City of Seattle
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City of Seattle
Integrated Pest Management Plan for Mosquito Control
February 20, 2003

Background

On April 20, 2002, the Washington Department of Ecology (Ecology) issued a general permit (NPDES Permit No. WAG-992000) (the "General Permit") covering all mosquito control activities that discharge insecticides directly into surface waters of the state. Under the General Permit, the use of insecticides for mosquito control in water is allowed when the effects are temporary and confined to a specific location, though locations where insecticides are used may be widespread throughout the State. Applications of insecticides are subject to compliance with Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) labels and monitoring requirements and reporting.

In order to obtain coverage under the General Permit, agencies are required to prepare and implement a Best Management Practices/Integrated Pest Management Plan. Permittees may either adopt the BMP plan developed by Ecology or develop their own and submit the plan to Ecology, in accordance with the General Permit at S5.

This document constitutes the City of Seattle's IPM Plan for mosquito control, which the General Permit requires the permittee to implement. However, the General Permit contains additional requirements beyond those contained in this IPM Plan. According to the General Permit, the City expects to adjust this IPM Plan based on any guidance received from Ecology and to "resubmit the plan according to the direction of the Department no later than January 1, 2004 or six months after written notification of a need for adjustment from the Department, whichever occurs latest." The City also expects to revise its IPM Plan from time to time, based on valid reasons that promote the principles of IPM as is allowed by the General Permit. It is not the City's understanding either that Ecology must formally approve the IPM Plan or that revisions must be submitted to Ecology before pesticide application may occur under the General Permit.

Introduction

Mosquito-borne diseases pose both human health and ecological risks. While mosquitoes have always been potential vectors for diseases including St. Louis encephalitis, lately West Nile Virus has become an increasing concern in this region. First detected in the eastern United States in 1999, West Nile Virus has rapidly spread to the west coast. Mosquito control efforts have not been successful in stopping the spread of the virus.

West Nile Virus was detected in Washington State in 2002 in birds and horses, however, to date; no human cases of West Nile Virus have been detected in Washington. In 2002 there were approximately 260 deaths due to West Nile Virus nationwide. While this represents a relatively low public health risk (for example approximately 30,000 people will die from the flu this season), steps can be taken to help minimize the risk.

As a large land and facility owner/operator, employer, drainage system owner/operator, and municipality, the City of Seattle can help manage these risks by initiating efforts to minimize mosquito breeding habitat and control mosquito larva in City facilities when warranted and to educate City employees about personal protection. At this time, the City anticipates that any application of pesticides by the City under the General Permit would be limited to City property, City facilities, other areas of concern for City activities, and possibly surrounding areas, and other property within the treatment area by order or by arrangement with the property owner or operator, the jurisdictional health authority, or WDOH; the IPM Plan is based on that assumption. If that assumption changes in the future, the City will revise its IPM Plan accordingly. As a consequence, the City will expect and rely on the local health department, which is part of King County (Public Health - Seattle & King County), to perform primary surveillance and primary public education and outreach functions for the purposes of general public health. The City's actions will supplement any actions of the County or any future mosquito control district.

Some City property, City facilities, other areas of concern for City activities, and surrounding properties, are located in Washington but outside of King County. The City will use this same general approach to permit compliance and pesticide application in those areas, and will also expect and rely on local and jurisdictional health authorities to perform the primary surveillance and primary public education and outreach functions for the purposes of general public health.

Approach

The City of Seattle recognizes that West Nile Virus poses risks to human health and ecology and intends to undertake prudent measures to mitigate that risk on or near City property and facilities, potentially including the judicious use of larvicides. However, the City will not use larvicides in its drinking water facilities. Additionally, the City does not intend to indiscriminately use pesticides as such use will not stop the spread of the virus and also poses some risks.

Seattle's overall approach is based on the assumption that the following hierarchy of general management steps is the most effective:

1) Conduct City employee education and awareness of risks, risk reduction steps, and personal protection
2) Support public education and outreach focused on the steps City residents can take to reduce breeding habitat
3) Monitor Public Health - Seattle & King County surveillance of West Nile Virus outbreaks in wildlife and humans and monitor surveillance conducted by public health agencies in the other counties.

4) Inventory certain major City owned or operated structures that may provide breeding habitat
5) Attempt to reduce breeding habitat in City facilities, taking steps such as:
   a) General facility housekeeping to eliminate unnecessary standing water
   b) Drainage facility operation modification when determined practical by the City
6) If appropriate, utilize larval predators in potential mosquito breeding habitat, in accordance with state and federal requirements
7) Larvicide at the City's discretion when in the City's view, larval populations exceed target thresholds, larviciding has a reasonable potential to reduce mosquito populations in an area, facility or operational modifications to reduce breeding habitat potential are not practical, and treatment costs are not prohibitive. The City intends to select the pesticide that is effective in controlling the mosquito population and that is the least toxic to non-target species and appropriate to the attributes of the facility, except in response to documented development of resistance or in a declared public health emergency.

The City may chose to use other methods to control mosquitoes such as the introduction of natural predators after following all appropriate procedures.

Because West Nile Virus has been detected in the State including Snohomish, Whatcom, Island, and Pend Oreille counties and is likely to already be in King County, the City will begin to implement the first five steps beginning in March 2003 and continuing throughout mosquito season into fall as determined appropriate. Step 7, use of larvicides, will be implemented only as described below.

Implementation

Step 1: Employee Education & Awareness
City Safety Officers will initiate an effort to inform affected City employees about the Best Management Practices that can be taken to avoid mosquito bites and to reduce breeding habitat (for example, Attachment 1). The effort is intended to be aimed at employees most at risk of mosquito bites during City employment.

A wide distribution City employee e-mail will be sent including general info, resources links, and BMPs for avoiding mosquito bites and reducing breeding habitat.

Step 2: Public Outreach
Any efforts City government undertakes will only be successful if other land owners are undertaking similar mitigation measures. Therefore, the City expects to include information in a mailing to drainage utility customers that reinforces the prevention and protection messages developed by Public Health - Seattle & King County.

Step 3: Monitor bird and human surveillance conducted by Public Health - Seattle & King County
Through subscription to the Public Health e-mail information service, the Office of Sustainability and Environment will monitor the incidence of West Nile virus in King County and the City of Seattle to help determine when control measures might be warranted. West Nile Virus has already been detected in Snohomish, Whatcom and

Pend Oreille counties. The City will periodically contact the health departments in the other counties as we determine appropriate, to help determine when control measures might be warranted.

Step 4: Inventory Breeding Habitat
Seattle Public Utilities, Seattle Parks and Recreation, Seattle City Light, Seattle Department of Transportation, Seattle Center, Fleets & Facilities, and Seattle Public Library will inventory selected structures and facilities that may provide mosquito breeding habitat

Step 5: Minimize Breeding Habitat
The City will take steps to eliminate unnecessary standing water from City facilities such as clogged gutters, containers, pavement holes, etc., at a level of effort that the City shall determine. When determined practical by the City, City drainage facilities will be operated to minimize standing water.

Step 6: Larval Predators
If determined appropriate and consistent with state and local requirements, the City may consider use of larval predators in limited circumstances. Possible opportunities include ornamental ponds that do not drain to natural systems.

Step 7: Larviciding
Before larviciding, the City expects to take the actions stated in this Step 7. When a facility or location is considered by the City to be a potentially significant source of mosquito larvae, sampling will be conducted using the BMPs such as those described in Attachment 2. If >.3 larvae per dip are found, larvicides may be used. The City may or may not choose to use larvicide once the minimum action threshold of .3 larvae per dip has been met. It is expected that any decision to use larvicide will be made through the following process:

A call from a resident or a call from an employee is made to a City departmental WNV coordinator that a facility or location is suspected of being a significant source of larvae. The concern is directed to the WNV coordinator of the City department that owns or operates the facility or location, if different from the original departmental WNV coordinator contacted.

The facility or location may be assessed for breeding potential at the City's discretion considering the following. It is assumed that where no is the answer to these questions, larvicide use at the facility or location may be warranted:

Is it a natural system with natural mosquito and larval predators?
Is the water in the facility greater than 3 feet deep?
Is there a base flow in the facility or water that will exchange the water within seven days?
Does the standing water drain a minimum of every 7 days?
Are more significant sources of lava present on adjacent properties?

If larvae are observable, then the facility may be tested for abundance of larvae. If all of the above are answered "no" and a minimum of .3 larvae per dip are present, then the

City may consider using larvicides. Also, if not all of the above are answered "no," but consistent with IPM principles, use of larvicide is determined to have the potential to reduce a significant larval population and a minimum of .3 larva per dip are present, then the City may consider using larvicides.

The departmental WNV coordinator should consider the reported information, available resources, the need to apply insecticides to control mosquito populations, whether larviciding has a reasonable potential to reduce mosquito populations in an area, whether or not facility or operational modifications to reduce breeding habitat potential are practical, and treatment costs in making a decision whether or not to use larvicides.

In accordance with FIFRA record keeping requirements, use of larvacides will be documented, and additionally is expected to be entered into the citywide pesticide use database.

If larvicides are used, the City will participate in a group monitoring program or make other arrangements considering the General Permit and in consultation with Ecology.

If larvacides are used, the City intends to use the pesticide that is effective in controlling the mosquito population and that is the least toxic to non-target species and appropriate to the attributes of the facility, except in response to documented development of resistance or in a declared public health emergency.

The following is the list of products, in the order of preference based on least toxicity to non-target species, which will be considered for use:

Bacillus thuringiensis israelensis (Bti)
Bacillus sphaericus (H-5a5b)
Monomolecular Surface Films
Methoprene Granular, Liquid, Pellet, or Briquet
Paraffinic white mineral oil. Paraffinic white mineral oil shall not be used in waters of the state unless:

a. The mosquito problem is declared a public health risk; or
b. The other control agents would be or are known to be ineffective at a specific treatment site; and
c. The waterbody is non-fish-bearing (consult WA State Fish and Wildlife concerning fish and wildlife)

Spills of pesticides will be promptly reported to the appropriate local and state authorities.

Attachments
West Nile Virus Mosquito Control: Reduce the Bite, Public Health Seattle & King Co.
Seven Ways to a Successful Dipping Career, Claudia O'Malley Burlington County Mosquito Extermination Commission, New Gretna, N.J.