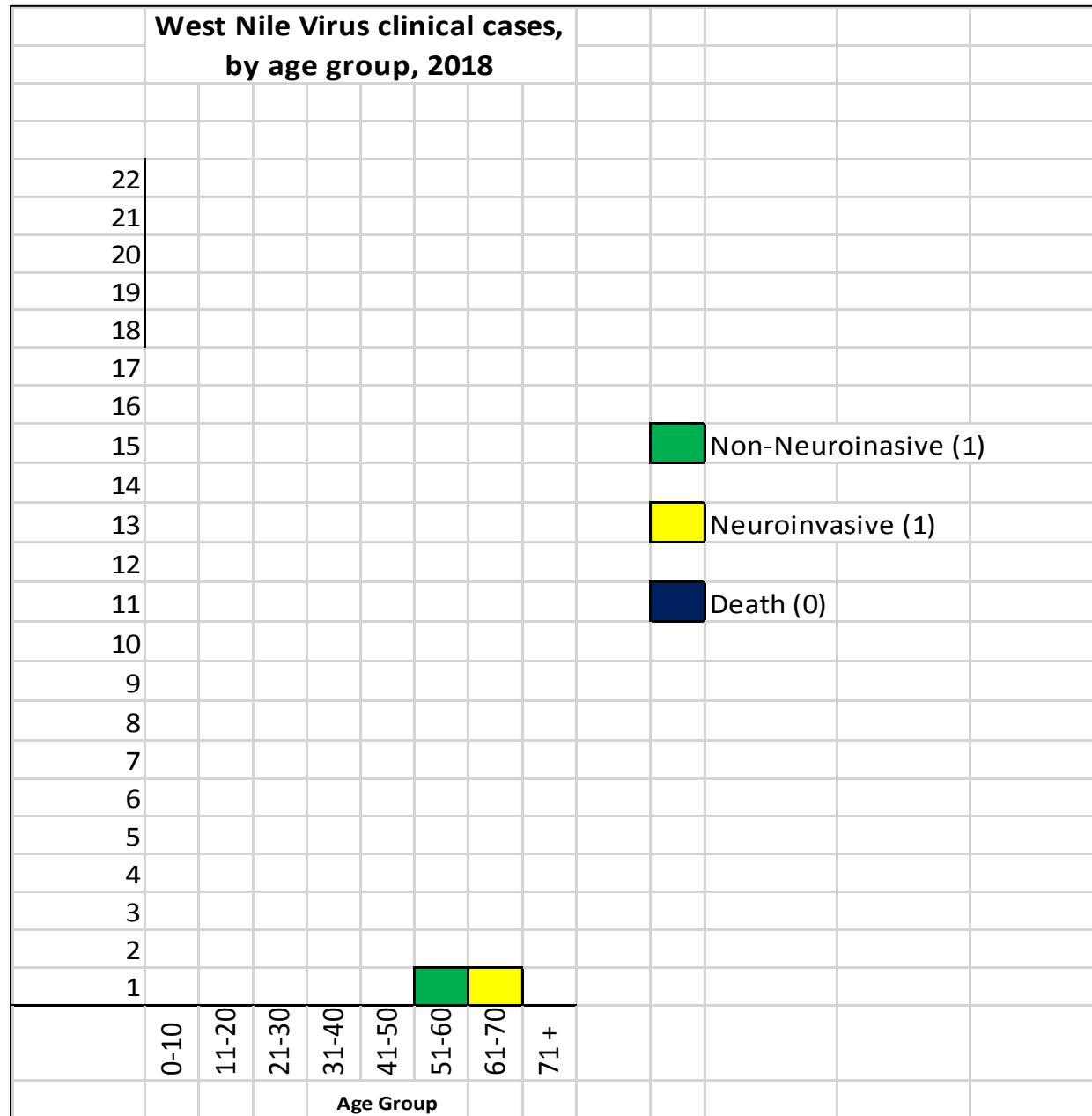


Figure 4. WNV human clinical cases by 10 year age groups, 2018.

Human Clinical Positives for West Nile Virus, Nebraska, 2018, (n = 2)

As of July 27

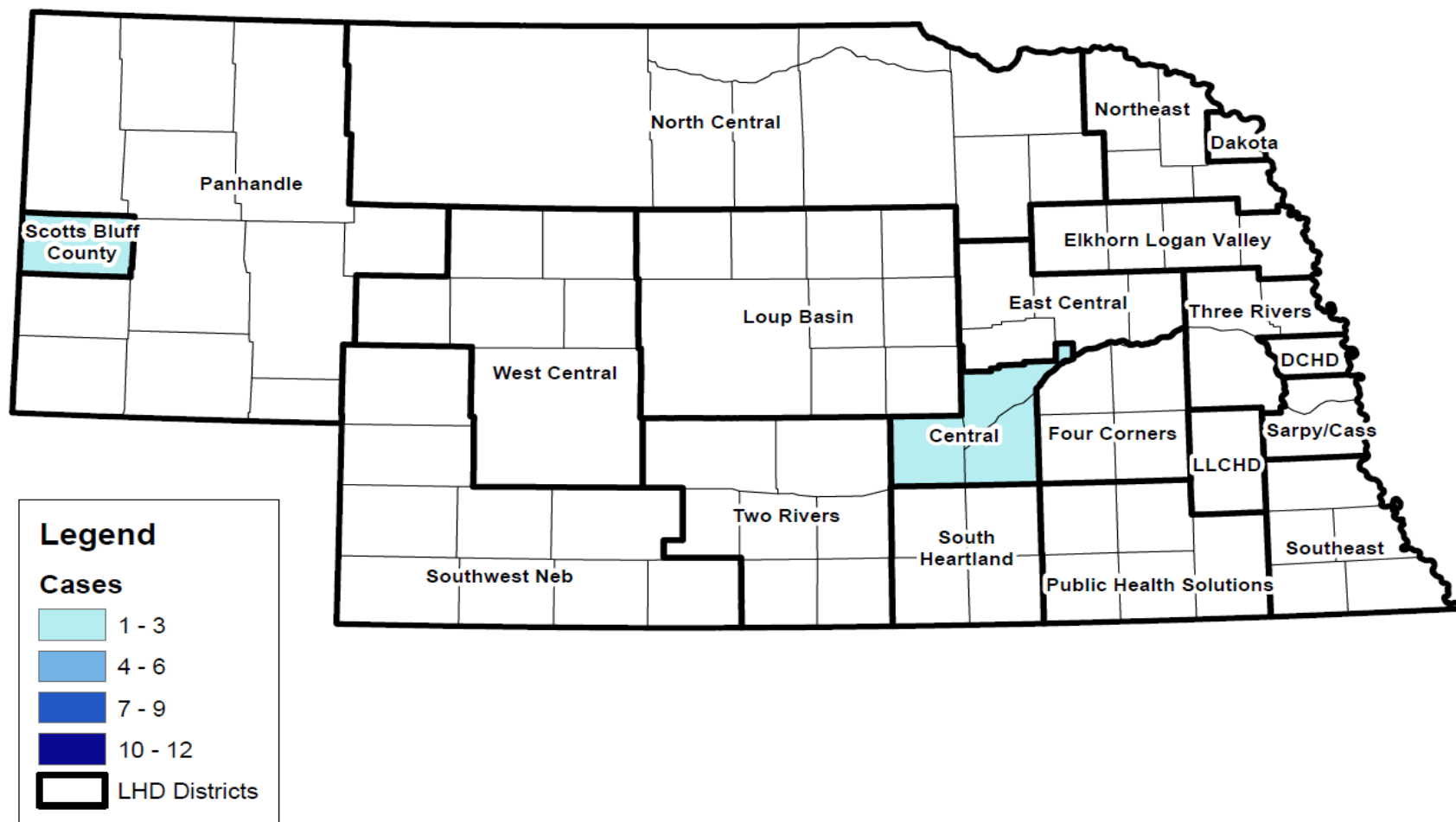


Figure 5. Nebraska human clinical WNV cases by local health jurisdiction, 2018.

Table 5. Number of Human WNV Clinical Cases by Onset Week and Nebraska Local Health Jurisdiction, 2018

CDC Wk.	17	18	19	20	21	22	23	24	25	26	27	28	29	30	
Local Health Dept. Jurisdiction															Total
Central District Health Dept.	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1
Dakota County Health Dept.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Douglas County Health Dept.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
East Central District Health Dept.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Elkhorn-Logan Valley Health Dept.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Four Corners Health Dept.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Lincoln-Lancaster County Health Dept.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Loup Basin Public Health Dept.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
North Central District Health Dept.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Northeast Nebraska Public Health Dept.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Panhandle Public Health Dept.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Public Health Solutions	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sarpy-Cass Dept. of Health and Wellness	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Scotts Bluff County Health Dept.	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1
South Heartland District Health Dept.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Southeast District Health Dept.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Southwest Nebraska Public Health Dept.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Three Rivers Public Health Dept.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Two Rivers Public Health Dept.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
West Central District Health Dept.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Statewide Total	0	0	1	0	0	0	0	0	0	1	0	0	0	0	2

Human Blood Donor Positives for West Nile Virus, Nebraska, 2018, (n = 1)

As of July 27

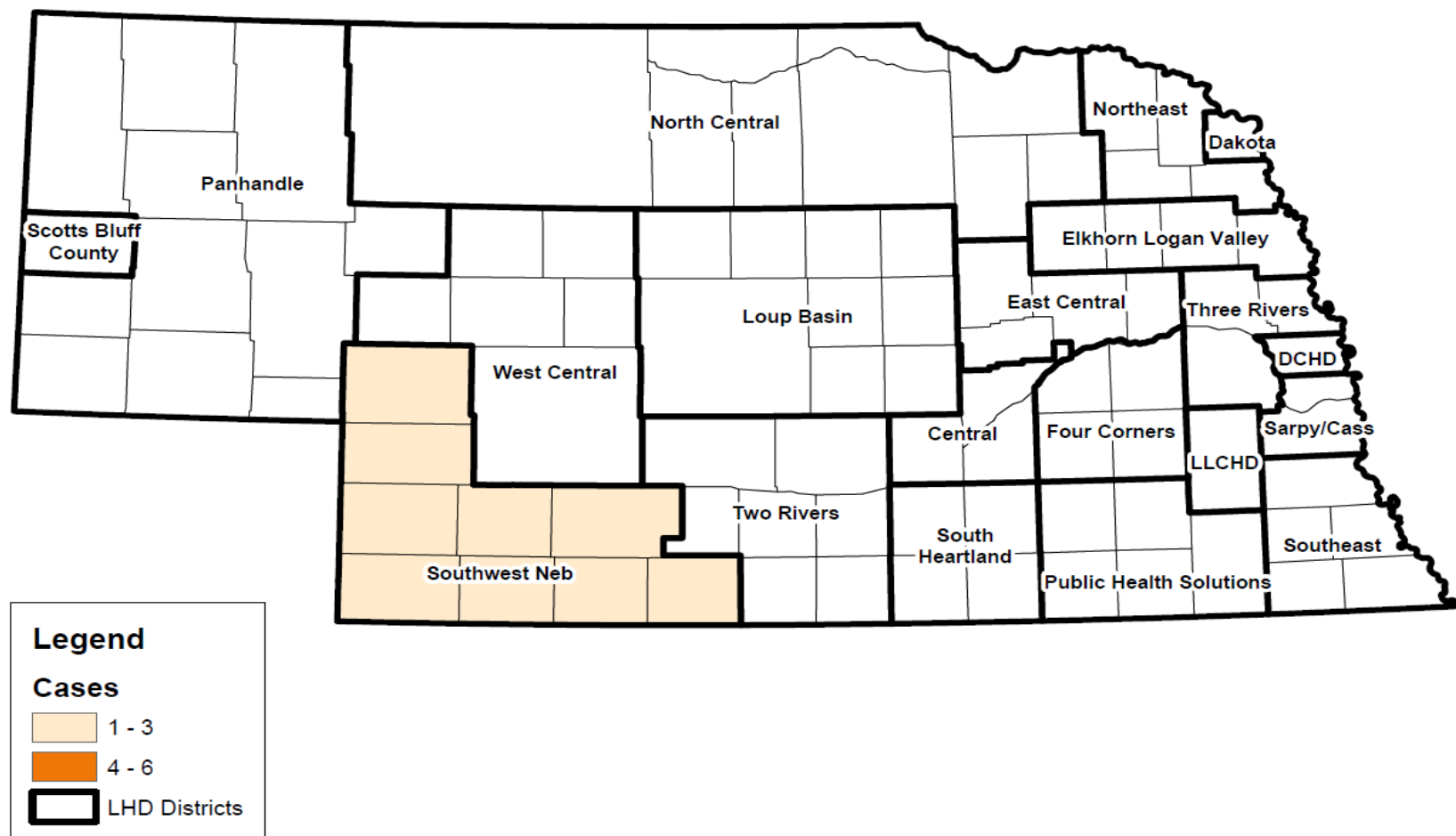


Figure 6. Nebraska asymptomatic WNV blood donors by local health jurisdiction, 2018.

Table 6. Number of Human WNV Blood Donors by Week of Donation and Nebraska Local Health Jurisdiction, 2018

CDC Wk.	17	18	19	20	21	22	23	24	25	26	27	28	29	30	
Local Health Dept. Jurisdiction															Total
Central District Health Dept.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Dakota County Health Dept.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Douglas County Health Dept.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
East Central District Health Dept.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Elkhorn-Logan Valley Health Dept.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Four Corners Health Dept.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Lincoln-Lancaster County Health Dept.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Loup Basin Public Health Dept.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
North Central District Health Dept.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Northeast Nebraska Public Health Dept.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Panhandle Public Health Dept.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Public Health Solutions	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sarpy-Cass Dept. of Health and Wellness	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Scotts Bluff County Health Dept.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
South Heartland District Health Dept.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Southeast District Health Dept.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Southwest Nebraska Public Health Dept.	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
Three Rivers Public Health Dept.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Two Rivers Public Health Dept.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
West Central District Health Dept.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Statewide Total	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1

Comment: WNV is the most widespread, locally acquired mosquito-borne disease in Nebraska. The state has one of the highest incidences of WNV in the U.S. and the virus is highly endemic to the state. **Two human clinical cases have been reported in Nebraska residents to date along with the first positive asymptomatic human blood donor.** Additionally, **six positive WNV mosquito pools have been detected indicating WNV is circulating in the environment.** Overall WNV risk will continue to increase as we move into the month of August. This is typically the highest risk for exposure in Nebraska. It is important to note that there are many factors that come into play in determining an individual person's risk of acquiring WNV and other mosquito-borne diseases. **Low WNV activity or no WNV activity detected DOES NOT mean NO RISK!** For travel related mosquito-borne diseases (confirmed and probable cases), three cases of malaria (South Sudan= 1 and Togo= 2) and one case of dengue (Thailand= 1) have been reported this year. Anytime mosquitoes are active there is always the possibility of acquiring WNV or another mosquito-borne disease and proper mosquito prevention methods should be utilized both here at home and when traveling abroad. Examples include:

- Applying an EPA approved mosquito repellent (DEET, picaridin, oil of lemon eucalyptus, or IR3535).
- Limiting exposure when outdoors by wearing long sleeve shirts and pants.
- Limiting time spent outdoors when mosquitoes are most active, typically dusk to midnight.
- Getting rid of standing water that mosquitoes may breed in at least once a week. Remember to change water in outdoor pet watering dishes along with bird baths and dump out water in flower pots, garden containers, or other objects that may hold water.

For more information on mosquito-borne diseases and prevention information please visit the following websites:

<http://dhhs.ne.gov/wnv> (Nebraska Department of Health and Human Services WNV Surveillance Program web site).

<http://dhhs.ne.gov/publichealth/EPI/Pages/Mosquito-borne.aspx> (Nebraska Department of Health and Human Services Mosquito-Borne Disease web site and links to downloadable educational pamphlets).

<https://www.cdc.gov/westnile/> (CDC West Nile Virus web site).

<https://www.cdc.gov/sle/> (CDC St. Louis Encephalitis Virus web site).

<https://www.cdc.gov/chikungunya/index.html> (CDC Chikungunya Virus web site).

<https://www.cdc.gov/dengue/index.html> (CDC Dengue Virus web site).

<https://www.cdc.gov/zika/index.html> (CDC Zika Virus web site).

<https://www.cdc.gov/parasites/malaria/index.html> (CDC Malaria web site).

<https://www.cdc.gov/features/stopmosquitoes/index.html> (CDC Avoid Mosquito Bites web site).

MOSQUITO RESULTS

The Nebraska CDC light trap network consists of 143 traps set across the state to monitor mosquito populations and test for the presence of arboviruses circulating in the state's mosquito populations.

Total mosquito and *Culex* mosquito counts from CDC light traps are described in relative terms based on individual historical county data and are depicted in the tables below:

0 to 40th percentile	41st to 60th percentile	61st to 80th percentile	81st to 97th percentile	>97th percentile
Low	Mod.	High	Very High	Extremely High

The individual county mosquito trapping data for the final trap period can be found on pg. 23-24.

Table 7. Nebraska CDC Light Trap Network Mosquito Results, 2018

	CDC Weeks 28/29	
Region/County	Total Mosquito	Total Culex
West Region	311.59	64.15
Box Butte	294.33	108.33
Chase	67.40	5.00
Cherry	171.50	60.17
Dawes	ND	ND
Garden	315.33	46.33
Lincoln	919.50	13.83
Red Willow	52.33	30.33
Scotts Bluff	320.00	175.17
	CDC Weeks 28/29	
Region/County	Total Mosquito	Total Culex
Central Region	369.25	21.24

Adams	7.00	5.67
Buffalo	4.00	1.00
Dawson	142.83	35.17
Garfield	269.33	8.83
Hall	154.50	15.50
Holt	1226.17	55.58
Phelps	1.17	0.83
Webster	111.00	4.67
	CDC Weeks 28/29	
Region/County	Total Mosquito	Total Culex
East Region	204.83	76.74
Dixon	266.33	125.33
Dodge	64.60	35.20
Douglas	329.50	16.50
Gage	50.50	4.50
Jefferson	97.50	29.25
Lancaster	57.33	9.17
Madison	393.83	163.00
Platte	87.40	40.40
Richardson	38.00	6.17
Seward	ND	ND
Wayne	820.00	493.67
York	ND	ND

Each county or region represents the average for all CDC light trapping sites in that county or region. ND= No Data.

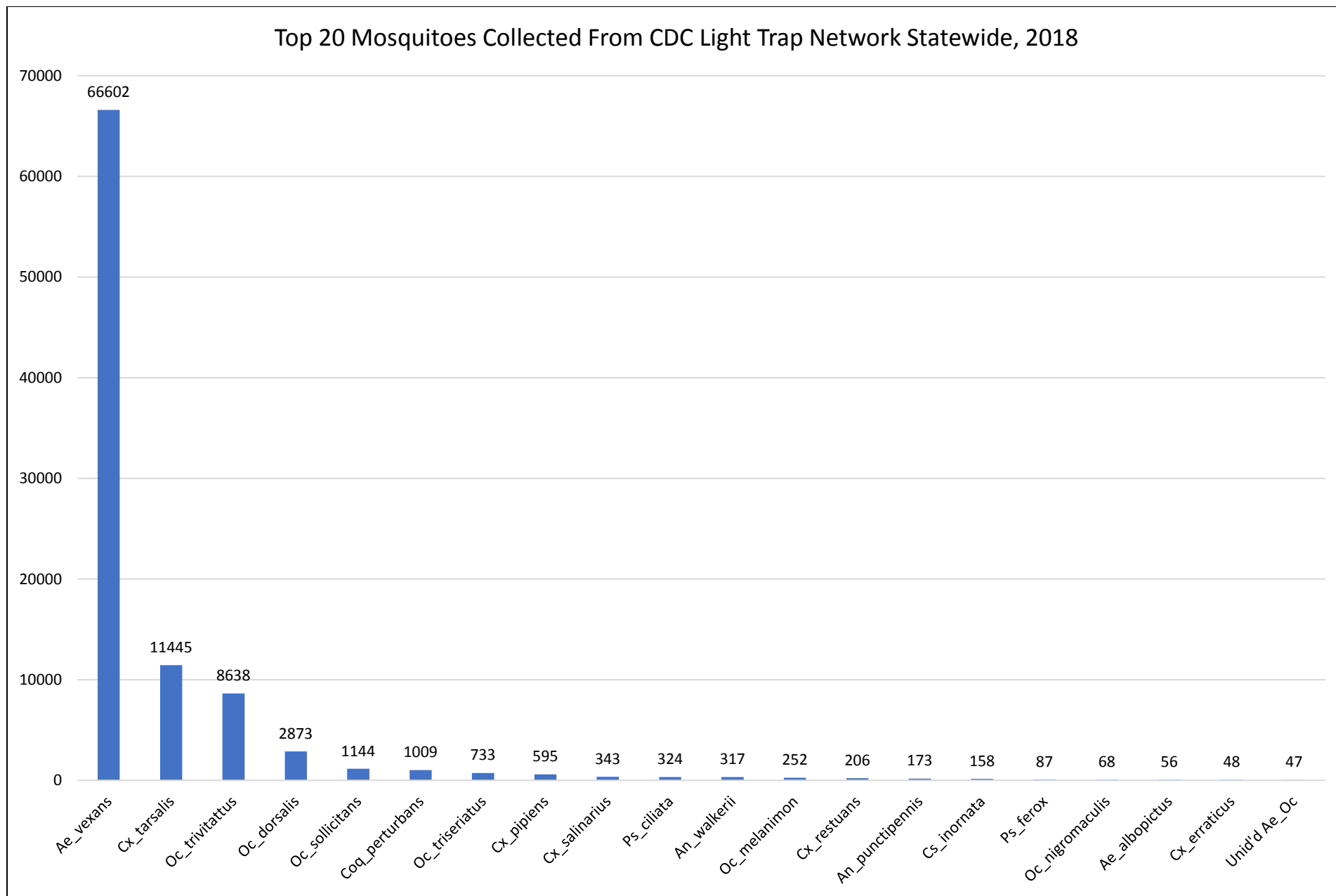


Figure 7. Top 20 cumulative mosquitoes collected statewide from CDC light trap network, 2018. Note that the first part of the mosquito species name has been abbreviated. Ae= *Aedes*, An= *Anopheles*, Cs= *Culex*, Cx= *Culex*, Oc= *Ochlerotatus*, Ps= *Psorophora*, Unid'd= Unidentified.

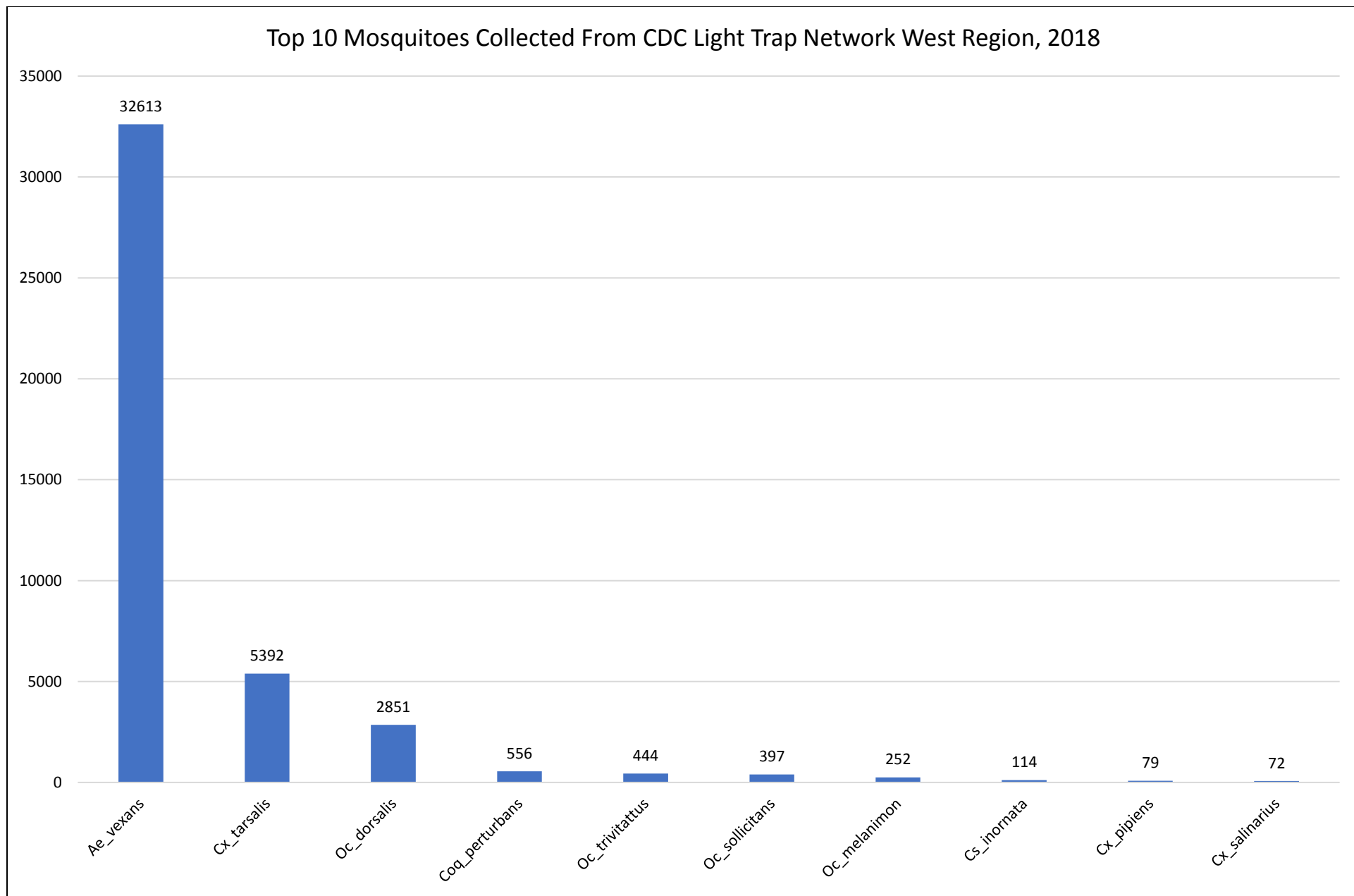


Figure 8. Top 10 cumulative mosquitoes collected in West region of the state from CDC light trap network, 2018. Note that the first part of the mosquito species name has been abbreviated. Ae= *Aedes*, An= *Anopheles*, Cs= *Culex*, Cx= *Culex*, Oc= *Ochlerotatus*, Ps= *Psorophora*, and Unid'd= Unidentified.

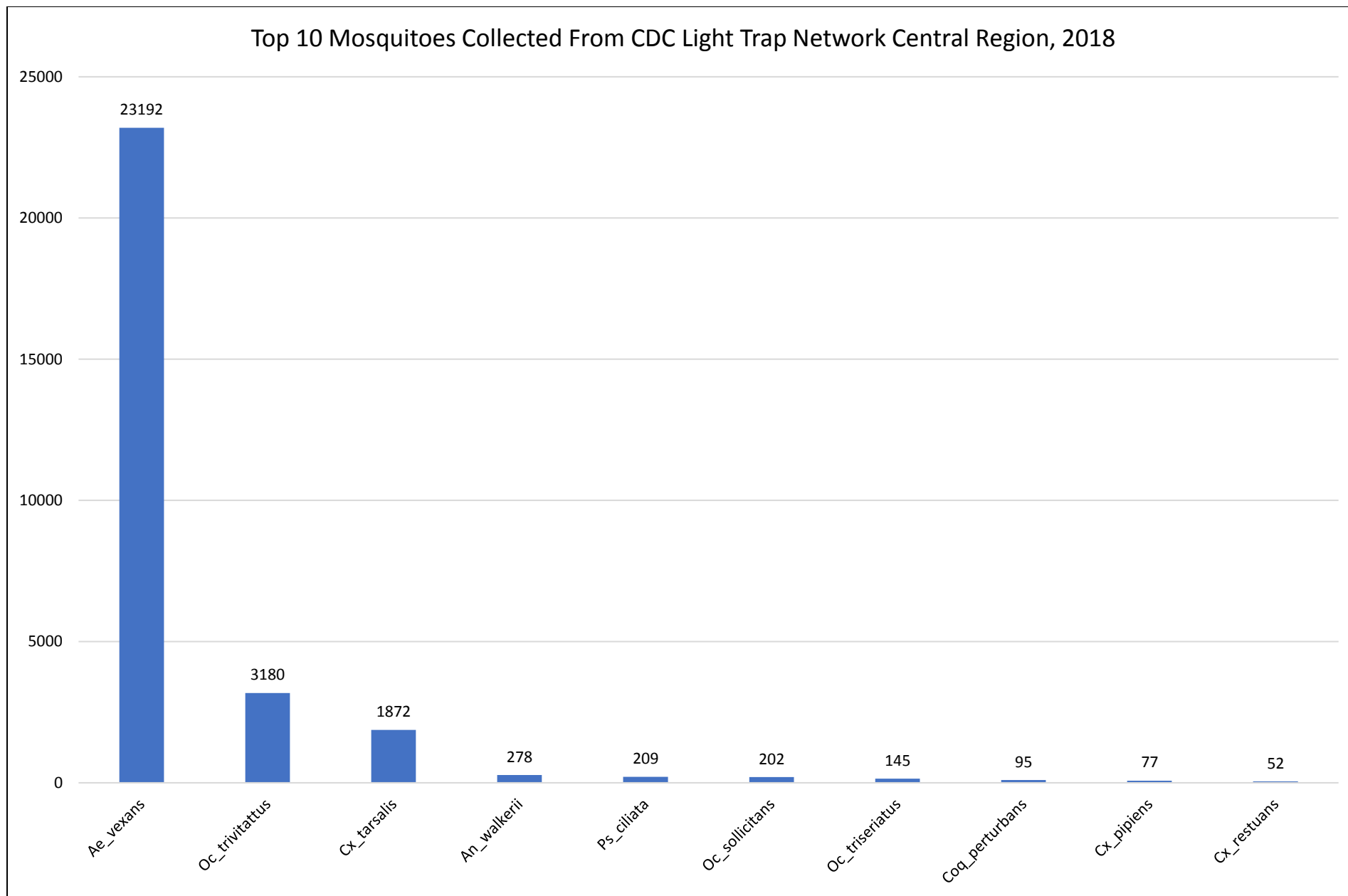


Figure 9. Top 10 cumulative mosquitoes collected in Central region of the state from CDC light trap network, 2018. Note that the first part of the mosquito species name has been abbreviated. Ae= *Aedes*, An= *Anopheles*, Cs= *Culex*, Cx= *Culex*, Oc= *Ochlerotatus*, Ps= *Psorophora*, and Unid'd= Unidentified.

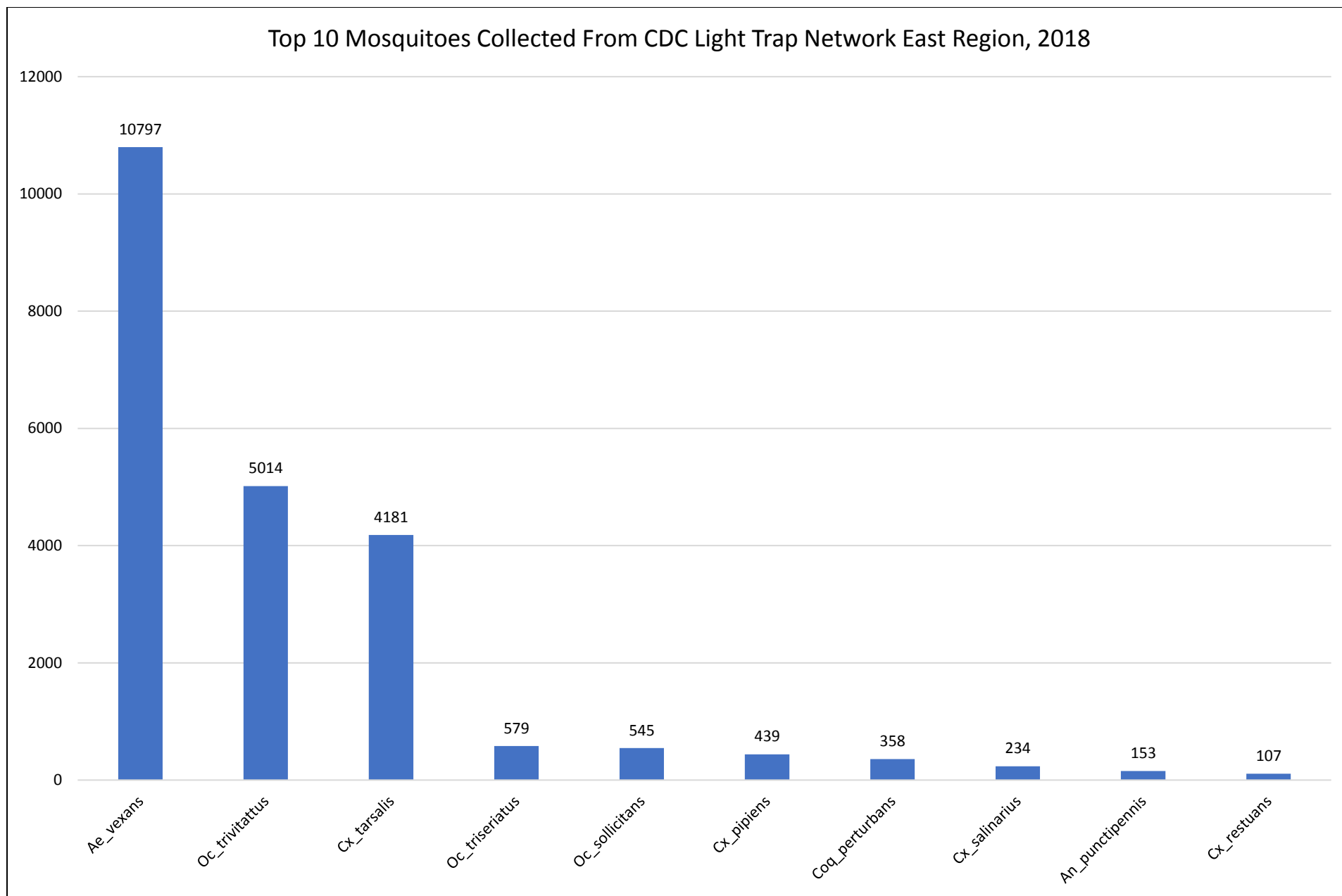


Figure 10. Top 10 cumulative mosquitoes collected in East region of the state from CDC light trap network, 2018. Note that the first part of the mosquito species name has been abbreviated. Ae= *Aedes*, An= *Anopheles*, Cs= *Culex*, Cx= *Culex*, Oc= *Ochlerotatus*, Ps= *Psorophora*, and Unid'd= Unidentified.

The Nebraska BG Sentinel 2 trap network was established this season to better survey areas of eastern and southeastern Nebraska for the presence of the invasive *Aedes albopictus* (Asian tiger) mosquito. During the mosquito surveillance season, four local health departments will participate in this trap network. This included: Douglas County Health Department, Lincoln-Lancaster Health Department, Sarpy-Cass Department of Health and Wellness, and Southeast District Health Department. For the season, counting all trap sites and types (CDC light and BG sentinel 2) from across the state, a total of 96,173 mosquitoes were captured with 60 (0.062%) *Aedes albopictus* collected.

Table 8. Cumulative Trap Collections in Counties Performing BG Sentinel 2 Trapping, 2018.

County	Trap Type	Total Mosquitoes	Total Culex	Total Ae_ albopictus
Cass	CDC Light	NA	NA	NA
	BG Sentinel 2	3	2	0
Cass Co. Overall Total		3	2	0
Douglas	CDC Light	3006	170	0
	BG Sentinel 2	724	58	0
Douglas Co. Overall Total		3730	228	0
Lancaster	CDC Light	2116	273	0
	BG Sentinel 2	72	12	0
Lancaster Co. Overall Total		2188	285	0
Nemaha	CDC Light	NA	NA	NA
	BG Sentinel 2	2	2	0
Nemaha Co. Overall Total		2	2	0
Richardson	CDC Light	839	383	56
	BG Sentinel 2	19	11	4
Richardson Co. Overall Total		858	394	60
Sarpy	CDC Light	NA	NA	NA
	BG Sentinel 2	26	20	0
Sarpy Co. Overall Total		26	20	0
Overall Total		6807	931	60

Note: ND= No data, NA = Not applicable.

Bird and Equine Surveillance

Dead bird reporting: For the season, 106 dead birds have been reported to the Nebraska DHHS dead bird database. Of these, four have met the established criteria for WNV testing, three results have been received (all negative) and one was unsuitable for testing.

Equine surveillance: For the season no equine WNV case has been reported to the Nebraska DHHS.



Fight the Bite!!