

MOSQUITO CONTROL and WEST NILE VIRUS RESPONSE PLAN

Purpose

It is the intent of this plan to reduce the mosquito population which transfers West Nile Virus (WNV) and other diseases to humans and animals, increase awareness of WNV, and promote personal protection from mosquito bites and WNV. Reducing the incidence of mosquitoes and mosquito borne diseases should provide improvements in the quality of life by reducing nuisances and disease.

Background

West Nile Virus is a neuroinvasive disease transmitted by an infected mosquito biting a person. WNV is a bird disease now endemic to the bird population. It is transferred from an infected bird to humans by mosquitoes. In severe cases, it may develop into meningitis or encephalitis. In limited cases, it can lead to death.

There are 26 species of mosquitoes in McLennan County (85 in Texas). One of these species, *Culex Quinquefasciatus*, is known to carry and transmit the virus in the Waco-McLennan County area. Mosquito breeding habitat is calm, stagnant water that exists for 7 days or more.

Depending on conditions, development from egg to adult can be as quick as 7 days but usually 10-14 days. The female mosquito lays up to 200 eggs at a time and repeats the cycle during its lifespan of about one month. The container holding the water can be natural or artificial and located on property that is public, private, residential, business, or commercial. The container can be any object such as tires, cans, birdbaths, clogged roof gutters, abandoned swimming pools, ponding of water, tree holes, blocked drainages, etc. The mosquito is a weak flier, usually traveling no more than 150 feet from the breeding site. Mosquitoes, eggs, and larvae do survive winter even though activity is reduced. When nighttime temperatures consistently are above 60 degrees Fahrenheit, mosquito activity increases. Eliminating mosquito habitat year round reduces the mosquito population and decreases WNV exposure.

Approaches

Five main approaches are recommended:

- Education
- Prevention
- Surveillance
- Direct action
- Evaluation

EDUCATION

Since the mosquito affects everyone and its habitat is found on all types of property the entire public including property owners need to know more and know what they can do personally. Educational emphasis must continue until the general public has an understanding and willingness to actively engage in self protection practices that include taking personal responsibility for the elimination of mosquito breeding sites on their own. Changing behaviors and perceptions may take several years to be effective.

The Health District has resources and educational materials to develop information strategies. Greater distribution of materials and information to different groups of people through varied communication methods is necessary. The following will be the concise message for the education program:

The best defense is to practice these habits, known as the “Four Ds”:

- Use insect repellent containing **DEET**, picaridin or oil of lemon eucalyptus.
- **Dress** in long sleeves and long pants when you are outside.
- Stay indoors at **Dusk and Dawn**, when mosquitoes are most active.

- **Drain** standing water where mosquitoes breed. Common breeding sites include old tires, flowerpots and clogged rain gutters.

Being proactive with several awareness campaigns and ongoing education efforts can prevent a high incidence of West Nile Virus by encouraging property owners to eliminate mosquito-breeding habitat, encouraging the general population to use preventative protection, and reduce activities that expose people to the mosquitoes.

SURVEILLANCE

West Nile Virus is endemic to both the bird and mosquito populations. Mosquitoes and mosquito populations can be sampled by trapping, identifying and testing but requires time, personnel, equipment, supplies, and laboratory space to be effective. A cooperative surveillance agreement and sharing of information with Baylor University through Drs. Sim and Duhrkopf as they continue research on WNV and mosquitoes provides the expertise and materials with a low cost. Additional activities and information may be obtained through projects using the Center for Reservoir and Aquatic Science Research (CRASR). This cooperative agreement between the City, the Health District, and Baylor University facilitates studies and surveillance that benefits all parties.

Occurrence of WNV in humans is monitored and tracked through disease reports submitted to the Health District. The Health District has an epidemiologist on staff to evaluate the information submitted in the reports.

DIRECT ACTION

Before 2012, there was less interest in knowing more about mosquitoes and WNV. Therefore, there is no background data to determine when mosquito populations are excessive, when WNV exposure is at its highest, how active and infective the virus is in the bird and mosquito populations, or when actual WNV cases are considered excessive. However, there is no question that WNV is present in McLennan County in the bird population and in the mosquito population.

No specific series of triggering conditions or thresholds are defined, rather, a continuous series of prevention actions (Prevention Section) are proposed. Additional data are needed to determine numerical or environmental factors that would indicate moving to a more aggressive action to prevent WNV exposures. The prevention actions can be implemented singly or in groups to respond to conditions and concerns.

Mosquito control and elimination of breeding locations is a year round activity due to our mild winters. Some predictive criteria to indicate when to increase efforts are:

- 1) Night time temperatures consistently above 60 degrees Fahrenheit, which starts active mosquito breeding
- 2) Virus activity increases from May through October, increasing human exposures, based on existing data (Dr. Sim)
- 3) Observed increases in mosquito populations (surveillance) by citizen reports and city employees
- 4) Increased number of reported WNV cases.

EVALUATION

The virus will never go away and mosquitoes will never be completely eliminated. Mosquitoes survive year round and their rapid and prolific development (7 to 14 days from egg to adult; 200,000 adults from one female within 30 days), and diversity in breeding locations and habitat ensure that the WNV will continue to be present.

Educational emphasis must continue until the general public has an understanding and willingness to actively protect themselves and eliminate breeding sites on their own. Changing behaviors and perceptions may take several years to be effective.

**FOR MORE INFORMATION, PLEASE REFER TO THE
WACO-MCLENNAN COUNTY PUBLIC HEALTH DISTRICT WEBSITE
<http://www.waco-texas.com/cms-healthdepartment>**