Appendix 1d

Mosquitoes

There are approximately 175 species of mosquitoes in the continental United States. For management in and around schools, mosquito species can be divided into two types; nuisance species and vector species. Vector species can spread disease and thus require more vigilance than nuisance species. About 40 species of mosquitoes found in the US are medically important.

Mosquitoes are of concern in the school environment because many species are painful biters and/or are capable of transmitting diseases. In the United States, the threat of developing encephalitis from mosquitoes is far greater than the threat from other mosquito vectored diseases. Encephalitis, meningitis and other diseases can develop from the bites of mosquitoes infected with certain viruses such as West Nile, and Eastern equine and Western equine encephalitis. An effective control program will not eliminate all mosquitoes, but will keep the population at a reasonable level and will reduce both nuisances and the risk for mosquito-borne diseases.

Mosquitoes pass through four distinct life stages: egg, larva, pupa and adult. Adult female mosquitoes bite animals including humans to obtain blood. Blood provides protein for forming eggs. A female lives two weeks on average, during which she may lay eggs in standing water up to ten times, 50-500 eggs at a time. Suitable water for egg laying can include swamps, storm retention basins, culverts, ponds, lakes, natural tree holes, hollow stumps or artificial containers such as pots, cans, tires, plastic covers, or plugged rain gutters. In general, anything that can hold water for four to seven days or more can provide a breeding site. Eggs are deposited either individually or in groups called —rafts on the surface of water or on soil where flooding will produce puddles or pools. Most eggs hatch within 48 hours. Larvae are called —wrigglers reflecting their movement in the water. Wrigglers feed on organic debris and microorganisms, and breathe at the surface of the water through tubes. After molting several times, a pupa is formed. Pupae are C-shaped and sometimes called —tumblers because they will somersault below the surface of the water when disturbed. Adults emerge from these puparia. As long as watery habitat is available, the population gradually increases. The entire life cycle varies from four to 30 days, depending on the species. The recommendations below for mosquitoes in schools generally apply to the most common —domestic mosquitoes that share the following characteristics:

a. widespread geographically;
b. breed in and around buildings in artificial containers;
c. always associated with humans;
d. typically small (<1/2 mile) flight range;
e. capable of transmitting disease.

These species are relatively easily managed by school personnel by eliminating larval habitat around buildings. However, your location may require special attention to other species.

Local Resources

West Umatilla Mosquito Control District The principal objective of the West Umatilla Mosquito Control District and the basic reason for its formation is to provide a comprehensive mosquito control program as the means for preventing the transmission of Western Equine Encephalitis through the reduction of its primary vector, the mosquito Culex tarsalis. Secondary objective which is also accomplished by the district's comprehensive program includes, freedom from mosquito annoyance increasing yields in livestock, enjoyment of our yards, patios, parks, golf courses and other outdoor recreational areas.

North Morrow Vector Control District We are committed to increasing public education, and further more sensibly improving the environment of which we both work and engage in recreation. The District accomplishes this by having an established Integrated Pest Management (IPM) program in place. IPM is intended to use cost effective control measures to reduce mosquito populations and the diseases they potentially carry, while being environmentally sensitive.

The Grant County Mosquito Control District (GCMCD) was created in 1958 due to an outbreak of Western Equine Encephalitis which resulted in unfortunate fatal cases in children. The initial program consisted of basic ground units which operated within the school district boundaries. As the district boundaries grew, aircraft were incorporated in 1986 in order to cover the large mosquito bearing areas surrounding Moses Lake. Today the GCMCD has four dedicated year round employees and up to five seasonal positions.

WHAT TO DO IF YOU FIND A DEAD BIRD

Call the West Umatilla Vector Control District at 541-567-5201

OR

The Umatilla County Public Health Department at 541-278-5432

Avoid direct contact with the bird.

Wear disposable latex gloves while handling the bird or wear gloves that can immediately be put through a hot soapy wash. A dead bird can also be picked up by inverting a plastic bag on your hand and grasping the bird through the plastic.

Double bag the bird in plastic and place in the garbage, unless otherwise instructed by the health district. Wash your hands.

Do not bring the bird into your home.

Do not eat, drink, smoke or touch your face with the gloves while handling the bird.

Wash your hands with soap and water for at least 20 seconds after handling the bird.

Only certain birds will be collected.

Many species of birds can be infected with WNV and have no symptoms or illness. Birds that are more susceptible are the **corvids** (crows, ravens and magpies) and **raptors**.

All birds accepted for testing must be:

- Freshly dead (within 24 hours)
- Intact (with no physical trauma)
- Dead by natural causes

West Umatilla Mosquito Control District
3005 South 1st Street, Hermiston, OR 97838
info@wumcd.org **Dedicated to the Protection of Public Health Through the Reduction of Public Health Vectors**

PROTOCOL FOR TREATING MOSQUITOES

Threshold: As determined by public health authorities, a landing rate of >5 per minute, trap counts of >100 per night, or several staff or student complaints.

Nonchemical Control Measures

In general, identification and elimination of mosquito oviposition (egg laying) sites is more effective and less hazardous than attempting to eliminate adults. These sites include any water that stays still, lacks predators (like fish), and lasts for more than a few days. Some examples are: rain barrels, tires, tarps, trash, take-out food containers, storm drains, and clogged roof gutters. Elimination of such waters on a weekly basis preempts the emergence of adults. Adults, on the other hand, once flying, are difficult to control without using chemical means. Adult control methods such as traps, "bug-zappers," etc. may not effectively reduce mosquito populations. Exclusion of mosquito adults from buildings is more feasible and can be accomplished with screens, closed doors, and fans. Keep in mind that during warm weather, mosquitoes can breed in any water that lasts more than four to seven days, depending on the temperature.

Sanitation/Cultural Control Measures

Source elimination and habitat manipulation:

A. When Staff observe mosquitoes on site they will:

1st) Identify anything outside that can hold water such as plastic bottles, cans, containers, and such. Dispose of items, turn containers over, drill holes in containers or dump out water weekly.
2nd) Turn over wheelbarrows and other water-holding tools when not in use
3rd) Not allow water to become stagnate in birdbaths or other outside areas.
4th) Jot down action taken in the pest log.

B. Maintenance Staff will:

1st) Regularly inspect and clean out gutters and drainpipes
2nd) Cover dumpsters, trash and recycling receptacles to prevent water accumulation
3rd) Alter landscaping to eliminate standing water
4th) Angle corrugated drain pipes to allow total drainage
5th) Make sure window and door screens are in good repair
6th) Jot down action taken in the pest log

C. Grounds Staff will:

1st) Eliminate adult resting sites (tall grass, brush, pines, and other vegetation)
2nd) Cut back or remove dense brush and other vegetation from around buildings
3rd) Keep grassy areas mowed

D. Health & Safety Coordinator will:

1st) Verify all the above items have been attempted
2nd) Contact local Vector Control agencies for assistance

Reduce outdoor exposure, especially at dawn, dusk and in the early evening during peak periods of mosquito activity in your location. Avoid areas where mosquitoes tend to concentrate tall grass, margins of wooded areas, or heavily wooded areas in dense vegetation. Avoid wearing dark colors. Some mosquitoes and other biting flies are attracted to dark greens, browns and black. They are less attracted to light-colored clothing, especially whites and yellows.

Insect repellents are considered to be pesticides by the EPA and as such, are not appropriate for application by staff to students. Precautions should be taken to avoid toxic repellents such as DEET.