

>> State of Oregon West Nile Virus Summary Report



Acknowledgments

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This report is possible because of the input and hard work of all Oregon vector control districts and the Oregon State University Veterinary Diagnostic Laboratory.

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Please cite this publication as follows:

Oregon Public Health Division. State of Oregon West Nile virus summary report 2021. Oregon Health Authority: Portland, Oregon 2023

Introduction

Oregon launched a West Nile virus (WNV) surveillance program in 2001. The virus was first identified in humans, birds and horses in Oregon in 2004. Our peak year followed two years later when 73 human cases were reported.

Incidence of human WNV disease remained low in Oregon in 2021. 5 human cases, 2 birds, 8 horses, and 75 mosquito pools tested positive for WNV in 2021.

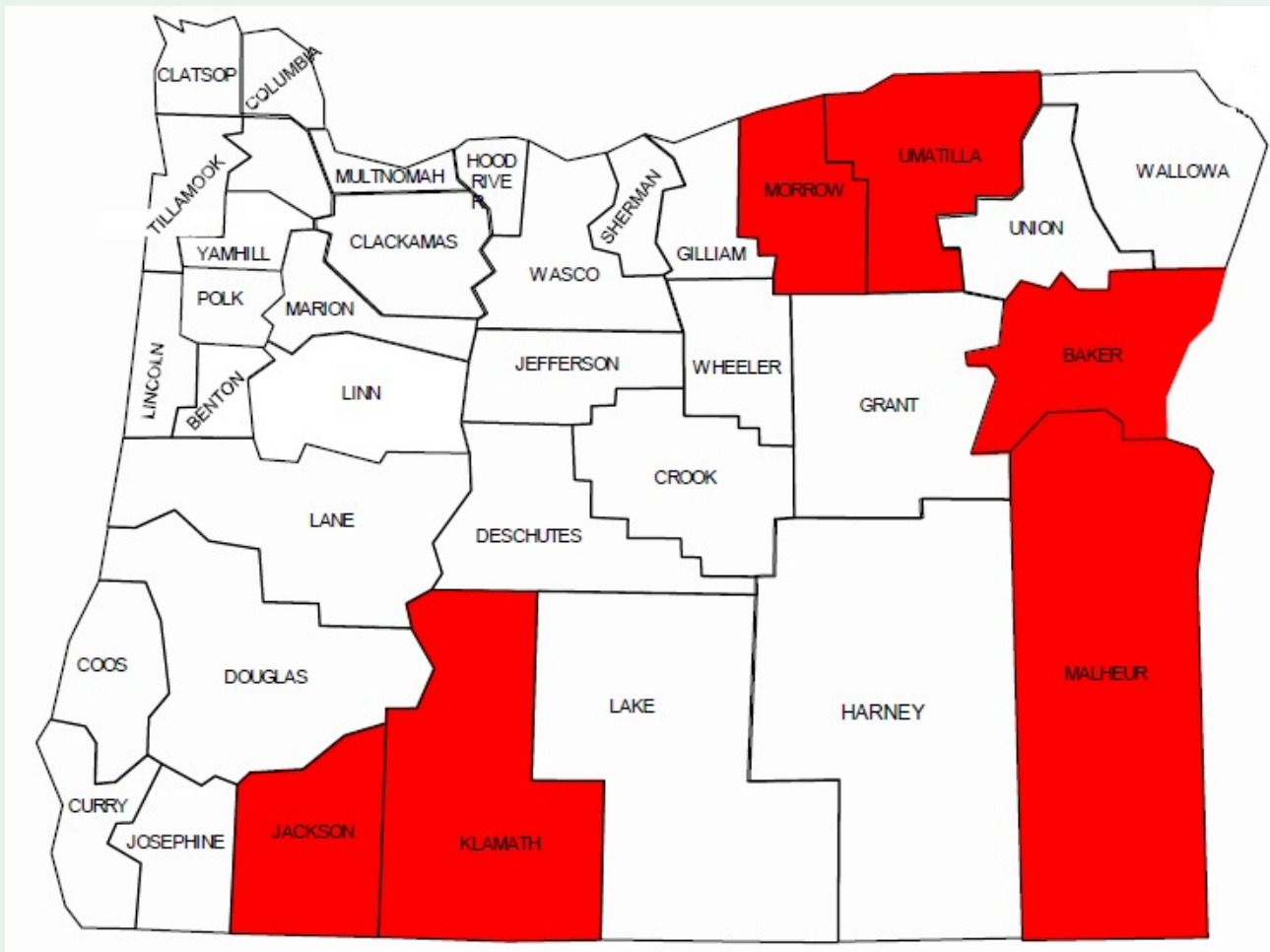
Thirteen vector control districts (VCDs) collect, identify and test dead birds and mosquitoes (in pools of approximately 40 females of the same species) for purposes of WNV surveillance (Figure 4). Some VCDs conduct initial WNV tests for mosquito pools and dead birds using the Rapid Analyte Measurement Platform (RAMP). The Oregon State Public Health Laboratory (OSPHL) performs confirmatory testing of WNV for human specimens.

Oregon State University's (OSU's) Veterinary Diagnostic Laboratory performs WNV testing of mosquitoes, dead birds, horses and other mammals.

The following sections summarize Oregon WNV surveillance findings for humans, horses, birds and mosquitoes in 2021.

Figure 2. Map of Oregon with shaded counties reporting WNV, 2021

County	Mosquitoes	Birds	Horses	Human
Baker	20	0	1	1
Jackson	3	0	1	1
Klamath	0	0	1	1
Malheur	1	0	3	2
Morrow	50	2	1	0
Umatilla	1	0	1	0
Total	75	2	8	5



See <https://www.oregon.gov/oha/PH/DISEASES/CONDITIONS/DISEASESAZ/WESTNILEVIRUS/Pages/wnile.aspx> for more information about West Nile virus.

WNV surveillance and related activities

Human surveillance

In 2021, five Oregon residents tested positive for WNV by Immunoglobulin M (IgM) antibody (Table 2). Illnesses related to neuroinvasive disease are usually characterized by the acute onset of fever with stiff neck, altered mental status, seizures, limb weakness, cerebrospinal fluid (CSF) pleocytosis or abnormal neuroimaging. Acute flaccid paralysis (AFP) may result from anterior myelitis, peripheral neuritis or post-infectious peripheral demyelinating neuropathy (i.e., Guillain-Barré syndrome). Less common neurological manifestations, such as cranial nerve palsies, also occur.

Table 2. Trend data for Oregon residents who contracted WNV in Oregon, 2004–2021

Year	All cases	Neuroinvasive	Deaths
2004	5	0	0
2005	8	1	0
2006	73	13	1
2007	27	7	1
2008	15	3	0
2009	8	0	0
2010	0	0	0
2011	0	0	0
2012	12	1	0
2013	16	8	0
2014	8	2	0
2015	1	0	0
2016	3	1	0
2017	7	4	1
2018	2	2	0
2019	9	6	0
2020	1	0	0
2021	5	0	0
Total	200	48	3

Source: Oregon State Public Health Laboratory

Veterinary surveillance

WNV surveillance in Oregon’s equine population resulted in 8 positive tests in 2021. Table 3 summarizes the test results by county.

Table 3. Positive equine WNV test results, Oregon, 2021

County	Horses Tested for WNV	Horses with Positive WNV Test Results
Baker	1	1
Jackson	1	1
Klamath	1	1
Malheur	3	3
Morrow	1	1
Umatilla	1	1
Total	8	8

Source: Oregon State University Veterinary Diagnostic Laboratory

Avian surveillance

WNV surveillance in Oregon’s avian population resulted in 2 positive test results out of 32 birds tested by OSU’s Veterinary Diagnostic Laboratory and the VCDs. Of the 32 birds collected, 15 were of the family Corvidae (aka corvids), while the remaining 17 were American species other than corvid. Table 4 shows Oregon’s avian species collection totals by county for 2021. Table 5 presents trend data for avian WNV testing and positive test results for Oregon counties for the years 2004–2021.

Table 4. Avian WNV test results by county, Oregon, 2021

County	Corvids tested	All other species tested	Total	Total Positive
Baker	0	2	2	0
Benton	0	8	8	0
Clackamas	2	4	6	0
Lane	3	0	3	0
Lincoln	0	1	1	0
Crook	0	1	1	0
Morrow	2	0	2	2
Multnomah	5	0	5	0
Umatilla	1	0	1	0
Union	0	1	1	0
Washington	2	0	2	0
TOTAL	15	17	32	2

Source: Oregon State Public Health Laboratory

Table 5. Avian WNV tests and trend of positive test results, Oregon, 2004–2021

Year	Number tested	Number positive	% positive
2004	448	23	5.1%
2005	298	15	5.0%
2006	212	25	11.8%
2007	246	55	22.4%
2008	117	2	1.7%
2009	90	16	17.8%
2010	24	0	0.0%
2011	20	0	0.0%
2012	35	2	5.7%
2013	22	2	9.1%
2014	35	7	20.0%
2015	36	11	30.6%
2016	44	12	27.3%
2017	27	1	3.7%
2018	30	1	3.3%
2019	19	0	0.0%
2020	24	1	4.2%
2021	32	2	6.3%

Source: Oregon State Public Health Laboratory

Sentinel chicken surveillance

Sentinel chicken surveillance was discontinued in 2011.

Mosquito surveillance

In 2021, the VCDs conducted WNV surveillance in Oregon's mosquito population. Figure 4, page 11 shows the counties with participating VCDs and their activities. Statewide, 2,614 mosquito pools were sampled (see Table 7, page 7). The tested mosquitoes comprise 13 mosquito species. OSU conducted polymerase chain reaction (PCR) testing.

Table 6 below displays the number of Oregon mosquito pools by species that tested positive for WNV in 2021. Table 8, page 8-9 displays Oregon mosquito species between 2004 and 2021 found positive for WNV. Figure 3, page 10 indicates the efficiency of vector transmission for various mosquito species (information obtained from the Centers for Disease Control and Prevention).

Table 6. WNV-positive mosquito pools, Oregon, 2021

VCD	Mosquito species	Number of positive mosquito pools	Collection date
Baker	<i>Culex pipiens</i>	1	7/20/2021
	<i>Culex tarsalis</i>	18	7/30 to 9/8/2021
	<i>Culex NFS</i>	1	8/19/2021
Jackson	<i>Culex NFS</i>	2	8/11 to 8/31/2021
	<i>Culex tarsalis</i>	1	8/4/2021
Malheur	<i>Culex tarsalis</i>	1	7/21/2021
Morrow	<i>Culex pipiens</i>	34	8/4 to 9/22/2021
	<i>Culex tarsalis</i>	16	8/4 to 9/22/2021
Umatilla	<i>Culex pipiens</i>	1	8/12/2021

Source: Oregon vector control districts

Table 7. Female mosquito pools collected by Oregon VCDs and tested for WNV at Oregon State University, 2021

County / VCD	<i>Aedes dorsalis</i>	<i>Aedes increpitus</i>	<i>Aedes nigromaculis</i>	<i>Aedes vexans</i>	<i>Anopheles freeborni</i>	<i>Anopheles punctipennis</i>	<i>Coquillettidia perturbans</i>	<i>Culex NFS</i>	<i>Culex pipiens</i>	<i>Culex tarsalis</i>	<i>Culiseta incidens</i>	<i>Culiseta inornata</i>	<i>Ochlerotatus nigromaculis</i>	Total mosquito pools
Baker								21	10	241				272
Clackamas			1		1				18	1	13			34
Columbia			5		2	2		111	20					140
Deschutes			10	2				17	6		1			36
Jackson								139	58	78				275
Klamath	49	1	26	33	93				30		33	5		270
Lane									12					12
Linn								68						68
Malheur								2	10					12
Morrow			17			6		409	242					674
Multnomah			10		1			7	14	1				33
Umatilla								5	30	22				57
Union			257					20	59					336
Washington					2			59	334					395
Total:	49	1	26	333	95	6	8	233	741	1069	14	34	5	2614

Source: Oregon vector control districts and Oregon State University

Table 8. Trend data, WNV-positive mosquito pools*, Oregon, 2004–2021

Year	Mosquito species	Number of positive pools
2004	-	-
2005	<i>Culex tarsalis</i>	11
	<i>Culex stigmatosoma</i>	
	<i>Culex pipiens</i>	
2006	<i>Culex tarsalis</i>	22
2007	<i>Aedes vexans</i>	8
	<i>Culex pipiens</i>	2
	<i>Culex tarsalis</i>	23
2008	<i>Aedes vexans</i>	5
	<i>Culex pipiens</i>	3
	<i>Culex tarsalis</i>	8
2009	<i>Aedes vexans</i>	1
	<i>Anopheles freeborni</i>	1
	<i>Anopheles punctipennis</i>	1
	<i>Coquillettidia perturbans</i>	1
	<i>Culex pipiens</i>	75
	<i>Culex tarsalis</i>	131
2010	<i>Culex pipiens</i>	1
	<i>Culex tarsalis</i>	2
	<i>Culex sp.</i>	1
2011	<i>Culex sp.</i>	3
2012	<i>Culex pipiens</i>	53
	<i>Culex tarsalis</i>	3
	<i>Culex sp.</i>	15
2013	<i>Culex pipiens</i>	14
	<i>Culex tarsalis</i>	74
	<i>Anopheles freeborni</i>	1

2014	<i>Aedes vexans</i>	4
	<i>Culex pipiens</i>	13
	<i>Culex tarsalis</i>	41
2015	<i>Culex pipiens</i>	20
	<i>Culex tarsalis</i>	35
	Genus <i>Culex</i>	4
2016	<i>Culex pipiens</i>	21
	<i>Culex tarsalis</i>	28
	Genus <i>Culex</i>	2
2017	<i>Culex pipiens</i>	49
	<i>Culex tarsalis</i>	15
	Genus <i>Culex</i>	28
2018	<i>Culex pipiens</i>	13
	<i>Culex tarsalis</i>	37
	Genus <i>Culex</i>	7
2019	<i>Culex pipiens</i>	65
	<i>Culex tarsalis</i>	22
2020	<i>Culex pipiens</i>	2
	<i>Culex tarsalis</i>	1
2021	<i>Culex NFS</i>	3
	<i>Culex pipiens</i>	36
	<i>Culex tarsalis</i>	36

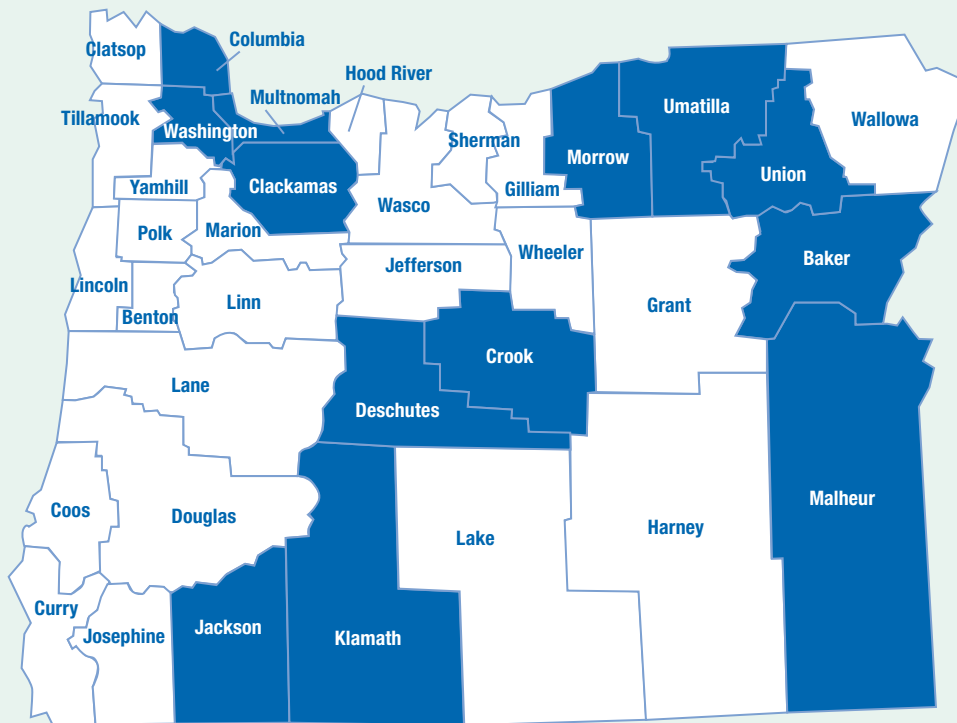
Source: Oregon State University Veterinary Diagnostic Laboratory

*1 pool ≈ 40 mosquitoes

Vector control districts in Oregon

Figure 4. Oregon counties with participating vector control districts (VCDs) and their activities

County	Mosquito collection	Bird collection
Baker	YES	YES
Clackamas	YES	YES
Columbia	YES	YES
Crook	YES	YES
Deschutes	YES	YES
Jackson	YES	YES
Klamath	YES	YES
Malheur	YES	YES
Morrow	YES	YES
Multnomah	YES	YES
Umatilla	YES	YES
Union	YES	YES
Washington	YES	YES



Source: Oregon Health Authority



PUBLIC HEALTH DIVISION

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