PESTICIDE DISCHARGE MANAGEMENT PLAN

Weber Mosquito Abatement District

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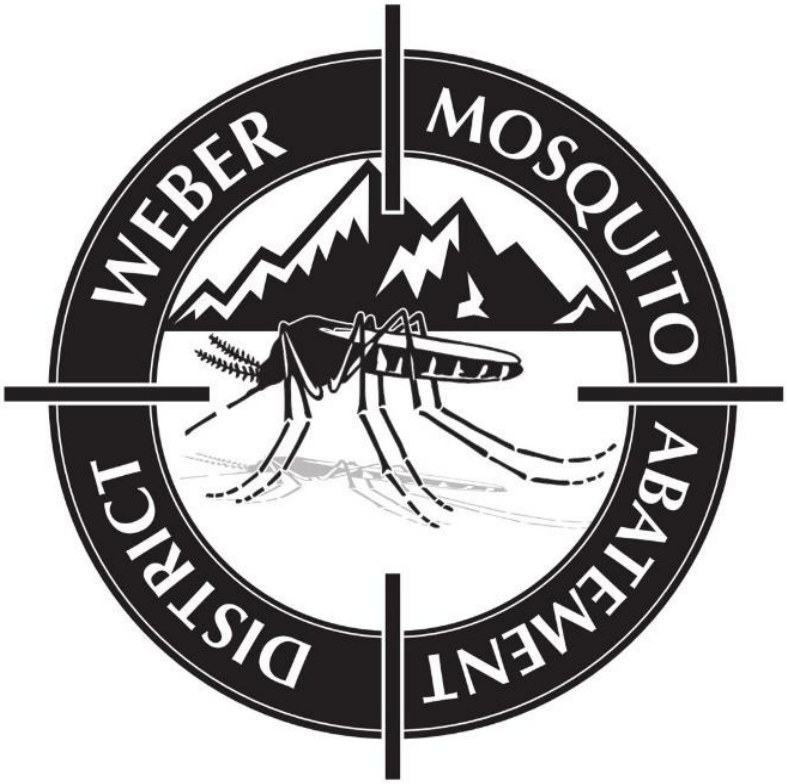

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~~Revised April 21, 2014~~

Weber Mosquito Abatement District
Pesticide Discharge Management Plan

The Weber Mosquito Abatement District's (Weber MAD) Pesticide Discharge Management Plan (PDMP) has been written to comply with the requirements imposed by the Sixth Circuit Court's January 9, 2009 decision to vacate EPA's 2006 NPDES Pesticides Rule in National Cotton Council of America v. EPA, 553 F.3d 927 (6th Cir., 2009). Therefore, pesticide applications need to be permitted under discharge elimination system programs in all state and federal permitting programs. The Utah Department of Environmental Quality has issued a permit for pesticide 'discharge'. This permit imposes certain reporting requirements which include the formulation of a pesticide discharge management plan that, upon request, must be made available to the public under the Freedom of Information Act.

Weber MAD's PDMP will conform to Integrated Mosquito Management (IMM) practices in the use of inspection, surveillance, biological control, chemical application, evaluation, recordkeeping/documentation, and equipment maintenance policies implemented by the Weber MAD.

This PDMP will focus on pesticides used for the control of mosquito larvae and pupae and adult mosquito control near or over water.

Contents of the PDMP include:

1. **Pesticide Discharge Management Team**
2. **Pest Management Area Description and Habitats**
    a. **Urban Habitats**
    b. **Rural Habitats**
3. **Pest Problem Description**
4. **Control Measure Descriptions**
    a. **Introduction**
    b. **Public Education**
    c. **Surveillance**
    d. **Source Reduction**
    e. **Biological Control**
    f. **Chemical Control**
    g. **Recordkeeping**
5. **Control Thresholds and Procedures**
6. **Spill Response and Adverse Incident Response Procedures**
7. **Signature Requirements**

1. Pesticide Discharge Management Team

a. Person(s) responsible for developing, managing, and revising the PDMP:
Ryan Arkoudas, Director

b. Person(s) responsible for developing, revising, and implementing corrective actions and other effluent limitation requirements:
Ryan Arkoudas, Director
Keith Hill, Assistant Director

c. Person(s) responsible for overseeing pesticide applications:
Ryan Arkoudas, Director
Keith Hill, Assistant Director
Mike Musgrave, Field Supervisor
Taylor Anderson, Field Supervisor
All Licensed Weber MAD employees
All Unlicensed Weber MAD employees operating under Director's license

2. Pest Management Area Description and Habitats

The Weber Mosquito Abatement District encompasses all of Weber County. The county has a total area of 659 square miles. The majority of mosquito habitat resides along the marshes of the Great Salt Lake. Flood irrigation throughout the western side of the county is also a primary source for floodwater mosquitoes in the county. Many permanent water sites exist county wide which contribute to the abundance of *Culex tarsalis* and *Culex pipiens* in mid to late summer. *Culex tarsalis* and *Culex pipiens* are the primary vectors of West Nile Virus in Weber County.

A. Urban Habitats

The four larval mosquito species that are found in urban habitats within Weber County are: *Culex pipiens, Culiseta inornata, Culiseta incidens and Aedes sierrensis.* Eleven species are commonly observed in the urban area as adult mosquitoes: *Aedes vexans, Aedes dorsalis, Aedes increpitus, Aedes nigromaculis, Aedes sierrensis, Anopheles freeborni, Culex erythrothorax, Culex pipiens, Culex tarsalis, Culiseta incidens and Culiseta inornata.*

I. Gutters/Catch Basins/Retention Basins

Gutters are the above ground conveyances for the removal of water from the urban area. Gutters are typically located on both sides of the street and commonly build up water from precipitation and over watering lawns. Low spots in the gutter often collects debris such as grass clippings, leaves, or litter and make it an ideal habitat for *Culex pipiens* larval development. Catch basins "catch" debris from water which drains from gutters. They are below ground level and are typically located at intersections of streets. There is usually a sump inside each catch basin which periodically becomes clogged with rocks, dirt, or silt and becomes an ideal habitat for *Culex pipiens*. Occasionally Ogden City Public Works Department cleans the catch basins. Retention Basins receive water from either direct runoff from gutters or underground storm drains. The main purpose is to filter debris out of runoff water so it doesn't enter natural waterways. One common feature all retention basins have is slowing down water flow after precipitation. When water becomes stagnant it becomes mosquito production habitat.

II. Tree holes

Tree hole may refer to a tree hollow or a natural cavity in a tree. Tree holes form as a result of damage to the heartwood caused by lightning, wind, fire, insects, bacteria, or fungi. Tree holes fill up with water by stem flow creating habitat for *Aedes sierrensis*, also known as the western tree hole mosquito. *Aedes sierrensis* lay their eggs in the tree hole and as the holes fill with water the eggs hatch and the larva stage begins.

III. Containers:

a. Swimming Pools. In ground swimming pools rarely cause problems due to their high use of chlorine. However, when swimming pools go untreated and are not properly cared for these turn green with

algae and become a larval habitat for *Culex pipiens*. *Culex pipiens* lay egg rafts on the surface of the water when the pools are unused for a short period of time.

b. Water Features. Ornamental ponds, fountains, bird baths, and artificial streams are an ideal habitat for *Culex pipiens*, *Culiseta inornata*, and *Culiseta incidens*. Some of these features have sump pumps, however, when the water stops flowing and becomes stagnant it becomes a problem. These artificial water features are commonly stocked with *Gambusia affinnis* (mosquitofish) which feed on mosquito larvae.

c. Water Storage. Many people collect rain water, which was made legal in Utah May 11, 2010, for use of watering their lawns and gardens. Storage is limited to one underground 2,500 gallon container or two above ground 100 gallon containers, both of which can be a perfect larval habitat for *Culex pipiens* if not properly maintained.

d. Water Troughs. Many people within Weber County own various livestock. When water troughs become stagnant they become excellent larval habitat.

B. Rural Habitats

Much of the area in western Weber County was once covered by the Great Salt Lake. As the lake receded most of the land developed into duck clubs, bird refuges, marsh land, agriculture land, and some housing developments. However, there is little consideration given for the management of water and the purpose of mosquito control when these lands are developed. The Weber Mosquito Abatement maintains a good working relationship with owners of the bird refuges and duck-hunting clubs in order to be allowed full access to the land for the treatment and control of mosquitoes.

Fourteen species of mosquitoes can be found in rural habitats as both larvae and adults: *Aedes campestris*, *Aedes dorsalis*, *Aedes fitchii*, *Aedes increpitus*, *Aedes nigromaculis*, *Aedes niphadopsis*, *Aedes vexans*, *Anopheles freeborni*, *Culex erythrothorax*, *Culex pipiens*, *Culex tarsalis*, *Culiseta incidens, Culiseta inornata*, and *Coquilletidia perturbans*.

I. Irrigation Canals/Ditches (includes leaks and overflow)

Several irrigation ditches and canals bring water to Weber County from the Weber River to pastures, croplands, bird refuge areas, and duck hunting clubs within the rural habitat. Some of these canals and ditches are above ground making them susceptible to leaks and seeps, which then collect in lower lying areas, making habitat for flood water mosquitoes which include: *Aedes dorsalis, Aedes increpitus, Aedes nigromaculis,* and *Aedes vexans.* When the water is flowing in canals and ditches, no mosquito larvae will hatch or develop, however, between irrigation cycles when the water sits and becomes stagnant it begins to produce larval habitat for *Culex pipiens, Culex tarsalis, Anopheles freeborni,* and *Culiseta inornata.*

II. Roadside ditches/Railroad Track Borrow Pits

Many rural roads throughout western Weber County are not paved and do not have a curb and gutter system to remove storm water. Instead man made ditches are dug beside the road that leads to drainage ditches. Roadside ditches are often not dug with sufficient slope and are not properly maintained thus becoming habitat for *Anopheles freeborni, Culex erythrothorax, Culex pipiens, Culex tarsalis, Culiseta incidens* and *Culiseta inornata.* Weber County has many railroad tracks that run throughout the district also. Most tracks have what is known as “borrow pits” that run down each side of the tracks. These borrow pits collect water in the spring and summer months that become stagnant and creates a problem. When vegetation becomes present in the pits *Aedes dorsalis, Aedes increpitus, Aedes nigromaculis,* and *Aedes vexans* larvae will become present with each new flood. If the water stays stagnant for more than a week then the following species may occur *Anopheles freeborni, Culex erythrothorax, Culex pipiens, Culex tarsalis, Culiseta incidens* and *Culiseta inornata.*

III. Pastures/Croplands

Pastures are generally flood irrigated in Weber County. Most pastures share irrigation canal water and thus coordinate regular flooding. When the pastures are level most of the irrigation water will drain off and not present a problem. Many pastures have ruts from vehicles and farm equipment allowing water to remain stagnant. The stagnant water provide habitat for mosquito species such as *Aedes dorsalis*, *Aedes nigromaculis*, and *Aedes vexans*. If the water remains stagnant for a week or more at a time second generation mosquitoes such as *Culex tarsalis, Culex pipiens,* and *Culiseta inornata* may develop. Major crops currently grown in this area include: feed corn, alfalfa, field grasses, and onions. Generally these crops are well drained and do not provide mosquito habitat, however, when water is drained from these crops it often creates a low area where water stands and becomes larval habitat for *Aedes dorsalis*. If this stagnant water remains for a week or two it may create second generation such as *Culex tarsalis, Culex pipiens,* and *Culiseta inornata*.

IV. Drainage Ditches

Drainage ditches are common throughout Weber County. These man-made conveyances are built for removing water from an area. If the water in the ditches is moving, no larvae are produced. However, if the water becomes stagnant larvae will be produced. Some ditches may contain larvae that hatched in fields or crops and then was drained off into the ditches, if the water becomes stagnant larvae will continue to develop.

V. Lakes/Reservoirs

The District has numerous bodies of water that are considered lakes or reservoirs. During summer months lakes and reservoirs become full due to precipitation, when runoff water becomes stagnant in the vegetation surrounding these bodies of water it becomes a breeding ground for mosquito larvae. Floodwater mosquito larvae include: *Aedes dorsalis* and *Aedes vexans* which lay their eggs when the soil is moist and cool, then when 1" to 12" of water covers these eggs they begin to hatch.

VI. Mudflats

Mudflats are lower areas, likes swales that because of lack of drainage accumulate salts in the soil through evaporation. Mudflats contain little to no vegetation. Typically mudflats remain dry but when flooded by precipitation they then dry and crack. The crevasses become an ideal place for *Aedes dorsalis* to lay their eggs which then hatch when the next flooding occurs.

VII. Marshes

The western part of Weber County is encompassed in the marshes of the Great Salt Lake. The Utah Division of Natural Resources manages these areas in waterfowl management areas (WMA) known as the Ogden Bay WMA, Howard Slough WMA, and Harold Crane WMA. These marshes, depending on the management of water, are responsible for producing floodwater and permanent / semi-permanent habitat for the following mosquito species: *Aedes dorsalis*, *Aedes vexans*, *Culex pipiens, Culex tarsalis*, *Culex erythrothorax*, *Culiseta inornata, Anopheles freeborni,* and *Coquilletidia perturbans*.

3. Pest Problem Description

Aedes campestris

- Larva. Prefers alkaline pools that are deep and devoid of vegetation except on pool edges. Larvae are often missed in dipping samples because they remain midway down in the water column rather than hanging out on the surface. Larvae are frequently found with *Aedes niphadopsis* and *Aedes dorsalis*. The eggs hatch once a year in the early spring with most collections being made in March and April, but may be found from February through May.

- Adult. This species is not readily attracted to light traps. In most years a single brood is produced with adults emerging in the spring months.

Aedes dorsalis

- Larva. Prefers shallow, intermittently flooded, alkaline pools with salt grass as the dominant vegetation. Larvae are also found in a variety of habitats including pastures and roadside ditches. The larvae are found in abundance from April through September. During March through May, larvae are often associated with *Aedes campestris* and *Aedes niphadopsis*. From June on it is found alone or is succeeded by *Culex tarsalis*, if the water source does not dry up.

- Adult. This species is readily attracted to New Jersey light trap and CO_2 traps and its movement can be effectively monitored with these traps. Its main importance is as a pest that is able to fly long distances in search of blood meals and will bite during the day also. This species tends to migrate in mass after large hatches especially in September and October.

Aedes fitchii

- Larva. The larvae, when present, are found only in the early spring. Larvae occupy a wide variety of habitats, including open fresh water marshes and overflow pools along streams. *Aedes fitchii* is fairly uncommon within the District.

- Adult. This spring species is rarely taken in the district's surveillance traps.

Aedes increpitus

- Larva. Collections of this single brood species are almost always made between March and May. Larvae normally appear early in the spring in overflow pools along streams and in depressions filled by rain or melting snow.

- Adult. A single brood species that is found mainly in the spring and is rarely collected in the district's surveillance traps. When present this species can be a troublesome biter and if not controlled will live for several weeks.

Aedes nigromaculis

- Larva. Found almost exclusively in freshly irrigated pasturelands and crops, usually with no other species present. Larvae can be found from June through September, but are usually most abundant in the hot summer months. During the hottest part of summer, the egg to adult development can be as short as 4 days. The habitat for this species has been greatly reduced in recent years, and as such, this species has not been as large of a problem.

- Adult. It can fly long distances in search of blood meals, but because of its limited larval habitat in the district it is rarely a problem in the city. When present, the females are very aggressive biters attacking throughout the day. In the 1970's and 1980's *Aedes nigromaculis* was a much more prominently collected species in the light traps. However, with a large reduction of ideal habitat, the numbers have substantially fallen.

Aedes niphadopsis

- This single brooded species is almost never collected in the district.

Aedes sierrensis

- Larva. This species is known as the "Western Tree-Hole" mosquito. Larvae of this species are found almost exclusively in rot cavities of trees. This species is limited to areas with mature trees, typically along waterways, parks and in neighborhoods. Larvae of this species have been found from January through November, but are most common in May through July when precipitation has been plentiful and temperatures are warm. A dry tree-hole late in the summer could easily have been wet in the spring and produced a brood of adults.

- Adult. Since this species is a very aggressive biter in shaded areas during daylight hours, it has been the source of many urban service requests in recent years. Typically it flies less than 300 feet from the tree hole which it came from.

Aedes vexans

- Larva. The larvae are usually found in shaded areas of fresh water where there has been leakage or overflow from a river or canal. Larvae may also be found to lesser degrees in freshly flooded pastures. Larvae can be found from May to September, but are most abundant from June through August.

- Adult. *Aedes vexans* is a very aggressive mosquito biting throughout the crepuscular and daytime periods. When present around people, it will solicit service requests. Collection of this species vary tremendously from year to year.

Culex erythrothorax

- Larva. The historical description of the larval habitat for this species in Utah is deeper water in cattail marshes, frequently in the open trails left by muskrat runs. However, in the years following the heavy flooding of the early 1980's a plant of the genus Phragmitis has largely displaced the common cattail in much of the wetlands within the district. The Phragmitis plants grow extremely thick making inspection within a stand of this plant very difficult. It is currently believed that the larvae of *Culex erythrothorax* are using this habitat.

- Adult. This species is known to take blood mainly from birds, but has been known to bite man and is a known vector of West Nile Virus.

Culex pipiens

- Larva. Commonly found in semi-permanent bodies of stagnant water that is high in organic content. This species is known as the "northern house mosquito," since it is frequently found in association with homes, in areas such as, ornamental ponds, poorly drained or clogged gutters, catch basins, and artificial containers. In recent years, larvae of this species have been found consistently in marshes throughout the county, especially invading the areas typically dominated by *Culex tarsalis*. Because of its close association to humans and its implicated role as a vector for St. Louis encephalitis and documented role as a vector of West Nile Virus, this species is monitored very closely. Larvae are generally collected from May through September, but in the greatest numbers June through August.

- Adult. This species breeds in close association with man, and adults enter buildings readily. It is not a severe biter of man, but is one of two vectors of West Nile Virus within the district. It is frequently the source of many service requests.

Culex tarsalis

- Larva. Larvae prefer semi-permanent pools that have fresh to slightly alkaline waters. The larvae are found in a wide variety of large habitats including pastures, roadside ditches, and salt grass marshlands. Unlike *Culex pipiens*, the larvae of *Culex tarsalis* are almost seldom found in artificial containers in Weber County. Larvae can be found in April, peak in late July through August and quickly decline in September.

- Adult. The vector of West Nile Virus and Western Equine Encephalitis, this species is the most commonly collected in the district. *Culex tarsalis* feed primarily on birds in the spring, but gradually switch to mammals in July. Blood meals are generally taken at dusk, the time when many homeowners are working around the house or children are out playing. Because of its disease-transmitting potential and large numbers, it is a major concern for control strategies

Culiseta incidens

- Larva. Becoming more common throughout the district, this species is usually found only in ornamental ponds. This species prefers larval sites in elevations higher than the valley floor. *Culiseta incidens* is typically found between May and August.

- Adults. With the extensive mosquito fish program and monitoring of ornamental ponds this species tends to not be much of a problem in the district. When adults of this species are present in the city, people call with the description of a very large mosquito that is biting.

Culiseta inornata

- Larva. Larvae are found in a wide variety of habitats with semi-permanent water. Larvae may over-winter in mild winters. Collections of larvae normally occur from April through September, peaking in May with a second smaller peak in September. Larval populations are highest in the spring and fall and tend to decline during the warmer months.

- Adult. This species takes its blood meals mainly from birds and large mammals. This is not a severe pest and not a vector of disease to humans in the district. The adults are large and when biting are not as aggressive as Aedes species. Adults are usually found throughout the summer, but generally in much larger numbers in the cooler times of the mosquito season, May-June and September-October.

Anopheles freeborni

- Larva. Larvae prefer pools with deep semi-permanent water. This species has been uncommon in most years but can be in found abundance in the Ogden Bay WMA. Anopheles larvae float parallel to the water surface when feeding. The low larval collection numbers do not reflect the true abundance of this species in the district.

- Adult. The principle vector of malaria in the western United States. This species is a relatively uncommon species in most of the district but found in abundance in the Ogden Bay WMA.

Coquilletidia perturbans

- Larva. Larvae and pupae of this species attach themselves to the roots and stems of aquatic plants by a modified siphon tube or respiratory trumpets; respiration occurs through plant tissue. Neither larvae or pupae have been collected in the district.

- Adult. Females can be aggressive biters but are very rare. Collections of this species only occur in close proximity to the Ogden Bay WMA and only for about 4 weeks during the summer.

4. Descriptions of Control Measures

Integrated Mosquito Management (IMM) is a comprehensive mosquito prevention/control strategy that utilizes all available mosquito control methods singly or in combination to exploit the known vulnerabilities of 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, water sanitation practices, and water or vegetation management or other types of source reduction measures where compatible with 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-borne disease, application of adulticides by certified applicators trained in special handling characteristics of these products may be needed. Adulticide products are chosen based upon their demonstrated efficacy against species targeted for control, resistance management concerns and minimization of potential environmental impact. IMM does not emphasize mosquito elimination or eradication.

IMM requires a thorough understanding of mosquitoes and their bionomics by control personnel; careful inspection and monitoring for their presence and conditions favoring their development; and prevention of ovipositor and

human/mosquito contact through effective public education, sanitation and facility maintenance. The Weber MAD strives to employ these IMM components to the extent possible, but resource availability may limit what any individual program can do. All intervention measures are driven by a demonstrated need based on surveillance data and action thresholds. Applying mosquito larvicides or adulticides on a pre-determined schedule absent of a documented need is not an acceptable practice of the Weber Mosquito Abatement.

A. Introduction

Since the need for mosquito control was recognized in the early twentieth century increased knowledge of mosquito biology has driven the formulation of a variety of methodologies designed to reduce both mosquito nuisance levels and mosquito-borne diseases. When properly implicated these strategies of surveillance plans are designed to accomplish the following: protecting human, environmental, and animal health; promote a rational use of pesticides; use target specific pesticides to the extent possible, emphasize the proper timing of each application, minimize pesticide resistance problems, utilize natural biological controls to every extent possible, and reduce environmental contaminants to soil, ground water, surface water, pollinators, wildlife and endangered species.

B. Public Education

Employee training. It is critical that all employees involved with mosquito control operations have a good understanding of the biology of the mosquito species that are controlled. The Weber MAD has a core group of employees including 6 full-time employees & 9 seasonal employees. Educational opportunities are offered to these employees through attendance to professional meetings and conferences.

Licensing: All District employees are required to obtain a Non-commercial Pesticide Applicator License from the Department of Agriculture and Food (UDAF) in the public health category.

No Spray Zones: Some citizens may wish to be excluded from the Weber MAD's mosquito control operations for various reasons such as allergies to pesticides, beehives on site, organic gardens, etc. Property owners who do not want their property sprayed can request to be put on the No Spray Zone list by providing us with their name and address and the location they do not want sprayed. Arrangements may be made to allow spraying if a vector-borne disease is detected and confirmed in the area.

C. Surveillance

Larval. Larval samples are collected from all sites that are to be treated for larval mosquitoes.

Adult. Adult mosquitoes are monitored through collections obtained by CO_2 traps, sentinel traps, and gravid traps, and through employee and public reporting.

Disease. Adult mosquitoes trapped in CO_2 traps, sentinel traps, and gravid traps are sorted by species, with *Culex tarsalis, Culex pipiens,* and *Culex erythrothorax* placed in vials of between 10 and 100. The District then processes these samples with Response BioMedical's RAMP early detection equipment for West Nile Virus. Samples that test positive for WNV via RAMP are taken to the Utah State Public Health Laboratory for disease confirmation using PCR. Positive RAMP samples are treated as positives internally on the District's records and sprayed accordingly but may not be counted on state records.

Mapping. The Weber MAD has produced maps and GPS locations identifying many of the known larval producing sources in the area controlled by the district. These maps are updated yearly to reflect new or eliminated areas. A list of catch basins, storm drains, and gutters which may contain mosquito larvae or have been pre-treated is also kept on file.

Efficacy. All larval sources that are treated are re-inspected within one week to verify the success or failure or each pesticide application. When at all possible it is important to do surveillance following adulticiding applications to verify that all equipment is working properly and the pesticide is effective. This is especially important after an aerial adulticide application is made.

Service requests. All calls from citizens are logged and generally sprayed within 48 hours if thresholds are met and the weather permits.

Dog Heartworm Cases. The Utah State Veterinarian provides the Weber MAD with a list of the addresses where dog heartworm was diagnosed from a dog the previous year. These areas are inspected for possible tree-hole sources.

D. Source Reduction

Source reduction is the elimination or removal of larval mosquito habitats. Source reduction is the most effective and economical long term method of mosquito control, but is not practicable for many larval habitats. Source reduction can be as simple as overturning a bucket to remove stagnant water, replacing pet dishes with fresh water, or cleaning out rain gutters.

E. Biological Control

Biological control includes using a natural predator to control a pest population. Weber MAD only uses one method of biological control – mosquitofish. Weber MAD annually stocks approximately 900 ornamental fish ponds with *Gambusia affinnis,* also known as mosquitofish, a non-native species to Utah. Weber MAD works closely with the Utah Department of Agriculture and Food and the Utah Division of Wildlife Resources to ensure a safe and effective introduction.

F. Chemical Control

1. Larval Control

Larval control is the primary means when source reduction and biological control are not pertinent or proven effective. All sites treated with larvicides have been inspected and larval samples collected. Tree-holes and catch basins are the exception to this rule, being pre-treatment areas.

2. Adult Control

The Weber MAD recognizes that adult mosquito control is necessary when larval control is not proven effective. Ground and aerial adulticiding treatments are made by the Weber MAD based on surveillance and public notification. Applications are followed up with additional surveillance.

G. Record Keeping

The Weber MAD uses a GIS map system for record keeping of all pesticide applications. All pesticide applications have the date, the applicator, a unique site ID name and number, and the amount of pesticide applied. All pesticide applications are kept on file for a minimum of three years.

5. Control Thresholds and Procedures

Control Measure	Control Description	Habitat	Active Ingredient / Formulation	Surveillance Method	Threshold	Application Method	Pesticide Rate
Source Reduction	Empty or eliminate man-made mosquito habitats and containers. This includes cleaning and clearing ditches where water backs up due to heavy vegetation.	Typically found in residential areas. Tire piles, containers, abandoned swimming pools and hot tubs, and storm drains. May also include drainages or drainage ditches.	N/A	Property inspections, service requests and complaints, public education.	Any presence of containers holding water. Any ditch or drainage impeding the adequate flow of water, thus causing the creation of mosquito habitat.	No application of pesticide. Containers are emptied of water and disposed of if possible. Landowner cooperation to clean or dredge slow flowing ditches and drainages.	N/A
Larval Control	Larvicides	Flood irrigation, river flooding, emerging groundwater, marshes, swamps, pastures, sloughs, ditches, drainages, ponds, depression, retention and detention ponds, sewage lagoons, and catchbasins.	BTI (bacillus thuringiensis) granules and liquid by ground and aerial, briquets by ground. BS (bacillus sphericus) granules by ground and aerial. Temephos granules by ground only. Methoprene briquets by ground only. Spinosad granules by ground and aerial.	Larval dipping.	Presence of live larvae of target species. Floodwater mosquitoes >3 larvae / dip. Permanent / semi-permanent mosquitoes >.5 larvae / dip. Catch basins, storm drains, and gutters are treated without larval inspection due to number and difficulty.	Ground application of granules, pellets, and briquets by hand, granule "shaker" bags, or Maruyama backpacks. Aerial application of granules by fixed wing aircraft. Liquid formulations by airplane, pump up hand sprayer or backpack.	BTI granules (ground and aerially) 7-20 lbs/acre; BTI briquets 1 / 100 sq ft; BTI liquid 1-2 pts/acre. BS granules (ground and aerially) 7-20 lbs/acre; WSP 1/100 sq ft. Temephos granules 5-20 lbs/acre. Methoprene Briquets 1 / 100 sq ft. Spinosad granules 5-10 lbs/acre. Tablets 1 /100 sq ft.
Pupal Control	Pupacides	Same as Larval Control	Oil - highly refined petroleum distillate.	Larval / pupal dipping	>1 / dip (unable to properly identify in pupa stage)	Pump up hand and backpack sprayers.	BVA2 larvicide oil 3-5 gallons / acre.

Control Measure	Control Description	Habitat	Active Ingredient / Formulation	Surveillance Method	Threshold	Application Method	Pesticide Rate
Adult Control (Aedes, Anopheles, Culiseta species)	Ground and aerial applications.	Urban and rural areas	Ground Application: Permethrin, PBO (Kontrol 30-30) Aerial applications: Prallethrin, Sumithrin, PBO (Duet) -or- Malathion (Fyfanon) -or- Natural Pyrethrin (Pyrocide)	CDC CO_2 baited surveillance traps, BG Sentinel Traps. Spray requests. Landing rates/bite counts.	>50 floodwater mosquitoes / trap night. **-or-** >2 citizen spray requests w/in ¼ mile radius. **-or-** Employee inspection	Ground application using truck and/or ATV mounted ULV equipment. Aerial application using fixed wing aircraft. "No spray" areas will be respected.	Ground application: Kontrol 30-30 @ 8 oz/minute at 10 mph. Aerial application: Duet (1 oz/acre) -or- Fyfanon (3 oz/acre) -or- Pyrocide (1 oz/acre)
Adult Control (Culex species)	Ground and aerial applications.	Urban and rural areas	Ground Application: Permethrin, PBO (Kontrol 30-30) Aerial applications: Prallethrin, Sumithrin, PBO (Duet) -or- Malathion (Fyfanon) -or- Natural Pyrethrin (Pyrocide)	CDC CO_2 baited surveillance traps, BG Sentinel Traps. Gravid traps. Spray requests.	>10 Culex species mosquitoes / trap night. -or- Confirmed WNV positive in human or animal. -or- >2 citizen spray requests w/in ¼ mile radius. -or- Employee inspection.	Ground application using truck and/or ATV mounted ULV equipment. Aerial application using fixed wing aircraft. "No spray" areas will be notified by phone of possible spray application.	Ground application: Kontrol 30-30 @ 8 oz/minute at 10 mph. Aerial application: Duet (1 oz/acre) -or- Fyfanon (3 oz/acre) -or- Pyrocide (1 oz/acre)

This section of the PDMP contains a list of the procedures used to implement the control measures described in table above and the schedules by which these procedures are performed.

Control Measure	Determination of Application Rate	Surveillance Method	Frequency of Application Rate	Spill Prevention Procedures and Schedules	Equipment Calibration Procedures	Equipment Maintenance Procedures	Environmental Condition Assessment
Physical Control and Source Reduction	N/A	Dipping/ larval counts	N/A	N/A	N/A	N/A	Property owner / manager / field supervisor consulted.
Larval Control	Use suggested application rate as determined by the label. The presence of heavy organic material or thick vegetation may make it necessary to use highest allowable rates.	Dipping / larval counts	Applications made when thresholds are exceeded and previous treatment is no longer effective.	Daily pre-trip inspections of equipment, spill kits on vehicles, mandatory chemical application training, including spill procedures.	Flow rates calibrated annually, at start of the season, and recorded on equipment for reference. Fixed wing calibration to be conducted and documented by pilot.	Daily pre-trip inspections of equipment for leaks, cracks, and proper operation. Repairs and maintenance completed during off season and as needed during season. Fixed wing maintenance to be conducted and documented by pilot.	Onsite weather evaluations by trained applicators. No applications made if wind is excessive.
Pupal Control	Use suggested application rate as determined by the label.	Same as larval control.	Same as larval control.	Same as larval control.	Same as larval control.	Same as larval control.	Onsite weather evaluations by trained applicators. No applications made if wind is excessive. No applications made if rain is likely within 6 hours.

Control Measure	Determination of Application Rate	Surveillance Method	Frequency of Application Rate	Spill Prevention Procedures and Schedules	Equipment Calibration Procedures	Equipment Maintenance Procedures	Environmental Condition Assessment
Adult Control (Aedes, Anopheles, Ochlerotatus, Culiseta, and Coquilletidia species)	Using ULV machine set at mid label rate of fluid ounces per minute at 10 mph.	CDC CO_2 baited surveillance traps. New Jersey Light Traps. Spray requests. Landing rates/bite counts.	Applications made when thresholds are exceeded.	Daily pre-trip inspections of equipment, spill kits on vehicles, mandatory chemical application training, including spill procedures.	Flow rate / calibration set at beginning of season. Checked periodically during spray season. Droplet testing completed and certified in May of each year.	Daily pre-trip inspections of equipment for leaks, cracks, and proper operation. Repairs and maintenance completed during off season and as needed during season. Problems reported immediately to the director.	Weather forecast monitored in advance. Onsite weather evaluations by trained applicators using wind and temperature gauges. No applications made when humans are present. No applications if wind exceeds 10 mph and/or temperature below 50°F.
Adult Control (Culex species)	Using ULV machine set at mid label rate of fluid ounces per minute at 10 mph.	CDC CO_2 baited surveillance traps. Gravid traps. New Jersey Light Traps. Spray requests. Confirmed WNV positive in human or animal.	Applications made when thresholds are exceeded.	Daily pre-trip inspections of equipment, spill kits on vehicles, mandatory chemical application training, including spill procedures.	Flow rate / calibration set at beginning of season. Checked periodically during spray season. Droplet testing completed and certified in May of each year.	Daily pre-trip inspections of equipment for leaks, cracks, and proper operation. Repairs and maintenance completed during off season and as needed during season. Problems reported immediately to the director.	Weather forecast monitored in advance. Onsite weather evaluations by trained applicators using wind and temperature gauges. No applications made when humans are present. No applications if wind exceeds 10 mph and/or temperature below 50°F.

6. <u>Spill Response and Adverse Incident Response Procedures</u>

The Weber Mosquito Abatement District has in place a Pesticide Spill Response Plan (PSRP) which will be used with this PDMP. A copy of the PSRP, with standard operating procedures in the event of a spill, is included.

7. <u>Approval and Signature</u>

The Weber Mosquito Abatement District's Pesticide Discharge Management Plan will be reviewed and updated by the Pesticide Discharge Management Team once per calendar year or whenever necessary to update the pest problem identified and to evaluate pest management strategies.

Signature of Director **Date**