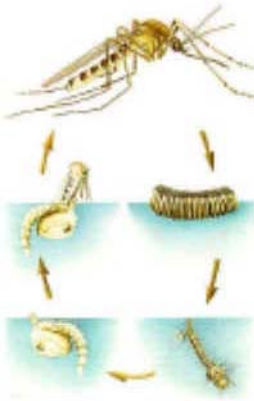


## Mosquito Surveillance and Control

Mosquitoes are small, long-legged, two-winged insects belonging to the order Diptera. Worldwide, there are over 2,600 known species. In Indiana, fifty-three species have been identified. In Allen County, thirty-six species of mosquitoes have been identified.



Mosquitoes have four distinct stages of development: egg, larvae, pupa, and adult. Eggs must be in water in order to hatch. Larvae and pupae are aquatic; adults are active, free-flying insects.

Male mosquitoes emerge from the pupal stage about twenty-four hours before the females. Mating occurs within forty-eight hours, so the majority of females in any population are always fertile. Both females and males utilize nectar and other plant juices as energy sources; only females take a blood meal, utilizing the protein to produce eggs.

Generally, mosquitoes remain inactive during the day, resting in cool, humid locations to minimize moisture loss. Feeding and mating occur from dusk through the night until just after dawn.

---

### Diseases Associated with Mosquitoes

Mosquitoes are responsible for the spread of many diseases throughout the world. Yellow fever, malaria, dengue, and elephantitis are common in tropical regions. For those of us living in the Midwest, encephalitis is the disease of most concern.

---

### Encephalitis

Encephalitis is an inflammation of the brain, which can be caused by a mosquito-borne virus. The onset of the disease is usually sudden and the symptoms may include high fever, headache, nausea, vomiting, stiff neck, dizziness, drowsiness progressing into a coma, muscular twitching, and convulsions. Some patients have speech difficulties, are mentally confused, lethargic, and show tremors of the tongue, lips and hands, while others are irritable, confused or irrational. In

some cases, there may be spastic paralysis. The eyes may be involved, causing double vision in the individual. Reflexes, such as the knee jerk, are exaggerated. In Indiana, there are four kinds of mosquito-borne encephalitis of major concern: St. Louis Encephalitis, Eastern Equine Encephalomyelitis, West Nile Virus, and the California Group of Encephalitis Viruses, represented in the Midwest by the LaCrosse Virus.

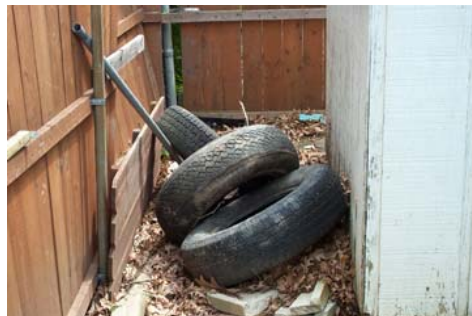
For more information on the mosquitoes that carry the encephalitis viruses and the viruses themselves, visit the Centers for Disease Control and Prevention's website at <http://www.cdc.gov/ncidod/dvbid/arbor/index.htm>

---

### Controlling Mosquitoes Around the Home

All mosquitoes require standing water for the first three stages of development. Consequently, the elimination of any vessel capable of holding water for extended periods of time is essential.

- Check your property for breeding sites. Report any natural standing water to the Vector Control Division.
- Clean out leaves and debris from clogged gutters.
- Do not allow **tires** to accumulate outside.
- Flush out birdbaths each week. Empty or turn over wading pools when not in use.
- Dispose of containers, trays, and cans that can hold water.
- Cover or store canoes and boats upside down.
- Properly maintain backyard swimming pools to discourage the development of mosquitoes by tightly covering any pool not in use so rainwater and leaves do not accumulate in it.
- Aerate ornamental ponds and water gardens. Contact the Vector Control Division for mosquito-eating fish to place in ponds.
- At night, wear loose, light-colored, long sleeves and pants. Use an insect spray with 10-30% DEET in it. Use a lower percentage for children. See the [DEET Guidelines](#) on the Vector Control website.
- Mix 2 tablespoons of malathion with a gallon of water. Spray this under bushes and high weeds. The mixture will kill adult mosquitoes resting on leaves and branches.
- Purchase a hand-fogger to use when working outside or having a backyard party.



## Biological Control

Biological control requires introducing a natural predator into the habitat of the mosquito. Dragonflies, praying mantids, bats, and purple martins have been promoted as natural controls, but have not shown the ability to significantly reduce mosquito populations.



*Gambusia affinis*, also known as “mosquitofish”, are a top-feeding minnow that offer excellent control of larvae and pupae in ornamental ponds and backyard garden pools. These fish have upturned mouths and work along the surface, feeding on mosquito larvae and other small invertebrates. They are

somewhat tolerant of organic pollution and reproduce rapidly.

Since the fish will interfere with the life cycle of other aquatic organisms around them, certain restrictions apply as to where they can be used. In general, they cannot be placed in an area, such as rivers, creeks, ditches, and lakes, where they will interfere with any Indiana game fish.

If you are interested in acquiring “mosquitofish” for your backyard pond, contact the Vector Control Division at 449-7459.