

**2004 West Nile Virus Summary Report for Oregon**  
**January 2005**



Emilio DeBess, DVM, MPH  
Mike Emerson, PhD

Acute and Communicable Disease Program  
800 NE Oregon St., Ste 772  
Portland, OR 97232  
Phone: (503) 731-4024  
Fax: (503) 731-4798  
E-mail: [Emilio.E.DeBess@state.or.us](mailto:Emilio.E.DeBess@state.or.us)

## Table of Contents

2004 Program Highlights .....	1
Introduction.....	1
WNV Surveillance and Related Activities .....	3
Human Surveillance.....	3
Equine Surveillance .....	3
Avian Surveillance.....	4
Mosquito Surveillance .....	6
Sentinel Chicken Surveillance .....	8
Zoo Surveillance and Activities.....	8
Oregon Department of Fish and Wildlife (ODFW) Activities .....	8

### List of Tables

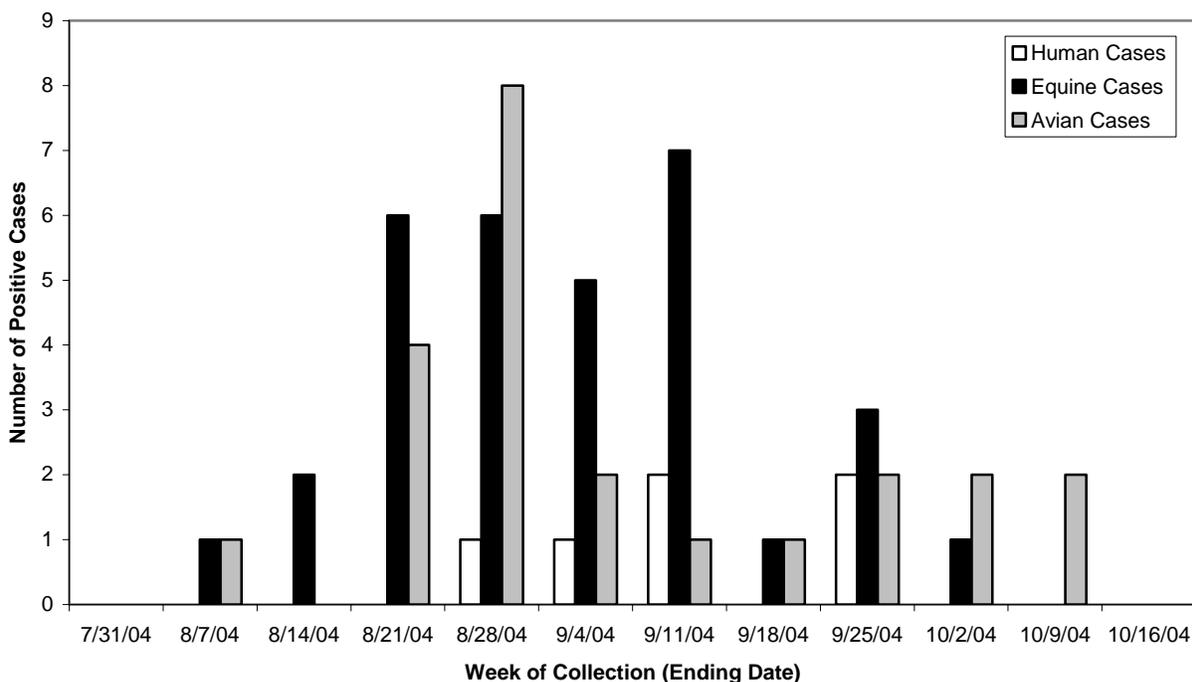
Table 1	Descriptive data for Oregon residents who contracted WNV in Oregon in 2004. ....	3
Table 2	Number of equine WNV tests and positive test results for Oregon counties in 2004. Counties with positive test results are indicated in bold. ....	3
Table 3	Number of avian WNV tests and positive test results for Oregon counties in 2004. Counties with positive test results are indicated in bold. ....	4
Table 4	Number of WNV tests and positive test results by avian species in Oregon in 2004. Species that tested positive are indicated in bold. ....	5
Table 5	Number of pools collected by Oregon VCDs for each mosquito species in 2004. ....	6
Table 6	Potential vectors of WNV based on laboratory vector competence studies (information obtained from CDC).....	8
Table 7	Number of WNV tests and positive test results for sentinel chicken flocks in Oregon VCDs for 2004. ....	8

### List of Figures

Figure 1	The number of human, equine, and avian positive WNV tests by week of collection (ending date) for Oregon in 2004. ....	1
Figure 2	Map of Oregon with the counties of participating Vector Control Districts (VCDs) marked in gray.....	2
Figure 3	Potentially risky behavior for transmission of WNV between equines and humans...9	9

## 2004 Program Highlights

- Identified first Oregon cases of West Nile Virus (WNV) in humans, horses, and birds. The number of positive tests by week is displayed in Figure 1 below.
- Conducted surveillance for WNV in humans, horses, birds, mosquitos, sentinel chickens, and other animals.
- Developed a bilingual toll-free telephone information line on WNV that included information for clinicians and the general public.
- Created bilingual pamphlets on WNV for the general public.
- Revised Oregon's state mosquito response plan, which will be available in March 2005.



**Figure 1** The number of human, equine, and avian positive WNV tests by week of collection (ending date) for Oregon in 2004.

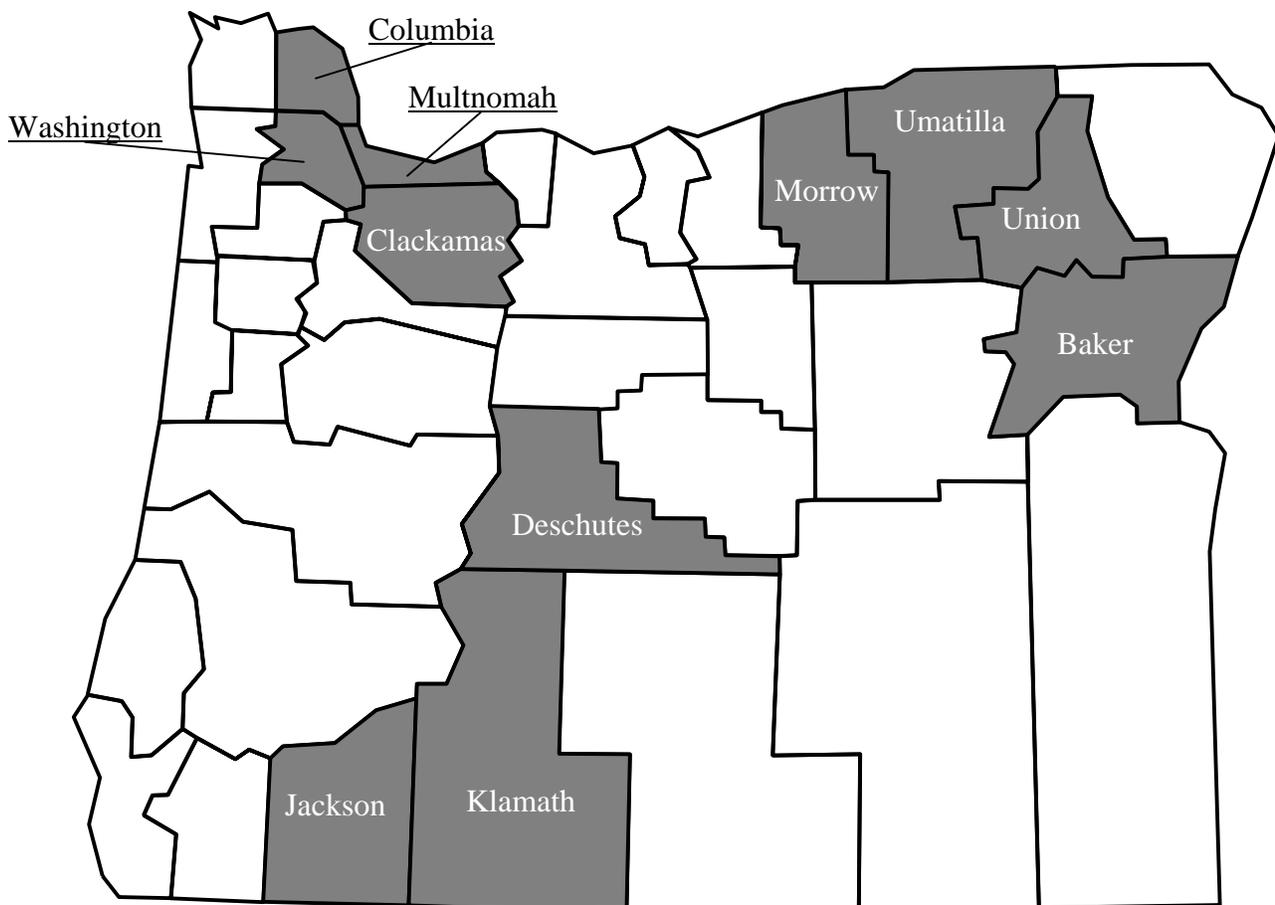
## Introduction

After more than 2 years of preparation and anticipation, West Nile Virus (WNV) appeared in Oregon in 2005. Our first human, avian, and equine WNV cases were all diagnosed in August 2004, and since that time there were a total of 5 humans, 23 birds, and 32 horses diagnosed with WNV in 2004.

Oregon's surveillance program for WNV was launched in 2001 and has expanded since then. Our surveillance is now conducted with the help of 11 Vector Control Districts (VCDs) located throughout the state (see map of Oregon with participating VCDs highlighted in Figure 2). The VCDs collect mosquito pools, maintain sentinel chicken flocks, and conduct initial WNV tests for mosquitoes, sentinel chickens, and dead birds. Confirmatory testing of WNV for

humans, mosquitoes, and sentinel chickens is performed by the Oregon State Public Health Laboratory (OSPHL), which now has the capacity to do both enzyme immunoassay (EIA) and polymerase chain reaction (PCR) for WNV. Oregon State University's (OSU's) Veterinary Diagnostic Laboratory performs all WNV testing of horses and dead birds. With the arrival of WNV in Oregon in 2004, both labs have increased their workload capacity and have conducted more than double the number of WNV-related tests in 2004 than in 2003. Moreover, increased testing capacity has also allowed us to assist other organizations, such as the local zoo, the Wildlife Safari Park, the Audubon Society, and raptor rehabilitation centers in testing a greater number of birds and other animals of concern such as bats, llamas, and squirrels.

The Oregon WNV surveillance findings for humans, horses, birds, mosquitoes, chickens, and zoos in 2004 are summarized in the sections below.



**Figure 2 Map of Oregon with the counties of participating Vector Control Districts (VCDs) marked in gray.**

# WNV Surveillance and Related Activities

## Human Surveillance

In 2004, six Oregon residents tested positive for WNV by IgM testing, including five people who contracted WNV in Oregon and one person who contracted WNV in another state. Five of the six cases were identified by OSPHL, which tested a total of 80 individuals, and one case was identified by the American Red Cross through testing of donated blood. Descriptive data for the five Oregon residents who contracted WNV in Oregon are presented in Table 1.

**Table 1 Descriptive data for Oregon residents who contracted WNV in Oregon in 2004.**

Case	Collection date	Gender	County	Symptoms
1	8/28/04	F	Malheur	West Nile Fever
2	8/29/04	M	Malheur	West Nile Fever
3	9/8/04	F	Malheur	West Nile Fever
4	9/22/04	F	Jackson	Asymptomatic
5	9/24/04	F	Malheur	Asymptomatic

## Equine Surveillance

Surveillance for WNV in Oregon’s equine population resulted in 32 positive test results out of 90 horses tested by OSU’s Veterinary Diagnostic Laboratory and other animal laboratories. The number of equine WNV tests and positive test results for Oregon counties in 2004 is summarized in Table 2.

**Table 2 Number of equine WNV tests and positive test results for Oregon counties in 2004. Counties with positive test results are indicated in bold.**

County*	Number of Equine Specimens Tested	Number of Positive Test Results
Baker	1	0
Benton	2	0
Clackamas	6	0
Crook	1	0
Curry	2	0
Deschutes	7	0
<b>Grant</b>	<b>4</b>	<b>1</b>
Harney	1	0
<b>Jackson</b>	<b>10</b>	<b>4</b>
<b>Josephine</b>	<b>4</b>	<b>4</b>
Klamath	1	0
Lane	2	0
<b>Linn</b>	<b>2</b>	<b>1</b>
<b>Malheur</b>	<b>31</b>	<b>22</b>
Marion	3	0
Polk	2	0
Umatilla	3	0
Wallowa	1	0

County*	Number of Equine Specimens Tested	Number of Positive Test Results
Washington	6	0
Yamhill	1	0
Total	90	32

## Avian Surveillance

Surveillance for WNV in Oregon's avian population resulted in 23 positive test results out of 448 birds tested by OSU's Veterinary Diagnostic Laboratory and the VCDs. The number of avian WNV tests and positive test results for Oregon counties in 2004 is summarized in Table 3. The number of WNV tests and positive test results by avian species is presented in Table 4.

**Table 3 Number of avian WNV tests and positive test results for Oregon counties in 2004. Counties with positive test results are indicated in bold.**

County*	Number of Avian Specimens Tested	Number of Positive Test Results
Baker	7	0
<b>Benton</b>	<b>18</b>	<b>1</b>
Clackamas	21	0
Clatsop	1	0
Columbia	7	0
Coos	4	0
<b>Crook</b>	<b>3</b>	<b>1</b>
Curry	1	0
Deschutes	11	0
Douglas	13	0
Harney	3	0
Hood River	4	0
<b>Jackson</b>	<b>42</b>	<b>11</b>
Jefferson	3	0
<b>Josephine</b>	<b>10</b>	<b>5</b>
Klamath	14	0
<b>Lane</b>	<b>40</b>	<b>2</b>
Lincoln	20	0
Linn	5	0
<b>Malheur</b>	<b>5</b>	<b>3</b>
Marion	8	0
Morrow	6	0
Multnomah	141	0
Polk	5	0
Tillamook	4	0
Umatilla	15	0
Wasco	5	0
Washington	30	0
Yamhill	2	0
Total	448	23

**Table 4 Number of WNV tests and positive test results by avian species in Oregon in 2004. Species that tested positive are indicated in bold.**

Avian Species	Number of Specimens Tested	Number of Positive Test Results
<b>Crow</b>	<b>267</b>	<b>14</b>
<b>Jay</b>	<b>51</b>	<b>2</b>
<b>Scrub jay</b>	<b>32</b>	<b>5</b>
<b>Magpie</b>	<b>16</b>	<b>1</b>
Raven	14	0
<b>Blue jay</b>	<b>12</b>	<b>1</b>
Stellar jay	6	0
Sparrow	5	0
Starling	3	0
Woodpecker	3	0
Grosbeak	2	0
Red-tailed hawk	2	0
Morning dove	2	0
Swallow	2	0
Owl	2	0
Pigeon	2	0
Golden finch	1	0
Chipping sparrow	1	0
Flicker	1	0
Hawk	1	0
House finch	1	0
Chicken	1	0
House wren	1	0
Cedar waxwing	1	0
Quail	1	0
Osprey	1	0
Parrot	1	0
Pinion jay	1	0
Wren	1	0
Robin	1	0
Sharp-shinned hawk	1	0
Varied thrush	1	0
Violet green swallow	1	0
Coot	1	0
Unknown	9	0
<b>Total</b>	<b>448</b>	<b>23</b>

## Mosquito Surveillance

In 2004, the VCDs conducted surveillance for WNV in Oregon's mosquito population. Statewide, a total of 2,829 mosquito pools were collected with representation from at least 17 mosquito species. Testing for WNV was conducted by OSPHL, which found no positive tests. Table 5 displays the number of pools collected by VCDs for each mosquito species. Table 6 indicates the efficiency of vector transmission for various mosquito species (information obtained from the Centers for Disease Control and Prevention).

**Table 5 Number of pools collected and tested by Oregon VCDs for each mosquito species in 2004.**

Vector Control District or County	Mosquito Species																Total				
	<i>Culex tarsalis</i>	<i>Culex pipiens</i>	<i>Aedes vexans</i>	<i>Coquillettidia perturbans</i>	<i>Ochlerotatus nigromaculis</i>	<i>Ochlerotatus dorsalis</i>	<i>Ochlerotatus sticticus</i>	<i>Culiseta erythrothorax</i>	<i>Culiseta inornata</i>	<i>Ochlerotatus washinoi</i>	<i>Anopheles freebornia</i>	<i>Anopheles punctipennis</i>	<i>Culiseta incidens</i>	<i>Culiseta minnesotae</i>	<i>Aedes species</i>	<i>Aedes increpitus</i>		<i>Ochlerotatus melanimon</i>	<i>Culex stigmatosoma</i>	Unknown	
Baker	286		18		138	65			5	4											516
Benton	3	2																	1		6
Clackamas	6											6									12
Columbia	5	3	44									2									54
Crook	3		2		2																7
Deschutes (Four Rivers)	64		18			1			21												104
Jackson	76	30	47	92				55													300
Klamath	107	14			3	11			20								1				156
Lane	531	1124	2100																		
Malheur	8	7	4		1	1															21
Morrow	185	101	52	3		31					22										394
Multnomah	154	242	119	54			11		34		3	7	2						1		627
Washington	13	65		1							1	2	1								83
West Umatilla	379	135	3			1	46		2	1				2	1						570

<b>Total</b>	1,289	599	307	150	144	110	57	55	48	34	27	12	9	3	2	1	1	1	1	2,850
--------------	-------	-----	-----	-----	-----	-----	----	----	----	----	----	----	---	---	---	---	---	---	---	-------

**Table 6 Potential Oregon vectors of WNV based on laboratory vector competence studies (information obtained from CDC and Turell et al 2005).**

Efficient	Moderate	Inefficient	Incompetent
<i>Ae. albopictus</i>	<b><i>Cx. pipiens</i></b>	<i>Cq. perturbans</i>	<i>Ps. ferox</i>
<b><i>Cx. tarsalis</i></b>	<i>Cx. quinquefasciatus</i>	<b><i>Ae. vexans</i></b>	<i>Oc. canadensis</i>
<i>Oc. j. japonicus</i>	<b><i>Cx. stigmatosoma</i></b>	<i>Cx. nigripalpus</i>	<i>Oc. taeniorhynchus</i>
<i>Cx. restuans</i>	<i>Oc. dorsalis</i>		
	<i>Oc. melanimon</i>		

## Sentinel Chicken Surveillance

Seven of the VCDs conducted surveillance for WNV in sentinel chicken flocks in 2004. None of the 1,536 specimens tested were positive for WNV. Table 7 displays the number of tests conducted on sentinel chicken flock specimens for each participating VCD.

**Table 7 Number of WNV tests and positive test results for sentinel chicken flocks in Oregon VCDs for 2004.**

Vector Control District	Number of WNV Tests*
Columbia	36
Jackson	260
Klamath	249
Multnomah	339
North Morrow	346
Union	51
West Umatilla	255
Total	1,536

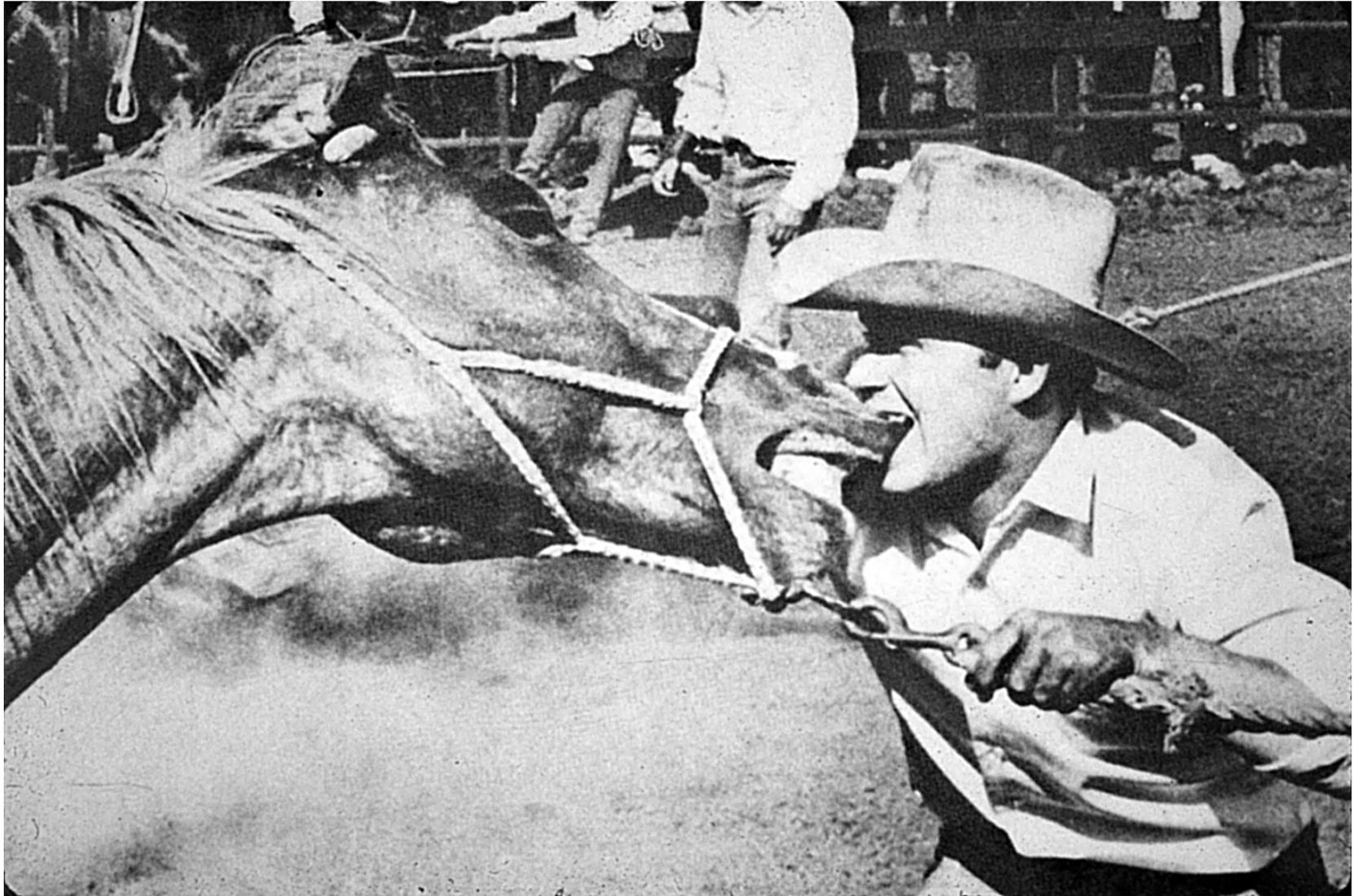
\* None of the sentinel chicken specimens tested positive for WNV.

## Zoo Surveillance and Activities

Many zoo animals—birds in particular—are considered to be highly sensitive to WNV. With the assistance of the Washington Zoo, we have conducted several activities within their facility with the objectives of diminishing the mosquito population and testing animals that may present with symptoms of WNV. Fifteen birds located in the zoo, including two birds from the zoo’s collection, were tested for WNV; none tested positive for WNV. The species tested included the following: crow (6), cedar waxwing (2), varied thrush (2), barn swallow, peahen, Rosenberg lorikeet, screech owl, and snowy owl.

## Oregon Department of Fish and Wildlife (ODFW) Activities

In 2004, ODFW collected bird specimens for serological study as a surveillance tool, the results of which will be made available in 2005. In addition, ODFW plans to collect specimens of sage grouse, a highly sensitive bird to WNV, in 2005 as an additional tool in WNV surveillance.



**Figure 3** Potentially risky behavior for transmission of WNV between equines and humans.