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Stormwater Structures & Mosquitoes

What's the Issue?

Stormwater structures that temporarily or permanently retain runoff are receiving increasing attention as potential mosquito breeding areas. Mosquito-borne diseases such as West Nile virus, St. Louis encephalitis, and eastern and western equine encephalitis are human health concerns. Measures that lower mosquito production in stormwater structures are needed to protect public health.

If designed properly, stormwater structures should not promote mosquito breeding. Ensuring that these structures are properly designed and maintained is the key to limiting mosquito production.

What is Stormwater?

Stormwater is the rain or snowmelt that does not initially infiltrate into the ground and runs off of surfaces and is transported into nearby waterways.

Facts About Mosquitoes

- There are over 2500 mosquito species worldwide, about 200 of which are found in the United States.
- Only female mosquitoes transmit diseases since they need the protein from blood to breed.
- The primary breeding habitat for mosquitoes is stagnant or shallow pools of water (generally less than 3 feet in depth) that exist for at least 7 days and/or aquatic sites with dense floating vegetation regardless of the water depth.
- Depending upon species, the adult mosquitoes may live from 1 week up to 3 months maximum.
- Mosquito predators include birds, fish, dragonflies, spiders, and a wide variety of aquatic insects.

How is Stormwater Managed?

Historically, stormwater controls were designed to quickly collect, store, and transport runoff away from developed areas into nearby streams to prevent flooding. However, it is now recognized that these systems alone are often not the ideal solution because they impact streams by increasing the volume and velocity of water and amount of pollutants.

Today stormwater management promotes a variety of practices and controls that help to infiltrate runoff and minimize contact of runoff with pollutants. For example, infiltration practices (which can be cheaper and easier to maintain than traditional stormwater practices) involve using vegetated areas like swales and rain gardens (a.k.a. bioretention cells) to slow the velocity of water and allow for percolation into the ground. When properly designed and maintained, stormwater management practices are not conducive as habitat for mosquito breeding.

What Should Local Authorities Do?

Stormwater managers should incorporate design, construction, management, and maintenance features into stormwater structures to minimize mosquito production (and therefore decrease or eliminate the need for insecticides) without compromising water quality functions.

Local authorities should properly inspect and maintain stormwater structures to ensure their continued effectiveness, reduce the need for costly pesticide applications, and prevent large outbreaks of mosquitoes.

However, it might still be necessary for state, county, or local governments to apply a limited amount of insecticides to control mosquitoes. Mosquito control officials use EPA-registered products that do not pose unreasonable risks to human health, wildlife, or the environment. Monitoring efforts that involve field inspections by mosquito control personnel determine when and where insecticide applications are needed. However, as with all pesticide use, the use of insecticides in stormwater structures should be minimized. Stormwater managers should work closely with mosquito control officials to help achieve this goal.