



2004 Zoonotic Infectious Disease Surveillance Report

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In 2004, the Clark County Health District, Environmental Health Division (EHD), Zoonotic Infectious Disease Program conducted surveillance for several diseases in nature communicable to man, including *Baylisascaris procyonis* (Raccoon Roundworm), rabies, plague, West Nile Virus, Western Equine Encephalitis, and St. Louis Encephalitis. The following report details the types of animals and insects tested and the results from these surveillance activities.

Baylisascaris procyonis (Raccoon Roundworm)

Baylisascaris procyonis is a parasitic organism common to raccoons and transmittable to humans through ingestion of contaminated soil, water, or on objects that have been contaminated with raccoon feces. Raccoon feces have been tested for the parasite in past years, however, ova (parasite eggs) were never isolated.

In 2004, the EHD submitted a total of sixteen (16) raccoon fecal samples for *Baylisascaris* analysis. Specimens were collected by the EHD and US Department of Agriculture (Wildlife Services) and submitted to the Nevada Department of Agriculture Animal Disease Lab (ADL). Two (2) specimens were positive for *Baylisascaris* and one was positive for *Capillaria*, another parasitic organism. All the positive raccoon samples were collected at the Clark County Water Reclamation District, 6000 E. Rochelle.

A “Frequently Asked Questions” sheet, to be located on www.cchd.org, and an article for the Epidemiology Newsletter are being developed in an effort to educate the community on *Baylisascaris procyonis*.

Rabies

A total of one hundred fifty five (155) specimens from sixteen (16) species of animals were tested for rabies. Animal specimens were collected by Animal Control agencies throughout Clark County and submitted to the EHD for shipment to the ADL. Four (4) wild bats tested positive for the disease. Figure 1 details the types of animals submitted and the results.

In 2003, one hundred fifty three (153) animals were tested for rabies, with one (1) wild bat testing positive.

Plague

A total of seventy four (74) serological specimens, collected from seven (7) species of animals were tested for *Yersinia pestis*, the causative agent of plague. Wildlife Services collected specimens from nuisance animals removed from areas throughout Clark County. The serological specimens were sent to the Centers for Disease Control and Prevention, Division of Vectorborne Infectious Diseases, Ft. Collins, Colorado for analysis. Demographic data and serological results from the specimens were entered into a database at the EHD.

Two (2) gray foxes and one (1) raccoon tested positive for plague. These positive specimens were collected in the Kyle Canyon area of Mt. Charleston. Figure 2 details the types and numbers of species tested and the results.

West Nile Virus (WNV), Western Equine Encephalitis (WEE), St. Louis Encephalitis (SLE)

During 2004, the EHD continued to develop a comprehensive WNV, WEE, and SLE surveillance program. This program includes dead bird surveillance, mosquito trapping, sentinel chicken flock surveillance, and WNV positive human and equine case investigations.

Dead Bird Surveillance:

A total of one hundred fifty five (155) birds from eleven (11) species were tested for WNV, WEE, and SLE. Eight (8) birds from six (6) species were positive for WNV. Figure 3a details the types and numbers of species tested and the results. Figure 3b details the common names of those birds for which positive species identification was not made. Map A shows the distributions of WNV positive birds within Clark County.

Oral swab specimens from the birds were collected by personnel from Wildlife Services, CCHD, Nevada Department of Wildlife, Animal Control agencies, and from concerned citizens informing the EHD of suspect animals.

Mosquito Surveillance:

The EHD, in conjunction with Clark County Vector Control (CCVC), trapped and tested over 4,900 mosquitoes in Clark, Nye, and Lincoln counties. The EHD used carbon dioxide traps exclusively to collect mosquitoes, submitted the insects to CCVC for species identification and separation into pools of fifty or less females of the same species, and then submitted the pools to the ADL for WNV, SLE, and WEE testing. Traps were set in areas where WNV was suspected to have been transmitted to humans and horses, as well as along humidity corridors such as washes, drainage areas, and rivers. In 2004, there were twenty (20) confirmed and three (3) probable human cases in Clark County, nearly half of the reported total of 43 human cases in Nevada.

Mosquito surveillance, conducted in the months of May through October, resulted in the submission of one hundred fifty four (154) pools from nine (9) mosquito species. Figure 4 details the types and numbers of species tested and the results. Of these 154 pools, twenty five (25) were positive for WNV, representing three (3) species of mosquito. No mosquitoes were positive for SLE and WEE. Map A details the distribution of WNV positive mosquitoes within Clark County.

Sentinel Chicken Flock Surveillance:

In 2004, the EHD implemented the use of captive sentinel chicken flocks to survey for WNV, SLE, and WEE. Chickens are a good sentinel animal due to their susceptibility to infection, low mortality, and relative incompetence as amplifying hosts¹.

Five (5) sentinel flocks were established throughout Clark County in areas likely for WNV transmission, where mosquito breeding, bird migration and human habitation interacted. The flocks were established at the Wetlands Park, Henderson; Floyd Lamb State Park, North Las

¹ <http://www.cdc.gov/ncidod/dvbid/westnile/resources/wnv-guidelines-apr-2001.pdf>

Vegas; Overton Wildlife Management Area, Overton; Moapa Valley High School, Logandale; and a private residence in Mesquite. Map A details the distribution of the chicken flocks within Clark County.

During the months of June through October, each flock of ten (10) chickens was bled seven (7) times, on a bi-weekly interval. Whole blood samples were submitted to the ADL for viral antibody analysis. The sentinel chicken flocks did not develop antibodies for WNV, SLE, or WEE.

WNV Control and Public Education:

In addition to surveillance activities, the EHD assigned eight (8) Environmental Health Specialists (EHS), working in four (4) teams of two (2), to work in conjunction with CCVC in abating potential mosquito breeding areas, such as stagnant private pools and standing water on golf courses. During the months of August through October, the EHS teams, each assigned a geographical area, abated over 420 private pools, treating many of them with larvacide and mosquito fish, and/or educating owners to maintain pools properly.

The EHD provided public health education to citizens of Clark County through different media sources. Public Health information sheets and Public Health Updates were posted on the CCHD website. The Public Information Office provided local print media with WNV information, as well as developed a 30 minute WNV television public service announcement which aired repeatedly on Clark County's channel 4.

In 2003, the EHD's arbovirus surveillance was limited to testing a total of one hundred forty one (141) birds and three hundred thirty three (333) mosquitoes. From this, two (2) mallards and one (1) great blue heron tested positive for the WEE. All mosquitoes were negative for WNV, SLE, and WEE.

The Environmental Health Division will continue to develop and improve its Zoonotic Infectious Disease program throughout 2005. Currently staff are developing action plans to continue with urban and rural surveillance for plague, hantavirus, and *Bartonella*. This program was not conducted in 2004 due to the intense labor requirements of implementing the WNV surveillance and control program. Additionally, plans to expand the WNV, WEE, and SLE surveillance activities into Esmeralda County are being developed.

Figure 1. Total Number of Rabies Specimens, Animal Distribution and Results

<u>Animal</u>	<u># of Specimens</u>	<u># Positive</u>
Dog	59	0
Cat	55	0
Bat	20	4
Mouse	4	0
Raccoon	4	0
Chipmunk	1	0
Coyote	1	0
Desert Wood Rat	1	0
Ferret	1	0
Gopher	1	0
Hamster	1	0
Mountain Lion	1	0
Pig	1	0
Skunk	1	0
Squirrel	1	0
Vole	1	0
Wolf	1	0
Total	155	4

Figure 2. Total Number of Plague Specimens, Specie Distribution and Results

<u>Specimen</u>	<u>Common Name</u>	<u># of Specimens</u>	<u># Positive</u>
<i>Canis latrans</i>	Coyote	47	0
<i>Procyon lotor</i>	Raccoon	11	1
<i>Felis catus</i>	Domestic Cat	7	0
<i>Urocyon cinereoargenteus</i>	Gray Fox	3	2
<i>Bassariscus astutus</i>	Ringtail Cat	1	0
<i>Canis familiaris</i>	Domestic Dog	1	0
<i>Didephis virginiana</i>	Opossum	1	0
Total		84	3

Figure 3a. Total Number of Avian Specimens, Specie Distribution and Results

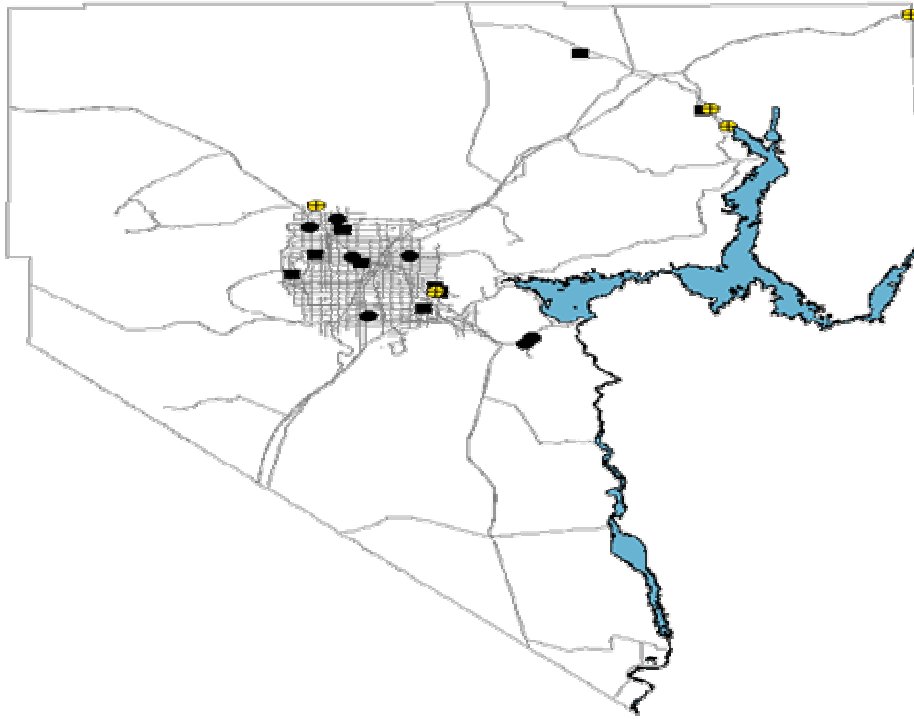
<u>Specimen</u>	<u>Common Name</u>	<u># of Specimens</u>	<u>WNV Positive</u>	<u>SLE Positive</u>	<u>WEE Positive</u>
<i>Accipiter cooperii</i>	Coopers Hawk	2	1	0	0
<i>Anas platyrhynchos</i>	Mallard	64	0	0	0
<i>Branta canadensis</i>	Canada Goose	9	0	0	0
<i>Buteo jamaicensis</i>	Red Tail Hawk	1	0	0	0
<i>Buteo lineatus</i>	Red Shoulder Hawk	4	1	0	0
<i>Casmerodius albus</i>	Great Egret	1	0	0	0
<i>Corvus corax</i>	Common Raven	20	0	0	0
<i>Falco peregrinus</i>	Peregrine Falcon	1	0	0	0
<i>Falco sparverius</i>	Kestrel	5	2	0	0
<i>Fulica americana</i>	American Coot	26	0	0	0
<i>Quiscalus mexicanus</i>	Great Tailed Grackle	6	1	0	0
<i>Zenaida macroura</i>	Mourning Dove	2	0	1	0
Species Unknown*	Species Unknown	14	3	0	0
Total		155	8	0	0

*** Figure 3b. Total Number of Unknown Avian Specimens and Results**

<u>Specimen</u>	<u>Common Name</u>	<u># of Specimens</u>	<u># of Positive</u>
Species Unknown	Hawk	3	2
Species Unknown	Chicken	6	1
Species Unknown	Blackbird	3	0
Species Unknown	Woodpecker	1	0
Species Unknown	Pigeon	1	0
Total		14	3

Figure 4. Total Number of Mosquito Specimens, Specie Distribution and Results

<u>Scientific name</u>	<u># of pools</u>	<u># of positive pools</u>	<u># of individuals tested</u>
<i>Culex tarsalis</i>	74	17	2560
<i>Culex erythrothorax</i>	31	0	1400
<i>Culex quinquefasciatus</i>	18	7	458
<i>Culiseta inornata</i>	12	1	83
<i>Psorophora signipennis</i>	6	0	300
<i>Anopheles freeborni</i>	6	0	125
<i>Anopheles franciscanus</i>	4	0	46
<i>Ochlerotatus dorsalis</i>	2	0	14
<i>Culex stigmatosoma</i>	1	0	8
Total	154	25	4994



Legend

- Positive Birds
- Positive Mosquitoes
- ⊕ Chicken Flocks



Map A. Distribution of chicken flocks, WNV birds and WNV positive mosquitoes in Clark County