



Three Rivers Mosquito and Vector Control

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20 November 2014

Chiloquin Vector Control District
PO Box 860
Chiloquin, Oregon 97624-0860

Re: 2014 Annual Report for Chiloquin Vector Control District

Please find enclosed the Annual report for the Chiloquin Vector Control District (CVCD).

I have compiled this report with the objective to provide the VCD Board with the technical and field operational information needed for the Annual Report due to the Klamath County Commissioner. If this report is accepted, it should be provided as an attachment to the BOCC, IAW ORS 452.120, by February 1st.

If desired, I can provide the Board with any additional information needed. As always, please let me know directly if you desire additional information included in the report to the CVCD's Board of Trustees. I will make every attempt possible to tailor my reports to meet the Board's needs.

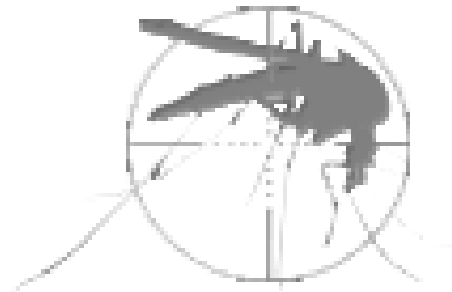
Sincerely,

Edward S. Horvath
Vector Ecologist/Program Manager

2014 ANNUAL REPORT

OF THE

CHILOQUIN VECTOR CONTROL DISTRICT



In compliance with:
Oregon Revised Statutes
452.120(5) (Partially)

Prepared by:

Edward S. Horvath
Contracted IPM Manager
Three Rivers Mosquito and Vector Control
December 31, 2014

District Name

Chiloquin Vector Control District

Applicator Name

Three Rivers Mosquito and Vector Control

Timeframe this Annual Report covers

January 1, 2014 – December 31, 2014

Contact Information

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SUMMARY

In 2012, the Chiloquin Vector Control District contracted with Three Rivers Mosquito and Vector Control (TRMVC) (a private company) to operate an Integrated Pest Management Program (IPM) for the District, utilizing the District's equipment and materials. In April 2014, CVCD put an all inclusive contract out for bid, to outsource all control, including equipment and materials. CVCD also sold all pesticide application equipment and vehicles. In July 2014, TRMVC was awarded the bid for a term of three (3) years with an optional two (2) year extension. All equipment upkeep, maintenance and calibration is now the sole responsibility of the contractor, rather than the CVCD Board of Trustees.

All procedures, materials and methods used were done so in accordance with the 2014 Pesticide Use Plan (PUP), submitted and approved in accordance with ORS 452.140 and in observance with an up-to-date Pesticide Discharge Management Plan (PDMP). TRMVC increased the accountability and recordkeeping by incorporating GPS/GIS technology to record adulticide spray missions with the truck mounted ULV sprayer. All application sites and inspection points are recorded digitally and maintained in accordance with Oregon Department of Agriculture Commercial Pesticide Application Recordkeeping standards.

A buffer of 100 yards was maintained from all natural water bodies when necessary as defined in the PUP. In addition, if applications were to be made within the 100 yard buffer, chemical sensitive strips would be used in order to ensure the buffer was adequate. In 2014, all areas where treatment was needed for adult mosquito control within the 100 yard buffer, Essentria IC^{3™} was used.

No adverse effects were detected with non-target species during surveillance pre or post application. No adverse incidents as described in Schedule B, Conditions 2-6.

THE VECTOR PROBLEM

A Vector shall mean any insect or arthropod, rodent, or other animal of public health significance capable of causing injury, or capable of harboring or transmitting the causative agents of disease to humans or domestic animals. The Chiloquin Vector Control District defines a vector as a mosquito capable of transmitting disease and/or pestiferous, reducing the quality of life of residents.

Most mosquito vectors are extremely mobile and often cause the greatest hazard or discomfort away from their breeding source. Each has a unique life cycle and most of them occupy different habitats.

The vector problem in Chiloquin is largely a human associated problem resulting from agricultural endeavors, increasing population, urbanization and lack of maintenance of drainage systems. Un-maintained fields, vegetation and overgrown vacant lots in and around the City of Chiloquin play a role in protecting adult mosquitoes from Ultra Low Volume adulticides, making it difficult to control mosquitoes in these areas that have developed into adults. Additionally, the Nature's Conservancy's reclamation and creation of wetlands on the southwest portion of the District has created large mosquito sources. The Fort Klamath irrigated fields continue to play a major influence for mosquitoes migrating into the District, largely affecting the residents and visitors of Spring Creek and Collier Park.

Additional problems will occur as urbanization continues into areas of high vector populations and as recreation and conservation areas expand.

In 2014, the Modoc Point Irrigation District shut off water supply to the irrigated properties, leaving ditches with miles of standing water. With the warm summer, these waters quickly created miles of stagnant mosquito sources.

New Federal and State regulations regarding the application of pesticides for Public Health Vector Control and the Clean Water Act/National Pollutant Discharge Elimination System (NPDES) have resulted in less pesticide applications and more monitoring and surveillance of vector populations. Spraying for mosquitoes is not based on service requests or complaints, rather based on justifiable mosquito population data.

GOALS:

The goals of the District are to prevent new vector sources from developing, to abate existing vector populations and their sources in order to protect public health and comfort, to reduce the level of vector populations throughout the District, as well as reduce vector and human interaction. Additionally, the District's environmental goals are to reduce mosquitoes with increased larviciding while being environmentally responsible by reducing adulticiding. Water soluble and non/petroleum based products are the first choice of the District.

DISTRICT STAFF

Chiloquin Vector Control District outsourced the labor for District operations beginning in 2002. In 2012, CVCD entered into a 3 year labor contract with Three Rivers Mosquito and Vector Control (TRMVC). In July 2014, CVCD disposed of all application equipment and outsourced not only labor but materials and equipment as well as an all inclusive, Integrated Pest Management Program (IPM).

Edward S. Horvath
Contracted IPM Manager

P.O. Box 191
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PROPOSED ANNUAL WORK PROGRAM FOR 2014-2015

1. Provide mosquito abatement services utilizing outsourced services.
2. Continue the District's policy of mosquito control in compliance with Oregon Revised Statutes, Chapter 452 and in compliance and agreement with the DEQ General Permit 2300A and the Oregon Department of Fish and Wildlife through a mutually approved Pesticide Use Plan.
3. Continue regular surveillance of all known mosquito sources throughout the District and investigate potential new ones.
4. Respond to service requests from residents of the District.
5. Request the cooperation of individuals in reducing the areas of mosquito production through proper irrigation and cultural practices.
6. Examine any new development in mosquito control for possible incorporation into our control program.
7. Maintain communication between CVCD and agencies involved in water management.
8. Maintain good public relations through news releases and informative programs.
9. Maintain spray records in accordance with Oregon Department of Agriculture standards; monitoring mosquito production and spray costs.
10. Use District resources, if available, to assist property owners, municipalities and irrigation districts in source reduction.
11. Create a long term plan to reduce mosquito sources each year using contracted services.

SURVEILLANCE

TRMVC conducts surveillance through adult and larval surveys. Several techniques used by TRMVC and recommended by the American Mosquito Control Association include landing rates, CDC Light Traps, and larval dipper counts. In 2014, TRMVC conducted ten (10) night time light trap sessions for twelve (12) weeks and more than 447 inspections of sites within the District using landing rates and larval surveys.

ADULT MOSQUITO SURVEILLANCE



TRMVC collects and monitors adult mosquito populations with CDC light traps. Three (3) CDC Light traps were set weekly and monitored. In addition, CVCD Board members placed and monitored several randomly placed CDC light traps to monitor results (efficacy) of the control program. These traps were used to provide justification per DEQ Pesticide General Permit Permit 2300A; in accordance with the Pesticide Discharge Management Plan (PDMP) and our PUP. TRMVC only used adulticides when the application was justified in accordance with the annual PUP and PDMP. Light traps were used to determine justification for all adult mosquito control pesticide application utilizing ULV sprayers. In addition to CDC light traps, landing rates were monitored and recorded at more than 169 locations, weekly from April through September 15th. Non-target species were monitored for effects from pesticide applications. It was determined that there were minimal, if any, effects on non-target species during the adult mosquito surveillance. In fact, it was noticed that there were more species of midges in Quality Control Inspection traps monitored by the CVCD Board of Trustees.

LARVAL MOSQUITO SURVEILLANCE

TRMVC conducted routine larval surveillance and uses this data to justify larval control utilizing State and Federally approved Integrated Mosquito Management principles. Either chemical, biological or mechanical (by modifying the source so that it does not retain mosquito larvae) are used to control mosquito larvae once discovered during the larval survey. A post inspection was conducted within a week/two weeks post application to determine efficacy toward target pest and monitor any adverse affects on non-target species. In 2014, no adverse affects were discovered on non-target aquatic species within the CVCD.



RESISTANCE MONITORING



Three Rivers Mosquito and Vector Control conducted resistance analysis using industry standard bio-assays on a monthly routine. No resistance was discovered in the target species to pesticides used in the current year. In addition, TRMVC conducted efficacy testing for each pesticide used within the Chiloquin Vector Control District. Results indicate that current pesticides used are effective in accordance with industry standards. TRMVC recommends that the District continue to monitor resistance and efficacy results.

CONTROL PROGRAM 2014

BIOLOGICAL CONTROL (LARVAE)

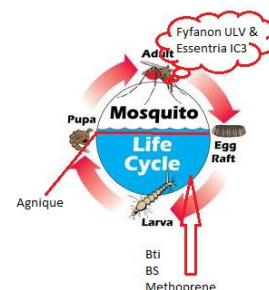


During the 2014 season, *Gambusia affinis* (Mosquito Fish) were of limited supply. Other Districts depleted the populations to a point that very few were available for CVCD. TRMVC planted approximately five (5) pounds of Mosquito Fish at approximately ten (10) confined locations for the control of mosquitoes. These fish are natural predators of mosquito larvae and have been known to consume their own weight in larvae in a single day. One of TRMVC's long term goals is to create a breeding reserve of *Gambusia affinis* for continuous and long term availability for Districts and residents.

The District also treated approximately 2381.42 acres for the control of mosquito larvae with the biological insecticides *Bacillus thuringiensis, var. israelensis* (Bti) and *Bacillus sphaericus* (BS). These microbial insecticide is highly toxic to mosquito larvae and has no harmful effects on humans, domestic animals, wildlife, beneficial insects, fish and other aquatic life. Excellent results were obtained with *Bacillus sphaericus* controlling larvae on approximately one (1) acre.

CHEMICAL CONTROL (LARVAE)

The chemicals used by the District are non-persistent public health insecticides. They are used at median application rates and have been cleared for mosquito control by the Environmental Protection Agency, the Oregon State Health Division, the Oregon State Department of Fish and Wildlife and the Oregon State Department of Agriculture. TRMVC produced a "duplex" mixture using methoprene and Bti (utilizing Altosid™ supplemental label, and treated approximately 768.75 acres with the duplex product. The use of this product resulted in excellent control of mosquitoes in storm drains and in several locations throughout the district, typically for several weeks-months.



CHEMICAL CONTROL (PUPAE)

TRMVC used Agnique® MMF, a mono-molecular film applied to standing water where late in-star mosquito larvae and pupae were identified. Agnique® MMF is a larvicide and pupicide with a unique physical mode of action rather than chemical toxicity. It is ideally suited for the District as it can be used in a wide range of habitats. Approximately 64.78 acres were treated using this product.

CHEMICAL CONTROL (ADULT)

CVCD began phasing out malathion which has been applied by a truck mounted ULV sprayer. Malathion (or other pesticide with similar mode of action) will only be used to control the potential of resistance within the mosquitoes of the District and will not be used as a sole adulticide. In 2014, TRMVC introduced the use of Aqualuer® 20-20, a permethrin based adulticide which is diluted with water and is formulated with a botanical, cold-pressed orange oils rather than petroleum products. The ULV sprayer was calibrated to ensure proper pesticide amounts were applied along with droplet sizes, bi-weekly.

During the 2014 mosquito season, TRMVC treated approximately 8,575.52 acres for the control of mosquito larvae and adults. Of this, 4,710.72 acres (*reduced malathion use by 48%*) were treated with malathion applied by pickup-mounted Ultra-Low Volume (ULV) fogger. 1261.33 acres were treated with Aqualuer® 20-20, using both ATV and truck mounted ULV foggers.

and 157.27 acres treated with an EPA exempt Eccentria™ IC³ fogging/barrier treatment using an ATV mounted ULV sprayer. Essentria IC³™ is a pesticide that targets the octopamine receptors of the adult mosquito. By targeting octopamine receptors, the essential oils that make up Essentria IC³™ provide insect control with a much wider margin of safety than other products. Because vertebrates like birds, fish, dogs and people don't have octopamine receptors; they are not affected by this unique mode of action. This product was used as both a barrier and fogging treatment when mosquito populations were unacceptable near natural bodies of water. All fogging operations are conducted during the evening hours for the control of adult mosquitoes with justification in accordance with NPDES General Permit 2300A.

PUBLIC HEALTH INSECTICIDES APPLIED DURING 2014

ADULTICIDES					
Material	EPA Reg #	Acres Treated	Rate of Application	Amount Used	Method Used
Aqualuer® 20-20	769-985	1,261.33	0.0035 lb ai/A	322.90 oz	Truck/ ATV ULV
Essentria™ IC ³	Exempt	157.27	10.0 oz/A	1,572.72 oz	ATV ULV Fogger
Fyfanon® ULV	67760-34	4,710.72	0.03 lbs ai/A	1,827.19 oz	Truck ULV Fogger
Total Acres Treated (Adulticide)		6,129.32			
LARVICIDES					
Material	EPA Reg #	Acres Treated	Rate of Application	Amount Used	Method Used
Aonique® MMF	2302-14	64.78	25.6–128.0 oz/A	2,630.00 oz	Hand can/Pres Spray
Bti Ffast™	432-1515	1,585.72	4.0-16.0 oz/A	12,685.76 oz	ATV ULV Fogger
Methoprene 2.1%	2724-375	90 ft ²	1 ea/ (up to 100 ft ²)	8 ea	Hand Toss
Methoprene 5.0% (<i>Duplex</i>)	2724-392 ¹	768.75	3.0-4.0 oz/A	439.30 oz	Pressure Sprayer
VectoBac® 12AS (<i>Duplex</i>)	73049-38 ¹	768.75	4.0-32.0 oz/acre	2,635.78 oz	Pressure Sprayer
Vecto-Bac® G	73049-10	25.95	2.5 -10.0 lb/A	129.88 lbs	Backpack Blower
Vecto-Lex® CG	73049-20	20.00 ft ²	5.0-10.0 lb/A	1.00 lbs	Backpack Spreader
Vecto-Lex® WSP	73049-20	1.00	5.0-10.0 lb/A	16 ea	Backpack Spreader
Total Treated Acres ² (Adulticide)		2,446.20			
Total Acres Treated		8,575.52			

¹ Methoprene 5.0% and VectoBac® 12AS were mixed together and applied as “Duplex” in accordance with Altosid Liquid Larvicide Supplemental Label

² Mixed pesticides are only counted once for total acres treated.

GROUND APPLICATIONS

RECORD KEEPING

All known mosquito sources were recorded in Geographic Information System (GIS) maps that serve as permanent records in TRMVC databases. Shape-files are contained in GPS enabled handheld computers and are used to dispatch ground surveillance and control. Labor cost for inspections, ground treatments and pesticide record keeping was \$23,100 and conducted by TRMVC staff as a contracted service. With the establishment of an all inclusive IPM contract, application of adulticides with the truck mounted fogger are recorded with GPS and GIS technology. All applications are recorded and maintained in order to provide better accountability of where adulticide pesticides were applied, as well as not applied.



the

TREATMENT METHODS



Fogging operations are conducted during the evening hours for the control of adult mosquitoes with justification in accordance with NPDES General Permit 2300A. The ULV sprayers were calibrated to ensure proper pesticide amounts were applied along with droplet sizes, bi-weekly or when ever service to the machine is conducted.

CVCD and TRMVC have partnered with the goals of using more environmentally responsible products, while increasing the control and satisfaction of residents of the District. One of the goals met was to reduce the amount of adulticiding while increasing the control efficacy by improving larviciding and source reduction. TRMVC increased larviciding by within the boundaries of CVCD by 275% which resulted in a 32% decrease in the use of adulticides.

The District approved the use of Essentria™ IC³, an EPA exempt natural product. Essentria IC³™ is a pesticide that targets the octopamine receptors of the adult mosquito. By targeting octopamine receptors, the essential oils that make up Essentria IC³™ provide insect control with a much wider margin of safety than other products. Because vertebrates like birds, fish, dogs and humans don't have octopamine receptors; they are not affected by this unique mode of action. This product was used as both a barrier and fogging treatment when mosquito populations were unacceptable near natural bodies of water. Essentria IC³ was applied with an ATV mounted ULV machine. These treatments were limited to Spring Creek residential area, Collier Park and areas close to the Williamson and Sprague Rivers, when mosquito populations in the area created a nuisance for the local residents.

Biological pesticides were the focus of the District's operation in 2014. TRMVC's 2014 application of *Bti* and *Bs* to irrigated property, isolated ponds and ditches within the District increased from 2013 by more than 300%. Granular *Bti* was applied by gas-powered Maruyama™ backpack blowers, belly grinder style seeders and by horn seeders. *Bti* with Ffast™ technology was applied utilizing an ATV-mounted ULV sprayer, providing efficient and effective control of larval mosquitoes, covering larger pastures. VectoLex® GG and WDG were used sparingly in a couple, more highly organic locations.



Agnique MMF™ was applied utilizing a B&G pressurized hand can and a 12-volt pressurized, ATV-mounted sprayer. The Modoc Point Irrigation district shut off water supply to irrigators in the middle of the season. This left miles of ditch canals with puddles of standing water. Mosquitoes quickly emerged as larvae and with the heat of the summer, pupae developed quickly. Agnique MMF™ was used throughout the irrigation district canals to control pupae with dipper counts in the 100's.

Altosid® XR Briquettes (2.1% Methoprene) were applied by hand while Altosid® ALL (5.0% Methoprene) was applied, after mixing in a duplex mixture with *Bti* in the formulation of VectoBac® 12AS, through a pressurized sprayer, diluted with water.

This year's larviciding program was kept busy inspecting and treating the sources throughout the district that are known producers of mainly *Aedes* and *Culex* mosquitoes and discovering new sources. Irrigated pastureland ranks as the number one problem for district technicians and is the cause for most of our complaints in the hot summer months. In 2014, the Modoc Point Irrigation District turned off the irrigation water flow and created a new problem. Standing waters normally flushed out by irrigation created sources that did not normally need treated.

INTEGRATED PEST MANAGEMENT (IPM)

Mosquito Control Policy:

Three Rivers Mosquito and Vector Control advocates management of mosquito populations when and where necessary by means of integrated programs designed to benefit or to have minimal adverse effects on people, wildlife, and the environment. This Integrated Pest Management (IPM) policy recognizes that mosquito populations cannot always be eliminated but often must be suppressed to tolerable levels for the well-being of humans, domestic animals, and wildlife and that selection of scientifically sound suppression methods must be based on consideration of what is ecologically and economically in the long-term best interest of mankind.

The following principles are advocated:

- Mosquito control measures should be undertaken only when there is adequate justification based upon surveillance data.
- IPM programs should be tailored to the needs and requirements of the local situation. The combination of methods for mosquito control should be chosen after careful consideration of the efficacy, ecological effects, and costs versus benefits of the various options, including public education, legal action, natural and biological control, elimination of breeding sources, and insecticide applications.
- Mosquito breeding sources, whether natural or created by human activity should be altered in such a manner as to cause the least undesirable impact on the environment.
- Insecticides and application methods should be used in the most efficient and least hazardous manner, in accordance with all applicable laws and regulations and available scientific data. The registered label requirements for insecticide should be followed. When choices are available among effective insecticides, those offering the least hazard to non-target organisms should be used. Insecticides should be chosen and used in a manner that will minimize the development of resistance in the mosquito population.
- Personnel involved in mosquito management programs should be properly trained and supervised, and certified in accordance with relevant laws and regulation and should keep current with improvements in management techniques through continuing education and/or training programs.

All methods and materials used by TRMVC for the Chiloquin Vector Control District are based on these principles. An annual Pesticide Use Plan is prepared before every season and sent to the Health Division of the Oregon Department of Human Resources and the Habitat Conservation Division of the Oregon Department of Fish and Wildlife. These two agencies must give approval on a yearly basis to any agencies intending to use chemicals for Vector Control.

MOSQUITOES OF CHILOQUIN VECTOR CONTROL DISTRICT

- | | | | |
|-----|-----------------------------|-----|------------------------------|
| 1. | <i>Aedes aboriginis</i> | 13. | <i>Aedes niphadopsis</i> |
| 2. | <i>Aedes campestris</i> | 14. | * <i>Aedes vexans</i> |
| 3. | <i>Aedes cataphylla</i> | 15. | * <i>Anopheles freeborni</i> |
| 4. | <i>Aedes cinereus</i> | 16. | <i>Culex peus</i> |
| 5. | <i>Aedes communis</i> | 17. | <i>Culex pipiens</i> |
| 6. | * <i>Aedes dorsalis</i> | 18. | <i>Culex tarsalis</i> |
| 7. | <i>Aedes exrucians</i> | 19. | <i>Culex territans</i> |
| 8. | <i>Aedes fitchii</i> | 20. | <i>Culiseta impatiens</i> |
| 9. | * <i>Aedes Increpitus</i> | 21. | <i>Culiseta incidens</i> |
| 10. | <i>Aedes intrudens</i> | 22. | * <i>Culiseta inornata</i> |
| 11. | <i>Aedes melanimon</i> | 23. | <i>Culiseta minnesotae</i> |
| 12. | * <i>Aedes nigromaculis</i> | | |

* Indicates species that pose a control problem

(These lists were comprised during the CVCD mosquito surveys from 2002-2007 and 2012-2014)

MOSQUITO INFORMATION

I. **Anopheles**

II.

Anopheles freeborni

An. freeborni (the western malaria mosquito) enters homes and animal shelters readily biting at dusk and dawn. In the fall, generally beginning in early September, the females seek shelter in buildings, culverts, cellars, and other protected places. On warm days in March and April females sometimes leave their shelters to feed and bite viciously. They are also a pest in the summer months with their peak period of biting activity during July and August.

Rain pools, river seepage areas, marshes, swamps, semi-permanent or permanent ponds in irrigated pastures and drainage ditches are sources commonly found to be breeding sites for this mosquito. Clear, sunlit water with emergent vegetation and floating algae is preferred.

Other *Anopheles* of lesser importance found in Chiloquin are:

- *An. punctipennis*
- *An. occidentalis*
- *An. Pseudopunctipennis*

II. **Aedes**

Aedes vexans

Ae. vexans (the irrigated pasture mosquito) is associated with intermittently irrigated crops, primarily with irrigated pastures and alfalfa. A brood is usually produced in sequence with each irrigation cycle, which can occur every 7 to 14 days.

The irrigation season usually extends from May to October. This is a major pest mosquito in Chiloquin readily attacking humans and animals during the day, and is most active at dusk. Large populations can be an annoyance to domestic animals and to persons engaged in recreation and labor.

Ae. vexans larvae are vigorous swimmers and are usually found in open fields where water remains stagnant following an irrigation. The length of the aquatic stage is influenced by temperature and can vary from five days at 86 degrees F to 16 days at 50 degrees F. During midsummer the larvae grow rapidly and pupate in three days. Peak production is reached in July and August. This combination of rapid growth rate, adult populations of up to 15 million per acre, and a flight range of up to 20 miles makes this mosquito one of the toughest problems to control.

Other flood water mosquitoes that occur in Chiloquin are:

- *Ae. melanimon*
- *Ae. nigromaculis*
- *Ae. melanimon*
- *Ae. dorsalis*
- *Ae. Sierrensis*

Aedes increpitus

In Chiloquin the larvae of *Ae. increpitus* are found in pools along streams left when spring floodwaters subside and in brush or tree covered depressions filled by heavy rains. The adult mosquitoes become active in late spring and early summer, sometimes flying several miles in search of a blood meal. *Ae. increpitus* are persistent biters and continue to be a problem in some areas of the County where housing developments have been built close to existing seasonal creeks and streams.

Aedes communis

Ae. communis (the snow water mosquito) is generally a mountain mosquito, associated with pools of water from melted snow. The females are often serious pests in the forests where they may be encountered in swarms in the spring, biting mostly in the shade or after sundown.

Other mosquitoes found in Chiloquin that are associated with pools of melted snow water are:

- *Ae. Fitchii*

III. Culiseta

Culiseta incidens

Cs. incidens (the cool weather mosquito) are found throughout Klamath County in natural depressions filled with rain or irrigation water and in artificial containers. Examples include troughs, hoof prints, ground pools, rock pools, and log ponds. In our area where the winter climate is moderate, breeding may take place throughout the entire year.

Cs. incidens is a large mosquito and extremely annoying in some areas. Adult mosquitoes have been observed biting on sunny days in mid winter but have a peak activity period between May and August.

Other cool weather mosquitoes found in Chiloquin are:

- *Cs. impatiens*
- *Cs. inornata*
- *Cs. Minnesotae*

IV. Culex

Culex tarsalis

Cx. tarsalis (the western encephalitis mosquito) is the most common of the *Culex* in Chiloquin. The larvae develop in nearly any conceivable containers holding water such as tires, rain gutters, bird baths, rooting buckets, discarded containers, standing pasture water, etc. The females are painful and persistent biters, attacking at dusk and after dark, and readily enter dwellings for blood meals. The adults hide in sheltered places during the day. Mosquitoes of this species can fly considerable distances (up to 16 miles) and when a large untreated source hatches off it can provide a community with several months of biting pests. *Culex* mosquito species are the species of mosquitoes known for the transmission of West Nile Virus.

Culex peus

This species is found in most types of moderately polluted types of water, such as mill ponds but are also found in road culverts, ornamental pools, and other semi-permanent sites.

***Culex pipiens* (Northern House Mosquito)**

The larvae of this mosquito are found in the polluted water of open septic drains and cesspools. They may be associated with *Cx. peus* past mid-summer in semi-polluted environments such as rain barrels or other artificial containers.

Other *Culex* mosquitoes found in Chiloquin are:

- *Cx. territan*