ALAMEDA COUNTY
MOSQUITO ABATEMENT DISTRICT
General Information

Alameda County Mosquito Abatement District
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510-783-7744

www.mosquitoes.org
Alameda County Mosquito Abatement District
@AlamedaMosquito

www.mosquitoes.org

Your District controls mosquitoes by focusing control efforts on the larvae which are found in standing water (larviciding). Preventing adult emergence is the most effective way to control mosquitoes and prevent the spread of disease.

Out for Blood

Mosquitoes are small biting flies.

Both male and female mosquitoes feed on plant juices for food.

Only females bite to get blood from mammals, birds, amphibians, and reptiles using specialized mouthparts (proboscis).

Proteins in blood are used to produce eggs.

Mosquitoes lay their eggs on or near water. Eggs may be laid singly or in a raft on still water, and around the edges of containers or on damp soil.

MOSQUITO CONTROL

Several methods of mosquito control are used by the District:

Physical control - improve water circulation or eliminate standing water

Biological control - use natural predators (e.g., fish), parasites, fungi, etc.

Biorational control - use bacterial agents and juvenile hormone mimics

Chemical control - emergency spraying for adults (adulticiding)

Public education - provide information on ways to eliminate mosquito breeding in and around the home and yard

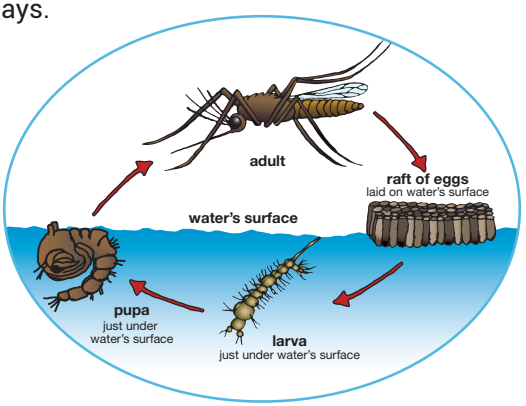
WHY DO WE ASK FOR A SPECIMEN?

A solution to your mosquito problem can be achieved much sooner if you provide us with a specimen of the biting mosquitoes. There are 22 known species of mosquitoes in Alameda County, each with unique characteristics and preference for certain breeding sites. Identifying the specimen assists us in finding these sites. The sites will then be inspected and treated to prevent additional mosquito breeding.

Another reason to ask for specimens is that there are many insects that look like mosquitoes but do not bite and are not health hazards. Information on these insects can be found in the mosquito-like insects section of this pamphlet.

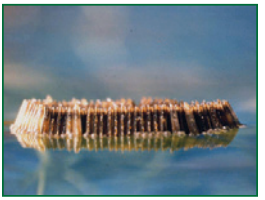
THE MOSQUITO LIFE CYCLE

Mosquitoes have four distinct developmental stages: egg, larva, pupa and adult. The average time a mosquito takes to go from egg to adult is five to seven days.



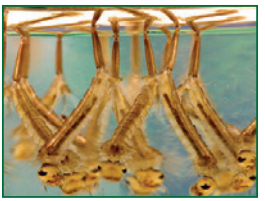
EGGS

Females deposit eggs singly or in rafts of up to 200 eggs on the water surface or in areas that may flood with water. The eggs will then hatch into larvae.



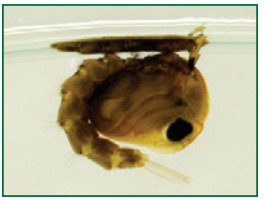
LARVAE

Because of their distinct movement through water, larvae are commonly called “wrigglers”. They are very active, feeding on microorganisms and debris, and usually can be seen at the water surface.



PUPAE

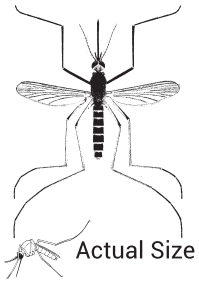
These are also active, but nonfeeding, and can be seen resting at the water surface. Because of their method of swimming, they are often called “tumblers”. During this stage, the transformation to the adult occurs.



ADULTS

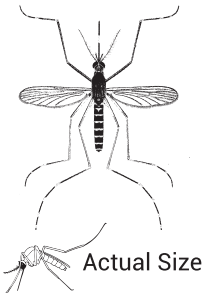
Only adult mosquitoes live out of water. After mating and then biting to obtain a blood meal, the females return to a water source to deposit eggs. Adult males do not feed on blood but drink only plant juices and nectar.

COMMON MOSQUITOES



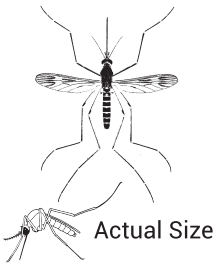
HOUSE MOSQUITO *(Culex pipiens)*

- Can be found all year, but most common during summer months
- Breed in polluted or highly organic water, catch basins, sumps, water underground, or water under buildings
- Flight range is < 1 mile
- Adults readily enter homes and bite at night
- Can transmit West Nile virus (WNV) and St. Louis encephalitis (SLE) to humans



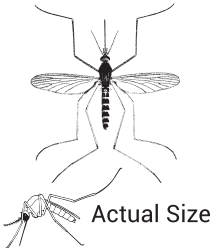
ENCEPHALITIS MOSQUITO *(Culex tarsalis)*

- Typically found from Spring to Fall
- Breed in fresh water sources such as rainwater pools, marshes, ponds, or non-maintained swimming pools
- Flight range is 10-15 miles
- Bites primarily at dusk and dawn
- Can transmit WNV, SLE, and Western equine encephalitis (WEE) to humans



COOL WEATHER MOSQUITO *(Culiseta incidens)*

- Can be found all year
- Breed in clear or semi clear water such as containers, fishponds, or creeks
- Flight range is < 5 miles
- Bites primarily at dusk and dawn
- Potential carrier of SLE, WEE, and Japanese encephalitis (JE)

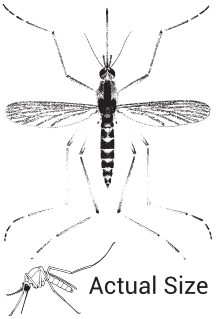


WINTER MARSH MOSQUITO *(Culiseta inornata)*

- Typically found from Fall to Spring
- Breed in marshes and temporary pools of water
- Flight range is < 5 miles
- Bites primarily at dusk and dawn
- Potential carrier of WEE and JE

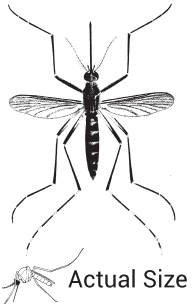
WINTER SALT MARSH MOSQUITO
(Aedes squamiger)

- Adults emerge in the Spring
- Breed in salt marshes and brackish pools of water
- Flight range is 10 – 20 miles
- Aggressive daytime biter; most annoying just before dusk
- High pest significance



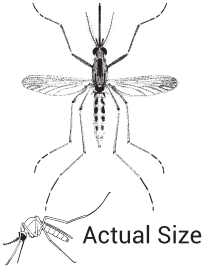
WESTERN TREE HOLE MOSQUITO
(Aedes sierrensis)

- Found from Spring to early Summer
- Breed in tree holes, tires, and miscellaneous containers filled with leaf litter
- Flight range is typically < .25 mile
- Aggressive daytime biter
- High pest significance
- Can transmit dog heartworm to dogs and cats



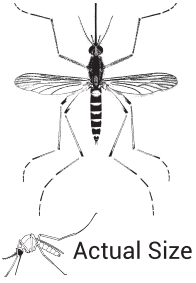
SALT MARSH MOSQUITO *(Aedes dorsalis)*

- Most common during the Summer months
- Breed in tidal salt marshes
- Flight range is > 20 miles
- Aggressive daytime biter
- High pest significance
- Potential carrier of WEE and California encephalitis (CE)



WOODLAND POOL MOSQUITO
(Aedes washinoi)

- Typically found during the Spring
- Breed in temporary woodland pools
- Flight range is < 1 mile
- Aggressive daytime biter
- High pest significance

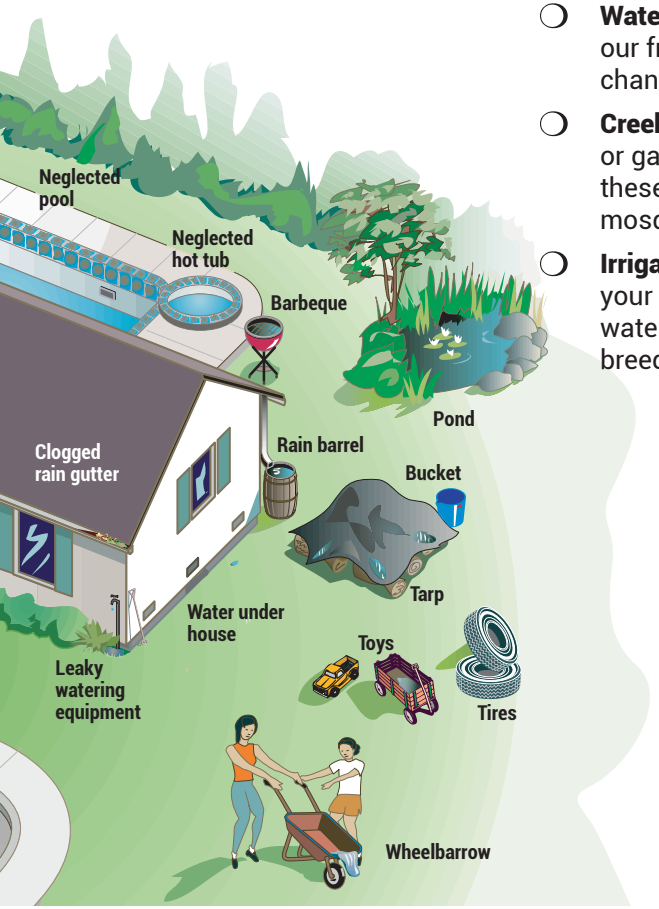


USE THIS HOME & GARDEN CHECKLIST TO HELP MAKE

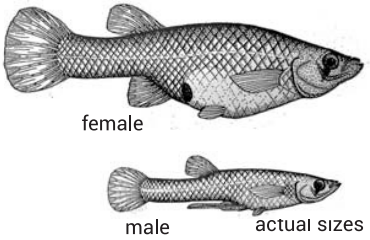
- ❍ **Fishpond:** Stock with free mosquitofish that we provide to you, remove excess vegetation and construct properly
- ❍ **Swimming Pool:** Keep sanitized and filtered; keep water off any cover; stock with fish if no longer being maintained
- ❍ **Spa, Hot Tub:** Keep sanitized, filtered and heated; if no longer in use, keep empty or remove it
- ❍ **Containers:** Empty, turn over, throw out or cover any container to prevent water from accumulating
- ❍ **Leaky Pipes:** Drain the area; correct leaky plumbing, dripping air conditioner or refrigerator; water under houses is a major source of mosquitoes in urban areas
- ❍ **Catch Basin, Storm Drains:** Do not throw garbage or garden debris into these as it enhances mosquito habitat
- ❍ **Sump:** Construct so that water does not stand, or screen to prevent mosquito entrance

ACTIVITIES AROUND YOUR HOME SAFER & ENJOYABLE.

- ❍ **Standing Water:** If water stands for more than a week eliminate it by draining or filling
- ❍ **Toys:** Remove water that collects inside or store upside down
- ❍ **Bird Bath:** Flush out completely once a week and refill
- ❍ **Tires:** Dispose of properly or cover so that water does not collect inside
- ❍ **Treeholes:** Inspect for pooling water during the rainy season; if present, consult a licensed arborist or tree service to determine the best method of eliminating water
- ❍ **Septic Tank:** Keep tightly covered or eliminate; septic tanks can produce huge numbers of mosquitoes
- ❍ **Watering Trough:** Stock with our free mosquitofish or change the water weekly
- ❍ **Creek:** Do not throw garbage or garden debris into creeks - these obstructions can create mosquito habitat
- ❍ **Irrigation:** Don't over-irrigate your landscaping; excess water can provide mosquito breeding habitat



CONTROLLING MOSQUITOES WITH FISH



Western mosquitofish (*Gambusia affinis*) are indispensable to our mosquito control program in Alameda County. The fish eat mosquito larvae. Mosquitofish are provided, without charge, to the public for ponds, unused swimming pools and animal watering troughs. They require minimal feeding or care, other than to protect them from garden sprays, chlorine, chloramines or other chemicals, and predators such as raccoons, cats, opossums, herons or egrets. Mosquitofish generally live peacefully with other pond fish. The District provides free mosquitofish to County residents to encourage the biological control of mosquitoes in ponds and other backyard sources.

THE DANGER OF CHLORAMINES TO FISH

All tap water in Alameda County is treated with chloramines (not chlorine) which are toxic to fish, shellfish, reptiles and amphibians. Chloramines are chemicals which contain chlorine and ammonia, and are being added to tap water as a disinfectant. If you use well water to fill your ponds or troughs, chloramines are not an issue.

What can you do to protect your fish?

Water used for fish must be treated in a manner appropriate to remove both the chlorine and ammonia components of the chloramines. In order to do this you must use conditioning chemicals designed to remove chloramines (such as Amquel® or ChlorOut®) available at pet stores, fish supply stores, and some variety stores.

Treatments which are NOT effective:

- Letting the untreated water stand outside for a day or two
- Boiling the water first
- Using chemicals that remove only chlorine

To be completely safe, always pretreat the new water before adding it to your pond, no matter how little you add. Treatment and test kits are available at most pet and fish supply stores. Chloramine residuals in treated water should be below 0.1 mg per liter.

MOSQUITOFISH STOCKING POLICY

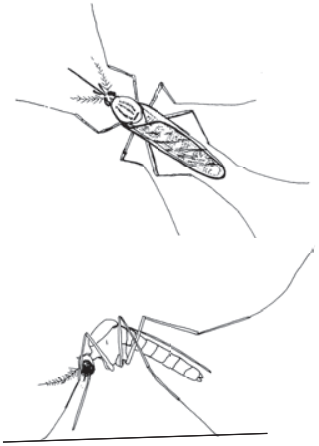
Mosquitofish provided by the Alameda County Mosquito Abatement District are intended for mosquito control only, and should not be introduced into natural water bodies. Mosquitofish can be used safely in ornamental fish ponds, watering troughs, and abandoned swimming pools without worrying about endangered species conflicts.

MOSQUITO-MIDGE COMPARISON

Homeowners frequently call us to report mosquito problems. In many instances, what appears to be a mosquito is actually another kind of insect.

The most commonly encountered look-a-likes are midges (gnats). These insects frequently form swarms and are also attracted to lights. They do not bite or spread diseases, but can still be annoying.

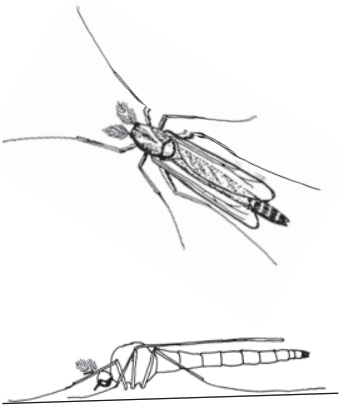
TYPICAL MOSQUITO



actual size

1. Bites with its proboscis (needlelike mouthparts)
2. Wings are slightly longer than body
3. Always develops in standing water
4. Rests on objects with its body above the surface
5. Can carry diseases

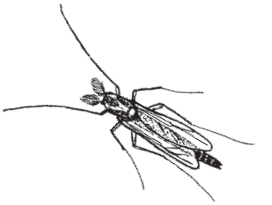
TYPICAL MIDGE



actual size

1. Cannot bite (has no proboscis)
2. Wings are shorter than body
3. Develops in mud on the bottom of lakes and ponds
4. Rests on objects with its body almost touching the surface
5. Cannot carry diseases

MOSQUITO-LIKE INSECTS (HARMLESS)



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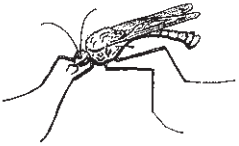
MIDGES *(Chironomidae)* are the most widespread and numerous insects resembling mosquitoes. Adult midges are commonly observed flying in swarms or “clouds", or are seen resting on fences, walls, under eaves and in protected areas such as porches and entryways.

Individual adults will live about seven days depending upon the species and weather conditions. The larvae, often called bloodworms, develop in sources that have extensive areas of standing water.



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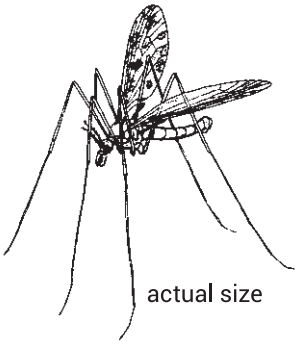
DIXID MIDGES *(Dixidae)* are common around moist areas where vegetation is abundant and may be seen swarming at dusk along the edges of streams and lakes.

The adults are short lived, usually being active less than a week. The larvae are found in slow moving water, at the surface, and swim in a characteristic “U” shape.



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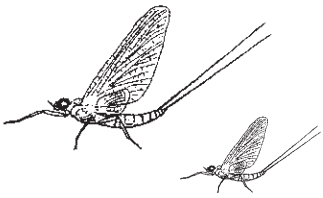
CRANE FLIES *(Tipulidae)* are delicate insects varying in size from 0.25 inch to as large as 1.5 inches in length. The largest crane flies are sometimes called “mosquito-eaters" or “mosquito hawks”.

They do not bite people and they do not (unfortunately) eat mosquitoes. Some species of crane flies emerge from aquatic sources and others from terrestrial or decaying vegetation sources.

MAYFLIES *(Ephemeroptera)* are quite abundant in Alameda County near creeks, flood control channels and other water sources. Their larvae are found in most aquatic habitats and can live in moving water. Usually the adults live for only one day.



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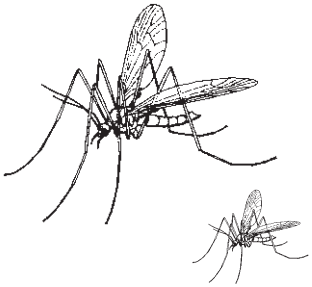
WINTER CRANE FLIES *(Trichoceridae)* are often quite abundant in Alameda County in the winter. They so closely resemble mosquitoes that they are frequently mistaken for them and reported to the District. Their larvae are found in roots, fungi, decaying vegetation, rotting leaves, manure, and other vegetative material.



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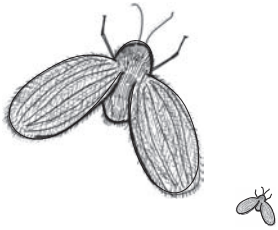
OWL MIDGES *(Psychodidae)* are small hairy flies that can move about very nimbly, but are weak fliers. The larvae are aquatic or semiaquatic and are very common in sewers and drains. The larvae are able to live in soapy water and are a good indicator of a leak in a shower/bath, sink, or laundry drain.



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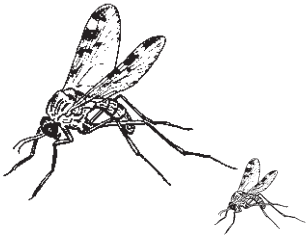
WOOD GNATS *(Anisopodidae)* larvae are found in or near decaying vegetation, fermenting sap, animal manure, tree trunks, mud and sometimes sewage. Adults can be found on foliage in or near damp places or around flowing sap. They are sometimes seen in small swarms.



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ALAMEDA COUNTY MOSQUITO ABATEMENT DISTRICT

An Independent Special District Protecting Public Health Since 1930

The Alameda County Mosquito Abatement District (ACMAD) has provided control of mosquitoes for the citizens of Alameda County (except Albany) since 1930. ACMAD is an independent special district governed by a Board of Trustees comprised of one representative from each city in our service area and the County-at-large. Funding is provided by a combination of property tax, a special tax authorized by more than two thirds of the voters in 1982, and a benefit assessment approved in 2008.

ACMAD works closely with other public agencies and park districts to provide ecologically sound mosquito control programs. The District also works with planning agencies to minimize mosquito production in wetland restoration and enhancement projects.

FREE Services for Alameda County Residents

MOSQUITOES *Inspection and Control*

MOSQUITOFISH *Free for residential ponds*

PUBLIC EDUCATION *Literature and Presentations*

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