



# Mosquitoes

Integrated Pest Management for Home Gardeners and Landscape Professionals

More than 50 species of mosquitoes occur in California, with habitats ranging from deserts at or below sea level to mountain meadows with elevations of 10,000 feet or higher. Many of these species are relatively uncommon and seldom pose a severe nuisance or threat to human health.

However, several species readily feed on people and can transmit microbial organisms that cause human diseases such as encephalitis and malaria. The mosquitoes of major concern in California belong to the genera *Culex* (Figure 1), *Aedes*, and *Anopheles*.

## IDENTIFICATION AND LIFE CYCLE

Mosquito adults are small, delicate, two-winged flies. Non-biting midges and the comparatively large crane flies, sometimes called mosquito hawks, are often mistaken for mosquitoes (although they don't actually eat mosquitoes). However, female mosquitoes differ from similar insects because of their long, slender proboscis, a tubular set of mouthparts adapted for piercing skin and sucking blood. Only female mosquitoes feed on animal blood; males do not. Male mosquitoes use their proboscis only for sucking plant juices and other sources of sugar rather than blood.

If you were to view a mosquito with a magnifying glass or microscope, you would see another characteristic that distinguishes mosquitoes from closely related flies—small scales cover their long, slender wings.

The life cycle of mosquitoes (and many other insects) involves an egg, larval, pupal, and adult stage. The life cycle



Figure 1. Adult *Culex tarsalis* mosquito.

of mosquitoes varies widely among species. Some female mosquitoes lay single eggs on water surfaces, while others lay batches of 100 or more eggs, called rafts (Figure 2). Other species lay single eggs just above the water line in moist soil, tree holes, or containers where later flooding is likely. Eggs deposited on water surfaces usually hatch within a couple of days, but eggs laid on the sides of saucers under plants, jars, cans, or soil surfaces won't hatch until flooding occurs, which can be months or even years later.

Larvae grow through stages called instars. First instar larvae, which are nearly invisible to the naked eye, hatch from the eggs. Larvae molt three more times, growing larger after each molt. Mosquito larvae, or wigglers, (Figure 3) are usually black or brown and occur in stagnant or nearly still water in surface pools, tree holes, or man-made containers

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Figure 2. Egg rafts of *Culex tarsalis*.

such as abandoned tires, saucers under flower pots or anything that will hold water. Larvae breathe air at the water's surface. *Culex* and *Aedes* larvae have a distinctive siphon, or air tube, at the rear of their bodies, which is lacking in *Anopheles*.

The fourth instar larvae molt to become pupae. Pupae, also called tumblers, are aquatic, small, comma-shaped, and usually a dark color (Figure 4). Like larvae, they breathe air at the water's surface.

Adult mosquitoes emerge from pupae after 1 to 2 days, with male mosquitoes emerging first. In summer, the entire life cycle, from egg to adult, can be completed in a week or less depending upon water temperature. Adult mosquitoes mate soon after emergence. Soon after, females will seek a blood meal from a vertebrate animal. Females require this extra nutrition to nourish the large number of eggs they will lay to complete the life cycle.

## IMPACT

Female mosquitoes of nearly all species require blood from vertebrate animals such as people, pets, livestock and wildlife. The most important consequence of this feeding is the acquisition and later transmission of viruses that cause human diseases including Western equine encephalomyelitis, St. Louis encephalitis, and West Nile virus disease. These viruses, which are transmitted predominantly by *Culex* mosquitoes, can cause serious, sometimes fatal, neurological ailments in people. Western equine encephalomyelitis and West Nile viruses also can affect horses and occasionally other domestic animals.

Most people infected with mosquito-transmitted viruses show no symptoms or only mild, flu-like symptoms that may not result in a visit to the doctor. However, severe symptoms following infection occur in a small percentage of people. Western equine encephalomyelitis infections tend to be more serious in infants, whereas St. Louis encephalitis affects older



Figure 3. Larvae of *C. tarsalis*.

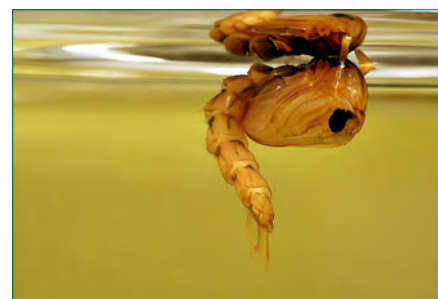


Figure 4. Mosquito pupal stage.

### West Nile Virus

West Nile Virus (WNV) is a virus that infectious mosquitoes transmit to susceptible vertebrate hosts such as humans and birds. More than 60 species of mosquitoes have been found to be infected with WNV, although most of these species don't play a significant role in the natural transmission cycles of WNV. Mosquitoes in the genus *Culex* are the most important vectors, or carriers, of WNV in the United States.

The primary cycle (Figure 5) involves the transmission of WNV between some species of birds and *Culex* mosquitoes. Humans and domestic animals can develop serious symptoms from WNV infection but usually are "dead-end" hosts, because they don't produce enough virus to infect mosquitoes that feed on them.

WNV infections have rarely occurred through other pathways such as blood transfusion, organ transplants, and breastfeeding, but enhanced screening of blood and organ supplies have virtually eliminated transmission by these non-mosquito sources.

In North America, WNV outbreaks usually start in the summer and continue into autumn. About 80% of people who are infected with WNV won't show any symptoms. Mild symptoms, which appear in about 20% of the people who become infected, include fever, headache, body aches, nausea, vomiting, and sometimes swollen lymph glands or a skin rash on the chest, stomach, and back. The symptoms can last for only a few days up to several weeks.

About one in 150 people infected with WNV will develop a neurological illness that sometimes results in death. Symptoms include high fever, headache, neck stiffness, stupor, disorientation, coma, tremors, convulsions, muscle weakness, vision loss, numbness, and paralysis. These symptoms can resolve themselves in several weeks or be permanent.

Currently no vaccine against WNV is available for humans. Even though a vaccine for WNV is available for horses, they still aren't routinely vaccinated across the United States, and mortality rates in horses can be as high as 40% for clinical WNV infections.

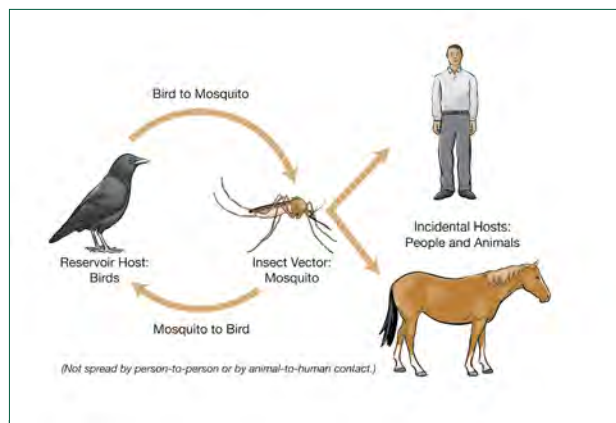


Figure 5. Transmission cycle of West Nile Virus. Mosquitoes spread the virus from birds to humans, animals, or other birds.

people. West Nile virus infections can range in severity from no detectable symptoms to West Nile fever to severe neuroinvasive diseases such as West Nile encephalitis, West Nile meningitis, or West Nile meningoencephalitis. For more information, see the sidebar on West Nile virus.

In 2011 and 2013, California was invaded by two species of *Aedes* mosquitoes (*Aedes aegypti* and *Aedes albopictus*) that can transmit some of the most debilitating and deadly mosquito-borne viral pathogens known to humans, such as Zika virus, dengue virus, chikungunya virus, and yellow fever virus. These mosquitoes had previously been found in California but vector control practitioners were able to eliminate the infestations before they were able to spread very far from the introduction site. However these two mosquitoes have spread across Southern California, the Central Valley, and into the San Francisco Bay Area (see the map of *Aedes* mosquito detections: [cdph.ca.gov/Programs/CID/DCDC/CDPH Document Library/AedesDistributionMap.pdf](http://cdph.ca.gov/Programs/CID/DCDC/CDPH%20Document%20Library/AedesDistributionMap.pdf)). A third species, *Aedes notoscriptus*, was also found in California in 2014 and has been detected in Los Angeles and San Diego.

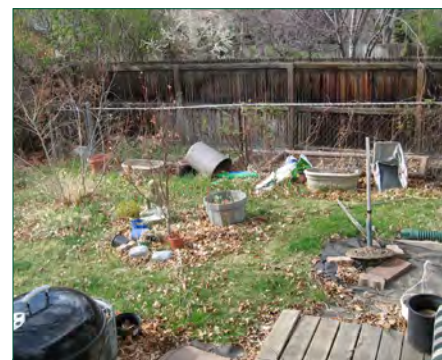
The transmission cycles of the *Aedes*-transmitted viral pathogens differ from West Nile virus cycles in several important ways. First, the primary epidemic cycles in urban habitats involve the transmission of viral pathogens between humans and *Aedes* mosquitoes. In the tropics, other animals and mosquitoes can be involved in forest transmission cycles, even in the absence of humans. Second, infected humans can transmit some of these viruses to mosquitoes even if they do not show disease symptoms. Like West Nile virus infections, transmission through other pathways such as blood transfusion and organ transplants is possible. It is rare that these viruses are transmitted from mother to child; however, Zika virus can be transmitted through the placenta or during birth, and is unique among these closely

related viruses in that it can be sexually transmitted.

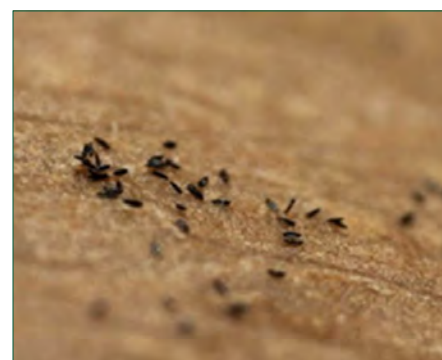
Many *Aedes* mosquitoes are intimately associated with human activities and are difficult to control. First, they utilize small and often cryptic sites for immature development. Any small amount of standing water, perhaps even a bottle cap holding water, can support larvae, making detection very difficult. Carrying out inspections of all the possible larval development sites in an urban area is time-consuming and prohibitively expensive. Backyards that contain assorted debris (Figure 6) are especially difficult to census. Second, the eggs are resistant to drying and remain viable for months or longer. The tiny eggs, only about 0.025 inches long, are typically laid along the water-air interface or on damp surfaces (Figure 7). The eggs serve as a “seed bank” that facilitates reinvasion of an area cleared of larvae and adults, and enables undetected movement of the mosquitoes to new locations. Not all of the eggs hatch when inundated for the first time, so mosquito larvae can continue to be produced with repeated wetting and drying. Third, many populations show significant levels of resistance to insecticides commonly used to control mosquitoes. The difficulties associated with the detection and control of these invasive mosquitoes highlight the need for new and novel approaches for vector control.

Some *Anopheles* mosquitoes found in California can transmit the parasites that cause human malaria. If these mosquitoes feed on a person who has malarial parasites in their blood, the insects can pass on the infection when they bite other people. Endemic malaria was eradicated from California by the 1940s; however, travelers have occasionally reintroduced the parasite, which has led to several small outbreaks.

Mosquitoes can transmit dog heartworm in California. Tree holes that fill with water, especially in the foothill areas of the state, harbor the larvae of the principal *Aedes* vector of this



**Figure 6. Cluttered backyard with multiple breeding sources for *Aedes* mosquitoes.**



**Figure 7. Close-up of *Aedes* mosquito eggs.**

disease. Some *Culex* mosquitoes that live in cities and residential areas, as well as some *Aedes* mosquitoes found in rural areas, can also transmit dog heartworm.

Even when mosquitoes don't transmit the causative agents of infectious diseases, they can be a serious nuisance and a health problem to people, livestock and wildlife. Mosquito bites can result in secondary infections, allergic reactions, pain, irritation, redness, and itching.

## MANAGEMENT

In many areas of California, public mosquito and vector control agencies aim to keep mosquito numbers down to tolerable levels all or most of the time. However, some Californians live in areas where no organized mosquito control exists. These usually are



low-density areas in foothill, mountain, or desert regions.

Where mosquito populations become bothersome, people can protect themselves and others from mosquitoes by using a variety of strategies. These include keeping fine mesh screens on windows and doors in good repair, draining standing water or treating it with a control agent such as *Bacillus thuringiensis* subspecies *israelensis* (Bti), incorporating mosquito-eating fish into isolated ponds and neglected swimming pools (Figure 8), and wearing repellents and protective clothing outdoors when mosquitoes are active.

### Cultural Control Around the Home

The most effective control methods are those targeted against the larval stage of the life cycle. If you have an area or object that can hold water for more than a few days, drain it, fill it with soil or cement, or treat it with a mosquito control agent. Even small containers such as soda cans, glass jars, flower pot saucers, or tree holes can provide a habitat for mosquito development. If not maintained regularly, storm drains, water treatment basins, and wetlands can be places of prolific mosquito production near neighborhoods.

Water capture structures such as rain barrels and landscape drainage systems can also produce high numbers of mosquitoes that affect entire neighborhoods. Rain barrels should be mosquito-proofed by either covering access points to the water with window screen or closing openings with a sealant. Keep barrel filters and pre-filters clean of debris. Perform regular inspections to be sure that your system does not have cracks or leaks, and that all fittings and seals around the valves are intact. For situations where screens or completely sealed barrels are impractical, Mosquito Dunks (Figure 9) are time-release rings that float on the water surface and contain a bacterial agent (Bti) which kills mosquito larvae, but does not affect people, animals or plants.



**Figure 8. Neglected swimming pool that provides ample habitat for mosquito larva.**

Clean all gutters and downspouts. Leaves, twigs, seeds, and other organic matter that block water flow can create standing water in which mosquito larvae can grow.

You can trap mosquitoes using a variety of products. Homeowner groups have participated in trapping programs to collect and kill egg-laying mosquitoes. Such efforts require the deployment and maintenance of many traps (e.g., 2 or more traps per yard) to reduce mosquito numbers. Traps, such as the Mosquito Magnet, release carbon dioxide to attract host-seeking mosquitoes. However, you'll want to weigh the cost of the trap and its operation against the fact that although the trap attracts mosquitoes searching for a host to feed on, it captures only a small proportion of the attracted insects. Also, a single trap might not be effective enough for controlling adult mosquitoes, which often disperse across a broad geographic area.

Electric bug zappers used to kill pest insects are counterproductive, because many of the insects these traps kill are those that prey on mosquitoes.

Keep in mind that some adult mosquitoes can fly several miles from where they develop. Even successful control of mosquito larvae on your premises might not result in eliminating mosquito numbers or biting activity. See Table 1 for ways to reduce mosquito populations in each situation.



**Figure 9. Mosquito dunks containing *Bacillus thuringiensis* var. *israelensis*.**

**Mosquito-eating fish.** Mosquito-eating fish, *Gambusia affinis*, can be an important control agent for immature mosquitoes. These fish are most effective in man-made bodies of water that don't connect with natural waters and don't contain dense stands of emergent vegetation. You can obtain mosquitofish from most vector control districts.

You never should release mosquito-eating fish into streams, ponds, and lakes because these fish aren't native to California. It is also illegal to do so. Fish native to California are being considered for use as mosquito control agents in habitats where mosquitofish cannot be released. Your local vector control district is a good source of additional information for mosquitofish alternatives.

### Chemical Control

**Insecticides Used in Water.** *Bacillus thuringiensis* subspecies *israelensis* (Bti) is a bacterium that forms spores which produce proteins toxic to mosquito larvae. To be effective, mosquito larvae must eat the compounds, which act as a stomach poison that damages mosquito midgut cells. Like the closely related forms of Bt used by gardeners to control specific insect pests, Bti is highly selective, killing only mosquitoes and the larvae of a few other related flies. This biopesticide is not effective against pupae, since they don't feed. Bti is marketed

in a variety of formulations for the homeowner, the most common being Mosquito Dunks which last for about 30 days in water.

Methoprene is an insect growth regulator (IGR), a mosquito hormone mimic that is applied to standing water and inhibits the emergence of adult mosquitoes. Examples of commercially available formulations include Altosid Pro-G and Pre-Strike Mosquito Torpedo. Spinosad is a mosquito-killing neurotoxin produced naturally by some bacteria and is used as an insecticide against many types of insects. For mosquito control, it is sold as Natular DT and applied to standing water.

**Outdoor Sprays.** Using insecticide sprays or outdoor foggers for controlling adult mosquitoes has limitations. While they can provide a temporary reduction of the adult population—which can be useful if you make the application shortly before a backyard picnic or family

gathering—alternative, more long-term approaches for controlling mosquitoes are preferable. Equipment for applying outdoor sprays is expensive and complex. The use of systems that continuously release small amounts of insecticides is not recommended.

Regardless of the product that you choose to use against mosquitoes, always follow the instructions for the amount and appropriate habitats for use found on the product’s label. It is a violation of federal law not to follow the instructions on the label!

**Personal Protection**

Probably the best way to protect yourself from mosquito bites is to avoid places where their densities are high and avoid being outside when mosquito activity is at its highest. In mountainous areas, most mosquito species bite during morning and afternoon hours and often not at all when it is dark. In some low-elevation

areas, such as the Central Valley, some mosquitoes tend to bite at night, while others bite during the day.

Here are some ways to protect yourself from mosquito bites:

- Maintain conditions around the home to reduce contact with mosquitoes.
- Repair broken window and door screens.
- Eliminate small pools of standing water.
- Reduce time outdoors, particularly in early morning and evening hours when host-seeking *Culex* mosquitoes are most active.
- Wear long pants and long-sleeved shirts.
- Apply mosquito repellent to exposed skin and to clothing.

**Repellents.** If you find yourself in a situation where you can’t avoid mosquitoes, first minimize the amount of exposed skin surface by wearing a

**Table 1. Checklist of Possible Mosquito Sources around the Home.**

Mosquito Sources	What to Do to Reduce Mosquitoes
Bird baths	Change water at least once a week
Cesspool or septic tanks	Seal and cover openings so mosquitoes can’t lay eggs in them
Containers	Empty water, store in an inverted position, dispose of unneeded containers, and cover so mosquitoes can’t lay eggs in them
Cooler drains	Prevent water from standing
Irrigated lawns or fields	Avoid excessive irrigation and drain standing water
Plastic pools	Drain when not in use or cover so mosquitoes can’t lay eggs in them
Ponds	Stock pond with fish, or use <i>Bacillus thuringiensis</i> subspecies <i>israelensis</i> and remove excess vegetation
Rain barrels	Cover access points to the water with window screen or close openings with a sealant, keep barrel filters and pre-filters clean of debris, and perform regular inspections to be sure that the system does not have cracks or leaks
Roof gutters	Clean once a year to remove debris
Standing water	Eliminate by draining and fill in low areas
Street gutter or catch basins	Remove litter and garden debris, don’t overwater lawns, maintain irrigation systems in working order, and use an automatic shut-off valve or sprayer when washing vehicles
Swimming pools	Keep water off the cover and maintain water quality at all times
Tree holes	Fill hole with sand or mortar
Watering troughs	Stock with fish or change water weekly

Adapted from the Sacramento-Yolo Mosquito and Vector Control District, [fightthebite.net](http://fightthebite.net)

hat or head net, long trousers, and a long-sleeved shirt. Some mosquitoes will bite through lightweight clothing, but the number of bites you receive will decrease if you cover most areas of your body.

When mosquito densities become very high, it is best to apply a mosquito repellent. The Centers for Disease Control and Prevention (CDC) recommends using products containing active ingredients registered by the U.S. Environmental Protection Agency (EPA) for use as repellents applied to skin and clothing. An EPA registration indicates the active ingredients of repellents have been tested for human safety when applied according to the instructions on the label.

The CDC currently recommends two general types of repellents for use on skin: conventional and biopesticide repellents. Conventional repellents include compounds such as DEET (N,N-diethyl-m-toluamide or N,N-diethyl-3-methyl-benzamide) and Picaridin (KBR 3023: 2-[2-hydroxyethyl]-1-piperidinecarboxylic acid 1-methylpropyl ester). DEET and picaridin are used most commonly to repel mosquitoes.

Biopesticide repellents are derived from natural materials or are synthetic versions of the natural product. The synthetic form of oil of lemon eucalyptus (OLE: use only when formulated as a repellent. The pure form of OLE is not currently registered by the EPA.) and IR3535 (3-[N-Butyl-N-acetyl]-aminopropionic acid, ethyl ester) are two recommended biopesticide repellents. A synthetic alternative to natural OLE is PMD (para-menthane-3,8-diol) and is recommended by the CDC. PMD isn't recommended for use on children younger than 3 years old. These repellents are available at retail outlets under different product names: the active ingredient and its percentage in the formulation are listed on the label of each product.

New repellents are continually being developed and tested. The federal government's latest recommendations

for mosquito repellents can be found on the CDC's website: [wwwnc.cdc.gov/travel/yellowbook/2020/noninfectious-health-risks/mosquitoes-ticks-and-other-arthropods](http://wwwnc.cdc.gov/travel/yellowbook/2020/noninfectious-health-risks/mosquitoes-ticks-and-other-arthropods) and EPA's website: [epa.gov/insect-repellents](http://epa.gov/insect-repellents).

A repellent's effectiveness and duration of protection vary considerably among products and mosquito species. Effectiveness typically lasts 4 or fewer hours depending on wind, high temperatures, high humidity, and perspiration amounts.

In general, higher concentrations of active ingredient provide a longer protection time, regardless of the active ingredient, although concentrations greater than 50% don't offer a marked increase in protection time. Products with less than 10% active ingredient might offer only limited protection, often only 1 to 2 hours.

Products that offer sustained release or controlled release (micro-encapsulated) formulations, even with lower active ingredient concentrations, might provide longer protection times. Regardless of which product you use, if you start to get mosquito bites, re-apply the repellent according to the label instructions or remove yourself from the area if possible.

DEET is the most effective mosquito repellent if you will be out for long periods where mosquitoes are abundant. However, DEET is an irritant to some people, and repellents containing high DEET concentrations can damage synthetic materials such as clothing or plastics. Apply sparingly to all exposed skin. Special formulations for children contain low concentrations of the chemical in an oil-based medium that slowly releases the compound and limits its absorption through the skin; these formulations also work well for adults.

If you wish to avoid DEET, many of the EPA-approved alternative repellents are as effective or are more effective for some people than are low concentrations of DEET, especially when only

short-term repellency (fewer than 2 hours) is desired and mosquitoes aren't very abundant.

In addition to the previously mentioned repellents, plant oils such as those from birch, bluestem grass, geranium, pine, rosemary, spearmint, yarrow, lantana, and neem somewhat repel mosquitoes; but most aren't available in commercial mosquito repellents. The insecticide permethrin functions as a repellent when applied to clothing, but it should never be applied directly to skin.

The EPA recommends several precautions when using insect repellents.

- Apply repellents only to exposed skin and clothing; never use repellents underneath clothing.
- Don't apply repellents over cuts or irritated skin.
- Never spray repellents directly onto your face; apply the repellent onto your hands first, then use your hands to apply the product sparingly onto your face and head.
- Never let children handle repellents.
- A small amount of repellent is sufficient to effectively deter mosquitoes.
- After returning indoors, wash treated areas with soap and water.
- If you develop a rash after using a repellent, wash the affected area with mild soap and water and seek guidance from a physician or poison control center.
- Always read and follow the directions on the product's label.

**Other Repellent Products.** Research has shown that the effectiveness of most other products marketed to repel mosquitoes differs appreciably. Some products such as clip-on dispensers emitting metofluthrin which kills and repels mosquitoes have shown some promise in limited studies. Manufacturers claim that clip-on, battery-operated



dispensers for the pyrethroid pesticide metofluthrin repel mosquitoes for up to 12 hours per refill; but like most repellents, effectiveness varies among users. Wristbands that contain an aromatic repellent, ultrasonic emitters, electric grids, electronic repellents, aromatic plants (the most common one is the so-called mosquito plant, *Pelargonium x citrosum*), incense coils, vitamin B1, and mixtures of brewer's yeast and garlic are ineffective.

Oil of citronella, which is extracted from *Andropogon nardus*, has a reputation for repelling mosquitoes. Burning citronella candles or mosquito coils containing allethrin works best if there is relatively little air movement, but these products are only for use outdoors.

### **Mosquito and Vector Control Agencies**

The goal of mosquito management is to keep populations below levels where they become a nuisance or a public health problem that leads to an outbreak of disease. Mosquito management often occurs on an areawide basis by public agencies that either are part of local health departments or

are independent mosquito and vector control districts organized specifically for mosquito control. California has more than 60 mosquito and vector control districts. Some are small and have responsibility for mosquito abatement in a city or portion of a county, while the activities of others can encompass one or more entire counties.

Vector control technicians search out mosquito larvae in standing water, collect adult mosquitoes to monitor the abundance of problematic species and determine the presence of disease-causing pathogens, and use evidence from surveillance to choose control measures that are as cost-effective and environmentally friendly as possible. Control measures include environmental manipulation to reduce aquatic habitats such as removing dense patches of decaying vegetation conducive to mosquito production, applying mosquito-specific control agents (Figure 10), and stocking fish that feed on the larvae. Many materials currently in use are biological in origin and are highly specific for mosquitoes while having little or no effect on other organisms.



**Figure 10. Vector control technician applying mosquito-specific control agents to a neglected swimming pool.**

Occasionally, mosquito abatement agencies may have to use chemical pesticides to kill adult mosquitoes; ordinarily this occurs only when adult populations become so large they cause extreme annoyance to many people or when the threat of an outbreak of a disease is high.



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## WARNING ON THE USE OF PESTICIDES

Pesticides are poisonous. Some pesticides are more toxic than others and present higher risks to people, nontarget organisms, and the environment. A pesticide is any material (natural, organic, or synthetic) used to control, prevent, kill, suppress, or repel pests. "Pesticide" is a broad term that includes insecticides, herbicides (weed or plant killers), fungicides, rodenticides, miticides (mite control), molluscicides (for snails and slugs), and other materials like growth regulators or antimicrobial products such as bleach and sanitary wipes that kill bacteria.

Always read and carefully follow all precautions and directions provided on the container label. The label is the law and failure to follow label instructions is an illegal use of the pesticide. Store all chemicals in the original labeled containers in a locked cabinet or shed, away from food or feeds, and out of the reach of children, unauthorized persons, and animals. Never place pesticides in food or drink containers. Consult the pesticide label to determine active ingredients, correct locations for use, signal words, and personal protective equipment you should wear to protect yourself from exposure when applying the material.

Pesticides applied in your garden and landscape can move through water or with soil away from where they were applied, resulting in contamination of creeks, lakes, rivers, and the ocean. Confine pesticides to the property being treated and never allow them to get into drains or creeks. Avoid getting pesticide onto neighboring properties (called drift), especially onto gardens containing fruits or vegetables ready to be picked.

Do not place containers with pesticide in the trash or pour pesticides down the sink, toilet, or outside drains. Either use all the pesticide according to the label until the container is empty or take unwanted pesticides to your local Household Hazardous Waste Collection site. Contact your county agricultural commissioner for additional information on safe container disposal and for the location of the Hazardous Waste Collection site nearest you. Follow label directions for disposal of empty containers. Never reuse or burn the containers or dispose of them in such a manner that they may contaminate water supplies or natural waterways.

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