Don't Let Mosquitoes Breed Around Your Home

**Trough**
- Stock large troughs with mosquitofish.
- Clean small weedy troughs weekly.

**Pool/Hot Tub**
- Chlorine will NOT kill mosquito larvae.
- Operate filters and skimmer every day to remove egg rafts and larvae.
- Drain filters and pump out sumps regularly.
- Keep covers tight.
- Drain water from top of cover weekly.
- Stock unused pools with mosquitofish.

**Clogged Rain Gutter**
- Clean frequently to remove leaf litter and keep water flowing.

**Pond/Water Garden**
- Stock with mosquitofish or use Bacillus thuringiensis (Bti) larvae (such as 
  *Bacillus thuringiensis* var. israelensis (Bti)). Ask about Bti at your local 
  hardware store or nursery.

**Street Gutter**
- Fill with standing water for more than a few days, remove source of water (for example, adjust sprinklers to stop overwatering).

**Rain Barrel**
- Screen top with fine wire mesh.
- Change water weekly.
- Treat with Bti.

**Blight/Hot Tub**
- Change water for 2–4 weeks.

**Boats**
- Keep boats tightly covered.
- Check and drain cover weekly.

**Storm Drain**
- If you think mosquitoes are breeding in storm drain, contact water control.

**Bed Bath**
- Change water weekly.

**Repair Leaky Plumbing**
- Trough: Stock large troughs with mosquitofish.
- Clean small weedy troughs weekly.

**Hole in Tree**
- Consult an arborist to see if a large hole may be safely filled with a polymer product.
- OR
- Place Bacillus thuringiensis (Bti) larvae (israelensis) in hole (effective for 2–4 weeks).

**Bait for Controlling Mosquitoes Around Your Home**
- Choose eco-friendly products for your home and garden. Look for this symbol before you buy.

- Polymer for filling tree holes: SoilMoist
- Products containing Bacillus thuringiensis subsp. israelensis (Bti): Bonide Mosquito Beater WSP (water soluble pouches, formerly Plunks), Summit Mosquito Dunks, Summit Mosquito Bits, Vectobac
- Product for making chloramine-treated water safe for fish: Kordon Pond NovAqua Plus
- Insect growth regulator: Pre-Strike Mosquito Torpedo
- Insect Repellents with plant oils: Bite Blocker (soybean, coconut, and geranium oils), Repel Lemon Eucalyptus Insect Repellent
- With IRD535: Avon Skin So Soft, Jungle Formula Outdoor & Camping Spray
- With DEET: OFF!
- With picaridin: Sawyer Picardin Insect Repellent

Mosquitoes are part of the aquatic ecosystem, providing food for fish and other aquatic creatures. For humans, however, it’s a different story. In addition to their annoying buzzing and itchy bites, mosquitoes carry diseases that can be serious, even fatal, to humans, like West Nile virus. Getting rid of mosquitoes and making sure they aren’t breeding around your home will help keep everyone safe—and keep you and your family from getting bitten.

Pesticides are not very effective for mosquito control. Pesticide sprays, which reach relatively few mosquitoes, are more likely to harm helpful insects. Follow the tips in this fact sheet to have the biggest effect on reducing the number of mosquitoes in your area.

Do not treat street gutters or storm drains with pesticides. Storm drains are connected directly to the Bay, and pesticides cause serious problems for aquatic life. Call your mosquito and vector control district if you suspect mosquitoes are breeding in the storm drains or catch basins in your neighborhood. To find your local district, go to: www.mvcac.org/resources/member-agencies

There are many different kinds of mosquitoes. Some bite during the day, while others feed at night. Only adult females bite humans and other animals to feed on blood. Adult male mosquitoes feed on flower nectar. Young mosquitoes (larvae) live in water and feed on microorganisms and organic matter. Just about any area or container that holds water for more than a few days can produce a large crop of mosquitoes. Your bites may be coming from mosquitoes you are raising in your own backyard.
MOSQUITOFISH
You can get free mosquito fish (Gambusia affinis) from your county mosquito and vector control district (www.mvcac.org). Mosquito fish are non-native predators of mosquito larvae and can be helpful in controlling mosquitoes in a backyard pond, pool, or water garden. Unfortunately, they also feed on several threatened and endangered species in Western states so they must NEVER be released into a creek, stream, or any place that might overflow to a creek or stream.

TAKE AWAY THEIR BREEDING PLACES
Mosquitoes can breed in any amount of standing water.

- Make sure there is no standing water in containers around your home, including water in cans, plastic containers, potted plant saucers, buckets, garbage cans or lids, barrels, wheelbarrows, or any container that holds water for more than a few days. Empty the water and then either turn over, cover, and throw away or recycle containers.
- Change water in bird baths and outdoor pet water dishes every two or three days.
- Fix leaky outdoor faucets and sprinklers, and don’t overwater your yard.
- Recycle tires or store them so they will not collect water. Tires are difficult to drain, and each one can produce thousands of mosquitoes.
- Keep roof gutters clean so water drains. Mosquitoes can breed on wet leaves in standing water.
- Don’t dump yard waste into street gutters, storm drains, or creeks. Mosquitoes can breed in clogged gutters and drains, and in stagnant water in creeks. Decaying organic matter then provides food for large numbers of mosquito larvae.
- Drain plastic wading pools or cover them tightly so mosquitoes won’t breed there.
- Drain fountains when they are not recirculating water. If the fountain is large enough, stock it with mosquito fish.
- Keep swimming pools and hot tubs chlorinated and filtering. When not in use for extended periods, cover pools and tubs tightly or dechlorinate and stock with mosquito fish. One pool or hot tub left to stagnate can breed enough mosquitoes to bother a whole neighborhood.
- Fill tree holes with a polymer such as Soil Moist. In the winter, the granules absorb water and eliminate mosquito breeding habitat. The granules can last for many years, absorbing water in winter and drying out in the summer. The western tree hole mosquito is the primary vector of canine heartworm in this area. Keep your dog’s heartworm medicine up to date.

PROTECT YOURSELF AND YOUR FAMILY FROM MOSQUITO BITES
- Install screens on windows and doors and patch any holes.
- Use a screen tent for outdoor eating (it will keep out yellowjackets, too).
- Some kinds of mosquitoes are attracted to light. Keep outside lighting to a minimum near entry doors, and keep those doors screened or close them at sunset.
- Wear long sleeves and long pants when mosquitoes are biting.
- Use insect repellents:
  - The Centers for Disease Control and Prevention recommends the following active ingredients in repellents. These are all registered by the US Environmental Protection Agency as safe and effective when applied according to label instructions:
    - DEET (NN-Diethyl-meta-toluamide or diethyltoluamide)
    - Picaridin
    - IR3535
    - Oil of eucalyptus and p-Menthane-3,8-diol (based on the oil of lemon eucalyptus).
  - Bite Blocker (soybean, coconut, and geranium oils, in a study, compared favorably with 66.5 percent DEET for 3.5 hours).

MOSQUITO TRAPS, BUG ZAPPERS, AND OTHER NON-EFFECTIVE CONTROLS
Propane-powered traps are not recommended by the American Mosquito Control Association. Although they attract mosquitoes with carbon dioxide and heat, they do not reduce the chance of being bitten. These devices can be very expensive and not only remove adult mosquitoes. Energy and money would be better spent reducing breeding habitat and buying products containing Bti, which are more effective. (See Less-Toxic Controls, at right.)

Don’t use electric bug zappers—they kill far more beneficial and neutral insects than mosquitoes. Ultrasonic devices are also not effective.

Wristbands treated with insect repellent are not effective, because repellents protect only areas very close to where they are applied.

Products containing plant oils such as citronella have been found to provide little if any protection.

LESS-TOXIC CONTROLS
The products described below can be used in ponds and water gardens, bird baths, fountains, pools, tree holes, and other standing water where mosquitoes lay eggs. Apply in the spring when mosquito larvae are first seen and continue as recommended on the package.

- Bacillus thuringiensis subspp. israelensis (Bt) is the active ingredient in a number of mosquito control products (Mosquito Dunks, Mosquito Bits, Vectobac) that are used in water. It kills only mosquitoes, black flies, and some midges, and does not harm other aquatic animals. Follow all label directions carefully.
- Methoprene is an insect growth regulator that interferes with the normal development of mosquitoes. Drop tablets into ornamental ponds, fountains, or other water features that do not drain to streets, storm drains, or creeks.

WEST NILE VIRUS
West Nile virus (WNV) is carried by mosquitoes and by wild birds—especially crows, ravens, jays, and magpies—that have been bitten by mosquitoes. In humans, WNV can be serious or even fatal, although many people who are infected do not develop symptoms.

Some people with WNV will have mild flu-like symptoms (fever, headache, body aches, nausea, vomiting, and sometimes swollen lymph glands or a skin rash on the chest, stomach and back) that last for just a few days. People with mild symptoms usually get better on their own. If you have severe WNV symptoms, such as very bad headaches or confusion, seek medical attention immediately. If you are pregnant or breastfeeding and think you might have WNV, talk to your doctor.

If you find a dead bir d—particularly a crow, raven, jay, magpie, sparrow, finch, or raptor—do not pick it up with your bare hands. File an online report about the bird at www.westnile.ca.gov or call toll-free 1-877-968-2473. Dead bird reports are important because they are usually the first indication that the virus is active in an area.

For more WNV information, go to www.westnile.ca.gov.

Contact your local mosquito and vector control district (www.mvcac.org/resources/member-agencies) if there is an uncontrolled mosquito source in your neighborhood, such as an abandoned pond or pool; or if you need assistance with a mosquito problem on your property. Most district services are provided free of charge.

Less than three inches long when fully grown, mosquito fish commonly eat three times their weight in mosquito larvae a day. Their diet also includes zooplankton, beetles, mayflies, caddisflies, mites, and other invertebrates. In fact, too many mosquito fish can make a mosquito problem worse by eating other mosquito predators.

- Mosquito fish are cannibalistic. Protect young fish in a backyard pond by providing rocks and plants for them to hide in.
- Do not feed mosquito fish. Overfed fish may not feed on mosquitoes, and extra food in the water may cause the growth of bacteria that harm the fish.
- Be sure to check with your water supplier before using tap water to fill your pond. Some tap water contains chlorine, which is toxic to mosquito fish. You must treat it first with a product that removes chlorine and chloramine, available in pet stores.
- Do not release mosquito fish into creeks or streams.