2004 – 2005 Surveillance Program Report

West Nile Virus Environmental Surveillance in Washington State

October 2006



Environmental Health Division Office of Environmental Health and Safety

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Mary C. Selecky Secretary of Health

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2004 – 2005 Program Highlights

- Surveillance efforts detected West Nile virus activity in Washington for the first time since 2002. Early detection resulted in an increase of local mosquito surveillance and control, and of efforts to raise public awareness of the presence of West Nile virus and appropriate prevention measures.
- Mosquito surveillance resulted in the identification of mosquito species never before reported in 15 counties. Multiple mosquito species were newly detected in several of these counties.
- Mosquito species considered potential West Nile virus vectors were newly detected in 12 counties.
- Outreach to minority communities was expanded. The *West Nile Virus Fight the Bite* flyer was translated into five languages: Russian, Khmer, Chinese, Korean, and Vietnamese. The flyer was made available to local health jurisdictions and other interest groups for distribution.
- The Washington State Department of Health bi-weekly West Nile virus newsletter continues to be a successful publication aimed at informing agencies of the latest local, regional, and national perspectives on West Nile virus.
- Two 60-second audio public service announcements were developed. These attentiongrabbing public service announcements provide a strong and clear message on West Nile virus prevention. The announcements were distributed to over 100 radio stations in both English and Spanish across the state.

West Nile Virus Environmental Surveillance Program

Introduction

The Washington State Department of Health established the West Nile virus surveillance program in 2000 under a grant sponsored by the U.S. Centers for Disease Control and Prevention. The program coordinates surveillance and response activities to reduce the exposure of Washington's citizens to West Nile virus.

The program is a cooperative effort of numerous partners including local health jurisdictions, mosquito control districts, local and state agencies, health care providers, veterinarians, and other interested parties. The program also collaborates with state and federal agencies including the Washington State Department of Transportation, Washington State Department of Fish and Wildlife, Washington State Parks and Recreation Commission, Washington Animal Disease Diagnostic Laboratory, Washington State University Extension, U.S.G.S. National Wildlife Health, U.S. Army Center for Health Promotion and Preventive Medicine-West, and U.S. Centers for Disease Control and Prevention.

The program coordinates the following activities:

- 1. Monitoring mosquito populations to identify potential West Nile virus vector species.
- 2. Testing mosquito pools for the presence of West Nile, western equine encephalitis, and St. Louis encephalitis viruses.
- 3. Providing extended coverage of the aquatic mosquito control National Pollutant Discharge Elimination System general permit to agencies and private entities.
- 4. Testing and reporting of dead birds, particularly corvids, for West Nile virus infection.
- 5. Testing of horses that exhibit clinical signs consistent with West Nile virus infection.
- 6. Distributing West Nile virus health educational materials to state and local agencies and the public.
- 7. Providing information on West Nile virus through the Internet.

This report summarizes the program's surveillance and prevention activities from January 2004 through December 2005.

West Nile Virus Activity

During 2005, West Nile virus surveillance detected viral activity in Washington for the first time since 2002. In August, the Benton County Mosquito Control District, which monitors for arboviruses in mosquito populations in areas of Benton and Yakima Counties, detected West Nile virus in two mosquito pools of *Culex pipiens*. These mosquitoes were collected from traps set approximately a mile apart along the eastern boundary of Yakima County near the Sunnyside Wildlife Recreation Area. In September, a Black-billed Magpie and a horse tested positive from the same vicinity. No human cases of West Nile virus acquired in-state were reported. Figure 1 shows a timeline of West Nile virus activity in 2005.

Figure 1. Sequence of West Nile Virus Activity in 2005

| | | August 22 Mosquito Pool 1 Yakima County | August 29 Mosquito Pool 2 Yakima County | September 2 Black-billed Magpie Yakima County | September 19 Horse Yakima Count y | |
|--------------------|--------|---|---|---|--|-----|
| 2005 WNV Positives | | | | | | |
| | August | | September | | Octo | ber |

As expected, West Nile virus activity occurred late in the summer after the virus had an opportunity to amplify in mosquito and bird populations within a localized area. These detections served as a warning for potential human infection. Mosquito trapping and control were increased in the area, and communications activities associated with the detections included messages to raise public awareness of the presence of West Nile virus.

Trends in West Nile Virus Activity and Surveillance

By the end of 2004, human infection caused by West Nile virus had been reported in every state in the contiguous United States with the exception of Maine and Washington. West Nile virus has become established throughout California and viral activity has spread northward into southern counties of Oregon and Idaho. Over the past three years, the number of human cases increased markedly in western United States, as shown in Table 1.

| Human WNV Cases and Fatalities by Year | | | | | | | |
|--|-------|------------|-------|------------|-------|------------|--|
| State | 20 | 03 | 20 | 04 | 2005 | | |
| | Cases | Fatalities | Cases | Fatalities | Cases | Fatalities | |
| Arizona | 13 | 1 | 391 | 16 | 113 | 5 | |
| California | 3 | 0 | 779 | 28 | 880 | 19 | |
| Idaho | 1 | 0 | 3 | 0 | 13 | 0 | |
| Nevada | 2 | 0 | 44 | 0 | 31 | 1 | |
| Oregon | 0 | 0 | 3 | 0 | 7 | 0 | |
| Utah | 1 | 0 | 11 | 0 | 52 | 1 | |
| Washington | 0 | 0 | 0 | 0 | 0 | 0 | |

Table 1. West Nile Virus Activity in Western United States, 2003-2005

Source: CDC West Nile virus statistics, 2003-2005

Despite the impact of West Nile virus on neighboring states, surveillance decreased in dead birds submitted for testing and mosquito trapping over the last two years. Equine specimens submitted for testing decreased as well;, however, this may be partially the result of owners vaccinating for West Nile virus. Mosquito pool testing increased due to available testing provided through the Washington State Department of Health and U.S. Army Center for Health Promotion and Preventive Medicine-West. Table 2 displays trends in West Nile virus surveillance and positive viral detection from 2001 through 2005.

| Non-human Surveillance and WNV-Positives by Year | | | | | | |
|--|------|------|------|------|------|--|
| | 2001 | 2002 | 2003 | 2004 | 2005 | |
| Dead Birds Tested | 28 | 325 | 906 | 553 | 660 | |
| WNV-Positive Birds | 0 | 4 | 0 | 0 | 1 | |
| Sentinel Chicken Sera Tested | 94 | 387 | 435 | 392 | 576 | |
| WNV-Positive Chicken Sera | 0 | 0 | 0 | 0 | 0 | |
| Equine Tested | 1 | 50 | 102 | 57 | 54 | |
| WNV-Positive Equine | 0 | 2 | 0 | 0 | 1 | |
| Mosquito Trapping Events* | 346 | 444 | 2370 | 1877 | 1637 | |
| Mosquito Pools Tested | 47 | 43 | 582 | 1015 | 915 | |
| WNV-Positive Pools | 0 | 0 | 0 | 0 | 2 | |

Table 2. Surveillance and West Nile Virus Activity in Washington State, 2001-2005

* Mosquito trapping events collected mosquitoes primarily for speciation and population density. Selected mosquitoes from these trapping events were pooled for West Nile virus testing.

As the virus spreads into Washington, the West Nile virus surveillance program anticipates an increased need for maintaining old and establishing new surveillance partnerships across the state to ensure early detection and protection against West Nile virus infection.

Mosquito Surveillance

Surveillance Activities

In 2004, between April and October, 23 local agencies from 22 counties collected adult mosquitoes primarily using carbon dioxide traps. Some mosquitoes were also collected as larvae and reared to adults. Mosquitoes were submitted for identification of potential West Nile virus vectors and to monitor population densities of those vectors within a particular area.

Mosquito surveillance efforts for 2004 resulted in a combined total of 1,877 trapping events. Surveillance partners conducted 1,557 trapping events, which collected 102,198 mosquitoes for identification by Washington State Department of Health and mosquito control districts. The U.S. Army Center for Health Promotion and Prevention Medicine-West also conducted 320 trapping events in six counties, which collected 4,130 mosquitoes for identification.

In 2005, between February and October, 26 local agencies collected adult mosquitoes from 23 counties using primarily carbon dioxide traps. Some mosquitoes were also collected as larvae and reared to adults.

For 2005, mosquito surveillance efforts resulted in a combined total of 1,637 trapping events. Partners conducted 1,389 trapping events, which collected 127,259 mosquitoes for identification

by Washington State Department of Health and mosquito control districts. The U.S. Army Center for Health Promotion and Prevention Medicine-West also conducted 248 trapping events in 4 counties, which collected 1,185 mosquitoes for identification.

Fewer local agencies remain involved in mosquito surveillance than in previous years, resulting in a significant decrease in effort. Twenty-three local agencies participated in mosquito surveillance in 2004 and 26 local agencies in 2005. In comparison, 35 local agencies conducted trapping events in 31 counties during 2003.

Figure 2 and Figure 3 display the state coverage of mosquito trapping events for 2004 and 2005, respectively. A majority of the trapping events continue to occur in the heavily populated counties. From 2004 to 2005, fewer trapping events occurred in the more populated counties, Snohomish, King, and Pierce. However, an increase of trapping events was observed among counties in southwest (Cowlitz and Clark) and southeast (Benton and Yakima) Washington.

Mosquito Species Findings

Mosquito surveillance during 2004 and 2005

resulted in the identification of species never before reported in 16 counties. Potential West Nile virus vectors were newly detected in 14 of these counties. Table 3 lists the new findings of mosquito species and potential vectors by county for the past two years.

Mosquito surveillance resulted in an increased understanding of the distribution of these vector species and populations in specific areas within the state. This information is useful in identifying geographic areas of high risk and implementing prevention and control measures to reduce the risk of human infection.









| County | Number | Species |
|--------------|--------|---|
| Adams | 4 | Aedes vexans*, Anopheles freeborni*, Coquillettidia perturbans*, and Ochlerotatus melanimon* |
| Benton | 2 | Coquillettidia perturbans* and Ochlerotatus cataphylla |
| Cowlitz | 4 | Culiseta minnesotae, Ochlerotatus aboriginis, Ochlerotatus aloponotum, Ochlerotatus communis, and Ochlerotatus fitchii* |
| Franklin | 4 | Aedes vexans*, Anopheles punctipennis*, Coquillettidia perturbans*, and Ochlerotatus campestris |
| Grays Harbor | 4 | Culiseta impatiens*, Culiseta minnesotae, Ochlerotatus sierrensis, and Ochlerotatus sticticus* |
| Jefferson | 4 | Anopheles punctipennis*, Culiseta inornata*, Ochlerotatus aboriginis, and Ochlerotatus sticticus* |
| King | 3 | Aedes vexans*, Culex boharti, and Culex morsitans* |
| Kitsap | 2 | Culiseta particeps and Ochlerotatus increpitus |
| Pierce | 2 | Culex boharti, Culex stigmatosoma*, and Culiseta minnesotae |
| Skagit | 1 | Culex pipiens* |
| Snohomish | 3 | Anopheles earlei, Anopheles freeborni*, Culiseta morsitans*, and Ochlerotatus dorsalis* |
| Spokane | 3 | Culex salinarius*, Culiseta minnesotae, and Ochlerotatus sierrensis |
| Wahkiakum | 10 | Anopheles freeborni*, Anopheles punctipennis*, Coquillettidia perturbans*, Culex pipiens*, Culiseta inornata*, Culiseta minnesotae, Culiseta particeps, Ochlerotatus aboriginis, Ochlerotatus fitchii*, and Ochlerotatus sierrensis |
| Whatcom | 1 | Culex boharti |
| Whitman | 1 | Ochlerotatus sticticus* |
| Yakima | 1 | Ochlerotatus trivittatus* |

Table 3. New Mosquito Species Findings by County, 2004-2005

* WNV-positive mosquito species reported to CDC, United States, 1999-2005.

Since 2001, West Nile virus surveillance has resulted in new findings of mosquito species for the state. Species identified included *Culex salinarius, Ochlerotatus trivittatus* (unconfirmed), and *Ochlerotatus japonicus japonicus*. Surveillance findings also indicate that *Culiseta morsitans* is becoming more widely spread in western Washington.

Potential West Nile Virus Vectors

In the United States, 60 mosquito species have been reported infected with West Nile virus. Although considered potential vectors, West Nile virus is transmitted primarily by members of the *Culex* species. Twenty-two mosquito species of these potential West Nile virus vectors have been found in Washington, including several *Culex* species. During 2004 and 2005, six members of the *Culex* species were identified. Members include *Culex* boharti, *Culex pipiens*, *Culex salinarius*, *Culex stigmatasoma*, *Culex tarsalis*, and *Culex territans*. Among these, *Culex pipiens* and *Culex tarsalis* are two of the most widespread species in the state. A general comparison of *Culex* species between western and eastern Washington reveals a difference in the occurrence and distribution of mosquito species. Figure 4 illustrates this comparison for the past two years of surveillance data.

The occurrence of *Culex* species in the western counties comprised 41 percent of the total number of mosquitoes collected during trapping events. The majority (88 percent) of the *Culex* species were *Culex* pipiens. Similar to past findings, the prevalence of *Culex pipiens* appears strongest in the more populated counties including King, Pierce, and Snohomish counties. To a much lesser extent,



Figure 4. Comparison of Culex Species in Western and Eastern Washington, 2004-2005

Culex tarsalis and three other *Culex* species constitute 12 percent of the *Culex* species. In general *Culex pipiens*, commonly referred to as the "northern house mosquito," can be found in rural environments, but reach their greatest numbers in urban and suburban areas.

In the eastern counties, *Culex* species comprised 29 percent of the total mosquitoes collected during trapping events. *Culex tarsalis* represented 52 percent of the *Culex* species collected and *Culex pipiens* represented 48 percent The prevalence of both species appears high in several counties including Benton, Franklin, Spokane, Walla Walla, and Yakima Counties. Infrequently, *Culex salinarius* and *Culex territans* are two other *Culex* species that are found in eastern counties. Surveillance history indicates *Culex tarsalis* as the predominant *Culex* species. *Culex tarsalis* is a mosquito found in large numbers in floodwater and irrigated habitats.

Culex pipiens and *Culex tarsalis* are anticipated to play a major role in the transmission of West Nile virus as indicated by outbreaks experienced in other states. Because large populations of *Culex pipiens* and *Culex tarsalis* are widely distributed throughout Washington, the activity of these competent West Nile virus vectors should be closely monitored. For more information on mosquito habitat, refer to Appendix A of the *Washington State Mosquito-borne Disease Response Plan*.

See Appendices 1 through 6 for the summary of mosquito species by county, including number of mosquitoes collected, total number identified, and total number of trapping events.

Mosquito Pool Testing

Mosquito pools were tested for West Nile virus by Washington State Department of Health, U.S. Army Center for Health Promotion and Preventive Medicine-West, and several mosquito control districts. Pools submitted by Benton and Cowlitz County Mosquito Control Districts were also

tested for western equine encephalitis and St. Louis encephalitis viruses. Pools from Clark County Mosquito Control District were tested for St. Louis encephalitis virus.

In 2004, 1015 mosquito pools from 11 counties tested negative for West Nile virus. The results of pools tested for other arboviruses were also negative.

In 2005, 915 mosquito pools from ten counties were tested. In late August, the Benton County Mosquito Control District detected two mosquito pools of *Culex pipiens* positive for West Nile virus. The mosquito pools were collected from traps set approximately a mile apart along the eastern boundary of Yakima County near Sunnyside Wildlife Recreation Area. No other mosquito pools tested positive for any arboviruses.

See Appendices 7 and 8 for a summary of the number of mosquito pools tested for West Nile virus by county for 2004 and 2005.

Mosquito Control

To reduce the risk from West Nile virus and other arboviral diseases, the Washington State Department of Health obtained a National Pollutant Discharge Elimination System general permit for aquatic mosquito control through the Washington State Department of Ecology. An extension of the department's permit coverage was available to entities qualified to follow the permit conditions and best management practices for mosquito control. The Washington State Department of Health completed the State Environmental Policy Act checklist and waived permit fees for entities covered under the department's permit.

During the 2004 and 2005 mosquito control season, the Washington State Department of Health extended permit coverage to over 70 entities in the state. For the first time, commercial pest control companies were allowed coverage under the department's permit. Pest control companies can now provide a rapid response to mosquito problems, and can simplify the permit process and maintain consistency by assuming permit requirements on behalf of their customers. Table 4 summarizes the type and number of entities covered and how many applied larvicide.

| Coverage Under Washington State Department of Health, Aquatic Mosquito Control Permit | | | | | | |
|---|-----------|----------------------|-----------|----------------------|--|--|
| | 20 | 04 | 2005 | | | |
| Entity Type | Permitted | Applied Larvicide | Permitted | Applied Larvicide | | |
| City/Town | 25 | 8 | 29 | 9 | | |
| County | 10 | 2 | 10 | 3 | | |
| Mosquito Control District | 10 | 10 | 10 | 10 | | |
| Pest Control Company* | 7 | 7 | 8 | 7 | | |
| Private | 15 | 5 | 13 | 5 | | |
| School District | 1 | 0 | 1 | 0 | | |
| State | 3 | 2 | 3 | 2 | | |
| Total | 71 | 34 | 74 | 36 | | |

Table 4. Entities and Larvicide Used Under Washington State Department of Health Permit, 2004-2005

* In 2004, 7 pest control companies contracted with 25 unique sites for potential larval control. In 2005, 8 pest control companies contracted with 31 unique sites. Sites included private businesses, residential properties, cities, and school districts. Not all of these contracted sites required larval control.

Bird Surveillance

Surveillance Activities

As part of a collaborative West Nile virus surveillance program, participating local health jurisdictions tracked dead bird reports and submitted suitable specimens for West Nile virus testing. Dead bird surveillance focused primarily on the reporting and collection of corvids (crows, jays, magpies, and ravens) and raptors. This type of surveillance acts as an early detection system for West Nile virus. Monitoring of infected dead birds is useful in identifying where humans may be at risk for infection. Resources for prevention and control may then be directed to those areas.

From March through November 2004, 572 dead birds collected from 32 counties were submitted for West Nile virus testing. All specimens tested negative for the virus. The majority of dead birds collected were from more populated counties, as shown in Figure 5.

From January through November 2005, 676 dead birds collected from 34 counties were submitted for testing. One specimen, a Blackbilled Magpie from Yakima County, tested positive for West Nile virus. The majority of dead birds collected were from the more



populated counties, as shown in Figure 6. Over these two years, dead bird surveillance efforts decreased.

Although corvids were the principal bird species tested for West Nile virus during 2004 and 2005, a variety of other species were tested as well. In the United States, the top five West Nile virus positive bird species reported to CDC for 2005 are 1) American Crow, 2) Blue Jay, 3) Western Scrub Jay, 4) Yellow-billed Magpie, and 5) House Sparrow. Table 5 summarizes the number and species of dead birds submitted for testing in 2004-2005 in Washington.

Figure 6. Dead Birds Tested, 2005



| Bird Species Submitted for WNV Testing | | | | | | | |
|--|------|------|--------------------------|------|------|--|--|
| Species | 2004 | 2005 | Species | 2004 | 2005 | | |
| American Crow | 446 | 533 | House Finch | 2 | 0 | | |
| American Kestrel | 2 | 2 | House Sparrow | 4 | 1 | | |
| American Robin | 8 | 1 | Mourning Dove | 4 | 4 | | |
| Barn Owl | 3 | 8 | Northern Flicker | 5 | 3 | | |
| Barn Swallow | 5 | 1 | Northern Pygmy Owl | 1 | 0 | | |
| Barred Owl | 1 | 2 | Pileated Woodpecker | 1 | 0 | | |
| Belted Kingfisher | 1 | 0 | Pacific-slope Flycatcher | 2 | 0 | | |
| Black-billed Magpie | 12 | 31 | Pigeon Guillemot | 0 | 1 | | |
| Blue Jay | 1 | 1 | Red-breasted Sapsucker | 1 | 0 | | |
| Cedar Waxwing | 1 | 1 | Red-headed Woodpecker | 1 | 1 | | |
| Chukar | 1 | 0 | Red-shafted Flicker | 1 | 0 | | |
| Common Grackle | 0 | 1 | Red-tailed Hawk | 7 | 4 | | |
| Common Raven | 7 | 3 | Rock Dove | 2 | 0 | | |
| Common Yellowthroat | 2 | 0 | Sharp-shinned Hawk | 2 | 8 | | |
| Cooper's Hawk | 1 | 5 | Spruce Grouse | 1 | 0 | | |
| Downy Woodpecker | 0 | 0 | Steller's Jay | 24 | 29 | | |
| European Starling | 2 | 15 | Swainson's Thrush | 1 | 0 | | |
| Evening Grosbeak | 1 | 0 | Western Screech Owl | 2 | 0 | | |
| Fox Sparrow | 1 | 0 | Western Scrub Jay | 5 | 4 | | |
| Great Horned Owl | 0 | 4 | Other Species | 10 | 13 | | |
| Herring Gull | 1 | 0 | | | | | |

Table 5. Bird Species Submitted for West Nile Virus Testing, 2004-2005

See Appendices 7 and 8 for a summary of the number of dead birds submitted for West Nile virus testing by county for 2004 and 2005.

Sentinel Chicken Serosurveillance

During 2004 and 2005, the Benton County Mosquito Control District maintained five sentinel chicken flocks with ten birds each, from which blood specimens were collected throughout the summer. In 2004, a total of 392 chicken sera were tested for West Nile virus as well as for western equine encephalitis and St. Louis encephalitis. Test results were negative for these three arboviruses. In 2005, a total of 576 chicken sera were tested. One specimen from a sentinel flock in Benton County tested positive for St. Louis encephalitis. All specimens tested negative for West Nile virus and western equine encephalitis. See Appendices 7 and 8 for a summary of the number chicken sera tested by county for 2004 and 2005.

Veterinary Surveillance

Surveillance Activities

The West Nile Virus Surveillance Program and Washington State Department of Agriculture encourage veterinarians to report suspect cases of West Nile virus in horses and other animals to the Washington State Department of Health. This surveillance provides early detection of West Nile virus activity, particularly in rural areas.

Between January and November 2004, 57 specimens from suspected horse cases were submitted for West Nile virus testing. All specimens tested negative. County information was only available for 43 of the total horse cases. These particular cases came from 20 counties across the state.

From January to December 2005, specimens from 54 suspected horse cases were submitted for West Nile virus testing. County information was only available for 32 of the total horse cases. These particular cases came from 17 counties. Figure 7 shows the horse cases tested for West Nile virus during 2004 and 2005.

In 2005, specimens from four horses tested positive for West Nile virus. Three of the four positive horse cases (two from Snohomish County and one from Thurston County) acquired West Nile virus out-of-state. One positive horse case from Yakima County acquired West Nile virus in-state.





Horse vaccines to prevent West Nile virus infection have been available since 2002. As local horse populations are vaccinated, the use of horses as early indicators for West Nile virus may become less effective. See Appendices 7 and 8 for a summary of horse cases by county for 2004 and 2005.

Zoo Surveillance

The Seattle Woodland Park Zoo participated in the National Surveillance System for West Nile Virus in Zoo Institutions. In 2004, the zoo collected 18 zoo specimens for West Nile virus testing, including 1 mammal and 17 bird specimens. No feral specimens were tested. The mammal and seven of the birds tested positive for West Nile virus. All positives resulted from animals known

to have been previously vaccinated, except for one bird. The bird arrived into quarantine from a California zoo with a low titer indicating vaccination or exposure. It was not determined whether the bird had previously been vaccinated. In 2005, 49 zoo and feral specimens were tested, including 5 mammal and 44 bird specimens. Seven of the birds were feral crows. Again, all positives resulted from animals known to have been previously vaccinated.

Outreach Activities

The program produces a variety of public information and educational materials to help communities understand the health significances of West Nile virus and how best to protect themselves and their families.

Educational Materials

- Jointly, the Washington State Department of Health West Nile Virus Surveillance Program and Public Health-Seattle & King County expanded outreach efforts to minority communities by providing translations of the West Nile virus prevention message. *West Nile Virus—Fight the Bite* flyers were printed in five different languages, including Russian, Khmer, Chinese, Korean, and Vietnamese.
- The following educational materials were distributed during 2004 and 2005:
 - West Nile Virus—Do You Know What's Biting You? available in English and Spanish: 22,244 brochures were distributed.
 - Mosquito Repellent—How to Use It Safely: 9,619 brochures were distributed.
 - *Mosquito Problems Start At Home* flyers, bookmarks, and posters: 7,414 were distributed.
- The West Nile virus electronic newsletter was published bi-weekly to provide agencies with the latest local, regional, and national perspectives on West Nile virus.

All health educational materials are available for print or order on the Washington State Department of Health, Health Education Resource Exchange Web site (www.doh.wa.gov/here).

Public Information

• Fifteen news releases relating to West Nile virus were issued by state agencies during 2004 and 2005. Ten of these were issued by the Washington State Department of Health and contained the program's prevention messages on West Nile virus.

- Two new audio public service announcements were developed. These 60-second radio spots are attention-grabbing and provide a strong and clear message on West Nile virus prevention. The public service announcements were distributed to over 100 radio stations in both English and Spanish across the state. The radio spots are made available on the West Nile virus Web site.
- A toll-free information line, 1.866.78VIRUS, was maintained for the public. Callers can learn the latest status on West Nile virus activity in Washington, have commonly asked questions answered, and be directed to additional resources. The information line received 578 calls during 2004 and 2005, of which 71 were out-of-state calls. The majority of the calls occurred during May through September, peaking in the month of June.
- The West Nile virus Web site (www.doh.wa.gov/wnv) continues to be one of the most popular Washington State Department of Health Web sites. The West Nile virus portal Web page reached the top 20 most accessed Web pages out of over 4,500 active department pages during the warmer months of June through September. Figure 8 indicates that July was the peak month for portal Web page hits for both 2004 and 2005. The highest peak in July 2005 of 6,265 hits was likely due to the reporting of a suspected human case.



Figure 8. West Nile Virus in Washington Web Site Portal Hits, 2004-2005

* January 2004 Web statistics were unavailable.

Appendices

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| County | Species | Number Collected | Total ID | Trapping Events |
|---------|---------------------------|------------------|----------|-----------------|
| Adams | Ochlerotatus dorsalis | 1 | | |
| | Ochlerotatus melanimon | 1 | | |
| | Aedes vexans | 1 | | |
| | Anopheles freeborni | 8 | | |
| | Coquillettidia perturbans | 3 | | |
| | Culex pipiens | 330 | | |
| | Culex tarsalis | 255 | | |
| | Culiseta inornata | 10 | 609 | 5 |
| Benton | Ochlerotatus dorsalis | 1 | | |
| | Ochlerotatus increpitus | 495 | | |
| | Aedes vexans | 6,344 | | |
| | Anopheles freeborni | 353 | | |
| | Anopheles punctipennis | 19 | | |
| | Coquillettidia perturbans | 79 | | |
| | Culiseta inornata | 425 | | |
| | Culex pipiens | 1,188 | | |
| Chalan | Culex tarsalls | 2,016 | 10,920 | 63 |
| Chelan | | 26 | | |
| | | 10 | | |
| | | 4 | | |
| | Aedes sp. | 2 | | |
| | Aeues vexans | 102 | | |
| | Anopheles punctipennis | 1 | | |
| | | 22 | | |
| | Culex larsails | 13 | | |
| | | 5 | 196 | 20 |
| Clallam | | 200 | 100 | 20 |
| Gianan | Coquillettidia perturbans | 209 | | |
| | Culiseta incidens | 23 | 234 | 2 |
| Clark | Other Species / Unknown | 71 | 237 | ٤ |
| Oldrik | Ochlerotatus increpitus | 1 | | |
| | Ochlerotatus sticticus | 442 | | |
| | Aedes vexans | 1.270 | | |
| | Anopheles freeborni | 5 | | |
| | Anopheles punctipennis | 95 | | |
| | Coquillettidia perturbans | 3 | | |
| | Culex pipiens | 410 | | |
| | Culex tarsalis | 250 | | |
| | Culiseta incidens | 89 | | |
| | Culiseta particeps | 15 | 2,651 | 42 |
| Cowlitz | Other Species / Unknown | 1 | | |
| | Ochlerotatus aboriginis | 16 | | |
| | Ochlerotatus aloponotum | 1 | | |
| | Aedes cinereus | 6 | | |
| | Ochlerotatus communis | 26 | | |
| | Ochlerotatus increpitus | 121 | | |
| | Ochlerotatus sierrensis | 77 | | |
| | Ochlerotatus sticticus | 3,383 | | |
| | Aedes sp. | 4 | | |
| | Aedes vexans | 580 | | |
| | Anopheles freeborni | 14 | | |
| | Anopheles punctipennis | 269 | | |
| | Coquiliettidia perturbans | 19,167 | | |
| | Culex pipiens | 4,087 | | |
| | Culex stigmatosoma | 28 | | |
| | | 1,047 | | |
| | Culex territans | 1 | | |
| | Culiseta impatiens | 18 | | |
| | Culisota incruens | 48 | | |
| | | 21 | | |
| | Culiseta narticens | 31 | 28 961 | 370 |
| | Sansola particopo | | 20,001 | 010 |

| County | Species | Number Collected | Total ID | Trapping Events |
|--------------|---------------------------|------------------|----------|-----------------|
| Franklin | Other Species / Unknown | 2 | | |
| | Ochlerotatus dorsalis | 1.380 | | |
| | Ochlerotatus increpitus | 91 | | |
| | Ochlerotatus nigromaculis | 197 | | |
| | Ochlerotatus sticticus | 13 | | |
| | Aedes vexans | 318 | | |
| | Anopheles freeborni | 37 | | |
| | Anopheles punctipennis | 5 | | |
| | Coquillettidia perturbans | 14 | | |
| | Culex pipiens | 9,271 | | |
| | Culex tarsalis | 4,078 | | |
| | Culiseta inornata | 119 | 15,525 | 313 |
| Grays Harbor | Ochlerotatus dorsalis | 142 | | |
| | Ochlerotatus fitchii | 10 | | |
| | Ochlerotatus sticticus | 1 | | |
| | Coquillettidia perturbans | 11 | | |
| | Culex pipiens | 8 | | |
| | Culex tarsalis | 1 | | |
| | Culiseta impatiens | 7 | | |
| | Culiseta incidens | 1 | 181 | 6 |
| Island | Other Species / Unknown | 1 | | |
| | Ochlerotatus dorsalis | 554 | | |
| | Ochlerotatus increpitus | 1 | | |
| | Ochlerotatus sierrensis | 3 | | |
| | Ochlerotatus sticticus | 1 | | |
| | Coquillettidia perturbans | 35 | | |
| | Culex pipiens | 8 | | |
| | Culex tarsalis | 30 | | |
| | Culiseta incidens | 3 | | |
| | Culiseta inornata | 120 | | |
| | Culiseta particeps | 13 | 769 | 16 |
| King | Ochlerotatus fitchii | 10 | | |
| | Ochlerotatus j. japonicus | 5 | | |
| | Ochlerotatus sierrensis | 9 | | |
| | Ochlerotatus sticticus | 39 | | |
| | Aedes vexans | 6 | | |
| | Anopheles punctipennis | 7 | | |
| | Coquillettidia perturbans | 85 | | |
| | | Z | | |
| | Culex pipiens | 11,093 | | |
| | Culex tarritono | 312 | | |
| | Culieste impetiene | 4 | | |
| | | 862 | | |
| | Culiseta incruens | 46 | | |
| | Culiseta minnesotae | 32 | | |
| | Culiseta narticens | 32 | 13 376 | 239 |
| Pacific | No Mosqutioes Collected | 0 | 0 | 1 |
| Pierce | Ochlerotatus fitchii | 9 | | · · · |
| | Ochlerotatus impiger | 209 | | |
| | Ochlerotatus increpitus | 34 | | |
| | Ochlerotatus sierrensis | 73 | | |
| | Ochlerotatus sticticus | 1 | | |
| | Aedes vexans | 2 | | |
| | Ochlerotatus sp. | 90 | | |
| | Anopheles punctipennis | 3 | | |
| | Coquillettidia perturbans | 923 | | |
| | Culex boharti | 4 | | |
| | Culex pipiens | 1,679 | | |
| | Culex stigmatosoma | 9 | | |
| | Culex tarsalis | 114 | | |
| | Culiseta impatiens | 3 | | |
| | Culiseta incidens | 961 | | |
| | Culiseta inornata | 11 | | |
| | Culiseta minnesotae | 2 | | |
| | Culiseta particeps | 6 | 4,133 | 98 |

| County | Species | Number Collected | Total ID | Trapping Events |
|-------------|--|------------------|----------|-----------------|
| Skagit | Culex pipiens | 1 | | |
| - | Culiseta incidens | 11 | 12 | 1 |
| Skamania | Ochlerotatus increpitus | 63 | | |
| | Ochlerotatus sierrensis | 8 | | |
| | Aedes vexans | 3 | | |
| | Culex pipiens | 2 | | |
| | Culiseta incidens | 3 | 79 | 5 |
| Snohomish | Other Species / Unknown | 6 | | |
| | Ochlerotatus aboriginis | 11 | | |
| | Aedes cinereus | 40 | | |
| | Ochierotatus dorsalis | 428 | | |
| | | 200 | | |
| | Ochlerotatus sierrensis | 290 | | |
| | Ochlerotatus sticticus | 10 | | |
| | Aedes vexans | 7 | | |
| | Anopheles punctipennis | 19 | | |
| | Coquillettidia perturbans | 394 | | |
| | Culex pipiens | 10,476 | | |
| | Culex tarsalis | 1,453 | | |
| | Culiseta impatiens | 49 | | |
| | Culiseta incidens | 44 | | |
| | Culiseta inornata | 310 | | |
| | Culiseta minnesotae | 10 | | |
| | Culiseta particeps | 17 | 13,599 | 233 |
| Spokane | Aedes cinereus | 11 | | |
| | Ochlerotatus fitchii | 1 | | |
| | Ochlerotatus flavescens | 3 | | |
| | Ochlerotatus increpitus | 193 | | |
| | Ochierotatus sierrensis | 1 | | |
| | Ochierotatus sp. | 1 | | |
| | Aedes vexans Apopholos frooborni | 10 | | |
| | Anopheles needonni Anopheles nunctinonnis | 19 | | |
| | Coquillettidia perturbans | | | |
| | Culex piniens | 591 | | |
| | Culex salinarius | 7 | | |
| | Culex tarsalis | 531 | | |
| | Culex sp. | 28 | | |
| | Culiseta inornata | 7 | | |
| | Culiseta sp. | 2 | 1,422 | 53 |
| Thurston | Ochlerotatus fitchii | 2 | | |
| | Ochlerotatus sierrensis | 10 | | |
| | Culiseta incidens | 45 | 57 | 2 |
| Walla Walla | Other Species / Unknown | 815 | | |
| | Ochlerotatus increpitus | 209 | | |
| | Ochlerotatus nigromaculis | 380 | | |
| | | 1 740 | | |
| | Aedes vexans Apopholos frooborni | 1,749 | | |
| | Culex pipiens | 182 | | |
| | Culex tarsalis | 91 | | |
| | Culex territans | 2 | | |
| | Culiseta inornata | - 1 | 3,453 | 32 |
| Whatcom | Other Species / Unknown | 1 | | |
| | Ochlerotatus dorsalis | 636 | | |
| | Ochlerotatus fitchii | 396 | | |
| | Ochlerotatus increpitus | 20 | | |
| | Ochlerotatus sierrensis | 35 | | |
| | Aedes vexans | 6 | | |
| | Anopheles punctipennis | 14 | | |
| | Coquillettidia perturbans | 43 | | |
| | Culex boharti | 5 | | |
| | Culex pipiens | 358 | | |
| | Culex tarsalls | 52 | | |
| | Culliseta impatiens | 1 | | |
| | Culiseta incluens | 55 | 1 620 | 36 |
| | | Ó | 1,030 | 30 |

| County | Species | Number Collected | Total ID | Trapping Events |
|---------|-------------------------|------------------|----------|-----------------|
| Whitman | Other Species / Unknown | 3 | | |
| | Ochlerotatus fitchii | 18 | | |
| | Ochlerotatus sticticus | 11 | | |
| | Anopheles freeborni | 1 | | |
| | Culex pipiens | 571 | | |
| | Culex tarsalis | 8 | | |
| | Culiseta inornata | 7 | 619 | 5 |
| Yakima | Ochlerotatus dorsalis | 7 | | |
| | Ochlerotatus increpitus | 207 | | |
| | Aedes vexans | 604 | | |
| | Anopheles freeborni | 86 | | |
| | Culex pipiens | 776 | | |
| | Culex tarsalis | 2,053 | | |
| | Culiseta inornata | 49 | 3,782 | 7 |
| | 22 Counties | 102,198 | 102,198 | 1,557 |

New mosquito species findings for county are listed in bold.

 Data Sources:
 Local Health Jurisdictions (11)

 Bayview School (Island County)

 Benton County Mosquito Control District (Benton County and areas of Yakima County)

 Bob Reineke, University of Washington (King County)

 Clark County Mosquito Control District

 Columbia Mosquito Control District

 Columbia Mosquito Control District

 Columbia Mosquito Control District

 Leavenworth Mosquito Control District

 Leavenworth Mosquito Control District

 Makah Tribe (Clallam County)

 Mosquito Control District of Cowlitz County

 Mosquito Control District

 Kainer National Park (Lewis and Pierce Counties)

 Skamania Mosquito Control District

Appendix 2 Final 2004 WNV Surveillance US Army Center for Health Promotion and Prevention Medicine-West Mosquito Species by County

| County | Species | Number Collected | Total ID | Trapping Events |
|-----------|---------------------------|------------------|----------|-----------------|
| Jefferson | Ochlerotatus dorsalis | 149 | | |
| | Ochlerotatus increpitus | 13 | | |
| | Anopheles punctipennis | 5 | | |
| | Coquillettidia perturbans | 35 | | |
| | Culex pipiens | 15 | | |
| | Culex tarsalis | 54 | | |
| | Culiseta incidens | 23 | 294 | 15 |
| Kitsap | Ochlerotatus dorsalis | 7 | | |
| | Ochlerotatus fitchii | 55 | | |
| | Ochlerotatus increpitus | 2 | | |
| | Ochlerotatus sierrensis | 11 | | |
| | Anopheles punctipennis | 72 | | |
| | Coquillettidia perturbans | 198 | | |
| | Culex pipiens | 831 | | |
| | Culex tarsalis | 63 | | |
| | Culiseta incidens | 148 | | |
| | Culiseta inornata | 13 | | |
| | Culiseta particeps | 2 | 1,402 | 158 |
| King | Culex pipiens | 4 | | |
| | Culex tarsalis | 1 | | |
| | Culiseta incidens | 4 | | |
| | Culiseta particeps | 2 | 11 | 4 |
| Pierce | Ochlerotatus aboriginis | 56 | | |
| | Ochlerotatus fitchii | 100 | | |
| | Ochlerotatus increpitus | 13 | | |
| | Ochlerotatus sierrensis | 5 | | |
| | Aedes vexans | 14 | | |
| | Anopheles punctipennis | 323 | | |
| | Coquillettidia perturbans | 1,144 | | |
| | Culex pipiens | 87 | | |
| | Culex tarsalis | 79 | | |
| | Culiseta incidens | 91 | | |
| | Culiseta inornata | 20 | | |
| | Culiseta particeps | 17 | 1,949 | 106 |
| Snohomish | Anopheles earlei | 11 | | |
| | Anopheles punctipennis | 30 | | |
| | Coquillettidia perturbans | 7 | | |
| | Culex pipiens | 6 | | |
| | Culex tarsalis | 5 | 59 | 5 |
| Yakima | Ochlerotatus dorsalis | 7 | | |
| | Ochlerotatus nigromaculis | 1 | | |
| | Ochlerotatus trivittatus* | 2 | | |
| | Aedes vexans | 2 | | |
| | Anopheles freeborni | 22 | | |
| | Anopheles punctipennis | 13 | | |
| | Culex pipiens | 87 | | |
| | Culex tarsalis | 217 | | |
| | Culiseta inornata | 64 | 415 | 32 |
| | | | | |
| | Totals | | 4 1 3 0 | 320 |

New mosquito species findings for county are listed in bold.

* Ochlerotatus trivittatus is a newly detected (unconfirmed) species for Washington State.

Data Sources for 2004 Mosquito Species Identification: USACHPPM-West

| Adams Ocherotatus dorsalis 37 Ocherotatus melanimon 19 Acadas vuxans 11 Anopholes Inveborni 49 Collex piperis 69 Cultex tarsalis 27 Bonton Ocherotatus dorsalis 3 Ocherotatus cataphylla 7 Ocherotatus cataphylla 7 Ocherotatus melanimon 6 Ades vacans ori 47 Ocherotatus melanimon 6 Ocherotatus statephylla 7 Otherotatus statephylla 7 Otherotatus statephylla 7 Ocherotatus stateratus 6 Ocherotatus stateratus 7 Otherotatus stateratus 7 Ocherotatus stateratus 7 Ocherotatus stateratus 7 <t< th=""><th>County</th><th>Mosquito Species</th><th>Total Number Collected</th><th>Total ID</th><th>Trapping Events</th></t<> | County | Mosquito Species | Total Number Collected | Total ID | Trapping Events |
|--|---------|---------------------------|------------------------|----------|-----------------|
| Ochlerotatus melaninon 19 Andros vesars 11 Anopheles freeborni 49 Coquilettidio perturbans 69 Culxo znails 277 Benton Ochlerotatus cetaphylia 77 Ochlerotatus cetaphylia 77 Colux znails 277 Benton Ochlerotatus melanimon Colux znails 100 Colux znails 140 Colux znails 1,90 Colux pipons 28 Colux znails 10 Culva znails 10 Culva znails 58 Coluca znails 58 Coluca znails 58 Coluca znails 1,34 Adobs vorani 3 Coluca znails 1,34 Coluca znails 1,34 Coluca znails 1,34 Coluca znails 1,34 Coherotaus scienonsis< | Adams | Ochlerotatus dorsalis | 37 | | |
| Addes vaxans 11 Anophelos froborni 49 Colulisitidia perturbans 69 Cilvis tarsalis 277 Cilviscat inoniata 277 Cilviscat inoniata 277 Senton Ocherotatus cataphylis 77 Ocherotatus cataphylis 77 Colulex ternians 44 Coluex ternians 52 Coluex ternians 52 Coluex ternians 53 Coluex ternians 55 Coluex ternians 55 Coluex ternians 73 Coluex ternia | | Ochlerotatus melanimon | 19 | | |
| Anopheles freeborni 49 Coquiletidia perturbans 1 Culex pipiens 69 Culex trasils 277 Culstat inornata 277 490 9 Benton Cehlerotatus cataphylia 77 Cehlerotatus cataphylia 77 Cehlerotatus cataphylia 77 Cehlerotatus cataphylia 77 Cehlerotatus cataphylia 77 Cehlerotatus cataphylia 77 Cehlerotatus cataphylia 193 Cequiletidie perturbans 44 Culex tersalis 1980 Culex tersalis 1984 Culex tersalis 1984 Cohlorotatus sierensis 2 Completicitie perturbans 58 Culex tersalis 1984 Cohlorotatus sierensis 2 Cohlorotatus sierensis 3 Cohlorotatus sierensis 3 Cohlorotatus sierensis 3 Cohlorotatus sierensis 3 Cohlorotatus sierensis 7 Cohlorotatus sierensis 7 Coh | | Aedes vexans | 11 | | |
| Codulisation perturbans 1 Cidex pipons 69 Cidex tensels 277 Cidiset inorate 27 99 Benton Ocherotatus octashis 3 Coherotatus cataphylle 77 Coherotatus cataphylle 77 Collistic monital 573 Coguliatid perturbans 44 Collex pipiens 1,405 Collex tentasis 1,980 Collex tentasis 1,980 Collex tentasis 1,980 Collex tentasis 52 Coherotatus Sifering 3 Coherotatus Sife | | Anopheles freeborni | 49 | | |
| Culex traslis 277 Culex trasls densits 277 Culex trasls densits 3 0 Chihoratus cataphylia 77 Ochioratus cataphylia 77 Cohioratus cataphylia 77 Cohioratus melanimo 6 Addes vaxans 47,083 Anopheles freborni 673 Coulex tarselis 1,980 Culex tarselis 5,98 Culex tarselis 5,98 Culex tarselis 5,98 Culex tarselis 5,98 Culex tarselis 5,98 Culex tarselis 5,8 Culex pipiens 1,374 Culex tarselis 5,8 Culex pipiens 7,5 Culex tarselis 6,61 Culex tarselis 7,99 Culex tarselis 7,99 Culex tarselis 7,99 Culex tarselis 7,99 Culex tarselis 7,99 Culex tarselis 7,99 Culex tarselis 7,9 Culex tarselis 7,7 Culex tarselis 1,374 Adedes vaxens 3,226 Adedes vaxens 3,226 Cohioratus selectrons 3,226 Culex tarselis 7,7 Culex tarselis 1,374 Adedes vaxens 3,226 Culex tarselis 2,477 Culex tarselis 1,374 Culex tarselis 1,374 Culex tarselis 1,374 Culex tarselis 1,374 Culex tarselis 2,497 Culex tarselis 2,497 Culex tarselis 2,497 Culex tarselis 2,497 Culex tarselis 3,217 Culex tarselis 3,217 Culex tarselis 3,217 Culex tarselis 3,217 Cu | | Coquillettidia perturbans | 1 | | |
| Culles instals 277 490 9 Benton Ochlorataus dorasils 3 3 Ochlorataus dotasils 3 7 Ochlorataus cataphylle 77 Ochlorataus melanimon 6 Addes varias 47,083 Anopheles freeborni 673 Coquilientidia perturbans 44 Collect transitis 1,980 Culles transitis 1,980 Culles transitis 1,980 Culles transitis 1,980 Culles transitis 1 Ochloratus sitemasis 1 Ochloratus sitemasis 1 Ochloratus sitemasis 2 Culles transitis 10 Culles transitis 10 Culles transitis 10 Culles transitis 13 Culles transitis 14 Culles transitis 2 Collect transitis 2 Culles transitis 13 Ochloratus sierensis 2 Culles transitis 138 Culles transitis 2 Culles transitis 2 Culles transitis 138 Culles transitis 138 Culles transitis 132 Och | | Culex pipiens | 69 | | |
| Cullesta incrnata 27 490 9 Benton Ochlerotatus dorsalis 3 3 Ochlerotatus daphylia 77 Ochlerotatus cataphylia 77 Ochlerotatus schenkninon 6 Acdes vexans 47,083 Anopheles Ineborni 673 Coquillattidia perturbans 44 Culex tarsalis 1,980 Culex tarsalis 1,980 Culex tarsalis 1,980 209 Chelan Otherotatus filtchini 8 Ochlerotatus filtchini 8 0 0 0 0 0 Culex territans 10 | | Culex tarsalis | 277 | | |
| Benton Ochierotaus dorsalis 3 Ochierotaus actaphylin 77 Ochierotaus malanimon 6 Adeles vexans 47.083 Anopholes freeborni 673 Coquilettidia porturbans 1405 Culux taralis 1,980 Culux taralis 1,980 Culux taralis 592 51,864 209 Cluck taralis 592 51,864 209 Cluck taralis 1,980 Culux taralis 700 Coherotaus fitchii 8 Ochierotaus fitchii 8 Ochierotaus sidemanis 58 Culus tarasis 10 Culus tarasis 58 Culus tarasis 59 Culus tarasis 59 Culus tarasis 59 Culus tarasis 59 Culus tarasis 59 Culus tarasis 59 Culus tarasis 70 Culus tarasis 70 Culu | | Culiseta inornata | 27 | 490 | 9 |
| Ochlerotatus cataphylia 77 Ochlerotatus melanimon 6 Andpels treborni 673 Coquillettidia perturbans 44 Culux taralis 1,980 Culus taralis 1,980 Chelan Other objects / Unknown Other objects / Unknown 6 Ochlerotatus sitemensis 1 Addes vexans 3 Culux taralis 10 Culux taralis 10 Culux taralis 13 Culus taralis 58 Culus taralis 2 Culus taralis tornatis 2 Ochlerotatus schemasis 2 Culus taralis tornatis 2 Culus taralis 50 Culus taralis 50 Culus taralis tornatis 2 Codelerotatus schemasis 2 Codelero | Benton | Ochlerotatus dorsalis | 3 | | |
| Ochlerotatus melanimon 6 Ardes vexans 47.083 Anopheles freeborni 673 Coquilettidi perturbans 1405 Culex frankis 1,980 Culex transis 1,980 Ochlerotatus sierrensis 1 Addes vexans 3 Cluex transis 1 Culex transis 10 Culex transis 10 Culex transis 10 Culex transis 2 Coluex transis 2 Culex transis 3 Cohlerotatus incorepins 3 Cohlerotat | | Ochlerotatus cataphylla | 77 | | |
| Andpheis Interbani Anapheis Interbani Capillattidia perturbans 44,023 Capillattidia perturbans 44 Culex taralis 1,980 Culex taralis 1,980 Culex taralis 1,980 Culex taralis 0 Other of pecies / Unknown 6 Ocherotatus siterina Culex taralis 10 Culex taralis 13 137 22 Ciallam 137 22 Ciallam 137 22 Ciallam 137 Culex taralis 138 138 Ciark 138 Ciark 138 Ciark 138 Ciark 138 Ciark 138 Ciark 138 137 Culex taralis 138 137 Culex taralis 138 137 137 137 137 137 137 137 137 | | Ochlerotatus melanimon | 6 | | |
| Anopheles freeboni 673 Coquilectiolia perturbans 144 Culex tipilens 1.980 Culex territans 1 Acedes varans 3 Culex territans 1 Acedes varans 3 Culex territans 5 Culex territans 53 Culex territans 61 Calver tersalis 73 | | Aedes vexans | 47,083 | | |
| Coquilistitidia perturbans 44 Culve tarsalis 1,405 Culve tarsalis 1,980 Culve tarsalis 1,980 Culve tarsalis inomata 592 51,864 209 Chelan Other Species / Unknown 6 Ochierotatus siternsis 1 Aedes vexans 28 Culve tarsalis 100 Culve tarsalis 50 Culve tarsalis 536 Culve tarsalis 6 Culve tarsalis 536 Culve tarsalis 536 Culve tarsalis 536 Culve tarsalis 536 Culve tarsalis 536 Culve tarsalis 6 Culve tarsalis 6 Culve tarsalis 73 Culve tarsalis 73 Culve tarsalis 73 Culve tarsalis 73 Culve tarsalis 73 Culve tarsalis 73 Culve tarsalis 709 Culve tarsalis 71 Culve tarsalis 709 Culve tarsalis 709 Culve tarsalis 709 Culve tarsalis 709 Culve tarsalis 709 Culve tarsalis 709 Culve tarsalis 70 Culve tarsali | | Anopheles freeborni | 673 | | |
| Culex pipiens 1,405 Culex territans 1 Culex territans 1 Culex territans 1 Culex territans 1 Culex territans 5 Chelan Other Species / Unknown 6 Ochierotatus fitchi Adedes vexans 3 Culex tersalis 10 Culex tersalis 10 Culex tersalis 10 Culex tersalis 10 Culex tersalis 536 Culex tersalis 536 Culex tersalis 6 Culex tersalis 7 Culex tersalis 7 | | Coquillettidia perturbans | 44 | | |
| Cluex tarsalis 1,980 Cluex terminans 1 Cluex terminans 592 51,864 209 Chelan Other Species / Uhrknown 6 Ochierotatus siterinais 8 Cohierotatus sierensis 3 Cluex pipiens 28 Cluex ternitans 5 Cluex ternitans 5 Cluex ternitans 5 Cluex ternitans 30 Cluex ternitans 532 137 22 Clailam Ochierotatus siorensis 2 Coluex ternitans 58 Cluex ternitans 6 Cluex ternitans 536 Cluex ternitans 538 Cluex ternitans 54 Cluex ternitans 54 Cluex ternitans 558 Cluex ternitans 54 Cluex ternitans 54 Cluex ternitans 558 Cluex ternitans 54 Cluex ternitans 55 Cluex ternitans 54 Cluex ternitans 55 Cluex ternitans 55 Cluex ternitans 55 Cluex ternitans 73 Cluex ternitans 74 Anotpheles freeborni 3 Aedes vexans 77 Ochierotatus siloritous 2,497 Aedes vexans 77 Ochierotatus siloritous 33 Cohierotatus siloritous 3 Cluex ternitans 73 Cluex ternitans 73 Cluex ternitans 73 Cluex ternitans 73 Cluex ternitans 74 Anotpheles freeborni 1 Anotpheles | | Culex pipiens | 1,405 | | |
| Culex territans 1 Chiesa inorata 592 51,864 209 Chelan Other Species / Unknown 6 Ochlerotatus sierrensis 1 Aedes vexans 3 Culex tarsalis 10 Culex tarsalis 137 Culex tarsalis 23 Ochlerotatus sierensis 23 Colaltam Ochlerotatus sierensis Ochlerotatus sierensis 2 Coquilitelida penturbans 58 Culex tarsalis 61 Ochlerotatus sicrensis 2 Ochlerotatus sicrensis 73 Culex tarsalis 709 Culex tarsalis 709 Culex tarsalis 700 Culex tarsalis | | Culex tarsalis | 1,980 | | |
| Culiasta inornata 592 51,864 209 Chelan Other Species / Unknown 6 Ocherotatus fitchii 8 Ocherotatus sierensis 1 Aedes vexans 28 Culex travails 10 Culex travails 10 Culex territans 5 Culiseta incidens 30 Culiseta incidens 53 Ocherotatus sierensis 2 Caquillettidia perturbans 58 Culex piptens 7 Culex travails 6 Ocherotatus sierensis 2 Caquillettidia perturbans 58 Culex travails 6 Ocherotatus siterensis 2 Catex Otherotatus siterensis 2 Caquillettidia perturbans 3.226 Anopheles freeborni 4 Anopheles freeborni 1 <td></td> <td>Culex territans</td> <td>1</td> <td></td> <td></td> | | Culex territans | 1 | | |
| Chelan Other Species / Unknown 6 Ochlerotatus siterensis 1 Aedes vexans 3 Culex tarsalis 10 Ochlerotatus sierensis 2 Coquilittidia perturbans 58 Culex tarsalis 6 Culex tarsalis 6 Cohlerotatus sincrepitus 61 Ochlerotatus sincrepitus 61 Ochlerotatus sincrepitus 1384 Adods vexans 3,226 Anopheles fueborni 4 Anopheles punctiponnis 29 Culex tarsalis 5 Culex tarsalis 70 Culex tarsalis 70 Culex tarsalis 70 Culex tarsalis 73 Culex tarsalis 33 Culex tarsalis 33 <td></td> <td>Culiseta inornata</td> <td>592</td> <td>51,864</td> <td>209</td> | | Culiseta inornata | 592 | 51,864 | 209 |
| Ochlerotatus silenensis 1 Aedes vexans 3 Culex tarsalis 10 Culex tarsalis 53 Culex tarsalis 536 Collectatus sierensis 2 Coquilitettidia perturbans 58 Culex tarsalis 61 Ochlerotatus sierensis 2 Cochicotatus sierensis 2 Ochlerotatus sierensis 3 Ochlerotatus sierensis 3 Culex tarsalis 709 Culex tarsalis 709 Culex tarsalis 3 Ochlerotatus aboriginis 3 Ochlerotatus aboriginis 3 Ochlerotatus sierensis < | Chelan | Other Species / Unknown | 6 | | |
| Ochlerotatus sierensis 1 Aedes vexans 3 Culex pipiens 28 Culex tersitis 10 Culex tersitis 10 Culex tersitis 10 Culex territans 53 Culex territans 32 Claistia incredens 30 Claistia incredens 32 Ochierotatus dorsalis 536 Ochierotatus sierensis 2 Coguititicitia perturbans 58 Culex tersalis 6 Culex tersalis 6 Culex tersalis 6 Cark Ochierotatus sincrepitus Ochierotatus sincrepitus 1.384 Aedes vexans 3.226 Anopheles treborni 4 Anopheles treborni 4 Anopheles treborni 4 Anopheles treborni 70 Culex tersalis 709 Culex tersalis 709 Culex tersalis 70 Culex tersalis 70 Culex tersalis 70 Culex tersalis 76 | | Ochlerotatus fitchii | 8 | | |
| Addes vexans 3 Culex territans 2 Culex territans 5 Culiseta impatiens 14 Culiseta increate 32 Calalam Ochlerotatus dosalis 536 Ochlerotatus dosalis 536 Ochlerotatus sierensis 2 Coquillettidia perturbans 58 Culex trasalis 6 Culex trasalis 6 Culex trasalis 6 Cark Ochlerotatus sierensis 2 Ochlerotatus sierensis 2 Ochlerotatus sierensis 2 Ochlerotatus sierensis 2 Ochlerotatus sierensis 2 Coquillettidia perturbans 33 Culex trasalis 70 Culex trasalis 71 Ochlerotatus solorginis 3 Adedes conerus 2 Cochlerotatus sitorentis 1 Ochlerotatus sitorentis 1 Ochlerotatus sitorentis 7 Ochlerotatus sitorentis 31 Coquilettidia perturbans 12,051 Culex trasalis 321 Culex trasalis 321 Cu | | Ochlerotatus sierrensis | 1 | | |
| Culex pipiens 28 Culex terralis 10 Culex territans 5 Culiseta impatiens 14 Culiseta inordens 30 Culiseta inornata 32 137 22 Clallam Ochierotatus dorsalis 536 Ochierotatus dorsalis 536 Coulisetia inornata 6 Culex tersalis 6 Culex tersalis 6 Culex tersalis 7 Culex tersalis 7 Ochierotatus stricticus 1,384 Aedes vexans 3,226 Anopheles freeborni 4 Anopheles punctipennis 29 Coguillettidia perturbans 3 Culex tersalis 709 Culex tersalis 709 Culex tersalis 709 Culesta inornata 15 Culiseta inornata 15 Culiseta inornata 73 Culex tersalis 709 Culiseta inortatus 30 Culex tersalis 709 Culiseta inortatus 30 Culex tersalis 709 Culiseta inortatus 32 Culex tersalis 709 Culiseta inortatus 3 Culex tersalis 70 Cohierotatus storcus 2 Ochierotatus fichii 1 Anopheles fuencipinis 31 Couliste inordens 4 Culiseta inordens 4 Culiseta inordens 4 Ochierotatus Culiseta inordens 4 Ochierotatus fichii 0 Ochierotatus fichii 0 Ochierotatus fichii 0 Ochierotatus fichii 0 Ochierot | | Aedes vexans | 3 | | |
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| Cules territans 5 Culiseta incidens 30 Culiseta incidens 30 Culiseta incidens 30 Culiseta incidens 30 Collectation formata 32 137 22 Calilam Ochlerotatus sierrensis 2 Coquilitidia perturbans 58 Culex pipiens 7 Culex tarsalis 6 Culiseta incrneat 4 613 8 Clark Ochlerotatus sincrepitus 61 Ochlerotatus sincrepitus 1,384 Aedes vexans 3,226 Anopheles freeborni 4 Anopheles functionens 29 Coquilititidia perturbans 5 Culex tarsalis 709 Culex tarsalis 709 Culex tarsalis 709 Culiseta incridens 73 Culex tarsalis 709 Culiseta incidens 73 Cules ta impatiens 5 Culiseta incidens 73 Culex tarsalis 709 Culex tarsalis 710 Culex tarsalis 710 Culex tarsalis 710 Culex tarsalis 710 Culex tarsalis 31 Cohlerotatus soloponotum 3 Aedes cinereus 22 Ochlerotatus soloponotum 3 Aedes vexans 41 Ochlerotatus sicticus 2,497 Aedes vexans 41 Cohlerotatus sicticus 2,497 Aedes vexans 41 Cohlerotatus sicticus 2,497 Aedes vexans 41 Cohlerotatus sicticus 2,497 Aedes vexans 41 Cohlerotatus sicticus 31 Coulex tarsalis 321 Culex | | Culex tarsalis | 10 | | |
| Culiseta incidens 14 Culiseta incidens 30 Culiseta incidens 32 Ciallam Ochlerotatus sierensis 2 Coquillettida perturbans 58 Culex pipiens 7 Culex tarsalis 6 Culiseta increpitus 61 Cehlerotatus sicrepitus 1,384 Aedes vexans 3,226 Anopheles freeborni 4 Anopheles precipiens 29 Coquillettida perturbans 3 Culex pipiens 1,374 Culex tarsalis 709 Culiseta incidens 73 Culiseta incidens 74 Anopheles puentipenis 74 Culiseta incidens 73 Culiseta incidens 74 Culiseta incidens 73 Culiseta incidens 73 Culiseta incidens 73 Culiseta incidens 73 Culiseta incidens 74 Culiseta incidens 73 Culiseta incidens 73 Culiseta incidens 73 Culiseta incidens 73 Culiseta incidens 73 Culiseta incid | | Culex territans | 5 | | |
| Culseta increas 30 Clallam Ochlerotatus dorsalis 536 Ochlerotatus dorsalis 536 Caquillettidia perturbans 58 Culex pipiens 7 Culex pipiens 7 Culseta inormata 4 613 8 Clark Ochlerotatus sincrepitus 61 Ochlerotatus sincrepitus 61 613 Clark Ochlerotatus sincrepitus 61 Ochlerotatus sincrepitus 1,384 Adedes vexans 3,226 Anopheles freeborni 4 Anopheles punctipennis 29 Couliseta impatiens 5 Culseta impatiens 5 Culseta impatiens 5 Culseta impatiens 5 Culseta inornata 15 Culseta protops 40 Ochlerotatus aborginis 3 Ochlerotatus aborginis 3 Ochlerotatus storcicus 2 Ochlerotatus sincrepitus 41 Ochlerotatus sincre | | Culiseta impatiens | 14 | | |
| Culseta inomata 32 137 22 Cialiam Ochlerotatus sorralis 536 0 Ochlerotatus sierrensis 2 0 0 Culex pipiens 7 0 0 0 Culex tarsalis 6 613 8 Clark Ochlerotatus sincrepitus 61 0 0 Ochlerotatus sincrepitus 1,384 4 613 8 Clark Ochlerotatus sincrepitus 1,384 4 643 8 Clark Ochlerotatus sincrepitus 1,384 4 4 613 8 Clark Ochlerotatus sincrepitus 1,384 4 4 693 8 Clark Ochlerotatus sincrepitus 1,374 29 0 | | Culiseta incidens | 30 | | 22 |
| Charlam Ochlerotatus sörvernsis 2 Coquillettidia perturbans 58 Culex tarsalis 6 Culex tarsalis 6 Culex tarsalis 6 Culex tarsalis 6 Culex tarsalis 6 Culex tarsalis 7 Ochlerotatus sicrensis 2 Ochlerotatus sicrensis 2 Ochlerotatus sicrensis 2 Ochlerotatus sicrensis 2 Ochlerotatus sicrensis 2 Ochlerotatus sicrensis 2 Ochlerotatus sicrensis 29 Coguillettidia perturbans 3 Culex tarsalis 709 Culiseta incidens 73 Culiseta incidens 3 Ochlerotatus aborionum 3 Acdes cinerus 2 Ochlerotatus sinceptius 41 Ochlerotatus sinceptins 41 Ochlerotatus sitchii 1 Ochlerotatus sitchii 1 Anopheles freeborni 1 Anopheles punctipennis 31 Coquilettidia perturbans 12,051 Culex tarsalis 321 Culiseta incidens 15 Culiseta incidens 15 Culiseta incidens 15 Culiseta incidens 15 Culiseta incidens 15 | Clallan | Cullseta Inornata | 32 | 137 | 22 |
| CouliedUnate Selections 2 Coulisation Selections 5 Culex pipiens 7 Culex tarsalis 6 Culiseta inornate 4 613 8 Clark Ochlerotatus increpitus 61 Ochlerotatus sticticus 1,384 Aedes vexans 3,226 Anopheles freeborni 4 Anopheles freeborni 2 Couliseta impatiens 3 Culex tarsalis 709 Culiseta impatiens 5 Culiseta increpitus 3 Culex tarsalis 709 Culiseta increpitus 41 Ochlerotatus storiginis 3 Aedes cinereus 2 Ochlerotatus storiginis 1 Cohlerotatus storepitus 41 Ochlerotatus storepitus 3 Aedes vexans 474 Anopheles freeborni 1 Anopheles freeborni 1 Anopheles fueborni 3 Culiseta inclens 11,100 Culex targalis 321 Culiseta incidens 12,051 Culex targalis 321 Culiseta incidens 15 Culiseta incidens 15 | Clanam | | 2 | | |
| Culex pipeins 7 Culex tarsalis 6 Culiseta inornata 4 Clark Ochlerotatus increpitus 61 Ochlerotatus sierrensis 2 Ochlerotatus sticticus 1,384 Aedes vexans 3,226 Anopheles freeborni 4 Anopheles freeborni 2 Coquillettida perturbans 3 Culex pipiens 1,374 Culex tarsalis 709 Culiseta impatiens 5 Culiseta incidens 73 Culiseta incidens 73 Culiseta incornata 15 Culiseta particeps 40 Ochlerotatus aloponotum 3 Ochlerotatus sierrensis 7 Culiseta particeps 76 Cowlitz Other Species / Unknown 30 Ochlerotatus aloponotum 3 Aedes cieneus 2 Ochlerotatus sierrensis 7 Ochlerotatus fichi 1 Anopheles freeborni 1 A | | Coquillettidia perturbans | 58 | | |
| Culex tarsalis 1 Culex tarsalis 61 Clark Ochlerotatus sicrepitus 61 Ochlerotatus sicrepitus 61 Ochlerotatus sicrepitus 1,384 Aedes vexans 3,226 Anopheles precipitus 2 Construction 4 Anopheles protripennis 29 Coquillettidia perturbans 3 Culex tarsalis 709 Culex tarsalis 709 Culiseta incidens 73 Culiseta incidens 74 Aedes cinereus 2 Ochlerotatus aloponotum 3 Aedes cinereus 2 Ochlerotatus fitchii 1 Ochlerotatus sicrepistis 7 Ochlerotatus sicrepistis 3 Ochlerotatus sicrepistis 1 A | | Culex piniens | 7 | | |
| Cuilseta inornata 4 613 8 Clark Ochlerotatus sicrepius 61 Ochlerotatus sicrensis 2 Anopheles freeborni 4 Anopheles punctipennis 29 Coquilettidia perturbans 3 Culex tarsalis 709 Culiseta incidens 73 Culiseta incidens 73 Culiseta incidens 73 Culiseta incidens 76 Cowlitz Other Species / Unknown Ochlerotatus aboriginis 3 Acdes cinereus 2 Ochlerotatus aloponotum 3 Aedes cinereus 2 Ochlerotatus siteritius 41 Ochlerotatus siteritius 41 Ochlerotatus siteritius 2,497 Aedes vexans 474 Anopheles punctipennis 31 Coulieta inpatiens 1,100 Culex tarsalis 321 Culiseta incidens 1,100 Culex tarsalis 321 Culiseta inpatiens 6 < | | Culex tarsalis | 6 | | |
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| Ochlerotatus sierrensis 2 Ochlerotatus sticticus 1,384 Aedes vexans 3,226 Anopheles freeborni 4 Anopheles punctipennis 29 Coguillettidia perturbans 3 Culex pipiens 1,374 Culex tarsalis 709 Culiseta impatiens 5 Culiseta inornata 15 Culiseta particeps 40 Ochlerotatus aboriginis 3 Ochlerotatus aboriginis 3 Ochlerotatus aloponotum 3 Aedes cinereus 2 Ochlerotatus fitchii 1 Ochlerotatus sitchii 1 Anopheles pructipennis 31 Ochlerotatus sitchii 1 Anopheles freeborni 1 Anopheles punctipennis 31 Coguillettidia perturbans 12,051 Culikest signatosoma 2 | Clark | Ochlerotatus increpitus | 61 | | |
| Ochlerotatus sticticus 1,384 Aedes vexans 3,226 Anopheles freeborni 4 Anopheles punctipennis 29 Coquillettidia perturbans 3 Culex pipiens 1,374 Culex tarsalis 709 Culiseta impatiens 5 Culiseta incidens 73 Culiseta particeps 40 Ochlerotatus aboriginis 3 Ochlerotatus alogonotum 3 Aedes cinereus 2 Ochlerotatus alogonotum 3 Aedes cinereus 2 Ochlerotatus sicromunis 1 Ochlerotatus increpitus 41 Ochlerotatus sicrensis 7 Ochlerotatus sicricicus 2,497 Aedes vexans 474 Anopheles freeborni 1 Anopheles freeborni 1 Anopheles punctipennis 31 Coullex tarsalis 321 Culex tarsal | | Ochlerotatus sierrensis | 2 | | |
| Aedes vexans 3,226 Anopheles freeborni 4 Anopheles freeborni 29 Coquillettidia perturbans 3 Culex pipiens 1,374 Culex tarsalis 709 Culiseta inpatiens 5 Culiseta incidens 73 Culiseta incidens 73 Culiseta particeps 40 6,925 76 Cowlitz Other Species / Unknown Ochlerotatus aboriginis 3 Ochlerotatus alopnotum 3 Aedes cinereus 2 Ochlerotatus communis 1 Ochlerotatus sicrensis 7 Ochlerotatus sicrensis 1 Anopheles punctipennis 31 Coquillettidia perturbans 12,051 Culex tarsalis 321 Cullex tarsalis 321 Cullex tarsalis 321 Cullex tarisalis 321 Culle | | Ochlerotatus sticticus | 1,384 | | |
| Anopheles freeborni 4 Anopheles punctipennis 29 Coquilletti dia perturbans 3 Culex pipiens 1,374 Culex tarsalis 709 Culiseta incidens 5 Culiseta incidens 73 Culiseta particeps 40 6,925 76 Cowlitz Other Species / Unknown Ochlerotatus aboriginis 3 Ochlerotatus communis 1 Ochlerotatus communis 1 Ochlerotatus sitercicus 2,497 Aedes vexans 474 Anopheles freeborni 1 Anopheles punotipenni | | Aedes vexans | 3,226 | | |
| Anopheles punctipennis 29 Coquillettidia perturbans 3 Culex pipiens 1,374 Culex tarsalis 709 Culiseta impatiens 5 Culiseta incidens 73 Culiseta incidens 73 Culiseta incidens 73 Culiseta particeps 40 6,925 76 Cowlitz Other Species / Unknown Ochlerotatus aboriginis 3 Acdes cincereus 2 Ochlerotatus aloponotum 3 Aedes cincereus 2 Ochlerotatus sictichi 1 Ochlerotatus sictichi 1 Ochlerotatus sicticus 2,497 Aedes vexans 474 Anopheles punctipennis 31 Coquillettidia perturbans 12,051 Culex tigmatosoma 2 Culex tigmatosoma 2 Culex tigmatosoma 22 Culex tigmatosoma 22 Culex tigmatosoma 22 Culex tigmatosoma 22 Culex tarsalis 321 Culiseta inicidens </td <td></td> <td>Anopheles freeborni</td> <td>4</td> <td></td> <td></td> | | Anopheles freeborni | 4 | | |
| Coquillettidia perturbans 3 Culex pipiens 1,374 Culex tarsalis 709 Culiseta impatiens 5 Culiseta incidens 73 Culiseta inornata 15 Culiseta particeps 40 Other Species / Unknown 30 Ochlerotatus aboriginis 3 Ochlerotatus aloponotum 3 Acedes cinereus 2 Ochlerotatus communis 1 Ochlerotatus sincrepitus 41 Ochlerotatus sicrensis 7 Ochlerotatus sicrepitus 41 Ochlerotatus sicrepitus 41 Ochlerotatus sicrensis 7 Ochlerotatus sicrepitus 41 Ochlerotatus sicrepitus 41 Ochlerotatus sicrensis 7 Ochlerotatus sicrensis 7 Ochlerotatus sicrepitus 31 Coquilletticia perturbans 12,051 Culex tigmatosoma 2 Culex tigmatosoma 2 Culex tigmatosoma 22 Culex tarsalis 321 Culiseta incidens 15 | | Anopheles punctipennis | 29 | | |
| Culex pipiens 1,374 Culex tarsalis 709 Culiseta impatiens 5 Culiseta incidens 73 Culiseta particeps 40 6,925 76 Cowlitz Other Species / Unknown Ochlerotatus aboriginis 3 Acdes cinereus 2 Ochlerotatus aloponotum 3 Aedes cinereus 2 Ochlerotatus fitchii 1 Ochlerotatus sicrensis 7 Ochlerotatus sicticus 2,497 Aedes vexans 474 Anopheles freeborni 1 Anopheles freeborni 1 Anopheles punctipennis 31 Coquillettidia perturbans 12,051 Culex tignatosoma 2 Culex tarsalis 321 Culest aimpatiens 6 Culiseta incidens 15 | | Coquillettidia perturbans | 3 | | |
| Culex tarsalis709Culiseta impatiens5Culiseta incidens73Culiseta inornata15Culiseta particeps406,92576CowlitzOther Species / Unknown03Ochlerotatus aboriginis3Ochlerotatus aloponotum3Aedes cinereus2Ochlerotatus communis1Ochlerotatus sicrepitus41Ochlerotatus sicrepitus41Ochlerotatus sicricus2,497Aedes vexans474Anopheles freeborni1Anopheles punctipennis31Coquillettidia perturbans12,051Culex tarsalis321Culex tarsalis321Culiseta inpatiens6Culiseta inpatiens7Culiseta inpatiens7 | | Culex pipiens | 1,374 | | |
| Culiseta impatiens5Culiseta incidens73Culiseta inornata15Culiseta particeps406,92576CowlitzOther Species / Unknown30Ochlerotatus aboriginis3Ochlerotatus aboriginis3Aedes cinereus2Ochlerotatus aloponotum3Aedes cinereus2Ochlerotatus increpitus41Ochlerotatus sierrensis7Ochlerotatus sierrensis7Ochlerotatus sierrensis7Ochlerotatus sicticus2,497Aedes vexans474Anopheles freeborni1Anopheles punctipennis31Couliettidia perturbans12,051Culex tigmatosoma2Culex tarsalis321Culiseta inpatiens6Culiseta inpatiens6Culiseta inpatiens6Culiseta inpatiens6Culiseta inpatiens7Other and | | Culex tarsalis | 709 | | |
| Culiseta inornata 73 Culiseta inornata 15 Culiseta particeps 40 6,925 76 Cowlitz Other Species / Unknown Ochlerotatus aboriginis 3 Ochlerotatus aloponotum 3 Aedes cinereus 2 Ochlerotatus communis 1 Ochlerotatus fitchii 1 Ochlerotatus sicrensis 7 Ochlerotatus sticticus 2,497 Aedes vexans 474 Anopheles freeborni 1 Anopheles punctipennis 31 Couliex tigmatosoma 2 Culiex stigmatosoma 2 Culex stigmatosoma 2 Culex tarsalis 321 Culiseta inpatiens 6 Culiseta inpatiens 6 Culiseta inpatiens 6 Culiseta inpatiens 15 | | Culiseta impatiens | 5 | | |
| Cuisseta inornata 15 Cuisseta particeps 40 6,925 76 Cowlitz Other Species / Unknown 30 Ochlerotatus aboriginis 3 Ochlerotatus aboriginis 3 Ochlerotatus aloponotum 3 Aedes cinereus 2 Ochlerotatus communis 1 Ochlerotatus fitchii 1 Ochlerotatus sicrepitus 41 Ochlerotatus sicrensis 7 Ochlerotatus sicticus 2,497 Aedes vexans 474 Anopheles freeborni 1 Anopheles fueborni 1 Coquillettidia perturbans 12,051 Culex pipiens 1,100 Culex stigmatosoma 2 Culex tarsalis 321 Culiseta impatiens 6 Culiseta incidens 15 | | Culiseta incidens | 73 | | |
| Consister Particeps 40 6,925 76 Cowlitz Other Species / Unknown 30 30 30 Ochlerotatus aloponotum 3 3 30 31 Ochlerotatus aloponotum 3 3 32 Aedes cinereus 2 2 32 Ochlerotatus communis 1 31 Ochlerotatus sincrepitus 41 33 Ochlerotatus sincrepitus 41 Ochlerotatus sincrepitus 41 Ochlerotatus sincrepitus 41 Ochlerotatus sticticus 2,497 Aedes vexans 474 Anopheles freeborni 1 Anopheles freeborni 1 Anopheles punctipennis 31 Coquillettidia perturbans 12,051 Culex pipiens 1,100 Culex stigmatosoma 2 Culex tarsalis 321 Culiseta impatiens 6 Culiseta incidens 15 | | Culiseta inornata | 15 | | |
| Cowint2Other Species / Onknowin30Ochlerotatus aloponotum3Aedes cinereus2Ochlerotatus communis1Ochlerotatus fitchii1Ochlerotatus sincrepitus41Ochlerotatus sierensis7Ochlerotatus stitcicus2,497Aedes vexans474Anopheles freeborni1Anopheles freeborni1Coquillettidia perturbans12,051Culex pipiens1,100Culex stigmatosoma2Culex tarsalis321Culesta impatiens6Culiseta incidens15Culiseta incidens15 | Cowlitz | Other Species / Upknown | 40 | 6,925 | 76 |
| Ochlerotatus alonginis3Aedes cinereus2Ochlerotatus communis1Ochlerotatus communis1Ochlerotatus fitchii1Ochlerotatus sierrensis7Ochlerotatus sierrensis7Ochlerotatus sticticus2,497Aedes vexans474Anopheles freeborni1Anopheles reeborni31Coquillettidia perturbans12,051Culex pipiens1,100Culex stigmatosoma2Culex tarsalis321Culiseta impatiens6Culiseta incidens15Culiseta incidens15 | COWILZ | Ochlerotatus aboriginis | 3 | | |
| Aedes cinereus2Ochlerotatus communis1Ochlerotatus fitchii1Ochlerotatus increpitus41Ochlerotatus sierrensis7Ochlerotatus sticticus2,497Aedes vexans474Anopheles freeborni1Anopheles punctipennis31Coquillettidia perturbans12,051Culex pipiens1,100Culex stigmatosoma2Culex tarsalis321Culiseta impatiens6Culiseta incidens15Culiseta incidens28 | | Ochlerotatus abonginis | 3 | | |
| Ochlerotatus communis1Ochlerotatus fitchii1Ochlerotatus fitchii1Ochlerotatus sierrensis7Ochlerotatus sierrensis7Ochlerotatus sticticus2,497Aedes vexans474Anopheles freeborni1Anopheles freeborni1Coquillettidia perturbans12,051Culex pipiens1,100Culex stigmatosoma2Culex tarsalis321Culiseta impatiens6Culiseta incidens15Culiseta incidens28 | | Aedes cinereus | 2 | | |
| Ochlerotatus fitchii1Ochlerotatus increpitus41Ochlerotatus sierrensis7Ochlerotatus sierrensis7Ochlerotatus sticticus2,497Aedes vexans474Anopheles freeborni1Anopheles punctipennis31Coquillettidia perturbans12,051Culex pipiens1,100Culex stigmatosoma2Culex tarsalis321Culiseta inpatiens6Culiseta incidens15Culiseta incidens15 | | Ochlerotatus communis | - 1 | | |
| Ochlerotatus increpitus41Ochlerotatus sierrensis7Ochlerotatus sticticus2,497Aedes vexans474Anopheles freeborni1Anopheles punctipennis31Coquillettidia perturbans12,051Culex pipiens1,100Culex stigmatosoma2Culex tarsalis321Culiseta inpatiens6Culiseta incidens15 | | Ochlerotatus fitchii | 1 | | |
| Ochlerotatus sierensis7Ochlerotatus sticticus2,497Aedes vexans474Anopheles freeborni1Anopheles punctipennis31Coquillettidia perturbans12,051Culex pipiens1,100Culex stigmatosoma2Culex tarsalis321Culiseta impatiens6Culiseta incidens15 | | Ochlerotatus increpitus | 41 | | |
| Ochlerotatus sticticus2,497Aedes vexans474Anopheles freeborni1Anopheles punctipennis31Coquillettidia perturbans12,051Culex pipiens1,100Culex stigmatosoma2Culex tarsalis321Culiseta impatiens6Culiseta incidens15 | | Ochlerotatus sierrensis | 7 | | |
| Aedes vexans474Anopheles freeborni1Anopheles punctipennis31Coquillettidia perturbans12,051Culex pipiens1,100Culex stigmatosoma2Culex tarsalis321Culiseta impatiens6Culiseta incidens15Culiseta incidens28 | | Ochlerotatus sticticus | 2,497 | | |
| Anopheles freeborni1Anopheles punctipennis31Coquillettidia perturbans12,051Culex pipiens1,100Culex stigmatosoma2Culex tarsalis321Culiseta impatiens6Culiseta incidens15Culiseta incidens28 | | Aedes vexans | 474 | | |
| Anopheles punctipennis31Coquillettidia perturbans12,051Culex pipiens1,100Culex stigmatosoma2Culex tarsalis321Culiseta impatiens6Culiseta incidens15Culiseta incidens28 | | Anopheles freeborni | 1 | | |
| Coquillettidia perturbans12,051Culex pipiens1,100Culex stigmatosoma2Culex tarsalis321Culiseta impatiens6Culiseta incidens15Culiseta incidens28 | | Anopheles punctipennis | 31 | | |
| Culex pipiens1,100Culex stigmatosoma2Culex tarsalis321Culiseta impatiens6Culiseta incidens15Culiseta incidens28 | | Coquillettidia perturbans | 12,051 | | |
| Culex stigmatosoma2Culex tarsalis321Culiseta impatiens6Culiseta incidens15Culiseta incidens28 | | Culex pipiens | 1,100 | | |
| Culex tarsalis 321 Culiseta impatiens 6 Culiseta incidens 15 Culiseta incidens 28 | | Culex stigmatosoma | 2 | | |
| Culiseta impatiens 6 Culiseta incidens 15 Culiseta incirata 28 | | Culex tarsalis | 321 | | |
| Culliseta incidens 15 | | Culliseta impatiens | 6 | | |
| 1 1000073 (0000373) | | Culiseta incidens | 15 | | |
| | | Culiseta mornata | 28 | | |
| Culiseta particeps 114 16.729 221 | | Culiseta particeps | 114 | 16.729 | 221 |

| County | Mosquito Species | Total Number Collected | Total ID | Trapping Events |
|--------------|---------------------------|------------------------|----------|-----------------|
| Franklin | Other Species / Unknown | 60 | | |
| | Ochlerotatus campestris | 302 | | |
| | Ochlerotatus dorsalis | 1,686 | | |
| | Ochlerotatus sticticus | 3 | | |
| | Aedes vexans | 1,467 | | |
| | Anopheles freeborni | 1,996 | | |
| | Anopheles punctipennis | 21 | | |
| | Culex pipiens | 2,202 | | |
| | Culex tarsalis | 3,588 | | |
| | Culiseta incidens | 2 | | |
| | Culiseta inornata | 638 | 11,965 | 191 |
| Grays Harbor | Ochlerotatus aboriginis | 5 | | |
| | Ochlerotatus dorsalis | 15 | | |
| | Ochlerotatus fitchii | 2 | | |
| | Ochlerotatus sierrensis | 1 | | |
| | Coquillettidia perturbans | 66 | | |
| | Culex pipiens | 48 | | |
| | Culies to imposione | 5 | | |
| | Culiseta impatiens | 24 | | |
| | Culiseta minnosotao | 2 | | |
| | Culieste nortieene | 1 | 170 | 10 |
| lofforcon | Ochlorotatus aboriginis | 3 | 172 | 10 |
| Jenerson | Ochlerotatus dorsalis | 3 27 | | |
| | Ochlerotatus fitchii | 21 | | |
| | Ochlerotatus sierrensis | | | |
| | Ochlerotatus sticticus | 1 | | |
| | Aedes sn | 1 | | |
| | Coquillettidia perturbans | 2 | | |
| | Culex pipiens | 22 | | |
| | Culex tarsalis | | | |
| | Culiseta incidens | 10 | | |
| | Culiseta inornata | 7 | 90 | 13 |
| King | Other Species / Unknown | 1 | | |
| Ū | Aedes cinereus | 31 | | |
| | Ochlerotatus fitchii | 4 | | |
| | Ochlerotatus j. japonicus | 1 | | |
| | Ochlerotatus sierrensis | 6 | | |
| | Anopheles punctipennis | 4 | | |
| | Coquillettidia perturbans | 122 | | |
| | Culex pipiens | 1,442 | | |
| | Culex stigmatosoma | 8 | | |
| | Culex tarsalis | 230 | | |
| | Culiseta incidens | 788 | | |
| | Culiseta inornata | 28 | | |
| | Culiseta minnesotae | 16 | | |
| | Culiseta morsitans | 3 | | 101 |
| Viteen | Culiseta particeps | 11 | 2,695 | 131 |
| nitsap | | 4 | | |
| | Culex pipiens | 6 | | |
| | Culex la sails | 3 | | |
| | Culiseta inclueris | 29 | 13 | 5 |
| Lowie | | 99 | 43 | 5 |
| LEWIS | | 20 | 108 | 2 |
| Pacific | | 599 | 100 | - |
| 1 donio | Ochlerotatus dorsalis | 639 | | |
| | Ochlerotatus fitchii | 505 | | |
| | Ochlerotatus sierrensis | 57 | | |
| | Aedes vexans | 16 | | |
| | Coquillettidia perturbans | 489 | | |
| | Culex pipiens | 74 | | |
| | Culex tarsalis | 17 | | |
| | Culiseta incidens | 1 | | |
| | Culiseta minnesotae | 1 | | |
| | Culiseta morsitans | 38 | | |
| | Culiseta particeps | 139 | 2,575 | 41 |

| County | Mosquito Species | Total Number Collected | Total ID | Trapping Events |
|-----------|---------------------------|------------------------|----------|-----------------|
| Pierce | Ochlerotatus aboriginis | 89 | | |
| | Ochlerotatus communis | 327 | | |
| | Ochlerotatus hexodontus | 4 | | |
| | Ochlerotatus j. japonicus | 2 | | |
| | Ochlerotatus pullatus | 47 | | |
| | Ochlerotatus sierrensis | 6 | | |
| | Aedes vexans | 4 | | |
| | Coquillettidia perturbans | 5 | | |
| | Culex pipiens | 224 | | |
| | Culex stigmatosoma | 9 | | |
| | Culex tarsalis | 125 | | |
| | Culiseta incidens | 859 | | |
| | Culiseta inornata | 1 | 4 | |
| Chamania | | 33 | 1,735 | 37 |
| Skamania | Anopheles punctipennis | 5 | | |
| | Culisota incidens | 2 | 12 | 2 |
| Snohomish | | 48 | 15 | 3 |
| ononomish | Ochlerotatus dorsalis | 2 | | |
| | Ochlerotatus fitchii | 257 | | |
| | Ochlerotatus increpitus | 8 | | |
| | Ochlerotatus sierrensis | 6 | | |
| | Ochlerotatus sticticus | 7 | | |
| | Aedes vexans | 1 | | |
| | Anopheles freeborni | 1 | | |
| | Anopheles punctipennis | 5 | | |
| | Coquillettidia perturbans | 1,354 | | |
| | Culex pipiens | 3,281 | | |
| | Culex tarsalis | 471 | | |
| | Culiseta incidens | 115 | | |
| | Culiseta inornata | 115 | | |
| | Culiseta minnesotae | 31 | | |
| | Culiseta morsitans | 13 | | |
| 0 | Culiseta particeps | 87 | 5,802 | 115 |
| Spokane | Aedes cinereus | 45 | | |
| | | 203 | | |
| | Ochlerotatus flavoscons | 91 | | |
| | Ochlerotatus increnitus | 102 | | |
| | Aedes vexans | 3 | | |
| | Ochlerotatus sp. | 7 | | |
| | Anopheles freeborni | 29 | | |
| | Anopheles punctipennis | 2 | | |
| | Coquillettidia perturbans | 74 | | |
| | Culex pipiens | 806 | | |
| | Culex salinarius | 11 | | |
| | Culex tarsalis | 571 | | |
| | Culex sp. | 24 | | |
| | Culiseta incidens | 10 | | |
| | Culiseta inornata | 14 | | |
| | Culiseta minnesotae | 113 | 2,111 | 44 |
| Thurston | Ochlerotatus fitchii | 7 | | |
| | Ochlerotatus sierrensis | 132 | | |
| | Coquiliettidia perturbans | 2 | | |
| | Culex pipiens | 21 | | |
| | Culex larsails | 10 | | |
| | Culiseta incideris | 40 | 215 | 10 |
| Wahkiakum | Ochlerotatus aboriginis | 4 | 210 | 10 |
| Tunnandin | Ochlerotatus fitchii | 6 | | |
| | Ochlerotatus sierrensis | 2 | | |
| | Anopheles freeborni | 4 | | |
| | Anopheles punctipennis | 6 | | |
| | Coquillettidia perturbans | 1,453 | | |
| | Culex pipiens | 109 | | |
| | Culex tarsalis | 43 | | |
| | Culiseta incidens | 6 | | |
| | Culiseta inornata | 1 | | |
| | Culiseta minnesotae | 13 | | |
| | Culiseta particeps | 12 | 1,659 | 25 |

| County | Mosquito Species | Total Number Collected | Total ID | Trapping Events |
|-------------|---------------------------|------------------------|----------|-----------------|
| Walla Walla | Other Species / Unknown | 1 | | |
| | Ochlerotatus increpitus | 2 | | |
| | Ochlerotatus nigromaculis | 1 | | |
| | Ochlerotatus sticticus | 1 | | |
| | Aedes sp. | 51 | | |
| | Aedes vexans | 2,604 | | |
| | Anopheles freeborni | 1,237 | | |
| | Culex pipiens | 2,961 | | |
| | Culex tarsalis | 3,344 | | |
| | Culiseta impatiens | 10 | | |
| | Culiseta inornata | 142 | 10,354 | 152 |
| Whatcom | Ochlerotatus fitchii | 92 | | |
| | Ochlerotatus sierrensis | 13 | | |
| | Aedes vexans | 31 | | |
| | Anopheles freeborni | 2 | | |
| | Anopheles punctipennis | 2 | | |
| | Coquillettidia perturbans | 39 | | |
| | Culex pipiens | 36 | | |
| | Culex tarsalis | 22 | | |
| | Culiseta impatiens | 1 | | |
| | Culiseta incidens | 36 | | |
| | Culiseta inornata | 7 | | |
| | Culiseta minnesotae | 17 | 298 | 16 |
| Whitman | Culiseta incidens | 28 | | |
| | Culiseta inornata | 1 | 29 | 2 |
| Yakima | Ochlerotatus dorsalis | 5 | | |
| | Ochlerotatus fitchii | 1 | | |
| | Ochlerotatus melanimon | 10 | | |
| | Aedes vexans | 762 | | |
| | Anopheles freeborni | 129 | | |
| | Coquillettidia perturbans | 5 | | |
| | Culex pipiens | 5,769 | | |
| | Culex tarsalis | 3,729 | | |
| | Culiseta inornata | 227 | 10,637 | 47 |
| | | | | |
| 2 | 3 Counties | 127.259 | 127.259 | 1.389 |

New mosquito species findings for county are listed in bold.

Data Sources:Local Health Jurisdictions (11)
Benton County Mosquito Control District (Benton County and areas of Yakima County)
Clark County Mosquito Control District
Columbia Mosquito Control District (Walla Walla County)
Franklin County Mosquito Control District
Julia Butler Hansen National Wildlife Refuge (Wahkiakum County)
Leavenworth Mosquito Control District (Chelan County)
Lee Pederson, US Army (Fairchild AFB, Spokane County)
Makah Tribe (Clallam County)
Mosquito Control District county
Mt. Rainier National Park (Lewis and Pierce Counties)
North Cascades National Park (Whatcom County)
Washington State Department of Transportation (Yakima County)
Washington State Parks
Willapa National Wildlife Refuge (Pacific County)

Appendix 4 2005 WNV Surveillance US Army Center for Health Promotion and Prevention Medicine - West Mosquito Species by County

| County | Mosquito Species | Total Number Collected | Total ID | Trapping Events |
|-----------|------------------|------------------------|----------|-----------------|
| Jefferson | Culex tarsalis | 23 | 23 | 14 |
| Kitsap | Culex pipiens | 889 | | |
| | Culex tarsalis | 48 | 937 | 133 |
| Pierce | Culex pipiens | 33 | | |
| | Culex tarsalis | 124 | 157 | 69 |
| Yakima | Culex pipiens | 6 | | |
| | Culex tarsalis | 62 | 68 | 32 |
| | | | | |
| | Totals | 1,185 | 1,185 | 248 |

New mosquito species findings for county are listed in bold.

Data Sources for 2005 Mosquito Species Identification: USACHPPM-West

Appendix 5

Mosquito Species by County, Western Washington

| | | | | | | | | | | | | - | | | | - | | | | - | | | | _ | | | | | | | | | | - | | | | | | | | | | | | | | | |
|---------------------|--|-----------------|---------------|------------------|----------------------|------------------------|-------------------------|-----|------------|----------|---------------|----------------|-----------------|-------------------|---------------------|-----------------|------------------|--------------------|--------------------|--------------------|---------------------|---------------------|--------------------|-------------------------|-------------------------|-------------------------|--------------------------|-------------------------|-----------------------|------------------------|-------------------------|-----------------------|-------------------------|-------------------------|----------------------|-------------------------|-------------------------|-----|-----------------------------------|-------------------------|----------------------------|----------------------|-----------------------|----------------------|-------------------------|-----------------------------------|-------------------------|--------------------|---------------------------|
| County | Aedes cinereus* | Aedes trichurus | Aedes vexans* | Anopheles earlei | Anopheles freeborni* | Anopheles occidentalis | Anopheles punctipennis* | | | | Culex boharti | Culex pipiens* | Culex restuans* | Culex salinarius* | Culex stigmatasoma* | Culex tarsalis* | Culex territans* | Culiseta impatiens | Culiseta incidens* | Culiseta inornata* | Culiseta minnesotae | Culiseta morsitans* | Culiseta particeps | Ochlerotatus aboriginis | Ochlerotatus aloponotum | Ochlerotatus campestris | Ochlerotatus canadensis* | Ochlerotatus cataphylla | Ochlerotatus communis | Ochlerotatus dorsalis* | Ochlerotatus excrucians | Ochlerotatus fitchii* | Ochlerotatus flavescens | Ochlerotatus hexodontus | Ochlerotatus impiger | Ochlerotatus implicatus | Ochlerotatus increpitus | | Ochlerotatus iaponicus iaponicus* | Ochlerotatus melanimon* | Ochlerotatus nioromaculis* | Ochlerotatus pionips | Ochlerotatus pullatus | Ochlerotatus punctor | Ochlerotatus sierrensis | Ochlerotatus spencerii idahoensis | Ochlerotatus sticticus* | Ochlerotatus togoi | Ochlerotatus trivittatus* |
| Clallam | | | V | 1 | V | | V | | 2 | | | v | | | | V | V | v | V | v | | | | 1 | V | | | | | V | | V | | | | | | | | 2 | | | V | | v | | 2 | _ | _ |
| Clanam | v | - | | | | - | | | | - | _ | ^ V | | - | | ^ V | ^ V | 2 | | | v | | 2 | | ^ | - | | - | - | ^ | 2 | ^ | - | - | - | - | 2 | | _ | 2 | | + | | - | | v | | - | + |
| Coulitz | \sim | - | | | | - | | / | <u>~ </u> | . | 2 | ^ V | - | - | v | ^ V | | 2 V | | | | | 2 | 4 | 4 | v | | - | 4 | V | - | 5 | - | + | - | + | | | , | + | + | - | + | - | 2 | | | - | - |
| Grave Harbor | ^ | - | | | ^ | - | | | 2 1 1 | < . < | 2 | ^ V | | - | ^ | ^ V | ^ V | ^ | | ^ | 4 | 2 | 2 | 4 | 4 | | | - | 4 | | _ | 2 | - | - | - | - | 2 | | ` <u> </u> | | - | + | - | - | 2 | ^ | | - | + |
| | Y | - | ~ | | Y | - | | | 2 | ^ | - | ^ Y | 2 | - | | ^ | ^ Y | 4 | | Y | 2 | 2 | 2 | Ŷ | 2 | ^ | | - | + | | Y | S V | - | + | - | + | 3 2 | | | 2 | | - | + | - | 3 | | 4 X | 2 | - |
| lofforcon | \sim | - | V | | ^ | - | | | 2 | - | - | ^ V | 3 | - | _ | 2 V | | v | | ~ | 3 | 2 | | 5 | 2 | | | - | v | | | | v | + | - | + | | | | | | v | + | - | v | | <u> </u> | | - |
| King | Ŷ | - | | | 1 | | 4 V | | | Y | 1 | X | | - | Y | × | × | × | | y N | Y | 5 | 2 | V | Y | - | | - | ^ | × | X | × | ^ | v | - | - | 2 | | 1 | | + | ^ | Y | - | X | | Y | _ | - |
| Kitoon | ^ | - | 4 | | - | | | | | ~ | 4 | × v | - | - | ^ | 2 | | | | 2 | | V | 4 | | | - | | - | - | | ^ | | - | | - | - | | | | | + | - | <u> </u> | - | | | ^ | _ | |
| Lowis | Y | - | 3 | | | - | | | <u> </u> | - | | ^ Y | | - | Y | 3 X | × | × | | 3 Y | ^ | ^ | 4 | | ^ | - | | - | v | ^ | - | | - | 2 | Y | - | 4 | | | + | + | - | - | - | | | | _ | - |
| Mason | Ŷ | - | | | | - | | | 2 | - | | ^ | | - | ^ | ^ | × | × | | ~ | - | | - | | Y | Y | | - | ^ | Y | Y | × | - | | ^ | - | Y | | | + | + | - | - | - | X | | | 1 | - |
| Pacific | ^ | - | Y | | | - | | | 2 2 | - | | Y | | - | | Y | × | 2 | | | 2 | 2 | 2 | | ^ | | | - | - | × | ^ | × | - | - | - | | | | | 2 | | - | - | - | X | | Y | | - |
| Pierce | Y | - | X | | 1 | | Y | , | 2 | | 1 | X | | 2 | Λ | × | 1 | 2 - X | | Y | 1 | 2 | 2 | Ŷ | Y | Y | | - | v | × | Y | × | Y | v | Y | × | | | / 2 | | | - | Y | - | X | Y | Y | _ | - |
| San luan | ^ | - | ~ | | | | 2 | | 2 | | 4 | 2 | | - | - | 2 | 2 | ~ | X | 2 | 4 | 5 | 2 | Ŷ | ^ | ^ | | Y | ^ | X | ^ | X | ^ | ^ | <u>^</u> | | | | | | - | - | _ | | X | ^ | | 2 | |
| Skagit | | - | Y | | | - | | | 2 | - | | 1 | | - | | Y | X | Y | X | | | | | | Y | - | | ~ | - | 2 | v | X | - | - | - | - | | - | | + | - | - | + | | X | | Y | 2 | |
| Skamania | × | x | X | | X | - | X | , , | 3 | | 2 | T X | | - | | X | 3 | X | X | x | - | | - | | X | - | | - | x | - | X | X | - | x | x | × | X | | | + | + | - | × | - | X | | X | | - |
| Snahomish | Ŷ | ^ | X | 1 | 5 | 2 | | | 2 , | Y | 5 | X | | - | | × | J V | × | | X | Y | 5 | 2 | | ^ | - | | - | ^ | 1 | X | × | - | ^ | ^ | | | | 2 | | + | - | <u> </u> | - | 2 | | Y | _ | - |
| Thurston | Ŷ | - | ^ | 4 | 5 | 3 | | | | ~ | | X | | - | | × | × | ^ | | X | ^ | 1 | X | Ŷ | | - | | - | - | 4 V | X | × | - | - | - | - | | | / | | + | - | - | - | Z V | | ~ | _ | - |
| Wahkiakum | ^ | - | | | 5 | - | 5 | | | - | | 5 | | - | | x | ^ | | X | 5 | 5 | | 5 | 5 | | - | | - | - | ^ | ^ | 5 | - | - | - | - | | | ` | + | - | - | + | | 5 | | | _ | |
| Whatcom | × | - | X | | X | X | X | | 3 | x | Δ | X | | - | | X | X | x | X | X | 3 | 3 | J | X | X | - | | - | x | X | x | X | | - | - | - | × | ·) | : | + | + | - | - | - | 3 | | X | 2 | - |
| *WNV-Positive Mosqu | WNV-Positive Mosquito Species Reported to CDC, 1999-2005 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| New Findings for | 4 | 20 | ~ 4 | | | | | | | | | ~~~ | | - | ~~~ | - | | | | _ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

The matrix shows the known distribution of mosquito species by county for western Washington through the year 2005. Previous findings are based on mosquito surveillance conducted by Washington State Department of Health in the 1960s and 1970s. New mosquito species findings which had not been identified during earlier surveillace efforts are presented by the surveillance year 2001 through 2005 when the species was first detected.

Appendix 6 Mosquito Species by County, Eastern Washington

| County | Aedes cinereus* | Aedes trichurus | Aedes vexans* | Anopheles earlei | Anopheles freeborni* | Anopheles occidentalis | Anopheles punctipennis* | Coquilletidia perturbans* | Culex apicalis | Culex boharti | Culex pipiens* | Culex restuans* | Culex salinarius* | Culex stigmatasoma* | Culex tarsalis* | Culex territans* | Culiseta impatiens | Culiseta incidens* | Culiseta inornata* | Culiseta minnesotae | Culiseta morsitans* | Culiseta particeps | Ochlerotatus aboriginis | Ochlerotatus aloponotum | Ochlerotatus campestris | Ochlerotatus canadensis* | Ochlerotatus cataphylla | Ochlerotatus communis | Ochlerotatus dorsalis* | Ochlerotatus excrucians | Ochlerotatus fitchii* | Ochlerotatus flavescens | Ochlerotatus hexodontus | Ochlerotatus impiger | Ochlerotatus implicatus | Ochlerotatus increpitus | Ochlerotatus intrudens | Ochlerotatus japonicus japonicus | Ochlerotatus melanimon* | Ochlerotatus nigromaculis* | Ochlerotatus pionips | Ochlerotatus pullatus | Ochlerotatus punctor | Ochlerotatus sierrensis | Ochlerotatus spencerii idahoensis | Ochlerotatus sticticus* | Ochlerotatus togoi | Ochlerotatus trivittatus* | Ochlerotatus ventrovittis |
|---|-----------------|-----------------|---------------|------------------|----------------------|------------------------|-------------------------|---------------------------|----------------|---------------|----------------|-----------------|-------------------|---------------------|-----------------|------------------|--------------------|--------------------|--------------------|---------------------|---------------------|--------------------|-------------------------|-------------------------|-------------------------|---------------------------------|-------------------------|-----------------------|------------------------|-------------------------|-----------------------|-------------------------|-------------------------|----------------------|-------------------------|-------------------------|------------------------|----------------------------------|--------------------------------|-----------------------------------|----------------------|-----------------------|----------------------|-------------------------|-----------------------------------|--------------------------------|--------------------|---------------------------|---------------------------|
| Eastern Washington | - | | | | | | | | | | | | _ | | | | | | | | | | i | | | | | | | | | | | | | | | | | | | | | 1 | | | _ | _ | |
| Adams | _ | | 4 | | 4 | - | | 4 | - | - | X | | | | X | | | | Х | | | | | | | | | | Х | | | | | | | | | | 4 | X | | | | | | | | | |
| Asotin | _ | | v | | X | v | V | | - | | V | | | X | X | ~ | | V | X | V | | | | | X | | - | | × | | X | | | | | X | | | X | V | | | | V | | X | | | _ |
| Benton | × | | X | | X | X | X | 4 | - | - | X | | | Х | X | X | ~ | X | X | X | | | | | Х | | 5 | X | X | X | X | ~ | V | × | V | X | × | | Х | X | | × | × | X | v | X | | | |
| Chelan | X | | X | | X | _ | X | + | - | | X | | | | X | Х | X | X | Х | X | 1 | | X | | | | X | Х | X | Х | Х | X | X | X | X | X | X | | | <u> </u> | | X | X | X | X | X | | | _X |
| Columbia | _ | | X | | X | _ | X | ļ. | - | | | | | | X | | | | | | | | | | | | | | | | | | | _ | | Х | | | | <u> </u> | | | | | | | | | |
| Douglas | | | X | | | | | | | _ | | | | | X | | | | Х | | | | | | | | | | X | | | | | | | | | | Х | | | | | | | | | | _ |
| Ferry | X | | X | | X | | | X | | _ | 2 | | | | X | X | | 2 | | | | | X | | | Х | | Х | | | Х | | Х | Х | Х | X | X | | | | Х | | | | | 2 | | | |
| Franklin | _ | | 4 | | 3 | X | 4 | 4 | - | _ | X | | | | Х | | | X | Х | | | | - | | 5 | | | | Х | | | Х | | | | 1 | | | | X | | | | 3 | | X | <u> </u> | | |
| Garfield | _ | | | | | _ | X | 1 | | _ | | | | | Х | | | X | | | | | | | | | | | | | | | | | | | | | | | | | | | | | <u> </u> | | |
| Grant | X | | 1 | | X | _ | | X | - | _ | X | | | | Х | | | X | Х | | | | | | Х | Х | | | X | Х | Х | Х | | | | X | | | Х | X | | | | X | 2 | | <u> </u> | | |
| Kittitas | X | | Х | | X | | X | 1 | <u>i</u> | | X | | | | Х | Х | Х | X | Х | X | X | | Х | | | | Х | Х | X | Х | Х | | Х | _ | | Х | | | | X | | | | | X | X | | | _X |
| Klickitat | _ | | Х | | | | | 1 | | | 3 | | | Х | Х | | | 3 | 3 | | | | Х | | | | | | | | | | Х | | | 3 | | | | | | | | 3 | | | — | | |
| Lincoln | _ | | Х | | X | | | | | X | 3 | | | | Х | | | Х | 3 | | | | <u> </u> | | | | | Х | | | Х | Х | | | | Х | | | | | | | | 3 | | | — | | |
| Okanogan | X | | Х | Х | X | X | X | 3 | | | X | | | | Х | Х | | Х | Х | | | | | | Х | Х | | Х | Х | | Х | Х | Х | | Х | Х | | | Х | | | X | | X | X | X | — | | |
| Pend Oreille | X | Х | Х | Х | X | | X | | | | Х | | | | Х | Х | | | | Х | | | | Х | | Х | | Х | | Х | Х | | Х | Х | Х | Х | X | | | | | X | X | | X | X | <u> </u> | | |
| Spokane | X | | Х | 3 | X | | X | 2 | | | Х | | 4 | | Х | | | 1 | Х | 5 | | | Х | | Х | | | | | Х | Х | Х | | | | Х | | | 3 | | | X | | 4 | | | | | |
| Stevens | X | | Х | Х | Х | | X | | | | Х | | | | Х | | Х | Х | Х | | | | ļ | | | Х | Х | Х | Х | | Х | | | | | Х | | | | | | | | 3 | | | <u> </u> | | |
| Walla Walla | X | | Х | | Х | | Х | 3 | | | Х | | | Х | Х | 1 | 1 | Х | Х | | | | Х | | | | | | Х | | | | | | | Х | | | 2 | Х | | | | 3 | | 2 | | | |
| Whitman | | | Х | | Х | | Х | | | | Х | | | | Х | | | Х | Х | | | | 3 | | Х | | | | | | 3 | | | | | Х | | | | | | | | | | 4 | | | |
| Yakima | Х | | Х | | X | | X | X | X | | X | | | Х | Х | Х | Х | Х | Х | Х | X | | İ. | | Х | | | Х | Х | Х | Х | Х | | Х | | Х | | | Х | X | | | | X | X | X | | 4 | 1 |
| *WNV-Positive Mosquito New Findings for: | Speci 1 | es F - 20 | Rep 01 | orte 2 | ed to - 20 | o CI 102 | DC, 3 | 199 - 20 | 99-2 003 | 005 4 | - 20 | 04 | 5 - | - 20 | 05 | | | P | rev | iou | s Fi | ndir | ngs: | x | | | | | | | | | | | | | | | | | | L | ast F | Revis | ed 0 | 6/06/ | '06 | | |

mosquito surveillance conducted by Washington State Department of Health in the 1960s and 1970s. New mosquito species findings which had not been identified during earlier surveillace efforts are presented by the surveillance year 2001 through 2005 when the species was first detected.

Appendix 7 Washington State Department of Health West Nile Virus Surveillance 2004 Testing Summary

| | Ho | rses* | Birc | ls** | Sentinel Fl | ocks*** | Mosquito | Pools**** |
|--------------|--------|----------|--------|----------|-------------|----------|----------|-----------|
| County | Tested | Positive | Tested | Positive | Tested | Positive | Tested | Positive |
| Adams | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 |
| Asotin | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| Benton | 0 | 0 | 18 | 0 | 311 | 0 | 84 | 0 |
| Chelan | 1 | 0 | 6 | 0 | 0 | 0 | 0 | 0 |
| Clallam | 0 | 0 | 6 | 0 | 0 | 0 | 0 | 0 |
| Clark | 1 | 0 | 54 | 0 | 0 | 0 | 22 | 0 |
| Columbia | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Cowlitz | 1 | 0 | 25 | 0 | 0 | 0 | 26 | 0 |
| Douglas | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ferry | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Franklin | 4 | 0 | 3 | 0 | 0 | 0 | 163 | 0 |
| Garfield | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Grant | 1 | 0 | 4 | 0 | 0 | 0 | 0 | 0 |
| Grays Harbor | 0 | 0 | 5 | 0 | 0 | 0 | 0 | 0 |
| Island | 3 | 0 | 23 | 0 | 0 | 0 | 0 | 0 |
| Jefferson | 1 | 0 | 6 | 0 | 0 | 0 | 53 | 0 |
| King | 3 | 0 | 93 | 0 | 0 | 0 | 5 | 0 |
| Kitsap | 1 | 0 | 0 | 0 | 0 | 0 | 241 | 0 |
| Kittitas | 0 | 0 | 5 | 0 | 0 | 0 | 0 | 0 |
| Klickitat | 1 | 0 | 2 | 0 | 0 | 0 | 0 | 0 |
| Lewis | 0 | 0 | 19 | 0 | 0 | 0 | 0 | 0 |
| Lincoln | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| Mason | 0 | 0 | 14 | 0 | 0 | 0 | 0 | 0 |
| Okanogan | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 |
| Pacific | 0 | 0 | 6 | 0 | 0 | 0 | 0 | 0 |
| Pend Oreille | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pierce | 3 | 0 | 58 | 0 | 0 | 0 | 227 | 0 |
| San Juan | 0 | 0 | 6 | 0 | 0 | 0 | 0 | 0 |
| Skagit | 0 | 0 | 16 | 0 | 0 | 0 | 0 | 0 |
| Skamania | 1 | 0 | 5 | 0 | 0 | 0 | 0 | 0 |
| Snohomish | 3 | 0 | 92 | 0 | 0 | 0 | 32 | 0 |
| Spokane | 8 | 0 | 14 | 0 | 0 | 0 | 0 | 0 |
| Stevens | 1 | 0 | 8 | 0 | 0 | 0 | 0 | 0 |
| Thurston | 1 | 0 | 38 | 0 | 0 | 0 | 0 | 0 |
| Wahkiakum | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Walla Walla | 5 | 0 | 5 | 0 | 0 | 0 | 0 | 0 |
| Whatcom | 2 | 0 | 10 | 0 | 0 | 0 | 0 | 0 |
| Whitman | 1 | 0 | 2 | 0 | 0 | 0 | 0 | 0 |
| Yakima | 1 | 0 | 3 | 0 | 81 | 0 | 139 | 0 |
| Totals | 43 | 0 | 553 | 0 | 392 | 0 | 992 | 0 |

*An additional 14 horses tested negative, but were not included in the table because county/state information was not available. WADDL Report Dated: December 1, 2004.

**A total of 572 birds were submitted for testing, of which 19 were unsuitable and not tested

for West Nile virus.

***Benton County MCD Report Dated: September 30, 2004

****USACHPPM-West Report Dated: November 12, 2004, WADDL Report Dated: September 29, 2004, Clark County MCD Reported: September 8, 2004, Benton County MCD Reported Date: September 29, 2004, and Franklin County MCD Reported Date: November 24, 2004.

Appendix 8 Washington State Department of Health West Nile Virus Surveillance 2005 Testing Summary

| | Ho | rses* ^t | Birc | ls** | Sentinel Fl | ocks*** | Mosquito | Pools**** |
|--------------|--------|--------------------|--------|----------|-------------|----------|----------|-----------|
| County | Tested | Positive | Tested | Positive | Tested | Positive | Tested | Positive |
| Adams | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| Asotin | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 |
| Benton | 1 | 0 | 29 | 0 | 456 | 0 | 277 | 0 |
| Chelan | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 |
| Clallam | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0 |
| Clark | 1 | 0 | 15 | 0 | 0 | 0 | 35 | 0 |
| Columbia | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Cowlitz | 0 | 0 | 21 | 0 | 0 | 0 | 26 | 0 |
| Douglas | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| Ferry | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 |
| Franklin | 0 | 0 | 3 | 0 | 0 | 0 | 71 | 0 |
| Garfield | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 |
| Grant | 1 | 0 | 2 | 0 | 0 | 0 | 0 | 0 |
| Grays Harbor | 0 | 0 | 10 | 0 | 0 | 0 | 0 | 0 |
| Island | 1 | 0 | 46 | 0 | 0 | 0 | 0 | 0 |
| Jefferson | 0 | 0 | 12 | 0 | 0 | 0 | 14 | 0 |
| King | 2 | 0 | 110 | 0 | 0 | 0 | 21 | 0 |
| Kitsap | 0 | 0 | 0 | 0 | 0 | 0 | 132 | 0 |
| Kittitas | 0 | 0 | 8 | 0 | 0 | 0 | 0 | 0 |
| Klickitat | 1 | 0 | 4 | 0 | 0 | 0 | 0 | 0 |
| Lewis | 0 | 0 | 19 | 0 | 0 | 0 | 0 | 0 |
| Lincoln | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Mason | 0 | 0 | 24 | 0 | 0 | 0 | 0 | 0 |
| Okanogan | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 |
| Pacific | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| Pend Oreille | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pierce | 1 | 0 | 105 | 0 | 0 | 0 | 81 | 0 |
| San Juan | 1 | 0 | 2 | 0 | 0 | 0 | 0 | 0 |
| Skagit | 1 | 0 | 12 | 0 | 0 | 0 | 0 | 0 |
| Skamania | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| Snohomish | 9 | 0 | 61 | 0 | 0 | 0 | 28 | 0 |
| Spokane | 3 | 0 | 21 | 0 | 0 | 0 | 0 | 0 |
| Stevens | 3 | 0 | 6 | 0 | 0 | 0 | 0 | 0 |
| Thurston | 0 | 0 | 82 | 0 | 0 | 0 | 0 | 0 |
| Wahkiakum | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Walla Walla | 1 | 0 | 9 | 0 | 0 | 0 | 0 | 0 |
| Whatcom | 1 | 0 | 13 | 0 | 0 | 0 | 0 | 0 |
| Whitman | 1 | 0 | 6 | 0 | 0 | 0 | 0 | 0 |
| Yakima | 3 | 1 | 21 | 1 | 120 | 0 | 230 | 2 |
| Totals | 32 | 1 | 660 | 1 | 576 | 0 | 915 | 2 |

*A total of 54 horses have been tested for West Nile virus. Twenty-two were not included in the table because county/state information was not available. WADDL Report Dated: January 18, 2006.

^tWNV positive acquired in state.

**A total of 676 birds have been submitted for West virus testing of which 16 birds were unsuitable and not

tested for West Nile virus. USGS Report Date: October 11, 2005 and WADDL Report Date: November 21, 2005 ***Benton County MCD Report Dated: November 9, 2005

**** Mosquito pools tested by USACHPPM-West Report Date: October 14, 2005 (Week #32),

Cowlitz County MCD Report Date: August 25, 2005, Benton MCD Report Date: October 7, 2005,

Franklin MCD Report Date: August 24, 2005, Clark MCD Report Date: September 12, 2005, and WADDL Report Date: September 7. 2005.