



DEP FACT SHEET

Mosquito Control, West Nile Virus, and EEE

Date: June 2008

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Background

West Nile Virus (WNV) and Eastern Equine Encephalitis (EEE) are growing concerns for many people who want to know more about these diseases, how much of a concern they are in Maine, how they spread, and what they can do to minimize their risks of exposure. Entomologists indicate there are at least 44 species of mosquitoes in Maine. Although many are certainly nuisances, it is important to know that less than half of those are biting pests of humans and only a few of them that feed on both humans and birds are actually potential vectors or transmitters for WNV and EEE. It also helps that the breeding locations of these species are known. This information will help all of us to determine an appropriate level of concern and to make informed decisions.

Breeding Habitat

The few potential WNV vector species primarily breed in two types of areas: stagnant water and high elevation salt marsh pools. The stagnant water areas can be found in artificial containers such as bird baths, used tires left outdoors, buckets, kiddie pools, stormwater and catch basins, drainage ditches, etc. where water may not be regularly exchanged and becomes stagnant. Many of these structures can be easily emptied to eliminate mosquito breeding conditions. The high elevation salt marsh pools refer to natural pools that are located above the normal high tide line. These areas are typically only flooded during significant storms or other extremely high tide events, often only once per month. Some of them contain fish that will act as natural predators, keeping the mosquitoes from surviving and breeding. Those pools without fish, however, provide mosquito breeding habitat. The one potential EEE vector species breeds in some of Maine's many red maple and cedar swamps, and these habitats can also contain natural predators.

If you are concerned about mosquitoes and WNV, the Department of Environmental Protection (DEP) recommends that you first eliminate or empty any artificial sources of stagnant water. This is a relatively easy step in eliminating breeding habitat, but is very important and extremely effective. For either WNV or EEE, use personal protection, as you would for any mosquitoes. Information on available and recommended methods can be found through the Maine Center for Disease Control (CDC) and the University of Maine's Cooperative Extension Service.

Pesticide Control

Some people ask about the use of pesticides for control of mosquitoes that may transmit WNV or EEE. Various chemical and biological agents are marketed for control of mosquitoes. In addition to requirements on the use of pesticides from the Maine Department of Agriculture, Food and Rural Resource's Board of Pesticide Control (BPC), you should be aware that **any discharge of pollutants, including pesticides, to waters of the State or in such a way that they enter a water of the State, first requires approval from the DEP.**

However, the DEP has determined that some means of non-chemical pesticide treatments can be conducted under specific conditions without DEP approval. Mosquitoes, black flies, and some non-biting midges have physiological differences from other species that make them particularly sensitive to the bacterial pesticides *Bacillus thuringiensis* subspecies *israelensis* (Bti) and *B. sphaericus* (Bs). These materials are available in solid and granular formulations that sink to the bottom of waterbodies, will not be released into the water column, and must be ingested to be

effective. They also have limited persistence in the environment. Based on these properties, DEP has determined (see DEP guidance DEPLW0704B) that treatments of solid or granular formulations of Bti or Bs as larvicides to those artificial containers that can not be emptied, to high elevation (extreme tide) salt marsh pools, constructed ponds, and isolated freshwater wetlands do not require a Maine Waste Discharge License (WDL). In each of these resources, there must be a presence of mosquitoes and an absence of fish or other predators that can control them. In the salt marsh pools, the Bti or Bs must be placed immediately after pool flooding to enable its dissipation prior to the next flood event. The ponds and isolated wetlands must be contained on one person's property and have no connection to other surface waterbodies. DEP emphasizes that people need to inspect breeding areas to make sure that stagnant, breeding conditions exist, that mosquito larvae are present, and that there are no natural predators that will take care of the mosquitoes for you. It should be noted that spraying for adult mosquitoes with appropriate precautions to avoid contact with surface waters and wetlands, including ground and aerial applications done according to the pesticide label instructions, does not require a permit from DEP.

In addition to the primary breeding areas noted above in which treatment approval is not required, some other natural habitats may at times offer potential breeding conditions for mosquitoes that carry WNV and EEE. There are two regulatory avenues available to address this. The DEP has developed a General Permit for Aquatic Pesticides for the Control of Mosquito-Borne Diseases that offers an expedited review for qualified projects. To qualify for the General Permit, there must be preferred breeding habitat for vectors of WNV or EEE, the presence of those mosquito vectors, and/or documentation of infected mosquitoes, birds, or humans within 20 miles. The proposed treatment program must be in conjunction with a written management plan with area-wide control strategies. If these and other conditions can not be met, an applicant can apply for an individual WDL. For either coverage under the General Permit or an individual permit, pursuant to DEP rules Chapter 514, *Regulations Concerning the use of Aquatic Pesticides*, the applicant must provide adequate protection for non-target species, must demonstrate a significant need to control the target species and that the pesticide offers the only reasonable and effective means, and the application must not result in violations of state water quality laws. These conditions require significant attention, as the DEP is very concerned about the greater environmental effects of aquatic pesticide treatments. It should be noted that Bti and Bs are effective at mosquito control during specific life stages of the mosquito larvae. Thus, it is important that people develop long-term, integrated management strategies and not rely on last minute decisions that may not be approvable within the desired timeframe or effective in controlling mosquito populations. Physical alterations to any protected natural resource also require approval from the DEP under the Natural Resources Protection Act and the Maine Wetland Protection Rules. As the U.S. Environmental Protection Agency states in *Wetlands & West Nile Virus* (draft), "*healthy wetlands are not uncontrolled breeding grounds for mosquitoes. These unique ecosystems sustain numerous species of fish, insects, amphibians and birds that feed on mosquito eggs and larva. Moreover, the mosquito species responsible for West Nile transmission do not prefer to reproduce in healthy wetlands.*"

It should be noted that all pesticide products must be registered with the BPC and all pesticide applications must be performed in accordance with the BPC's regulations. For further information on regulatory requirements, contact the Maine DEP at (207) 287-3901. For information on mosquitoes, WNV and EEE, methods of personal protection, and pesticide regulations, contact: the Maine CDC at (207) 287-3960 (www.maine.gov/dhhs/boh/ddc/_lyme/index.htm), the BPC at (207) 287-2731 (www.maine.gov/agriculture/pesticides/wnv), or the DEP at (207) 287-3901 (www.maine.gov/dep/blwq/topic/westnile/index.htm).