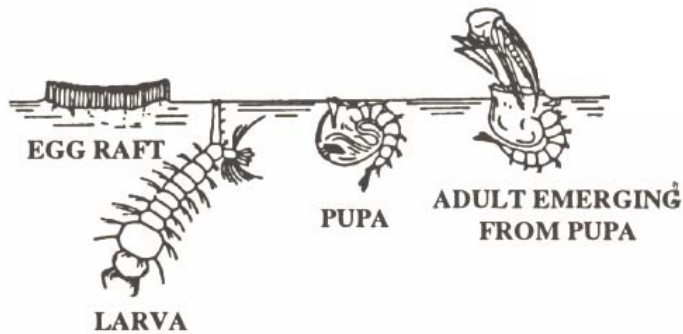


Mosquito Control In Los Angeles County



What You Can Do
What Your County is Doing
What You Can Expect



COUNTY OF LOS ANGELES
DEPARTMENT OF HEALTH SERVICES
Public Health

Acute Communicable Disease Control Program

This booklet was made possible by the Epidemiology and Laboratory Capacity (ELC) and Emerging Infections Program (EIP) Cooperative Agreement funds (Grant No U50/CCU912801-07/3) from the Centers for Disease Control and Prevention (CDC) and dedicated professionals from the following independent, city, and county public services in Los Angeles County.

WEST NILE TASK FORCE, LOS ANGELES COUNTY (2003-2005)

Independent Mosquito/Vector Control/Abatement Districts

**Antelope Valley
Mosquito and Vector Control District**
P.O. Box 1192
Lancaster, CA 93584-1192
Telephone: 661-942-2917
Website: www.avmosquito.org

**Compton Creek
Mosquito Abatement District**
1224 S. Santa Fe Ave.
Compton, CA 90221
Telephone: 310-639-7375
Email: comptoncreekmad@earthlink.net

**Greater Los Angeles County
Vector Control District**
12545 Florence Ave.
Santa Fe Springs, CA 90670
Telephone: 562-944-9656
Website: www.glacvcd.org

**Los Angeles County West
Vector Control District**
6750 Centinela Ave.
Culver City, CA 90230
Telephone: 310-915-7370
Website: www.lawestvector.org

**San Gabriel Valley
Mosquito & Vector Control District**
1145 N. Azusa Canyon Rd.
West Covina, CA 91790
Telephone: 626-814-9466
Website: www.sgvmosquito.org

State of California

Department of Health Services
Toll Free Telephone: 877-968-2473
E-mail: arbovirus@dhs.ca.gov
Website: <http://www.westnile.ca.gov>

Los Angeles County, Public Health, Department of Health Services

Acute Communicable Disease Control Program
313 N. Figueroa St., Rm. 212, Los Angeles, CA 90012
Telephone: 213-240-7941
Website: www.lapublichealth.org/acd/index.htm

Environmental Health Vector Management
5050 Commerce Dr., Baldwin Park, CA 91706
Telephone: 626-430-5200
Website: www.lapublichealth.org/eh/index.htm

Veterinary Public Health
3834 S. Western Ave., Rm. 38, Los Angeles, CA 90062
Telephone: 323-730-3723
Website: www.lapublichealth.org/vet/index.htm

Cities

City of La Cañada Flintridge
1327 Foothill Blvd., La Cañada Flintridge, CA 91011
Telephone: 818-790-8880
Website: www.lacanadaflintridge.com/city/index.htm

City of Long Beach
2525 Grand Ave., Long Beach, CA 90815
Telephone: 562-570-4132
Website: www.ci.long-beach.ca.us/health/enviro_health.html

City of Pasadena
1845 Fair Oaks Blvd., Pasadena, CA 91103
Telephone: 626-744-6004
Website: www.ci.pasadena.ca.us/publichealth/

City of Vernon
4305 S. Santa Fe Ave., Vernon, CA 90058
Telephone: 326-826-1420
Website: www.cityofvernon.org/index1.htm

MOSQUITOES: MYTHS VERSUS FACTS

MYTH: There are no mosquitoes in Southern California.

FACT: Ten different mosquito species flourish in our temperate environment, including several which can transmit diseases to humans, including West Nile virus.

MYTH: Mosquitoes have never been a serious problem in Los Angeles County.

FACT: Approximately 1 out of every 10 housing structures in Los Angeles County has mosquitoes breeding in the surrounding yard—front and/or back.

MYTH: Malaria and other exotic diseases are minor problems compared with AIDS.

FACT: According to the World Health Organization, insect-borne diseases will kill millions of people worldwide in the next decade.

MYTH: Mosquitoes can transmit AIDS; you can get HIV from a mosquito bite.

FACT: The human immunodeficiency virus (HIV that results in AIDS) does not replicate or develop in the mosquito; HIV does not survive in the insect's gut.

MYTH: Vector-borne diseases only occur in undeveloped tropical regions.

FACT: Migrating birds, global travelers, and “stowaway” mosquitoes can bring diseases that spread in cities or rural areas anytime mosquito populations are uncontrolled.

MYTH: Mosquito-borne diseases happen in tropical climates, not in Southern California.

FACT: Outbreaks of arboviruses (mosquito-borne diseases) occurred in 1952 and again in 1984. In response, independent mosquito abatement and vector control districts, Los Angeles County Department of Health Services, and other public service institutions established sentinel chicken flocks to test for evidence of arboviruses.

MYTH: Mosquito control is not healthy for people, birds, fish and other living things.

FACT: Modern control methods utilize environment-friendly larvicides to suppress developing, water-dependent mosquitoes to prevent them from becoming airborne adults.

MYTH: Los Angeles County provides mosquito surveillance and suppression to all of its cities as well as its unincorporated areas.

FACT: There are five independent mosquito/vector control district agencies in Los Angeles County (and individual programs). Approximately 25% of the cities and unincorporated areas are not serviced by mosquito surveillance and suppression programs (as voted by the majority of their respective residents). (See map of *Los Angeles County Mosquito and/or Vector Control Districts*, page 7.)

Compiled from a publication from: Los Angeles County West Vector Control District

WHERE TO LOOK AND WHAT TO DO

CONCRETE OR PLASTIC SWIMMING POOLS

Operate filter and skimmer everyday to remove egg rafts and larvae. Provide drainage for filter and pump sumps. Chlorine will NOT kill mosquito larvae. If pool cover is used, keep it tightly sealed. Remove rainwater from top of pool cover. If pool is “a green pool,” do NOT stock it with mosquito [eating] fish (*Gambusia affinis*). Children and pets may be attracted by these light-reflecting, active fish. It is difficult, if not impossible, to see past the surface of an algae-dense body of water. (See *Facts on Mosquito Fish*.)

ORNAMENTAL PONDS

Stock with mosquito fish. Add goldfish for looks if desired. Avoid spraying with garden insect sprays. Remove leaves and thin out pond lilies. Keep water level up. Screen inlet of recirculation pump. Chlorine kills fish, so transfer fish to glass bowl when cleaning pond. If pond is no longer desired, break holes in bottom and fill with dirt or sand.

SEPTIC TANKS (ON-SITE WASTEWATER TREATMENT SYSTEMS)

Maintain septic tank according to manufacturer’s instructions (per number of users and types of water usage). Inspect and replace fine screen cover on access or inspection port of septic tank on a regular basis. An “open-pipe access” to sewage creates breeding places for mosquitoes and other insects.

ANIMAL WATER TROUGHS, BIRD BATHS, PET WATER BOWLS

Keep large troughs stocked with mosquito fish. Clean small troughs, bird baths and pet water bowls at least once a week.

BOATS

Prevent accumulation of bilge water. Mosquitoes breed in saltwater as well as fresh water. Store small boat upside down or cover it to keep out rain and water from sprinklers. Cover large boat and avoid “pockets” and creases that can collect water.

OTHER CONTAINERS

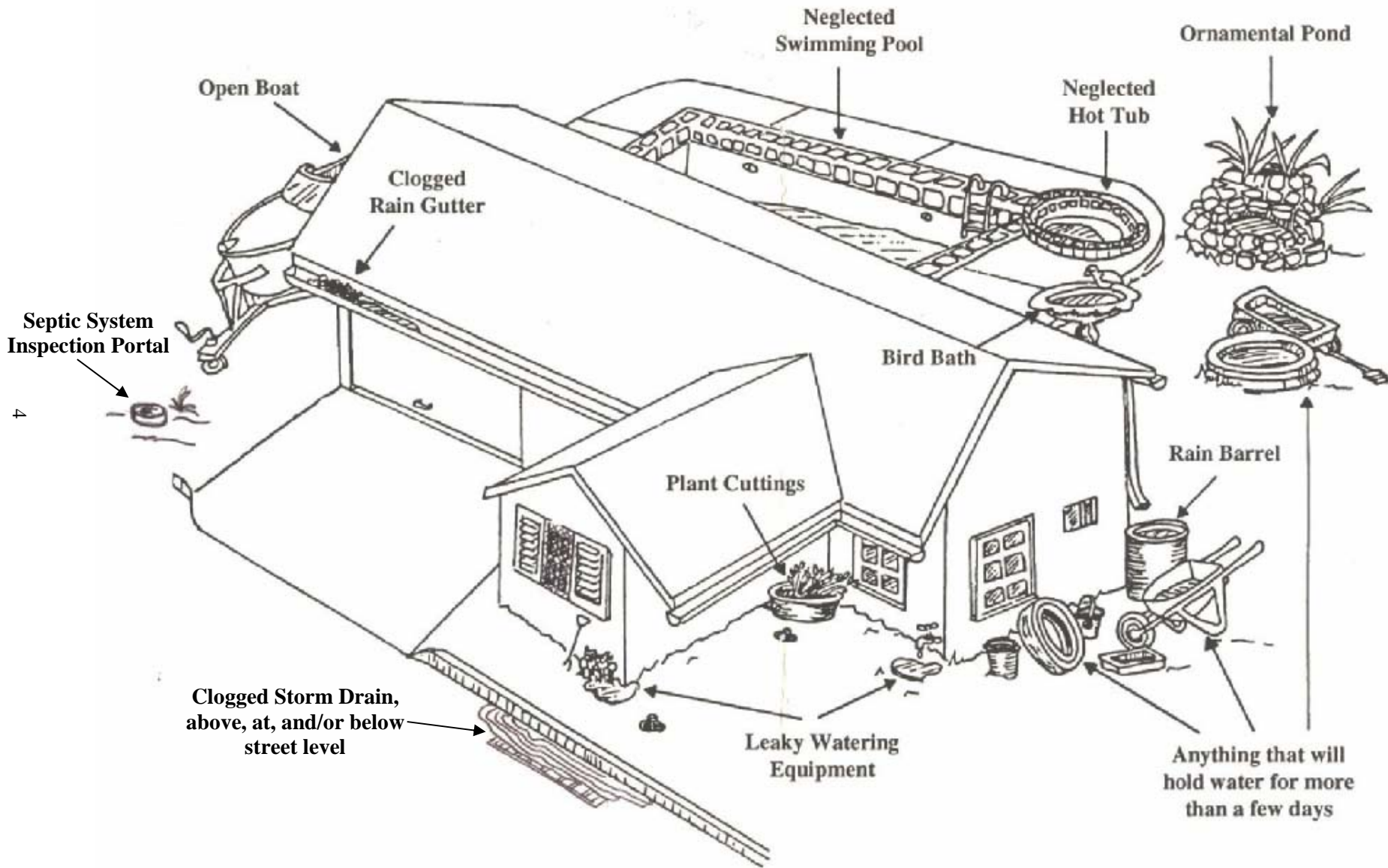
Remove and dispose of all unused containers that will collect rain or water from sprinklers: cans, jars, barrels, old tires, buckets, tubs, and so forth. Usable containers, such as toys, planters, wheelbarrows, buckets, and so on, should be stored upside down when not in use.

“POTENTIAL COLLECTORS”

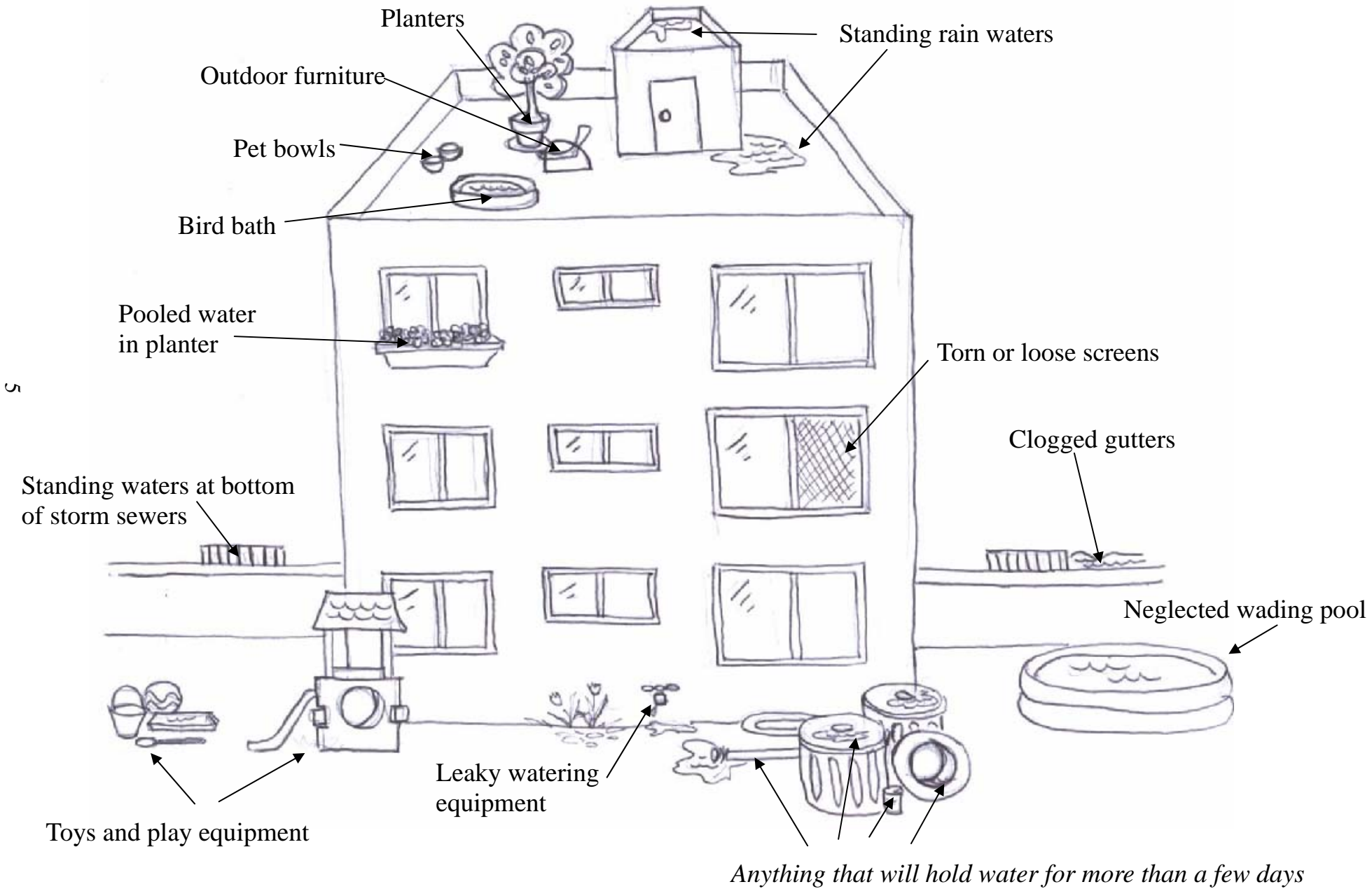
Just ½ inch of water can breed hundreds of mosquitoes! Identify and tip-to-drain potential collectors, such as lawn furniture, gardening tools, hoses, lawn ornaments, etc. Inspect and clean rain gutters in the spring and after storms and strong wind conditions. Home gardeners rooting plant cuttings in vases and other containers should change their water at least once a week.

Courtesy of: Los Angeles County West Vector Control District,
and San Gabriel Valley Mosquito & Vector Control District

COMMON BACKYARD MOSQUITO BREEDING SOURCES

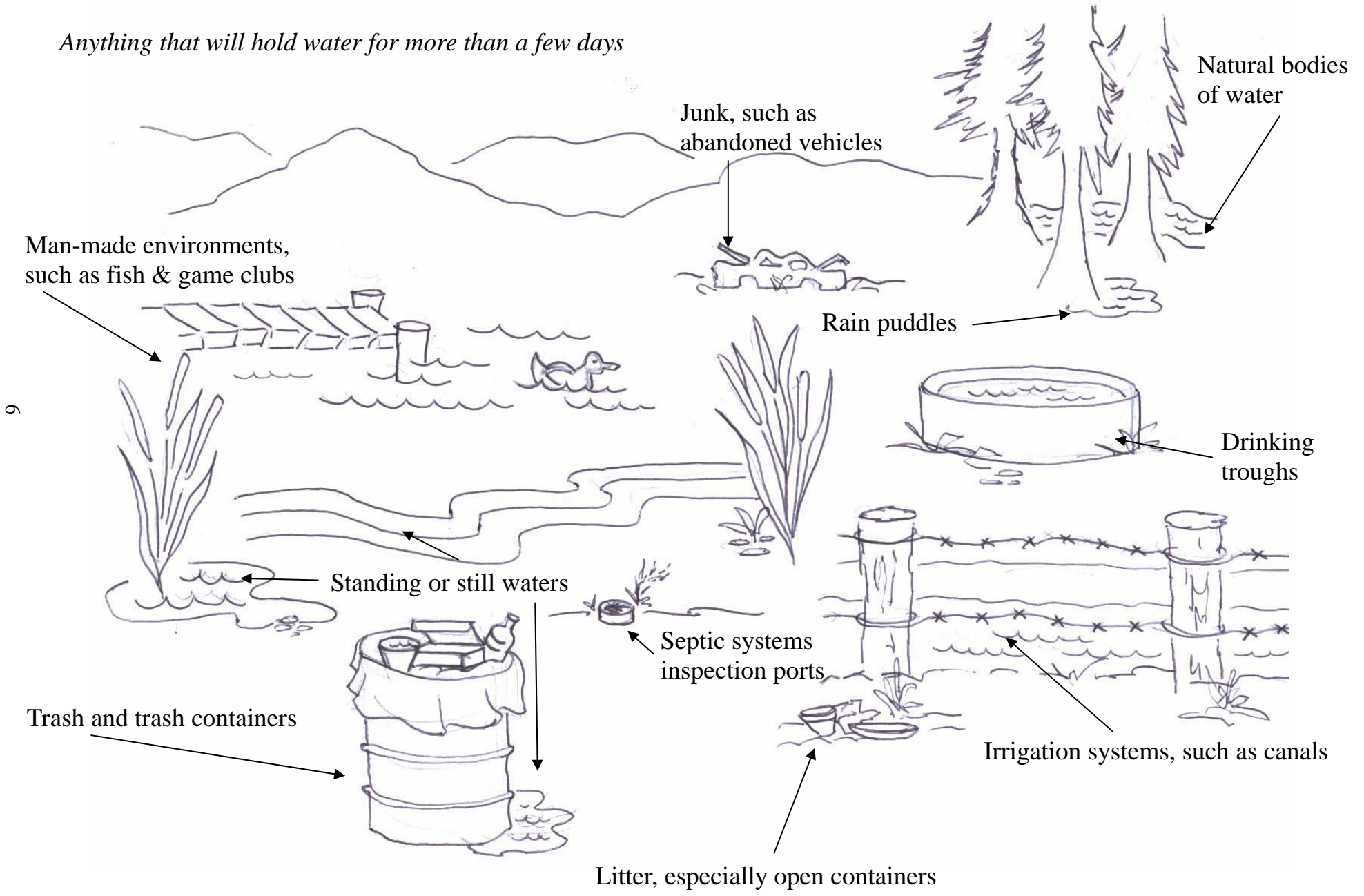


Common City Mosquito Breeding Sources

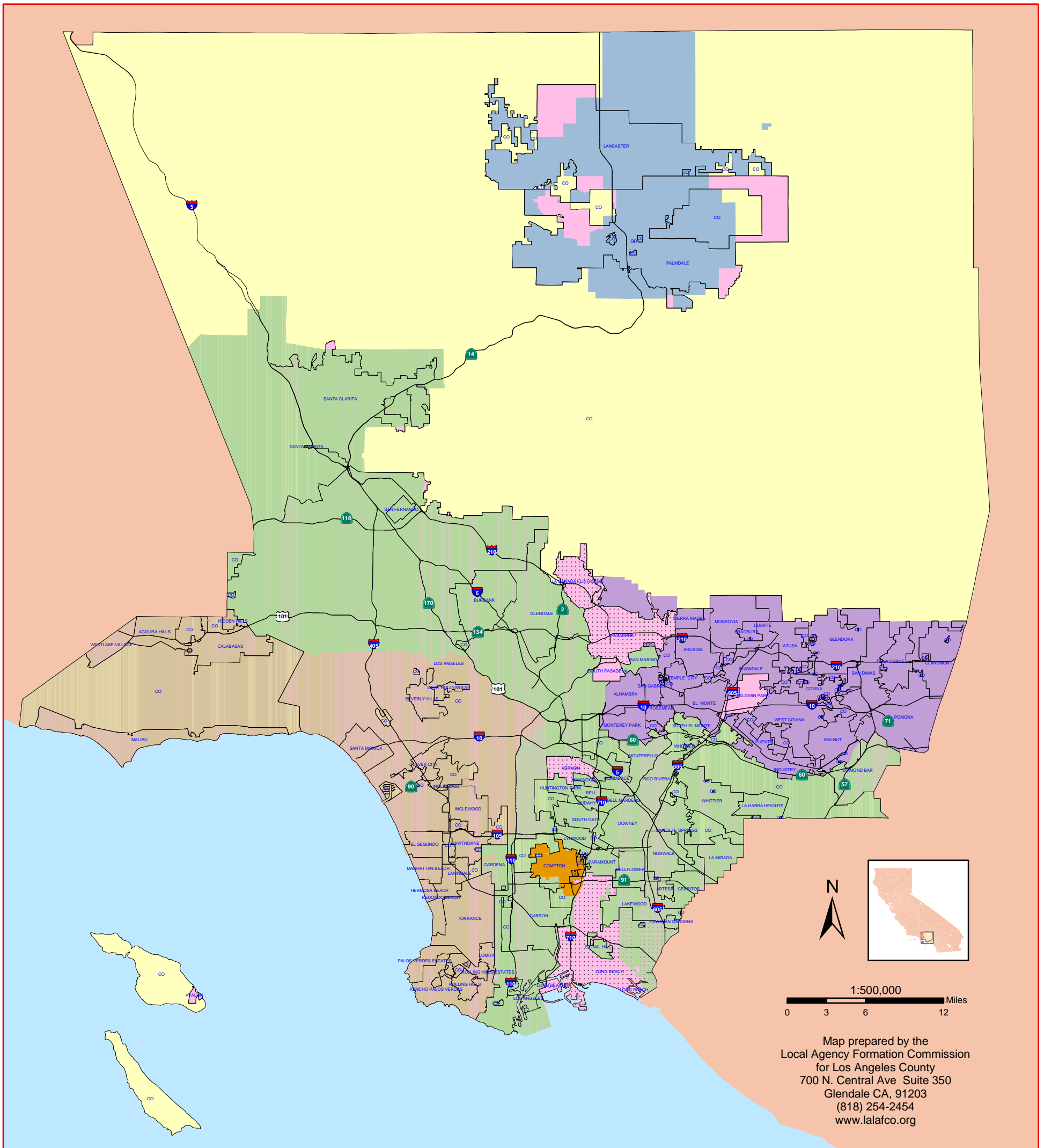


Common Rural Mosquito Breeding Sources

Anything that will hold water for more than a few days



Mosquito and / or Vector Control Districts Incorporated and Unincorporated Areas of Los Angeles County



Map prepared by the
Local Agency Formation Commission
for Los Angeles County
700 N. Central Ave. Suite 350
Glendale CA, 91203
(818) 254-2454
www.lalafco.org

Antelope Valley
Mosquito and Vector Control District
P.O. Box 1192
Lancaster, CA 93584
(661) 942-2917
www.avmosquito.org

Compton Creek
Mosquito Abatement District
1224 S. Santa Fe Ave.
Compton, CA 90221
(310) 639-7375

Greater Los Angeles County
Vector Control District
12545 Florence Ave.
Santa Fe Springs, CA 90670
(562) 944-9656
www.glacvcd.org

San Gabriel Valley
Mosquito & Vector Control District
1145 N. Azusa Canyon Rd.
West Covina, CA 91790
(626) 814-9466
www.sgvmosquito.org

Los Angeles County West
Vector Control District
6750 Centinela Ave.
Culver City, CA 90230
(310) 915-7370
www.lawestvector.org

Non-District Mosquito and / or Vector Control

City of Long Beach
Health and Human Services
2525 Grand Ave. Rm. 220
Long Beach, CA 90815
(562) 570-4132
www.longbeach.gov

City of Pasadena
Public Health Department
1845 N Fair Oaks Ave
Pasadena, CA 91103
(626) 744-6005
www.ci.pasadena.ca.us/publichealth/

City of LaCañada-Flintridge City Hall
1327 Foothill Blvd.
La Cañada Flintridge, CA 91011
(818) 790-8880
www.lacanadaflintridge/city/index.htm

City of Vernon
4305 South Santa Fe Ave
Vernon, CA 90058
(326) 826-1420
www.cityofvernon.org/index1.htm

Los Angeles County Public Health Department of Health Services

Acute Communicable Disease Control Program
313 N. Figueroa St.
Los Angeles, CA 90012
(213) 240-7941
www.lapublichealth.org/acd/index.htm

Environmental Health Vector Management
5050 Commerce Dr.
Baldwin Park, CA 91706
(626) 430-5200
www.lapublichealth.org/eh/index.htm

Veterinary Public Health
3834 S. Western Ave., Suite 238
Los Angeles, CA 90062
(323) 730-3723
www.lapublichealth.org/vet/index.htm

State of California Department of Health Services

Communicable Disease Control
Toll Free Telephone: 877-968-2473
E-mail: arbovirus@dhs.ca.gov
www.westnile.ca.gov

Cities not covered by Mosquito and/or Vector Control Districts

Unincorporated County areas not covered by Mosquito and/or Vector Control Districts

This map was made possible by the Epidemiology and Laboratory Capacity (ELC) and Emerging Infections Program EIP) Cooperative Agreement funds (Grant No. U50/CCU912801-07/3) from the Centers for Disease Control and Prevention (CDC) and dedicated professionals for the independent, city, county and state public services in Los Angeles County.

MOSQUITO CONTROL IN UNINCORPORATED CITIES AND AREAS IN LOS ANGELES COUNTY

SERVICE PROVIDED KEY: N/S= No Service, AV=Antelope Valley, CA=State of California, CC=Compton Creek, GLA=Greater Los Angeles, LAW=Los Angeles West, PPH=Pasadena Public Health, P/S=Private Service, SGV=San Gabriel Valley

MCS AREA/CITY	MCS AREA/CITY	MCS AREA/CITY	MCS AREA/CITY
N/S Acton	GLA Eastmont	N/S Los Cerritos Wetlands	GLA Signal Hill
LAW Agoura	GLA El Camino Village	GLA Los Nietos	N/S Soledad
LAW Agoura Hills	N/S El Dorado	GLA Lynwood	GLA South El Monte
N/S Agua Dulce	SGV El Monte	LAW Malibu Bowl	GLA South Gate
SGV Alhambra	LAW El Segundo	LAW Malibu Canyon	N/S South Pasadena
N/S Alpine	N/S Elizabeth Lake	LAW Malibu Lake	SGV South San Gabriel
SGV Altadena	N/S Fairmont	LAW Malibu Vista	SGV South San Jose Hills
N/S Antelope Acres	LAW Fernwood	LAW Malibu/Sycamore Canyon	GLA South Whittier
SGV Arcadia (islands)	GLA Firestone [Park]	LAW Manhattan Beach	GLA Stevenson Ranch
GLA Artesia	GLA Florence	LAW Marina del Rey	GLA Sulphur Springs
LAW Athens (West Athens)	GLA Forrest Park	GLA Maywood	N/S Sun Village
N/S Avalon	N/S Franklin Canyon	GLA Mint Canyon	GLA Sunland
GLA Avocado Heights	GLA Gardena	SGV Monrovia (islands)	N/S Sunset Mesa
LAW Baldwin Hills	GLA Glendale	LAW Monte Nido	N/S Sunshine Acres
N/S Baldwin Park	SGV Glendora (islands)	GLA Montebello	GLA Sylmar
GLA Bandini (islands)	LAW Glenview	SGV Monterey Park	LAW Sylvania Park
GLA Bassett	N/S Gorman	GLA Montrose	SGV Temple City
GLA Bell	N/S Graham	LAW Mulholland Corridor	N/S Three Points
GLA Bell Gardens	N/S Green Valley	N/S Neenach	LAW Topanga
GLA Bellflower	GLA Hacienda Heights	SGV North Claremont (islands)	N/S Topanga Canyon
GLA Belvedere Gardens	GLA Hawaiian Gardens	GLA Northeast Whittier (island)	LAW Torrance
LAW Beverly Hills	LAW Hawthorne	GLA Northwest Whittier	N/S Triunfo Canyon
N/S Big Pines	LAW Hermosa Beach	GLA Norwalk/Cerritos (islands)	GLA Tujunga
GLA Bouquet Canyon	N/S Hi Vista	N/S Oat Mountain	N/S Twin Lakes
SGV Bradbury	LAW Hidden Hills	N/S/AV Palmdale	GLA Universal City
GLA Burbank	GLA Huntington Park	LAW Palos Verdes Estates	GLA Val Verde
LAW Calabasas (adjacent)	LAW Inglewood	GLA Paramount	SGV Valinda
LAW Calabasas Highlands	SGV Irwindale	PPH Pasadena	N/S Valley Glen
GLA Carson	N/S Juniper Hills	N/S Pearblossom	GLA Vasquez Rocks
GLA Castaic	GLA Kagel Canyon	GLA Pico Rivera	N/S Vernon
GLA Castaic Junction	SGV Kinneola Mesa	SGV Pomona	P/S Veterans Admin. Ctr.
GLA Cerritos	P/S La Canada Flintridge	N/S Placerita Canyon	LAW View Park
SGV Charter Oak	GLA La Crescenta	N/S/AV Quartz Hill	SGV Walnut
SGV Citrus (Covina islands)	GLA La Habra Heights	GLA Rancho Dominguez	GLA Walnut Park
SGV City of Industry	GLA La Mirada	LAW Rancho Palos Verdes	SGV West Arcadia (islands)
GLA City Terrace	SGV La Puente	N/S Redman	GLA West Carson
SGV Claremont	N/S La Rambla	LAW Redondo Beach	GLA West Chatsworth
GLA Commerce	SGV La Verne	LAW Rolling Hills	SGV West Covina
LAW Cornell	LAW Ladera Heights	LAW Rolling Hills Estate	LAW West Hollywood
SGV Covina	GLA Lake Balboa	N/S Roosevelt	SGV West Pomona (islands)
N/S Crystalair	N/S Lake Hughes	SGV Rosemead	GLA West Puente Valley
GLA Cudahy	N/S Lake Los Angeles	CC Rosewood	GLA West Rancho Dominguez
LAW Culver City	N/S Lakeview	GLA Rowland Heights	GLA West Whittier
GLA Deer Lake Highlands	GLA Lakewood	N/S San Clemente Island	N/S Westfield
N/S Del Aire	N/S/AV Lancaster	SGV San Dimas	LAW Westlake Village
N/S Del Sur	N/S Lang	GLA San Fernando	N/S Westmont
GLA Diamond Bar	N/S Las Virgenes	SGV San Gabriel	N/S White Fence Farms
GLA Downey	LAW Lawndale	GLA San Marino	GLA Whittier Narrows
SGV Duarte (islands)	LAW Lennox	N/S San Pasqual	GLA Willowbrook
SGV East Azusa (islands)	N/S Leona Valley	GLA Santa Catalina Island	N/S Wilsona Gardens
CC East Compton	N/S Littlerock	GLA Santa Clarita	LAW Windsor Hills
GLA East Los Angeles	N/S Llano	GLA Santa Fe Springs	N/S Wiseburn
PPH East Pasadena	LAW Lomita	LAW Santa Monica	N/S Wrightwood
SGV East San Gabriel	GLA Long Beach (islands)	LAW Seminole Hot Springs	
GLA East Whittier	N/S Longview	SGV Sierra Madre	

WEST NILE VIRUS SURVEILLANCE: PRECAUTIONS & ACTIONS

DEAD BIRD SURVEILLANCE

Dead birds may be a sign that West Nile virus (WNV) is circulating between birds and the mosquitoes in an area. WNV-positive birds usually provide the earliest indicator of this viral activity. Individual residents can make a difference: Dead birds can be reported *by the public* as well as local health officials to Los Angeles County Veterinary Public Health Section or California Health Department of Health Services. Arrangements for testing are made if the bird has died recently (24-48 hours), is in good condition, and belongs to the corvid family (crows, ravens, magpies, jays) or is a raptor (hawk, owl). Additional types of birds may be tested when requested by the State of California Health Department. **To report a dead bird, call the Los Angeles County Veterinary Public Health hotline at 877-747-2243, or the California Department of Health Services at 877-968-2473.**

MOSQUITO SURVEILLANCE AND TESTING

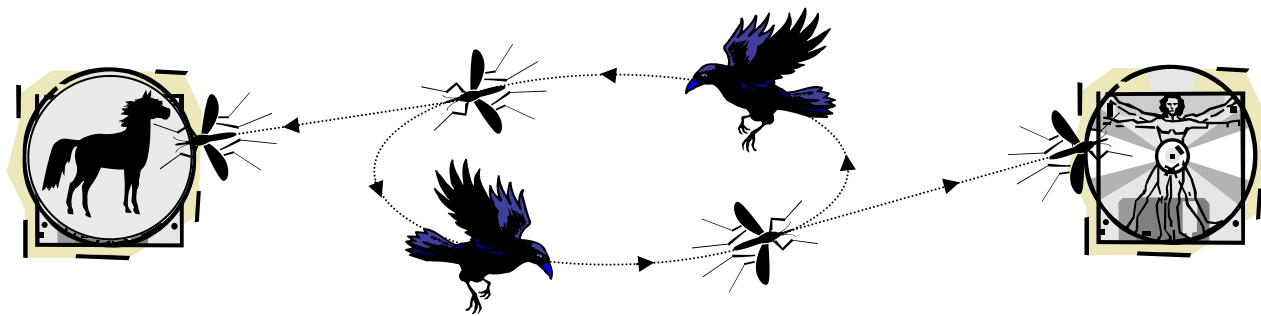
While dead-bird surveillance has proven to be the most sensitive method of detecting WNV presence in an area, mosquito-based surveillance remains the primary tool for quantifying the intensity of virus transmission in an area. Mosquitoes are collected by local mosquito and vector control programs in Los Angeles County and counties throughout California for speciation and virus testing, including West Nile, Western equine encephalitis, and St. Louis encephalitis (WNV, WEE, and SLE). Mosquito traps are maintained above control pools as well as natural and artificial bodies of standing water. Individual residents can make a difference: Report any mosquito problems, “green pools,” stagnant waters (natural or artificial), etc. If the subject area is serviced by a mosquito and vector control program, their technicians will investigate and help to remedy these and other mosquito problems.

The California State Health and Safety Code state that *the owner of the property* on which a breeding source is located is responsible for the abatement of the nuisance and for the prevention of its recurrence. Areas and residences not serviced by a mosquito control program may vote to cover the costs of these services through a nominal increase in their annual property taxes. (See *Mosquito Control in Unincorporated Cities and Areas in Los Angeles County*, page 8.)

SENTINEL CHICKEN TESTING

Sentinel chickens have been successfully used in flavivirus surveillance for over sixty years. Currently, over 200 chicken flocks are strategically placed throughout California. Each of these flocks is routinely tested during the mosquito season to detect evidence of infection from WNV, WEE, or SLE viruses.

Compiled from publications from: California Department of Health Services,
and Los Angeles County Department of Health Services.



MOSQUITO-BORNE DISEASES

Several of the 48 known species of mosquitoes in California can carry various disease causing organisms and transmit them to humans and other animals. There are three forms of viral encephalitis transmitted by mosquitoes in California: West Nile, St. Louis, and Western Equine. All three viruses are carried into an area by wild birds that are infected elsewhere. These infected birds are then fed on by local mosquitoes that transmit disease causing organisms on to humans through future bites—as well as previously uninfected birds. Further, these organisms are transmitted through the “blood meal” with which the birthing female nourishes her eggs; the eggs mature and hatch into infected adults to perpetuate the cycle (illustrated above).

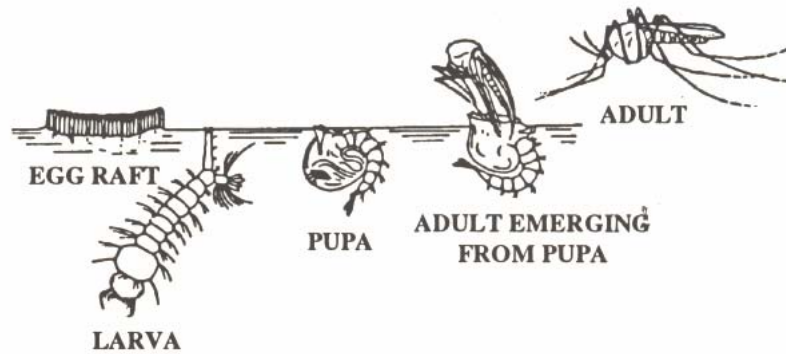
The California Department of Health Services (CADHS) has overseen a statewide mosquito-borne encephalitis surveillance program since 1969 for Western equine encephalitis (WEE), Eastern equine encephalitis (EEE), St. Louis encephalitis (SLE), and other viruses. In 2000, DHS and other agencies, including the Los Angeles County Department of Health Services (LACDHS), expanded their programs to include West Nile virus (WNV).

Mosquito-borne viruses—WNV, WEE, EEE and SLE—are most prevalent from May to October when mosquitoes are abundant. These viruses usually pass back and forth between birds and the mosquitoes that bite them; the mosquitoes transmit these viruses to humans or animals. Mosquitoes sustain high levels of these viruses. As the female mosquito extracts her blood meal, she salivates viruses into the puncture she feeds through. There are no cases of animal to human or bird to human transmission. There is evidence that WNV may have been acquired via blood transfusion or organ transplant from an infected donor (*prior to* today’s laboratory screenings). The benefits of mothers’ milk far outweigh the risk of WNV for nursing infants.

In the United States in 2002, the median age among the 2,942 patients reported with West Nile meningoencephalitis, the median age was 59 years. Only 4 percent of these cases were in persons younger than 18. Most people infected with WNV, WEE, or SLE may suffer flu-like symptoms. About 1 in 150 people infected with WNV will require hospitalization, with the worst cases leading to fatal inflammation of the brain and spinal cord. Human cases of WNV, while still relatively uncommon, continue to increase each season as infected birds migrate westward. The human mortality rate with WNV ranges from 3% to 15%. Human cases of WEE and SLE remain rare.

Birds are especially vulnerable to WNV. Horses are especially vulnerable to WNV, WEE, and EEE. Veterinarians are contacted annually by CADHS and the California Department of Agriculture to ensure that equines are vaccinated for WNV. Both domestic and wild animals—even reptiles—are affected by WNV. As of this writing, companies are developing a WNV vaccine for humans. Mosquito control remains *the* most effective method to break the transmission cycles of these (and other) mosquito-borne diseases in Los Angeles County.

MOSQUITO LIFE CYCLE



All mosquitoes must have water in which to complete their life cycle. In Los Angeles County, permanent, artificial bodies of water provide the most breeding opportunities for mosquitoes, *not* our natural bodies of water. Mosquitoes can complete their life cycle in chlorinated water as well as sewage water. Most mosquitoes can make do with as little as ½ inch of water—the depth of screw-down bottle cap. During warm weather, mosquitoes complete their life cycle—egg raft to larvae to pupae to adult—within seven days.

EGG RAFT: The most common mosquitoes lay egg rafts that float on the water. Each egg raft contains from 100 to 400 eggs. Within a few days each egg raft hatches into larvae.

LARVAE: Each larva or “wiggler” comes to the water surface to breathe through a specialized tube called a siphon. It sheds its skin or molts four times during several days of growth. It grows rapidly between each molt, changing into a pupa on the fourth molt.

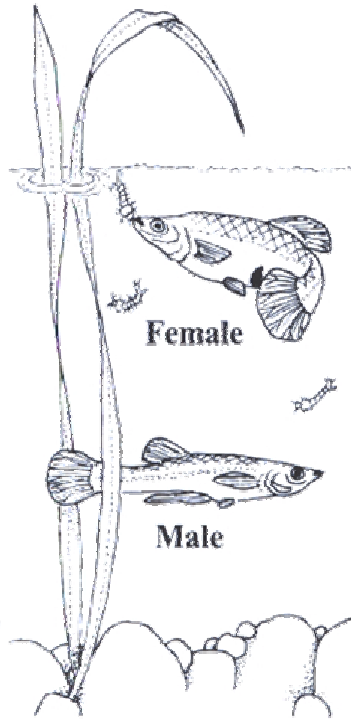
PUPA: Each pupa or “tumbler” breathes thorough 2 tubes in its back. Pupae resemble commas and tumble around rapidly. The adult mosquito grows inside the pupa until it is fully developed. In about two days, it splits the pupal skin and emerges as a fully developed, *hungry* adult.

ADULT: Each newly emerged adult mosquito rests on the surface of the water until it is strong enough to fly away and feed. Both male and female mosquitoes feed on plant juices for food. Only females bite and suck blood from humans and other mammals, birds, and reptiles. Proteins in the blood are used to produce eggs. Females lay eggs several days after they fly. Females live up to 15 days, but males live only a few days.

During the warm months of summer, female mosquitoes may live as long as 3 weeks. During the cold months of fall and winter, female mosquitoes hibernate in order to lay their eggs the following spring. Various disease carrying organisms present within the female mosquito “hibernate” with her, to begin their “life cycle” of transmission during the feeding and breeding sequences in the spring.

Compiled from publications from: Los Angeles County West Vector Control District,
and San Gabriel Valley Mosquito & Vector Control District

FACTS ON MOSQUITO FISH



Gambusia affinis, called “mosquito fish,” are minnows that are bred and used in manmade, permanent sources of water to control mosquitoes—and to help reduce the use of pesticides. Mosquito fish give birth to well developed and very active young, about 40 to 60 young each brood. The young are approximately ¼ inch in length when born, and grow to 2 to 3 inches in length as adults. The young eat mosquito larvae as fast as they hatch out of their eggs. An adult mosquito fish can eat up to 100 mosquito larvae per day! (See *Mosquito Life Cycle*.)

Mosquito fish are used for stocking bird baths, fountains, ornamental ponds, water gardens, unused or “out of order” swimming pools, and animal water troughs. They are easy to care for; no special feeding is required. When there are no mosquito larvae present (their natural diet), regular fish flakes or crushed dry dog food can be used. Garden sprays, insecticides and chlorine used to kill algae in water can be harmful to fish and should be avoided where the fish are placed.

Mosquito fish are provided free of charge to residents of mosquito and vector control programs in Los Angeles County and for a minimal charge to residents outside of their boundaries. (See *Mosquito & Vector Control Programs*.) The earliest broods of the season are born in April and May, the “beginning of mosquito season.” While they begin eating mosquito larvae at birth, they do not produce young until they are 6 to 8 weeks old.

Although mosquito fish are a natural way of controlling mosquito larvae without the use of insecticides or chemicals, they should *never* be placed in any natural habitat, such as lakes, streams, rivers, or creeks. Rather, recycle them as natural fertilizers for plant life, or dispose of them properly (after use) as environmentally compatible trash.

IMPORTANT: Scientific experiments have shown that mosquito fish do not distinguish between mosquito larvae and tadpole or tree frog larvae. Moreover, their introduction into certain natural habitats, such as the Santa Monica Mountains, has disrupted the ecological balance that exists there. (See *Science Daily* magazine, at web address <http://www.sciencedaily.com/releases/1999/08/990803073233.htm> for details.)

Compiled from publications from: Los Angeles County West Vector Control District
and San Gabriel Valley Mosquito & Vector Control District

THE ABCD'S OF THE PREVENTION OF WEST NILE VIRUS

Avoid: mosquito bites

Bite-proof: your home and community

Community coverage: independent, city, and state mosquito control programs

Dusk & Dawn: Avoid being outdoors when mosquitoes are most active.

Dress: Cover your skin with protective clothing.

DEET: Protect bare skin with mosquito repellent containing DEET

Drain: Empty containers holding water in which mosquitoes breed

Avoid mosquito bites! Apply insect repellent containing DEET (look for *N, N-diethyl-metatoluamide*) to exposed skin when you go outdoors. Even a short amount of time outdoors is enough to get a mosquito bite.

Bite-proof your home and community! Drain and empty containers holding water in which mosquitoes breed. *All* mosquitoes must have water in which to complete their life cycle. (See *Common Rural, Backyard and City Mosquito Breeding Sources* for illustrated examples.) Install or repair your screens. Some mosquitoes like to come indoors. Offer to help neighbors whose screens might be in bad shape.

Most communities in the incorporated cities and areas of Los Angeles County are serviced by one of five independent mosquito control programs. Communities in unincorporated cities and areas of the county may also be serviced by one of these five programs, or by their city public health departments, the State of California Department of Health Services, or a private service hired by individual City Councils. Other communities and private properties are not serviced by *any* mosquito control service. Refer to your annual property tax assessment, ask your landlord, or contact the one nearest your address to determine if your neighborhood is serviced. (See *Map of Incorporated and Unincorporated Cities and Areas of Los Angeles County* as well as *Mosquito Control in Unincorporated Cities and Areas in Los Angeles County*.) Find out if your neighborhood is serviced by a mosquito control program; contact them if you are bothered by mosquitoes, or if you have any questions. Mosquito-borne disease control in Los Angeles County depends on its individual residents! (See *West Nile Virus Websites & Contact Information* for further information.)

Did you know that you can dress to help reduce mosquito bites? When possible, wear long-sleeves, long pants and socks when outdoors. Mosquitoes may bite through thin clothes, so spraying clothes with repellent containing permethrin or DEET provides extra protection (proven safe and effective over 40 years of use). Always follow manufacturer's instructions carefully. (See *West Nile Virus Websites & Contact Information* for further information on DEET and its usage.)

Dusk and dawn are peak mosquito biting times. Consider avoiding outdoor activities during these times—or take extra care to use repellent and protective clothing during evening and early morning hours.

Compiled from publications from: Centers for Disease Control and Prevention (CDC),
San Gabriel Valley Mosquito & Vector Control District, Los Angeles County
Department of Health Services, Acute Communicable Disease Control,
and J. Rutherford, Monroe, Florida.

**ADDITIONAL RESOURCES AND WEB SITES FOR INFORMATION ON
WEST NILE VIRUS (WNV) AND MOSQUITO CONTROL**

Centers for Disease Control and Prevention (CDC)

1600 Clifton Rd.

Atlanta, GA 30333

Toll Free Telephone: 800-311-3435

Websites: <http://www.cdc.gov/ncidod/dvbid/westnile/index.htm>

http://www.kidshealth.org/kid/index.jsp/watch/out/west_nile.html

http://www.kidshealth.org/teen/infections/bacterial_viral/west_nile.html

http://www.kidshealth.org/parent/firstaid_safe/outdoor/west_nile.html

Metropolitan Water District

P.O.Box 54153

Los Angeles, CA 90054-1253

Telephone: 213-217-6000

<http://www.bewaterwise.com>

Mosquito and Vector Control Association of California

660 J St., Suite 480

Sacramento, CA 95814

Telephone: 916-440-0826

Website: <http://www.mvcac.org>

Animal and Plant Health Inspection Service

Website: <http://www.aphis.usda.gov/lps/issures/wnv/wnv.html>

Cornell University—Department of Communications & Center for the Environment

Website: <http://environmentalrisk.cornell.edu/WNV/>

National Safety Council

Website: <http://www.nsc.org/library/facts/westnile.htm>

United States Environmental Protection Agency

Website: <http://www.epa.gov/pesticides/factsheets/mosquito.htm>

United States Geological Survey (USGS)

National Wildlife Health Center

Website: http://www.nwhc.usgs.gov/research/west_nile.html

West Nile Virus Task Force, Los Angeles County

Respective websites, telephone numbers, email addresses,
and office addresses listed on page 1 of this booklet.

MOSQUITO CONTROL IN LOS ANGELES COUNTY BEGINS WITH YOU

What Can You Do? (Pages 3-6, 9, 13, 14)

Mosquito control begins with you. The *number one* source of mosquitoes in Los Angeles County is man-made sources of water—gutters, pools, containers, litter. Individual residents make the largest difference for the smallest investment in time and cost. Check-out your yard, street, school, park, and workplace at least once a week. Report any collected waters that you can not empty, such as heavy planters or swimming pools, to your mosquito control district or to your local health department, or city hall.

Experience bears out that West Nile virus (WNV) in birds is followed by WNV in humans and other large animals. Residents are usually the first to notice dead birds in their outdoor environments. Report dead birds to county or state West Nile virus programs. A positive lab-test enables public services professionals to alert you and others of the potential presence of mosquito-borne diseases-- where you live, where you work, where you play.

What is Being Done? (Pages 1, 7-9, 13)

In a proactive response to the westward spread of WNV, professionals from a diverse group of independent public services in Los Angeles County established a WNV Task Force (see page 1), stating its collaborative purpose as:

Recognizing the distinctly separate responsibilities and authority of each Task Force participant: that collective knowledge of same would be beneficial to coordinate a timely effective response to the matters of public health; and that shared resources and coordinated implementation measures creates increased public confidence and understanding (2003).

This booklet was completed by the Los Angeles County, Public Health, Department of Health Services (LACDHS), Acute Communicable Disease Control Program, in coordination with the WNV Task Force. It is one of several projects funded by a grant from the Centers for Disease Control and Prevention (Grant No.U50/CCU912801-07/3): to

survey unincorporated areas of the County *not* serviced by a public or private mosquito control program for evidence of WNV-infected mosquito activity.

What Can You Expect? (Pages 2, 9-12)

Human cases of WNV continue to increase each season as infected birds continue to migrate westward. Public services professionals in Los Angeles County and the State of California anticipate—*and are preparing for*—a probable local outbreak of human WNV cases within the next one to two years.

Mosquito control remains *the* most effective method to break the transmission cycles of mosquito-borne diseases. Mosquito control begins with residents of Los Angeles County working with certified mosquito control professionals: eliminating mosquito breeding sources by draining stagnant or standing waters from where they live, work, play. It continues with public services professionals: locating and exterminating larvae and pupae with before they hatch (larvicide). Spraying airborne, adult mosquitoes to reduce their numbers (adulticide) is done only in an emergency situation (outbreak of mosquito-borne diseases in human population).

The effectiveness of mosquito control decreases with each stage in the life cycle of the mosquito. Mosquito eggs, larvae, and pupae are more difficult to find and more costly to eliminate than most sources of stagnant waters. Controlled spraying only kills a percentage of airborne adults, many of which have already fed and bred, transmitted diseases to humans, animals and birds, and their offspring.

Infected adult females hibernate during the cold months to breed in the spring. Some species survive fall and winter in the egg stage, and hatch as infected adults. Individual residents can make a collective difference, in the least time, at the lowest cost, by eliminating (or reporting) collected and still-standing waters. *All* mosquitoes must have water to complete their life cycle.

LACDHS