



LAKE COUNTY VECTOR CONTROL DISTRICT

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Mosquitoes of Lake County

Twenty-three mosquito species in six genera occur in Lake County. Each mosquito has its own preferred larval habitat, season, and blood meal hosts.

<u>Scientific name</u>	<u>Common Name</u>
1. <i>Aedes bicristatus</i>	Snowpool mosquito
2. <i>Aedes fitchii</i>	Snowpool mosquito
3. <i>Aedes increpitus</i>	Snowpool mosquito
4. <i>Aedes melanimon</i>	Irrigated pasture mosquito
5. <i>Aedes nigromaculis</i>	Irrigated pasture mosquito
6. <i>Aedes sierrensis</i>	Western treehole mosquito
7. <i>Aedes vexans</i>	Inland floodwater mosquito
8. <i>Anopheles franciscanus</i>	No common name
9. <i>Anopheles freeborni</i>	Western malaria mosquito
10. <i>Anopheles punctipennis</i>	Woodland malaria mosquito
11. <i>Culex apicalis</i>	No common name
12. <i>Culex boharti</i>	Bohart's mosquito
13. <i>Culex erythrothorax</i>	Tule mosquito
14. <i>Culex pipiens</i>	Northern house mosquito
15. <i>Culex stigmatosoma</i>	Banded foul water mosquito
16. <i>Culex tarsalis</i>	Western encephalitis mosquito
17. <i>Culex territans</i>	No common name
18. <i>Culex thriambus</i>	No common name
19. <i>Culiseta incidens</i>	Cool weather mosquito
20. <i>Culiseta inornata</i>	Large winter mosquito
21. <i>Culiseta particeps</i>	No common name
22. <i>Orthopodomyia signifera</i>	White-lined mosquito
23. <i>Coquillettidia perturbans</i>	Cattail mosquito



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1. *Aedes bicristatus* (Snowpool mosquito)

Lake County Vector Control employee Eric C. Winkler (Thurman and Winkler 1950) discovered this previously unknown species in Lake County in 1950. *Aedes bicristatus* is a large, robust, univoltine (one generation per year) mosquito that develops in pools of rain water and snowmelt water. The larvae hatch from eggs laid on the mud and in the vegetation the previous year (or the last time the pond flooded). In Lake County, the larvae usually hatch in December-February. The adults emerge in late February to early May, depending on the temperatures (they emerge earlier in warm years, and later in cool years). They will bite people, but are not known to transmit any diseases of public health importance.

2. *Aedes fitchii* (Snowpool mosquito)

This large, univoltine (one generation per year) species develops in pools of snowmelt water in the higher elevations of northern Lake County. It was first detected in Lake County in 2007 by David Woodward, the Lake County Vector Control District's entomologist (Woodward et al. 2010). The larvae hatch from eggs laid in the vegetation of receding pools the previous year. In Lake County, the larvae usually hatch in December-February. The adults emerge in mid-February to early May, depending on the temperatures (they emerge earlier in warm years, and later in cool years). They can be an aggressive human biter, but are not known to transmit any diseases of public health importance.

3. *Aedes increpitus* (Snowpool mosquito)

This large, univoltine (one generation per year) species develops in pools of rain and snowmelt water. It occurs throughout Lake County, but is especially noticeable in along the southern shoreline of Clear Lake in years when the lake level is high. The larvae hatch from eggs laid on the mud and in the vegetation the previous year (or the last time the pond flooded). In Lake County, the larvae usually hatch in December-February. The adults emerge in late February to early May, depending on the temperatures (they emerge earlier in warm years, and later in cool years). The eggs can last for years before hatching. *Aedes increpitus* can be an aggressive human biter, but is not known to transmit any diseases of public health importance.

4. *Aedes melanimon* (Irrigated pasture mosquito)

This is a large, multivoltine (many generations per year) floodwater mosquito. It is often found with *Aedes nigromaculis*. In Lake County, it is usually found in irrigated pastures, but may occur anywhere with intermittent flooding in the late spring and summer months. The eggs are laid in the mud and vegetation just above the receding floodwater, and will hatch when the area floods again—even if it's decades later! They readily bite people and livestock, and may fly several miles to feed. They are known vectors of California encephalitis (CE) virus and Western equine encephalitis (WEE) virus, and St. Louis encephalitis (SLE) virus has been isolated from *Ae. melanimon* collected in Kern County, CA.



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6. *Aedes sierrensis* (Western treehole mosquito)

This small, black-and-white mosquito develops in the water that collects in treeholes. It is the most widely distributed—and most widely complained about—mosquito in Lake County. The larvae hatch in October-February and continue to grow through the winter. The adults emerge in mid-March through the end of May, but persist through the summer, especially in well-shaded woodlands. The females readily bite people, as well as dogs, deer, rabbits, and other mammals. The Western treehole mosquito is not known to transmit West Nile virus, but it is the primary vector of dog heartworm (*Dirofilaria immitis*), and feeds aggressively on people, particularly near sunset and in shaded woodlands.

7. *Aedes vexans* (Inland floodwater mosquito)

This is a mid-sized mosquito that develops in temporary floodwaters, usually where rivers or creeks overflow their banks. Locally, it is most common in the early summer. It occurs in highly localized populations in Spring Valley, Lower Lake, Upper Lake, and Lake Pillsbury. It is a very aggressive human biter, but is not known to transmit diseases to man, however females are capable of transmitting heart worm to dogs.

8. *Anopheles franciscanus* (No common name)

The adult mosquito can be recognized by its “checkerboard-pattern” of light and dark patches on its wings. Like other immature *Anopheles*, the larvae rest and feed parallel to and just under the water's surface. The adult females feed on large and small mammals, but rarely bite people. Their populations peak in the summer months. Adult females spend the winter in sheltered locations such as barns, sheds, animal burrows, and hollow logs where they are protected from rain, wind, and freezing temperatures.



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9. *Anopheles freeborni* (Western malaria mosquito)

Adult *Anopheles freeborni* have spotted wings, but unlike the other Lake County *Anopheles* species, its wing spots are entirely dark. It reaches its highest numbers in late summer and early fall, and is known to fly more than 30 miles to feed. In the fall, the adult females seek sheltered locations such as barns, sheds, animal burrows, and hollow logs where they are protected from rain, wind, and freezing temperatures. Once they find shelter, they spend the winter in a semi-dormant state, but will emerge on warm days in January and February to seek blood meals. This mosquito readily enters houses to bite man, and is considered the most important vector of malaria in the western United States. It can also transmit myxoma virus to rabbits. Although West Nile, Western equine encephalomyelitis, and St. Louis encephalitis viruses have occasionally been isolated from field-collected specimens, *An. freeborni* is not believed to play an important role in transmitting these diseases.

10. *Anopheles punctipennis* (Woodland malaria mosquito)

Females have a “checkerboard pattern” on the wings, but the pattern is much darker than that of *An. franciscanus*. The larvae are usually found in cut off pools in streambeds and along the edges of slow-flowing streams with abundant algae. Females rarely enter dwellings, preferring to feed on man and other large mammals outside at night.

11. *Culex apicalis* (No common name)

This mosquito is most commonly found in the spring and fall when temperatures are cool. The larvae are found in cut-off pools along woodland creeks. Adult females seek sheltered locations to spend the winter, and emerge in the spring. They are known to feed on toads, reptiles, birds, and small mammals. They are capable of transmitting malaria to people.

12. *Culex boharti* (Bohart’s mosquito)

This mosquito is found in the spring and fall when temperatures are cool. It is known to feed on toads and reptiles, but has not been observed biting man. The larvae are usually found in clean, clear, natural water sources, including the margins of slow-moving streams. This species is not known to transmit any disease.

13. *Culex erythrorhax* (Tule mosquito)

This mosquito has a noticeable reddish-gold color. It is a very aggressive biter of mammals, including humans. Larvae develop and overwinter in permanent and semi-permanent waters with tules and cattails. The adults usually begin emerging in June and are active through October. They usually stay close to their larval habitat, rarely flying more than a mile to find a bloodmeal. Females can transmit West Nile virus, but they seldom pick up the virus in nature since they rarely feed on birds.



14. *Culex pipiens* (Northern house mosquito)

This mosquito is uncommon in Lake County, but extremely common worldwide. It is a small, drab mosquito that usually occurs in manmade water sources like neglected pools, buckets, and wastewater treatment ponds. It tolerates highly polluted water sources, but also occurs in relatively clean water. This mosquito enters homes readily, and (outside of Lake County) is best known as the mosquito you hear buzzing in your ear as you try to sleep. It plays a major role in transmitting West Nile virus, and is also involved in transmitting St. Louis encephalitis virus.

15. *Culex stigmatosoma* (Banded foul water mosquito)

This is a common “backyard” mosquito in Lake County. It will tolerate water that is highly polluted or with a high content of organic material (wastewater ponds, settling ponds, etc.), and is frequently found in unmaintained swimming pools or backyard containers. It feeds mostly on birds and rarely bites people. It transmits West Nile virus and St. Louis encephalitis virus between birds and serves as an important amplifier of those viruses in nature.

16. *Culex tarsalis* (Western encephalitis mosquito)

This is one of the most common mosquitoes in Lake County. This species is easily recognized by the combination of banded legs and the chevron pattern on the underside of the abdomen. The larvae develop in rice fields, ponds, ditches, neglected pools, and other standing water, including backyard sources. Like most other *Culex* mosquitoes, the adult females spend the winter in sheltered locations where they are protected from rain, wind, and freezing temperatures, and emerge in the early spring to feed and lay their eggs. The females are opportunistic feeders, and bite people, other mammals, and birds readily. They are important vectors of West Nile, Western equine encephalomyelitis, and St. Louis encephalitis viruses.

17. *Culex territans* (No common name)

This mosquito is most active in the cool spring and fall months. It is much more common in the northern mountains of Lake County than it is in the Clear Lake basin. It occasionally bites people, but prefers to feed on frogs, snakes, and turtles. It is not known to transmit any diseases to humans, but transmits frog filariasis.

18. *Culex thriambus* (No common name)

This mosquito is closely related to—and closely resembles—*Culex stigmatosoma*. Like its cousin, it also prefers to feed on birds, and is regularly found infected with West Nile virus. However, unlike its cousin, its larvae occur in clean, clear water as well as hoofprints and rockpools.



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19. *Culiseta incidens* (Cool weather mosquito)

This large, dark mosquito with spotted wings likes the cool temperatures of late fall through early spring. It readily bites people and warm-blooded animals. The larvae are found in a wide variety of sources including treeholes, artificial containers, neglected pools, snowpools, temporary ponds, and even brackish (salt) water. They feed at dawn and dusk on a variety of mammals (including people). Although they can transmit West Nile virus (WNV), they are not considered an important vector because they are most active in cool weather when WNV activity is low, and they seldom pick up the virus in nature since they prefer to feed on mammals over birds.

20. *Culiseta inornata* (Large winter mosquito)

This is the largest mosquito in Lake County. As its scientific name indicates, it is a rather plain mosquito. The larvae occur in a wide range of habitats, including ponds, irrigation ditches, rainpools, neglected pools, and artificial containers. It feeds on mammals, but because it is most active during the cooler months, it is not considered an important disease vector.

21. *Culiseta particeps* (No common name)

This large, dark mosquito is very similar to *Culiseta incidens*, but is less common. The larvae are found in shaded, clear pools with algae, leaves and other detritus. The females feed on large mammals, and may bite man. They are not known to transmit any diseases of public health importance.

22. *Orthopodomyia signifera* (White-lined mosquito)

This unusually ornate mosquito develops in permanent treeholes (ones that hold water all year long). It overwinters as a larva, and the adult emerges in mid- to late summer. The larvae are usually pinkish to light red in color, and the adults have a very fine silvery-white lines on the thorax. This species prefers to bite birds, but is rarely collected, and is not known to transmit any disease.

23. *Coquillettidia perturbans* (Cattail mosquito)

The larvae of this mosquito live in permanent ponds that have cattails or other emergent vegetation. The adults are aggressive human biters. Unlike other mosquitoes, *Cq. perturbans* larvae do not come to the surface of the water to breathe; instead, they use their modified siphon to pierce the rootlets of aquatic plants to obtain oxygen from the plants.

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