FINAL
MUNICIPAL SERVICE REVIEW AND SPHERE OF INFLUENCE PLAN

for the

GLENN COUNTY MOSQUITO AND VECTOR CONTROL DISTRICT

GLENN LOCAL AGENCY FORMATION COMMISSION
ADOPTED FEBRUARY 11, 2019
RESOLUTION NO. 2019-02

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TABLE OF CONTENTS

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MUNICIPAL SERVICE REVIEW AND SPHERE OF INFLUENCE PLAN FOR THE GLENN COUNTY MOSQUITO AND VECTOR CONTROL DISTRICT

LAFCO

Established in 1963, Local Agency Formation Commissions (LAFCo) are responsible for administering California Government Code Section 56000 *et. seq.*, which is known as the Cortese-Knox-Hertzberg Local Government Reorganization Act of 2000 (CKH). CKH charges LAFCos with encouraging the orderly formation and development of all local governmental agencies in their respective counties in a manner that preserves agricultural and open-space lands, promotes the efficient extension of municipal services, and prevents urban sprawl. Principle duties include regulating boundary changes through annexations or detachments, approving or disapproving city incorporations; and forming, consolidating, or dissolving special districts. There is a LAFCo located in each of the 58 counties in California.

Spheres of Influence

Under the CKH Act, LAFCos are required to "develop and determine the sphere of influence of each local governmental agency within the county and enact policies designed to promote logical and orderly development of areas within the sphere" (Section 56425, CKH). A Sphere of Influence (SOI) is generally considered a 20-year, long-range planning tool, and is defined by Government Code Section 56425 as ". . . a plan for the probable physical boundary and service area of a local agency. . . ." The sphere indicates the logical area in which the jurisdiction anticipates services will be needed and can be provided. According to the CHK Act, LAFCos are required to review and update SOIs every five years, or as necessary.

A Sphere of Influence is a long-range planning tool that analyzes the physical boundary of a local agency or jurisdiction, and the present and probable need for services within that area. As such, it does not give property inside the sphere boundary any more development rights than already exist as land use authority in these areas remains entirely at the discretion of the applicable local jurisdiction (city or county). Realistically, an agency's SOI is solely reactive to the land use decisions already adopted by the agencies with land use authority. Ultimately, an SOI study assists LAFCo in making decisions about a change in a jurisdiction's future service area boundary.

Various different categories of spheres of influence boundaries are allowed, including: "***growth***" spheres that are larger than an agency's jurisdictional boundaries and anticipates a need to expand services to new territory; "***coterminous***" spheres which mirror the agency's jurisdictional boundaries and indicates no additional service expansions are needed or an inability to expand services; a "***zero***" spheres, which indicate the agency cannot or does not provide any services and should be considered for a merger or dissolved altogether; and a "***minus***" sphere when an agency does or cannot provide services to the territory in question. Establishing the appropriate sphere

category can be challenging as individual circumstances can vary between agencies. City spheres, which may convey future land use entitlements, are more scrutinized for growth impacts than an agency providing limited services such as mosquito abatement districts. Although a helpful tool for future planning, a sphere of influence determination does not convey any specific entitlements to landowners nor require an agency to guarantee services should priorities change.

Municipal Service Reviews

The Cortese-Knox-Hertzberg Act requires that a Municipal Service Review (MSR) be conducted prior to, or in conjunction with, the update of an SOI. A MSR is a comprehensive analysis of service provision by each of the special districts, cities, and the unincorporated county service areas within the legislative authority of the LAFCo. It essentially evaluates the capability of a jurisdiction to serve its existing residents and future development in its SOI. The legislative authority for conducting MSRs is provided in Section 56430 of the CKH Act, which states "... in order to prepare and to update Spheres of Influence in accordance with Section 56425, LAFCos are required to conduct a MSR of the municipal services provided in the County..."

Pursuant to Section 56430, in order to update a SOI, the associated MSR must have written determinations that address the following factors:

1. Growth and population projections for the affected area.

2. The location and characteristics of any disadvantaged unincorporated communities within or contiguous to the sphere of influence.

3. Present and planned capacity of public facilities, adequacy of public services, and infrastructure needs or deficiencies including needs or deficiencies related to sewers, municipal and industrial water, and structural fire protection in any disadvantaged, unincorporated communities within or contiguous to the sphere of influence.

4. Financial ability of agencies to provide services.

5. Status of, and opportunities for, shared facilities.

6. Accountability for community service needs, including governmental structure and operational efficiencies.

7. Any other matter related to effective or efficient service delivery, as required by commission policy.

These determinations must be made by the Commission before, or concurrently with, the sphere review and update for the Glenn County Mosquito and Vector Control District.

Sphere of Influence Plan Update Process

Glenn LAFCo is now in the process of creating an SOI Plan for the Glenn County Mosquito and Vector Control District (GCMVCD). There are numerous factors to consider in reviewing an SOI Plan, including current and anticipated land uses, facilities, and services, as well as any relevant communities of interest. Updates generally involve a comprehensive review of the entire SOI Plan, including boundary and SOI maps and the District's MSR. In reviewing an agency's sphere, the Commission is required to consider and prepare written statements addressing five factors enumerated under California Government Code Section 56425(e). These factors are identified below.

1. The present and planned land uses in the area, including agricultural and open-space lands.

2. The present and probable need for public facilities and services in the area.

3. The present capacity of public facilities and adequacy of public services that the agency provides or is authorized to provide.

4. The existence of any social or economic communities of interest in the area if the commission determines that they are relevant to the agency.

5. For an update of a sphere of influence of a city or special district that provides public facilities or services related to sewers, municipal and industrial water, or structural fire protection, that occurs on or after July 1, 2012, the present and probable need for those public facilities and services of any disadvantaged unincorporated communities within the existing sphere of influence.

Since the GCMVCD does not provide public services or facilities related to sewers, municipal or industrial water or structural fire protection, factor number 5 listed above is not relevant to the analysis.

Special District Background

Special districts are local governments that are separate from cities and counties, yet provide public services. California has over 3,400 special districts, which provide wide range of services from airports to mosquito abatement, fire protection, water conservation and drainage, to name a few. The GCMVCD is an independent district, which means that it is governed by an elected or appointed board of directors. There are over 2,109 independent special districts in the State of California.

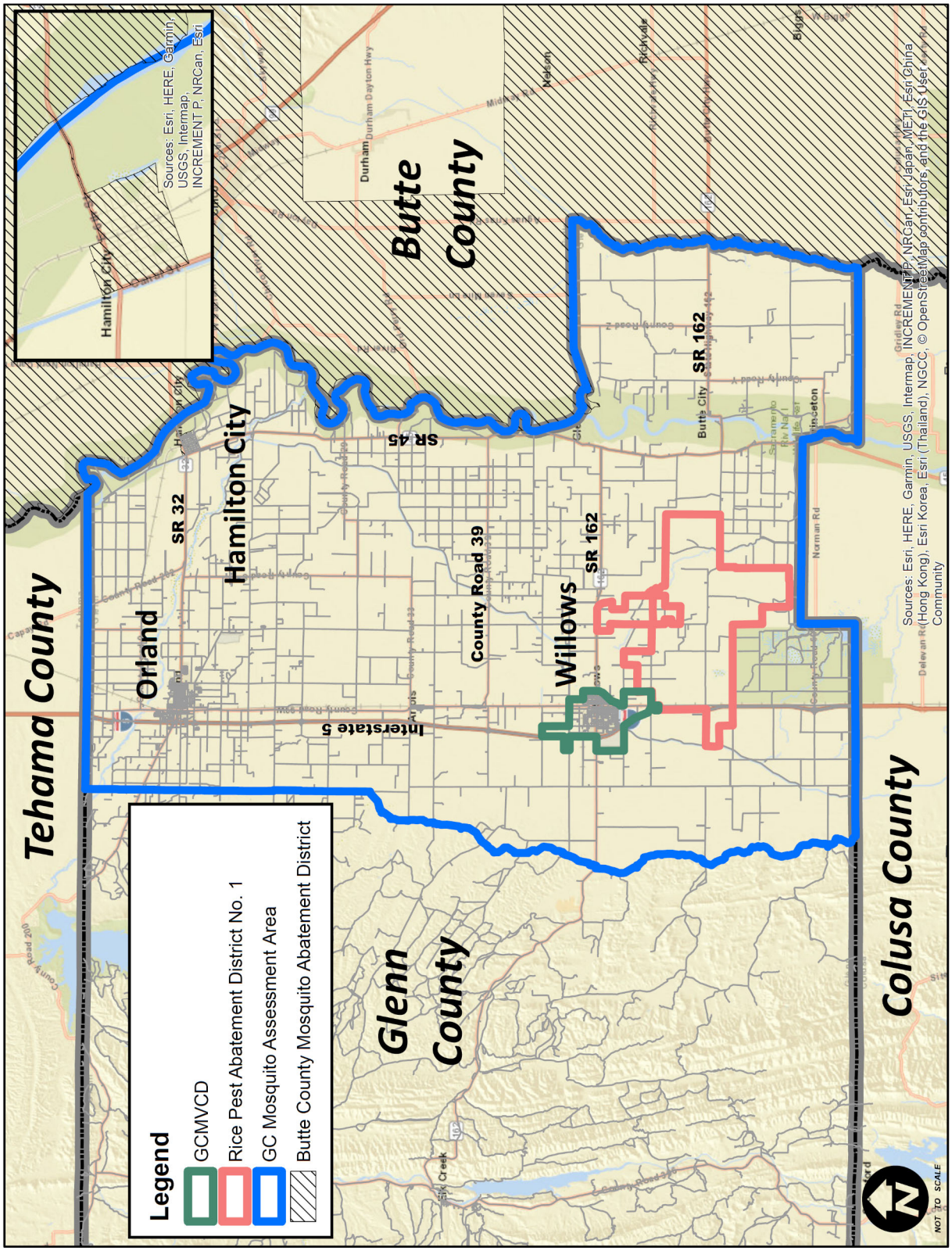
MOSQUITO ABATEMENT DISTRICTS IN GLENN COUNTY

There are four entities in Glenn County that provide mosquito abatement services or generate funding for mosquito abatement services:

- The Glenn County Mosquito and Vector Control District (GCMVCD), which is an independent special district that provides mosquito abatement services to the City of Willows and surrounding area. Additionally, the District provides mosquito abatement services to a large portion of Glenn County under contract with the Glenn County Valley-Wide Mosquito Abatement Assessment District.
- The Butte County Mosquito and Vector Control District (BCMVCD), which is an independent special district that provides mosquito abatement services to a large portion of Butte County and to the unincorporated community of Hamilton City in Glenn County. The parcels within the Hamilton City portion of BCMVCD are assessed an annual fee for the provision of mosquito abatement services.
- Rice Pest Abatement District Number 1, which is an independent special district that provides various types of pest abatement, including mosquito abatement services, to rice fields located southeast of the City of Willows.
- The Glenn County Valley-Wide Mosquito Abatement Assessment District, which was created by the Glenn County Board of Supervisors in 2007. This district is not a special district subject to review by LAFCo, but is a county program administered by the Glenn County Public Health Department. The assessment district's only function is to provide funding for the provision of mosquito abatement services to a large portion of Glenn County. Parcels within the assessment district are assessed an annual fee for the provision of mosquito abatement services. The parcels in the unincorporated Hamilton City area are within the assessment area but are not assessed an annual assessment by the Valley-Wide Mosquito Abatement Assessment District. As previously noted, the Glenn County Mosquito and Vector Control District provides mosquito abatement services to the parcels within the Valley-Wide Mosquito Abatement Assessment area under a contract with Glenn County.

The following map shows the location of the four mosquito abatement entities in Glenn County.

Mosquito Abatement Entities in Glenn County



Mosquito and Vector Control District Laws

All mosquito and vector control districts within the State of California operate under the authority of the State of California, which is codified in the Health and Safety Code, Section 2000, *et seq,* and which is known as the Mosquito Abatement and Vector Control District Law. Prior to 2003, mosquito abatement districts operated under the requirements of the Mosquito Abatement District Law, which became law in 1939. In 2003, Senate Bill 1588 enacted the new Mosquito Abatement and Vector Control District Law. SB 1588 was the first thorough revision of the districts' principal act in decades. A 20-member Working Group carefully drafted the new Law to spell out the districts' policies, powers, procedures, and oversight duties.

The Mosquito Abatement and Vector Control District Law allows a district to exercise the following powers:

- Conduct surveillance programs, prevent, abate, and control vectors and vector-borne diseases.
- Request inspection warrants and enter property "where there is no reasonable expectation of privacy."
- Participate in land use planning and environmental quality processes.
- Abate public nuisances and recover the districts' costs with liens.
- Impose a $1,000 a day civil penalty for failing to abate a public nuisance.
- Pay the boards of trustees' expenses and benefits but not regular stipends.
- Raise revenues with special taxes, benefit assessments, and fees.
- Borrow funds, like other local governments, for cash-flow purposes.
- Manage their own finances, similar to some other special districts.

The Mosquito Abatement and Vector Control District Law also:

- Provides that forming a new district requires adherence to the Cortese-Knox-Hertzberg Act but does not require voter approval.
- Allows county boards of supervisors and city councils to appoint the members of the districts' boards of trustees.
- Allows the Director of the State Department of Health Services to resolve disputes between districts and other public agencies.
- Retains an exception from public nuisance abatement for flies from agricultural operations that use accepted standards and practices.
- Exempts property that has not been artificially altered from its natural condition from the districts' power to abate public nuisances.
- Clarifies the districts' annual budget procedures, increasing the controls over budget reserves, including public health emergencies.
- Allows special benefit assessments to finance vector control projects and programs, consistent with Proposition 218.

- Allows officials to create zones within a district to provide different levels of service with different revenue sources.
- Contains cross-references to other major statutes that apply to mosquito abatement districts as well as to other local governments.
- Requires officers and employees to be bonded if they manage a district's funds.
- Requires stricter accounting for budgetary reserves.
- Repeats the requirement for the districts to conduct regular audits and file annual reports with the State Controller.

California Health and Safety Code §2022(a) states that each person appointed by a board of supervisors to be a member of a board of trustees shall be a voter in that county and a resident of that portion of the county that is within the district. Section 2022(b) states that each person appointed by a city council to be a member of a board of trustees shall be a voter in that city and a resident of that portion of the city that is within the district. California Health & Safety Code §2022(d) states that it is the intent of the Legislature that persons appointed to boards of trustees have experience, training, and education in fields that will assist in the governance of the districts. Finally, §2022(e) states that all trustees shall exercise their independent judgment on behalf of the interests of the residents, property owners, and the public as a whole in furthering the purposes and intent of this chapter. The trustees shall represent the interests of the public as a whole and not solely the interests of the board of supervisors or the city council that appointed them. A mosquito abatement district trustee serves for a fixed term of office, and not merely at the pleasure or discretion of the appointing authority.[1]

Brief History of California Mosquito Abatement Districts[2]

Although the state laws on mosquito abatement districts date from 1915, the state's first efforts to control mosquitoes occurred against salt marsh mosquitoes in San Rafael in 1904 under the direction of Professor C.W. Woodworth of the University of California, Berkeley. According to a history of these efforts, "hordes of mosquitoes were causing great annoyance and lowering real estate values." In February 1905, the Burlingame Improvement Club provided $2,000 to the UC Agricultural Experiment Station for ditches and dikes that drained tidal salt marshes along San Francisco Bay. Using techniques developed along the Panama Canal, UC personnel applied oil and "Panama Larvicide" to kill immature mosquitoes.

Reactions to disease. Thousands of cases of malaria in California resulted in 112 deaths in 1909. In 1910, specific areas of the state had malaria death rates that were significantly higher than the national rate. While the national death rate was 4.8 per 100,000, in the Shasta-Tehama-Butte area the rate was 46.3 per 100,000.

First efforts. A 1908 malaria outbreak in the Central Valley prompted the Southern Pacific Railway to sponsor a mosquito control education program by UC professor William B. Herms. Anti-malaria programs followed in 1910 in Penryn, **Oroville**, and Bakersfield and in

[1]State of California, Office of the Attorney General, Opinion No. 09-502.
[2]California Senate Local Government Committee. Science, Service, and Statutes: A Legislative History of Senate Bill 1588 and the "Mosquito Abatement & Vector Control District Law." September 2003.

Los Molinos in 1911. The California Mosquito Control Association credited the Penryn effort as "the first organized anti-malaria campaign in the United States."

First bill. In 1913, Governor Hiram W. Johnson pocket-vetoed a bill that would have allowed communities to create "mosquito control districts" and make appointments to mosquito control boards. Later, Assembly Bill 1463, authored by Assemblyman John H. Guill, Jr. (D-Oroville), passed the Assembly in April 1913 but apparently ran into trouble in the Senate Committee on Public Health and Quarantine, which recommended against the bill. Although Guill's measure passed the Senate in May 1913, Governor Johnson declined to sign the bill and it did not become law. In those days, when a governor pocket-vetoed a bill, he did not have to issue a veto message that explained his reasons. A governor's inaction simply killed a bill.

First law. Legislative success occurred in 1915 when Governor Johnson signed Assembly Bill 1565 that allowed communities to set up "mosquito abatement districts." The author of AB 1565 was the Assembly Committee on Public Health and Quarantine, chaired by Assemblyman George Beck (D-Livermore). Signed into law as Chapter 584 of the Statutes of 1915, the measure spelled out the steps needed to form a mosquito abatement district and provided for county boards of supervisors and city councils to appoint five-member boards of trustees to govern the districts.

First districts. The first three districts formed in 1915-16 were the Marin Mosquito Abatement District, the Three Cities Mosquito Abatement District (San Mateo County), and the Kern Mosquito Abatement District. The Pulgas Mosquito Abatement District (San Mateo County) and the Oroville Mosquito Abatement District followed the next year.

Statutory revisions. In 1929, the Legislature overhauled the original 1915 statute by passing Assembly Bill 568, authored by Assemblyman Frank L. Coombs (R-Napa). Born in Napa in 1853, Coombs was an attorney with a distinguished public career which included two stints as Speaker of the Assembly (1891 and 1897), U.S. ambassador to Japan, State Librarian, U.S. Attorney for Northern California, and Member of Congress. Coombs returned to the Assembly in the 1920s. Governor C.C. Young signed AB 568 into law as Chapter 804 of the Statutes of 1929.

The California Mosquito Control Association formed in 1930 through the efforts of UC Berkeley Professor Herms and with Harold F. Gray, the manager of the Alameda County Mosquito Abatement District. Now called the Mosquito and Vector Control Association of California, the professional association continues to represent the districts and other local programs.

Codification. The bewildering complexity of California's state laws led to a decades-long effort that systematically organized the statutes into topical codes. In 1939, legislators created the Health and Safety Code, combining hundreds of earlier laws. Senate Bill 657 was authored by Senator Frank W. Mixler (R&D-Tulare) and Senator John D. Foley (D-Santa Clara). Because of SB 657, the state laws governing the mosquito abatement districts became Chapter 5 (commencing with Section 2200) of Division 3 of the new Health and Safety Code.

By 1945, there were 25 local mosquito control agencies in California, most of them mosquito abatement districts. However, after World War II there was a "meteoric growth in the number of new districts and the expansion of existing districts," according to Charles Myers. Myers attributed this growth and expansion to three factors:

- Fear of mosquito borne diseases returning with servicemen
- The availability and initial effectiveness of DDT
- State financial aid to local efforts, including the mosquito abatement districts.

The districts remained popular and effective even though the insecticides changed and the state stopped its subventions. By 1977-78, there were 53 mosquito abatement districts. In 1999-00, the State Controller counted 46 mosquito abatement and vector control districts.

SB 1588 (Mosquito Abatement and Vector Control District Law.) On September 5, 2002, Governor Gray Davis signed SB 1588. The next day the Governor's office issued a press release that declared:

> *This law gives mosquito abatement and vector control districts the tools they need to stand as guardians of epidemics, public health emergencies, and economic disasters. California needs this additional protection to help prevent the spread of diseases carried by mosquitoes.*

On September 6, 2002, Secretary of State Bill Jones chaptered the Committee's bill as Chapter 395 of the Statutes of 2002. The newly enacted Mosquito Abatement and Vector Control District Law became effective on January 1, 2003.

GENERAL INFORMATION ABOUT MOSQUITOES[3]

Mosquitoes are insects belonging to the order Diptera, the True Flies. Like all True Flies, they have two wings, but unlike other flies, mosquito wings have scales. Female mosquitoes' mouthparts form a long skin piercing-sucking proboscis. Males differ from females by having feathery antennae and mouthparts not suitable for piercing skin. A mosquito's principal food is nectar or similar sugar source, however, females do require blood protein in order to lay eggs.

There are over 3,000 different species of mosquitoes throughout the world; currently 176 species are recognized in the United States. A new species, *Anopheles grabhamii*, was reported from the Florida Keys in 2001 (Darsie et al. 2002). Each mosquito species has a Latin scientific name, such as *Anopheles quadrimaculatus*. *Anopheles* is the "generic" name of a group of closely related mosquitoes and *quadrimaculatus* is the "species" name that represents a group of individuals that are similar in structure and physiology and capable of interbreeding. These names are used in a descriptive manner so that the name tells something about each particular mosquito, for example, *Anopheles* - Greek meaning hurtful or prejudicial and *quadrimaculatus* - Latin meaning four spots (4

[3] Most of the information in this section was obtained from the American Mosquito Control Association's web page (http://www.mosquito.org/mosquito-info).

dark spots on the wings). Some species have what are called "common names" as well as scientific names, such as *Ochlerotatus taeniorhynchus*, the "black salt marsh mosquito."

Scientific investigators (taxonomists) are constantly looking for new mosquitoes, as well as reviewing previously identified specimens for new information or identifying characteristics. Better microscopic equipment developed in the last 20 years has improved the taxonomist's ability to determine differences between species. Recently such a review by Dr. John Reinert (2000) led to a change in the name of many mosquitoes belonging to the genus *Aedes*. Using improved methods and over 30 years' experience he elevated a subgenus of *Aedes* (*Ochlerotatus*) to the status of genus. This will necessitate the renaming of many mosquitoes previously named Aedes to the genus Ochlerotatus and the rewriting of many taxonomic keys important to public health entomologists working in mosquito control.

The Name "Mosquito"

The Spanish called the mosquitoes "musketas," and the native Hispanic Americans called them "zancudos." "Mosquito" is a Spanish or Portuguese word meaning "little fly" while "zancudos," a Spanish word, means "long-legged." The use of the word "mosquito" is apparently of North American origin and dates back to about 1583. In Europe, mosquitoes were called "gnats" by the English, "Les moucherons" or "Les cousins" by French writers, while the Germans used the name "Stechmucken" or "Schnacke." In Scandinavian countries mosquitoes were called by a variety of names including "myg" and "myyga" and the Greeks called them "konopus." In 300 B.C., Aristotle referred to mosquitoes as "empis" in his "Historia Animalium" where he documented their life cycle and metamorphic abilities. Modern writers used the name Culex and it is retained today as the name of a mosquito genus. What is the correct plural form of the word mosquito? In Spanish it would be "mosquitos," but in English "mosquitoes" (with the "e") is correct.

Mosquitoes can be an annoying, serious problem in man's domain. They interfere with work and spoil hours of leisure time. Their attacks on farm animals can cause loss of weight and decreased milk production. Some mosquitoes are capable of transmitting diseases such as malaria, yellow fever, dengue, filariasis and encephalitis [St. Louis encephalitis (SLE), Western Equine encephalitis (WEE), LaCrosse encephalitis (LAC), Japanese encephalitis (JE), Eastern Equine encephalitis (EEE) and West Nile virus (WNV)] to humans and animals.

Some species of mosquitoes *fly over twenty miles*, while others fly no further than they must to find a human or animal host to bite. Only female mosquitoes bite; the female needs proteins in blood for egg development, although both males and females feed on plant nectar as a source of carbohydrates. Some species lay several hundred eggs at a time in rafts on water, while other species will lay their eggs singly on the water. Generally, females lay eggs in all types of freshwater and certain species prefer somewhat polluted water such as sewage, street drainage, septic tanks, cesspools, and industrial waste. Some species do not lay their eggs in water however, all mosquito larvae require water to develop. When eggs are laid directly in water they float in clusters called rafts and hatch into larvae in one to four days. Larvae, or "wigglers", feed on small organic

particles and microorganisms in the water, however they must always return to the surface to breath.

At the end of the larval stage in approximately four to six days, the wigglers will molt in to the aquatic pupa called "tumbler". At this stage, the pupa will not feed and will only move if disturbed. The tumbler will transform into an adult in about two days at which time the new adult splits the pupal skin and emerges at the surface. Transformation from egg to adult, under optimum conditions, ***generally takes a week***. However, mosquito development times will vary dependent on temperatures and nutrients of the water in which they develop.

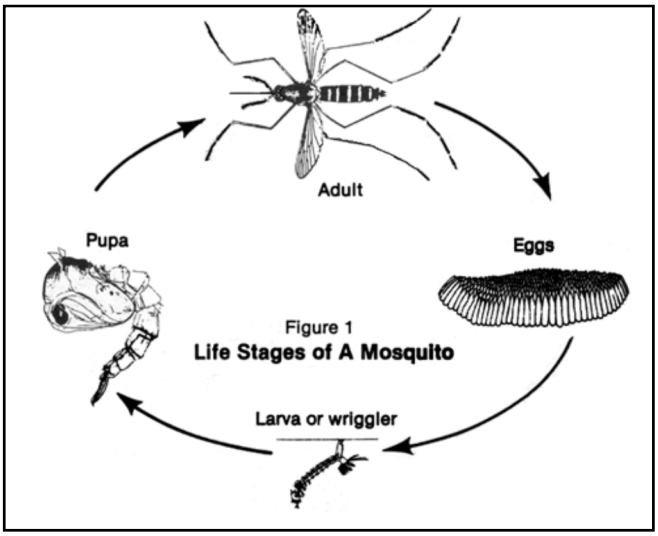


Figure 1
Life Stages of A Mosquito

Mosquito Biology

Many mosquitoes, such as *Culex quinquefasciatus*, lay their eggs on the surface of fresh or stagnant water. The water may be in tin cans, barrels, horse troughs, ornamental ponds, swimming pools, puddles, creeks, ditches, catch basins or marshy areas. Mosquitoes prefer water sheltered from the wind by grass and weeds.

Culex mosquitoes usually lay their eggs at night over a period of time sticking them together to form a raft of from 100 to 300 eggs. A raft of eggs looks like a speck of soot floating on the water and is about 1/4 inch long and 1/8 inch wide. A female mosquito ***may lay a raft of eggs every third night during its life span***.

Anopheles and many other mosquitoes lay their eggs singly on the water surface. *Aedes* and *Ochlerotatus* mosquitoes lay their eggs singly, usually on damp soil. *Aedes* and *Ochlerotatus* eggs are more resistant to drying out (some require complete drying out before the eggs will hatch) and hatch only when flooded with water (salt water high tides, irrigated pastures, tree holes flooded by rains, flooded stream bottoms). *Anopheles, Culex* and *Mansonia* eggs are susceptible to drying out during extended droughts. Tiny mosquito larvae (1st instar) emerge from the eggs within 24 - 48 hours almost in unison.

Mosquito Larva

Mosquito larvae, commonly called "wigglers," live in water from 4 to 14 days depending on water temperature. Larvae of almost all species must come to the surface at frequent intervals to obtain oxygen through a breathing tube called a siphon. Larvae of *Coquillettidia* and *Mansonia* possess modified siphons that allow them to pierce the stems of emergent vegetation in water and draw their oxygen from the plant in this process. Larvae are constantly feeding since


MOSQUITO LARVAE

maturation requires a huge amount of energy and food. They hang with their heads down and the brushes by their mouths filtering anything small enough to be eaten toward their mouths to nourish the growing larvae. They feed on algae, plankton, fungi and bacteria and other microorganisms. They breathe at the water surface with the breathing tube up breaking the water surface tension. The larvae of a few mosquito species are cannibalistic, feeding on larvae of other mosquitoes: *Toxorhynchites* and some *Psorophora*, the largest mosquitoes known, are predators of other mosquito larvae sharing their habitat. Their larvae are much larger than other mosquito larvae.

During growth, the larva molts (sheds its skin) four times. The stages between molts are called instars. At the 4th instar, the usual larva reaches a length of almost 1/2 inch and toward the end of this instar ceases feeding. When the 4th instar larva molts, it becomes a pupa.

Mosquito Pupa

Mosquito pupae, commonly called "tumblers," live in water from 1 to 4 days, depending upon species and temperature. The pupa is lighter than water and therefore floats at the surface. It takes oxygen through two breathing tubes called "trumpets." The pupa does not eat, but it is not an inactive stage. When disturbed, it dives in a jerking, tumbling motion toward protection and then floats back to the surface.

MOSQUITO PUPAE

The metamorphosis of the mosquito into an adult is completed within the pupal case. The pupal case thus serves as a factory wherein the mosquito makes an adult out of a larva. The adult mosquito splits the pupal case and emerges to the surface of the water where it rests until its body dries and hardens.

Mosquito Adult

Only female mosquitoes require a blood meal and bite animals - warm or cold blooded - and birds. Stimuli that influence biting (blood feeding) include a combination of carbon dioxide, temperature, moisture, smell, color and movement. Male mosquitoes do not bite, but feed on the nectar of flowers or other suitable sugar source. Acquiring a blood meal (protein) is essential for egg production, but mostly both male and female mosquitoes are nectar feeders for their nutrition. Female *Toxorhynchites* actually can't obtain a bloodmeal and are restricted to a nectar diet. Of those female mosquitoes capable of blood feeding, human blood meals are seldom first or second choices. Horses, cattle, smaller mammals and/or birds are preferred.

Aedes and *Ochlerotatus* mosquitoes are painful and persistent biters. They search for a blood meal early in the morning, at dusk (crepuscular feeders) and into the evening. Some are diurnal (daytime biters) especially on cloudy days and in shaded areas. They usually do not enter dwellings, and they prefer to bite mammals like humans. *Aedes* and *Ochlerotatus* mosquitoes are strong fliers and are known to fly many miles from their larval developments sites.

Culex mosquitoes are painful and persistent biters also, but prefer to attack at dusk and after dark. They readily enter dwellings for blood meals. Domestic and wild birds usually are preferred over man, cows, and horses. *Culex nigripalpus* is known to transmit St. Louis encephalitis to man in Florida. *Culex* mosquitoes are generally weak fliers and do not move far from home, although they have been known to fly up to two miles. *Culex* usually live only a few weeks during the warm summer months. Those females that emerge in late summer search for sheltered areas where they "hibernate" until spring. Warm weather brings them out again in search of water on which to lay their eggs.

Culiseta mosquitoes are moderately aggressive biters, attacking in the evening hours or in the shade during the day. *Psorophora, Coquillettidia* and *Mansonia* mosquitoes are becoming more pestiferous as an ever-expanding human population invades their natural habitats. Anopheles mosquitoes are persistent biters and are the only mosquitoes which transmit malaria to man.

MOSQUITO-BORNE DISEASES

Mosquitoes cause more human suffering than any other organism -- over one million people worldwide die from mosquito-borne diseases every year. Not only can mosquitoes carry diseases that afflict humans, they also transmit several diseases and parasites that dogs and horses are very susceptible to. These include dog heartworm, West Nile virus (WNV) and Eastern equine encephalitis (EEE). In addition, mosquito bites can cause severe skin irritation through an allergic reaction to the mosquito's saliva - this is what causes the red bump and itching. Mosquito vectored diseases include protozoan diseases, i.e., malaria, filarial diseases such as dog heartworm, and viruses such as dengue, encephalitis and yellow fever. CDC Travelers' Health provides information on travel to destinations where human-borne diseases might be a problem.

Malaria

Malaria is an ancient disease. In all likelihood originating in Africa, it has been described by the Chinese as far back as 2700BC and the Sumerians from 1700 BC. The malaria parasite (plasmodium) is transmitted by female Anopheles mosquitoes. The term malaria is attributed to Horace Walpole in a letter from Italy in 1740 and is derived from the Italian 'mal-aria" or "bad air" because it was thought to come on the wind from swamps and rivers. Scientists conducted much research on the disease during the 1880s and early 1900s. Approximately 40% of the world's population is susceptible to malaria, mostly in the tropical and sub-tropical areas of the world. It was by and large eradicated in the temperate area of the world during the 20th century with the advent of DDT and other organochlorine and organophosphate mosquito control insecticides. An elevated standard of living, including the use of air conditioners and window screens, along with public health interventions have largely remanded malaria transmission to tropical areas. Nonetheless, it can still be found in northern Europe.

More than one million deaths and 300 - 500 million cases are still reported annually in the world. It is reported that malaria kills one child every 40 seconds. In the United States malaria affected colonization along the eastern shore and wasn't effectively controlled until the 1940s when mosquito control organization instituted Anopheles control programs. A resurgence occurred during the 1960s and early 70s in the United States due

to returning military personnel from Vietnam. Minor outbreaks of locally-acquired malaria occur sporadically in the United States, but have been quickly controlled by aggressive mosquito control measures. The influx of illegal immigrants in addition to returning tourists may provide for infrequent outbreaks in the future.

Antimalarial drugs have been available for more than 50 years and recently scientists in Britain and the United States have cracked the code of the malaria parasite genome, a step that may help boost the campaign against the disease. In the meantime, active case detection

Chikungunya
Chikungunya virus is a pathogen transmitted by mosquitoes, and has established itself in the Caribbean (approximately 350,000 suspected cases in the Western Hemisphere since December 2013). It has now resulted in two cases of locally-transmitted Chikungunya virus in Florida in July of 2014. As of July 22, 2014, 497 travel-related cases have been found in 35 states, Puerto Rico and the U.S. Virgin Islands. The occurrence of locally-transmitted cases causes public health officials fear to its spread and establishment in states bordering the Caribbean. The name "Chikungunya" is attributed to the Kimakonde (a Mozambique dialect) word meaning "that which bends up", which describes the primary symptom – excruciating joint pain. Although rarely fatal, the symptoms are debilitating and may persist for several weeks. There is no vaccine and primary treatment is limited to pain medication.

The mosquito species that transmit this disease are the Asian Tiger Mosquito (*Aedes albopictus*) and the Yellow Fever Mosquito (*Aedes aegypti*). Genetically, it appears that viral strain currently spreading throughout the Americas is more easily transmitted by *Ae. aegypti*. Both species lay their eggs in containers such as cans, discarded tires and other items that hold water close to human habitation, but *Ae. aegypti* is more geographically confined to the southeastern United States. Traditional mosquito methods of truck-mounted and aerial sprays are ineffective in controlling these mosquitoes. Removal of water-bearing containers and sanitation are key preventive strategies.

Dog Heartworm (*Dirofilaria immitis*)
Dog heartworm (Dirofilaria immitis) can be a life-threatening disease for canines. The disease is caused by a roundworm. Dogs and sometimes other animals such as cats, foxes and raccoons are infected with the worm through the bite of a mosquito carrying the larvae of the worm.

It is dependent on both the mammal and the mosquito to fulfill its life cycle. The young worms (called microfilaria) circulate in the blood stream of the dog. These worms must infect a mosquito in order to complete their lifecycle. Mosquitoes become infected when they blood feed on the sick dog. Once inside the mosquito the microfilaria leave the gut of the mosquito and live in the body of the insect, where they develop for 2-3 weeks. After transforming twice in one mosquito the third stage infective larvae move to the mosquito's mouthparts, where they will be able to infect an animal. When the mosquito blood feeds, the infective larvae are deposited on the surface of the victim's skin. The larvae enter the skin through the wound caused by the mosquito bite. The worms burrow

into the skin where they remain for 3-4 months. If the worms have infected an unsuitable host such as a human, the worms usually die. The disease in dogs and cats cannot be eliminated but it can be controlled or prevented with pills and/or injections. Some risk is present when treating dogs infected with heartworms but death is rare; still prevention is best. Of course, good residual mosquito control practices reduce the threat of mosquito transmission. Until the late sixties, the disease was restricted to southern and eastern coastal regions of the United States. Now, however, cases have been reported in all 50 states and in several provinces of Canada.

Arthropod-borne viruses (arboviruses) are the most diverse, numerous and serious diseases transmitted to susceptible vertebrate hosts by mosquitoes and other blood-feeding arthropods. Arboviral encephalitides are primarily zoonotic, being maintained in complex life cycles involving a nonhuman primary vertebrate host and a primary arthropod vector. These cycles usually remain undetected until humans encroach on a natural focus, or the virus escapes this focus via a secondary vector or vertebrate host as the result of some ecologic change. Humans and domestic animals can develop clinical illness but usually are "dead-end" hosts because they do not produce significant viremia, and do not contribute to the transmission cycle. There are several virus agents of encephalitis in the United States: West Nile virus (WN), eastern equine encephalitis (EEE), western equine encephalitis (WEE), St. Louis encephalitis (SLE), La Crosse (LAC) encephalitis, dengue and yellow fever all of which are transmitted by mosquitoes. Another virus, Powassan, is a minor cause of encephalitis in the northern United States, and is transmitted by ticks. A new Powassan-like virus has recently been isolated from deer ticks. Encephalitis is global, in Asia, for example, about 50,000 cases of Japanese encephalitis (JE) are reported annually.

Dengue

Dengue is a serious arboviral disease of the Americas, Asia and Africa. Although it has a low mortality, dengue has very uncomfortable symptoms and has become more serious, both in frequency and mortality, in recent years. *Aedes aegypti* and *Ae. albopictus* are the vectors of dengue. These mosquitoes prefer to lay their eggs in containers close to human habitations and are not well-controlled by standard spraying techniques. The spread of dengue throughout the world can be directly attributed to the proliferation and adaptation of these mosquitoes. Over the last 16 years dengue has become more common, for example; in south Texas 55 cases were reported in 1999 causing one death. More recently, Hawaii recorded 85 cases of dengue during 2001 and the Florida Keys reported over 20 cases in 2010. In 2004 Venezuela has reported more than 11,600 cases classic dengue fever and over 700 cases of DHF. Indonesia dengue outbreak has caused over 600 deaths and more than 54,000 cases. In 1999, Laredo and Nuevo Laredo had an outbreak of almost a 100 cases.

In 2010, Puerto Rico experienced its largest outbreak, with 21,000 cases reported. In 2009, Florida reported the first cases of local dengue transmission in 75 years, within Old Town, Key West. A serosurvey of residents suggested an infection rate of 5%, indicating serious risk of transmission. Despite thorough control efforts carried out by the county and state in early 2010, by the end of 2010, Florida had reported an additional 65 locally acquired

dengue cases. All the cases were in Key West, except two cases in two more northerly counties.

Yellow fever
Yellow fever, which has a 400-year history, at present occurs only in tropical areas of Africa and the Americas. It has both an urban and jungle cycle. It is a rare illness of travelers anymore because most countries have regulations and requirements for yellow fever vaccination that must be met prior to entering the country. Every year about 200,000 cases occur with 30,000 deaths in 33 countries. It does not occur in Asia. Over the past decade, it has become more prevalent. In 2002 one fatal yellow fever death occurred in the United States in an unvaccinated traveler returning from a fishing trip to the Amazon. In May 2003, 178 cases and 27 deaths caused by yellow fever were reported in southern Sudan. In the Americas 226 cases of jungle yellow fever have been reported with 99 deaths (ProMed 12-22-03).

Eastern Equine Encephalitis (EEE)
Eastern Equine Encephalitis (EEE) is spread to horses and humans by infected mosquitoes. It is among the most serious of a group of mosquito-borne arboviruses that can affect the central nervous system and cause severe complications and even death. EEE is found in freshwater hardwood swampland in the Atlantic and Gulf Coast states in the eastern part of North America, Central and South America, and the Caribbean. It has a complex life cycle involving birds and a specific type of mosquitoes including several *Culex* species and *Culiseta melanura*. These mosquitoes feed on infected birds and become carriers of the disease and then feed on humans, horses and other mammals. EEE cannot be transmitted from humans or other mammals because the viremia presented in the disease is not sufficient to further transmission. Thus, humans and other animals are known as "dead-end hosts." Symptoms may range from none at all to a mild flu-like illness with fever, headache, and sore throat. More serious infections of the central nervous system lead to a sudden fever and severe headache followed quickly by seizures and coma. About half of these patients die from the disease. Of those who survive, many suffer permanent brain damage and require lifetime institutional care. There is no specific treatment. A vaccine is available for horses, but not humans.

St. Louis Encephalitis (SLE)
St. Louis Encephalitis (SLE) is transmitted from birds to man and other mammals by infected mosquitoes (mainly some Culex species). SLE is found throughout the United States, but most often along the Gulf of Mexico, especially Florida. Major SLE epidemics occurred in Florida in 1959, 1961, 1962, 1977, and 1990. The elderly and very young are more susceptible than those between 20 and 50. During the period 1964-1998 [35 years] a total of 4478 confirmed cases of SLE were recorded in the United States Symptoms are similar to those seen in EEE and like EEE, there is no vaccine. Mississippi's first case of St. Louis Encephalitis since 1994 was confirmed in June 2003. Previously the last outbreak of SLE in Mississippi was in 1975 with over 300 reported cases. It was the first confirmed mosquito-borne virus in the United States in 2003. It turned up in October 2003 in California Riverside County in sentinel chickens. The last [SLE] human case in California occurred in 1997. In Louisiana in 2003 there was a fatal St Louis Encephalitis case previously listed as a West Nile caused death.

LaCrosse Encephalitis (LAC)
LaCrosse encephalitis (LAC) is much less widespread than EEE or SLE, but approximately 90 cases occur per year occurs in all 13 states east of the Mississippi, particularly in the Appalachian region. It was reported first in 1963 in LaCrosse, Wisconsin and the vector is thought to be a specific type of woodland mosquito (*Aedes triseriatus*) called the tree-hole mosquito, with small mammals the usual warm-blooded host. Infrequent fatalities occur in children younger than 16. It is not transmissible from human to human. There is no vaccine for LaCrosse encephalitis.

Western Equine Encephalitis (WEE)
Western Equine Encephalitis (WEE) was first recognized in 1930 in a horse in California. It is found west of the Mississippi including parts of Canada and Mexico. The primary vector is *Culex tarsalis* and birds are the most important vertebrate hosts with small mammals playing a minor role. Unlike LAC it is nonspecific in humans and since 1964 fewer than 1000 cases have been reported. As with EEE, a vaccine is available for horses against WEE but not for humans.

West Nile Virus (WNV)
West Nile virus (WNV) emerged from its origins in 1937 in Africa (Uganda) into Europe, the Middle East, west and central Asia and associated islands. It is a Flavivirus (family Flaviviridae) with more than 70 identified viruses. Serologically, it is a Japanese encephalitis virus antigenic complex similar to St. Louis, Japanese and Murray Valley encephalitis viruses. Similar to other encephalitises, it is cycled between birds and mosquitoes and transmitted to mammals (including horses) and man by infected mosquitoes. WNV might be described in one of four illnesses: West Nile Fever might be the least severe, characterized by fever, headache, tiredness and aches or a rash, sort of like the "flu". This might last a few days or several weeks. At least 63% of patients report symptoms lasting over 30 days, with the median being 60 days. The other types are grouped as "neuroinvasive disease" which affects the nervous system; West Nile encephalitis which affects the brain, and West Nile meningitis (meningoencephalitis) which is an inflammation of the brain and membrane around it. West Nile virus first appeared in North America in 1999 in New York with 62 confirmed cases and 7 human deaths. In the United States (2004) over 43 species of mosquitoes have tested positive for WNV transmission, and the Culex pipiens group seems the most common species associated with infecting people and horses. Currently, 65 mosquito and 300 bird species have tested positive in the United States for this virus.

From 2003 through 2017, there have been 48,033 cases of WNV from throughout the United Stated reported to the CDC, with 1,879 deaths reported.[4] For the same years California had a total of 6,583 reported cases of WNV, with 292 WNV-related fatalities. The following table shows the number of WNV cases in California for the years 2003 through 2017.

[4] https://www.cdc.gov/westnile/index.html.

West Nile Virus Disease Cases Reported to CDC in California, 2003 through 2017

2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	Total
3	779	880	278	380	445	112	111	158	479	379	801	783	442	553	6,583

Glenn County has experienced a significant number of West Nile virus-related cases since the virus became established in the county. Since 2013, Glenn County has had 48 reported cases of West Nile virus, which resulted in three deaths. It should be noted that Glenn County has the highest incidence rate of WNV per 100,000 persons in California, which can be attributed to the county's very low population and its location in an area with large mosquito populations. The following table shows West Nile virus activity in Glenn County for the years 2013 through 2018.

Reported Incidence of West Nile Virus in Glenn County, 2013 through 2018

	Total # Infections	Symptomatic Infections (Cases)	Asymptomatic Infections	Deaths	Incidence per 100,000 persons
2013	9	9	0	1	31.75
2014	10	10	0	1	35.27
2015	21	19	2	0	67.02
2016	6	6	0	0	21.16
2017	0	0	0	0	0
2018	2	2	0	1	6.95
Totals	**48**	**46**	**2**	**3**	N/A

Source: California West Nile Virus Website (http://westnile.ca.gov/)

Zika Virus

Zika virus has emerged from its origins in central Africa and has rapidly spread to the South Pacific and western hemisphere. A Flavivirus related to West Nile, Yellow Fever, St Louis and the equine encephalitides, Zika was first discovered in macaque monkeys in 1947 in the Zika Forest region of Uganda. Since its discovery in 2014 off the coast of South America, Zika cases have been found in 35 countries in the Americas.

As of 28 April, 2016, there have been 426 reported cases of Zika virus due to travel to endemic areas. However, local transmission within the continental United States has, as yet, not been reported. In US Territories in the Caribbean, a total of 599 cases have been reported, with 596 being locally acquired, primarily in Puerto Rico and the US Virgin Islands.

Although in rare cases Zika can be spread through sexual contact with an infected person, it is usually transmitted through the bite of an infected Aedes agypti or Aedes albopictus mosquito. The illness is usually quite mild, with fever, rash, conjunctivitis and joint pain lasting a few days to several weeks or months. Often patients are not sick enough to seek medical treatment so a great many cases are not reported. It is thought that one attack confers immunity. However, cases of microcephaly, a congenital defect of cranium and brain size resulting in profound neurological defects in newborns usually resulting in death have been positively identified as being caused by Zika infection. An autoimmune condition called Guillain-Barré syndrome, causing damage to nerve cells

resulting in muscle weakness and, on occasion, paralysis and death has been linked to Zika infection.

The mosquito vectors of Zika virus are peridomestic, preferring to lay their eggs above the waterline of containers, treeholes, creases in tarpaulins and other vessels that may contain water. Aedes aegypti, in particular, will lay eggs in a series of containers after feeding. Both Aedes agypti and Aedes albopictus will feed day or night when a potential host comes within their limited flight ranges. Aedes agypti has more of a tendency to enter and stay within houses if conditions are proper. This species is exceedingly skittish, often leaving its host prior to taking a full blood meal when the host moves. Both mosquitoes also seem to prefer feeding on the host's lower extremities.

Traditional outdoor ULV sprays are ineffective against Aedes agypti, it being difficult to obtain contact with the spray droplets in flight due to its cryptic habits. Some success with ULV sprays has been obtained against Aedes albopictus in urban areas, while suburban areas remain difficult to control. The primary means of controlling both species is to eliminate their oviposition (egg-laying) habitats by removing water bearing containers or emptying them and scrubbing the insides to remove eggs deposited above the waterline. Personal protective measures such as application of EPA-registered repellents and wearing of long-sleeved shirts and long pants are also effective measures.

When traveling to areas endemic for Zika in the Caribbean, it is also recommended to stay in hotels with air conditioning and window and door screens to keep mosquitoes outside. If available, it is advised to sleep under mosquito bed nets.

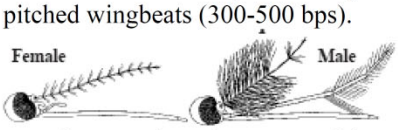
The following graphic from the Prairie Research Institute (http://www.prairie.illinois.edu) provides some interesting information about mosquitoes.

Mosquito Facts

Why do mosquitoes drink blood?
Only female mosquitoes take blood. They use the protein and iron found in blood to make their eggs. Females feed on nectar and water, just like males do.

How much blood does a female mosquito "drink" per bite?
Female mosquitoes "drink" about 3 millionths of a liter, or 3 milligrams, of blood.

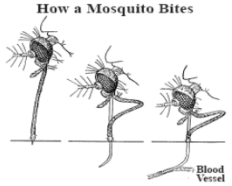
How do you tell male from female mosquitoes?
The easiest way is to look at the antennae. Male mosquitoes have very feathery antennae. They help sense female mosquitoes high-pitched wingbeats (300-500 bps).



Female mosquitoes have very plain antennae sparsely covered in small hairs.

Why do mosquito bites itch?
Mosquito saliva contains several enzymes and proteins that affect the body's clotting ability. Most people are allergic to these enzymes. The itch and bump is our allergic response to them.

How a Mosquito Bites



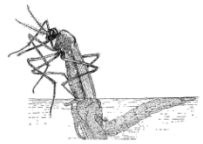
How do mosquitoes find prey?
Mosquitoes use a range of signals to find their hosts, including movement, odor, carbon dioxide, and body heat.

Do all mosquitoes suck human blood?
Only a small number of mosquitoes feed primarily on humans. Mosquitoes usually feed on birds, a wide range of mammals, and even amphibians and reptiles. Mosquitoes in the genus *Toxorhynchites* (toxo-rin-kite-ees) do not feed on blood at all. Females use nectar to make their eggs.

How far can mosquitoes fly?
Most mosquitoes stay within 1-2 miles of their larval (breeding) habitat, but some can fly 20 miles away!

What is the mosquito life cycle?
First, eggs hatch into larvae. They live in the water and feed on algae and bacteria. After the larvae are fully developed, they metamorphose into pupae. Pupae do not eat at all. Larvae and pupae live in the water, but they breathe air. Next, adult mosquitoes emerge, or "hatch," from the pupae and rest on the surface of the water before flying away.

Emergence of an Adult Mosquito



How long do mosquitoes live?
In nature, female mosquitoes can live for a few weeks and males usually live for about a week. Life span depends on temperature, humidity and time of year.

How much does a mosquito weigh?
About 2 to 2.5 milligrams for medium size mosquitoes.

What do mosquitoes do in winter?
Some species of mosquitoes can survive the winter. The mosquitoes can sense when the days are getting shorter and enter diapause. Diapause is a hibernation-like state that allows them to live off fat stores. Adult mosquitoes find warm places to stay, like sewer drains, so they do not freeze. Females do not take blood or reproduce during this time. Mosquitoes in diapause can live for several months!

How many mosquito species are there?
There are about 2,700 species worldwide, about 175 species in North America, and about 60 species in Illinois.

Can mosquitoes carry HIV or hepatitis?
No. Mosquitoes carry viruses and pathogens in their salivary glands. In HIV and hepatitis, the virus does not replicate in the salivary glands, so it cannot be injected into the next host.

How many people die from mosquito-borne diseases per year?
Worldwide estimates range from 1-2 million people per year. The most common disease is malaria. A single malarial mosquito can infect more than 100 people.

How common is West Nile Virus?
West Nile virus is found in over 60 mosquito species and over 200 vertebrates. The virus usually cycles between *Culex* (cue-lex) mosquito species and common urban birds like American robins, northern cardinals, and house sparrows.

MOSQUITO ABATEMENT PROCESS

Integrated Pest Management

Mosquito and vector control is based on scientifically planned management tactics and control strategies that reduce the abundance of target pests in a timely manner. This method is commonly referred to as "integrated pest management" (IPM). This comprehensive program incorporates five basic methods:

- public information and education,
- mosquito and vector surveillance,
- biological control,
- physical control, and
- chemical control (larvicides and adulticides)

Public Information and Education

Advertising and outreach programs educate and inform the public about mosquito control and prevention methods through the use of media, participation in community events, a comprehensive school program and presentations to various organizations.

Mosquito and Vector Surveillance

Surveillance consists of closely monitoring mosquito activity, climate change, and virus activity by testing mosquitoes, sentinel chickens and wild birds for the presence of a virus or parasite. This research and surveillance information helps guide all control efforts.

Biological Control

Biological control is the use of living organisms to control a particular pest. This organism will attack the harmful pest, resulting in a reduction of its population levels. Biological control elements are natural predators, parasites or pathogens that can be used to achieve desired reductions in pest population levels. The primary biological control used against mosquitoes is the mosquitofish, *Gambusia affinis*. Mosquitofish are ideal control agents for several reasons. They feed primarily at the water's surface, where larvae can be found. They can tolerate a significant range in water temperature and water quality. They are also easy to handle, transport, stock, and monitor. The use of mosquitofish is a long-term control strategy that works well in artificial water bodies such as ornamental ponds, animal watering troughs, water gardens, fountains, and unmaintained swimming pools.

Mosquito pathogens include an assortment of viruses and bacteria. Examples of bacteria pathogenic to mosquitoes are *Bacillus sphaericus* (Bs), *Bacillus thuringiensis israelensis* (Bti), and *Saccharopolyspora spinosa* (spinosid). These materials are also referred to as biorational products. Bs and Bti, produce proteins that are toxic to most mosquito larvae, while spinosid produces compounds known as spinosysns, which effectively control all larval mosquitoes.

Physical Control

Physical control (also known as source reduction, environmental manipulation, or permanent control) to reduce mosquito breeding sites is a very effective method of

mosquito control. Physical control is usually the most effective of the mosquito control techniques available and is accomplished by eliminating mosquito breeding sites or modifying these sites to favor natural predation or to be unfavorable to mosquitoes. Source reduction can virtually eliminate the need for pesticide use in the affected habitat. Source reduction is appropriately touted for its effectiveness and economic benefits. A few examples of physical control include: promoting effective drainage, controlling vegetation, and appropriate timing of irrigation.

Microbial and Chemical Control

Microbial and chemical control is the prudent use of chemical compounds (insecticides) that reduce mosquito populations. Chemical products are used when biological control methods have been incapable of maintaining mosquito numbers below a tolerable level. Chemical control is the judicious application of specific chemical compounds (insecticides) that reduce adult and immature mosquitoes. It is applied when bio-rational methods are unable to maintain mosquito numbers below a level that is considered tolerable or when emergency control measures are needed to rapidly disrupt or terminate the transmission of disease to humans. Adulticides are chemicals that specifically reduce adult mosquitoes. Larvicides target mosquito larvae and pupae.

The UC Davis Western Integrated Pest Center recently published a very informative report on the importance of an integrated pest management program in preventing the spread of West Nile Virus in California. This report - *Management of Mosquitoes: A Case Study of West Nile Virus in California* (October 2017) - documents the many integrated pest management tools used by three mosquito abatement districts in California and how recent changes in decision-tools, mapping and surveillance, area-wide management, and outreach, have further reduced the exposure of humans and the environment to mosquitoes and the products used to control them. This report can be downloaded at the following web address: http://westernipm.org/index.cfm/about-the-center/publications/special-reports/mosquito-pdf/ .

MUNICIPAL SERVICE REVIEW AND SPHERE OF INFLUENCE PLAN

FOR

THE GLENN COUNTY MOSQUITO AND VECTOR CONTROL DISTRICT

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GLENN COUNTY MOSQUITO AND VECTOR CONTROL DISTRICT DATA SHEET

Contact: Luke Niblack, General Manager
Address: 165 County Road G, Willows, CA
Phone: (530) 934-4025
Webpage: https://www.countyofglenn.net/mosquito-and-vector-control-district-glenn-county

GOVERNING BOARD

Board of Trustees	Appointing Body	Term Expires
John E. Richter, President	Glenn County Board of Supervisors	6/30/2019
Vince Holvik, Vice President	City of Willows City Council	6/30/2019
Ray Crabtree	Glenn County Board of Supervisors	6/30/2019
Bradley Mallory	Glenn County Board of Supervisors	6/30/2020
Mike Rutherglen	Glenn County Board of Supervisors	6/30/2020

Normal Board Meeting Dates: Last Tuesday of each month at 12:00 p.m.
Meetings are held at: 165 County Road G, Willows

FORMATION INFORMATION

Date of Formation: Formed in 1962 and began providing services in 1963.

PURPOSE

1. Enabling Legislation: GC §2000 et. seq.
2. Provided Services:
   - Mosquito Abatement
   - Vector Control
   - Public Education
   - Mosquitofish

AREA SERVED

1. No. of Parcels: 2,896
2. District Size: 3,188 acres (5 sq. miles)
3. Estimated Population: 7,313
4. Location: City of Willows and surrounding area.
5. Sphere of Influence: Coterminous with approved district boundaries.

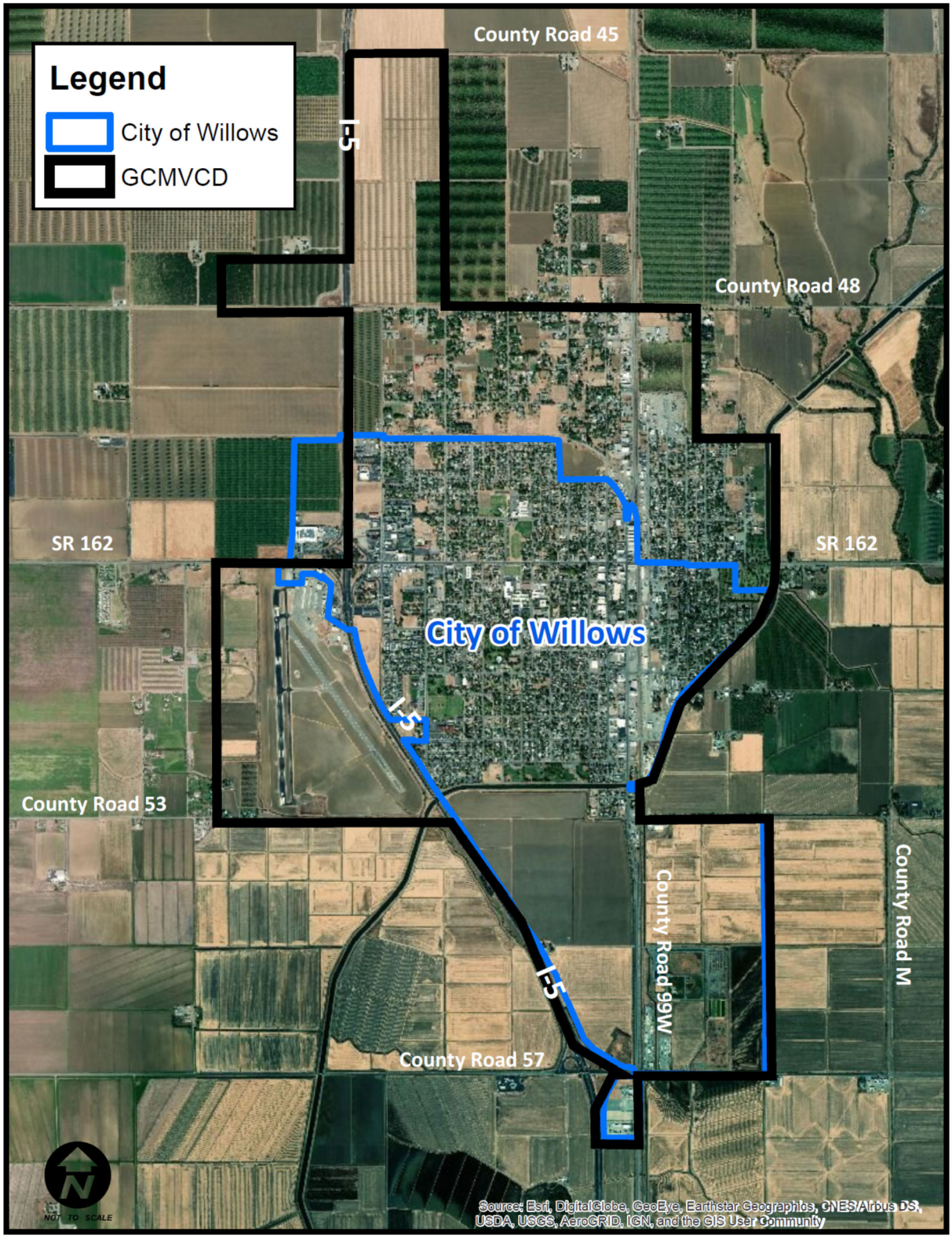
FINANCIAL INFORMATION

End of Fiscal Year 2017-18
Revenues: $276,723
Expenditures: $241,294

Fund Balance end of FY 2017-18
Unassigned: $246,608
Reserved for building and equipment: $99,000

Revenue Sources:
- Property taxes
- Annual per parcel assessments
- Fees for services
- Interest

FIGURE 2-1 GLENN COUNTY MOSQUITO AND VECTOR CONTROL DISTRICT



DISTRICT CHARACTERISTICS

The Glenn County Mosquito and Vector Control District (GCMVCD), which was formed in 1962, provides mosquito abatement services to the City of Willows and the surrounding area (Figure 2-1). The District's service area encompasses approximately 3,188 acres (5 square miles) and consists of approximately 2,896 parcels. Approximately 1,811 acres (2.9 square miles) of the District, consisting of approximately 2,297 parcels, lies within the City of Willows' jurisdictional boundaries. The District has an estimated population of 7,313.

Land uses within the District boundaries is primarily urban, including residential, commercial, industrial, agricultural, and public uses. Most of these uses are located within the City of Willows. Outside of the City of Willows, land uses within the District consists of residential uses, agricultural uses, agricultural processing facilities, some commercial uses, and public uses. Most of the agricultural uses within the District consists of rice fields, along with several large orchards.

The GCMVCD Board of Trustees consists of five members, four of whom are appointed by the Glenn County Board of Supervisors and one of whom is appointed by the City of Willows City Council. The GCMVCD board meetings are held the last Tuesday of each month at 12:00 p.m. and are held at the District's office located at the Willows-Glenn County Airport, at 165 County Road G, Willows.

GCMVCD Services

The Glenn County Mosquito and Vector Control District is an independent special district (not part of any county or city) that monitors and controls mosquitoes. The District protects the usefulness, desirability and livability of property and the inhabitants of property within its jurisdictional area through the abatement of mosquitoes. The District provides the following services:

- Larvicide applications (control products applied directly to breeding sources).
- Adulticide applications (control products applied using ULV foggers. Ultra-low volume (ULV) spraying is the process of putting very small amounts of liquid (typically 4 ounces per acre or less) into the air as a fine mist of droplets. These droplets can float on air currents for up to 1 hour and quickly kill mosquitoes that come into contact with them. ULV adulticides are applied when mosquitoes are most active – typically sunset and early evening).
- The District provides mosquitofish free of charge. The mosquitofish can be picked up at the District office and are also distributed at Bucke's Feed & Grain feed store, located at 1308 Railroad Ave, Orland.
- Surveillance: The District uses light and carbon dioxide traps to track mosquito populations during the mosquito season (generally May through October). The traps are usually placed at the same locations but can be moved it needed. The District sends the trapped mosquitoes to UC Davis for testing for viruses. The District collects dead birds, takes samples of the bird's saliva, and sends the saliva to UC David for testing for West Nile virus.

- District Manager provides public information talks to local groups and schools to keep the public informed.
- The District provides localized and personal mosquito abatement services upon request.
- The District provides year-round service.
- The District follows an Integrated Pest Management Plan (IPM) and Best Management Plan (BMP).

Services Provided to the Glenn County Valley-Wide Mosquito Abatement Assessment District Area

In 2007, the Glenn County Board of Supervisors approved the creation of the Glenn County Valley-Wide Mosquito Abatement Assessment District. The assessment district area generally includes all of the parcels located east of the Tehama Colusa Canal and east of County Road "D", but does not include the areas currently served by the Glenn County Mosquito and Vector Control District nor the area served by Rice Pest Abatement District No. 1. The City of Orland and the unincorporated community of Hamilton City are located within the assessment district.

The assessment district is not a special district subject to review by LAFCO but is a county program administered by the Glenn County Public Health Department. The assessment district's only function is to provide funding for the provision of mosquito abatement services to a large portion of Glenn County. Parcels within the assessment district are assessed an annual assessment for the provision of mosquito abatement services. The parcels that are located in the Hamilton City area are not assessed the annual assessment by the Valley-Wide Mosquito Abatement Assessment District because that area already received mosquito abatement services from the Butte County Mosquito and Vector Control District.

The Glenn County Valley-Wide Mosquito Abatement Assessment District does not provide any actual mosquito abatement services and instead contracts with the Glenn County Mosquito and Vector Control District to provide mosquito abatement services to the parcels within the assessment district. GCMVCD and Glenn County currently have a three-year contract for the provision of mosquito abatement services, which expires in 2021. GCMVCD has been providing mosquito abatement services for the assessment district for the last twelve years. GCMVCD bills Glenn County for providing mosquito abatement services to the assessment area. Glenn County has provided equipment to GCMVCD for use in the assessment area.

The assessment area is located outside of GCMVCD's Sphere of Influence and jurisdictional boundaries. California Government Code §56133 requires an agency to obtain authorization from LAFCO prior to providing services outside of the agency's jurisdictional boundaries or sphere of influence. It is not clear if Glenn LAFCO provided the required authorization to GCMVCD to provide services to.

I. MUNICIPAL SERVICE REVIEW

MSR FACTOR NO. 1 GROWTH AND POPULATION PROJECTIONS FOR THE AFFECTED AREA

GCMVCD's jurisdictional boundaries consist of the incorporated City of Willows and the surrounding area. It is estimated that GCMVCD has a population of approximately 7,313 (6,064 people in the City of Willows and 1,250 people in the unincorporated portion of the District). Land uses within the District include single-family and multi-family residential uses, commercial uses, industrial uses, and public uses. Outside of the immediate Willows area, the predominant land use is agricultural, consisting primarily of rice fields.

Population growth within Glenn County as a whole has been very minimal due to the rural and agricultural nature of the county. From 2010 to 2018, the population of Glenn County rose from 28,122 to 28,796, an increase of approximately 2.4 percent over an eight-year period.[5] From 2010 to 2018, the population of the City of Willows decreased from 6,166 to 6,064, a decrease of approximately 1.6 percent.

The following table shows the current estimated population of the county as a whole, the estimated population of the two incorporated cities within the county, and the estimated population of the unincorporated area of the county.[6] Additionally, the table shows the percent change in population from 2017 to 2018.

County/City	Total Population		
	1/1/2017	1/1/2018	Percent Change
Glenn	28,730	28,796	0.2
Orland	7,844	7,932	1.1
Willows	6,066	6,064	0.0
Balance of County	14,820	14,800	-0.1

Development potential within the District is highly feasible given that a large portion of the District is designated for residential, commercial, and industrial uses at urban densities. Most of the parcels within the District are located within the City of Willows, which provides provide sanitary sewer service to the parcels within their jurisdiction. The provision of sanitary sewer service facilitates development at urban densities.

The population of the District is not expected to significantly increase in the near future. No significant residential developments, which could cause an increase in population, are anticipated to be constructed within the district.

As population increases, and growth occurs within the District, demands and expectations for mosquito control services will increase. Urban areas provide abundant

[5] State of California, Department of Finance, *E-4 Population Estimates for Cities, Counties, and the State, 2011-2018, with 2010 Census Benchmark*. Sacramento, California, May 2018.
[6] State of California, Department of Finance, *E-1 Population Estimates for Cities, Counties and the State with Annual Percent Change — January 1, 2017 and 2018.* Sacramento, California, May 2018.

breeding habitats for mosquitoes (stagnant water), and treatment becomes more difficult and costly, as treatment efforts need to occur more frequently and on individual private properties. Expansion of services would be implemented through increases in revenues, including property tax income and the collection of annual assessment fees from new development.

MSR DETERMINATION 1-1: *The District has a current population of approximately 7,313 people.*

MSR DETERMINATION 1-2: *The population within the District is not expected to have any significant growth based upon the historic low population growth rates of Glenn County and the City of Willows. New development within the District is expected to occur within the City of Willows portion of the District.*

MSR DETERMINATION 1-3: *As population increases, and growth occurs within the District, service demands will increase. Expansion of services by the District would be facilitated by increases in revenues from property tax revenue and annual assessment fees from new development.*

MSR FACTOR NO. 2: THE LOCATION AND CHARACTERISTICS OF ANY DISADVANTAGED UNINCORPORATED COMMUNITIES WITHIN OR CONTIGUOUS TO THE SPHERE OF INFLUENCE

Disadvantaged unincorporated communities (DUCs) are defined by statute as inhabited territory (meaning 12 or more registered voters), or as determined by commission policy, that constitutes all or a portion of a community with an annual median household income (MHI) that is less than 80 percent of the statewide annual MHI (Water Code Section 79505.5). The statewide MHI data is obtained from the US Census American Community Survey (ACS) 5-Year Data: 2010 - 2014. California's MHI for this period was $61,489, and 80 percent of that is $49,191. The identification of DUCs as it relates to LAFCo is to ensure that these communities are fairly served with essential municipal services of public sewer, water and fire protection.

DUCs were identified by utilizing the Disadvantage Communities Mapping tool offered by the California Department of Water Resources at https://gis.water.ca.gov/app/dacs/. Based on an analysis of census block groups, a large portion of the District, primarily within and adjacent to the City of Willows, is identified as a Severely Disadvantaged Community, with a median household income of less than $38,270.

Most of the DUC areas within the District receive a wide range of municipal services, including domestic water, sanitary sewer, fire, and police services. The District provides mosquito and vector control services to all of the parcels within the District's boundaries, including those identified as being within a disadvantaged unincorporated community. The existence of disadvantaged unincorporated communities within the District does not impact the District's ability to provide services, nor do the District's services impact the status of these communities as "disadvantaged".

MSR DETERMINATION NO. 2: *A large portion of the District is identified as being within a Severely Disadvantaged Community based on community block group data. The District provides the same level of service to the parcels within these disadvantaged unincorporated communities as the District provides to the non-disadvantaged communities within the District.*

MSR FACTOR NO. 3: PRESENT AND PLANNED CAPACITY OF PUBLIC FACILITIES ADEQUACY OF PUBLIC SERVICES, AND INFRASTRUCTURE NEEDS OR DEFICIENCIES INCLUDING NEEDS OR DEFICIENCIES RELATED TO SEWERS, MUNICIPAL AND INDUSTRIAL WATER, AND STRUCTURAL FIRE PROTECTION IN ANY DISADVANTAGED, UNINCORPORATED COMMUNITIES WITHIN OR CONTIGUOUS TO THE SPHERE OF INFLUENCE.

FACILITIES

The District's office/maintenance shop is located at the Willows-Glenn County Airport, at 165 County Road G, Willows. The parcel that the District's facility is located on is owned by the County of Glenn and the District leases the parcel from the county for $800 per year. The District also maintains mosquito fish rearing ponds at the City of Willows' wastewater treatment plan.

It is not known when the District's office/maintenance building, which is approximately 2,000 square feet in size, was constructed, but it was probably constructed at the time the District began operations, which was in 1963. The building, while functional, is antiquated and is showing its age and major repairs, or even reconstruction, may be needed in the near future. The District currently has approximately $99,000 in fund balance that is reserved for structures and equipment, which may not be sufficient to rebuild their building.[7] The District should consider increasing the structure and equipment reserve to ensure that there is adequate funding for any future building repairs or reconstruction.

One issue that may impact the District's facility at the Willows-Glenn County Airport is that current Federal Aviation Administration rules may prohibit non-aviation-related businesses from being located on government-owned land at the airport. It may be plausible that the District may be required to move their facility elsewhere because they are not an aviation-related business, or it may also be plausible that the District may not be allowed to make any major improvements to, or rebuild, their existing building. This issue is

[7] GCMVCD Financial Statement, as of and for the Year Ended June 30, 2018.

something that the District is already aware of. The District should collaborate with Glenn County staff to determine if the District can continue to operate at its current location and make improvements to their existing structure.

The District's office is generally open Monday through Friday, between the hours of 7:00 a.m. and 4:00 p.m. Either the District's general manager or the assistant general manager, both of whom are full-time employees, are in the office during normal business hours. The District hires a secretary during the mosquito season (normally May through October) to staff the District's office during normal business hours. The District general manager may also at times adjust work schedules and office hours throughout the mosquito season to accommodate the operational needs of the District. Residents of the District can leave a voice mail if no one is in the office to answer the phone.

GCMVCD Building – East Side

GCMVCD Building – West Side

District Equipment

The District owns various types of equipment that is utilized to perform mosquito abatement services. Equipment includes standard office equipment, seven pickup trucks, seven electric ultra-low volume (ULV) truck-mounted foggers, two gas-powered backpack sprayers (for liquid & granules), one gas powered ULV hand fogger, and one forklift. The District utilizes various types of computer software for administrative purposes, but does not utilize any type of geographic information system (GIS) for mapping purposes.

GCMVCD Trucks

The district performs all minor maintenance services on trucks. Major repairs for the trucks are performed by either a certified vehicle repair business or by the County of Glenn Fleet Services Division.

Maintenance of the foggers is performed by District staff. The foggers, which are mounted in the beds of the trucks during the mosquito season, are electric powered and are operated remotely via cable by the drivers.

GCMVCD Equipment/Maintenance Shop

The District also operates equipment provided by Glenn County for use in the assessment district area. The County-owned equipment used by the District includes:

- Four pickup trucks
- Six electric ULV truck mounted foggers
- Ten New Jersey light traps
- Three back pack sprayers (liquid and granules)
- One electric ULV backpack fogger

Maintenance of the four County-owned pickup trucks is performed by the County of Glenn Fleet Services Division. These four pickup trucks have emblems identifying them as belonging to the Glenn County. The District performs maintenance of the County-owned foggers and sprayers.

Glenn County-Owned Truck Operated by GCMVCD

Adequacy of Public Services

The District provides the following services:

- Larvicide applications (control products applied directly to breeding sources).
- Adulticide applications (control products applied using ultra low volume foggers).
- The District provides mosquitofish free of charge. The mosquitofish can be picked up at the District office and are distributed at several locations.
- Surveillance: The District uses New Jersey light traps and Encephalitis Virus Surveillance traps (which use carbon dioxide as the attractant) to track mosquito populations during the mosquito season (generally May through October). This surveillance data is used to coordinate effective applications of adult mosquito public health pesticides.
- The District collects and submits dead bird specimens for testing of West Nile virus.
- District staff conducts annual public relations, outreach, and education campaigns.
- The District provides localized and personal mosquito abatement services plus continuous control for schools and parks.
- The District provides year-round service.

The District appears to provide effective and efficient mosquito abatement services throughout its jurisdictional boundaries and to the parcels within the Glenn County Valley-Wide Mosquito Assessment District area.

Service Requests
A major factor influencing service demand is the presence of vectors (in particular mosquitoes) and vector-borne disease agents within the District and neighboring areas. The District responds to service requests within its boundaries. Any property owner, business, or resident in the District may contact the District to request mosquito abatement service and District staff will respond promptly to the particular property to evaluate the threat situation and to perform appropriate control services. The District indicates it responds to all service requests in a timely manner, regardless of location, within its boundaries.

MSR DETERMINATION 3-1: *The District has sufficient facilities and resources to provide comprehensive, efficient, and effective mosquito abatement services.*

MSR DETERMINATION 3-2: *District equipment appears to be adequately maintained and is replaced as necessary to ensure uninterrupted mosquito abatement operations.*

MSR FACTOR NO. 4: FINANCIAL ABILITY OF AGENCIES TO PROVIDE SERVICES

This section analyzes the financial structure and fiscal viability of the District. Included in this analysis is the consideration of revenue sources, amount of revenue, stability of revenues, and expenditure sources.

GCMVCD follows the General Accounting Standard Board Statement No. 34 (GASB 34) accounting standards. The District complies with Generally Accepted Accounting Principles (GAAP).

As required by the laws of the Health and Safety Code of the State of California, the District's Board of Trustees must approve a tentative budget no later than June 30 and adopt a final budget no later than October 1 of each fiscal year end for the General Fund. A public hearing must be conducted to receive comment prior to adoption. Until the adoption of this financial budget, operations are governed by the adopted proposed budget approved by the Board. The District's Board of Trustees satisfied these requirements.

Revenues
Total expenditures for the District for Fiscal Year 2017-18 was $276,723. The District receives revenue from three main sources:

- **Ad-valorem Property Taxes**
  In Fiscal Year 2017-18, approximately 30.4% ($84,132) of GCMVCD's revenues were received from the District's share of the ad valorem property tax. Ad-valorem[8]

[8] Latin for "according to value"

property tax is a one percent general levy of the assessed market value of a property. This one percent is distributed among many agencies in the county. For cities and the county, this tax is usually deposited into their general funds, which can be used for any service. For special districts, this tax is also deposited into the district's general funds to be used for the district's sole purpose.

The level of revenue from property taxes can be considered relatively consistent, as the taxes usually remain at the same level from year to year. However, property tax revenue can decrease due to decreasing property values, which is what occurred beginning in 2008 because of the downturn in the economy and housing market. Due to the downturn in the economy, properties were reassessed to a lower value, which reduced property tax revenue flowing to cities and special districts. Revenue from property taxes has been increasing over the last few years as properties are reassessed to a higher value. New development on a property raises the property value of that parcel, with a corresponding increase in property tax revenues.

The Glenn County Tax Collector's Office bills and collects the District's share of property taxes and assessments. The Glenn County Treasurer's Office remits current and delinquent property tax collections to the District throughout the year.

- **Assessment Fees**

  In Fiscal Year 2017-18, approximately 34.9% ($96,669) of GCMVCD's revenues were received from special benefit parcel assessments. The District's original assessment was approved in 1988, and the current assessment was approved in 2003. The current minimum assessment is $35 with a maximum of $50 per residential parcel, and a minimum of $50 and a maximum of $75 per commercial parcel. The District is currently charging the minimum per parcel assessment for both residential and commercial properties ($35 residential and $50 commercial). The District hasn't increased its assessment rate in 17 years.

- **Charges for Services**

  In Fiscal Year 2017-18, approximately 29.3% ($81,086) of GCMVCD's revenues were received from charges for services. The charges for services are reimbursements for the mosquito abatement services that GCMVCD provides to the parcels within the Glenn County Valley-Wide Mosquito Abatement Assessment District.

District revenues have been relatively steady for the last four years, ranging from a low of $260,004 to a high of $279,742.

EXPENDITURES

Total operating and capital expenditures for the District for Fiscal Year 2017-18 was $241,294. Expenditures for GCMVCD generally consist of salaries and employee benefits, services and supplies (costs for pesticides, fuel, insurance, maintenance) and fixed (capital) assets expenditure (purchase of new vehicles or equipment). In Fiscal Year 2017-18, salaries and employee benefits ($178,541) accounted for 74% of the District's expenditures and services and supplies ($56,768) accounted for 23.5% of the District's expenditures. In Fiscal Year 2017-18, there were no expenditures for fixed assets.

District expenditures vary from year to year, reflecting the amount of anticipated revenue for that year and any high-cost expenditures, such as a vehicle or fogging equipment.

ANNUAL BUDGETS

A special district's budget is a financial plan that details the district's projected revenues and expenditures for a defined period of time, usually one fiscal year (July 1 to June 30.) Special districts typically have operating budgets, which is a plan of current (annual) spending and the means to pay for it (taxes, fees, etc.). As previously noted the District prepares a budget for each fiscal year that shows anticipated revenue and anticipated expenditures (appropriations).

The District's budgets for Fiscal Years 2014-15 to 2018-19 are shown in the below table. The budgets for FY 2014-15 to FY 2017-18 show the actual revenue and expenditure figures, while the FY 2018-19 budget shows the budget as adopted by the District Board of Trustees, which only reflects anticipated revenues and appropriations (anticipated expenditures).

GLENN COUNTY MOSQUITO AND VECTOR CONTROL DISTRICT - REVENUES AND EXPENDITURES					
Detail by Revenue Category and Expenditure Object	**2014-15 Actuals**	**2015-16 Actuals**	**2016-17 Actuals**	**2017-18 Actuals**	**2018-19 Adopted By District Board**
REVENUES					
Property Tax	81,078	88,586	79,935	84,132	83,000
Intergovernmental	-	-	800	788	1,000
Investment Earning	761	1,655	1,488	3,039	1,000
Investment Earning, Fiscal Agent	-	-	-	56	-
Special Assessments	95,975	99,483	95,371	96,669	95,900
Charges for Services	67,692	77,456	83,260	81,086	100,000
Other	14,498	12,562	2,450	10,953	7,000
TOTAL REVENUES	**$260,004**	**$279,742**	**$263,304**	**$276,723**	**$287,900**
EXPENDITURES					
Salaries and Benefits	204,916	231,933	201,710	178,541	221,500
Services and Supplies	51,939	48,678	70,644	56,768	71,500
Other Expenditures	4,744	5,710	4,664	5,985	6,900
Contingency	-	-	-	-	1,000
Fixed Assets	-	5,000	-	-	-
TOTAL EXPENDITURES / APPROPRIATIONS	**$261,599**	**$291,321**	**$277,018**	**$241,294**	**$300,900**
NET COSTS / USE OF FUND BALANCE	**$-1,595**	**$-11,579**	**$-13,714**	**$35,429**	**$13,000**

As shown in the above table, for Fiscal Years 2015-16 and 2016-17 District expenditures exceeded revenues, resulting in a revenue shortfall. The annual expenditures of a special district should generally equal, or, ideally, be less than the revenue a district receives in any given fiscal year. When expenditures exceed revenues, which is referred to as a budget deficit, a non-enterprise district such as the GCMVCD, must resort to the use of fund balance, if available, or borrow money to cover the shortfall in revenues.

Budgets are meant to balance revenues and expenditures, so that a public agency is able to provide needed services with the resources available. However, the reality is that budgets will rarely work out precisely as planned, leading to operating deficits (when

expenditures exceed revenues) or operating surpluses (when revenues exceed expenditures.) As long as these deficits or surpluses are minor or intermittent, they do not constitute a material problem for a local government and should not be cause for concern. It is when there is a persistent pattern of larger surpluses or deficits that there should be concern about the budgeting practices of the agency.[9]

The District currently has a large unassigned fund balance, which was $246,608 at the end of Fiscal Year 2017-18. The large fund balance is the result of revenues exceeding expenditures over numerous years. The District also has $99,000 in fund balance reserved for building and equipment expenditures at the end of Fiscal Year 2017-18.

For public agencies, unappropriated fund balances are not just money in a bank; they are fundamental resources for ensuring reliable core services and community security.[10] Public agencies designate money toward savings in order to balance their budget, respond to emergencies, keep rates affordable, maintain current infrastructure and plan for future public works projects. The following are the benefits of a public agency maintaining an adequate level of unappropriated fund balance:

- Balancing Budgets – Over the course of the fiscal year, fund balances help balance the ebb and flow of revenues verse expenditures.
- Emergency Preparation – In the event of a disaster, communities can't afford not to have savings readily available to quickly repair critical local infrastructure and bring core services back online.
- Affordable Rates – With appropriate savings, special districts are able to use resources wisely and smooth out the highs and the lows of volatile economic conditions, rather than spend their entire surplus and then seek new revenue or jeopardize services.
- Infrastructure Maintenance – Reserves mean the pipes are fixed, roofs are patched, and worn equipment is replaced without going back to the taxpayers or ratepayers to pay for routine upkeep.
- Planning for the Future – A long-term, thoughtful approach to public infrastructure requires the foresight to plan for, and discipline to save for, future needs.

FINANCIAL AUDIT

State Law requires that every public agency retrain the services of a certified public accountant to prepare that agency's financial audit. An audit involves performing procedures to obtain audit evidence about the amounts and disclosures in an agency's financial statements. Financial statements include all transactions for which a public agency is financially accountable. The procedures selected depend on the auditor's judgment, including the assessment of the risks of material misstatement of the financial statements, whether due to fraud or error. In making those risk assessments, the auditor considers internal control relevant to the entity's preparation and fair presentation of the financial statements in order to design audit procedures that are appropriate in the

[9] *Citizens' Guild to Local Budgets*, Office of the New York State Comptroller-Division of Local Government and School Accountability. 2010.
[10] *Special District Reserve Guidelines - A Guide to Developing a Prudent Reserve*. Second edition. California Special Districts Association. 2013.

circumstances, but not for the purpose of expressing an opinion on the effectiveness of the entity's internal control. An audit also includes evaluating the appropriateness of accounting policies used and the reasonableness of significant accounting estimates made by management, as well as evaluating the overall presentation of the financial statements.

The last financial audit for the District was prepared in December 2018, which was for Fiscal Year 2017-18, and was prepared by Roy R. Seiler, a Certified Public Accountant in Willows. The financial audit did not note any material deficiencies in the District's financial statements.

CalPERS Costs/Liability

For the fiscal year ended June 30, 2018, the contributions recognized as part of pension expense for the District's retirement plan with CalPERS were as follows:

Contributions - employer $10,731
Contributions - employee (paid by the District) $10,311
Total CalPERS contributions for FY 2017-18 - $21,042

As of June 30, 2018, the District reported net pension liabilities of $263,931 for its proportionate shares of the net pension liability. The net pension liability is the unfunded liability for the pension benefits promised to current employees, retirees, and their beneficiaries. Another way of defining net pension liability is that it is the disparity between the estimated amount of a pension plan's obligations and the current value of its assets.

For Fiscal Year 2018-19, the District has an unfunded accrued liability (UAL) payment of $12,232.[11] The UAL payment is the amortized dollar amount that is needed to fund past service credit earned (or accrued) for members who are currently receiving benefits, active members, and for members entitled to deferred benefits. In FY 2017-18, the District's UAL was $7,750. The District's future annual UAL payments can be expected to increase significantly as shown in the following table.[12]

	Required Contribution	Projected Future Employer Contributions (Assumes 7.25% Return for Fiscal Year 2017-18)				
Fiscal Year	**2019-20**	**2020-21**	**2021-22**	**2022-23**	**2023-24**	**2024-25**
Normal Cost %	10.868%	11.6%	11.6%	11.6%	11.6%	11.6%
UAL Payment	$16,872	$20,000	$24,000	$27,000	$28,000	$30,000

[11]Accessed from the CalPERS website on 1-6-19 (https://www.calpers.ca.gov/page/employers/actuarial-services/employer-contributions/public-agency-contributions)
[12]Miscellaneous Plan of the Glenn County Mosquito and Vector Control District (CalPERS ID: 2031042354) Annual Valuation Report as of June 30, 2017

The District should ensure that their future annual budgets plan for the increased CalPERS UAL payments. District services levels may need to be reduced in order to fund the increased UAL payments unless there is a corresponding increase in revenues.

MSR DETERMINATION NO. 4-1: *Revenue for the District provides adequate funding to cover the cost of providing comprehensive mosquito abatement services.*

MSR DETERMINATION NO. 4-2: *The District's current minimum annual parcel assessment is $35 with a maximum of $50 per residential parcel, and a minimum of $50 and a maximum of $75 per commercial parcel. The District is currently charging the minimum per parcel assessment for both residential and commercial properties. The District has the ability to increase the annual parcel assessment up to the maximum amount allowed if additional revenue is needed to ensure adequate funding for the provision of effective mosquito abatement services.*

MSR DETERMINATION NO. 4-3: *Normal expenditures for the District include salaries, insecticides, pension and health insurance contributions, gas and oil, and the occasional purchases of new vehicles and equipment. The District's expenditures do not appear to be excessive and are necessary to provide services efficient and effective mosquito abatement services.*

MSR DETERMINATION NO. 4-4: *The district currently has a large fund balance that could be utilized for unanticipated expenses, capital improvements, or to cover revenue shortfalls. In addition, the District has a large reserve for building and equipment expenditures.*

MSR DETERMINATION NO. 4-5: *The District has required financial audits prepared in a timely manner. The Fiscal Year 2017-18 financial audit for the District showed no material deficiencies in the District's financial statements.*

MSR DETERMINATION NO. 4-6: *The District should ensure that their future annual budgets plan for increased CalPERS UAL payments. District services levels may need to be reduced in order to fund the increased UAL payments unless there is a corresponding increase in revenues.*

MSR FACTOR 5: STATUS OF, AND OPPORTUNITIES FOR SHARED FACILITIES

There are four entities in Glenn County that provide mosquito abatement services or generate revenue for mosquito abatement services:

- The Glenn County Mosquito and Vector Control District (GCMVCD), which is an independent special district that provides mosquito abatement services to the City of Willows and surrounding area. Additionally, the District provides mosquito abatement services to a large portion of Glenn County under contract with the Glenn County Valley-Wide Mosquito Abatement Assessment District. Glenn LAFCo approved an extension of services application to allow GCMVCD to provide services to the parcels within the assessment area.
- The Butte County Mosquito and Vector Control District (BCMVCD), which is an independent special district that provides mosquito abatement services to a large portion of Butte County and to the unincorporated community of Hamilton City in Glenn County. The parcels within the Hamilton City portion of BCMVCD are assessed an annual fee for the provision of mosquito abatement services.
- Rice Pest Abatement District No. 1, which is an independent special district that provides various types of pest abatement, including mosquito abatement services, to rice fields located southeast of the City of Willows.
- The Glenn County Valley-Wide Mosquito Abatement Assessment District, which was created by the Glenn County Board of Supervisors in 2007. This district is not a special district subject to review by LAFCo but is a county program administered by the Glenn County Public Health Department. The assessment district's only function is to provide funding for the provision of mosquito abatement services to a large portion of Glenn County. Parcels within the assessment district are assessed an annual fee for the provision of mosquito abatement services. The parcels in the Hamilton City area are within the assessment area but are not assessed an annual assessment by the Valley-Wide Mosquito Abatement Assessment District. As previously noted, the Glenn County Mosquito and Vector Control District provides mosquito abatement services to the parcels within the Valley-Wide Mosquito Abatement Assessment area under a contract with Glenn County.

Opportunities for shared facilities between some of the mosquito abatement entities within Glenn County already exist and there may be additional opportunities for shared facilities. The primary example of shared facilities is the contract between the Glenn County Mosquito and Vector Control District and the Glenn County Valley-Wide Mosquito Abatement Assessment District. The assessment district only collects an annual assessment fee from each parcel in the assessment area and does not provide any actual mosquito abatement services. The assessment district contracts with GCMVCD, which provides comprehensive mosquito abatement services to the parcels within the assessment district area. The assessment district has provided vehicles and fogging equipment to GCMVCD for use in the assessment district area.

Another example of existing shared facilities is between GCMVCD and Rice Pest Abatement District No.1, where GCMVCD provides mosquito fish to the rice pest district.

GCMVCD has also sprayed for adult mosquitoes for Rice Pest Abatement District No. 1 twice in the last 15 years.

Additional opportunities for shared facilities between the four mosquito abatement entities may exist. One opportunity may be that the Butte County Mosquito and Vector Control District could provide aerial spraying operations within GCMVCD and the assessment area if such spraying is needed. Additionally, the Butte County Mosquito and Vector Control District, which has numerous employees and a large inventory of equipment, could provide short-term service to the mosquito abatement entities in Glenn County in the event of a public health emergency, such as an outbreak of a mosquito-borne illness. The reverse scenario is also possible, with the Glenn County entities providing short-term service to Butte County in the event of a public health emergency.

MSR DETERMINATION NO. 5: *Several of the mosquito abatement entities in Glenn County are already sharing facilities, with the primary example being the contract for services between the Glenn County Valley-Wide Mosquito Abatement Assessment District and the Glenn County Mosquito and Vector Control District.*

MSR FACTOR 6: ACCOUNTABILITY FOR COMMUNITY SERVICES NEEDS, INCLUDING GOVERNMENTAL STRUCTURE AND OPERATIONAL EFFICIENCIES.

GCMVCD BOARD OF TRUSTEES

The Glenn County Mosquito and Vector Control District is governed by a 5-member Board of Trustees. The Board of Trustees are appointed pursuant to California Health and Safety Code, Sections 2022 to 2025, with a term of office of two or four years at the discretion of the appointing authority. Four of the trustees are appointed by the Glenn County Board of Supervisors and one trustee is appointed by the City of Willows City Council. The District Trustees are not compensated for their service.

The Board of Trustees is responsible for setting policy and general administrative procedures for the District, establishes and regulates fees, and selection of the District Manager, who serves at the will of the Board. The policies and procedures set by the Board of Trustees are administered by the District Manager.

Regular meetings of Glenn County Mosquito and Vector Control District Board of Trustees are held on the last Tuesday of each month at 12:00 p.m. The Board of Trustees meetings are held at the District's office located at the Willows-Glenn County Airport, at 165 County Road G, Willows. Normally no members of the public attend the Board of Trustees meetings.

The public notices for the Board of Trustees meeting are posted at least 72 hours before the meetings are held and are posted at the entrance to the Willows Memorial Hall, located at 525 West Sycamore Street, Willows. The District also emails each meeting notice to the *Sacramento Valley Mirror* newspaper, which often will have a short article in the paper about an upcoming District Board of Trustees meeting.

GCMVCD Office and Board Room

GCMVCD STAFFING

While public sector management standards vary depending on the size and scope of the organization, there are minimum standards. Well-managed organizations evaluate employees annually, track employee and agency productivity, periodically review agency performance, prepare a budget before the beginning of the fiscal year, conduct periodic financial audits to safeguard the public trust, maintain relatively current financial records, conduct advanced planning for future service needs, and plan and budget for capital needs.

GCMVCD is managed by the District Manager, who is appointed by the GCMVCD Board of Trustees and serves at the will of the Board. The current District Manager has been with the District for 13 years, serving the last two years as the district manager.

The District has two full-time employees – the District Manager and a Supervisor. The District utilizes seasonal employees during the mosquito season (usually May through October), which includes one secretary and five night-time foggers.

The District Manager and the Supervisor are licensed by the California Department of Public Health to provide mosquito abatement services. The five seasonal employees are not certified or licensed and perform mosquito abatement duties under the license of the District Manager. The District Manager's and the Supervisor's licensees require continuing educational training and recertification every two years.

The management structure of GCMVCD is very simple and reasonable for the type of operations undertaken by the District. No alternative structures or reorganizations of staff would result in more efficient daily operations, and the existing structure is considered appropriate.

The District's two full-time employees – the District Manager and the Supervisor – participate in the District's Miscellaneous Employee Pension Plan, cost-sharing multiple

employer defined benefit pension plans administered by the California Public Employees' Retirement system (CalPERS). The District's CalPERS plans, provisions and benefits in effect at June 30, 2018, are summarized as follows:[13]

Hire Date	Prior to January 1, 2013	On or after January 1, 2013
Benefit Formula	2.7% at 55	2% at 62
Benefit Vesting Schedule	5 years service	5 years service
Benefit Payments	Monthly for life	Monthly for life
Retirement Age	50 - 55	52 -67
Monthly benefits, as a % of eligible compensation	2.0% to 2.7%	1.0% to 2.5%
Required employee Contribution rates	8%	8%
Required employer Contribution rates	8.12%	8.12%

District Transparency

Governmental transparency promotes accountability and provides information for citizens about what their government is doing. A public agency's transparency is necessary to provide the residents of the agency a thorough knowledge of the services the agency provides, how it operates, how and by who the agency is governed, and the financial status of the agency. Information on an agency should be easily accessible.

The District's transparency is limited, which makes it difficult for the residents of the District to easily obtain information on the District. As required by State law, the District does provide notice of upcoming Board of Trustee meetings by posting a notice at the Willows Memorial Hall. The District also provides one notice, published in a newspaper before the start of the mosquito season, that the District will be conducting fogging operations within the District at undetermined times. Board of Trustee meeting minutes, and other information, can be obtained through the District Manager. All of these measures do require residents to make an effort to either attend District Board meetings or visit the District office.

Pursuant to California Government Code Section 53051, every public agency is required to submit a *Statement of Facts-Roster of Public Agencies Filing* to the California Secretary of State anytime there is a change in the membership of the governing board of the agency or the agency's official mailing address. Agencies are required to also submit the *Statement of Facts-Roster of Public Agencies Filing* to the county clerk of the applicable county. The District last updated its *Statement of Facts-Roster of Public Agencies Filing* on December 20, 2018, and the District is in compliance with the requirements of §53051.

To provide for greater transparency, many special districts within California have websites that allow for easy access to district services, information, and documents. The District does have a webpage, which is found on the County of Glenn's website. The District's

[13]Glenn County Mosquito and Vector Control District, Financial Statement, together with the Independent Auditor's Report as of and for the Year Ended June 30,2018

webpage can be accessed at: https://www.countyofglenn.net/mosquito-and-vector-control-district-glenn-county.

On September 14, 2018, Senate Bill 929 was signed by the Governor and chaptered into law by the California Secretary of State, which added §6270.6 and §53087.8 to the California Government Code. This law requires, beginning on January 1, 2020, that every independent special district maintain an Internet Web site that clearly lists contact information for the special district. An exception to this requirement is allowed if, pursuant to a majority vote of its governing body at a regular meeting, the district adopts a resolution declaring its determination that a hardship exists that prevents the district from establishing or maintaining an Internet Web site. The District's current webpage does contain the information required by §6270.6 and §53087.8, although the email address and the contact person's name are incorrect. The District cannot directly make changes to their webpage and must ask County staff to make any necessary changes.
While the District's existing webpage meets the minimum State requirements, the District should consider creating a new, comprehensive website that is independent of the County of Glenn. The website would provide an avenue for the residents of the District to easily obtain important information about the District, significantly increasing the District's transparency. The District should create and maintain a website that provides, at a minimum, the following information:

- District contact information, including the names of the District Manager and Board of Trustees.
- Board of Trustee meeting notices.
- Board of Trustee agendas and staff reports/memorandums
- Adopted annual budget
- Financial audits/reports
- Map of the District
- Fogging notice
- District by laws
- List of enterprise systems (SB 272)
- Financial Transaction Reports
- Compensation Reports
- ADA compliance

Due to cost and time considerations, the District may object to creating and maintaining a comprehensive website. However, the benefits of having a website far outweigh the cost or the time it takes to maintain a website. There are numerous website designers that can create and host custom websites at a nominal monthly cost. One such website designer - Streamline™ Web – creates and hosts websites that are designed specifically for local government at a very affordable cost.[14]

[14] http://www.getstreamline.com/web/

OPERATIONAL EFFICIENCIES

The District utilizes a variety of cost avoidance and facilities sharing measures in its operations. The District is a member of the Vector Control Joint Powers Agency (VCJPA). The VCJPA is a public entity formed by a joint powers agreement in accordance with the California Government Code. The purpose of this JPA is to provide insurance coverage to the District's real and personal property and liability coverage. As of June 30, 2018, the District had $39,515 in cash and investments managed by the VCJPA.

The District is also a member of the Mosquito and Vector Control Association of California. This organization is comprised of 62 public agencies and provides its members with a number of valuable services, including cost avoidance opportunities relating to training services and publication materials. Other notable services offered by this organization include serving as a legislative advocate for statewide vector control and abatement issues and facilitating the exchange of service information between member agencies.

Board of Trustees Composition

As previously noted, four of the five District board of trustees are appointed by the Glenn County Board of Supervisors, while one trustee is appointed by the City of Willows City Council. The majority (79.3%) of the parcels within the District are within the jurisdictional boundaries of the City of Willows, and the vast majority (83%) of the District's residents live within the jurisdictional boundaries of the City of Willows. Given that the majority of the parcels and the majority of the residents within the District are within the City of Willows, it would seem logical to question why the City of Willows City Council is only allowed to appoint one of the five District's trustees, while the Glenn County Board of Supervisors appoints four of the trustees. California Health and Safety Code §2021(b), which addresses the composition of the board of trustees for mosquito abatement districts, states:

> *In the case of a district that is located entirely within a single county and contains both incorporated territory and unincorporated territory, the board of supervisors may appoint one person to the board of trustees, and the city council of each city that is located in whole or in part within the district may appoint one person to the board of trustees. If those appointments result in a board of trustees with less than five trustees, the board of supervisors shall appoint enough additional persons to make a board of trustees of five members.*

Health and Safety Code clearly states that the board of supervisors shall be responsible for appointing any additional trustees needed to make a board of trustees of five members. With the City of Willows being the only incorporated territory within the district, the current composition of GCMVCD Board of Trustees is consistent with §2021(b).

MSR DETERMINATION 6-1: *GCMVCD is governed by a five-member Board of Trustees, four of whom are appointed by the Glenn County Board of Supervisors and one appointed by the City of Willows City Council. GCMVCD holds meetings that are open and accessible to the public. GCMVCD maintains accountability and compliance in its governance, and public meetings appear to be held in compliance with Brown Act requirements.*

MSR DETERMINATION 6-2: *The District operates with a full-time staff of two (the District Manager and the Supervisor) and six seasonal employees (one secretary and five night-time foggers). The overall management structure of the District is sufficient to perform effective and efficient mosquito abatement services.*

MSR DETERMINATION 6-3: *The Glenn County Mosquito and Vector Control District currently has a webpage on the County of Glenn's website. The District should consider creating and maintaining a new comprehensive website, independent of the County. The new website would allow the District to post contact information, public meeting notices, Board of Trustee meeting minutes, financial documents (budgets, audits), and fogging notices and maps, greatly increasing the District's transparency.*

MSR DETERMINATION 6-4: *The Glenn County Mosquito and Vector Control District should ensure that the information on the District's webpage located on the County of Glenn's website is kept current.*

MSR FACTOR NO. 7: ANY OTHER MATTER RELATED TO EFFECTIVE OR EFFICIENT SERVICE DELIVERY, AS REQUIRED BY COMMISSION POLICY.

District Map

An accurate, large-scale map of the Glenn County Mosquito and Vector Control District does not appear to exist. Additionally, the Glenn County Planning Division does not have a digital geographical information system (GIS) layer of the District. A GIS layer of the District was found on-line but the accuracy of the layer cannot be verified due to the lack of the large-scale map to compare it to. The lack of an accurate map and GIS layer of the District could result in difficulties in determining if a parcel is within the jurisdictional boundaries of the District. To solve this issue, the Glenn Local Agency Formation Commission, the Glenn County Mosquito and Vector Control District, the Glenn County Planning Division, and the Glenn County Assessor's Office should work together to create an accurate large-scale map and GIS layer of the District.

GCMVCD - Out of Jurisdiction Services

As previously noted, The Glenn County Valley-Wide Mosquito Abatement Assessment District, which is only a revenue-generating entity administrated by the Glenn County Public Health Department, does not provide any actual mosquito abatement services and instead contracts with the Glenn County Mosquito and Vector Control District to provide mosquito abatement services to the parcels within the assessment district. None of the parcels within the assessment district are within the sphere of influence or jurisdictional boundaries of GCMVCD. It is not known if GCMVCD received authorization from Glenn LAFCO to provide services outside its sphere of influence and jurisdictional boundaries as required by California Government Code §56133.

Even if such authorization was approved by Glenn LAFCO, the current arrangement between GCMVCD and the assessment district needs to be reviewed to determine if this arrangement has resulted in effective and efficient governance and if another arrangement, such the annexation of the parcels within the assessment district to GCMVCD, would result in better governance, more effective and efficient mosquito abatement services, and logical boundaries.

GCMVCD has been providing mosquito abatement services for the assessment district for the last twelve years. The current contract between these agencies, which is for Fiscal Years 2018-19, 2019-20, and 2020-21, states that the total amount of the agreement shall not exceed $100,000 per fiscal year. The following table shows the amount per fiscal year for the last four years that GCMVCD has billed the assessment district for providing services.

Year	**FY 2014-15**	**FY 2015-16**	**FY 2016-17**	**FY 2017-18**
Amount Billed	$67,692	$77,456	$83,260	$81,086

The assessment district collects the annual assessment from each parcel within the assessment area and in turn pays GCMVCD for the mosquito abatement services it provides. The revenue collected from the assessment district is also utilized to pay for County staff time preforming administrative services on behalf of the assessment district, to pay for vehicle servicing and repairs, and to pay for new equipment for the assessment district. The current arrangement may result in higher costs to administer the program, such as the need to prepare a new contract every few years, staff time spent monitoring the work performed by GCMVCD, and staff time spent processing and auditing invoices submitted by GCMVCD.

There does not appear to be any significant issues with the current arrangement between GCMVCD and the assessment district. However, because there are two agencies involved, there may be an issue with the residents of the assessment area not knowing who to contact if they need service or have a complaint or question; a resident within the assessment area, who does not know that GCMVCD actually provides the service, would call the County who in turn would tell the resident to call GCMVCD. The trucks utilized by GCMVCD within the assessment area have emblems that identify them as belonging to Glenn County, which could lead to some confusion as to what agency is actually providing the mosquito abatement services.

Annexing the parcels within the assessment district to the Glenn County Mosquito and Vector Control District appears to be feasible and would appear to result in improved efficiencies and cost savings. The annexation would require approval of the landowners and registered voters within the annexation area and an election may be required if a certain percentage of protests against the annexation are received. Annexation would also require the County and GCMVCD to come to an agreement regarding the current parcel assessment revenue that is being collected from the parcels within the assessment area; the existing assessment would have to be continued and be permanent in order for GCMVCD to provide services to the new area.

In order to provide for effective and efficient governance and for effective and efficient jurisdictional boundaries, consideration should be given to annexing the parcels within the assessment district area to GCMVCD. A sphere of influence amendment would be required to add the annexation area to GCMVCD's sphere of influence. Glenn County and Glenn LAFCO should work together to determine if annexation of the parcels within the assessment district area to GCMVCD is feasible and if so, develop a plan to accomplish this goal.

MSR DETERMINATION NO. 7-1: *An accurate large-scale map of the Glenn County Mosquito and Vector Control District does not exist. The Glenn Local Agency Formation Commission, the Glenn County Mosquito and Vector Control District, the Glenn County Planning Division, and the Glenn County Assessor's Office should work together to create an accurate large-scale map and GIS layer of the District.*

MSR DETERMINATION NO. 7-2: *GCMVCD provides comprehensive mosquito abatement services to the parcels within the Glenn County Valley-Wide Mosquito Abatement Assessment District under contract with the assessment district. The parcels within the assessment district area are not within the Sphere of Influence or jurisdictional boundaries of GCMVCD.*

In order to provide for effective and efficient governance and for effective and efficient jurisdictional boundaries, consideration should be given to annexing the parcels within the assessment district area to GCMVCD. A sphere of influence amendment would be required to add the annexation area to GCMVCD's sphere of influence. Glenn County and Glenn LAFCO should work together to determine if annexation of the parcels within the assessment district area to GCMVCD is feasible and if so, develop a plan to accomplish this goal.

II. SPHERE OF INFLUENCE PLAN

The existing Sphere of Influence (SOI) for the Glenn Mosquito and Vector Control District is coterminous with the District's jurisdictional boundaries. The SOI Plan recommendation is based directly on the information and discussions in the MSR and the MSR factor determinations above.

SPHERE OF INFLUENCE PLAN REVIEW FACTORS FOR THE GLENN COUNTY MOSQUITO AND VECTOR CONTROL DISTRICT

There are numerous factors to consider in reviewing a SOI Plan, including current and anticipated land uses, facilities, and services, as well as any relevant communities of interest. Updates generally involve a comprehensive review of the entire SOI Plan, including boundary and SOI maps and the District's MSR. In reviewing an agency's sphere, the Commission is required to consider and prepare written statements addressing five factors enumerated under California Government Code Section 56425(e). Each of the SOI review factors are listed below, with a corresponding determination.

SOI FACTOR NO. 1: The present and planned land uses in the area, including agricultural and open-space lands.

SOI DETERMINATION NO. 1-1: *The City of Willows retains the responsibilities for land use decisions for those parcels within the District located within the City of Willows, while the County of Glenn retains the responsibilities for land use decisions for the parcels located within the unincorporated portion of the District. The City of Willows portion of the District is zoned for single-family and multi-family residential, commercial, industrial, and public uses at urban densities. The unincorporated portion of the District located near the City of Willows is zoned for single-family and multi-family residential, commercial, industrial, and public uses at urban densities. The unincorporated portion of the District is also zoned for agricultural uses on large parcels.*

SOI DETERMINATION NO. 1-2: *New development within the District is expected to occur primarily within the City of Willows portion of the district. The provision of mosquito abatement services has no impact on existing or future land uses within the District, including agricultural uses.*

SOI FACTOR NO. 2: The present and probable need for public facilities and services in the area.

SOI DETERMINATION NO. 2-1: *GCMVCD provides vital and necessary mosquito abatement services to the residents of the District and to the residents of the Glenn County Valley-Wide Mosquito Abatement Assessment District. The District's services are crucial to the prevention of significant mosquito populations and the prevention of mosquito-borne diseases.*

SOI DETERMINATION NO. 2-2: *GCMVCD provides comprehensive mosquito abatement services to the parcels within the Glenn County Valley-Wide Mosquito Abatement Assessment District under contract with the assessment district. The parcels within the assessment district area are not within the Sphere of Influence or jurisdictional boundaries of GCMVCD.*

In order to provide for effective and efficient governance and for effective and efficient jurisdictional boundaries, consideration should be given to annexing the parcels within the assessment district area to GCMVCD. A sphere of influence amendment would be required to add the annexation area to GCMVCD's sphere of influence. GCMVCD, Glenn County, and Glenn LAFCO should work together to determine if annexation of the parcels within the assessment district to GCMVCD is feasible and if so, develop a plan to accomplish this goal.

SOI FACTOR NO. 3: The present capacity of public facilities and adequacy of public services that the agency provides or is authorized to provide.

SOI DETERMINATION NO. 3: *GCMVCD has adequate facilities, equipment, staff, and funding to provide efficient and effective comprehensive mosquito abatement services to the residents of the District and to the residents within the Glenn County Valley-Wide Mosquito Abatement Assessment District.*

SOI Factor No. 4: The existence of any social or economic communities of interest in the area if the commission determines that they are relevant to the agency.

SOI DETERMINATION NO. 4-1: *The jurisdictional boundaries of GCMVCD include most of the City of Willows and the surrounding unincorporated area.*

SOI FACTOR NO. 5: For an update of a sphere of influence of a city or special district that provides public facilities or services related to sewers, municipal and industrial water, or structural fire protection, that occurs pursuant to subdivision (g) on or after July 1, 2012, the present and probable need for those public facilities and services of any disadvantaged unincorporated communities within the existing sphere of influence.

SOI DETERMINATION NO. 5: *GCMVCD does not provide public facilities or services related to sewers, municipal and industrial water, or structural fire protection.*

GLENN COUNTY MOSQUITO AND VECTOR CONTROL DISTRICT MUNICIPAL SERVICE REVIEW AND SPHERE OF INFLUENCE FINDINGS AND RECOMMENDATIONS

Based on the MSR and SOI determinations as listed above, the Commission:

1. Finds that the District provides efficient and effective comprehensive mosquito abatement services to the residents of the District.

2. Finds that the District provides comprehensive mosquito abatement services to the parcels within the Glenn County Valley-Wide Mosquito Abatement Assessment District, under contract with the assessment district, and further finds that the parcels within the assessment district are not within the Sphere of Influence or jurisdictional boundaries of GCMVCD.

3. Finds that in order to provide for effective and efficient governance and to provide for effective and efficient jurisdictional boundaries, consideration should be given to annexing the parcels within the assessment district area to GCMVCD. A sphere of influence amendment would be required to add the annexation area to GCMVCD's sphere of influence. GCMVCD, Glenn County, and Glenn LAFCO should work together to determine if annexation of the parcels within the assessment district area to GCMVCD is feasible and if so, develop a plan to accomplish this goal.

4. Finds that no changes to the Sphere of Influence boundary for the District are necessary at this time, but changes should be considered in the future pursuant to Paragraph 3 above.

5. Affirms the existing Sphere of Influence coterminous boundary for the Glenn County Mosquito and Vector Control District as shown on Figure 2-1 on page 2-2.

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Adopting Resolution

GLENN LOCAL AGENCY FORMATION COMMISSION
RESOLUTION 2019-02

RESOLUTION APPROVING A MUNICIPAL SERVICE REVIEW AND A SPHERE OF INFLUENCE PLAN FOR THE GLENN COUNTY MOSQUITO AND VECTOR CONTROL DISTRICT

WHEREAS, California Government Code Section 56425 requires that the Local Agency Formation Commission ("LAFCO") adopt and periodically review Sphere of Influence Plans for all agencies in its jurisdiction; and,

WHEREAS, California Government Code Section 56430 requires that LAFCO conduct a review of the municipal services provided by and within an agency prior to updating or adopting its Sphere of Influence Plan; and,

WHEREAS, the Sphere of Influence Plan is the primary planning tool for LAFCO and defines the probable physical boundaries and service area of a local agency as determined by LAFCO; and,

WHEREAS, at the time and in the manner provided by law, the Executive Officer gave notice of the date, time, and place of a public hearing by the Commission for the Glenn County Mosquito and Vector Control Districts MSRs and SOI Plans including approval of the report and adoption of the written determinations contained therein; and,

WHEREAS, the Commission hereby determines that the Municipal Service Reviews for the Glenn County Mosquito and Vector Control Districts and written determinations contained therein is otherwise consistent with the purposes and responsibility of the Commission for planning the logical and orderly development and coordination of local governmental agencies so as to advantageously provide for the present and future needs of the county and its communities; and,

WHEREAS, the Commission has heard all interested parties desiring to be heard and has considered the report by the Executive Officer and all other relevant evidence and information presented at said hearing;

WHEREAS, acting as Lead Agency pursuant to the California Environmental Quality Act (CEQA) Guidelines, the Commission finds that the Glenn County Mosquito and Vector Control Districts Municipal Service Reviews/Sphere of Influence Plans is Categorically Exempt from the provisions of CEQA under Section 15306, "Information Collection" and Section15061(b)(3) – General Rule Exemption, respectively; and

NOW, THEREFORE, the Glenn Local Agency Formation Commission hereby further resolves, orders and determines as follows:

1. That the proposed Municipal Service Reviews and Sphere of Influences for the Glenn County Mosquito and Vector Control Districts comply with the provisions of California Government Code Section 56000, et seq.

2. That no significant objections have been received

Resolution 2019-02

GLENN LAFCO RESOLUTION
Mosquito and Vector Control DISTRICTS MUNICIPAL SERVICE REVIEWS AND SPHERE OF INFLUENCE PLANS

3. That the Commission adopts the written determinations, findings, and recommendations as set forth in the Glenn County Mosquito and Vector Control Districts Municipal Services Reviews/Sphere of Influence Plans, dated January 2019 and adopted by the Commission on February 11, 2019.

The foregoing resolution was duly passed by the Glenn Local Agency Formation Commission at a regular meeting held on Tuesday, February 11, 2019, by the following roll call vote:

Ayes: Commissioners Barr, Corum, Stifter, Warren, and Roundy (Chair)
Noes: None
Abstentions: None
Absent: None

Bruce Roundy
BRUCE ROUNDY, Chairman
GLENN LOCAL AGENCY FORMATION COMMISSION

Attest:

Adele Lee
Adele Lee, Executive Officer
GLENN LOCAL AGENCY FORMATION COMMISSION

COMMENTS RECEIVED AND RESPONSES TO COMMENTS

No written comments were received with regards to the public review draft Municipal Service Review/Sphere of Influence Plan

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GLOSSARY

ABATEMENT The removal or elimination of a problem, nuisance, or other disturbance especially of public health or safety significance.

ADOPTED BUDGET The spending plan approved by resolution of the Board of Supervisors after the required public hearing and deliberations on the Recommended Budget. The Adopted Budget must be balanced with Total Financing Sources equal to Total Financing Uses.

ADULTICIDE A pesticide targeted to eliminate an insect pest in the adult stage.

ANNEXATION The inclusion, attachment, or addition of a territory to a city of district.

BOARD OF SUPERVISORS The elected board of supervisors of a county.

BUDGET The planning and controlling document for financial operation with appropriations and revenues for a given period of time, usually one year.

CALIFORNIA ENVIRONMENTAL QUALITY ACT (CEQA) The California Environmental Quality Act (CEQA) is intended to inform governmental decision-makers and the public about potential environmental effects of a project, identify ways to reduce adverse impacts, offer alternatives to the project, and disclose to the public why a project was approved. CEQA applied to projects undertaken, funded, or requiring issuance of a permit by a public agency.

CONTINGENCY An amount appropriated for unforeseen expenditure requirements.

DISTRICT OR SPECIAL DISTRICT An agency of the state, formed pursuant to general law or special act, for the local performance of government or proprietary functions within limited boundaries. "District" or "special district" includes a county service area.

EXPENDITURES Expenditures occur when the County buys goods and services and pays its employees. Expenditures can be categorized into three types: operating expenditures, capital expenditures, and debt service expenditures.

	Operating expenditures are the day-to-day spending on salaries, supplies, utilities, services, and contracts. Capital expenditures are generally for acquisition of major assets such as land and buildings or for the construction of buildings or other improvements. Debt expenditures repay borrowed money and interest on that borrowed money.
FISCAL YEAR	Twelve-month period for which a budget is prepared, generally July 1 through June 30 of each year.
FUND BALANCE	The difference between assets and liabilities reported in a governmental fund.
GENERAL PLAN	A document containing a statement of development policies, including a diagram and text setting forth the objectives of the plan. The general plan must include certain state mandated elements related to land use, circulation, housing, conservation, open-space, noise, and safety.
INTEGRATED PEST MANAGEMENT (IPM)	IPM is an ecosystem-based strategy that focuses on long-term prevention of pests or their damage through a combination of techniques such as biological control, habitat manipulation, modification of cultural practices, and use of resistant varieties. Pesticides are used only after monitoring indicates they are needed according to established guidelines, and treatments are made with the goal of removing only the target organism. Pest control materials are selected and applied in a manner that minimizes risks to human health, beneficial and nontarget organisms, and the environment.
INTERFUND TRANSFER	A transfer made between budget units in different funds for services rendered and received. The service rendering budget unit shows these transfers as revenue, as opposed to expenditure reduction.
LAFCO	Local Agency Formation Commission. A state mandated local agency that oversees boundary changes to cities and special districts, the formation of new agencies including incorporation of new cities, and the consolidation of existing agencies. The broad goals of the agency are to ensure the orderly formation of local government agencies, to preserve agricultural and open space lands, and to discourage urban sprawl.

LARVICIDE A pesticide targeted to eliminate an insect pest in the larval stage.

LOCAL ACCOUNTABILITY AND GOVERNANCE The term "local accountability and governance," refers to public agency decision making, operational and management styles that include an accessible staff, elected or appointed decision-making body and decision making process, advertisement of, and public participation in, elections, publicly disclosed budgets, programs, and plans, solicited public participation in the consideration of work and infrastructure plans, programs or operations and disclosure of results to the public.

MANAGEMENT EFFICIENCY The term "management efficiency," refers to the organized provision of the highest quality public services with the lowest necessary expenditure of public funds. An efficiently managed entity (1) promotes and demonstrates implementation of continuous improvement plans and strategies for budgeting, managing costs, training and utilizing personnel, and customer service and involvement, (2) has the ability to provide service over the short and long term, (3) has the resources (fiscal, manpower, equipment, adopted service or work plans) to provide adequate service, (4) meets or exceeds environmental and industry service standards, as feasible considering local conditions or circumstances, (5) and maintains adequate contingency reserves.

MOSQUITO-BORNE Delivered by a mosquito.

MUNICIPAL SERVICE REVIEW (MSR) A study designed to determine the adequacy of governmental services being provided in the region or sub-region. Performing service reviews for each city and special district within the county may be used by LAFCO, other governmental agencies, and the public to better understand and improve service conditions.

PUBLIC AGENCY The state or any state agency, board, or commission, any city, county, city and county, special district, or other political subdivision.

RESERVE (1) For governmental type funds, an account used to earmark a portion of the fund balance, which is legally or contractually restricted for a specific use or not appropriate for expenditure. (2) For proprietary

	type/enterprise funds, the portion of retained earnings set aside for specific purposes. Unnecessary reserves are those set aside for purposes that are not well defined or adopted or retained earnings that are not reasonably proportional to annual gross revenues.
REVENUE	Funds received to finance governmental services from various sources and treated as income to the County. Examples: property taxes, sales taxes, and per parcel service charges.
SPHERE OF INFLUENCE (SOI)	A plan for the probable physical boundaries and service area of a local agency, as determined by the LAFCO
SPHERE OF INFLUENCE DETERMINATIONS	In establishing a sphere of influence the Commission must consider and prepare written determinations related to present and planned land uses, need and capacity of public facilities, and existence of social and economic communities of interest.
ULV	Ultra Low Volume. A method of pesticide dispersal using small amounts of concentrated material to treat a large area.
VECTOR	Any animal capable of transmitting the causative agent of human disease or capable of producing human discomfort or injury, including, but not limited to, mosquitoes, flies, mites, ticks, other arthropods, and rodents and other vertebrates (Health and Safety Code Section 2002(k)).
VECTOR CONTROL	Any system of public improvements or services that is intended to provide for the surveillance, prevention, abatement, and control of vectors as defined in subdivision (k) of Section 2002 of the Health and Safety Code and a pest as defined in Section 5006 of the Food and Agricultural Code (Government Code Section 53750(l)).
ZONE OF BENEFIT	A geographic area within a special district that provides a particular service or services to the parcels within that area.
ZONING	The primary instrument for implementing the general plan. Zoning divides a community into districts or "zones" that specify the permitted/prohibited land uses.

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