COWLITZ COUNTY MOSQUITO CONTROL DISTRICT

2020 Annual Report

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Cowlitz County

Mosquito Control District

PURPOSE: To operate, maintain, and supervise the services and facilities necessary to control mosquito populations for the benefits desired.

AUTHORITY: R.C.W. 17.28.090

FORMED: August 6, 1990

Mission Statement:

We will minimize mosquito borne disease by reducing mosquito populations in Cowlitz County.

Policy Statement:

It is impossible to eliminate all mosquitoes from the county. By larviciding areas where mosquitoes breed, we can greatly reduce mosquito populations, and thereby reduce the chance of mosquito borne disease. Adult mosquito treatments will only be made when public health is threatened by large populations of mosquitoes that cause extreme annoyance or carry disease.

Office Location:

1319 South 13th Ave
Kelso, WA 98626
Phone: 360-423-5311

Mailing Address:

PO Box 1261
Longview, WA 98632

COWLITZ COUNTY MOSQUITO CONTROL DISTRICT

BOARD OF TRUSTEES

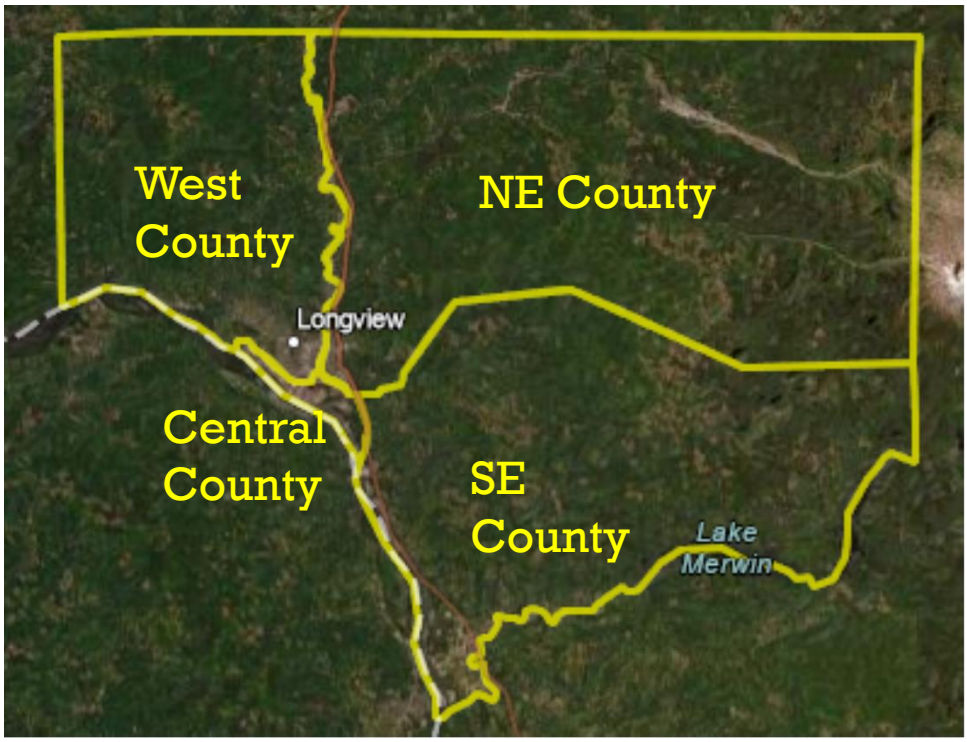
Representing	Trustee Name
Longview	Bill Josh
Cowlitz County Dist. # 1	James 'Mike' Langham
Cowlitz County Dist. #2	Jeane Moksness, President
Cowlitz County Dist. # 3	Rex Ogden
Kelso	Betty J. Wilson, Secretary
Castle Rock	Paul Helenberg
Kalama	Colleen Neel
Woodland	Frank Occhipinti

STAFF MEMBERS

Program Manager	Trevor Schneider
Attorney	Pat Brock
Budgeting & Finance Manager	Charlotte Brock

CCMCD District Boundary

CCMCD covers the entirety of Cowlitz County. The district separates Cowlitz County into four "zones" as shown on the map



INTRODUCTION

Dear Reader,

It is a pleasure to bring to you Cowlitz County Mosquito Control's Annual Report. Contained within this report you will find statistics of the District's operations for the year of 2020.

This year presented some unique challenges especially regarding the COVID-19 Pandemic that swept our County. We experienced many hurdles stemming from the pandemic such as; acquiring personal protective equipment, social distancing creating challenges for communicating with the public and training staff, operations via aerial applications (helicopters), having employees stay home whenever they felt the slightest bit sick to name a few.

In regards to mosquitoes it was a challenging year as well. We started the mosquito season with a relatively dry and warm winter then turned in to a very wet January. The plentiful January rains led to quite a bit of standing water throughout the county and caused enormous hatching of rainwater Aedes mosquitoes in January.

As we moved into the spring the Columbia River, Cowlitz and other rivers made their annual rises with the snow melt. Most years the river rises and falls a few times a year. This year however, the river came up and stayed up through May, June and part of July created new hatching every tidal event.

As we moved into summer, Culex populations quickly grew to moderate levels. This was caused by the considerable amounts of standing water throughout the county from the rivers running high into July and high amounts of rain in June coupled with the the mild winter and high survivability of the mosquito hatch from log pond in 2019. However the bright side of this year was that no logs were placed in the Longview log pond this mosquito season resulting in minimal culex population for this site.

Cq. Perturbans were quite prolific this year. Which is attributed to a wet late summer/early fall leading to lots of habitat, coupled with a warm winter leading to high larval survivability. The Perturbans caused the majority of service requests and the majority of adulticide was used to control Perturbans.

Last but not least, the May and June rains also lead to a high amount of Aedes Sierrienses (tree hole mosquitoes). These mosquitoes caused a handful of service requests. However they are difficult to get a good idea of actual population density as they are not attracted to our normal CO_2 mosquito traps. Future investigation will help determine habitat and location using different traps in suspected and confirmed areas to better assess the issue. These mosquitoes also can be quite hard to find as larvae, sometimes they may be coming from a single tree hole well above eyesight or rubbish hidden in blackberries.

2020 MOSQUITO SEASON AT A GLANCE

2,021
Larval Site Inspections

347
Adult Mosquito Traps set

3,891
Larvae collected and identified

6,058
Adult Mosquitos collected and identified

710
Acres treated for Larvae

5,624
Acres treated for Adult Mosquitoes

58
Public Service Requests

INTEGRATED MOSQUITO MANAGEMENT

Cowlitz County Mosquito Control District (CCMCD) is designed to keep mosquito populations below levels where they become a nuisance or a threat to public health throughout Cowlitz County. The Integrated Mosquito Management (IMM) is used by Cowlitz County Mosquito Control District

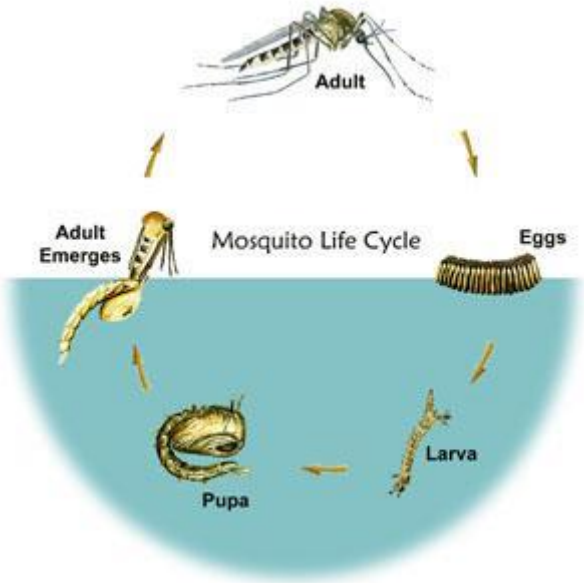
The District utilizes Integrated Mosquito Management (IMM) to formulate operation strategies and response to threats from mosquito borne disease. IMM is an effective integrated strategy endorsed by Washington State's Department of Ecology and the Centers for Disease Control (CDC). IMM emphasizes a strategy of multiple methods to achieve long-term control of mosquito populations in order to prevent adults that are able to spread disease. Prevention is achieved through public education, surveillance, monitoring of treatment threshold levels, and control activities that use the least toxic and most environmentally friendly methods available.

The most important and least visible part of our program involves larval surveillance; searching out mosquito larvae in standing water and using control measures that are cost-effective and environmentally friendly to eliminate these pests before they develop into adults. Most of the products we use are biological in origin and are highly specific for mosquitoes while having little or no effect on other organisms.

Other control measures include environmental manipulation to reduce aquatic habitats such as; removing water flow blockages, removing tires and dumping small containers that are conducive to mosquito production. As well as education of the public, businesses and other agencies on mosquito prevention on their property.

We also use pesticides to kill adult mosquitoes, but this occurs only when adult populations become so large they cause extreme annoyance to many people or when the threat of an outbreak of a disease-causing pathogen is high.

MOSQUITO LIFE CYCLE



Eggs

The common mosquito lays a mass of eggs on the water which float like a raft. Each raft contains 100-400 eggs. The eggs hatch in a day or so into larva.

Larva

The larva, or "wiggler," comes to the water surface to breath through a tube called a siphon. It sheds its skin or molts four times during the next several days. It grows rapidly between molts. On the fourth molt it turns into a pupa.

Pupa

The pupa or "tumbler," cannot eat. It breaths through 2 tubes on it's back. The mosquito grows inside the pupa and in approximately 2 days, when it is fully formed, it splits the pupa skin and emerges as an adult to complete the lifecycle.

Adult

The newly emerged adult rests on the water surface until it is strong enough to fly away and look for food. Only female mosquitoes bite to obtain a blood meal.

MOSQUITO SURVEILLANCE

Cowlitz County Mosquito Control District utilizes a number of surveillance methods:

- Technicians go out in the field to sample standing water for mosquito larva, collect larval samples for identification and larval counts. This allows the technicians to apply the best control measure for larva.
- Service request investigations, are inquiries from the public in regards to nuisance mosquitoes or standing water concerns.
- Lab Technicians trap and identify the populations and specific species of adult mosquitoes. Lab Technicians test adult mosquito samples for West Nile Virus using the RAMP test in the District lab and maintain collection data on mosquitoes and mosquito-borne diseases. CCMCD routinely communicates with other regional mosquito districts, sharing information about mosquito populations and species as an important part of surveillance. CCMCD reports all trapping data including RAMP test results to the Zoonotic Disease Program, and Washington State Department of Health.

The District focuses on four main major groups of human biting mosquito species: Rainwater Aedes, Floodwater Aedes, Cq Perturbans and permanent water mosquitoes.

Rainwater Aedes mosquitoes: Hatch from egg to larvae in the winter following the first hard frost and accumulation of rainwater. These mosquitoes are larvae typically from January through April. They hatch to adults in April and May.

Floodwater Aedes Mosquitos: Hatch from egg to larvae in the spring following the annual rise of local rivers following snow melt. Typically occur between April through June as larvae. These mosquitoes can hatch off in enormous numbers, are very aggressive biters and can travel far distances.

Cq Perturbans: Develop in cattail and similar plant marshes. There is only one emergence per year starting mid May. Adults normally peak around the beginning to middle of July.

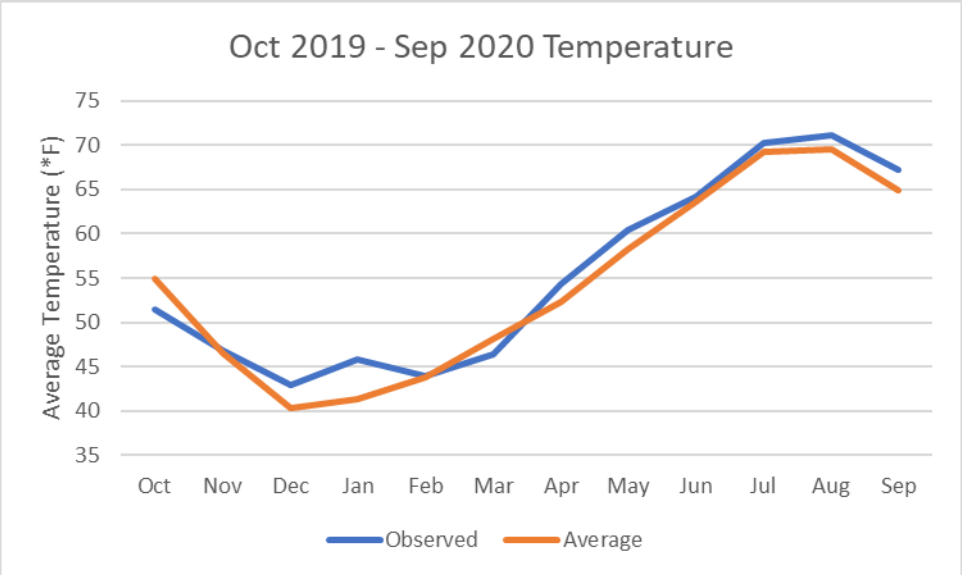
Permanent Water Mosquitoes: Overwinter as adults beginning seeking bloodmeals and laying eggs in early summer. They can produce multiple generations a year and are the primary disease vector mosquitoes.

Dipper for Larval Surveillance

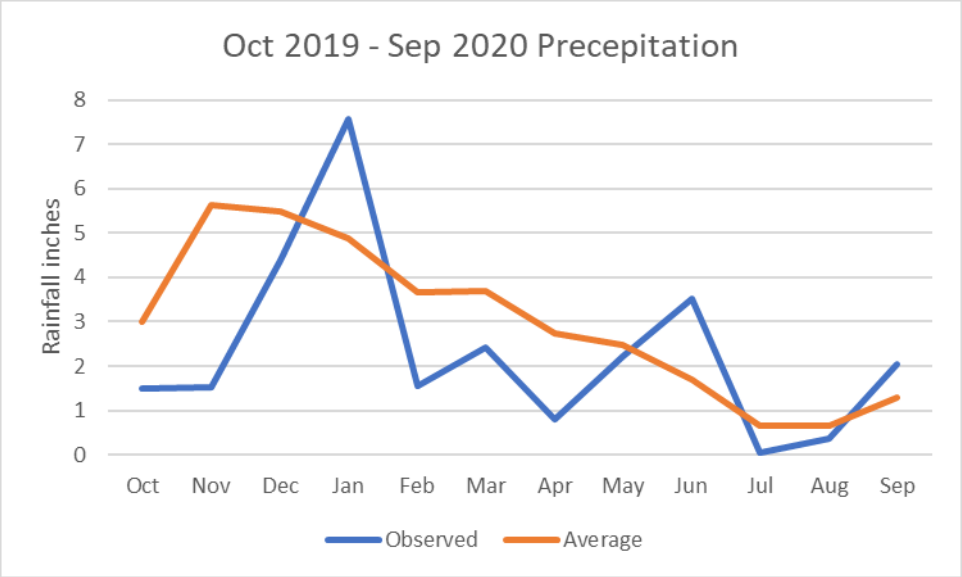
EVS Trap for Adult Surveillance

2020 ENVIRONMENTAL CONDITIONS

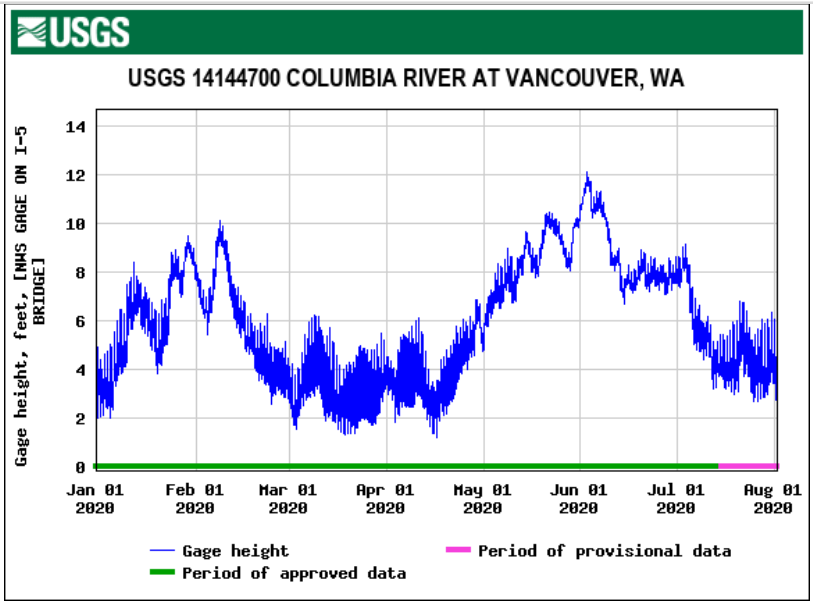
Overall slightly warmer year than average. Winter was warmer than average and that caused the Cq. Perturbans larvae and Culex Adults to have a high survivability through winter.



High amounts of rain in the months of January and June led to hatching of Aedes mosquitoes and abundant areas of water for permanent mosquitoes into summer.



The Columbia River had a peak flow in February causing rain water mosquito hatch out. The river rose in May causing multiple floodwater hatches, and did not recede till the beginning of July.

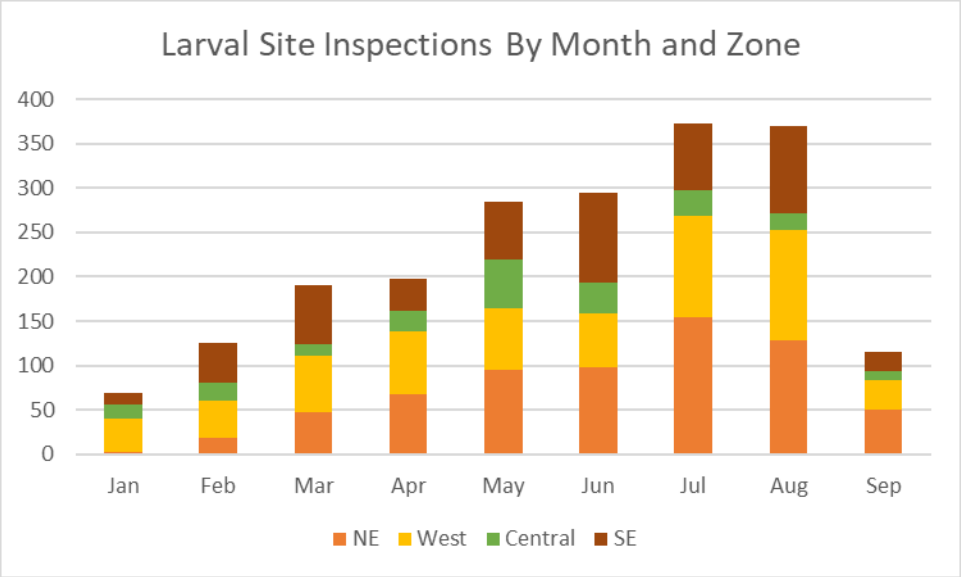


LARVAL SURVEILLANCE

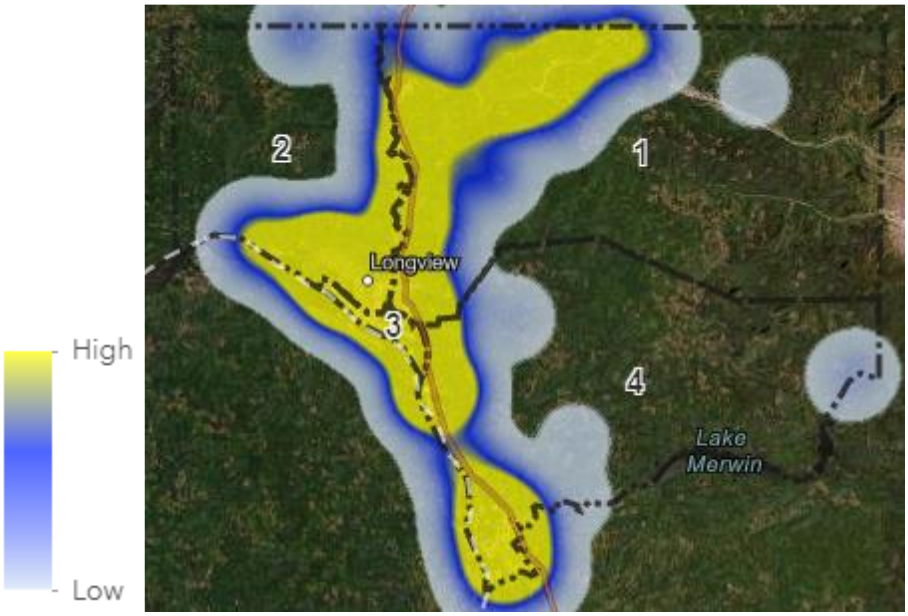
Immature mosquito surveillance can provide early warning to forecast the size of future adult mosquito populations and provide estimates of control effectiveness. The data collected from dipping immature mosquito breeding sites are recorded and maintained. The sites that are found positive for mosquitoes will be mapped by Global Positioning System (GPS). The mosquitoes collected are brought to the CCMCD laboratory for identification. When sufficient data is obtained, the information will be utilized in the control process.

Throughout the Mosquito Season, employees check known and previously unknown areas for larval mosquitoes. This year the District performed **2,021** Larval mosquito inspections throughout the county. If mosquito larvae are found during inspection they are brought back to our lab for identification. This year the District Identified **3,891** mosquito larvae.

Graph shows larval mosquito inspection counts by month and zone. In the early months, sites are considerably larger with more water which reduces the amount that can be visited in the time available. As sites dry up and become smaller it takes less time to check and more sites can be visited.

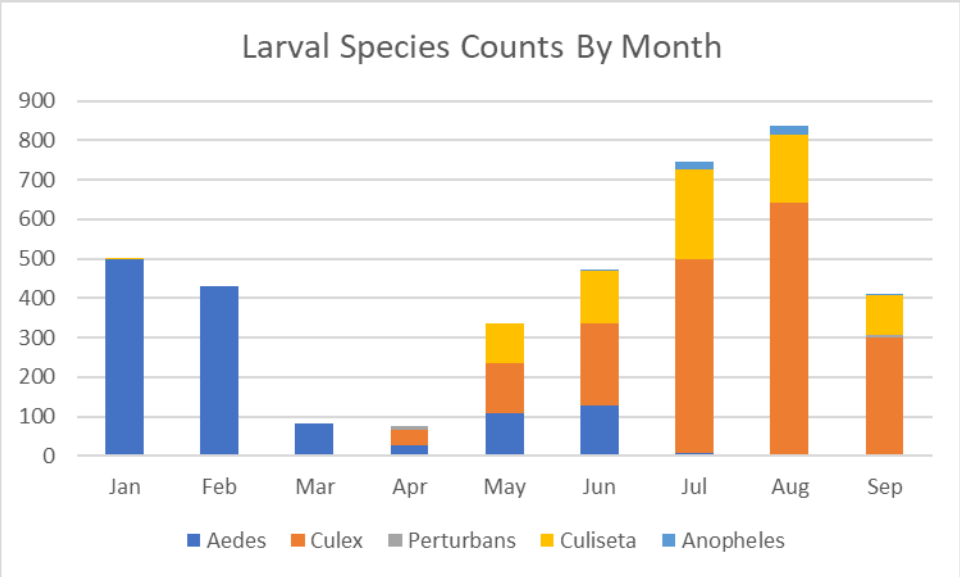


Gradient map shows concentration of larval site inspections throughout the county. Larval inspections are focused on populated areas of the County.



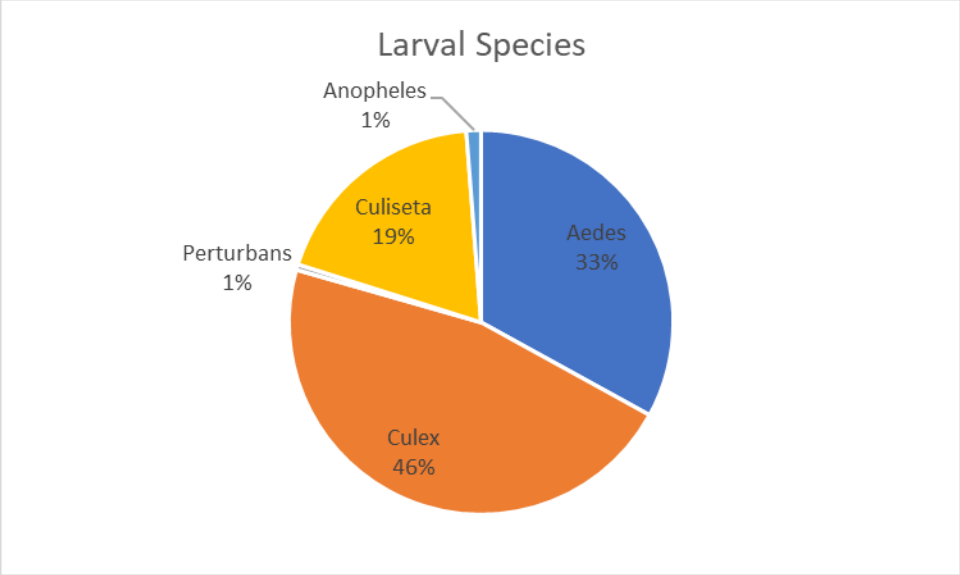
LARVAL SURVEILLANCE CONT.

Graph shows larval mosquito abundance and species by month. Large populations of rainwater mosquitoes were present this year due to high January rains. As the temperature increased through the summer there was a corresponding increase in permanence mosquito larvae found

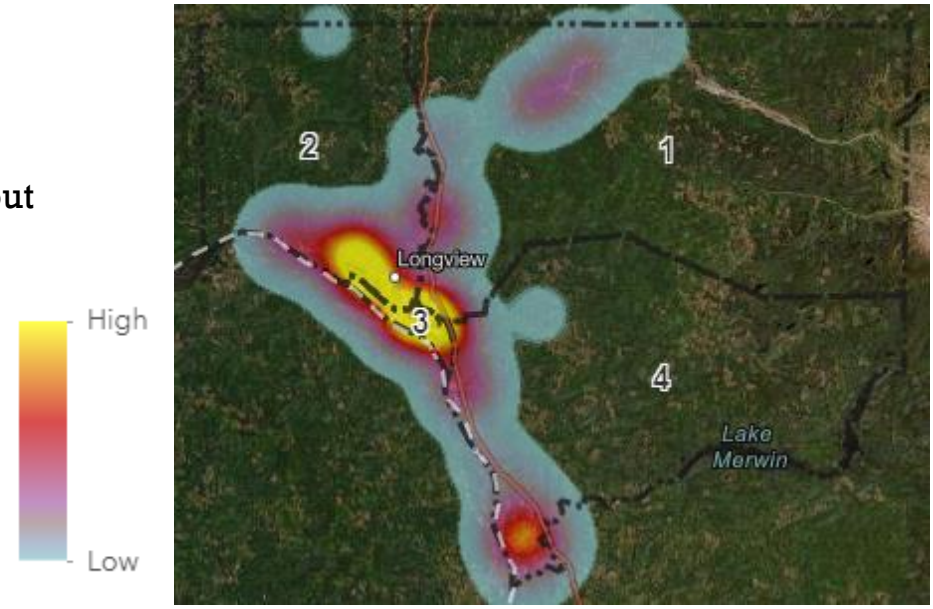


Pie Chart shows Larval species distribution by species. Culex and Aedes being the most abundant this year.

Note; Perturban larvae are very hard to collect and time intensive. Hence not many were collected, this does not reflect their abundance



Gradient Map shows Larval mosquito abundance throughout the County. Most Larvae found around Longview and Kelso Area as well as Woodland.

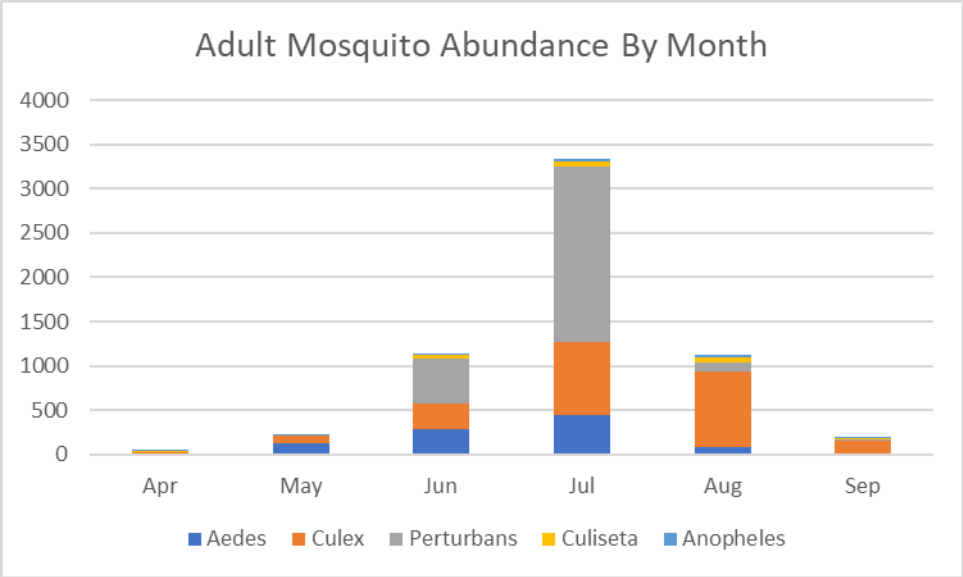


ADULT MOSQUITOES SURVEILLANCE AND TESTING

Monitoring adult mosquito populations provides essential information on population size, infectivity rate and effectiveness of larval and adult control efforts. The primary method used by CCMCD to sample adult mosquito populations is the EVS trap. CCMCD has predetermined locations for placement of these traps, mapped using GPS. The mosquitoes collected in these traps will be returned to the CCMCD laboratory for identification and WNV testing using a RAMP test. All trapping data and test results are reported to the Zoonotic Disease Program through Washington State Department of Health (DOH). Results from these tests will be a key factor in determining the areas requiring adult control measures.

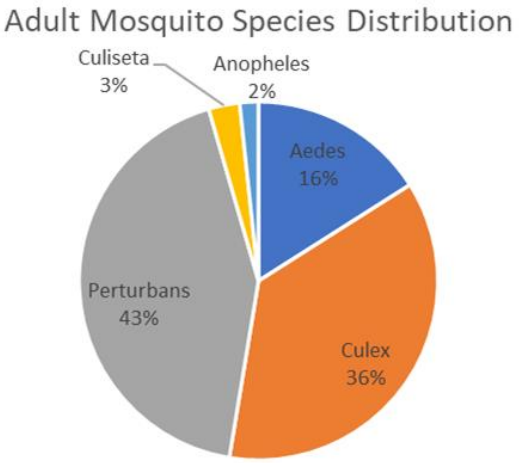
Adult Mosquito trap locations were established throughout the County and trapped every week during the Mosquito Season. We do this to get a weekly picture of county wide mosquito abundance, visualize trends, evaluate mosquito control efficacy and test for Arbovirus emergence. Additionally, the District sets adult mosquito traps at service requests locations. For 2020; in total the District set **347** Adult Mosquito Traps. The District caught and Identified **6,058** Adult Mosquitoes, of those mosquitoes trapped we tested **1,131** Adult Mosquito Vectors for West Nile Virus. All adult mosquitoes tested for West Nile Virus were negative.

Graph shows the adult mosquitoes caught by month and species. Aedes mosquitoes peaked in July, most were flyover from other counties down in Woodland. This year we saw large amounts of Cq. Perturbans throughout county peaking in July. Culex mosquito counts climbed as temperature did through the summer.

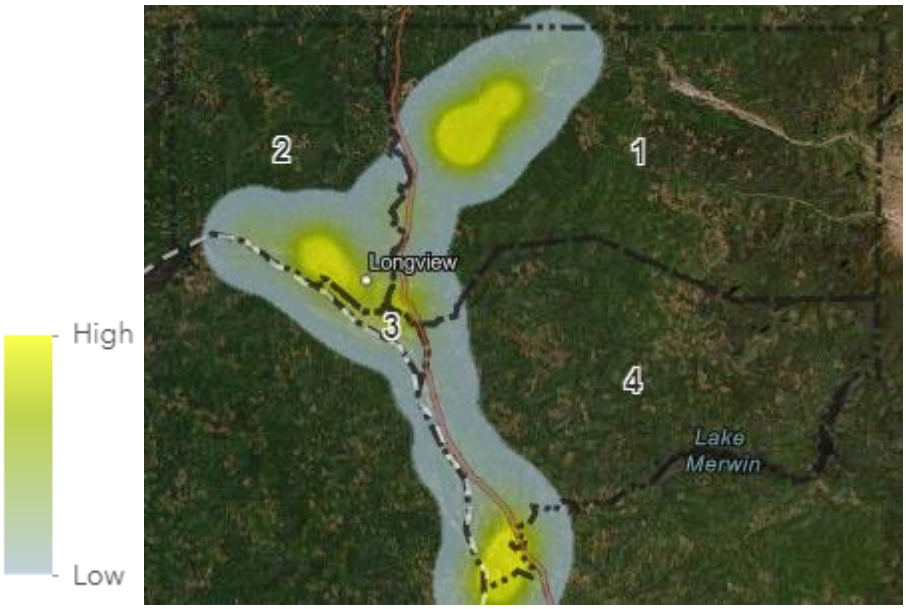


ADULT MOSQUITOES SURVEILLANCE AND TESTING CONT.

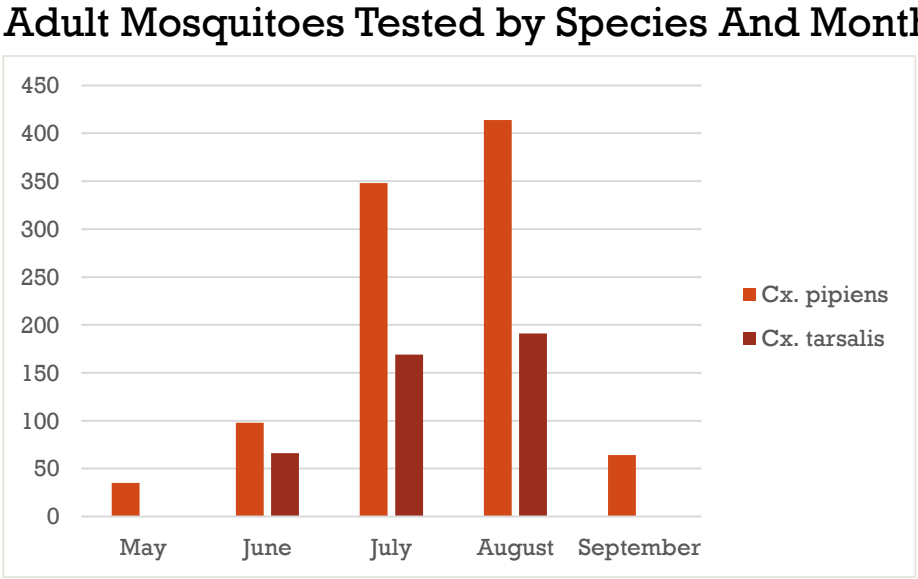
Chart shows the species distribution of adult mosquitoes caught in 2020. Majority of mosquitoes caught were Perturbans and Culex.



Gradient map shows Adult mosquito abundance throughout the county. Majority of Adult Mosquitoes Came from Perturbans at Silver Lake and West Longview and Aedes and Culex flyover in Woodland.



Graph shows the number of mosquitoes tested for West Nile Virus by species and month. Culex Tarsalis and Culex Pipiens are the main WNV Vectors in our District.



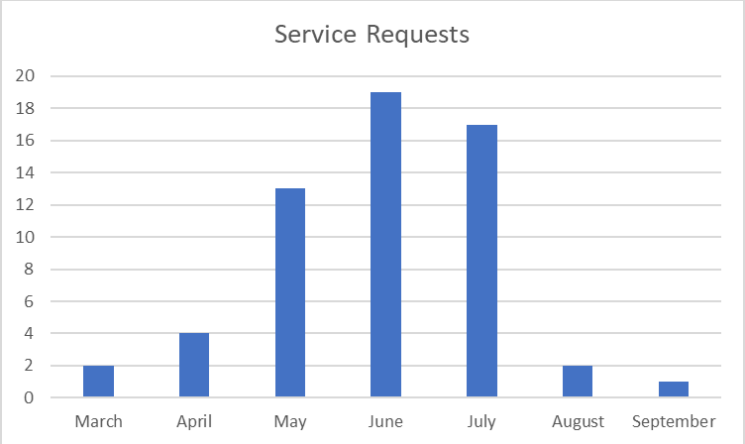
PUBLIC SERVICE REQUESTS

CCMCD has a public phone number for inquiry calls and a request form on our website where citizens can report mosquito problems in their area. All of these requests initiate the following actions.

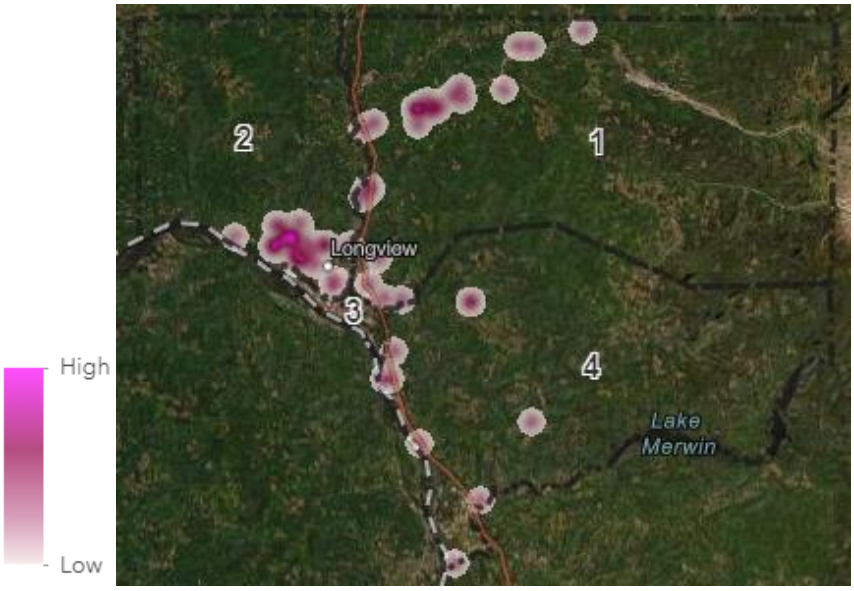
- A return call is made by a Technician to gather more information.
- A Technician visits the location to talk with the property owner and inspect the area for larva development sites.
- An adult trap is set in the area.
- When sufficient data is obtained, the information will be utilized in the control process.

This year the District received **58** mosquito service requests throughout the county. Most of the requests came from west Longview and around Silver Lake, both of which experienced noticeable Cq. Perturban adult numbers.

Graph shows the amount of service requests by month. Service requests peaked in late June and early July as Cq. perturbans began flying around.



Gradient Map shows locations of service request received through the year. Most Request came from Silver Lake and West Longview for Perturbans. We also received a handful of requests from people who saw abundant mosquitoes from log pond last year hoping to remind us to provide service early to prevent high numbers again.



MOSQUITO CONTROL

Integrated Mosquito Management (IMM) is used by Cowlitz County Mosquito Control District. If mosquito surveillance indicates that mosquito abundance thresholds are exceeded, the District will control mosquitoes using the principles of IMM.

Integrated Mosquito Management (IMM) control methods include:

1) habitat source reduction
2) habitat modification
3) larviciding
4) adulticiding

Non-chemical treatment methods are always considered first, but if a chemical pesticide is required, then it will be of the lowest toxicity (and least persistent) pesticide that is efficacious on mosquitoes.

Source Reduction and Habitat Modification

Whenever possible CCMCD will reduce mosquito breeding sites through the elimination of standing water. As part of our public education, we urge residents to eliminate breeding sites around their homes and commercial properties and to report potential standing water in their neighborhoods. Additionally, CCMCD will collaborate with local, state, federal, and private agencies to identify water sources that create mosquito breeding problems and reasonable efforts will be made to reduce mosquito development in these zones.

- The District performed numerous Source reduction tasks through the year, some as simple as turning over buckets to spending hours pulling debris blockages from culverts and drainage channels.
- This year the District is looking into Habitat Modification with other agencies dealing with the invasive plant Yellow Flag Iris. Yellow Flag Iris is a problematic plant in many regards growing very dense clumps in the water. In some areas of the county they are the primary habitat for Cq Perturbans.

LARVAL CONTROL

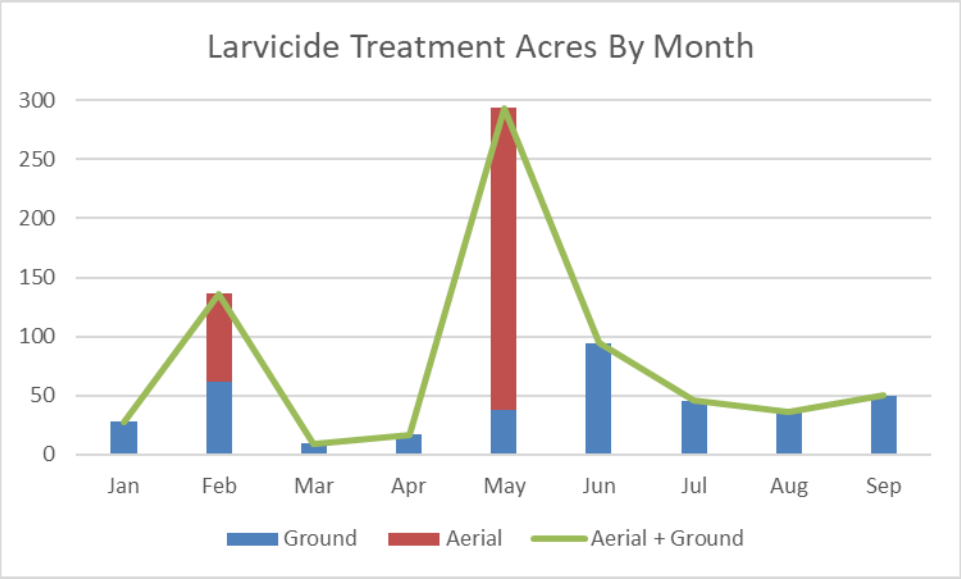
Larviciding is the process of controlling mosquitoes when they are in the larval or pupal form. Controlling mosquitoes when they are in the water is an effective approach because the mosquitoes are concentrated, relatively immobile and mosquito specific larvicides can be used. For many Districts, including Cowlitz County MCD, this is the bulk of their operations.

If surveillance indicators meet established thresholds, the District will reduce development of larvae and pupae by selective use of larvicides in areas that cannot be emptied or drained. CCMCD will consider the toxicity and environmental impact when selecting pesticides and will make efforts to choose the least toxic and environmentally friendly pesticide that meets treatment requirements. The accuracy, quality and efficacy of the larvicide application will be closely monitored to ensure compliance with Federal and State guidelines.

This year the District performed **1,043** larval treatments totaling **710** acres throughout the County. Of those **710** acres treated: **331** acres were performed aerially and **379** acres were done by ground treatments. Aerial treatments are down this year due to challenges and unavailability of helicopter contractor this year. Although aerial treatments were comparatively down we made up for this with more ground treatments, in total we treated above average acreage for larvae. Similar to other years the largest amount of larval treatment acreage occurs during the floodwater season in the spring when the mountain snow melts and brings river levels up.

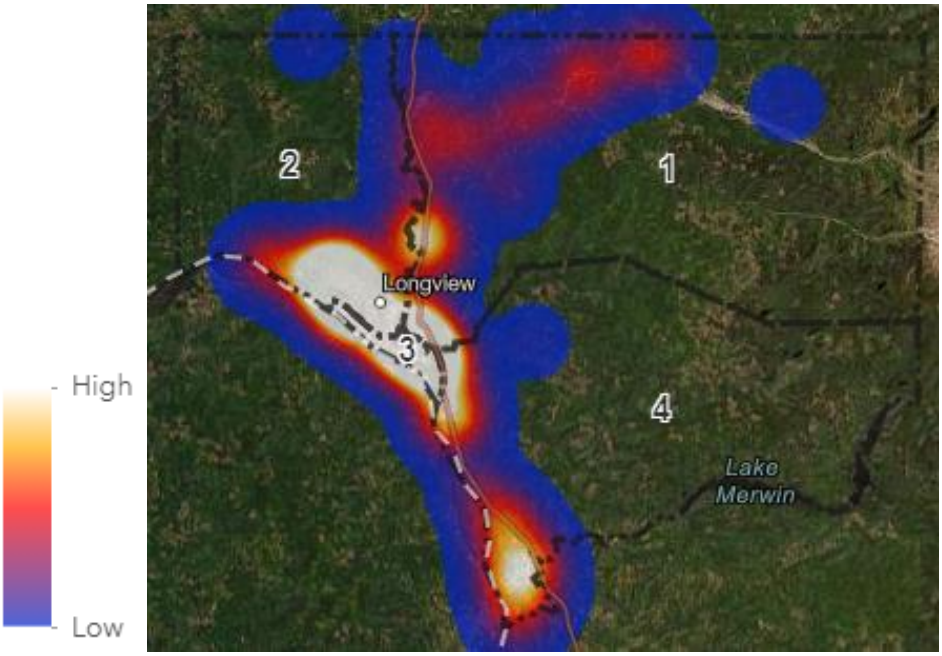
The District also treats storm drain catch basins for larval mosquitoes. This year the District treated **5,207** storm drain basins throughout the county.

Graph shows ground and aerial larval treatments by month. Large rainwater areas and populations led to high treatment area in February. Floodwater hatching in May and Floodwater and Culex hatching in June also led to high amounts of treatments.

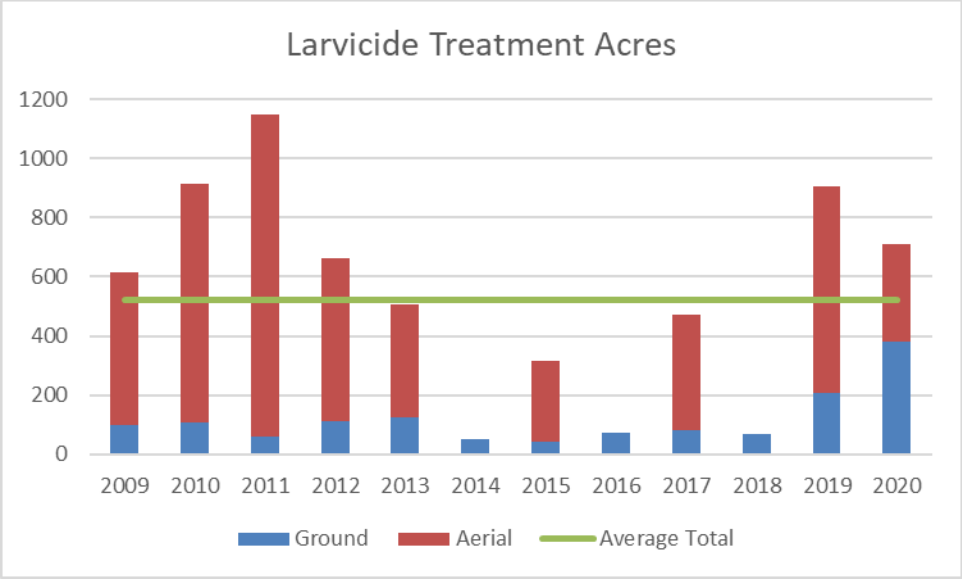


LARVAL CONTROL CONT.

Gradient map shows the distribution of larvicide treatments through the county. Large amount of Larval treatments occurred around Longview and Woodland for Aedes and Culex mosquito Larvae.



Graph shows the amount of aerial and ground larval acres treated compared to previous years. Although helicopter availability challenges reduced aerial treatment acres, we made up for it by increasing ground treatments. Ground treatments were almost 4X past average.



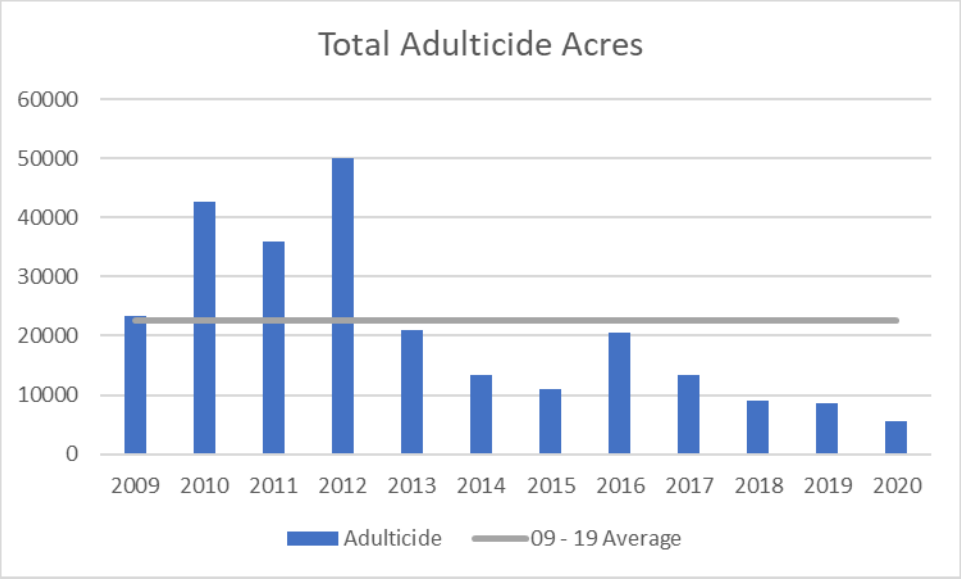
ADULT CONTROL

Adulticiding is the process of controlling mosquitoes when they are mature, flying mosquitoes. Only adult female mosquitoes are the ones that bite, they take a blood meal to reproduce, therefore they provide the largest threat to public health. Adulticiding is necessary because larviciding is not 100% effective, some sites may be unknown, and mosquitoes can migrate into the District from surrounding areas. Also, there are areas that we cannot access to treat, and the mosquitoes have the opportunity to develop without intervention from CCMCD. Adulticiding can provide temporary control of mosquitoes in a given area, but it is not practical as the only method of control.

If surveillance indicators meet established thresholds, adult mosquitoes will be controlled through the use of adulticides. Mosquito density and distribution, mosquito species, persistence of WNV activity, weather, time of year, and the proximity to human populations will be carefully considered in determining the necessity for adult mosquito control. The accuracy, quality and efficacy of the adulticide application will be closely monitored to ensure compliance with Federal and State guidelines. When adulticiding is required, the least toxic products possible will be applied using truck-mounted Ultra Low Volume (ULV) sprayers.

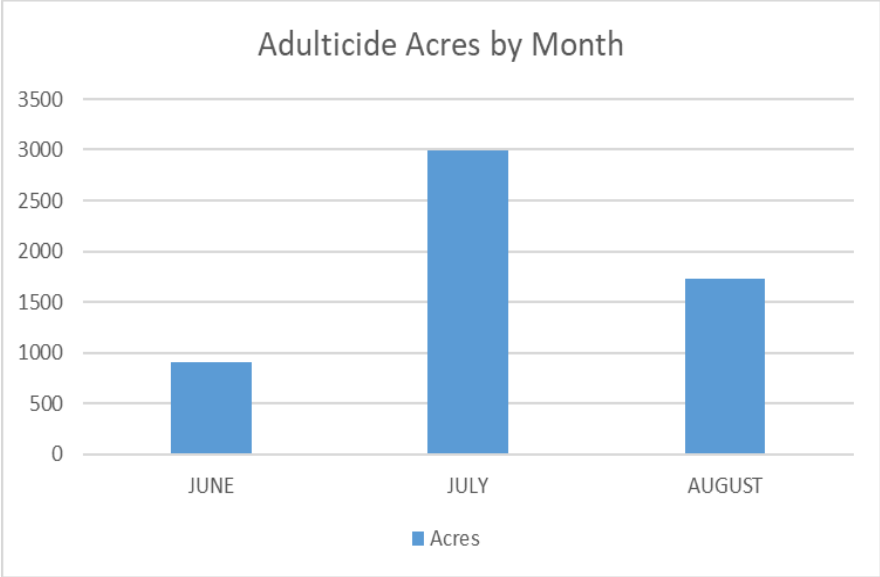
This year was yet another record low year of ULV adulticide acres treated of **5,624** acres from **36** Applications. As we focus more efforts on larval mosquito control, the need for adulticide decreases. Larvicide mosquito treatments are more effective, specific to mosquitos and less harmful to non target species and the environment.

Chart shows adulticide acreage by year. Adulticide acreage is trending down as we focus more on larviciding.

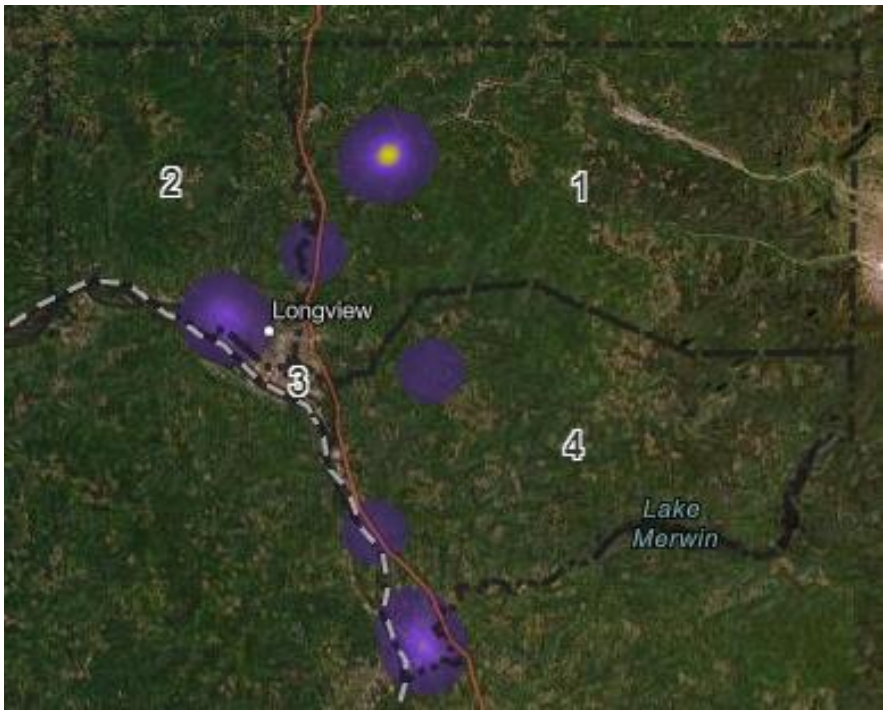


ADULT CONTROL CONT.

Graph shows adulticide acres by month. Most of which occurred in the month of July to control Cq. Perturbans.



Gradient map shows the distribution of adulticide treatments. Majority of adulticide treatments were to control Cq. Perturbans around Silver Lake and West Longview, as well as Aedes and Culex mosquito flyover from neighboring counties in the Woodland area.



PUBLIC EDUCATION AND OUTREACH

Public education is essential part of IMM. Personal prevention and breeding source reduction is vitally important in controlling populations and reducing public nuisance. The more people know about mosquitoes and mosquito borne illnesses, the better they can protect themselves and help in reducing breeding sources.

- **Public Notification:** Notification of our activities is published in local newspapers and website before we begin field work.
- **Service Requests**: We provide community education to homeowners and others about mosquito prevention and control measures
- **Presentations:** Each season we make available presentations to groups interested in our work. We have done this at city council and county commissioner meetings, schools, private organizations such as Kiwanis, Rotary, and homeowner associations.
- **Community Events**: We set up and staff displays at various community celebrations such as the county fair.
- **Web Site:** We maintain a web site with public education material and a request form for further information or to report a mosquito problem.
- **Brochures and Letters:** We provide brochures to individuals who notify us of a complaint or request information.

This year due to COVID-19 restrictions, community events were canceled and presentations to groups were not allowed. We focused our outreach and education in a socially distanced person to person approach to numerous citizens and organizations throughout the season. We also expanded information available over our website including more about our operations including surveillance and treatment methods. We also incorporated an interactive adulticide treatment map so people can know when CCMCD will be in their neighborhood.

TRAINING

All staff is to maintain a current state pesticide license or work under the supervision of a state licensed pesticide applicator. Staff are also offered the necessary training to meet state certification requirements. Staff members attend local, regional and national mosquito association conferences to learn new technological advances. Specialized training in mosquito identification and surveillance, equipment maintenance and use, and other training is provided as needs are identified. Staff are required to review and understand District policies and procedures. Additionally, anyone who handles mosquito control products must attend our annual and monthly staff and safety meetings where we review label and SDS data and discuss the requirements to legally and safely apply each product for worker's protection.

This year due to COVID-19 restrictions most of the trainings we normally would attend through the year had been canceled. Some of the district employees had to attended internet based trainings for education and continuing education credits. In house trainings on District operation, mosquito surveillance and control as well as proper pesticide applications were preformed. Monthly district staff safety meeting were held with social distancing guidelines followed. Pesticide License testing scheduling was challenging with long wait times to test and only a few non-local testing locations.

2021 IMPROVEMENTS AND PROJECTS

Drone Program

For 2021 the District plans to acquire, setup, calibrate and use a drone for larvicide applications in large or hard to access areas. This will provide much better application coverage than is possible from conventual ground treatments with greater speed and efficiency. District Staff who operate the Drone will be properly trained and licensed by the FAA and Washington State Department of Agriculture.

Cq. Perturban Control

Through 2020 the District has been mapping and documenting Cq. larval habitat. During September of 2020, CCMCD started larviciding accessible areas in attempts to reduce numbers. Additionally, in some areas we have been in contact with local drainage districts to have them mechanically remove some of the Yellow Flag Iris larval habitat. In the beginning of the 2021 mosquito season we will continue to treat more Perturban larval habit and will use the drone in the areas inaccessible by ground.

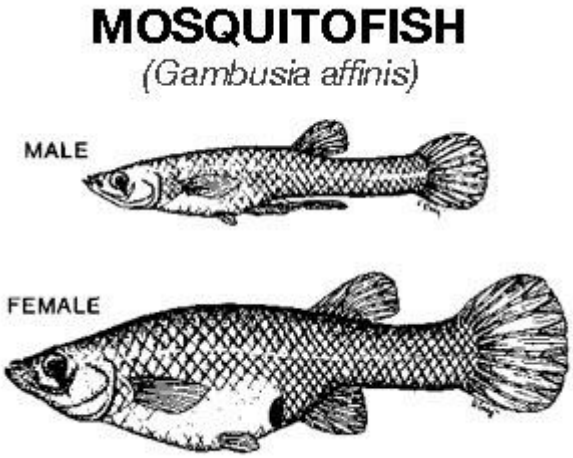
Adulticide Product Rotation

Over the last couple years the District has noticed decreased efficacy of the traditional adulticide product and active ingredient used; Permethrin. The same class of chemical has been used for an extended length of time, so in order to combat resistance of mosquitoes to this chemical CCMCD will be switching to a different adulticide product with active ingredient; Deltamethrin. Although Deltamethrin is chemically very similar to the chemical we have traditional used, it is a new class of Pyrethroid and is will work on resistant mosquitoes. In addition, the product contains no PBO synergist and is an EPA reduced risk product. CCMCD will monitor efficacy of this new adulticide through 2021.

2021 IMPROVEMENTS AND PROJECTS

Mosquito Fish Program

For 2021, the District is planning to implement a mosquito fish program for the residents of Cowlitz County. Although mosquito fish (Gambusia) are considered invasive fish, Washington State does allow mosquito control districts to put stock in isolated bodies of water with no inlet or outlet such as back yard ponds, livestock water troughs, rain barrels and abandoned swimming pools. We plan to add this to our service request and education program and it will be free of charge to residents of our district.



Website and Public Education

For 2021, the District will continue to add more content to the District website including the new interactive treatment map for adulticide applications and add drone flight applications to the map as well. The District will also look into possibly expanding to social media platforms to reach more citizens of our district. Depending on how COVID-19 restrictions go in 2021 we will continue our normal outreach at events and at other organization meetings when requested.

Mosquito Surveillance

In 2021 we will continue to look for new larval mosquito areas and map them with GPS in our database. We also hope to utilize an increased amount of different types of adult mosquito traps in order to have better awareness of new invasive mosquito species and other hard to trap species.

Log Pond Surveillance And Control

We will continue to monitor mosquito populations and when necessary control mosquitoes in the Longview Log Pond by Drone.

2020 MOSQUITO CONTROL MATERIALS

Product	Num Applications	Total Amount	Unit of Measure	Acres Treated	EPA Reg No
Altosid P35	16	32.47	lb	3.12	89459-95
Altosid Pellets	10	5.21	lb	0.73	2724-448
Altosid XR Briquets	38	704.00	briquet	1.57	2724-421
CocoBear	6	6.85	gal	2.28	8329-93
FourStar Briquets 180	40	1,002.00	briquet	2.29	83362-3
FourStar Briquets 90	2	133.00	briquet	0.31	83362-3
Natular G30	3	0.88	lb	0.09	8329-83
Natular G30 WSP	39	465.00	pouch	1.07	8329-91
Natular XRT	450	3,596.00	briquet	6.55	8329-84
Permanone RTU	36	108.07	gal	5,623.62	432-1277
Suspend SC	5	32.00	fl oz	0.82	432-763
Vectobac 12AS	29	460.00	fl oz	28.75	73049-38
Vectobac G	139	2,469.26	lb	332.81	73049-10
Vectolex FG	28	507.92	lb	48.11	73049-20
Vectomax FG	165	963.47	lb	101.50	73049-429
Vectoprime FG	73	639.50	lb	180.03	73049-501

DISTRICT BUDGET

In 2018, the Mosquito Control District changed from a value-based assessment to a benefit-based assessment. The District only assess owners of land and strive to structure our assessments so that the charge reflects the benefit received. The District uses a combination of a base rate, an acreage multiplier, and a surcharge multiplier, along with an allowance for Designated Forest Land. Most properties in Cowlitz County pay the base rate according to their acreage. Property located in a surcharge area identified by the District as a high-treatment area is also subject to a 50% multiplier. The base rate for 2020 payable is **$4.55** per parcel for one acre or less.

Assessment Schedule 2020 Payable

Base Rate = **$4.55**

Parcel Size Assessment

1.00 ac or less Base Rate

1.01 to 5.00 acres Base Rate x 2

5.01 to 25.00 acres Base Rate x 3

25.01 to 50.00 acres Base Rate x 4

50.01 to 100.00 acres Base Rate x 5

100.01 to 500.00 acres Base Rate x 6

Over 500 acres Base Rate x 7

Surcharge Area = 50% multiplier

Designated Forest Land = 10% of Regular Assessment

Total Operating Budget for 2020 = $356,700