County of Riverside
Department of Environmental Health
Vector Control Program
800 South Sanderson Avenue
Hemet, California  92545

Steve Van Stockum, Director
Keith Jones, Deputy Director
Dorothy Ellis-Merki, Program Chief

Prepared by
Doug Osborn, Supervising Environmental Health Specialist
Barry Hess, Environmental Health Specialist IV
# TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introduction</td>
<td>4</td>
</tr>
<tr>
<td>Service Calls</td>
<td>5</td>
</tr>
<tr>
<td>Mosquito-borne Virus Surveillance</td>
<td>8</td>
</tr>
<tr>
<td>WNV Positive Mosquito Pool Locations</td>
<td>12</td>
</tr>
<tr>
<td>Source Check Locations</td>
<td>15</td>
</tr>
<tr>
<td>Dead Bird Surveillance</td>
<td>16</td>
</tr>
<tr>
<td>Sentinel Flock Surveillance</td>
<td>17</td>
</tr>
<tr>
<td>Tick-borne Disease Surveillance</td>
<td>18</td>
</tr>
<tr>
<td>Plague Surveillance</td>
<td>19</td>
</tr>
<tr>
<td>Hantavirus Surveillance</td>
<td>22</td>
</tr>
<tr>
<td>Positive Hantavirus Locations</td>
<td>23</td>
</tr>
<tr>
<td>Poultry Ranches</td>
<td>24</td>
</tr>
<tr>
<td>State Certifications</td>
<td>25</td>
</tr>
<tr>
<td>Vector Control Program Staff</td>
<td>26</td>
</tr>
</tbody>
</table>
INTRODUCTION

The vast majority of vector-borne diseases are found in tropical areas of the world. Although Riverside County has a more temperate climate, vector-borne diseases exist in this area that can cause serious health problems. These diseases include Plague, Encephalitis, Lyme Disease, Hantavirus, and West Nile Virus. Monitoring and controlling the presence of these diseases is vital to the protection of the health and well being of the residents of Riverside County.

Riverside County is under the jurisdiction of multiple agencies which provide vector control services. The Riverside County Vector Control Program has been active in surveillance and vector control activities since 1972 and provides vector control services to mid-western Riverside County and the Palo Verde Valley area outside the city limits of Blythe. Services are also provided to contract cities which include Banning, Beaumont, Hemet, Menifee, Moreno Valley, Murrieta, Perris, San Jacinto, Temecula and Wildomar. The service area is 4,800 square miles with an approximate population of 990,000 people.

There are two other vector control districts within Riverside County. Northwest Mosquito and Vector Control District provides services to the northwest area of the County including the cities of Calimesa, Canyon Lake, Corona, Eastvale, Jurupa Valley, Lake Elsinore, Norco, and Riverside. The Coachella Valley Mosquito and Vector Control District provide services to the desert areas of the County, ranging from Palm Springs to Chiriaco Summit, including the Salton Sea.

Encephalitis and West Nile Virus are mosquito-borne diseases continually detected in Riverside County with most surveillance and control activities being conducted throughout the spring and summer. Lyme Disease surveillance and tick population studies are conducted throughout the spring. Plague is endemic in the ground squirrel population of the mountain areas and has been monitored during the summer since 1978. Hantavirus and Arena virus surveillance is also conducted each year. This annual report highlights the efforts of this Program during the year 2014 and its efforts to provide vector control services to the residents of Riverside County.
The Riverside County Vector Control Program responded to 386 service calls (complaints) in 2014. The majority of the service calls addressed mosquitoes and can be attributed to unmaintained backyard swimming pools, spas, and ponds which have been abandoned. Mosquito service calls are investigated and mosquito breeding sites are abated using various methods. Property owners are notified of the problem and are encouraged to correct it. If owners refuse to abate the violation, a variety of enforcement actions may be taken.

Mosquito complaints involving areas which are not private residences are assigned a source number and serviced on a routine basis to maintain mosquito control. Sources include flood channels, retention basins, ditches and similar areas which are collection points for water runoff or hold stagnant water for any length of time.

An integrated approach to controlling vectors is applied to all complaints. An example of this is introducing mosquito fish to closed water bodies like abandoned swimming pools to feed on mosquito larvae and pupae. Technicians inform members of the public on how to prevent the harborage and proliferation of vectors (including mosquitoes, rodents, and flies). Some complaints are handled by educational brochure. Others require the identification of samples and/or control measures. While non-pesticide methods are preferred, in many instances pesticides are the only effective solution.
2014 Complaints by Type in Contract Cities

<table>
<thead>
<tr>
<th>Type</th>
<th>Banning</th>
<th>Beaumont</th>
<th>Hemet</th>
<th>Menifee</th>
<th>Moreno Valley</th>
<th>Murrieta</th>
<th>Perris</th>
<th>San Jacinto</th>
<th>Temecula</th>
<th>Wildomar</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rodents (0)</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Bees (39)</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>26</td>
<td>12</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Flies (2)</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Mosquitoes (138)</td>
<td>1</td>
<td>1</td>
<td>29</td>
<td>0</td>
<td>1</td>
<td>73</td>
<td>4</td>
<td>5</td>
<td>23</td>
<td>1</td>
</tr>
<tr>
<td>WNV Cases (7)</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>1</td>
<td>2</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

2014 Complaints by Type for Contract Cities
2014 Complaints by Type for the Unincorporated Areas

- Bees: 19
- Flies: 21
- Mosquitoes: 164
- Rodents: 3

2014 Total Complaints By Type

- Mosquitoes (302): 77%
- Bees (58): 14%
- Flies (23): 6%
- Rodents (3): 1%
- WNV Human Cases (7): 2%
The Riverside County Vector Control Program continued to monitor mosquito populations during 2014. Six New Jersey light traps were monitored in the western portion of Riverside County. Over the course of the 2014 season 9,948 mosquitoes were collected and identified in the western portion of Riverside County.

**New Jersey Light Trap Locations (6 Locations)**
Population Specifications

_Culex tarsalis_, the “western encephalitis mosquito”, and the main vector of West Nile Virus (WNV), St. Louis Encephalitis (SLE), and Western Equine Encephalomyelitis (WEE) in California, made up 89% of the mosquitoes collected in the western portion of Riverside County.

**Mosquito Population by Species 2014**

- Cx. quinquefasciatus: < 1%
- Cx. stigmatosoma: < 1%
- Cx. erythrothorax: 5.2%
- Anophelene spp.: 3.3%
- Culiseta spp.: 2.1%
- Other Species: 5%
- Cx. tarsalis: 89%

**Mosquito Populations by Month 2014**

- Jan: 139
- Feb: 137
- Mar: 111
- Apr: 825
- May: 1,205
- Jun: 739
- Jul: 1,445
- Aug: 1,635
- Sep: 1,189
- Oct: 1,736
- Nov: 337
- Dec: 0
Another potential vector, *Culex quinquefasciatus*, the “southern house mosquito”, made up 3.5% of the mosquitoes collected. *Culex erythrothorax*, the “tule mosquito”, made up 17.7% of the mosquitoes collected. *Culex stigmatosoma*, the “banded foul water mosquito”, represented 3.1% of the total collection.

**Testing Mosquito Pools**

Mosquito-borne encephalitides are caused by viruses and the related diseases which affect the central nervous system of the infected animal or person. The three types of arthropod-borne viruses detected in Riverside County are St. Louis Encephalitis (SLE), Western Equine Encephalomyelitis (WEE), and West Nile Virus (WNV). These viruses normally cause infection of wild birds and small mammals. Horses and humans can show clinical conditions to these diseases although they are considered dead end hosts (i.e. cannot infect a mosquito). The viruses that cause WEE, SLE, and WNV are normally transmitted from bird to mosquito to bird; and less commonly from bird to mosquito to man or horse.
A program for monitoring Encephalitis in Riverside County has been in effect for more than two decades. Our Program has joined a cooperative effort with the California Department of Public Health (CDPH), the University of California, the Mosquito and Vector Control Association of California, and the Riverside County Public Health Department. Since its introduction to Southern California in 2003, surveillance for West Nile Virus has been a primary focus of our Program.

**Historic Mosquito Counts**

The type of surveillance we utilize is driven by live mosquito trapping. Carbon dioxide baited traps are set overnight, returned to our lab in the morning for initial processing which consists of identifying mosquito types down to the genus/species. We then “pool” them into groups of individuals of the same species from 12-50 individuals. These will all be females which were searching for a blood meal since female mosquitoes are attracted to the carbon dioxide used in the baiting process. These pooled samples are sent to a lab at UC Davis for virus detection. All collection sites are registered with the State Department of Public Health and are included in the West Nile Virus detection and oversight surveillance program.
WNV POSITIVE MOSQUITO POOL LOCATIONS

WNV Positive Mosquito Pools by Surveillance Area 2014

- Hemet: 1
- Moreno Valley: 1
- Temecula: 6
- Murrieta: 8

Map showing West Hemet, Hemet, and other areas.
Vector Control Program

East Murrieta

West Murrieta
The following numbers of permanent or semi-permanent “source check” locations have evolved over the years either by responding to service calls or by pro-actively seeking out problem areas.

**Contract Cities (451 sites)**
- Banning: 7
- Beaumont: 24
- Hemet: 99
- Menifee: 85
- Moreno Valley: 80
- Murrieta: 41
- Perris: 46
- San Jacinto: 39
- Temecula: 25
- Wildomar: 5

**Unincorporated Areas (227)**
- Blythe area
- Menifee area
- Beaumont area
- Cherry Valley
- Gavilan Hills
- Hemet area
- Horsethief Canyon
- Homeland
- Idyllwild
- Lake Elsinore area
- Lakeview/Nuevo
- Mead Valley
- Perris area
- Temecula area
- Wildomar area
- Water District locations
DEAD BIRD SURVEILLANCE

The dead bird surveillance program is coordinated by CDPH where the public can report dead birds via their website (www.westnile.ca.gov). If CDPH staff determines that a dead bird is deemed acceptable for testing. Due to the change in dead bird collection protocol by CDPH, Riverside County Department of Environmental Health Vector Control Program has discontinued the collection and testing of dead birds within our jurisdiction.

This department still responds to dead bird calls that are verified by CDPH as viable for testing by investigating the surrounding areas for any signs of mosquito breeding and adult mosquitoes.

In 2014 no dead birds investigations were conducted within our jurisdiction.
Another aspect of this Program consists of sentinel chicken flocks being placed in areas where high populations of *Culex tarsalis* and *Culex quinquefasciatus*, the western encephalitis mosquito and the southern house mosquito, are known to exist and where such areas infringe on local communities. Blood samples are collected on a biweekly basis via filter strips and sent to the CDPH Viral & Rickettsial Disease Laboratory where they are analyzed for the antibodies to mosquito-borne viruses. Our Program maintains five surveillance flocks, all of which are in the western portion of Riverside County. Of the 60 chickens tested as sentinels during the 2014 season, there were 6 positive seroconversions for WNV. All 6 were in the Murrieta area flock.
Lyme disease is a potentially debilitating illness transmitted to people and other animals by certain ticks. The disease is caused by a spirochete, *Borrelia burgdorferi*, a cork-screw shaped bacterium. In California, Western Black-legged Ticks (*Ixodes pacificus*) are thought to be responsible for most human infections. The first California report of the disease came in 1978. California health authorities began monitoring Lyme disease in 1983 and designated it a reportable disease in 1989. Only 2 to 3 percent of the ticks carry the spirochete which causes this disease in California.

People appear to be at risk in spring and early summer, when nymphal ticks are most abundant. Nymphs attach readily to people and their size makes them hard to see. Adult ticks are most active in cooler weather, especially in the winter. They feed on medium to large animals such as field mice, dogs, deer, and humans.

In 2014, Lyme disease in Riverside County is monitored via complaint investigations. This year we did not receive any human cases of illness due to Lyme disease nor did we receive any complaints about ticks.
PLAGUE SURVEILLANCE

Twenty million people died in Europe from 1346 to 1352. This period was known as the great pestilence and was later referred to as the Black Death. Today it is called the Plague. The disease has obviously undergone a decline since those times, but still occurs sporadically in various parts of the world today including the United States.

Plague is a specific disease caused by a bacterium named *Yersinia pestis*. The bacterium that causes Plague produces a toxin that causes the destruction of blood vessels. Plague can also attack the lungs leading to pneumonic Plague, the most serious form of this disease. It occurs in localized and sometimes devastating epidemics among persons living in crowded conditions.

Plague has historically been transmitted by the bite of the Oriental Rat Flea (*Xenopsylla cheopsis*). The hosts for this flea have been the Norway rat (*Rattus norvegicus*) and the Roof rat (*Rattus rattus*).

This disease is thought to have been introduced into California in 1900 through the seaport of San Francisco where it was first recorded. It was later recorded in Los Angeles in 1908. The infected rats were arriving from Asia where an epidemic was in progress. Outbreaks in rats and human epidemics followed this introduction in San Francisco and Los Angeles. These epidemics involved domestic rats, rat fleas, and humans.

Plague was first isolated from native ground squirrels and wood rats in California in 1908. A pneumonic Plague epidemic occurred in 1919 in Oakland where a hunter contracted the disease from native ground squirrels. Thirteen out of fourteen of these cases were fatal. The second and last epidemic in California occurred in 1924 in Los Angeles where thirty-one of thirty-two individuals infected died from this disease. There have been a total of 426 human Plague cases in early California epidemics, 55% of which were fatal.

Since 1970, there have been approximately 40 human Plague cases in California, all associated directly or indirectly with the sylvatic (wilderness) Plague cycle. This has occurred in a variety of habitats ranging from sea level on the coast to an elevation of approximately 9000 feet in our California wilderness areas.
In Riverside County, Plague is commonly associated with animal disease outbreaks in populations of California Ground Squirrels (*Spermophilus beecheyi*). The vector is the Squirrel Flea (*Oropsylla montana*). In 1970 during a disease outbreak among California ground squirrels in Silent Valley, located south of the City of Banning, a boy contracted Plague. It was properly diagnosed and he recovered. This incident provided impetus to start our Plague Surveillance Program and eventually establish our Vector Control Program. Plague is endemic in the ground squirrel population of the San Jacinto mountain range and has been monitored during the summer since 1978.

During the 2014 season 89 California Ground Squirrels were collected and processed from eight sites in the San Jacinto Mountains. Blood samples were sent to CDPH for Plague testing. In addition, 211 fleas were collected, identified, and held for potential Plague testing. Of the fleas collected, 83% were found to be *Oropsylla montana* and 17% were found to be *Hoplopyllus anomalus*. CDPH only accepts testing pools of fleas collected from rodents associated with a human case investigation or an apparent plague epizootic. Knowledge about the infection histories of these animals provided by ear-tagging data has helped to make sure that control measures are undertaken only when absolutely necessary. In 2014 there were no samples that tested positive for Plague.
<table>
<thead>
<tr>
<th>CAMPGROUND</th>
<th>DATE</th>
<th>M♂</th>
<th>F♀</th>
<th>M♂</th>
<th>F♀</th>
<th>M♂</th>
<th>F♀</th>
<th>M♂</th>
<th>F♀</th>
<th>M♂</th>
<th>F♀</th>
<th>FLEA INDEX</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hurkey Creek</td>
<td>5/22/2014</td>
<td>2</td>
<td>4</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>17</td>
<td>14</td>
<td>0</td>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td>Hurkey Creek</td>
<td>6/26/2014</td>
<td>5</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>6</td>
<td>1</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Hurkey Creek</td>
<td>8/14/2014</td>
<td>2</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>10</td>
<td>2</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Hurkey Creek</td>
<td>9/15/2014</td>
<td>6</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>3</td>
<td>10</td>
<td>5</td>
<td>5</td>
<td>0</td>
</tr>
<tr>
<td>Idyllwild</td>
<td>5/15/2014</td>
<td>4</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>4</td>
<td>2</td>
<td>0</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>Idyllwild</td>
<td>6/19/2014</td>
<td>1</td>
<td>5</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>7</td>
<td>6</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Idyllwild</td>
<td>7/31/2014</td>
<td>1</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>11</td>
<td>14</td>
<td>6</td>
<td>8</td>
<td>0</td>
</tr>
<tr>
<td>Idyllwild</td>
<td>9/4/2014</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Mt. San Jacinto</td>
<td>5/15/2014</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Mt. San Jacinto</td>
<td>6/19/2014</td>
<td>2</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>6</td>
<td>0</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Mt. San Jacinto</td>
<td>7/31/2014</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Mt. San Jacinto</td>
<td>9/4/2014</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Dark Canyon</td>
<td>5/8/2014</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Dark Canyon</td>
<td>6/12/2014</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Dark Canyon</td>
<td>7/17/2014</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Dark Canyon</td>
<td>8/21/2014</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Fern Basin</td>
<td>5/8/2014</td>
<td>1</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Fern Basin</td>
<td>6/12/2014</td>
<td>1</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Fern Basin</td>
<td>7/17/2014</td>
<td>1</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>4</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Fern Basin</td>
<td>8/21/2014</td>
<td>0</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>7</td>
<td>10</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Marion Mtn.</td>
<td>6/5/2014</td>
<td>0</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Marion Mtn.</td>
<td>7/25/2014</td>
<td>2</td>
<td>2</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>3</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Marion Mtn.</td>
<td>8/28/2014</td>
<td>1</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>5</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Marion Mtn.</td>
<td>9/18/2014</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Stone Creek</td>
<td>6/5/2014</td>
<td>3</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Stone Creek</td>
<td>7/25/2014</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Stone Creek</td>
<td>8/28/2014</td>
<td>0</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Stone Creek</td>
<td>9/18/2014</td>
<td>1</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>5</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Boulder Basin</td>
<td>5/29/2014</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Boulder Basin</td>
<td>8/6/2014</td>
<td>2</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Boulder Basin</td>
<td>9/25/2014</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

**TOTALS:** 37 50 0 2 0 70 105 14 21 0 1 2.37
During the Korean War 2,500 soldiers became infected with a mysterious illness. The symptoms included fevers, weakness, and kidney failure. The virus responsible for these infections was isolated years later. It was found to belong to a group of rodent-borne viruses called Hantaviruses. The Hantaviruses belong to the family Bunyaviridae and the Korean strain was named for the Hantaan River where it was first encountered. It has been determined that the disease is contracted through skin exposure or inhalation of airborne particles of feces or urine from infected rodents.

In 1993, the investigation of two fatal cases in New Mexico revealed a new strain of Hantavirus. It was named the Sin Nombre (no name) Virus and the clinical conditions it caused in humans were referred to as Hantavirus Pulmonary Syndrome (HPS).

HPS is a rare but life-threatening illness that has been diagnosed in many areas of the western United States. The western portion of Riverside County has many habitats that are suitable locations for the development of deer mice. Surveillance activities were conducted during the Spring, Fall, and Winter seasons in 2014 due to the necessary focus of WNV surveillance and mosquito control activities during the summer. Blood samples were collected, processed at our laboratory, and sent to CDPH for Hantavirus antibody analysis. There were 4 positive results returned out of 35 specimens submitted.
POSITIVE HANTAVIRUS LOCATIONS

Norton Younglove Preserve — 4 positives
(Peromyscus maniculatus)
POULTRY RANCHES

As defined by Riverside County Ordinance No. 565, a commercial poultry ranch is any building, structure, enclosure, or premises located within the unincorporated territory of Riverside County, where 1,000 or more domestic fowl are kept or maintained for the primary purpose of producing fowl, eggs, or meat for sale.

The maintenance of sanitary conditions on poultry ranches is essential in the control of synanthropic flies, mosquitoes, and commensal rodents. To insure sanitary conditions, bimonthly inspections are conducted on 17 poultry ranches located in the western portion of Riverside County. Many aspects of ranch management are investigated during these inspections including manure management, manure disposal, maintenance of watering and feeding devices, timely removal of dead fowl and broken eggs and other conditions that could result in a vector breeding situation.

Bimonthly inspections were conducted at all permitted poultry ranches during 2014. Our Environmental Health Technicians comply with very strict bio-security measures due to past quarantines such as Exotic New Castle Disease and the potential threat of Avian Influenza.

Permitted Poultry Ranches

Beaumont Ranch, Beaumont
Cramer Lake Ranch, Riverside
Demler Egg Ranch, San Jacinto
Golden Fresh Egg Ranch, Cherry Valley
Hidden Villa-Cajalco, Perris
McAnally Enterprises #6, Lakeview
MCM Lakeview, Lakeview
Romoland Pullet Ranch, Romoland
Cottonwood Pullet Ranch, San Jacinto
Cramer Perris Ranch, Perris
Fairgrow Pullets, Hemet
Jong’s Poultry Farm Inc., Riverside
Hidden Villa-Juniper Flats, Homeland
McAnally Ranch #9, San Jacinto
MCM San Timoteo, El Casco
Romoland Ranch, Menifee
Sage Ranch, Hemet
In accordance with California Health and Safety Code, Section 106925 and Title 17 of California Code of Regulations, Sections 30001-30061, every government agency employee who handles, applies, or supervises the use of any pesticide for public health purposes must be certified by CDPH. Applicants striving for full certification status must pass all four examinations in the categories of pesticide safety, mosquito control, terrestrial invertebrate control, and vertebrate vector control. In addition, personnel must acquire a set number of continuing education units in all categories. At the end of 2014, our Program had six fully certified staff. Fifty Environmental Health Specialists are classified with Limited status meaning that they have obtained one or more certifications without being required to acquire continuing education units.

Vector Control and the associated discipline, Medical Entomology, are constantly changing. Keeping abreast of these changes would be an impossible task without the aid of memberships in various organizations. Active memberships were maintained with the Mosquito and Vector Control Association of California, the Society of Vector Ecology, and the American Mosquito Control Association in order to keep our Program informed of the current trends of importance in vector control.

There were no new certifications in 2014.
Supervising Environmental Health Specialist
Doug Osborn

Environmental Health Specialist IV
Barry Hess

Environmental Health Technician II
Andrea Merrill

Environmental Health Technicians I
Nancy Burgett, Leonard Carpenter, Terrence Wiggins, Angie Gilbert

Office Assistant III
Maria Oropeza

For more information go to our website
www.rivcoeh.org