2018 Annual Report
Water Valley and Pelican Lakes
Mosquito Control Program

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Water Valley and Pelican Lakes
Mosquito Management Operations

Annual Report For 2018

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Program Objectives

Vector Disease Control International, LLC (VDCI) completed its 14th year of cost-effective Integrated Mosquito Management (IMM) for Water Valley and Pelican Lakes in 2018. The primary objective of Water Valley and Pelican Lake's IMM Program is to monitor and reduce mosquito populations through the use of specific, environmentally sound, control techniques in order to protect its residents from the threat of mosquito-borne diseases. VDCI prioritizes the detection and elimination of larval mosquitoes in aquatic habitats, in conjunction with the monitoring of adult mosquito populations through routine surveillance, in order to assess West Nile virus vector species abundance in the area.

Open communication is maintained by VDCI between the HOA Residents, Property Management Companies, the Weld and Larimer County Departments of Health & Environment and surrounding municipalities to ensure that the highest level of mosquito control and epizootic response is achieved. This diligent and cooperative communication is important to Water Valley and Pelican Lake's mosquito management program and provides significant benefit to public health throughout the entire area.

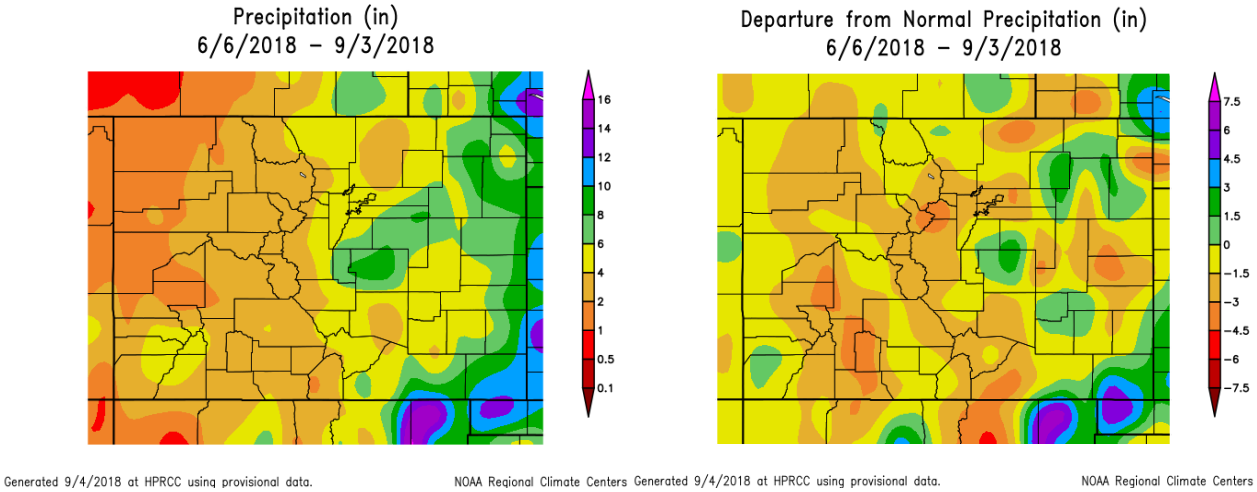
VDCI's Commitment

Vector Disease Control International is a company built on the foundations of public health, ethics, professionalism, and technical expertise. VDCI is committed to providing our customers with scientifically based, environmentally sensitive and technologically advanced Integrated Mosquito Management (IMM) programs of the highest quality. All of our employees are committed to excellence in vector control and public health and strive to improve the quality of human life in communities through public education and the control of mosquitoes and the diseases they can transmit. VDCI currently has programs across the state of Colorado, providing services for towns, cities, counties, homeowners associations, and encephalitis surveillance monitoring programs for county health departments.

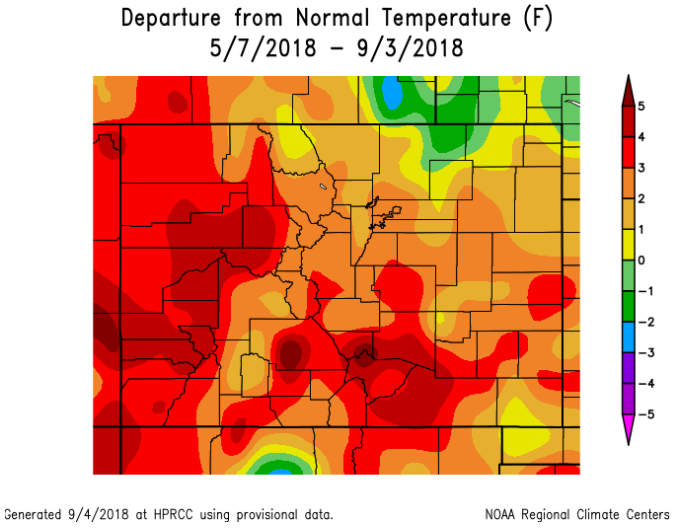
Vector Disease Control International, as the contractor for the Water Valley and Pelican Lakes, will continue to use proven scientific Integrated Mosquito Management techniques to survey and control local mosquito populations using biorational larval controls and limited low-toxicity insecticide applications. All of the methods and materials used have been reviewed and registered by the US Environmental Protection Agency, the Centers for Disease Control, the Colorado Department of Agriculture and the American Mosquito Control Association.

2018 Season Perspective

At VDCI we have come to expect each Colorado summer to present a unique set of temperature, precipitation, irrigation, and human interactions that combine to create new and different challenges in both mosquito control and mosquito-borne disease proliferation. The late-spring and early summer of 2018 started off with an earlier than normal peak runoff from snow melt. As the season started, precipitation was significantly lower than average throughout most of the state causing drought conditions with larval production concentrated along the river and permanent water sources. Rainfall throughout Larimer and Weld County was 1.5 inches below historical averages but came in significant bursts throughout the season creating significant flooding and altered landscape in some areas. Mosquito abundance remained above historical averages for most of the season. However, West Nile virus activity in both mosquito and human populations remained below average throughout the summer.



Temperatures throughout Northern Colorado seem to increase every summer and 2018 was no different. The High Plains Regional Climate Center reports temperatures 2-3 degrees higher than average throughout the 2018 summer months. As temperatures increase so does the rate of growth in larval mosquito populations.



West Nile Virus Season

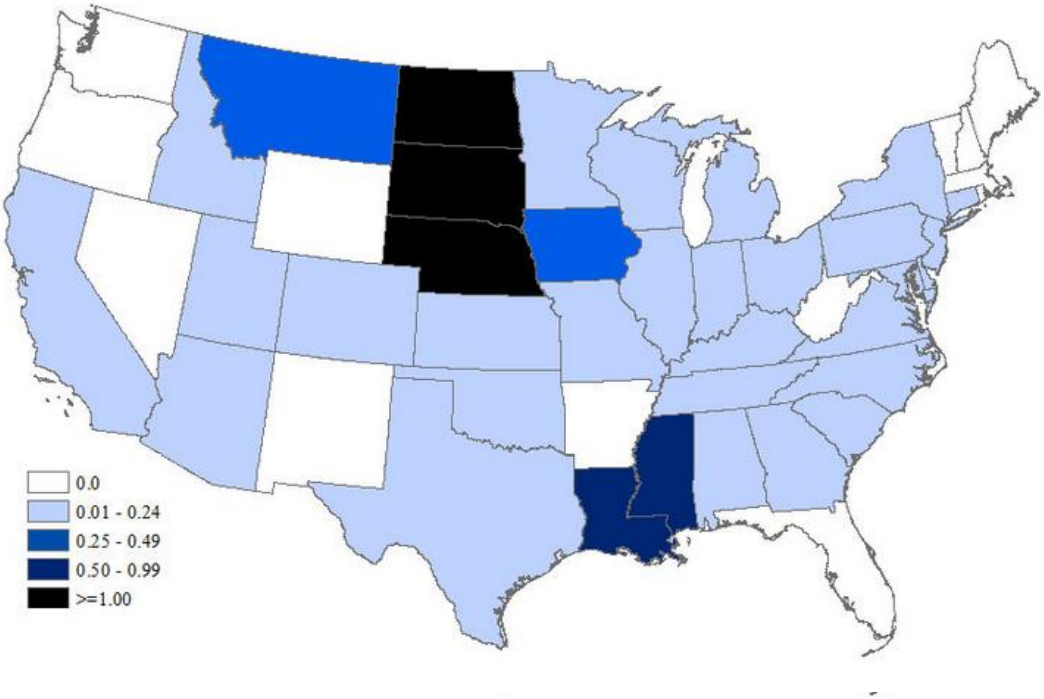
Since the introduction of West Nile virus to the United States in 1999, the virus has made a complete westward expansion to the West Coast. Starting in the Northeastern parts of the United States, the virus steadily spread through the South, the Midwest, the Rocky Mountain region, and to the Western States. This extensive distribution is due to the ability of WNv to establish and persist in the wide variety of ecosystems present across the country. WNv has been detected in 65 different mosquito species in the U.S., though it appears that only a few *Culex* species drive epizootic and epidemic transmission (WNv Guidelines, CDC 2013). Although West Nile virus has been endemic to the United States since 1999, researchers continue to seek an understanding for some of the factors which contribute to region specific spikes in vector abundance and human risk. We still do not understand why some humans develop West Nile fever while other infections develop into more serious West Nile encephalitis or West Nile meningitis cases. Additionally, physicians and researchers continue to seek answers to the variable recovery times and occurrence of deaths that result with some infections. WNv has expanded to the point that it can now be found in all 48 contiguous states and since its introduction has produced two additional, large nationwide epidemics in 2003 and 2012 (WNv Guidelines, CDC 2013).

As of September 4, 2018, a total of 45 states and the District of Columbia have reported West Nile virus infections in people, birds, or mosquitoes in 2018. Overall, 559 cases of West Nile virus disease in people have been reported to CDC. Of these, 312 (56%) were classified as neuroinvasive disease (such as meningitis or encephalitis) and 247 (44%) were classified as non-neuroinvasive disease.

West Nile Virus Activity by State – United States, 2018 (as of September 4, 2018)

*WNV human disease cases or presumptive viremic blood donors. Presumptive viremic blood donors have a positive screening test which has not necessarily been confirmed.

West Nile Virus Neuroinvasive Disease Incidence by State – United States, 2018 (as of September 4, 2018)



This map shows the incidence of human West Nile virus neuroinvasive disease (e.g., meningitis, encephalitis, or acute flaccid paralysis) by state for 2018 with shading ranging from 0.01-0.24, 0.25-0.49, 0.50-0.99, and greater than 1.00 per 100,000 population.

Neuroinvasive disease cases have been reported to ArboNET from the following states for 2018: Alabama, Arizona, California, Colorado, Connecticut, Delaware, District of Columbia, Georgia, Illinois, Iowa, Kansas, Kentucky, Louisiana, Maryland, Minnesota, Mississippi, Nebraska, New Jersey, North Carolina, North Dakota, Ohio, Oklahoma, Pennsylvania, South Carolina, South Dakota, Tennessee, Texas, Virginia, and Wisconsin.

Colorado 2018

As of August 21st, the Centers for Disease Control has reported 16 cases of human West Nile virus (WNv) infections from the state of Colorado. 8 of these cases were neuroinvasive including symptoms of meningitis or encephalitis (including meningoencephalitis), and 8 were non-neuroinvasive which includes cases where individuals are non-symptomatic or present with fever and other minor symptoms. To date, there have been no deaths associated with West Nile virus infections from Colorado in 2018.

West Nile Virus Disease Cases by State 2018

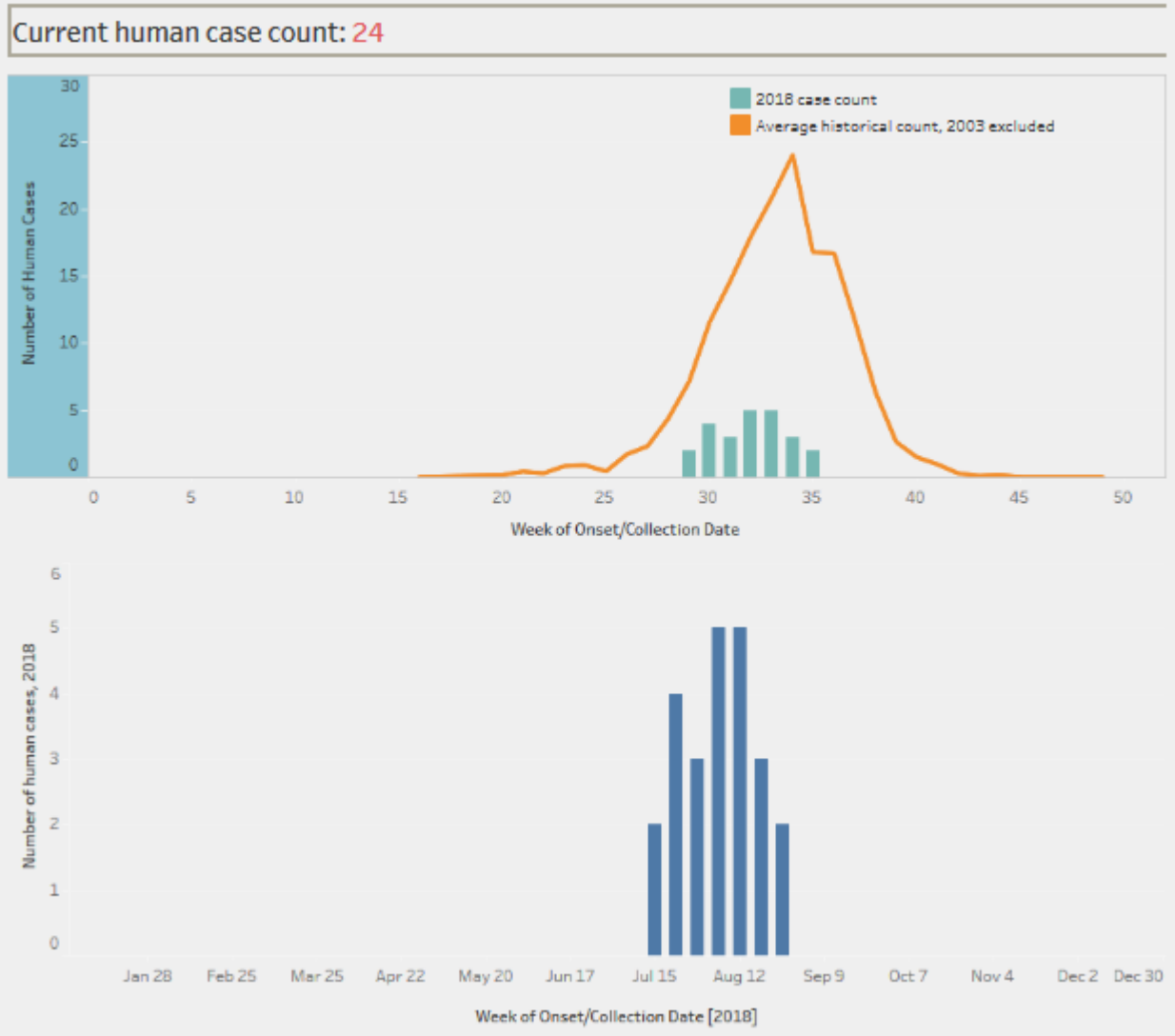
West Nile Virus Disease Cases* and Presumptive Viremic Blood Donors by State – United States, 2018 (as of September 4, 2018)

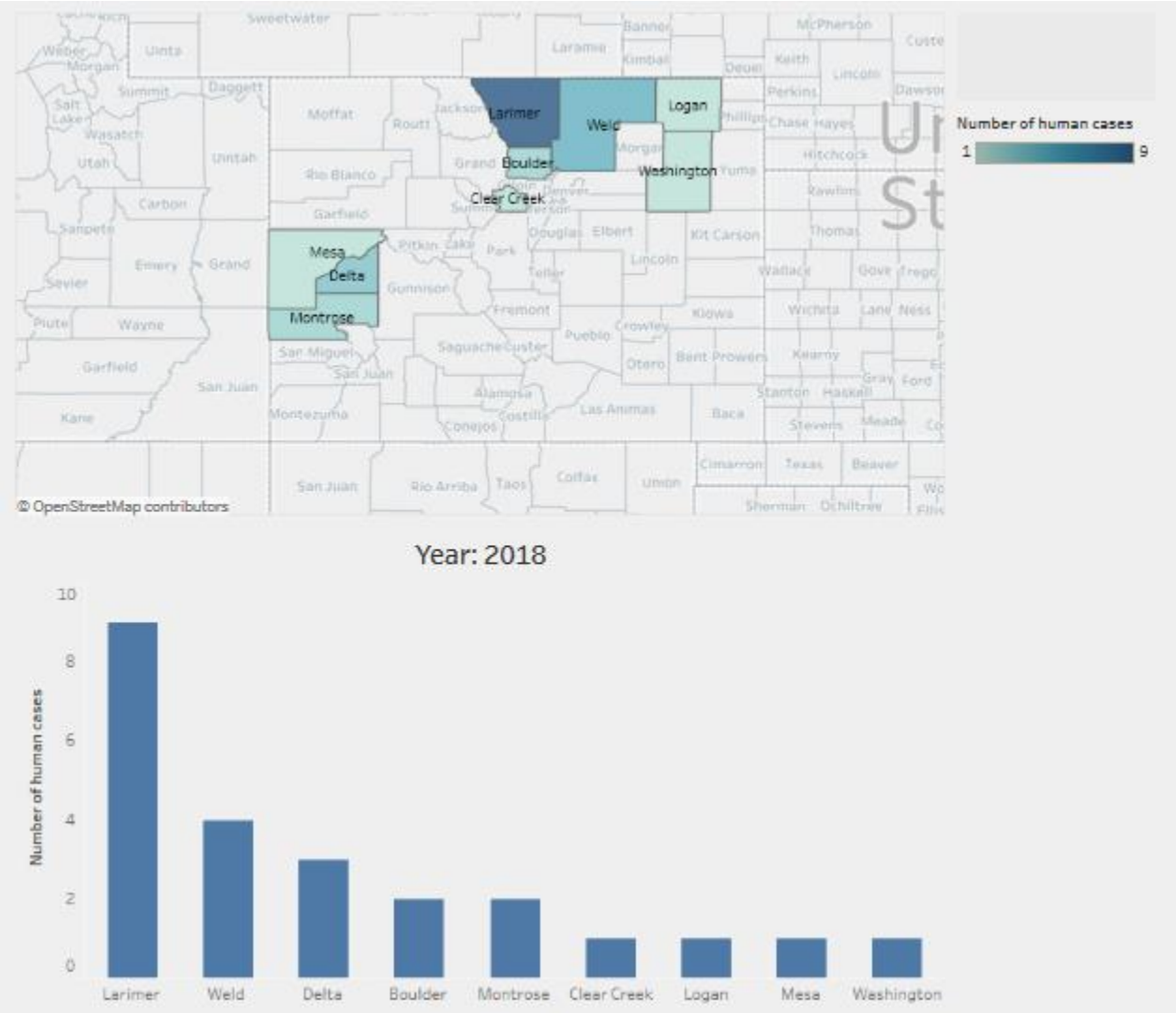
State	Neuroinvasive Disease Cases†	Non-neuroinvasive Disease Cases	Total cases	Deaths	Presumptive viremic blood donors‡
Colorado	8	8	16	0	1

(https://www.cdc.gov/westnile/statsmaps/preliminarymapsdata2018/disease-cases-state.html)

The Colorado Department of Health and Environment reports a total of 24 human cases of West Nile virus infection from the state of Colorado. Many of these human cases are concentrated in Northern Colorado with 9 human cases reported from Larimer County, 4 from Weld County and 2 from Boulder County. While we have passed the historical peak of WNv risk these numbers are expected to rise as there is often a delay in onset of symptoms, diagnosis and reporting. Please note that the additional cases reported by CDPHE will also be reported to the Centers for Disease Control.

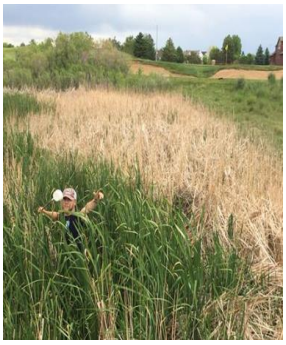
Nine Counties across the state of Colorado have reported human West Nile virus infection. These include Larimer, Boulder, Weld, Clear Creek, Delta, Logan, Mesa, Montrose and Washington.




Larimer
Weld
Logan
Boulder
Washington
Clear Creek
Mesa
Delta
Montrose
Number of human cases
1
9
© OpenStreetMap contributors
Year: 2018
Number of human cases
10
8
6
4
2
0
Larimer
Weld
Delta
Boulder
Montrose
Clear Creek
Logan
Mesa
Washington

Larval Mosquito Control

Larval mosquito control is the foundation of Water Valley and Pelican Lake's Mosquito Control program and can be an extremely effective way to manage mosquitoes, thereby reducing the number of potential disease vectors and annoyances associated with biting adults. Years of research and practical experience have shown that the most effective way to control mosquito populations is through an aggressive Integrated Mosquito Management (IMM) approach. This approach aims at using a variety of concepts, tools, and products to reduce a pest population to a tolerable level.



Pre-season larval control work involved ground truthing GIS maps and remapping areas where new development or flooding had altered the landscape. VDCI began larval site inspections in many areas mid-April. Hiring of seasonal field technicians began in March and continued into May. VDCI's Annual Field Technician Classroom Training Day took place on May 21st with over 50 new and returning field technicians in attendance. Field training by VDCI management and veteran employees lasted through May and full-time field activities were in force by mid-June.

In 2018, Vector Disease Control field technicians performed 241 larval site inspections within the Water Valley and Pelican Lakes area, of which 189 (78.4%) were wet upon inspection, 117 (61.9%) were producing mosquito larvae. To prevent these larvae from emerging as adult mosquitoes, VDCI applied 539.4 lbs. of VectoBac (Bti) to 78.2 acres of land.

In 2017, Vector Disease Control field technicians performed 261 larval site inspections within the Water Valley and Pelican Lakes area, of which 220 (84.3%) were wet upon inspection, 93 (41.8%) were producing mosquito larvae. To prevent these larvae from emerging as adult mosquitoes, VDCI applied 363.8 lbs. of VectoBac (Bti) to 66.7 acres of land.

In 2016 Colorado Mosquito Control performed 183 larval site inspections, of which 156 (85.2%) were wet upon inspection, 94 (60.3%) were producing mosquito larvae. CMC applied 411.2 lbs. of VectoBac (Bti), and 1 lbs of Vectolex (Bs) to 67.3 acres of land.

Larval mosquito control can be achieved in several ways including biological, biochemical, chemical, and mechanical means. No single larvicide product will work effectively in every habitat where mosquito larvae are found, so a variety of products and methods should be employed. Additionally, although there are a variety of methods for reducing larval populations, some may have negative consequences that outweigh their benefits. Mechanical or physical habitat modification is a technique which VDCI uses on relatively small scale projects, as the area to be modified must be carefully reviewed.

VDCI's favored method of larval mosquito control is through the use of bacterial bio-rational products. The main product used by VDCI is a variety of bacteria (*Bacillus thuringiensis var. israeliensis*). *Bti,* as it is known, has become the cornerstone of mosquito control programs throughout the world. The benefits include its efficacy and lack of environmental impacts. When used in accordance with its label, successful control of mosquito larvae can be achieved

without impact to non-target species such as other aquatic invertebrates, birds, mammals, fish, amphibians, reptiles, or humans. A broad label allows for the use of the product in the majority of the habitats throughout the service area. Another bacterial product closely related to *Bti* is *Bacillus sphaericus (Bs)*. *BS* provides similar benefits to *Bti* while also providing residual control of certain species of mosquitoes. It is used specifically in difficult to treat areas where *Culex* are the predominant species due to its limitations and high cost.

Other larval control products include the insect growth regulator methoprene (Altosid), and light mineral oils (BVA 2 larvicide oil). Methoprene is a synthetic version of a juvenile growth hormone in larval mosquitoes. The hormone prevents the normal development of larval mosquitoes into pupae and adults, eventually causing death. VDCI limits the use of chemical larvicides to areas with little biodiversity, such as road side ditches, or areas that chronically produce high mosquito populations. They are only used after a thorough assessment has been made of any habitat where their use is being considered. Mineral oil is the only product effective in controlling mosquito pupae and therefore is an essential tool when pupae are present.

VDCI Surveillance Laboratory

Information about mosquito abundance and species diversity is essential to integrated program. Vector Disease Control International utilizes two kinds of traps to monitor mosquito populations. The most commonly used is the CDC light trap which uses carbon-dioxide from dry ice as bait to attract female mosquitoes seeking a blood meal from a breathing animal. Once attracted by the CO_2, the mosquitoes are lured by a small light to a fan that pulls them into a net for collection. The second type of trap VDCI uses is called a gravid trap. Gravid traps use a tub of highly-organic water as bait to attract female mosquitoes that are looking for a place to lay their eggs. A fan placed close to the water surface forces mosquitoes that come to the water into a collection net. Once back in the laboratory, the contents of the trap nets are counted and speciated by trained technicians.

In 2018, Vector Disease Control International monitored a statewide network of hundreds of weekly trap sites, collecting 687,368 adult mosquitoes that were counted and identified to species by the VDCI Surveillance Laboratories. While individual traps provide only limited information, trap data is interpreted in the context of historical records for the same trap site, going back in time more than a decade. Individual traps are also compared to other traps from around the region that were set on the same night and therefore exposed to similar weather conditions. Technicians working in the Surveillance Laboratories at Vector Disease Control International are trained to provide accurate species-level identification of both larval and adult mosquitoes.

Additionally, the VDCI Surveillance Laboratory conducts an intensive larval identification program with larval mosquito samples collected by I&L technicians prior to larviciding being identified to species. This information is now invaluable in targeting mosquito control efforts as we gain a greater understanding of the habitat types preferred by Colorado mosquito species and the seasonality of these habitats as sites for mosquito development.

Specimens and data collected from these traps and larval identification are used in:

- Determining the effect of larval control efforts. Each mosquito species prefers specific kinds of habitats for larval development. If a trap includes large numbers, it could indicate the presence of an unknown larval habitat and, based on the species identification and known habitat preference for that species, direct field technicians as to possible sources of the mosquitoes collected.

- Determining larval and adult mosquito species. This helps to illustrate the threat of mosquito-borne disease amplification and transmission because different mosquito species can vector different diseases to people and animals.

- Determining where adult control efforts were necessary. While mosquito eradication is impossible, significant population reduction is achievable. In places where larval control is insufficient, such as neighborhoods where adult mosquitoes have migrated in from outside of the control area, it may be necessary to use adulticide methods, such as ULV truck fogging or barrier sprays of harborage areas. Trap counts that exceed an acceptable threshold for an area may trigger adult control measures.

- Surveillance for Mosquito-borne Disease. Historically, VDCI efforts were targeted primarily at controlling mosquito nuisance problems with limited disease surveillance. However, since the arrival of the West Nile virus in Colorado in August of 2002, the paradigm has shifted toward disease prevention and control. Accurate species identification of the mosquitoes in the traps is important when monitoring species population trends. It also is necessary for evaluating whether a population spike represents an actual increase in disease transmission potential or only an increased nuisance level.

SURVEILLANCE LIGHT TRAP DATA

In 2018, there were 24 CDC light surveillance traps set within Water Valley and Pelican Lakes Golf Course, which collected a total of 1,565 mosquitoes. There was an average of 65 mosquitoes caught per trap per night and an average 21 Culex mosquitoes per trap per night. The composition of mosquitoes trapped was 32.6% (510) Culex spp., 66.7% (1,044) Aedes/Ochlerotatus spp. and <1% (11) Culiseta spp. Please refer to the Light Trap Genus Summary for a weekly breakdown of mosquitoes collected by trap location.

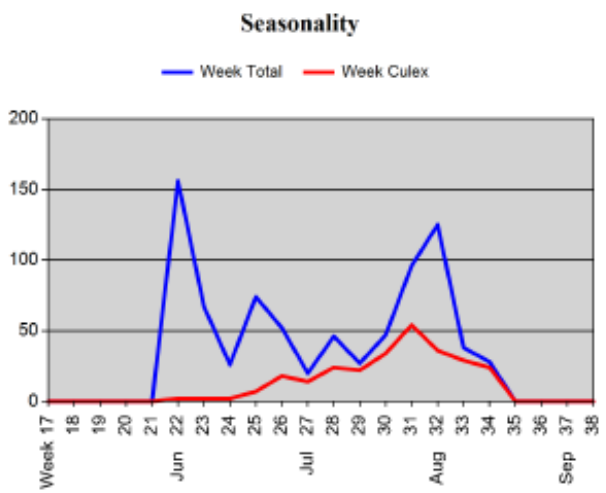
In 2017, there were 26 CDC light surveillance traps set within Water Valley and Pelican Lakes Golf Course, which collected a total of 1,278 mosquitoes. There was an average of 49 mosquitoes caught per trap per night and an average 10 Culex mosquitoes per trap per night. The composition of mosquitoes trapped was 21.3% (272) Culex spp., 78.5% (1,003) Aedes/Ochlerotatus spp. and 0.2% (2) Culiseta spp. Please refer to the Light Trap Genus Summary for a weekly breakdown of mosquitoes collected by trap location.

2018 Water Valley CDC Trap Composite Data

Total number of trap/nights set:	24
Total number of mosquitoes collected:	1,565
Average mosquitoes per trap/night:	65
Average Culex per trap/night:	21

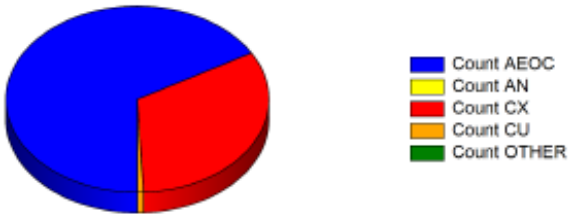
Species collected and abundance:

Aedes (Oc.) dorsalis	55	3.5 %
Aedes (Oc.) increpitus	4	0.3 %
Aedes (Oc.) melanimon	108	6.9 %
Aedes (Oc.) trivittatus	1	0.1 %
Aedes vexans	876	56.0 %
Culex pipiens	216	13.8 %
Culex salinarius	23	1.5 %
Culex tarsalis	271	17.3 %
Culiseta inornata	11	0.7 %



Genus proportions:

Genus	Number	Percent of Total
Aedes/Ochlerotatus	1,044	66.7 %
Anopheles	0	0.0 %
Culex	510	32.6 %
Culiseta	11	0.7 %
Other	0	0.0 %



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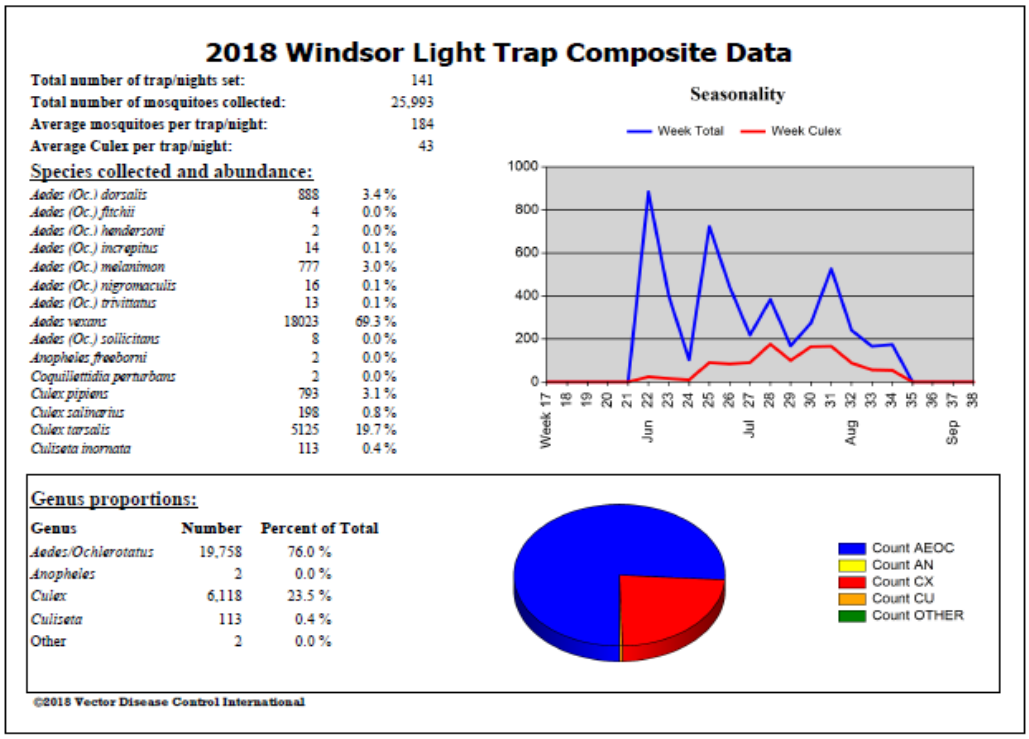

2018 Windsor Light Trap Composite Data

Total number of trap/nights set: 141
Total number of mosquitoes collected: 25,993
Average mosquitoes per trap/night: 184
Average Culex per trap/night: 43

Species collected and abundance:

Aedes (Oc.) dorsalis	888	3.4 %
Aedes (Oc.) fitchii	4	0.0 %
Aedes (Oc.) hendersoni	2	0.0 %
Aedes (Oc.) increpitus	14	0.1 %
Aedes (Oc.) melanimon	777	3.0 %
Aedes (Oc.) nigromaculis	16	0.1 %
Aedes (Oc.) trivittatus	13	0.1 %
Aedes vexans	18023	69.3 %
Aedes (Oc.) sollicitans	8	0.0 %
Anopheles freeborni	2	0.0 %
Coquillettidia perturbans	2	0.0 %
Culex pipiens	793	3.1 %
Culex salinarius	198	0.8 %
Culex tarsalis	5125	19.7 %
Culiseta inornata	113	0.4 %

Seasonality

Genus proportions:

Genus	Number	Percent of Total
Aedes/Ochlerotatus	19,758	76.0 %
Anopheles	2	0.0 %
Culex	6,118	23.5 %
Culiseta	113	0.4 %
Other	2	0.0 %

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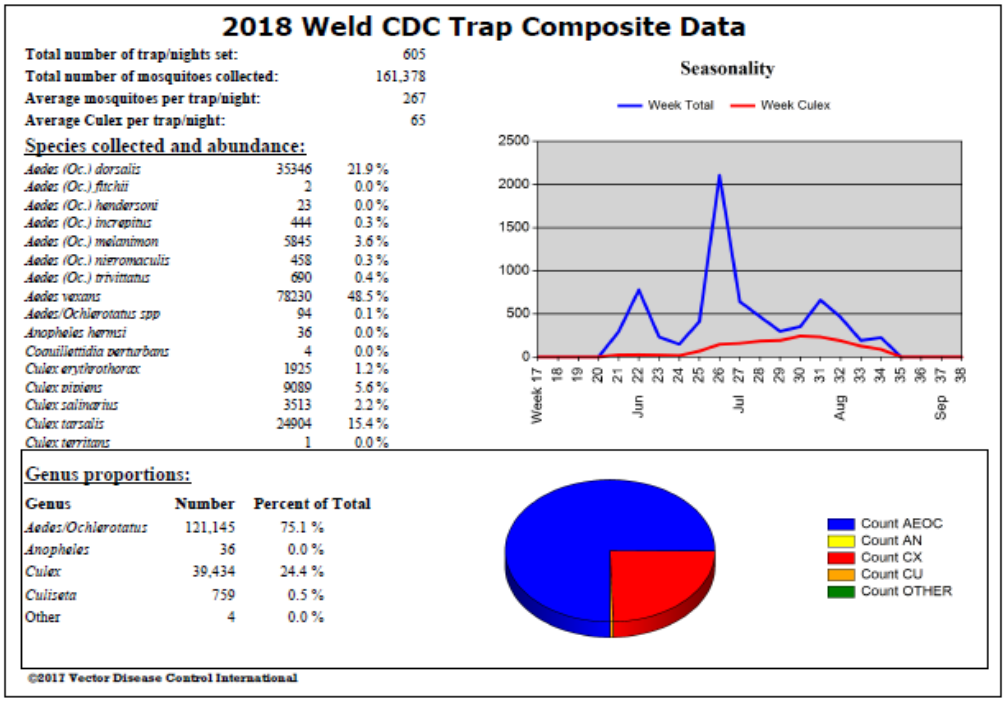
By comparison, in 2018, there were a total of 605 surveillance light traps set within the entire Weld County area, which collected 161,378 total mosquitoes. The average number of mosquitoes collected per trap per night was 267 and the average number of *Culex spp.* mosquitoes collected per trap per night was 65. See image below for percent composition of mosquitoes collected in Weld County.



2018 Weld CDC Trap Composite Data

Total number of trap/nights set: 605
Total number of mosquitoes collected: 161,378
Average mosquitoes per trap/night: 267
Average Culex per trap/night: 65

Species collected and abundance:

Aedes (Oc.) dorsalis	35346	21.9 %
Aedes (Oc.) fitchii	2	0.0 %
Aedes (Oc.) hendersoni	23	0.0 %
Aedes (Oc.) increpitus	444	0.3 %
Aedes (Oc.) melanimon	5845	3.6 %
Aedes (Oc.) nigromaculis	458	0.3 %
Aedes (Oc.) trivittatus	690	0.4 %
Aedes vexans	78230	48.5 %
Aedes/Ochlerotatus spp	94	0.1 %
Anopheles harrisi	36	0.0 %
Coquillettidia perturbans	4	0.0 %
Culex erythrothorax	1925	1.2 %
Culex pipiens	9089	5.6 %
Culex salinarius	3513	2.2 %
Culex tarsalis	24904	15.4 %
Culex territans	1	0.0 %

Seasonality

Genus proportions:

Genus	Number	Percent of Total
Aedes/Ochlerotatus	121,145	75.1 %
Anopheles	36	0.0 %
Culex	39,434	24.4 %
Culiseta	759	0.5 %
Other	4	0.0 %

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CSU West Nile Virus Mosquito Sample Testing Results - Larimer County

Many local health departments have moved towards mosquito-based surveillance indicators to assess the weekly risk of West Nile transmission and guide response decisions for adult mosquito control applications. The vector index and infection rate is derived by testing the mosquitoes VDCI collects for the presence of West Nile virus. This value is closely monitored by the CDPHE and local health departments to evaluate the risk posed by the vector mosquito population.

As defined in the CDC guidelines for West Nile virus surveillance, prevention and control, the vector index (VI) is an estimate of the number of West Nile virus infected mosquitoes in an area. This number can serve as a human health risk value. An operational value of 0.5, which was derived from the comparison of historical data for human infections, as well as relative abundance and infection in mosquitoes, serves as an indicator of high risk for West Nile virus transmission to humans in the corresponding area. As the value of the vector index increases there is a corresponding risk of human disease and this value can be used to offset epidemics.

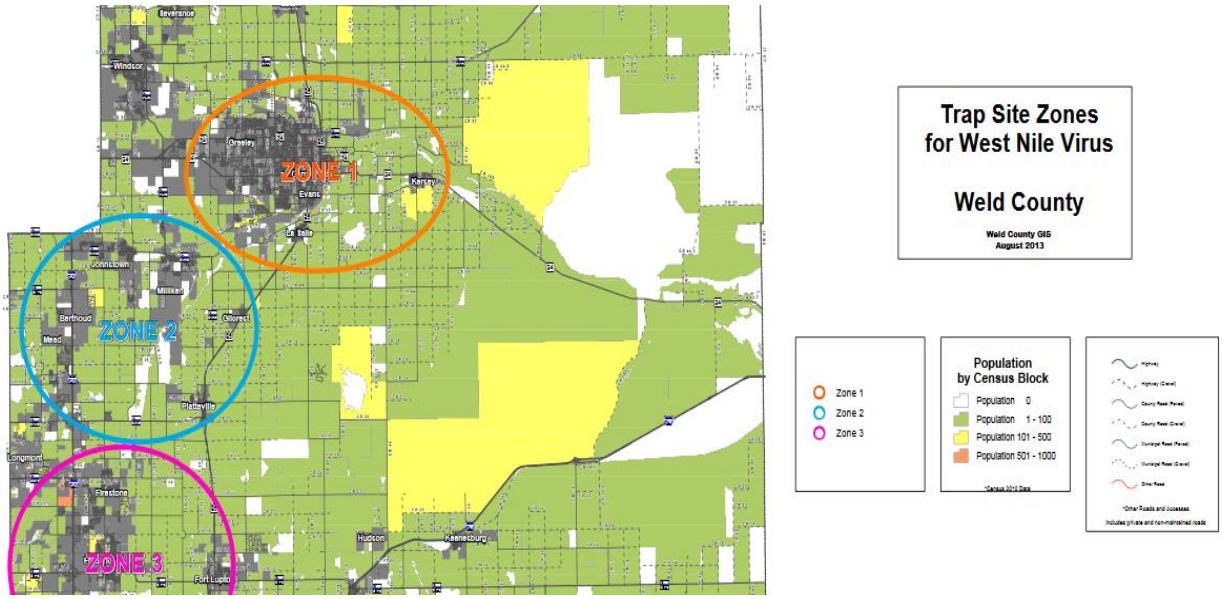
Due to budget cutbacks associated with West Nile virus surveillance in recent years, the CDPHE does not have the ability to test mosquitoes from across the state. As a result, there is very limited testing done within unincorporated Weld County and there were no traps tested from Water Valley and Pelican lakes in 2018. As stated on the CDPHE website, the seasonal variation of West Nile virus risk can change throughout a summer and it is best to assume you have some risk for WNV if you have mosquitoes.

As of Sept 1st, 2018 Colorado State University's Department of Microbiology, Immunology and Pathology, has tested a total of 1,283 mosquito pools from Larimer County. A total of 85 mosquito pool samples have tested positive for WNv with 4 of those being collected from Berthoud, 5 from Loveland and 76 from the City of Fort Collins. Testing of these mosquitoes for West Nile virus is paid for by the City of Fort Collins, Loveland, and Berthoud. Its important to note that the large number of WNv positive sample pools reported from Fort Collins is highly correlated with the fact they test all mosquitoes with the potential for transmitting disease versus just a subset of the population.

CDPHE West Nile Virus Mosquito Sample Testing Results – Weld County

In 2018 there were a total of 164 mosquito pools samples submitted for West Nile virus testing from mosquitoes collected in Weld County from all three sentinel zones. There were 17 confirmed positive samples.

Vector Index Log			
Week	Zone 1	Zone 2	Zone 3
June 10-16	0	0	0
June 17-23	0	0	0
June 24-30	0	0	0
July 1-7	0	0	0
July 8-14	0	0	0.07
July 15-21	0	0	0
July 22-28	0.20	0.20	0.20
July 29-August 4	0.00	0.67	0.40
August 5-11	0.46	0.37	0.19
August 12-18	0.20	0.61	0
August 19-25	0	0.20	0.17



Adult Mosquito Control

The goal of Vector Disease Control International is to provide our customers with the best options for safe, effective, modern mosquito management. The primary emphasis of the Water Valley and Pelican Lakes Mosquito Management Program is to control mosquitoes in the larval stage, using safe biological control products. When mosquito counts surpass action thresholds of 100 mosquitoes, VDCI uses EPA and CDC approved adulticides to reduce mosquito populations. During the 2018 season a total of 37 miles of roads and access paths within the Water Valley and Pelican Lakes area were fogged using AquaKontrol 3030.

VDCI uses state of the art technology, calibrated application timing, and least-toxic products to minimize non-target impacts. All adult mosquito control is accomplished using Ultra Low Volume (ULV) fogging equipment and performed after dusk when the majority of mosquito species are most active. This type of equipment produces droplets averaging 12 microns in diameter and allows for a minimal amount of product to be put into the environment. These treatments take place in the evening when mosquitoes are flying in greater numbers and non-target insect activity (for example, day-flying pollinators like bees) is greatly reduced. Using this application technique, the overall goal of minimal environmental impact and effective adult control is achieved in the targeted area.

Vector Disease Control International

Adulticide Data

Customer	Subdiv/Area	Material	Start Time	End Time	Miles
Water Valley					
Backpack					
08/20/2018	Pelican Lakes GC	Talstar	08:20:00	09:27:00	1.0
		Backpack		**Sum**	**1.0**
				Avg	**1.0**
				Min	**1.0**
				Max	**1.0**
Truck					
06/07/2018	WATER VALLEY SOUTH	Aqua Kontrol 30 30	22:29:00	23:04:00	8.0
06/07/2018	WATER VALLEY NORTH	Aqua Kontrol 30 30	21:46:00	22:22:00	8.0
08/09/2018	WATER VALLEY SOUTH	Aqua Kontrol 30 30	22:40:00	23:27:00	10.0
08/16/2018	WATER VALLEY SOUTH	Aqua Kontrol 30 30	12:12:00	12:57:00	10.0
		Truck		**Sum**	**36.0**
				Avg	**9.0**
				Min	**8.0**
				Max	**10.0**
				Grand Total	**37.0**

CMMS - Comprehensive Mosquito Management System ©2017 Vector Disease Control International

Public Relations and Education

VDCI is dedicated to providing strong Public Outreach and Education Programs to residents in all of our communities. Citizen complaints, inquiry, information and satisfaction surveys can aid in evaluating the effectiveness of a program. VDCI constantly looks for ways to better serve the communities we work with and encourages both the citizen and local media involvement in order to increase the effectiveness of our programs. We have clearly demonstrated that commitment and belief by proactively serving Water Valley and Pelican Lakes (and all of our contracted communities) with numerous innovative programs, activities and services.

Customer service is always a high priority for VDCI. We take pride in training each and every technician so that they have the knowledge to provide residents with the correct answers to their questions. Each field technician spends part of their day responding to resident concerns in their work area. This in-field customer service personalizes the mosquito control program, provides VDCI with local information on mosquito activity and presents a valuable opportunity to educate our residents about mosquito biology and control.

MosquitoLine™

VDCI maintains a toll-free telephone line (877-276-4306) and local line to the Northern Colorado Office (970-962-2582) at no cost to the customer. This service can be utilized to accept calls from the public concerning:

- Information about mosquito biology and source reduction of mosquito habitats
- information on program components, operations and monitoring
- Information on program components, operations, and monitoring
- Seasonal West Nile virus activity
- Personal protection options for mosquito annoyances and West Nile virus risk
- Reports about mosquitoes and possible larval mosquito habitats
- Requests to perform larvicide applications and/or opt-out of any adulticide spraying via a shut-off list
- Request notification when adulticide spraying is planned in their neighborhood
- Request health and safety information about mosquito control operations and pesticide products used

VDCI has provided Mosquito Hotlines to the residents in communities which we are contracted to also reduce workload by municipal personnel. This enables direct communication and response by mosquito control employees to resident's concerns about West Nile virus and larval site activity and treatment. VDCI maintains a log of calls received and will summarize call activity in monthly and annual reports.

VDCI received 14 mosquito annoyance calls from residents of the Water Valley area during the 2018 mosquito season. Residents were informed of the Water Valley spray threshold policy which requires 100 mosquitoes per trap night. Residents were given information on how to check weekly trap count data in their area via the interactive dashboard at www.vdci.net/colorado

In 2018 we received 12 email requests for spray notification. Residents were added to our proprietary data management system and will be called the day applications occur.

CALL NOTIFICATION & SHUTOFF SYSTEM

VDCI continues to maintain a comprehensive Call Notification & Shutoff database and will notify residents on the list when conducting ULV adulticide spray applications within Water Valley and Pelican Lakes.

DAILY POSTING OF ULV SPRAY ZONES are maintained and updated online daily at http://www.vdci.net/colorado

Appendix 1: Water Valley Individual Light Trap Summaries

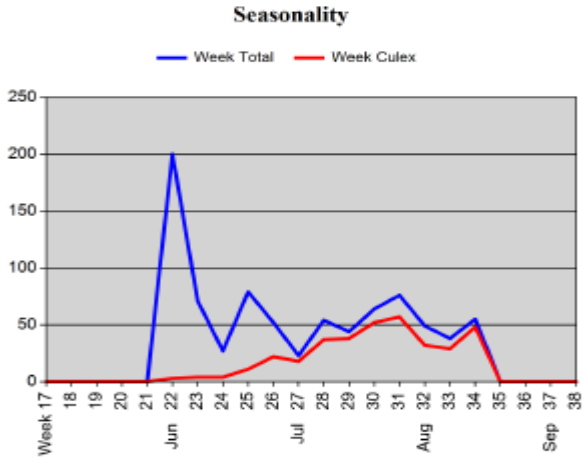
WR-17: Windsor Water Valley North

Season: 2018
Trap Type: Light/CO2
Location: drainage west of Bayside Circle townhomes
GPS: N40° 27.625' W104° 53.865'

Total number of trap/nights set:	13
Total number of mosquitoes collected:	832
Average mosquitoes per trap/night:	64
Average Culex per trap/night:	27

Species collected and abundance:

Aedes (Oc.) dorsalis	9	1.1 %
Aedes (Oc.) increpitus	4	0.5 %
Aedes (Oc.) melanimon	23	2.8 %
Aedes vexans	432	51.9 %
Culex pipiens	201	24.2 %
Culex salinarius	23	2.8 %
Culex tarsalis	131	15.7 %
Culiseta inornata	9	1.1 %



Genus Proportions:

Genus	Number	Percent of Total
Aedes/Ochlerotatus	468	56.3 %
Anopheles	0	0.0 %
Culex	355	42.7 %
Culiseta	9	1.1 %
Other	0	0.0 %

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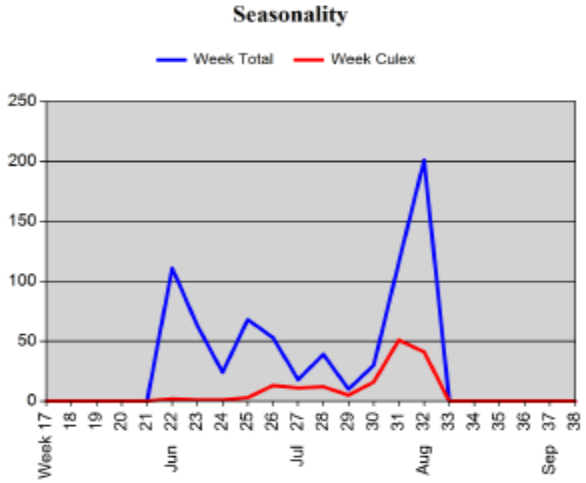
WR-18: Windsor Water Valley South

Season: 2018
Trap Type: Light/CO2
Location: playground near 1859 Seadrift Dr.
GPS: N40° 26.835' W104° 53.725'

Total number of trap/nights set:	11
Total number of mosquitoes collected:	733
Average mosquitoes per trap/night:	67
Average Culex per trap/night:	14

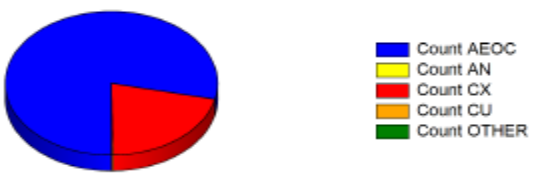
Species collected and abundance:

Aedes (Oc.) dorsalis	46	6.3 %
Aedes (Oc.) melanimon	85	11.6 %
Aedes (Oc.) trivittatus	1	0.1 %
Aedes vexans	444	60.6 %
Culex pipiens	15	2.0 %
Culex tarsalis	140	19.1 %
Culiseta inornata	2	0.3 %



Genus Proportions:

Genus	Number	Percent of Total
Aedes/Ochlerotatus	576	78.6 %
Anopheles	0	0.0 %
Culex	155	21.1 %
Culiseta	2	0.3 %
Other	0	0.0 %



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Appendix 2: Adult Mosquito Surveillance Light Trap Genus Summaries

Vector Disease Control International

Adult Trap Data - Genus Summary

Trap #	Type	County	Date		Ae/Oc	An	Cx	Cs	Other	TOTAL
WR-17	LIGHT	Weld	06/07/2018	Windsor Water Valley North	196	0	3	1	0	**200**
WR-17	LIGHT	Weld	06/14/2018	Windsor Water Valley North	67	0	4	0	0	**71**
WR-17	LIGHT	Weld	06/21/2018	Windsor Water Valley North	22	0	4	1	0	**27**
WR-17	LIGHT	Weld	06/28/2018	Windsor Water Valley North	65	0	11	3	0	**79**
WR-17	LIGHT	Weld	07/03/2018	Windsor Water Valley North	30	0	22	0	0	**52**
WR-17	LIGHT	Weld	07/12/2018	Windsor Water Valley North	4	0	18	1	0	**23**
WR-17	LIGHT	Weld	07/19/2018	Windsor Water Valley North	16	0	37	1	0	**54**
WR-17	LIGHT	Weld	07/26/2018	Windsor Water Valley North	6	0	38	0	0	**44**
WR-17	LIGHT	Weld	08/02/2018	Windsor Water Valley North	12	0	52	0	0	**64**
WR-17	LIGHT	Weld	08/09/2018	Windsor Water Valley North	18	0	57	1	0	**76**
WR-17	LIGHT	Weld	08/16/2018	Windsor Water Valley North	17	0	32	0	0	**49**
WR-17	LIGHT	Weld	08/23/2018	Windsor Water Valley North	8	0	29	1	0	**38**
WR-17	LIGHT	Weld	08/30/2018	Windsor Water Valley North	7	0	48	0	0	**55**
WR-18	LIGHT	Weld	06/07/2018	Windsor Water Valley South	109	0	2	0	0	**111**
WR-18	LIGHT	Weld	06/14/2018	Windsor Water Valley South	62	0	1	0	0	**63**
WR-18	LIGHT	Weld	06/21/2018	Windsor Water Valley South	22	0	0	2	0	**24**
WR-18	LIGHT	Weld	06/28/2018	Windsor Water Valley South	65	0	3	0	0	**68**
WR-18	LIGHT	Weld	07/03/2018	Windsor Water Valley South	40	0	13	0	0	**53**
WR-18	LIGHT	Weld	07/12/2018	Windsor Water Valley South	7	0	11	0	0	**18**
WR-18	LIGHT	Weld	07/19/2018	Windsor Water Valley South	27	0	12	0	0	**39**
WR-18	LIGHT	Weld	07/26/2018	Windsor Water Valley South	5	0	5	0	0	**10**
WR-18	LIGHT	Weld	08/02/2018	Windsor Water Valley South	14	0	16	0	0	**30**
WR-18	LIGHT	Weld	08/09/2018	Windsor Water Valley South	65	0	51	0	0	**116**
WR-18	LIGHT	Weld	08/16/2018	Windsor Water Valley South	160	0	41	0	0	**201**
WR-18	LIGHT	Weld	08/30/2018	Windsor Water Valley South	0	0	0	0	0	**0**