CLARK COUNTY
MOSQUITO CONTROL DISTRICT

ANNUAL WORKPLAN 2009-2010

Contents

Executive Summary

The purpose of the 2009-2010 Annual Work Plan (AWP*) is to describe the Clark County Mosquito Control District's (CCMCD) routine strategy for nuisance mosquito* abatement, and to propose a strategy for addressing the threat of West Nile Virus (WNV) and other mosquito borne diseases. The AWP, once adopted, will provide relevant information and guidance for CCMCD staff, the CCMCD Board of Trustees, Clark County Public Health, and community stakeholders.

CCMCD utilizes Integrated Pest Management* (IPM) to formulate abatement strategies and respond appropriately to mosquito borne disease threats. IPM is an effective, integrated strategy endorsed by the Department of Ecology and the Centers for Disease Control (CDC) that emphasizes using multiple methods to achieve long-term control of mosquito populations before they become adults and are able to spread WNV. Prevention is achieved through public education, surveillance, monitoring of treatment threshold* levels, and control activities that use the least toxic and most environmentally friendly methods available.

The development of the 2009-2010 work plan is based on the following principles:

- The CCMCD was originally formed in 1982 to mitigate the presence of nuisance mosquitoes as directed by the Revised Code of Washington 17.28.

- In 1999, WNV emerged as an infectious and deadly mosquito borne disease that continues as a threat to public health. WNV is carried to humans as part of a larger cycle of infection that primarily involves birds and mosquitoes.

- Effective WNV prevention and control methods decrease the potential of transmission of the disease to humans and animals by infected mosquitoes. Prevention is best accomplished by engaging the public into taking actions that reduce mosquito breading habitat and to protect themselves from exposures.

- Prevention and control methods for WNV must be effective as well as environmentally and economically sustainable over a long period of time.

- Reducing the risk of WNV involves balancing the benefits of these control methods with the possible negative consequences on humans and the environment.

2. Background and Introduction

The Board of Trustees is responsible for program oversight; establishes policy; prepares, approves and reviews the budget; and approves expenditures. The Board contracts with Clark County Public Health for administration of operations. The ten-member Board is composed of one member appointed by each County Commissioner for the county at large, and one member appointed by and representing each of the cities and towns of Vancouver, Camas, Washougal, Ridgefield, LaCenter, Battle Ground and Yacolt.

West Nile virus was first detected in the United States in New York City in 1999. This virus, a mosquito transmitted disease, had never before been detected in the Western Hemisphere. Since 1999, WNV has rapidly spread throughout the continental United States. In 2008 Washington experienced 3 human cases with no fatalities; 41 horses, 22 birds and 14 mosquito samples tested positive for the virus.

This AWP describes CCMCD's current approach to mosquito prevention and control, and provides a West Nile Virus risk-based response plan should the disease become widespread in Clark County.

It is expected through continual community involvement, changing circumstances in mosquito populations and mosquito borne diseases that the AWP can be adapted to respond to those changes.

3. Current Program Overview and 2009 WNV Recommendations

3-1. Staffing and Training Requirements

The CCMCD has sufficient funding and staffing capacity to meet the routine, seasonal demands of mosquito control in Clark County. All staff work under the supervision of a state licensed pesticide applicator, and are also offered the necessary training to meet state certification requirements. Staff members attend local, regional and national mosquito association conferences to learn new technological advances. Specialized training in mosquito identification and surveillance, equipment maintenance and use, and other training is provided as needs are identified.

3-2. Equipment and Supply Requirements

Historically, MCD responds to individual homeowner complaints about mosquitoes. Ultra Low Volume (ULV)***** spray equipment and associated vehicles are used for ground adulticide application. ***Recommendation****: When WNV is detected in Clark County, additional control products should be purchased as needed. If additional vehicles, equipment or services (such as extensive aerial spraying) are needed beyond what is budgeted for this year, consideration should be given to contracting out for additional services.*

3-3. Community Outreach/Public Education

Primarily through staff presentations and one-to-one consults, it is standard practice for CCMCD to provide community education to homeowners and others about nuisance mosquito prevention and control measures. Clark County Public Health (CCPH) provides outreach and education on the health threat of WNV, placing educational materials on the Clark County website and in locations such as pharmacies, physician and veterinary offices. CCPH also provides media outreach through its Public Information Officer. ***Recommendation****: Clark County Public Health should give high priority to establishing a communication plan for public education regarding West Nile Virus in Clark County before the crises arrives. It should emphasize the importance of the public taking steps toward personal protection and reducing the possibility of infection by eliminating conditions (such as stagnant water) that encourage mosquito breeding.*

3-4. Surveillance

CCMCD utilizes a number of surveillance methods: Service requests by telephone from the public in response to nuisance mosquitoes, trapping and identification of mosquitoes, preparation of samples for testing by the University of Californian at Davis, mapping and collection data on mosquitoes and mosquito-borne diseases. ***Recommendation****: CCMCD should continue routine prevention and control measures as well as adult and immature mosquito* surveillance and testing for WNV.*

3-5. Nuisance Mosquito Control

CCMCD inspects new areas reported by the public. Catch basins, retention ponds, and flood water areas that are known breeding sites for surveillance are monitored for control purposes. If required the least toxic approach such as biorational insecticides will be used.

4. West Nile Virus Response Plan

When WNV is detected in the county, priority will be given to area disease prevention rather than nuisance mosquito abatement at individual residences. This plan provides risk-based guidelines for the abatement of disease-carrying mosquitoes. Additionally, the plan provides all stakeholders with educational information about WNV and about the methods and materials to be used to reduce the potential for transmission of the disease in humans and domestic animals.

No changes to this plan will be made without approval of the CCMCD Board of Trustees. When the use of insecticides is required, all application methods and materials used will be in compliance with federal, state and local regulations.

4-1. Public Education /Community Outreach

The most effective way for the public to prevent WNV exposure involves self-protection (taking measures to avoid being bitten, e.g., using DEET and other proven insect repellants, protective clothing, staying inside at dawn/dusk etc.).The public can also take actions such as eliminating potential mosquito breeding areas (i.e. emptying gutters or containers in the yard that accumulate water). CCPH coordinates dissemination of information about WNV to the public and media. Both CCMCD and CCPH coordinate closely with local and state officials.

4-2. Surveillance

4-2.1. Immature Mosquito Surveillance

Immature mosquito surveillance can provide early warning to forecast the size of future adult mosquito populations and provide estimates of control effectiveness. The data collected from immature (breeding)*****sites must be carefully recorded and maintained. The sites that are found positive for *Cx. pipiens* and *Cx. tarsalis* (the species considered most likely to transmit WNV to humans in Washington) will be mapped by GPS. When sufficient data is obtained, the information will be utilized in the control process. Control measures as given in Risk Levels 2-4 will be implemented at these sites.

4-2.2. Adult Mosquito Surveillance

Adult mosquito density is a key factor contributing to the risk of WNV. Monitoring adult mosquito populations provides essential information on population size, infectivity rate and effectiveness of larval and adult control efforts.

Two methods are used by CCMCD to sample adult mosquito populations. One is the EVS trap* to collect *Cx. tarsalis*, the other a gravid trap* to collect *Cx. pipiens.* CCMCD has predetermined locations for placement of these traps, mapped using the Global Positioning System (GPS). The EVS trap will be used in urban and rural areas; the gravid trap, primarily in urban areas. Over time, this trapping regime will provide valuable information that may allow prediction of high-risk areas for WNV transmission to humans.

The mosquitoes collected in these traps will be returned to the CCMCD laboratory, identified and sent to UC Davis for testing. The findings are reported to the CCMCD, CCPH, and to the Washington State Department of Health (DOH)**.** Results from these tests will be a key factor in determining the areas requiring adult control measures.

4-2.3. Dead Bird Surveillance

In addition to testing adult mosquitoes for WNV, the disease can be detected in dead birds, particularly corvids* (crows, jays, magpies). CCPH is the agency responsible for the pick-up and testing of dead birds. It will provide CCMCD with information on all dead bird locations to facilitate planning, surveillance and control strategies. Contact information for CCPH can be found in *Appendix 2.*

4-2.4. Human Surveillance for WNV

Clark County Public Health has primary responsibility for WNV surveillance. Human WNV is reportable first to CCPH. The Washington Department of Health (DOH) works closely with CCPH and maintains all information regarding human infections of WNV in Washington State. Contact information can be found in *Appendix 2.*

4-2.5. Domestic Animal Surveillance for WNV

Domestic animals, particularly equines, can be seriously affected by WNV. The Washington Department of Agriculture* (WDA) provides surveillance and laboratory detection of WNV in animals. Contact information is given in *Appendix 2*.

4-3. Control Activities

The CCMCD Response Guidelines use five risk levels to provide a phased response based on surveillance results. The levels (1-5) represent increasing risk of human health impacts from WNV in the County. Each level builds on the activities of the previous levels and includes specific response actions, emphasizing public education and control methods to reduce the spread of WNV.

Larviciding will be limited to those areas where the mosquito species are potential carriers of WNV. These sites will not be treated if adequate predator populations are present. The use of larvicides* and adulticides* will be limited to the conditions set in Risk Levels 2 through 4.

When ecologically sensitive areas* are involved, such as the Ridgefield Wildlife Refuge, this process will be carried out cooperatively between CCMCD and the agency responsible for stewardship of the area of concern.

4-3.1. Larvae/Pupae Control

This control program will reduce development of larvae* and pupae* by habitat management and the selective use of larvicides. The materials to be used are given in *Appendix 3* along with pertinent information on the use of each product. Additionally, CCMCD will collaborate with local, state federal and private agencies to identify water sources that create mosquito breeding problems and reasonable efforts will be made to reduce mosquito development in these zones.

4-3.2. Adult Mosquito Control

When adulticiding is required, the least toxic products possible will be applied using truck-mounted or hand held Ultra Low Volume (ULV)* sprayers. If a major outbreak of WNV should occur in Clark County, consideration would be given to aerial application by order of Clark County Public Health's Health Officer. This application would be done by a qualified contractor using EPA* and state approved insecticides. Additionally, ground or aerial application for adult mosquitoes will require the recommendation of the CCMCD Operations Manager, authorized by the Board of Trustees. If application of adulticides becomes necessary, advance notice will be given through the media and the CCMCD and/or Clark County Public Health Website.

5. Risk Level Descriptions

5-0. West Nile Virus Risk Level 0

Status1

- No nuisance mosquitoes present.
- Environmental conditions not conducive to mosquito development.

Action

- Monitor environmental conditions to include: rainfall, temperature, humidity and snowmelt.
- Routine administrative and maintenance activities.
- Update Annual Plans.
- Attend training classes and mosquito control association meetings as appropriate.
- Consolidation and interpretation of previous year's data for Annual Reports.
- Map standardized locations for all mosquito control activities, to include: surveillance and control measures.
- Coordinate with Public Works and other public agencies in Clark County responsible for surface water management to identify catch basins, retention/detention systems and other water holding areas.
- Identify locations to place an EVS or gravid trap.
- Draft bid specifications and submit closed bid contracts to qualified distributors of pesticide products to be used by CCMCD in 2009.
- Prepare and implement contracts with private companies for the lease or purchase of vehicles and ground ULV* spray equipment to be used for adulticiding.

Status 2: Nuisance Mosquitoes Present

- Environmental conditions conducive to mosquito development.

Action

- CCMCD staff responds to requests for service. Explanation of service and requirements of property owners are provided by CCMCD staff.
- Types of service provided to property owners related to nuisance mosquito prevention and control include: public education (both printed and verbal), inspection of property for surveillance or control purposes.
- CCMCD works to eliminate mosquitoes through mechanical modification of problem areas. This includes making recommendations to local, state and federal agencies and property owners of Clark County to eliminate or alter practices involving vegetation, water and animal management that create or maintain mosquito breeding habitat.

Summary WNV Risk Level 0

The actions taken in Risk Level 1 include routine nuisance mosquito monitoring, seasonal mosquito control activities, and public education efforts. Given the presence of WNV in Washington State over the past several years, services to property owners for nuisance mosquitoes will be less of a priority than WNV surveillance and control.

5-1. West Nile Virus Risk Level 1

Status

- No WNV activity in State, Clark County or bordering counties.
- Environmental conditions not conducive to support WNV activity.

Actions

- Recruit stakeholder individuals and groups for volunteer activities during WNV season.
- Identify individuals, groups or locations considered higher risk for WNV.
- Prepare specifications for a contingency aerial contract for controlling adult mosquitoes in response to a WNV emergency situation.

Summary WNV Risk Level 1

The actions taken in Risk Level 1 include basic monitoring, seasonal mosquito control activities, and public education efforts that realistically describe WNV risks, transmission, and prevention strategies. As historical data is collected these actions will evolve and provide CCMCD information critical to the maintenance and improvement of the program.

5-2. West Nile Virus Risk Level 2

Status

- No WNV activity detected in Clark County.
- Environmental conditions suitable for mosquito development.

Actions

Public Information and Agency Coordination

- Provide media general information on WNV; follow media's response to public.
- Coordinate source reduction activities, such as container removal and site modification with public agencies and stakeholders.

Surveillance and Control

- Maintain close coordination with county and state health officials responsible for WNV monitoring of dead birds and human infections. Notify these agencies when immature mosquito activity is found. Provide these agencies with locations, species (*Cx. pipiens* and/or *Cx. Tarsalis)* and numbers of the immature mosquitoes.
- Initiate trapping of adult mosquitoes using EVS and gravid traps. These traps will be set throughout the county to monitor WNV activity in mosquito populations. Number of traps and locations will be adjusted throughout the season to provide maximum coverage for detection of WNV.
- Identify and map mosquito-breeding sites not presently in CCMCD's database.
- Implement immature mosquito control measures. Criteria for control are given below.

Control Criteria

Criteria 1

One mosquito larva and no pupae per dip. Count based on the average from 10 dips. Mosquitoes identified and data recorded. Recommended treatment—No insecticide application at this time. Monitor site monthly for any mosquito population changes.

Criteria 2

One or more larvae or pupae present. Count based on the average from 10 dips. Mosquitoes identified and data recorded. Recommended treatment—larvicide with state and federal approved materials. Site monitored weekly until it meets Criteria 1 or produces negative collections.

Summary Risk Level 2

At this level, the prevention and control activities from Level 1 continue and public education is heightened. The action taken in WNV Risk Level 2 is directed at the surveillance and control of immature mosquitoes (larval/pupal stages). The purpose of these actions is to reduce Mosquito populations, particularly *Cx pipiens* and *Cx tarsalis* to a level where adult mosquito populations are reduced to a level that greatly diminishes the transmission of WNV to wild birds.

Information on larvicides to be used by CCMCD is given in *Appendix 3*. All insecticides used meet EPA and state approval.

5-3. West Nile Virus Risk Level 3

Status

- Environmental conditions ideal for mosquito development.
- West Nile virus detected in *Cx. pipiens*, *Cx. tarsalis* or dead birds in Clark County.
- No human or equine cases diagnosed.

Actions

Public Information and Agency Coordination

- Coordinate with Clark County Public Health regarding: increasing public information through community outreach and media releases, including general locations of WNV positive mosquito samples.
- Coordinate with Clark County Public Health and state health officials regarding the media release of locations where positive dead birds are located.
- Initiate daily contact with local and state officials regarding potential human or equine cases.
- Coordinate with Clark County Public Health media outreach regarding when and where identified locations will be treated for adult mosquito control. This information will also be posted on the Clark County Public Health website.

Surveillance and Control

- Increase immature mosquito surveillance in locations where WNV has been detected. Monitor these sites two times per week and adjacent zones once a week.
- Treat larva/pupa sites using the same criteria as given in **Risk Level 2.**
- Initiate ground adult control measures (adulticides) in locations identified as having adult populations of a WNV carrying mosquito.

Control Criteria

- Immature Mosquito Control—Use same criteria as in Risk Level 2.
- Adult Mosquito Control—WNV detected in one mosquito sample in one location. No adult mosquito control initiated.
- Multiple positive samples from any surveillance method detected in one location. Adulticides applied using ground ULV application in that zone using EPA and state approved materials. Adulticides applied to positive and adjacent areas.
- Multiple positive samples detected in two or more locations and adjacent areas. Adulticides applied to positive and adjacent locales.

Summary Risk Level 3

The action taken in **Risk Level 3** is done to reduce the potential for increased WNV activity in adult mosquito populations, thereby, reducing the threat to humans and domestic animals. No treatment for adult mosquitoes will be done without the recommendation of Clark County Public Health's Health Officer and approval of the CCMCD Board of Trustees and communication with appropriate local and state officials.

Information on adulticides and larvicides to be used by CCMCD is given in *Appendix 3*. All insecticides used meet state and EPA approval.

5-4. West Nile Virus Risk Level 4

Status

- Environmental conditions ideal for mosquito development.
- West Nile virus detected in *Cx. pipiens, Cx. tarsalis* or other mosquito species in multiple areas in the county.
- One or more equine cases.
- One or more human cases diagnosed in one or more locations in Clark County.

Actions

Public Information and Agency Coordination

- Daily information exchanged between CCMCD and CCPH on status of WNV outbreak.
- Consideration of the following actions in collaboration with local and state health officials: recommend the restriction/cancellation of outdoor evening activities and closing of recreational areas.
- Local and state health officials will provide direct notification to health care facilities, nursing homes and other with high risk locations.

Surveillance and Control

- Immature mosquito surveillance activities the same as **Risk Level 2.**
- Increase ground adult mosquito control operations using the criteria given below.
- Consider the use of aerial application for the control of adult mosquitoes in high risk areas using the criteria given below.

Control Criteria

- Immature Mosquito Control—Use same criteria as in **Risk Level 2.**
- Two or more positive mosquito samples in one location or in multiple locations with two or more positive mosquito samples or one human case. Increase ground adult control to include all areas meeting these criteria.
- Three or more human cases diagnosed in adjacent locations or 10 or more human cases countywide. Initiate aerial adult mosquito control in areas determined to be highest risk of more human cases.

Summary Risk Level 4

The action taken in **Risk Level 4** will be based on a severe outbreak of WNV. All decisions made at this level must be approved by the Board of Trustees and by state and local health officials, including Clark County Public Health's Health Officer.

Information on adulticides and larvicides to be used by CCMCD is given in *Appendix 3*. All insecticides used meet state and EPA approval.

6. Glossary/Acronyms

Adulticide	Insecticides used to kill adult mosquitoes. All must be approved by EPA and state.
AWP	Annual Work Plan
Biorational Insecticide	Biorational pesticides are considered the safest to humans and the environment. They are derived from a variety of biological sources, including bacteria, viruses, fungi and protozoa. They also include chemical analogues of naturally occurring biological chemicals such as pheromones and insect growth regulators (IGRs). These analogues are considered third-generation pesticides that are more environmentally sound and closely resemble or are identical to chemicals produced by insects and plants. Biorational products are quite different from conventional, broad-spectrum pesticides in that they are typically target-specific and have little to no acute impact on most non-target organisms.
Breeding Habitat	An aquatic habitat where immature mosquitoes hatch and develop into adults.
CCPH	Clark County Public Health
CCMCD	Clark County Mosquito Control District
Corvid	Member of the family of birds including jays and crows.
DOE	Department of Ecology
DOH	Washington State Department of Health
EPA	Environmental Protection Agency
Equine	Horse
Ecologically Sensitive Areas	Areas that are maintained or preserved primarily for their habitat value, or that have local ecosystems that are particularly sensitive to disruption.
EVS Trap	Encephalitis viral surveillance trap
GPS	Global Positioning System
Golden Bear Oil (GBO)	A surface film product that prevents air intake by the larva, used as a last resort due to the broad spectrum of organisms that can be affected. GBO is used where control efforts have begun too late to for immature mosquito control.

Gravid Trap	A mosquito trap designed to attract and catch pregnant female mosquitoes.
Immature Mosquitoes	The larval and pupal forms of mosquitoes. All are found in aquatic habitats.
Integrated Pest Management	The best management practices used by mosquito control agencies that include: surveillance, public education, source reduction, and the use of insecticides in the most environmentally friendly ways possible.
Larvae	The aquatic, immature stage of a mosquito that undergoes four molts then changes into the pupal stage.
Larvicides	Natural and synthetic insecticides that are used with the intent of killing immature mosquitoes during the phases of their life when they live in water.
Mosquito	An organism, usually an insect or other arthropod, capable of carrying and transmitting a disease agent from one host to another.
Nuisance Mosquitoes	Mosquitoes that bite but are not considered important in the transmission of disease to humans.
Pupae	The aquatic, immature form of a mosquito prior to emerging as an adult.
RAMP	Rapid Analyte Measurement Platform. Test used to detect WNV in mosquitoes and dead birds.
Treatment Threshold Levels	Levels of immature or adult mosquitoes that are used as guidelines for control activities: ▪ Larval – 1 larva per standard dip (random 400 mL dip in body of water) ▪ Adult –more than 100 adult mosquitoes collected in an EVS (encephalitis viral surveillance), New Jersey Light trap in 8 hours.
ULV	Ultra Low Volume. The term used to described insecticide spray units that break up spray particles into micron size units, typically 15-25 microns. Insecticide labels state micron size allowable for that particular material.
WNV	West Nile virus

Appendix 2

Key Agencies

This list provides only the key agencies with WNV responsibilities in Clark County and Washington. Most have websites can provide further information regarding these and other organizations involved with WNV.

- Clark County Mosquito Control District, Steve Kessler, Operations Manager (360) 574-7906
- Clark County Public Health, Dr. Alan Melnick (360) 397-8412
- State of Washington, Department of Health, 1-866-78VIRUS
- U.S. Department of Agriculture (360) 753-9430
- Washington Department of Fish and Wildlife(360) 902-2926
- Washington State Department of Ecology Integrated Pest Management, http://www.ecy.wa.gov/programs/swfa/upest/what.html

Appendix 3

Larvicides

Products

These insecticides are applied directly to the water or to habitats that routinely flood by vector control staff by using vehicle mounted applicators, backpack sprayers, or hand-held squirt bottles. The larvicides given below will be used by CCMCD. Complete product information, including details for use, labels and material safety data sheets is available at the listed websites and/or e-mail addresses.

- Altosid (methoprene) www.altosid.com
- Bti (*Bacillus thuringiensis var. israelinsis*) www.clarkemosquito.com
- Bs (*Bacillus sphaerius*) www.clarkemosquito.com
- Golden Bear Oil www.clarkemosquito.com
- Agnique (monomolecular surface film) info@myadapco.com

Rationale

CCMCD primarily uses larval sampling results to select the appropriate pesticide before application.

- Biorationals are not effective on late 4th instars and pupae, thus are not used as a control product in areas where those life stages are present. Instead, CCMCD will use alternate products such as oils and films (e.g. GBO*) on sites with those specific life stages present.

Application

There are two basic techniques used for applying larvicides.

- Ground-based application. Larvicides are applied to bodies of water by CCMCD staff by using vehicle mounted applicators, backpack sprayers, or hand-held squirt bottles.
- Aerial application. Granular larvicides (e.g., BTi on corn-cob granules) are broadcasted on bodies of water from a helicopter. Aerial application has the benefits of being able to efficiently treat large areas or areas that are not accessible by CCMCD staff.

Adulticides

Products

These insecticides are applied into the air to kill flying, adult mosquitoes. Three classes of insecticides may be used by CCMCD as adulticides; organophosphates, pyrethroids and natural pyrethrins.

Pyrethroids: permethrin (Flit 13.3EC), sumithrin (Anvil 2+2, Duet) and resmethrin (Scourge).
Natural Pyrethrins: Aqua Halt
Organophosphates: malathion (Mosquitomist).

Complete product information including detail for use, labels and material safety data sheets are available at the websites listed below.

- Anvil, Aqua Halt, Duet, Mosquitomist, Flit 13.3ec www.clarkemosquito.com

Rationale

In the event of a Health Emergency due to the detection of WNV in a vector population in Clark County and specific criteria as described above being met, CCMCD would initiate a local adulticide program. CCMCD would apply pesticides at appropriate times of the day when adult mosquitoes are most active with ULV output to minimize the quantity of active ingredient applied. CCMCD may use barrier sprays in areas with elevated public exposure. A synthetic pyrethroid, applied to residential property, agricultural areas, green spaces etc., would be used by CCMCD in a ground application ULV form.

Application

There are two basic techniques used for applying adulticides:

- Barrier application: Adulticides are sprayed onto vegetation or other surfaces to leave a residual adulticide intended to kill mosquitoes that land on that surface. Barrier application is typically done with backpack sprayers that produce large droplets that immediately fall out of the air onto the intended surface. Barrier type adulticides can kill "non-target" insects.
- ULV (Ultra Low Volume) application: Adulticides are sprayed into the air with the intent of killing mosquitoes that are flying or resting in the sprayed area. ULV application is typically done with truck-mounted sprayers, but can be done with aircraft. ULV produces very small droplets that hang in the air for a few hours. ULV application is done during atmospheric conditions that promote slow drift of the adulticide for a distance of a few hundred feet from the path (or point) of application. By definition, ULV uses that smallest possible amount of adulticide that will kill adult mosquitoes. ULV applied adulticides can also kill "non-target" insects.