

## 2018 Annual Report

Submitted to Canyon County Board of County Commissioners

**Authority: Idaho Mosquito and Vermin Act of 2007**

**Idaho Code: Title 39 Health and Safety, Chapter 28**

As per **Section 39-2804 (p) 9**, the Canyon County Mosquito Abatement District (**CCMAD**) is submitting our annual report that documents the work accomplishments, methods employed of the District and where monies were spent.

### **Operational Challenges:**

- Meeting the conditions of the Clean Water Act National Pollution Discharge Elimination System (NPDES). Maintaining and following the conditions of the Pesticide Discharge General Permit as an unfunded mandate proves to be a significant obstacle with added pre- and post-treatment inspections and paper work. This is our second year under the authority and regulations of the renewed Pesticide General Permit of the Clean Water Act. The Clean Water Act Pesticide General Permit adds increased administrative expenses to our annual M&O Budget including annual upgrades and licensing to our data collection and mapping. These tools are necessary to justify pesticide application on Waters of the United States and defined by the Clean Water Act.
- Residential and urban growth in areas that have been traditional agriculture, grazing or public use has created reduced tolerance level of mosquitoes to residents which adds to increase in urban residential inspections and treatments. Urban inspection and treatment cost and acreage are small in area; however, they are labor intensive and create increased administrative costs.
- Meeting labor demands. With a robust economy and higher wages, it has become a challenge to meet our labor demands and to compete for qualified employees.
- The “learning curve” of introducing a new data/information management and GIS system.
- Training new seasonal staff: The District experienced a heavy turnover of eight-month seasonal staff.

### **Operational Highlights:**

- Cooperation from the U.S. Fish and Wildlife Service and approval of a mosquito management plan to perform mosquito abatement activities on Deer Flat National Wildlife Refuge remains to be the District’s highest priority. High vector mosquito numbers around Deer Flat National Wildlife Refuge continue to be a challenge to the district as well as residents who live around the wildlife refuge and recreate there. (Nearly 20% of CCMAD budget goes towards mosquito suppression efforts on Deer Flat National Wildlife Refuge and surrounding private property.)
- Early monitoring of vector mosquito numbers (Culex species) is the “backbone” of the district’s operations. Early monitoring and responding to potential disease vectors before any disease is detected is an important strategy to maintain. As of now, there were only 2 human cases of West Nile virus in Canyon County reported by the Idaho Dept of Health and Welfare
- The introduction of a new Mosquito Management Plan with emphases on:
  1. Combatting potential pesticide resistance in the mosquito population.
  2. Verifying mosquito service requests.

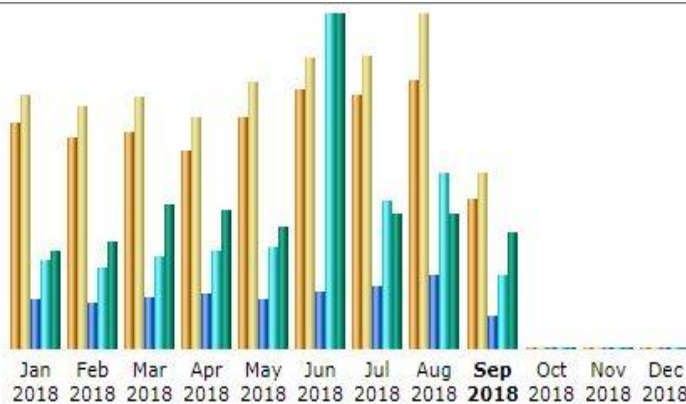
**Public Relations and Public Outreach:**

- Canyon County Mosquito Abatement District participated in Nampa Water Education Day in May which is an educational event for the Nampa School District elementary students.
- **CCMAD** webpage: The ([www.canyoncountymosquito.com](http://www.canyoncountymosquito.com)) webpage provides valuable information on mosquitoes, updates of West Nile Virus activity locally and state wide. Also, there are valuable links to the Center of Disease Control and Prevention web page called Arbor-Net which tracks West Nile Virus and other mosquito borne disease activity. The CCMAD webpage also contains an easy to use service request on line form that may be submitted to our office via email. **(See Fig.1 number of visits/month)**
- CCMAD Facebook page provided valuable updates on local mosquito abatement treatments as well as national news regarding mosquitoes and virus transmission.
- Availability of District informational flyers. These flyers are also made available at many local business, Senior Citizen Centers, and medical offices and are available on our webpage for downloading.

**Service Requests Statistics**

**Fig. 1: Number of Webpage Visits per Month**

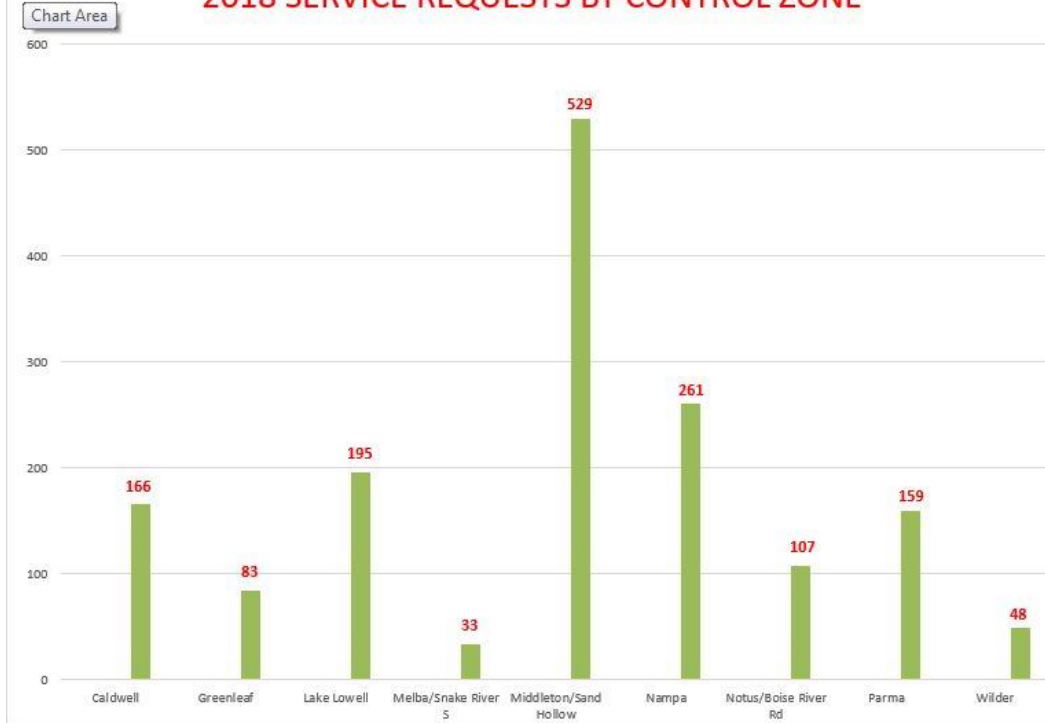
Web page activity reached the heaviest use in June, July and August when West Nile Virus interest and concern was at the highest level nationally and locally. The total number of webpage visits: 33554 total unique visits with 39,073 total visits.



Month	Unique visitors	Number of visits	Pages	Hits	Bandwidth
Jan 2018	3,778	4,239	6,036	10,928	886.28 MB
Feb 2018	3,519	4,042	5,693	10,069	971.18 MB
Mar 2018	3,598	4,191	6,291	11,447	1.28 GB
Apr 2018	3,308	3,873	6,702	12,104	1.22 GB
May 2018	3,846	4,463	6,179	12,637	1.07 GB
Jun 2018	4,322	4,863	7,031	41,363	2.95 GB
Jul 2018	4,222	4,883	7,678	18,375	1.18 GB
Aug 2018	4,471	5,579	9,121	21,724	1.19 GB
<b>Sep 2018</b>	2,490	2,940	3,982	9,055	1.03 GB
Oct 2018	0	0	0	0	0
Nov 2018	0	0	0	0	0
Dec 2018	0	0	0	0	0
<b>Total</b>	<b>33,554</b>	<b>39,073</b>	<b>58,713</b>	<b>147,702</b>	<b>11.75 GB</b>

**Fig. 2: Total Number of Service Requests by Control Zone**

**2018 SERVICE REQUESTS BY CONTROL ZONE**



Total number of Service Requests: (including webpage requests): 1,581

2017: 2,218 Service Requests

**CANYON COUNTY MOSQUITO ABATEMENT DISTRICT CONTROL ZONES**

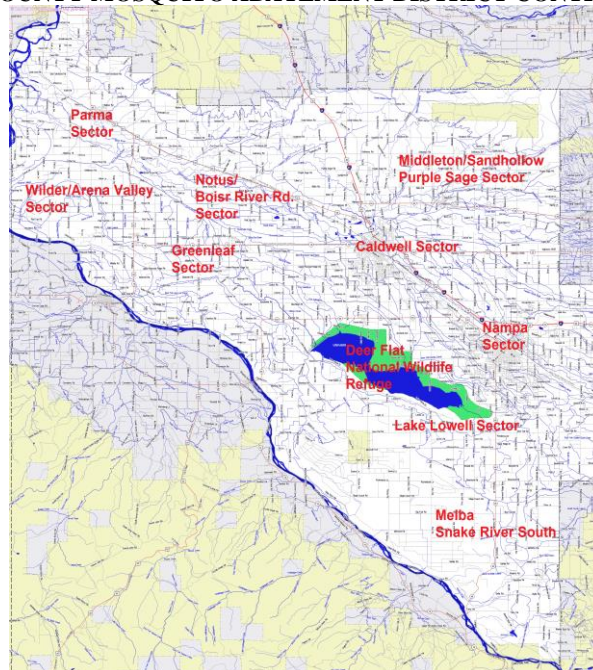




Table 2: West Nile Virus Testing Data:

MONTH	CULEX TARSALIS	CULEX PIPIENS	CULEX ERYTHROTHORAX
<b>MAY</b>			
Sample Numbers	2131	46	0
RAMP tests	65	3	0
WNV+	0	0	0
<b>JUNE</b>			
Sample Numbers	4528	124	191
RAMP tests	155	7	6
WNV+	0	0	1
<b>JULY</b>			
Sample Numbers	8266	1076	497
RAMP Tests	254	44	15
WNV+	5	0	0
<b>AUGUST</b>			
Sample Numbers	3513	1069	1455
RAMP Tests	93	46	34
WNV+	3	0	0

722 West Nile Virus tests were conducted in 2018    2017: 630 tests

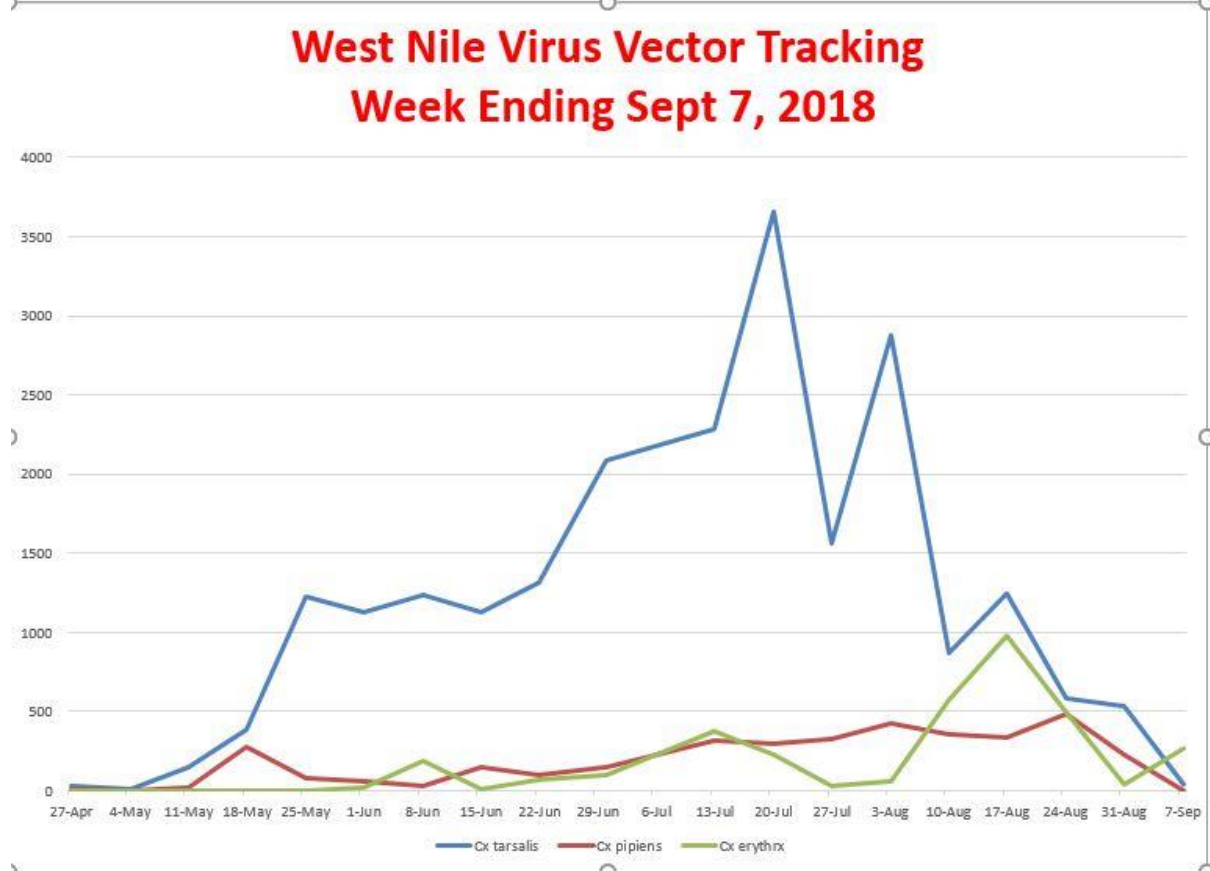
Rapid Analyte Measurement Platform



EVS C02 Baited Light Trap



Fig 3: 2017 West Nile Virus Vector Weekly Species Tracking



West Nile Vector Species **Culex tarsalis** (coded: **Cx tarsalis**) peaked in late July. Normal population peak for this species is on or about July 1. West Nile Vector Species **Culex pipiens** (coded: **Cx pipiens**) population were moderate with no significant population peaking. West Nile Vector Species **Culex erythrothorax** population numbers peaked in mid-August.

#### Invasive Species Aedes Surveillance:

Because of the emergence of Zika virus in the United States, Canyon County Mosquito Abatement District started an invasive Aedes sp. mosquito surveillance program utilizing a special designed trap to be placed at strategic locations that may trap invasive Aedes species of mosquitoes. Traps were deployed at various locations in Canyon County to capture potential invasive mosquito species. These traps were rotated between used tire collection and retail sites and local garden centers that ship in plant materials from other states.

#### Sentinel II Bio agent Aedes Collection Trap.



Sentinel II traps were deployed June-August with contents analyzed daily. No invasive mosquitoes were collected during the time of trapping.

**Surveillance and Arbovirus Testing Expenses:**

- **Labor: Lab Analysts and Surveillance Team: \$22,841**
- **Surveillance testing equipment and arbovirus testing supplies: \$21,919**
- **Estimated Fuel Costs: \$3,500**

**Total West Nile Virus Surveillance Expenditures: \$48,260 2017: \$53,451**

**Note: Canyon County Mosquito Abatement District also received an \$8000 grant for arbovirus testing, resistance monitoring, and invasive Aedes surveillance that offset some of our expenditures towards mosquito surveillance and testing.**

## **Pesticide Use Report**

CCMAD is divided into the following Control Sectors for operational and management efficiency. Priority Control Sectors are centered on population densities and where the interaction between mosquitoes and constituents are greatest. Sectors are continually evaluated, and larval production sites are updated on continual bases.

### **GROUND APPLIED APPLICATIONS TOTAL ACRES SUMMARY**

- **Lake Lowell Sector:** Constitutes areas around Lake Lowell bordering Deer Flat National Wildlife Refuge. The sectors encompass parts of the city limits of Nampa south of Greenhurst Road.
- **Nampa Sector:** City limits of Nampa. The main sources of mosquitoes are concentrated on the east side of the city and the boundary ends at McDermott Road /Ada County line.
- **Caldwell Sector:** The city limits of Caldwell. There are several main sources of mosquitoes for this sector: Boise River, Simplot Plant, Canyon Hill area east to Middleton. South of Middleton, south of the Boise River, north to Marble Front Road to the Boise River.
- **Melba/Snake River Sector:** Map Rock Road to the west and Celebration Park to the east and includes the city of Melba and borders to the north at Belmont Road.
- **Wilder/Arena Valley Sector:** The city limits of Wilder, River Bend Golf Course, and Arena Valley area to the Snake River. The areas south of Wilder to Owyhee County line.
- **Greenleaf Sector:** Ustick Road to the south and Howe Road/Allendale Road, to the north, including the city of Greenleaf and along Simplot Blvd. (Hwy 19).
- **Notus/Boise River Road Sector:** From Howe Road to the north to Boise River Road and east to Dixie River Road. To the west along the Boise River to the intersection of Boise River Road and Highway 95. North of Boise River along Hwy 20/26, city of Notus, north to Payette county line.
- **Parma Sector:** City limits of Parma, Parma Waste Water Treatment Facility, and University of Idaho Agricultural Experiment Station. Areas south and west of Parma, Hwy 16 to Oregon State Line, Roswell Marsh WMA. North to Payette County line along the Snake River and the Fort Boise WMA.
- **Middleton/Sand Hollow-Purple Sage Sector** North to Gem County line. City of Middleton, to Boise River to Ada County line. West border: I84. North boarder; Oasis Road (Payette County/Gem County line. Purple Sage golf Course and to the west to Stafford Lane. Farmway Village to Highway 20-26.

- **Deer Flat National Wildlife Sector:** (DFNWR) Boundaries of Deer Flat National Wildlife Refuge managed by the U.S. Dept. of Fish and Wildlife Service. DFNWR requires a special use permit and reporting. **Note: No mosquito adulticide fogging operations are performed on Deer Flat National Wildlife Refuge.**

### Mosquito Larvae Control:

**Mosquito Larval Control Product List**

Larvicide Product	Formulation	Application Rate	EPA Reg. No.
Agnique MMF	Liquid rtu	0.014 oz./acre	53263-28
Altosid 30 day Briquette	Briquette (ea.)	1 briq./100 sq. ft.	2724-375
Altosid XR Briquette	Briquette (ea.)	1 briq./100 sq. ft.	2724-421
Aquabac 200G	Granular	8-10 lbs./acres (by aircraft)	62637-3
Altosid XRG	Granular	5-10 lbs./acre	2724-451
Fourstar 150 day	Briquette (ea.)	1 briq./100 sq. ft.	83362-3
Fourstar 45 Briquette	Briquette (ea.)	1 briq./100 sq. ft.	83362-3
Fourstar Bti-CRG	Granular	8-10 lbs./acre	85685-4
Fourstar MBG	Granular	5-10 lbs./acre	85685-3
Natular Tablets	Tablet (ea.)	1 tablet/100 sq. ft	8329-84
MetaLarve S-PT	Pellet	5-10 lbs./acre	73049-475
Teknar SC	Liquid Concentrate	.25-2pts./acre	73049-435
Teknar CG* and G	Granular	8-10/lbs./acre (by aircraft)	73049-403
Vectobac 12AS	Liquid Concentrate	0.25-2pts./acre	73049-38
Vectobac G and GR	Granular	8-10 lbs./acre	73049-486
VectoMax FG	Granular	5-20 lbs./acre	73049-429
Vectobac GS	Granular	8-10 lbs./acre	73049-10
VectoPrime FG	Granular	5-20 lbs./acre	73049-501
Spheratax SPH G	Granular	5-20 lbs./acre	84268-2

**Total Amount of Product Use (Ground and Air Applications)**

Product	Total Amount Used
Agnique MMG	0.2137 gal.
Altosid 30-day briquets (Methoprene IGR)	2286 each.
Altosid XR briquets (Methoprene IGR)	40 ea.
Altosid XR Granules (Methoprene IGR)	2,255 lbs.
Aquabac 200 CG: Granular	<b>Air:</b> 27,455 lbs. <b>Ground:</b> 1541 lbs.
FourStar Bti 45-day briquets	5685 ea.
FourStar CRG Bti Granular	8371 lbs.
FourStar MBG Bti	4136.75 lbs.
Natular G (Spinosyd)	1596 lbs.
Naular XRT tablets (Spinosyd)	52 ea.
Spheratax 50G (Bacillus sphaericus)	50.5 lbs.
Summitt Bti G Granular	15 lbs. (trial product)
Teknar CG Bti Granular	1430 lbs.
Vectobac 12AS (liquid concentrate)	482 gal (concentrate)
Vectobac GR Bti Granular	20,872 lbs.
VectoMax FG Bti/Bacillus sphaericus) Granular	<b>Air:</b> 4950 lbs. <b>Ground:</b> 5600 lbs.
Vectobac GS Bti Granular	<b>Air:</b> 6,246 lbs. <b>Ground:</b> 8462 lbs.
VectoPrime FG: Bti/Methoprene IGR	<b>Air:</b> 4,400 lbs. <b>Ground:</b> 30705 lbs.



## AERIAL APPLIED APPLICATIONS LOG (Larvicide treatments)

### Deer Flat National Wildlife Refuge

Date	Location	Product	Amount	Acres Treated
April 18	Access 2-4 Lakeshore Drive	Aquabac 200 CG	2600 lbs.	260 Acres
May 7	Access 2-5 Lakeshore Drive	Aquabac 200 CG	2300 lbs.	230 Acres
May 11	East Marsh-Schaeffer's Access	VectoMax FG	2150 lbs.	215 Acres
May 25	Access 0-Access 5/ East Marsh /Levitt Tract	Aquabac 200 CG	5300 lbs.	530 Acres
June 6	Access 2-5 and Access 7-8 Lakeshore Drive	Aquabac 200 CG	2125 lbs.	212.5 Acres
June 13	East Marsh – Gott's Pt.	Aquabac 200 CG	4030 lbs.	403 Acres
July 6	Levitt Tract to Gott's Pt.	Aquabac 200CG	3200 lbs.	400 Acres

- Total acres treated with mosquito larvicides by air: 2,250.5 acres
- Total product use: Aquabac 200 CG: 19555 lbs. VectoMax FG: 2150 lbs.

### Middleton/Sand Hollow Control Zone

Date	Location	Product	Amount	Acres Treated
May 8	Lansing/Landruff Tract	VectoPrime FG	2100 lbs.	210 Acres
June 6	Boise River: Lansing Lane to Blessinger	Vectobac GS	2,416 lbs.	302 Acres
June 6	Middleton lakes Subdiv. to Lansing Lane	Vectobac GS	2,080 lbs.	260 Acres
June 27	Brumhaul/Blessinger Marsh/Lansing/Landruff	VectoPrime	2,300 lbs.	230 Acres

- Total acres treated with mosquito larvicide by air: 1,002 acres.
- Total product use: VectoPrime FG: 4,400 lbs. Vectobac GS: 4,496 lbs.

### Caldwell Control Zone

Date	Location	Product	Amount	Acres Treated
August 3	Caldwell Ponds/Boise River	Vectobac GS	1,750 lbs.	175 Acres (WNV response)

- Total acres treated by air: 175
- Total product use: Vectobac GS: 1,750 lbs.

### Notus-Boise River Rd. Control Zone

Date	Location	Product	Amount	Acres Treated
6/29	Boise River Notus Bridge to Lemp Ln.	Aquabac 200 CG	1,500 lbs.	150 Acres
7/20	Hwy 95 to Notus Bridge Boise River	Aquabac 200 CG	6,400 lbs.	441 Acres (WNV response)

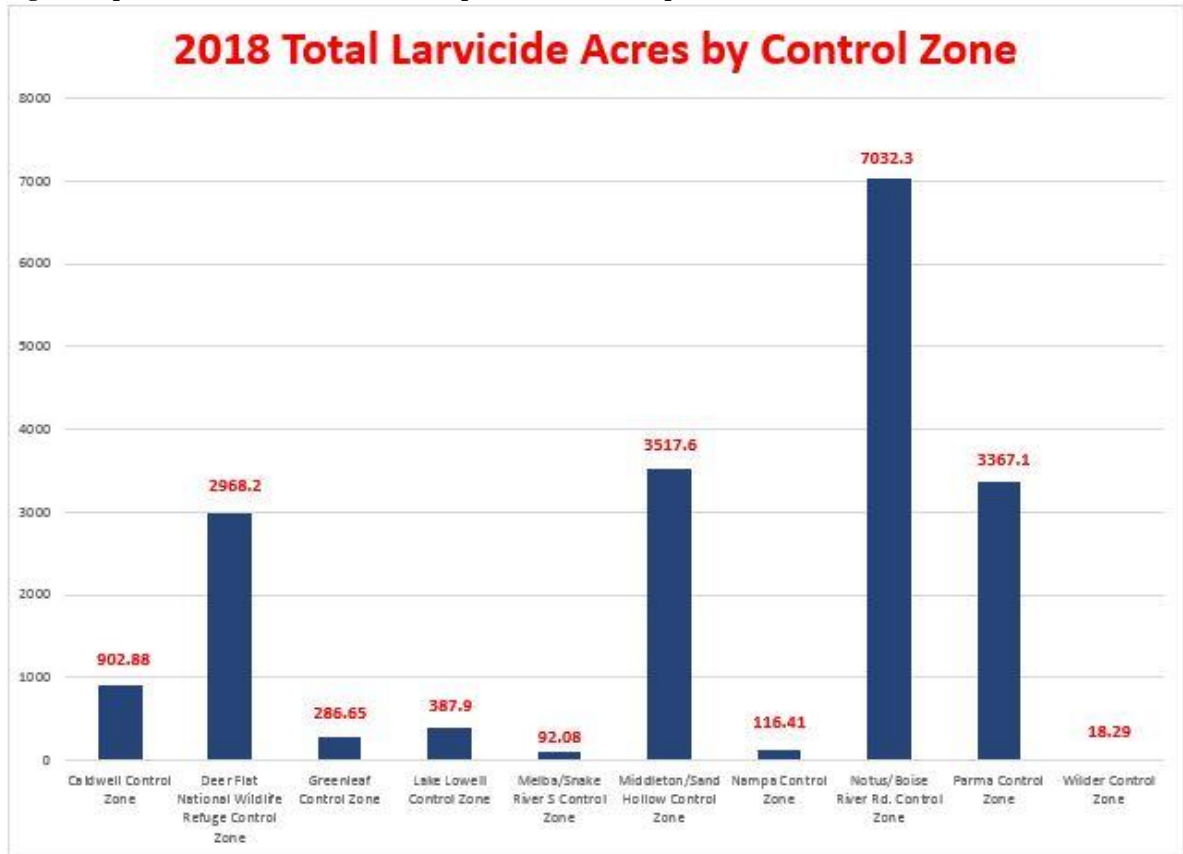
- Total acres treated by air: 591
- Total product use: 7,900 lbs.

### Parma Control Zone

Date	Location	Product	Amount	Acres Treated
August 21	Boise River: Hexon Rd Bridge to Sharp Lane	VectoMax FG	2800 lbs.	325 (WNV Response)

- Total acres treated by air: 325
- Total product use: 2,800 lbs.

**Fig 4: Graph of total acres treated with mosquito larvae control products.**

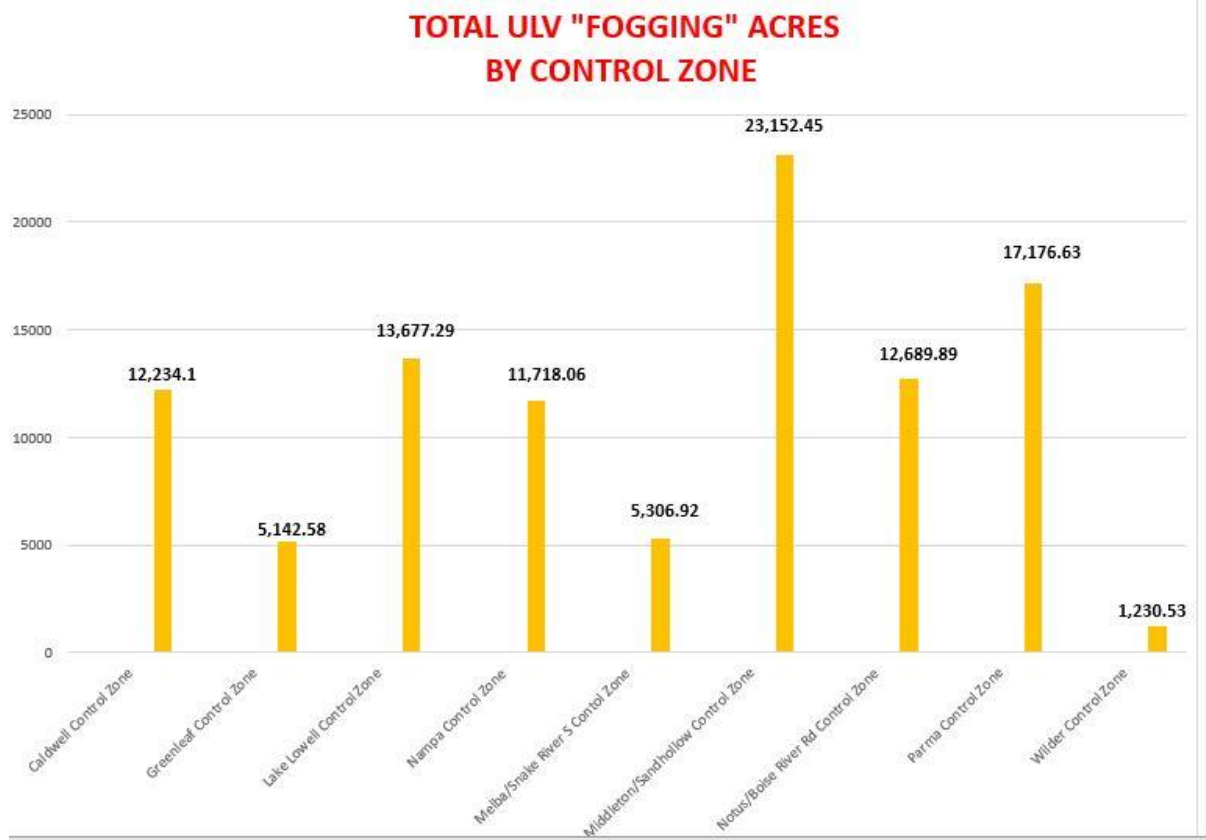


- **Control Zone with the most acres treated: Notus/Boise River Zone with 7032.9 acres.**
- **Middleton/Sand Hollow Zone has the second most at: 3517.6**
- **Total acres treated with larvae control applications both ground and air: 18,689.4 acres (17% more than 2017 which has a total of 16,044 acres)**

Larvicide Operations Costs	2017 Comparison
Labor: (Management and Staff) \$236,153	\$207,515
Product: \$485,308	\$383,526
Aerial Application Contract: \$51,927	\$82,720
Fuel: \$8,850	\$ 7500
Cost/Acre: \$41.85/acre	Cost/Acre \$42.46/acre

## Adult Mosquito Control: (Ultra Low Volume U. L.V. “Fogging”):

Fig. 5: Adult Mosquito Control Applications Total Acreage by Control Sector



- Total Acres Treated: 102,472.8 acres **2017 Comparison: 102,298.1 acres**
- Sector with most acres treated: Middleton/Sand Hollow/Purples Sage: 23,152.44 acres. The second highest was the Parma Control Zone with 17,176.63 acres. These two sectors accounted for 39% of all acres treated.

ULV Treatment Costs (direct costs)	2017 Comparison
Labor: \$70,284	<b>\$92,585</b>
Chemical Costs: \$118,468	<b>\$112,944</b>
Fuel: \$8000	<b>\$6000</b>
Cost/Acre: \$1.92/acre	<b>\$1.54/acre</b>

### Adult Mosquito Control Product List/Amount Used/Acres treated

Adult Mosquito Control Product	Active Ingredient	Amount Used	Acres Treated	EPA Reg. No.
DUET	Sumithrin 5%-Prallethrin 1%	435.99 gal. <b>2017: 362.34 gal.</b>	56,845.7	1021-1795-8329
DeltaGard	Deltamethrin (concentrate) 3:1 ratio	237.03 gal. <b>2017: 269.7 gal.</b>	45,843.38	432-1534

### Adult Mosquito Control: Residual Yard Power Sprays:

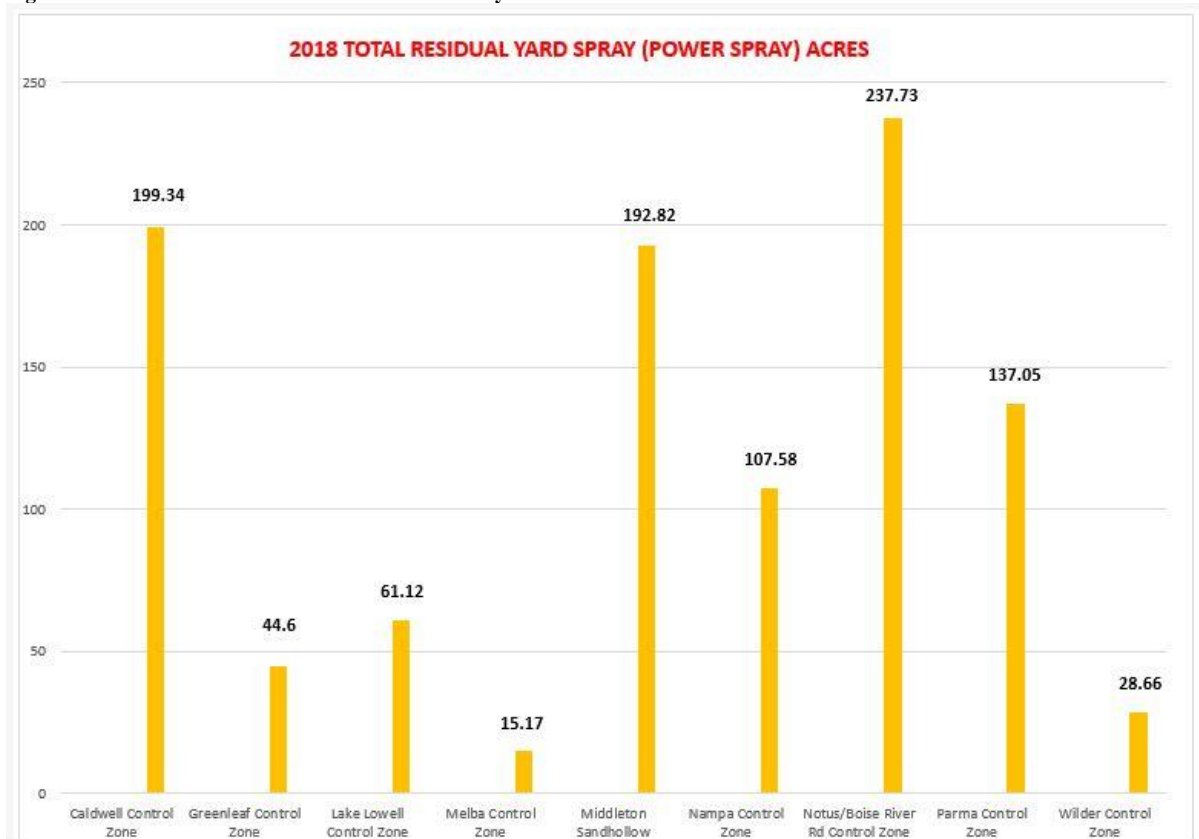
CCMAD conducts Residual Yard Sprays throughout the mosquito season. These sprays are conducted on constituent's properties for assorted reasons, some of which are listed below:

- Properties adjacent to sensitive (no spray) areas where the possibilities of pesticide drift from U.L.V. fogging may occur.
- Areas that are close proximities to honey bee colonies or Leaf Cutter Bee locations.
- Properties adjacent to Certified, Registered Organic Growers.
- Parks, athletic fields, and school grounds that may have an upcoming function or event.
- Special Events such as Snake River Stampede, Canyon County Fair, Nampa Art in the Park, Middleton Harvest Festival, Old Fort Boise Days in Parma.
- Constituents with health issues that may be compromised by potential disease carrying mosquitoes.

Procedures for Residual Yard Spray: The active ingredient product Bifenthrin (a commonly used insecticide for landscape and pest control) is applied at the rate of 33 fluid ounces concentrate diluted in 100 gallons of water and applied at the rate of 100 gallons diluted product/acre on lawns, weedy areas, shrubs and lower foliage of trees that may harbor adult mosquitoes.

Residual Yard Spray Data:

Fig.8: Total Residual Yard Treatments Total Acres by Control Zone



**Product Use for Residual Yard Power Sprays**

<b>Product</b>	<b>Amount Used (gals. Concentrate)</b>	<b>Acres</b>
Bifenthrin	134 gallons concentrate	<b>777.6</b>
Suspend Polyzone	29 gallons concentrate	246.5

Total acres treated: 1,024.1 acres	<b>2017 comparison: 1,197.39</b>
Total amount applied (concentrate): 163 gal.	<b>2017: 251 gal. (concentrate)</b>
Chemical Costs: \$16,290	<b>Chemical Costs: \$11,430</b>
Labor: \$74,633	<b>Labor: \$60,300</b>
Fuel: \$5,653	<b>Fuel: approx. \$4,492</b>
Total Costs: \$96,576	<b>Total Costs: 74,395</b>
Cost/Acre: \$94.30 /acre	<b>Cost/Acre: \$63.66/acre</b>

**Tick Treatments:**

The Idaho Mosquito and Vermin Control Act of 2007 does enable that when conditions arise, Mosquito and Pest Abatement Districts have the authority to abate other potential disease carrying arthropods such as ticks and black fly.

**Tick Treatments:** Bifenthrin 33 oz. /100 gal of water,

Tick treatments are conducted when complaints by constituents are verified by area inspections around property and adjacent areas. Most complaints about ticks come from subdivisions that border irrigation ditches, areas along the Boise River or Deer Flat National Wildlife Refuge. Tick treatments are conducted when the threshold level of one tick is found during routine inspections. **Note: Canyon County Mosquito Abatement District performed a tick treatment request for Southwest District Health for a confirmed case of Rocky Mountain Spotted Fever. \***

Tick treatment pesticide use data:

- 12.4 acres of yard, irrigation ditch banks, wooded areas bordering river edge or wildlife refuge borders.
- 1157 gallons of finished product insecticide with active ingredient Bifenthrin were used at rate of 33 oz. /gal.
- Treatments started when ticks became active in early March and the first week of June when tick complaints ceased, and ticks became inactive.
- Tick species treated: Rocky Mountain Wood Tick and American Brown Dog Tick. Both species are potential vectors of Rocky Mountain Spotted Fever, Tularemia, and Tick-Borne Relapse Fever. \*

**Black Fly Abatement:**

Black fly are a major pest to cattle and horses and the larvae are treated with *Bacillus thuringiensis israelensis* bacteria to clean running water. There is limited or no control measures effective on adult Black Fly.

CCMAD conducted two Black Fly treatments along the Boise River and the Indian Creek tributary. The first session was conducted on March 19 and 20.

**Areas treated:**

- Phyllis Slough and Boise River: Middleton
- Can-Ada Road/Boise River: Middleton
- Middleton Bridge/Boise River: Middleton
- Old Hwy 30 & Plymouth: Boise River: Caldwell
- Notus Bridge-Boise River: Notus
- Parma Bridge/Hwy 95/Parma

Total gallons of Vectobac 12AS used: 35.47 gallons concentrate.

Second Session treatment conducted September 21-24 along the Boise River, and Indian Creek.

**Areas treated:**

- Plymouth Rd/Hwy 30: Caldwell
- Indian Creek Plaza area: Caldwell
- Dixie Slough/Notus Rd.: Parma
- Middleton Bridge/Boise River: Middleton
- Boise River/N Midland Sports Access/ Joplin Rd.: Nampa
- Indian Creek/Nampa Simplot Plant: Nampa
- Indian Creek Marsh: Nampa
- Notus Bridge/Boise River: Notus

Total gallons of Vectobac 12AS: 32.5 gallons concentrate.

## 2018 Annual Report Summary:

- Surveillance data submitted for West Nile Virus testing:
  - **2018:** 722 West Nile Virus tests conducted.
  - **2017:** 630 West Nile Virus tests conducted.
- Disease Vector populations elevated in early June and peaked mid-July and again early August. The first Positive West Nile Virus occurred early in the season on June 8, located in the Hexon Rd/Scott Pitt Rd. area West of Parma. This was followed by eight (8) more positive West Nile sites located along the Boise River.
- State wide West Nile Virus statistics again show that this disease is not going away: West Nile reported cases state wide were at 15 reported human cases with 9 of those cases diagnosed as neuro-invasive Encephalitis. Canyon County reported 2 human West Nile Virus neuro-invasive cases.
- The ratio of mosquito larvae control operational expenses compared to adult mosquito control operations was approximately **27%** adult mosquito control to **73%** mosquito larvae control. The ideal ratio goal that is strived for is 70% mosquito larvae control to 30% adult mosquito control, so the District is well within those standardized goals set by the American Mosquito Control Association for sustainable mosquito abatement operations.
- Operational costs per acre:
  - Adult Mosquito Control: **up** from 2017 (\$1.54/acre in 2017 to \$1.92/acre
  - Mosquito Larvae Control: **down** from 2017 (\$42.46/acre in 2017 to 41.85 in 2018)
- The ongoing vigilance to monitor West Nile Virus disease vectors and a response to positive activity remains a challenge and the highest priority and a public health issue.
- The monitoring for invasive species such as Zika virus species has become an added challenge and responsibility of the district.
- The continued vigilance in monitoring the possibility of St. Louis Encephalitis introduction into Idaho and Canyon County.
- Other arthropod vector species management such as Rocky Mountain Spotted Fever from tick species detected in Canyon County this past summer.

The Canyon County Mosquito Abatement District wishes to thank the Board of County Commissioners, County PIO Joe Decker and other County personnel for their support.

Respectfully submitted,

Ed Burnett, District Director

