VECTOR CONTROL

The information for this assessment was obtained from the Orange County Vector Control District website.

The Orange County Vector Control District ("The District") routinely conducts field surveys to determine the presence of vector-borne disease. The diseases of primary concern are those carried by mosquitoes, fleas, ticks, and rodents. Surveillance and detection programs are designed around each of these vectors. When a vector-borne disease is detected by routine surveillance activities, the risk options are evaluated by the District management. If it is determined that a risk to the public exists, then local and state health agencies and the public are informed.

The district routinely surveys for several pest carried diseases that have been in the County for some time. These include:

MOSQUITO-BORNE DISEASES

The primary concern with mosquito-borne disease is the transmission of encephalitis virus to humans. Since encephalitis viruses are known to be carried by certain wild birds, the District samples blood from the birds from key locations throughout the County. The blood samples are tested for antibodies associated with a recent infection (via mosquito bite) of either St. Louis Equine Encephalitis (SLE) or Western Equine Encephalomyelitis (WEE) virus. Human SLE infections normally affect elderly persons, while WEE infections impact infants and adolescents. Human SLE cases are more abundant from late summer to early fall, and WEE cases usually occur in late spring and early summer. Protocols have been developed for the detection of West Nile Virus using the wild bird serosurveillance system already in place. The District also closely monitors local mosquito population numbers by operating carbon dioxide-baited traps that selectively trap female mosquitoes searching for blood meals from a vertebrate host.

PLAGUE

Plague is a natural occurring bacterial disease associated with wild rodents and fleas. In Orange County, plague has demonstrated some sporadic historical occurrence in the uplands along the Santa Ana River adjoining San Bernardino and Riverside Counties. Plague in southern California is typically associated with ground squirrels and pack rats, and is very rarely associated with rodents like the roof rat. The District routinely traps ground squirrels at parks and historic plague sites. A sample of blood is taken along with the fleas brushed from their bodies. The blood sample is tested for plague antibodies and fleas are tested for the presence of infectious plague bacteria.

HANTAVIRUS

Hantavirus is a recently discovered viral pathogen found in rodents that affects humans by attacking the lungs and producing an often (50%) fatal pneumonia. The virus is

inhaled as an aerosol originating from contaminated fecal pellets (droppings) and urine from rodents. The particular strain of Hantavirus encountered locally is the Sin Nombre Virus (or SNV) associated naturally with deer mice and is rarely associated with pack rats (See Figure 21). The District traps and takes blood samples from both deer mice and pack rats throughout the County.

LYME DISEASES

Lyme Disease, carried by ticks, is caused by a single-celled bacterial parasite called a spirochete. When a tick carrying Lyme Disease spirochetes attaches and begins ingesting blood, transmission of the spirochetes occurs approximately six to eight hours later. The disease can become very debilitating if not treated shortly after infection. Common symptoms include a rash followed by aches and pains, stiffness in joints, muscular abnormalities, and loss of equilibrium/coordination.

Lyme Disease in California is more prevalent along the north coast where the cool and wet climate favors optimal survival of the Pacific Black-legged Tick vector. This tick is relatively common in Orange County, but the factors affecting the Black-legged tick that trigger its spirochete infection capacity are unknown. Because the risk of Lyme spirochete transmission is probably cyclic, the District continues to regularly collect and test Pacific Black-legged Ticks and other tick species.

Figure 21 – Distribution of Deer Mice and SNV in Orange County

