

COUNTY OF SAN DIEGO
DEPARTMENT OF ENVIRONMENTAL HEALTH
COMMUNITY HEALTH DIVISION
VECTOR SURVEILLANCE AND CONTROL



ANNUAL REPORT FOR
CALENDAR YEAR 2002



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**Department of Environmental Health
Mission Statement**

Protecting the environment and enhancing public health by preventing disease, promoting environmental responsibility and, when necessary, enforcing environmental and public health laws.

**Vector Surveillance and Control
Mission Statement**

To protect the public health and safety, and promote the welfare of San Diego residents by preventing vector-borne diseases and minimizing discomfort and injury caused by vectors.

INTRODUCTION

Since July 1, 1989, the Vector Surveillance and Control program (VSC) of the County Department of Environmental Health (DEH) has provided countywide vector prevention and control services under the powers of a vector control district, as adopted by the County Board of Supervisors. Mosquito, domestic rat, fly and other vector prevention and control programs are provided to reduce the risk of diseases these vectors can transmit and to minimize nuisances they cause. A total of 4,391 customer service requests and complaints were investigated during calendar year 2002. These services are funded by parcel service charges. The service charges are established annually by the Board of Supervisors after public review.

PARCEL SERVICE SUB-REGIONS

For the purpose of Vector Surveillance and Control Division, the Board has defined three service sub-regions within the county. These sub-regions are described in detail below:

- **COASTAL SUB-REGION:** The Cities of Carlsbad, Coronado, Del Mar, Encinitas, Imperial Beach, Oceanside, San Diego and Solana Beach and Unincorporated Areas included in the following School Districts: Cardiff, Del Mar, Encinitas Union, Rancho Santa Fe, Solana Beach, San Ysidro, South Bay Union, Unified Coronado, Unified Carlsbad, Unified Oceanside, and Unified San Diego.
- **INLAND SUBURBAN SUB-REGION:** The Cities of Chula Vista, El Cajon, Escondido, La Mesa, Lemon Grove, National City, Poway, San Marcos, Santee and Vista and Unincorporated Areas included in the following School Districts: Cajon Valley Union, Chula Vista City, Escondido Union, Lakeside Union, La Mesa-Spring Valley Union, Lemon Grove, National City, San Pasqual Union, Santee, Valley Center Union, Unified Poway, Unified Ramona, Unified San Marcos, and Unified Vista;
- **INLAND RURAL SUB-REGION:** Areas included in the following School Districts: Alpine Union, Bonsall Union, Dehesa, Fallbrook Union, Jamul-Los Flores Union, Julian Union, Pauma, Spencer Valley, Vallecitos, Warner Union, Unified Borrego Springs, and Unified Mountain Empire.
- The current parcel service charges are:
 - Coastal Sub-region: \$3.00/per parcel
 - Inland Suburban Sub-region: \$2.28/per parcel
 - Inland Rural Sub-region: \$2.28/per parcel

MOSQUITO CONTROL

To prevent and control mosquitoes, the VSC conducts inspections, manages and takes control actions at approximately 600 permanent major breeding sources. The sources include rivers, streams, marshlands, lagoons, ponds, and various other man-made and natural sources of standing water. In 2002, staff responded to 799 citizens' complaints or service requests regarding mosquito nuisances and breeding. While many complaints involved major sources, most involved smaller or intermittent backyard sources. Staff continued its source management efforts by working closely with property owners and regulatory agencies to prevent and control mosquito breeding in known sources.

Source reduction activities were performed at:

- Chollas Creek
- Los Caches Creek
- Sycamore Creek
- Forrester Creek
- Kumeyaay Lake
- Talone Lake
- Lindo Lake
- Fenton Pond
- Otay River
- San Diego River
- Sweetwater River
- Tijuana River
- San Elijo Lagoon.

Staff reviewed proposed land use projects in the design stages and during permit reviews to provide technical assistance for the prevention and control of mosquitoes as well as other arthropods. Staff participated in pre-application meetings held by the State Department of Fish and Game and the Army Corps of Engineers to emphasize the need for project design to reduce areas that could breed mosquitoes. In addition, staff participated in various wetland and lagoon management meetings and provided mosquito source management recommendations for incorporation into the operating plan.

RODENT CONTROL

In 2002, VSC staff responded to 3,327 citizens' complaints or service requests relating to domestic rats. Each of these complaints or service requests resulted in a site investigation and a consultation with residents regarding rat prevention and control practices. Rodenticide bait was distributed to residents along with guidelines for placing bait stations. VSC staff coordinated work with other regional agencies to prevent and eliminate rat infestations and harborages. As with mosquito control, educational presentations were provided to a wide range of audiences to promote prevention and control of rodents.

FLY CONTROL

VSC responded to 265 citizens' complaints of excessive numbers of nuisance¹ flies during 2002. One hundred and twenty of these complaints involved commercial poultry ranches. In 2002, 34 poultry ranches were currently in operation in San Diego County. In 2002, all ranchers have complied with the county standards for preventing and controlling fly breeding on commercial poultry ranchers. Three Notices of Violation were issued to two poultry ranches. These violations were immediately corrected. Also in 2002, members of the Fly Abatement and Appeals Board met twice to discuss routine business.

VSC staff again worked closely with the Del Mar Racetrack operators to prevent fly breeding at the facility and at area mushroom farms, which process the manure and bedding

¹ VSC responds to residential complaints related to house flies and lesser house flies as opposed to agricultural operations with associated fruit flies.

materials.

VECTOR-BORNE DISEASE SURVEILLANCE AND CONTROL

MOSQUITOES:

Arboviral Encephalitis - While encephalitis positive samples occurred in other southern California counties during 2002, all specimens collected (48 mosquito pools and 540 chicken blood samples) in San Diego county were negative for St. Louis encephalitis, Western equine encephalitis, West Nile virus, and other mosquito-borne encephalides. Also, there were no confirmed human cases of mosquito-borne encephalitis reported in the county.

West Nile virus: In preparation for the impending arrival of West Nile virus, a comprehensive response plan has been developed and will be released to the public. As of this writing, West Nile virus has not been detected in San Diego County. Included in the plan are some new surveillance measures as well as some enhancements to existing surveillance. One of the new measures is the addition of dead bird testing. Some bird species are particularly sensitive to the virus and can provide an early warning that the virus is circulating in the general area.

Enhancements include:

- Mosquito trapping all year.
- Increased mosquito testing (pooling).
- New equipment and enhanced public education and outreach.
- Dedicated website for West Nile virus: www.sdfightthebite.com.

Malaria: Case investigations were coordinated with the County Health and Human Services' Community Epidemiology Program. Although there were eleven imported cases of malaria reported in 2002, there were no known locally acquired cases.

RODENTS:

Hantavirus: No human cases of hantavirus have been reported in San Diego County. Both hemorrhagic and respiratory strains of hantavirus occur in rodents in San Diego County. Sin Nombre is the respiratory strain and was first described in the Four Corners area of the Southwest where numerous deaths occurred during 1993. Hantavirus surveillance began in the county in January 1994 to determine the prevalence and distribution of the rodent species infected with this virus. Results have shown that from 5 to 20 % of the wild mice trapped were seropositive for the virus. These seropositives were found at 14 localities throughout the county. Of the 217 rodents tested in 2002, three (or 1.4 %) were seropositive for this strain of the virus. These mice were collected at the Otay Lakes area, Pecosquitos Preserve, and near Agua Hedionda Lagoon.

Public education efforts for hantavirus prevention have included:

- Providing information for preventing and controlling wild rodents inside or outside structures.
- How to properly disinfect infested premises while cleaning.
- Posting of warning signs at sites where positive samples have been obtained.

During 1980-2002, the California Department of Health Services (CDHS) reported that 33 cases have occurred within California. These have mostly been from areas in the Sierra Nevada Mountains.

Arenavirus: In 1998 VSC began monitoring arenavirus, a causative agent for a meningitis-type infection called lymphocytic choriomeningitis that occurs in South America. VSC Surveillance in 2000 reported a total of 71 *Neotoma* specimens (wood rats) being sampled with 11 (or 15.5 %) being positive, while in 2002, 51 were sampled with none being seropositive. Public education and new warning signs were provided to rangers and staff at these seropositive localities used by the public for camping or recreation.

TICKS:

Tularemia: In July of 2002, a wild rabbit from Encinitas was found to have died of tularemia. VSC staff responded by collecting 437 ticks (44 pools), from August through December, in and near the area where the rabbit was found and having them tested for this tick-borne disease. Results showed that 12 pools were positive for the bacteria. These positives were restricted to the immediate area where the rabbit was found. Trails in the area were posted with tick-warning signs and a news release was issued so that individuals using trails in the area would be aware to take necessary precautions to avoid being bitten and thus possibly infected with tularemia.

Lyme Disease: Testing in 1994 and 1995 established that Lyme disease does occur in San Diego County. The primary vector for this disease, the western blacklegged tick, is commonly found in most rural areas of the county. Four to five percent of these ticks were shown to be infected. During 2002, 620 tick specimens representing 81 pools from 17 localities were sent for testing. These also were negative for the Lyme disease spirochete. Various agencies, camp rangers, and docent education programs have aided VSC in posting tick warning signs, and in providing information to visitors to outdoor recreational areas regarding trail precautions and personal inspection techniques that can be used to avoid exposure to this tick-borne disease.

FLEAS:

Plague: During 1992–1998, plague surveillance conducted at the higher mountainous localities has consistently yielded three or more plague-positive ground squirrels during each season. During 2002, 409 ground squirrels were sampled with 11 (or 2.7 %) being seropositive. These seropositives were found only at Heise County Park. Dust-bait stations to control fleas have been maintained at Heise County Park and at Doane Valley State Park from April through October beginning in 1996. Both these campgrounds have a history of seropositive squirrels, although the use of these stations at these campgrounds, together with warmer temperatures occurring during the last three years, have kept the flea counts at low levels (< 0.50), resulting in helping to reduce the transmission of plague to humans.

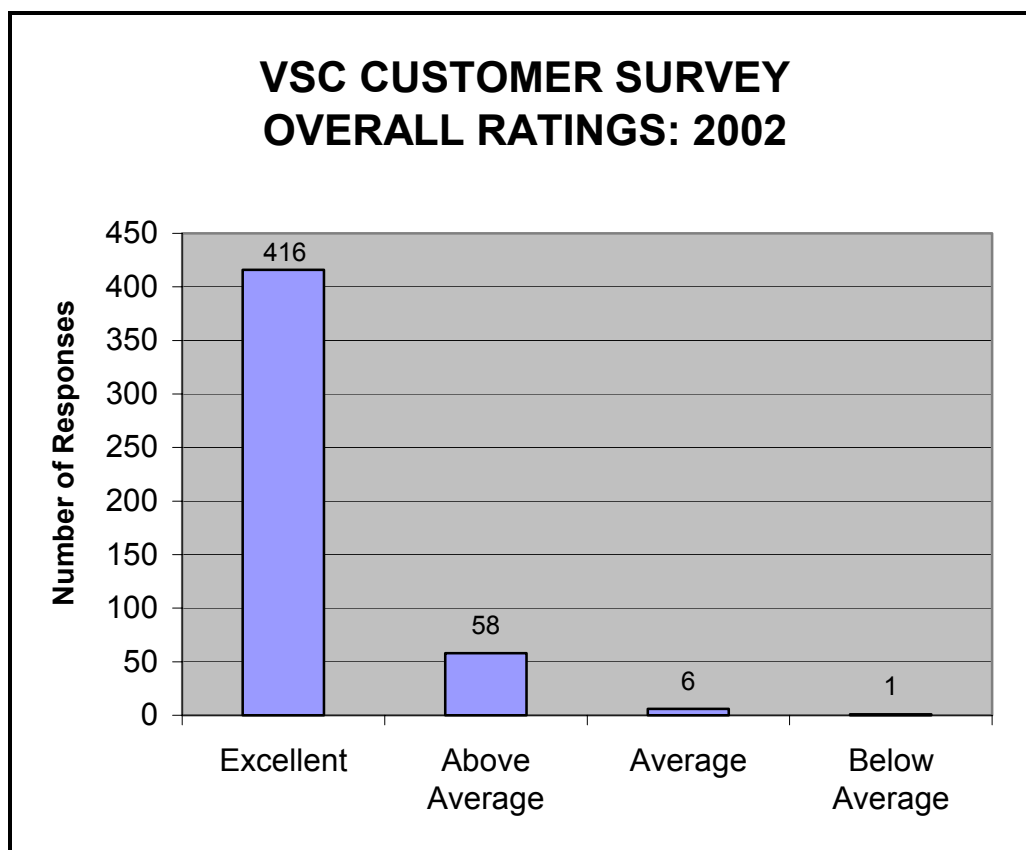
Plague warning signs continue to be posted at campgrounds with a history of plague. In addition plague information pamphlets are provided to park officials to distribute to campground visitors. Except in response to confirmed human cases, the State Health

Department discontinued flea pool testing for plague in 2000. Fleas were not tested in San Diego County during 2002.

CUSTOMER SERVICE SURVEY RESULTS

For the calendar year 2002, 2044 (or 47.3 %) of 4,323 customers of the VSC Program were requested to complete customer survey forms by rating the performance of the VSC service staff based on five categories (timeliness of service, courtesy of staff, staff's know-ledge, information the customer received, and overall quality of the service provided). As depicted in Figure 1 below, 474 (98 %) of the 484 customers who replied gave VSC staff a rating of excellent or above average.

Figure 1



FUTURE CHALLENGES

WEST NILE VIRUS

As discussed earlier, a comprehensive countywide strategic response plan has been completed in order to meet the challenge of the pending arrival of West Nile virus in the county. This plan includes protocols in which VSC staff will respond to a positive mosquito pool, dead bird, equine, and/or human case caused by West Nile virus. These responses will include increased surveillance and control activities at the suspect locality and via sharing information with other agencies, particularly:

- the Community Epidemiology Division of the Health and Human Services Agency,
- the Animal Diagnostic Disease Laboratory of the Department of Agricultural Weights and Measures,
- local municipalities,
- military operations,
- State agencies, and
- stakeholder organizations (e.g. Wild Animal Park, San Diego Zoo, Conservancies, etc).

The threat of West Nile virus has increased our mosquito-borne encephalitis surveillance activities for 2003 by trapping and testing mosquitoes year round, extending the testing of sentinel chicken flocks into December, relocating our sentinel chicken flocks to more favorable sites, increasing public education and outreach, and by purchasing new equipment. Without increasing existing staffing levels the prioritization of activities will thus be on mosquito-borne encephalitis surveillance, with less surveillance being conducted concerning rodent- and tick-borne diseases.

DEPARTMENT COST CONTROLS

Late in 2002, in response to requests from industry concerning the Department of Environmental Health's (DEH) proposal for fee adjustments associated with hazardous materials, food and housing and land and water quality, the Department adopted a guiding principle for cost containment. The goal is to achieve a 5% cost reduction, cost containment and/or cost avoidance for each program, per fiscal year.

DEH will strive to meet this goal by:

1. Cost Reduction- continually striving to improve service delivery and process efficiency. A reduction of one day processing time for development projects can mean significant savings for applicants;
2. Cost Containment- absorption of new workload or program changes within existing program budget. As an example, the VSC Program has addressed problems associated with the Tiger Mosquito- a recent addition to the local mosquito population in containers of decorative bamboo. VSC has been involved in creation of more stringent standards for importing and for eradication of the introduced mosquito population. These efforts were controlled within the existing budget structure. Hundreds of staff hours have been devoted to the creation of the West Nile Virus Strategic Response Plan without reducing service levels.
3. Cost Avoidance- minimize future costs by working to modify existing or proposed new mandates. DEH constantly monitors legislative and regulatory changes, provides input and in some instances develops clean-up language or alternative

legislation.

Unfortunately, even with the above strategies, it will likely not be possible to continue to provide the same level of service, for the same per parcel service charge, in the foreseeable future. The VSC program fees have been variable since inception in 1989. In FY 95-96 service fees were reduced to the current levels to reduce the Trust Fund to a contingency of \$250,000. Rates were to have been adjusted once this target was achieved. However, with the passage of Proposition 218, a voter approval is necessary for any rate increases. In the near future, in order to meet the Board of Supervisor's policy directive for full cost recovery, it will be necessary to increase the parcel fee for service and/or create other sources of funding.

POTENTIAL REVENUE ENHANCEMENTS

Before any revenue enhancement is proposed, DEH will meet with all interested stakeholders to examine all issues and determine the most prudent course of action. Community workshops held in various locations throughout the County, posting the recommendations on the website and publishing public notifications of the recommended adjustments in local newspapers are just a few of the notifications that would be provided.

Some of the areas that will be examined include:

1. Fees for service for review and approval of Best Management Practices (BMPs) in compliance with the existing stormwater ordinance in relation to vector control issues. VSC has worked closely with Caltrans and has developed guidelines (soon to be posted on the website) for wet basin maintenance.
2. Currently, municipal, county, state and federally owned parcels are not charged the VSC parcel service charge. Services are provided to many of these parcels, especially for mosquito control and surveillance. VSC will consider instituting the appropriate fees for these locations.
3. Parcel owners that do not prevent mosquito breeding on their property are in violation of the current County Ordinance under the definition of a public nuisance. Mosquito abatement/nuisance charges are detailed in the California Health and Safety Code Sections 2060–2067. Section 2063 states, “In addition to abating the public nuisance and taking any necessary actions to prevent the recurrence of the public nuisance, a board of trustees may impose a civil penalty on the owner of the property for failure to comply with the requirements of Section 2061. The civil penalty may not exceed one thousand dollars (\$1,000) per day for each day that the owner of the property fails to comply with the district's requirements.” In the past, VSC was able to assist these property owners (including municipalities, state and federal agencies) with maintenance and control measures. DEH will examine a process for a combination of source reduction (increased maintenance activities) and/or collection for services or remediation (e.g. summary abatement).
4. In relation to the existing per parcel service charge structure: any proposal concerning modification of these rates will ultimately require voter approval. As the District encompasses the entire County, this will likely be in coordination with other general elections. Under the Proposition 218 requirements, this will either be a 2/3-majority vote of the general population or a simple majority for the impacted parcels (50% + 1 yeas of the affected parcel owners). The entire process is usually 12-18 months and must be

directed by the Board of Supervisors. The current State budget crisis and political climate will be a challenge that will need to be examined and incorporated into any plans to move forward with a voter referendum. DEH has not formalized a plan for this action at this point in time.

- In 1997, County Ordinance 7025 went into effect. This Ordinance addresses fly control measures for the poultry industry. VSC has one full-time dedicated staff member that works with the 34 existing poultry ranches in the County to prevent excessive fly breeding. Last year, DEH was successful in pursuing an extensive abatement case and received \$25,000 for the costs involved with this remediation. VSC will be proposing a permit fee for poultry ranches and a more formalized mechanism for collection of costs associated with investigation and remediation of fly breeding violations.

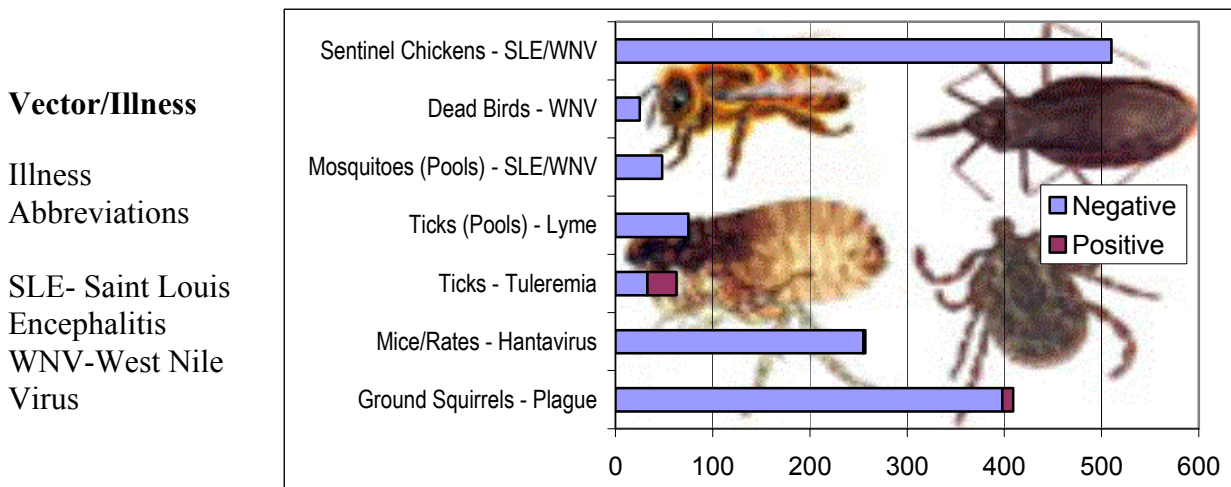
OUTCOME BASED PERFORMANCE MEASURES

DEH has established production standards for evaluating program performance. In addition, in the current fiscal year, DEH has implemented a strategic planning concept known as outcome based performance measures. One of the current performance measures is:

Maintain zero % mosquito and rodent disease transmission to humans.

The graph below (figure 2) illustrates our surveillance activity². One of the objectives of this analysis is to assist in prioritizing allocation of limited vector staff and resources such as reducing the collection and sampling levels on “dormant” vector sources, enabling staff to spend more time to investigate “emerging”vector diseases (e.g. Tularemia).

Figure 2
2002 Vector Surveillance Activities



Testing results
(e.g. mosquito and tick pools, chicken and rodent sera testing)

² The Centers for Disease Control reported 8 cases of Lyme Disease in the County of San Diego.