

CANYON COUNTY MOSQUITO ABATEMENT DISTRICT  
9719 Booker Lane  
Nampa, Idaho 83686

Phone – (208) 461-8633  
Fax – (208) 461-4459

Members: IMVCA, ECA of Idaho,  
NWMVCA, AMCA

## CANYON COUNTY MOSQUITO ABATEMENT DISTRICT MOSQUITO MANAGEMENT PLAN FOR 2011

**Submitted to the Canyon County Board of Commissioners: Idaho Code, Title 39  
Health and Safety chapter 39-2804 paragraph 9.**

**Authority:** Idaho Code Title 39 Health and Safety. 39-2801A. Authorization to form abatement districts. There may be formed, under the provisions of this chapter, districts for the abatement of mosquitoes or other vermin of public health and welfare importance, in any area of the state from territory of one (1) or more counties, one (1) or more cities or towns, or any combination or portion thereof.....

### MISSION GOAL

The mission goal is to help protect the citizens that live within the CCMAD boundaries from disease carrying mosquitoes such as the Culex species, which is the primary vector for the West Nile Virus. The second part of CCMAD mission is to improve the quality of life for District constituents by managing mosquito populations to prevent a nuisance and or economic loss to areas of the district. The third part of CCMAD mission is to help protect District animal and livestock populations from mosquito borne disease or parasites. CCMAD operates on Integrated Pest Management principles (I.P.M.) using precision targeting methods that are tied to a **pesticide reduction effort**. This I.P.M. approach translates into a sustainable method of managing mosquito populations that combine biological, cultural, physical and chemical tools in a way that will minimize economic, health and environmental risks. This approach relies on extensive monitoring to aid in predicting potential insect and disease outbreaks, thus allowing intervention methods to be **preventative rather than reactive**.

## INTRODUCTION

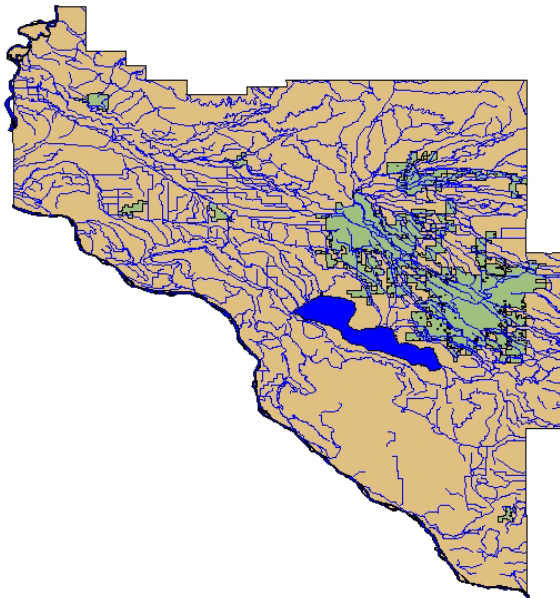
**The Mosquito Management for 2011 also is designed to meet the requirements of Pesticide General Permit (PGP) for the Point Source Discharges to the Waters of the United States from the Application of Pesticides:**

The Canyon County Mosquito Abatement District jurisdiction encompasses the geographic borders of Canyon County Idaho:

**Canyon County Idaho: 589 Square Miles  
Population: 186,600**



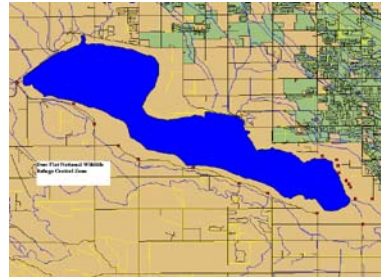
**Canyon County Mosquito Abatement District Jurisdiction Boundaries**



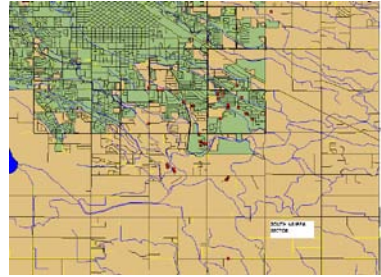
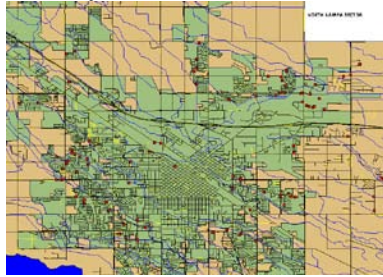
## Canyon County Mosquito Abatement District Control Sectors:

CCMAD is divided into the following **control sectors** for control and mosquito population surveillance purposes.

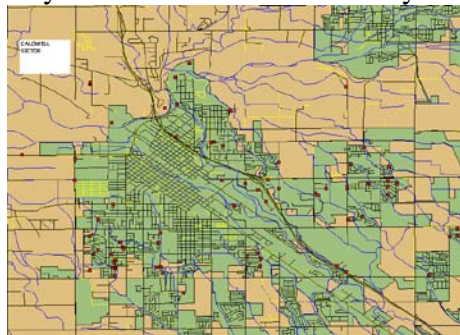
- **Lake Lowell Sectors:** This constitutes areas around the south side, east side and north side of Lake Lowell adjacent to the Deer Flat National Wildlife Refuge. This sector also encompasses city limits of Nampa south of Greenhurst Road and west of South Powerline Road. To the north to Ustick Road and the Deer Flat National Wildlife Refuge.



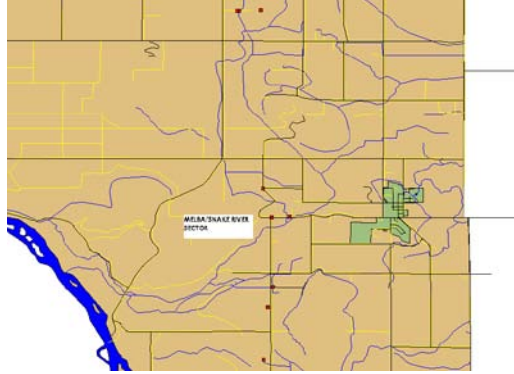
- **Nampa Sectors:** City limits of Nampa. The main sources of mosquitoes are concentrated on the east end of the city and ends at McDermott Road/Ada County Line. To the north to Boise River south of Middleton and Star.



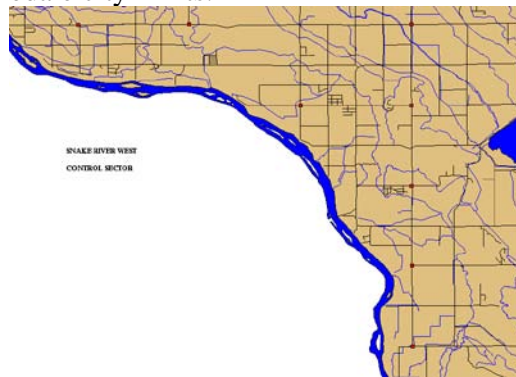
- **Caldwell Sector:** The City Limits of Caldwell. There are several main sources for mosquitoes for this sector. Boise River area, Simplot potato processing plant area and the Canyon Hill and to Middleton city limits.



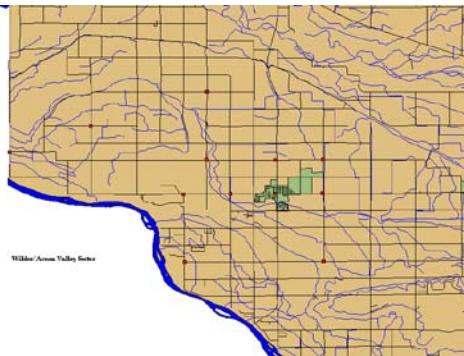
- **Melba/Snake River South:** Starts at Bowmont Road to the Snake River along Map Rock Road to the west to Celebration Park to the east.



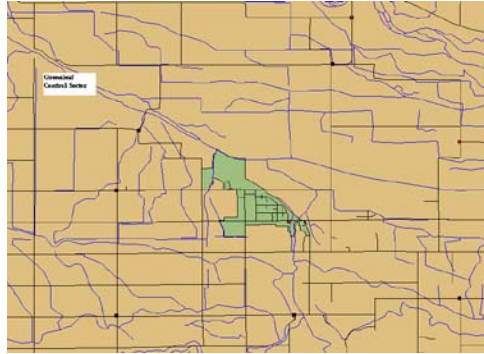
- **Snake River West:** From Sunnyslope area to Marsing Bridge. North to Ustick Road and Homedale city limits.



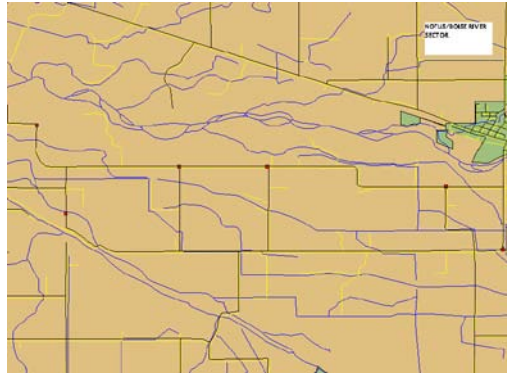
- **Wilder Sector:** The Wilder Sector includes Arena Valley area to the west, the City of Wilder to River Bend Golf Course to Homedale city limits.



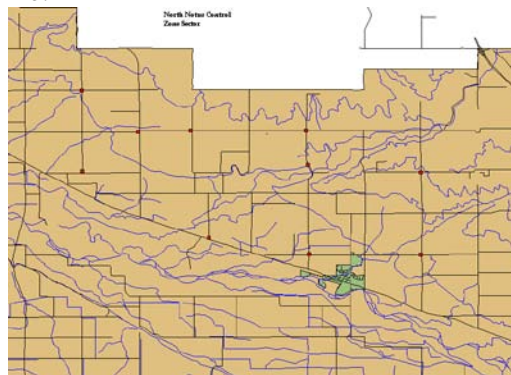
- **Greenleaf Sector:** Ustick Road to the south. Howe Road/Allendale Road to the north. Includes the city of Greenleaf and along Simplot Blvd. to Simplot potato processing plant to the east.



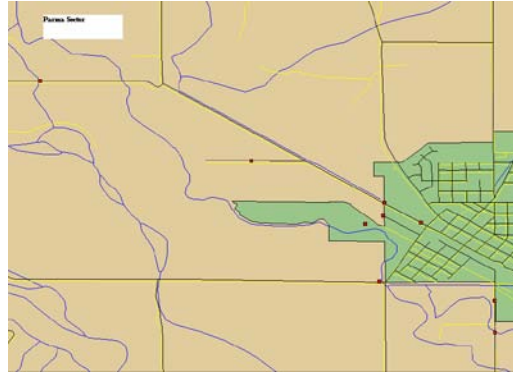
- **Notus/Boise River Road Sector:** From Howe Road to the north to Boise River Road. To the east to Dixie River Road. To the west along Boise River to Highway 95.



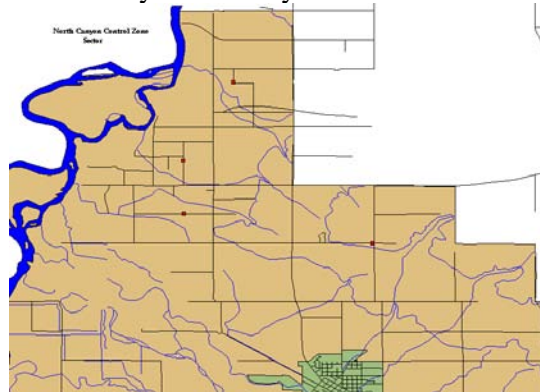
- **Notus North Sector:** Includes city of Notus to the north to Market Road and Payette County line.



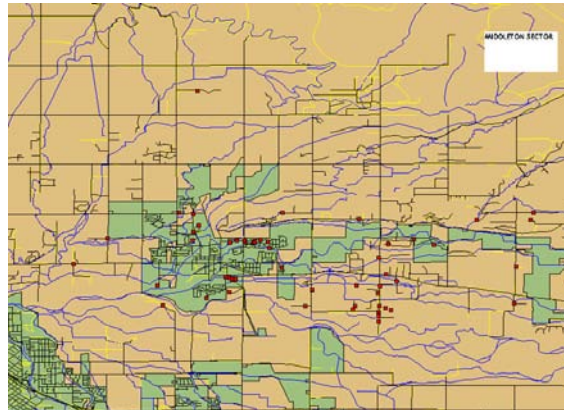
- **Parma Sector:** Includes the city of Parma. To the northwest along Boise River to Sharp lane. To the south through Roswell to Arena Valley. To the north to Klahr Road to Oregon state line.



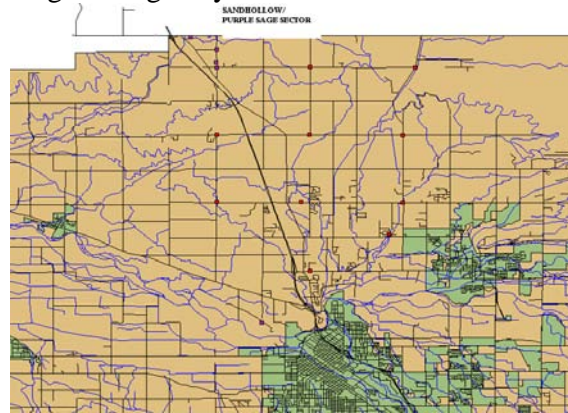
- **North Canyon Sector:** North of Klahr Road to Payette County Line, to Oregon State Line Nyssa bridge along Snake River and Apple Valley. To the East of Anderson Corners to Payette County line.



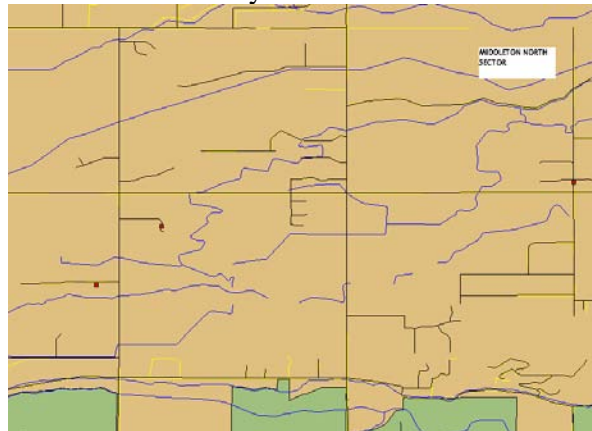
- **Middleton Sector:** City of Middleton to Ada County line. To the north to Willis Road. To the south to Boise River and to the West to I-84.



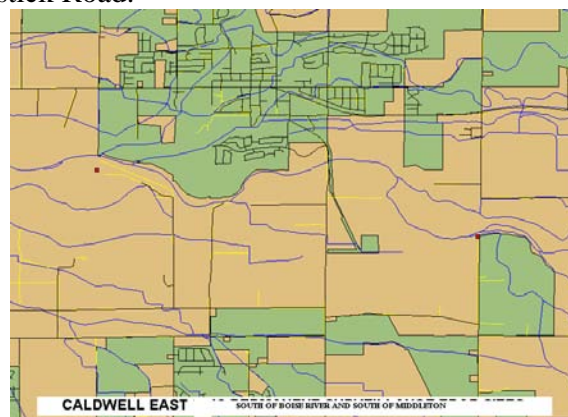
- **Sand Hollow/Purple Sage Sector:** Oasis Road to the north and Payette County line/Gem County line. Purple Sage Golf Course and to the West to Stafford Lane. Farmway Village to Highway 20-26.



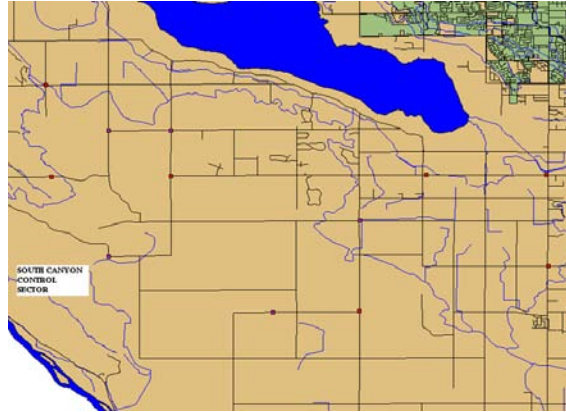
- **North Middleton Sector:** North of Foothill Road to Gem County line, east of Cemetery Road to Ada County Line.



- **East Caldwell Sector:** West of Middleton Road to Boise River to the north. South to Ustick Road.



- **South Canyon Sector:** South of Deerflat Road, west of Powerline Road, south to Bowmont Lane.



### **INTEGRATED PEST/MOSQUITO MANAGEMENT PRINCIPLES (I.P.M.)**

I.P.M./I.M.M. principles are as outlined in the American Mosquito Control Association (AMC) document “Best Management Practices for Integrated Mosquito Management, December 2, 2009.

Integrated Pest Management/Mosquito Management is a comprehensive pest strategy that utilizes all available mosquito control methods singly or in combination to exploit the known vulnerabilities for mosquitoes in order to reduce their numbers to tolerable levels while maintaining a quality environment. Integrated mosquito management methods are specifically tailored to safely counter each stage of the mosquito life cycle. Larval control utilizing natural biological control methods, sanitation practices, and water or vegetation management methods or other types of source reduction measures where compatible with the other land management uses, are prudent mosquito management alternatives-as is use of EPA-registered larvicides and adulticides. When source elimination or larval control measures are not feasible or are clearly inadequate, or when faced with imminent mosquito/insect-borne disease, application of adult mosquito control products are chosen based upon their demonstrated efficacy against species targeted for control, resistance management concerns and minimization of potential environmental impact. (from AMCA Best Management Practices for Integrated Mosquito Management)

Integrated Mosquito Management/Pest Management program activities goals will strive towards the wise use and reduced use of pesticides. IPM/IMM is a decision making process that uses all available pest management strategies. This process will help determine what method of control will reduce the mosquito populations to an acceptable level. The Canyon County Mosquito Abatement District’s IPM/IMM methods will take into account the potential health risk to an arbovirus threat to determine the most effective abatement strategy.

The Canyon County Mosquito Abatement District Integrated Pest Management/Mosquito Management program is knowledge base and surveillance driven and is designed to accomplish the following:

- Protect human, animal and environmental health.
- Promote a rational use of pesticides.
- Reduce environmental contamination to soil, ground water, bee pollinators, wildlife and endangered species.
- Encourage the use of natural biological controls to augment other control methods.
- Use target specific pesticides to the extent possible.
- Proper timing of pesticide applications.
- Minimize resistance

CCMAD IPM/IMM will identify the following strategies for the management of mosquito populations:

- **Education:** This is the first strategy and in many cases the most effective. When constituents are trained to recognize, report or remove potential mosquito production sites on their property or other property, it makes the job of CCMAD easier. Education can be done very economically and has a direct impact on mosquito populations. Examples of CCMAD education efforts and programs are the following:
  1. Distribution of CCMAD neighborhood flyer “Take the Bite Out of Summer, a Guide to Backyard Mosquito Control”.
  2. CCMAD Webpage: [canyoncountymosquito.com](http://canyoncountymosquito.com) which is updated weekly or more frequently during the mosquito season.
  3. CCMAD is an active source for news articles in local newspaper and TV/Radio features.
  4. CCMAD participates in community functions such as the annual Deer Flat National Wildlife Refuge “BioBlitz”.
- **Cultural:** This strategy is tied very closely to education and involves behavior changes to avoid mosquito bites such as:
  1. Wear long sleeved shirts and long pants during peak mosquito activity.
  2. Limit outdoor activity during mosquito peak activity or change time of day of outdoor activity.
  3. Be aware of irrigation practices and practice good water management
  4. Wear mosquito repellent when outside during peak mosquito activity.
- **Mechanical:** These strategies involve the actual habitat manipulation of mosquito production sites “source reduction” and harborage for adult mosquito resting sites. Examples of Mechanical strategies are:
  1. Cleaning house gutters.
  2. Emptying bird baths and making sure boat covers, swimming pool covers are free of standing water.

3. Keeping weeds and excess vegetation levels down; mowing ditch banks and vacant lots; proper pruning of shrubs and trees. (eliminate harborage areas).
4. Actual source reduction, and standing water, chronic wet area drainage.

**Note:** The main source of mosquito population in the Canyon County Mosquito Abatement District is Deer Flat National Wildlife Refuge and the Boise River corridor from the Ada County line to the confluence of the Snake River west of Parma, Idaho. Water levels for these two sources are dictated by snow run off and regulated by the Bureau of Reclamation-Boise Project Board of Control. Source reduction is either seasonal or as managed by this agency.

- **Biological:** Biological control is the introduction predators to help control mosquito populations. Mosquito larvae eating fish such as Gambusia, blue gills or minnows are all sources of mosquito eating predators that may be introduced to permanent water bodies. Other mosquito predators are dragonfly larvae and bats for adult mosquitoes. Biological control efforts are very intensive and not efficient efforts to control mosquitoes on a large scale but can be utilized on a specific site.



[Gambusia "Mosquito Fish"](#)

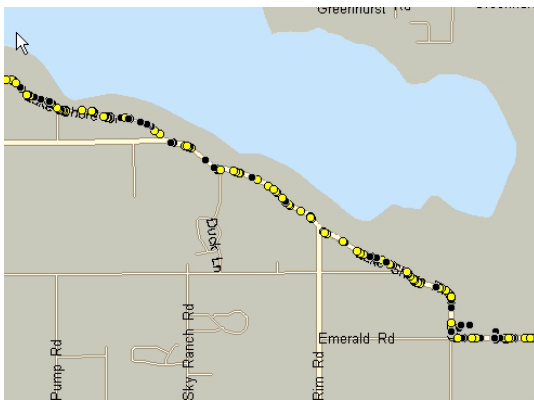


[Bat House](#)

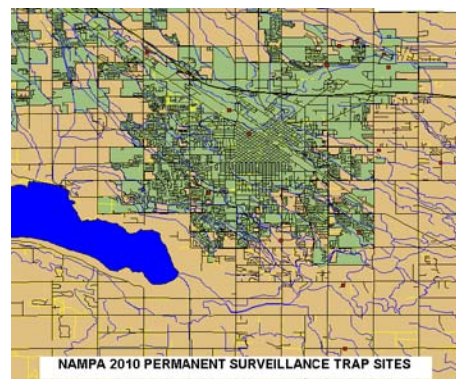
- **Chemical or Pesticide Use:** This strategy is divided into two main categories:
  1. Larvae Control: Larvicide applications are the main key to sustainable mosquito population management and is the primary effort of the Canyon County Mosquito Abatement District. Studies have shown that 1 acre of mosquito larvae control operations can prevent up to 100 acres of adult control measures such as "neighborhood fogging." The pesticides that CCMAD use for larvae control are very targeted and specific with little or low impact on the environment or non targeted arthropod species. Larvicide operations are either conducted by ground crews or by aircraft.
  2. Adult Mosquito Control: This is the most high profile of all mosquito abatement activities and is used when conditions warrant, such as the presence of a disease threat, elevated population levels of disease vector species or high levels of other mosquito species that may pose a quality

of life or economic threat to both people or animals. Adult mosquito control operations are deployed when other I.P.M. strategies are not sufficient to reduce mosquito populations to a manageable level. Adult mosquito control is either conducted by truck mounted units or in extreme cases and in the event of arbovirus emergency outbreak, conducted by aerial applications.

- **Surveillance and Arbovirus Testing:** Surveillance is the backbone to Canyon County Mosquito Abatement District Integrated Pest Management program. Treatment decisions are made based on surveillance data and monitoring of mosquito population dynamics. Adult mosquito surveillance and mosquito larvae surveillance are conducted routinely within the boundaries of CCMAD.
- **Action Thresholds:** An action threshold is a function of mosquito population monitoring and surveillance and when reached warrant the use of chemical control measures (pesticides). Action Thresholds vary for different mosquito species, location, and time during the mosquito season.
- **Mapping and Record Keeping:** The Canyon County Mosquito Abatement District utilizes the Vector Control Management System (VCMS) and DataMaster Mobile GPS system for electronic record keeping and mapping of control zones for pesticide applications both larvae control and adult mosquito control. CCMAD also uses backup hard copy pesticide application records for field applications. All application records are kept in accordance with Idaho State Department of Agriculture regulations and are kept on file at CCMA District Office.



Examples of DataMaster Mobil GPS showing ULV Applications.



Example of VCMS mapping showing surveillance site.

## MOSQUITO ABATEMENT OPERATIONS

### **Mosquito Monitoring and Surveillance and Arbovirus Testing:**

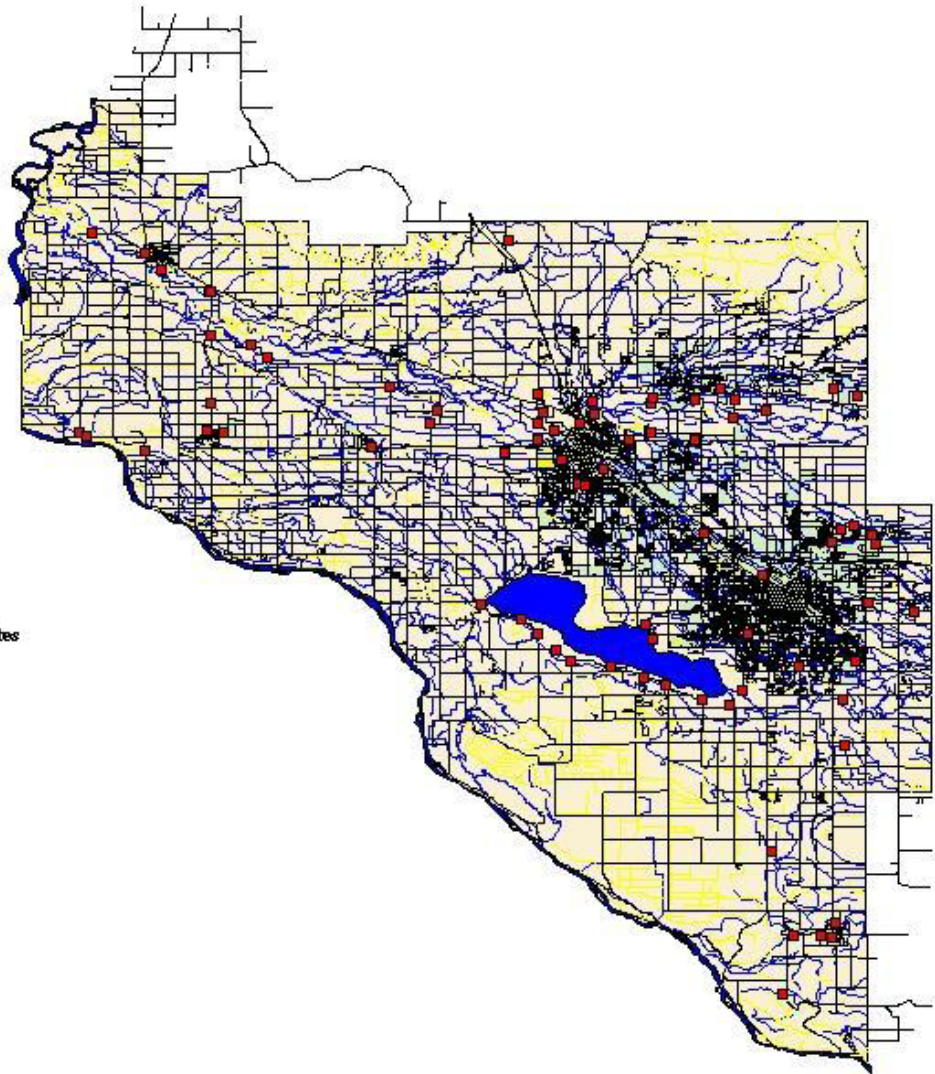
Continuous monitoring of population dynamics. This is accomplished by deployment of CDC CO<sub>2</sub> baited traps in strategic production sites locations and cataloging data. Factors that govern monitoring are service requests, air temperature, water temperature, humidity, rainfall, permanent water levels, irrigation water levels and retention catch basin water levels.

1. Evaluation of control measure efficacy and effectiveness. This becomes important after adulticide applications and in certain cases emergency aerial applications.
2. Arbovirus detection. This is by far the most important function of mosquito monitoring and surveillance. Past history has shown that early detection is important in preventing the spread of an arbovirus disease such as West Nile Virus. Surveillance and testing is important in the evaluation process and what degree of management action can be implemented.

Virus surveillance is done in all CCMAD Sectors each week starting in May or as weather permits sooner. Eight to ten CDC CO<sub>2</sub> baited light traps are deployed in any given sector, per night. Most of the traps are at permanent sites while the others are moved on a continuous basis. All sites are GPS coordinate marked. Some of the trap sites are earmarked as canopy sites, meaning that the traps are suspended into trees 25 to 30 feet for surveillance of actively feeding *Culex tarsalis* or *pipiens*. This is all dependent on site location. Traps are deployed before sun down and retrieved the next morning. Mosquitoes are frozen and identified. Vector species (*Culex* sp.) are pooled into testing groups and tested for West Nile Virus using the R.A.M.P. (Rapid Analytical Measuring Platform) system. Test results are known within 24 to 48 hours, so mosquito management decisions can be implemented in a timely manor. Positive virus pools are communicated with Idaho Dept. of Health and Welfare and with County officials so appropriate press release information can be made. Positive pools are further tested by the Idaho Bureau of Laboratories for Western Equine Encephalitis or St. Louis Encephalitis.

Below is a map that shows the location of **permanent** adult mosquito surveillance sites. Traps are deployed at sundown and retrieved the next morning. Trapping is conducted Monday through Thursday nights starting in May and throughout the mosquito season. Additional “floater” traps are deployed when conditions warrant such as in areas of elevated service request or when an arbovirus is detected.

2011 Surveillance Sites



### Action Thresholds:

An Action Threshold is a function of mosquito population numbers that, when reached, warrants the use of control measures. Action thresholds vary for different mosquito species, location, and time in the mosquito season. Action thresholds are determined by monitoring the mosquito larval and adult population.

**Larval Control Action Thresholds:** Larval action thresholds are determined by standard mosquito dipping techniques. Dipping is done in open water, along banks, under vegetation, under grass hanging in water, standing water pools that are shallow, such as irrigation tail ditches, catch basins, water features, ponds, street storm drains, or virtually any container that holds water for a period of time.

Density determinations: Low: 1-4 larvae per dip (**No action taken**)  
Medium: 5-10 larvae per dip. (**lowest effective rate**)  
High: >than 10 larvae per dip. (**lowest effective rate**)

**Control measures are implemented when density average 5 larvae per dip /10dips.**

Note: Action Threshold for Altosid pre-treatment of catch basins and storm drains are based on habitat conditions conducive to the production of vector species such as the Culex genus of mosquitoes and not actual larval counts.

**Adult Mosquito Control Action Thresholds:** Adult mosquito action thresholds can be determined by the following factors:

1. Mosquito monitoring using various trapping techniques. The most common being the CDC CO<sub>2</sub> baited light trap. These traps are portable; battery operated and can be placed most anywhere.

Action Thresholds: For Culex species: 5 mosquitoes per night.  
These action thresholds may vary with the threat of a disease or emergency declaration.

For other species of mosquitoes the trap numbers may be higher: Up to 25 mosquitoes per night for two nights.

**Note: These numbers Action threshold numbers may be lower depending on population pressures or disease threat levels.**

2. The presence of a disease such as West Nile Virus. Adulticide applications may be scheduled by the presence of a disease and continued in a particular area until it is determined that the threat has been abated.
3. Citizen verifiable complaint levels. This action threshold can be determined by adult mosquito trapping and monitoring in areas where complaint levels are high.

**Action Threshold, Emergency Declarations:** Emergency aerial applications for adult mosquito populations may be declared when certain criteria are met.

1. The presence of a disease in horses and birds and mosquito population pools.
2. The indication of a Minimum Infection Rate in tested positive mosquito pools that may be a indicator of a possible virus outbreak. Note: **An M.I.R ratio of 5 mosquitoes/1000 has been set as a standard to initiate aggressive ground adulticiding activity or emergency aerial applications.**
3. Number of Human Cases.

Minimum Infection Rates (M.I.R.) are calculated using the following formula:

$$\frac{\text{Total \# of positive pools /trap}}{\text{Total \# of mosquitoes trapped}} \times 1000 = \text{M.I.R.} *$$

**\* Indicates data furnished through the Department of Interior- National Park Service Integrated Pest Management manual, American Mosquito Control Association (AMCA), CDC, and Idaho Mosquito and Vector Control Association and Arbovirus Surveillance and Mosquito Control in Idaho, Guidance for Counties.**

## PESTICIDE USE LIST FOR OPERATIONAL YEAR 2011

### Larvicide Agents:

1. Bti. This is a bacteria agent that affects mosquito larvae in the first through fourth instar stages and not effective on egg, pupae or adult stages. CCMAD uses Bti agents distributed under the following names: Active ingredient: Bacillus thuringiensis israelensis or Bacillus sphaericus.

Product	Formulation	EPA Reg. No.	Most Effective Rate Used
Vectobac 12AS	Aqueous suspension	73049-38	.50pt./ Acre*
Vectobac CG	Granular formulation	73049-19	8 lbs. per Acre*
Teknar CG	Granular formulation	73049-403	8 lbs. per Acre*
Aquabac xt	Aqueous suspension	62637-1	.50pt/ Acre*
VectoMax CG	Granular formulation	73049-429	7 lbs. per Acre*
FourStar Briquettes	Briquette formulation	83362-3	1 brqt./100 sq. ft.

2. Insect Growth Regulator (I.G.R.) affects mosquito larvae and keep from them from developing into adult stage. CCMAD uses IGR agents under the following names. Active ingredient: (S)-Methoprene

Product	Formulation	EPA Reg. No.	Lowest Effective Rate
Altosid SBG	Granular	2724-489	10 lbs./ Acre*
Altosid XR	Briquette/Ingots	2724-421	1 brqt/100 sq. ft.*
Altosid XRG	Granular	2724-451	5 lbs./Acre*
Altosid Brqt.	Briquette	2724-375	1 brqt/100 sq. ft.*

3. Monomolecular Films. CCMAD will utilize one MMF in its' operations in 2011. Active ingredient Poly (oxy-1,2ethanediyl hydroxyl). Following Brand Name:

- Agnique MMF EPA Reg. No. 53263-28  
Most Effective Rate: 0.2gal/acre\*

### Adulticide Agents:

1. Permethrin U.L.V. Applied as a Ultra Low Volume (ULV) using truck mounted equipment over urban, most crop and range land, wet lands and recreation areas. CCMAD utilizes the following brand name Permethrin based chemicals:
  - BIOMIST 4+4 EPA Reg. No. 8329-35 Lowest effective rate: 1.25 oz./acre\*
  - KONTROL 4-4 EPA Reg. No.73748-4 Lowest effective rate: 1.25 oz./acre\*
2. Etenofenprox U.L.V. Applied as a Ultra Low Volume (ULV) using truck mounted equipment over urban, wetlands and recreational areas.
  - Zenivex E4 EPA Reg. No. 2724-807 Lowest effective rate: 0.75 oz./acre\*
3. Bifenthrin. Applied as a barrier treatment to yards, recreation areas, parks and around buildings. CCMAD utilizes two products with Bifenthrin active

ingredient used as a barrier treatment:

- TalstarOne EPA Reg. No. 279-6217 **Lowest effective rate: 21.6 oz./acre\***
- Bifenthrin I/T EPA Reg. No. 53883-118 **Lowest effective rate: 21.6 oz./acre\***

**4. Emergency Aerial Application adulticide products: \***

- **Dibrome (Naled): EPA Reg. No. 5481-480**
- **Evergreen (pyrethrum) EPA Reg. No. 1021-1770**

Rates determined by disease level and population dynamics of vector species.

**CCMAD selection of pesticide tools to be used during the 2011 operation year is subject to change do to availability of product and pricing.**

\*As proposed in criteria for emergency aerial adulticide applications.

\* **Lowest effective rate is the first rate chosen as according to label rates and may change to most effective rate dictated by pest pressure or disease outbreak.**

## **PESTICIDE METHODS OF APPLICATION**

All pesticides used by CCMAD are applied by EPA label rates and recommendations and methods.

### **Larvicide Products:**

1. Bti liquid aqueous suspensions are applied by backpack sprayer, ATV mounted sprayers or hydraulic power spray equipment if large areas are treated.
2. Bti granular products are applied by hand granular spreaders or if large areas are treated, backpack power blower equipment. In some instances Bti granular products are applied by fixed wing aircraft to inaccessible or large acreage.
3. Bti/Bs Briquettes are hand placed or dropped into catch basins.
4. I.G.R. Altosid SBG granular products are applied by either hand operated granular applicators or backpack power blowers.
5. I.G.R. briquets are hand placed or dropped into catch basins.
6. MMF Agnique is applied by hand held pump up spray applicators.

### **Adulticide Products:**

1. Ultra Low Volume (U.L.V.) both Permethrin based and Etenophenprox based are applied by truck mounted equipment cold fog application machines that travel through neighborhoods or along roads and access frontage roads and in some cases pastures and along irrigation ditches at 5 m. p.h. to 10 M.P.H. with the delivery and the dispersing of insecticide at a 300 ft swath. Applications are made approximately ½ hour after sundown until 1:00 a.m. In certain cases truck mounted U.L.V. applications are made early in the a.m. before daylight. Applications are suspended when sustained wind speeds exceeds 10 m.p.h.
2. Bifenthrin based products are applied to yards, parks, athletic fields and around homes and commercial facilities using high pressure, high volume, hydraulic spray equipment. Bifenthrin is used as a “barrier treatment” operation. Barrier treatments are used near sensitive areas such adjacent to organic farms, crop areas not on label

list when using U.L.V. treatments and for special request functions on private property, parks, and special event centers.

**Calibration:**

1. All ULV spray equipment is calibrated annually by measuring droplet size and output per minute. CCMAD has 6 truck mounted ULV machines. Each unit is equipped with the Clarke Smart Flow system and is controlled by DataMaster Mobil GPS system.
2. Truck mounted power sprayers are calibrated periodically through the season at an output of 50 gallons/acre.
3. Backpack sprayer and Gas Powered Backpack granular applicators are calibrated daily to assure proper pesticide dispersal.

**Pesticide Spill Response:**

1. Each vehicle is equipped with spill kit equipment to contain any pesticide spills. U.L.V. trucks are labeled with DOT placards that identify a flammable pesticide.
  2. Personnel are trained throughout the season in pesticide spill response.
  3. A written spill response plan is in place along with documented verifiable training.
- Spill prevention and training are key to preventing pesticide spills. CCMAD’s first response to chemical spills is to keep all vehicles and application equipment properly maintained. CCMAD keeps a log for all equipment maintenance.

When a pesticide spill occurs, the following response procedure is used:

- Immediately notify the District Director or Supervisor with description of incident.
- Supervisors are trained in spill procedures and will instruct or supervise on how to proceed.
- Refer to Guidelines of “3 C,s” in response: Control, Contain and Clean Up the spill.

**Pesticide Discharge Management Team:**

**Supervisory Staff**

Name	ISDA Certification No.	Area of Responsibility
Ed Burnett	3978	District Director is responsible for Managing pest in relation to pest management area. Develop and revision of PDMP.
Teresa Babcock	50451	Director’s Assistant: Training and Safety Coordinator. Also is responsible for information record keeping.
Jane Puyear	N/A	Office Manager: Responsible for data entry.
Carrie Maes	47598	Surveillance Coordinator, Field Operations Supervisor pesticide application coordination.
Tom Harrelson	50452	Maintenance Supervisor: Calibration of equipment, preventative maintenance and pesticide applications.
Julie Brown	50562	ULV Operations Manager and applications.
Michael Moses	505485	Larvicide Operations Forman: Pesticide applications.
Cruz Banda	50520	Larvicide Operations Crew Leader
Isaac Almaraz	50832	Larvicide Operations Crew Leader

**Adverse Incident Response:**

- In the case of a fish or wildlife adverse incident, the USFWS and/or the Idaho Dept. of Fish and Game will be notified.
- In the case of an adverse incident that involves an uncontrolled pesticide spill over the reportable quantities then the National Response Center (NRS) will be notified at (800) 424-8802.

**Monitoring:**

Monitoring of post pesticide applications will be conducted by CCMAD monitor team. One team will monitor aerial larvicide applications on Deer Flat National Wildlife Refuge. Another team will monitor larvicide application on Idaho State Dept. of Fish and Game properties and access as well as Boise River larvicide applications. Monitoring activity will be recorded on CCMAD Pesticide Monitoring forms.

**PESTICIDE APPLICATION MONITORING FORM**

*All pesticide applications are completed within Canyon County Mosquito Abatement District's boundaries for the public health and pest nuisance protection.*

Application Date: \_\_\_\_\_

Application Type(s): Aerial Larvicide \_\_\_\_\_ Ground Larvicide \_\_\_\_\_ Ground U.L.V. \_\_\_\_\_

Location of Application: (GPS coordinates) or Physical Address: \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_

Start Time AM PM	Stop Time AM PM	Wind Direction	Wind Speed	Ambient Temperature	Amount Used	Acres Treated

Survey of Non Target organisms and condition: \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_

\_\_\_\_\_  
Inspector

Inspection Date: \_\_\_\_\_

## MOSQUITO PROBLEMS

Many areas of CCMAD may be affected by one or more mosquito problem. The Canyon County Mosquito Abatement District focuses the abatement efforts towards reducing the populations of Culex species of mosquitoes which are the **primary** disease vectors for West Nile Virus.

**Permanent Water Species:** Adults of these species are active primarily during the evening hours and mainly in the Culex genus group. Permanent water sources can be anything from discarded tires, planter vases, buckets, swimming pools, tree holes or any container that will hold water for a length of time, such as retention ponds, storm water catch basins, wetlands, marshes or shallow ponds. The Culex genus groups are the primary vectors of West Nile virus and Western Equine Encephalitis in Canyon County.



Culex tarsalis (permanent Water Genus-species)



Culex pipiens (permanent water Genus-species)



Culex erythrorhax (permanent water Genus-species)

**Irrigated Pasture Species:** The Irrigated Pasture mosquitoes are fierce biters, are active primarily during the day and are found in irrigated farmlands, pastures and lawns. These mosquitoes generate the most complaint calls because of the hatching off in very high numbers starting in the spring.



**Flood Water Species:** Perhaps the most common mosquito found. This species, produces eggs below flood line and flooded irrigated fields and hatches off in very high numbers and can be active both day and night.



**Inland Flood Water Mosquito (Aedes vexans)** The most common mosquito in Idaho which hatches off in huge numbers, are day time biter, and generate the most complaints to Canyon County Mosquito Abatement District.

**Disease Vector Species:** Any of the fore mentioned mosquitoes can be vectors of disease when the conditions are favorable. The Culex genuses of mosquitoes are our **principle** vectors species for Western Equine Encephalitis, St. Louis Encephalitis, and West Nile Virus in Idaho. These mosquitoes have a wide distribution and can be strong flyers. Constant inspection of their production habitat (permanent standing water sites) vigilance and control are needed.

#### **Mosquito species found in Canyon County:**

Of the 51 mosquitoes species found in Idaho only a few are of public health, economic and quality of life importance. The species identified can be divided into two types of mosquitoes: Permanent and Floodwater type. The distinction between the types of mosquitoes is very important. The methods to monitor and control the different types can be unique to each type.

#### **Permanent Water Mosquitoes:**

- Culex tarsalis: Common name-Western Encephalitis Mosquito. This species is the predominate vector for West Nile Virus in Canyon County. In the 2006 epidemic, it accounted for over 50 of the positive mosquito pools. In 2007, 27 of the positive mosquito pools were Culex tarsalis. In 2008 only 4 positive pools of Culex tarsalis were detected. In 2009, Culex tarsalis numbers spiked

to very high levels and resulted in 29 positive mosquito pools. Culex tarsalis can over winter as a fertilized female. Females are active at twilight and night. Birds and mammals are preferred host. Surveillance for this species utilizes some trapping in tree canopies. The species may have multiple breeding sites. Eggs are laid in rafts on the water surface.

- Culex pipiens: Common name-Northern House Mosquito. This species is a very efficient vector of West Nile virus. In Canyon County, the numbers are not nearly as high as Culex tarsalis however many positive pools have occurred in recent years. All of the positive pools collected of this species were found near urban sites such as waste water treatment facilities and catch basins. The species over winters as a fertilized female. The females are active at twilight and night. Birds are the preferred host. Surveillance for this mosquito utilizes trapping in tree canopy layers. Impoundments of foul water are the preferred production sites. Eggs are laid in rafts on water surface. They are multi-brooded. Species is very common in communities with storm water systems.
- Culex erythrothorax: Common name-Tulle Mosquito. In 2005, this mosquito produced the first positive West Nile Virus pool in the state. The trapped numbers in 2009 and 2010 were relatively small compared to the other two Culex species. Never the less this species has proven to be a vector for West Nile Virus and was documented in Canyon County as first positive West Nile Virus in Idaho. Species over-winter as a fertilized female or larvae. Females are active at twilight and night or in the breeding habitat. Birds and mammals are the preferred host. Fresh water with heavy growth of emergent vegetation is the preferred production sites. The species is multi-brooded and is found in only a few sites within CCMAD.
- Anopheles freebornii: Common name-Western Malaria Mosquito. This mosquito was trapped in moderately low numbers in 2009. The species over winters as fertilized females. The adult mosquito is active at twilight and evening. Mammals are the preferred host. Semi permanent and permanent water sources with floating plant material and debris are the preferred production sites. Eggs are laid singly on water surface. This is a multi-brood mosquito and the females readily enter dwellings to feed. As the common name implies, is the vector species for Western Malaria.
- Culiseta sp.: Common names- Winter Marsh Mosquito (sp. inornata) and Fish Pond Mosquito (sp. incidens). Both of these species were identified in very low numbers in Canyon County. They both prefer to feed on large mammals and reproduce in semi-permanent and permanent water sources.

#### **Flood Water Mosquito Species/Irrigated Pasture Species:**

- Aedes vexans: Common name-Inland Flood Water Mosquito. This is the most common mosquito in Canyon County. This species was trapped throughout Canyon County Mosquito Abatement District in very high numbers in 2009. It is a known vector for West Nile Virus but not a primary

efficient vector. It is occasionally tested for the virus. The species overwinters in egg stage. Females are active during day, twilight, and at night. It is a relatively small mosquito and heavy biter. The eggs are laid on soil below flood line. The mosquito hatches off in very large numbers and is the cause of many complaint and service calls through out the County and District. **(the presence of *Aedes vexans* is sign of over irrigation practices)**

- Ochlerotatus sp.: Two very common species are found within the District and County. Och. dorsalis, common name-Salt Marsh Mosquito and Och. nigromaculis, common name-Irrigated Pasture Mosquito. Both of these species are found through out the District and County and are major source of nuisance calls and service calls. They are ferocious day time biters. The Salt Marsh Mosquito can migrate a long way from it's production sites and can be very difficult to control. These mosquitoes can be of major economic importance, especially to golf courses and recreation area. They are not primary vectors of disease and are not routinely tested. Both of these species have been trapped in very high numbers throughout the County. The Irrigated Pasture Mosquito can be experienced in very high numbers around school grounds and athletic fields.

**Note: Other species that may be found in Canyon County but at insignificant numbers include:**

- **Little Smokey Mosquito (*Aedes cinereus*)**
- **Salt Marsh Mosquito (*Ochlerotatus dorsalis*)**
- **Wetlands Mosquito (*Ochlerotatus melanimon*)**
- **Western Treehole Mosquito (*Ochlerotatus sierrensis*)**
- **Cattail mosquito (*Coquillettidia pertrubans*)**

Information data on mosquitoes trapped in Canyon County come from Idaho Mosquito Field Guide by Don Brothers printed and distributed by the Idaho Dept. of Agriculture and Idaho Mosquito and Vector Control Association.

# CANYON COUNTY MOSQUITO ABATEMENT DISTRICT PHASED RESPONSE GUIDELINES FOR ARBOVIRUS EMERGENCIES

Adopted from Idaho West Nile Virus Phased Response Guidance for Counties  
Revised 7/19/07\*

(Note: Phased response has been modified to meet CCMAD current status or needs)

## **Principles of Phased Response to Arbovirus Detection**

- The primary mission of the phased response guidance is to protect the public health and safety of the Citizens of Canyon County and guests.
- The following arbovirus protection provisions for mosquito abatement are proposed as responses to various indicators of virus or the threat of virus in the environment.
- The levels of response are presented in a phased manner categorized by perceived risk to human health.
- The response guidance is modeled after plans adopted by other states in the United States, with revisions to address Idaho's current situation.
- The phased response thresholds should always take into consideration local surveillance findings.
- The response guidance is consistent with acceptable national practice.

\*Originally published 3/14/2003 as section 3.F: "Idaho Model Arbovirus Surveillance and Response Guided from the "Arbovirus Surveillance and Mosquito Control in Idaho: Guidance for Counties"

## **DEFINITIONS:**

### **Arbovirus:**

An Arthropod-Borne virus is considered vector-borne; transmitted by the bite of an infected arthropod such as a mosquito or a tick. Examples include West Nile Virus (WNV), St. Louis Encephalitis (SLE), and Western Equine Encephalomyelitis Virus (WEE). Many of the mosquitoes responsible for transmission of these viruses do exist in Idaho.

### **Epizootic:**

An outbreak of a disease in an animal population.

### **Epidemic:**

An outbreak of a disease in humans.

**Integrated Pest Management (IPM):**

A tiered approach to decision making and mosquito population control identification, development site location, site reduction or removal, larviciding, adulticiding and public education.

**Level #:**

The level number represents the recommended response phases based on surveillance findings. NOTE: level designations are NEW and do not correspond with the original phases response numbers in the 3-14-03 Guidance for Counties document.

**Pest Management Plan (PMP):**

An objective, sustainable plan which includes strategies and tactics to control mosquito s in a defined area.

**Response:**

Recommended activities for pest control in counties.

**Status:**

Features that clarify level designations in the County.

**Vector:**

A carrier, often an arthropod such as a mosquito or tick, transferring disease from one host to another through a bite or scratch.

**PUBLIC HEALTH/MOSQUITO CONTROL RESPONSE LEVELS**

- Level 1:** Probability of human infection: Remote
- Level 2:** Probability of human infection: Low
- Level 3:** Probability of outbreak in humans: Moderate or High
- Level 4:** Probability of outbreak in humans: in progress (100%)
- Level 5:** Probability human infection: in decline

**LEVEL 1: Probability of human infection: Remote**

**Status:**

- No positive surveillance indicators currently found in Canyon County and
- Mosquitoes are starting to emerge in spring.

**CCMAD Response to Level 1 Status:**

- Review currant PMP (Pest Management Plan) and update, make necessary changes.
- Update Arbovirus contact persons and communication links
- Update list of contacts of related agencies or resource personnel such as outside contracts.
- Identify and keep record of special interest groups such as beekeepers, organic farmers/growers, and pesticide sensate individuals. Update no spray list and pre-notification lists.

- Hiring/training of personnel.
- Initiate first steps of I.P.M. process such as collection, identification of adult mosquitoes, locate and identify new mosquito production sites. Monitor larval mosquito populations and pay attention to presence of known vector species. Initiate viral testing of vector adult mosquito pools.
- Start analyzing early findings and action level thresholds: Initiate proper control methods using hierarchy of I.P.M. principles.
- Plan for the development of bid specifications for contract aerial applications of adulticide in the event of an arbovirus emergency or the operational need for enhanced adulticide.

**LEVEL 2: Probability of human infection: Low**

**Status:**

- The first evidence of an arbovirus activity has been detected in Canyon County or in neighboring counties in non-human surveillance indicator such as positive mosquitoes, birds, horses or other mammals.

**CCMAD Response to Level 2 Status:**

- Continue with Level 1 activities
- Make any revisions to PMP if warranted
- Work with other agencies such as Southwest District Health Department, Idaho Department of Fish and Game, Idaho State Department of Agriculture to communicate consistent messages regarding positive surveillance findings, notification of affected areas, personal risk reduction practices, and use of mosquito control measures.
- Work with Canyon County Public Information Officer in the dissemination of any appropriate news releases to the media.
- Define geographic area (s) for increased monitoring and control where virus transmission appears most active. Expand monitoring activities in scope, frequency, and type as necessary.
- Monitor Minimum Infection Rates (MIR) of Culex species (primary vectors of WNV) also monitor vector populations of mosquitoes for increase in numbers.
- Increase control measures using CCMAD action thresholds. Thresholds may need to be adjusted according to trapping data. Increase or initiate ground ULV operations in the defined geographic and positive trap locations.

**LEVEL 3: Probability of human infection: Moderate to High**

**Status:**

- Increase in WNV-positive surveillance indicators in the District or County or
- Large increase in Vector species population in County or District or
- Large increase in positive infected mosquito pools and rising MIR numbers or
- First human case detected in Canyon County or neighboring county. Note: On average the first human case occurs approximately two weeks after first positive pools are detected.

### **CCMAD Response to Level 3 Status:**

- Continue with Levels 1 and 2 activities
- Keep current with human surveillance findings within the County and State by frequent contacts with Southwest District Health and published website data.
- Update PMP, make any changes that warrant as surveillance data develops and dictates.
- Enhance mosquito control activities such as larvicide and adulticide treatments in areas where disease is located.
- Monitor MIR and if it reaches 5/1000 bench mark, step up adulticide activity and consider aerial applications.
- Begin preparation if aerial application is being considered. Create spray blocks of disease activity. Start implementing check list activities in preparation of aerial applications. Start pre-trapping/surveillance activity in created spray blocks.
- Document costs of emergency aerial treatments.

### **LEVEL 4: Probability of outbreak in humans: High/In Progress**

#### **Status:**

- Multiple human cases occurring in county and surrounding counties that may suggest epidemic level of activity.
- Ongoing evidence of disease in surveillance indicators such as positive mosquito pools, birds, horses or other mammals.

### **CCMAD Response to Level 4 Status:**

- Continue with Levels 1, 2, 3 activities.
- Update and adjust PMP, if necessary, as surveillance and disease data dictates.
- Discuss whether there is a need for a disaster declaration or is current or stepped up enhanced mosquito control activity sufficient.
- Cease mosquito population disease surveillance and conduct mosquito trapping to define areas that need control and to monitor effectiveness and efficacy of adult control activity.
- If a decision is made to conduct emergency aerial application, start implementing pre-spray preparation check list.
- Begin extensive public information and education campaign on aerial application activity and where, when and how application will be accomplished.

### **LEVEL 5: Probability of human infection: In Decline**

#### **Status:**

- Late season with mosquito activity declining.
- Rate of new human infection rate and animal cases declining.
- Positive mosquito pools in decline.

### **CCMAD Response to level 5 Status:**

- Reduce or discontinue enhanced adult mosquito control activities based on surveillance and climatic data.
- Compile mosquito survey data.

- Gather year end statewide and county wide specific data from state agencies carrying out surveillance activities in order to evaluate the current response.
- Update PMP, if necessary and evaluate response.
- Compile after-action report including action taken, effectiveness of actions using surveillance data, observations from year's operational plan and operation cost.

Provide associated agencies with copies of after action reports, plans and expenditures. Include end of year report to Board of County Commissioners, reports to Municipality's City Councils and USFWS Deer Flat National Wildlife Refuge.

- Process any emergency funding documents.

**The initiating of Phased response levels is a very fluid decision and activity can change very rapidly within the District and County as was demonstrated in both 2006 and 2007. The different response to Phased Level Status may move between levels at any time as local conditions warrant.**

**CRITERIA AND CHECK LIST OF ITEMS THAT WILL NEED TO BE MET:**  
(Adopted from checklist of items to be submitted to the Office of the Governor for State Disaster Declaration: Aug.18, 2006)

- **When consideration of Disaster Declaration.**
- **When considering Emergency Adulticide Aerial Applications.**
- **Identify mosquito breeding/production areas.**
  1. Public \_\_\_
  2. Private \_\_\_
- **Conduct Public Education Campaign through County Public Information Dept. and District Health Departments. Include the following items to consider.**
  - Self Protection \_\_\_
  - Reduce mosquito breeding sites around home and property. \_\_\_
  - Pesticide application relative toxicity and safety precautions during application events. **May** include the following recommendations: \_\_\_
    1. Plan for you and family to stay indoors, if possible during pesticide applications.
    2. Close windows prior to pesticide spraying in your area. For evening spraying, leave windows closed overnight. Also close vehicle windows.
    3. **It is ok to use home air conditioners.** Air inside a home is re-circulated and does not draw air from the outside.
    4. While driving during an aerial pesticide application event, keep vehicle windows closed and make sure vents are set to re-circulate air inside vehicle.
    5. Take precautions to avoid pesticide residues that may be left after a spray: Wipe pets' paws when they come into the house. Cover gardens before spray event or wash produce. Remove children's toys from yard. Cover larger toys or playground equipment.
    6. If a park or public area has been treated, consult with officials as to when it is okay to reenter. The spraying down of playground equipment is not recommended. Pesticide products used during aerial applications breakdown very rapidly in sunlight.

**Note: The duration of the above precautions is dependant upon the nature of the pesticide used and their persistence.**

- **Pesticide Application Guidelines.** (The Idaho State Dept. of Agriculture is the executive agency statutorily assigned the responsibility of regulating pesticide applications and will be consulted regarding application methods and product

choice (s). ISDA will consult with Idaho Dept. of Health and Welfare, Dept of Environmental Quality and Dept. of Fish and Game, as necessary).

Guidelines to consider:

- Targeted Application of Insecticide. (Ground or Aerial) CCMAD has a strategy in place for interrupting vector mosquito life cycle with a larvicide use integrated with targeted Adulticide measures.
  - Before aerial applications, CCMAD to submit a detailed map of the proposed insecticide spray area. The proposed treatment areas will be selected from arbovirus surveillance data and/or verified clusters of arbovirus human or animal cases.
  - Best-Practice Choices of Insecticide: To meet the following criteria.
    1. Not to be formulated in diesel oil-based carrier.
    2. Registered for mosquito control.
    3. Must degrade rapidly in the environment.
    4. Best efficacy for the job which may include the combination of two or more products.
- 

- **Adequate and Appropriate Notification of the Public, Businesses, Government: Via Media Outlets**

1. Make a detailed map of proposed pesticide application area available to the public not later than **48 hours** prior to spray event.
  2. Accommodate reasonable requests for No Spray Zones such as Bee Keepers, Farmers using insect pollinators, Organic farms, Fish farms, Aviaries or avian rehabilitation centers, Nature Centers, Zoological gardens.
  3. Prior notification, via media outlets, to certain businesses that use outdoor patios, playing fields, or swimming pools.
  4. Notification of Government Agencies.
  5. Notification of Law Enforcement and Bureau of Homeland Security.
  6. Health Advisory to local physicians and other health professionals.
-

- **Route and Content of Notification:** Notifications of aerial applications are done normally through the media; however, some at risk populations may not be reached by standard media releases and additional efforts may need to be made to reach them.
  - Posting of public access areas.
  - Notification efforts to non-English speaking individuals.
  
  - Content of notification criteria:
    1. Date and time of aerial application.
    2. Location that will be affected (directly or by drift)
    3. Height of aircraft above ground.
    4. Chemical and concentration to be delivered.
    5. Risk to human health.
    6. Risk to animal health.
    7. Concerns on toxicity to bee populations.
    8. Recommendations on duration of precautionary actions.
    9. Whom to contact for further information about treatments.
    10. Resources for more information.

—

## **TRAINING OF PERSONNEL**

Personnel that apply pesticides and are employed by the Mosquito Abatement District currently are not required by law to possess a Commercial Pesticide Applicators License issued by the Idaho State Department of Agriculture. It is however a condition of employment for personnel of CCMAD to obtain the ISDA Commercial Pesticide Applicators license within a reasonable amount of time. Possession of a Commercial Pesticide Applicators license is documented evidence of competency in knowing the methods and procedures of applying a pesticide in a safe and responsible manner. Unsupervised applicators that are employed by the Canyon County Mosquito Abatement District are required to possess a pesticide applicators license with the Public Health endorsement. CCMAD personnel attend recertification training on a regular basis.

### **CCMAD Membership in Professional Associations:**

- **AMCA:** American Mosquito Control Association: CCMAD is a sustaining member of this national association.
- **NPMA:** National Pest Management Association: National Pest Management Association is one of the world's largest professional trade associations.
- **NWMVCA:** North West Mosquito and Vector Control Association: The NWMVCA is made up of the states of Washington, Oregon, Idaho, Montana, Alaska and the Canadian provinces of British Columbia, Alberta, and Saskatchewan. CCMAD Director, Ed Burnett is the Idaho representative on the NWMVCA Board of Directors.
- **IMVCA:** Idaho Mosquito and Vector Control Association: CCMAD Director is Secretary/Treasurer.
- **ECA of Idaho:** Environmental Care Association of Idaho is the state professional organization for professional pesticide applicators. CCMAD Director is the past President of this Association and sits on its Board.

## INTEGRATED PEST MANAGEMENT AROUND PUBLIC SCHOOLS

CCMAD does apply mosquito control agents both adulticide and larvicide applications to School District Properties that are within the Mosquito Abatement District jurisdiction. IPM principles outlined starting on **page 8** of this plan are the guidelines used when conducting mosquito abatement activities on public school properties.

Public school grounds and athletic fields can be the source of large numbers of mosquito population hatch offs. Intensive landscape watering practices in late summer are initiated to prepare grounds for school functions and athletic events for school year. CCMAD monitors mosquito populations through the season to determine mosquito species and population dynamics on school grounds. As a result of intensified irrigation practices in late summer, the **dominate** species of mosquitoes that are produced on school grounds are:

1. **Ades vexans**: Inland Flood Water Mosquito. These mosquitoes hatch off in very large numbers with control measures limited to treating accumulated water on irrigated athletic fields and school grounds with larvicide products. Other control measures may involve the use of mosquito barrier control products such as Bifenthrin. In some instances ground U.L.V. applications are made.
2. **Ochlerotatus nigromaculis**: Irrigated Pasture Mosquito. Like Ades vexans this species of mosquito hatches off in tremendous numbers following prolonged irrigation and pockets of standing water pools on irrigated athletic fields and school grounds. Control measures are the same for this species.

Both of these species of mosquitoes are ferocious daytime biters and are the source of many complaints in late summer and early fall by school officials, parents, and students.

To reduce numbers of flood water mosquitoes and irrigated pasture mosquitoes the following irrigation guidelines are communicated to school grounds and maintenance personnel.

**The following schedule is recommended by the University of Idaho in reference to ornamental landscape and turf at ½ inch of water per irrigation cycle:**

April.....Once every 7 days.  
May.....Once every 4 days.  
June and July.....Once every 3 days.  
August.....Once every 2 days.  
September.....Once every 6 days.  
October.....Once every 12 days.

Below is a list of Public Schools that under the jurisdiction of Canyon County Mosquito Abatement District:

**NAMPA SCHOOL DISTRICT**

Columbian High School  
Nampa Senior High School  
Skyview High School  
Teen Parent Alternative School  
Ridgeline Alternative High School  
Two Roads GED Alternative school  
East Valley Middle School  
Lone Star Middle School  
South Middle School  
West Middle School  
Centennial Elementary School  
Central Elementary School  
Endeavor Elementary School  
Franklin D. Roosevelt Elementary School  
Greenhurst Elementary School

Iowa Elementary School  
Lake Ridge Elementary School  
New Horizon Dual Language Magnet School  
Owhyee Elementary School  
Park Ridge Elementary School  
Ronald Reagan Elementary School  
Sherman Elementary School  
Snake River Elementary School  
Sunny Ridge Elementary School  
Willow Creek Elementary School

**CALDWELL SCHOOL DISTRICT**

Caldwell High School  
Canyon Springs High School  
Jefferson Middle School  
Syringa Middle School  
Lewis and Clark Elementary School  
Lincoln Elementary School  
Sacajawea Elementary School

Van Buren Elementary School  
Washington Elementary School  
Woodrow Wilson Elementary School

**VALLIVUE SCHOOL DISTRICT**

Vallivue Senior High School  
Vallivue Middle School  
Sage Valley Intermediate School  
Birch Elementary School

Central Canyon Elementary School  
East Canyon Elementary School  
West Canyon Elementary School

**MELBA SCHOOL DISTRICT**

Melba High School  
Melba Middle School  
Melba Elementary School

**MIDDLETON SCHOOL DISTRICT**

Middleton High School  
Middleton Middle School  
Middleton Heights Elementary School  
Mill Creek Elementary School  
Purple Sage Elementary School

**NOTUS SCHOOL DISTRICT**

Centerpoint High School  
Notus Junior/Senior High School  
Notus Elementary School

**PARMA SCHOOL DISTRICT**

Parma High School  
Parma Middle School  
Maxine Johnson Elementary School

**WILDER SCHOOL DISTRICT**

Wilder High School  
Holmes Elementary School

**CHARTER SCHOOLS**

Victory Charter School  
Liberty Charter  
Vision Charter School  
Thomas Jefferson Charter School

## 2011 MOSQUITO MANAGEMENT PLAN CONCLUSION

- Snow pack levels should be slightly above normal for 2011, this may have a determination on irrigation practices in late summer.
- Lake Lowell levels will be well **above** normal at the start of the spring irrigation season. Since DFNWR and Lake Lowell account for over 30% of the Culex disease vectors then this factor may indicate an elevated disease threat for 2011. (see **appendix**)
- CCMAD continues to discover and update mosquito production sites. The year 2011 will be the third year of county wide comprehensive abatement operations.
- Integrated Pest Management principles are applied in operational decisions and CCMAD will have some funds available for source reduction projects.
- There was no arbovirus disease activity noted in the mosquito population in 2010.

Respectfully submitted,

Ed Burnett,  
Director of Operations

Canyon County Mosquito Abatement District Comprehensive Management Plan copies submitted to:

**CCMAD Board of Trustees:**

Dr. Dan Wingard  
Mr. Norm Brown  
Mr. Doug Shinn  
Mrs. Lois Marshall  
Mrs. Liz Mamer

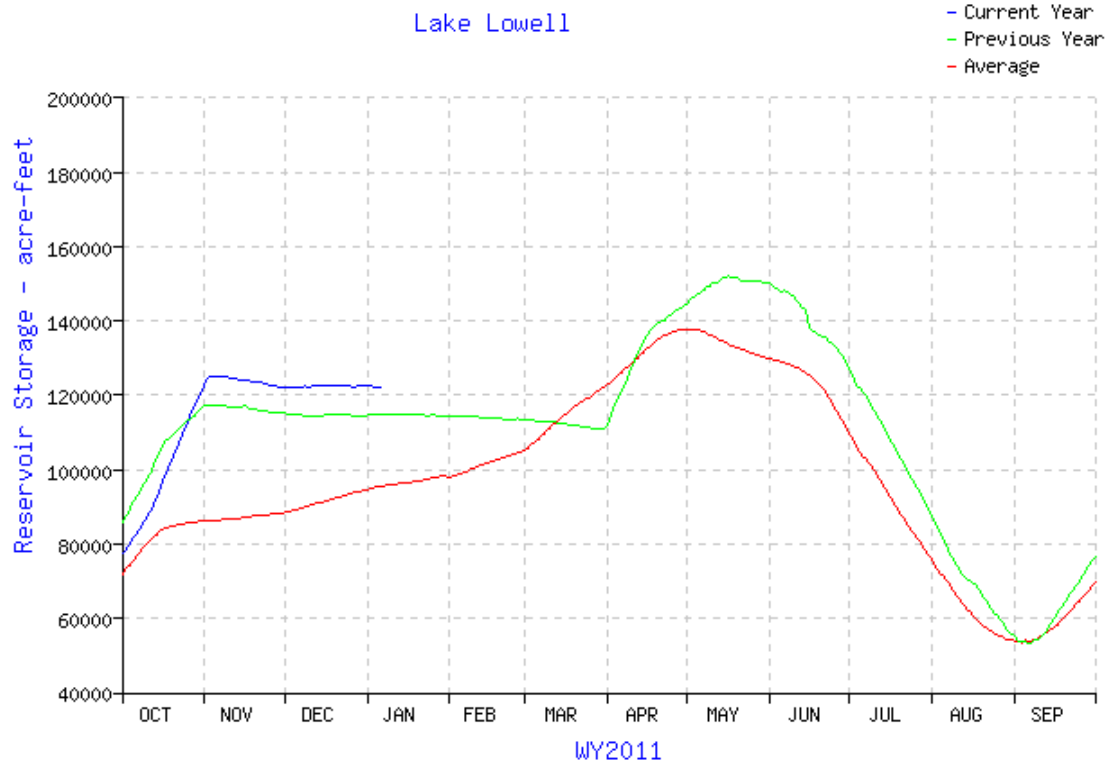
**Additional copies submitted to:**

Mr. Lynn Thompson, City of Nampa Risk Manager  
Ms. Jamie Delmore, SWDH  
Ms. Jennifer Brown Scott, USFWS DFNWR  
Mr. Jerry Neufeld, University of Idaho  
Canyon County Extension

# APPENDIX

## 2011 Water Year Current Lake Lowell Water level.

Blue: Current level  
Green: 2010 level  
Red: Normal level



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