

Washington Tick Surveillance Project

June 2014 –
July 2015



5th Year Summary Report for Project Partners

Washington Tick Surveillance Project

We're happy to present a summary of our fifth year of tick surveillance and testing. Thanks to your participation and efforts, as of July 31, 2015 (dating back to the beginning of this project in 2010), we have received over 8,200 ticks and tested 2,037 ticks for five specific pathogens, with additional testing on other pathogens provided on some ticks by the University of Massachusetts (UMass). During the time frame covered in this report, 97 partners collected 2,178 ticks with an additional 258 ticks being submitted by 155 members of the general public. All other ticks were collected by Dept. of Health staff.

This year we began collaborating with the Centre for Disease Control in British Columbia (BC-CDC), where we sent live, unfed *Ixodes* ticks to be tested for *Borrelia burgdorferi*. Positive ticks then have the pathogen cultured for additional analysis. Of the 100 ticks submitted, one tick, from Klickitat County, was positive for *B. burgdorferi*. BC-CDC is actively studying *B. burgdorferi* in British Columbia tick populations; analysis of positive ticks from WA will help improve our knowledge of this pathogen's dynamics in the Pacific Northwest.

The following tables and figure show the number of ticks we've submitted for testing each year and the results, as well as a breakdown by species and county where they were collected. These data reflect tick collections conducted from approximately June 2014 through July 2015. All *Ixodes* ticks sent to UMass were tested for *A. phagocytophilum*, *B. burgdorferi*, *B. miyamotoi*, and *Babesia* species. All *Dermacentor* ticks were tested for *Rickettsia rickettsii* and *Francisella tularensis*. Of the 320 ticks tested, two *Ixodes pacificus* ticks, from Pierce and Thurston counties, tested positive for *Anaplasma phagocytophilum*. All other ticks were negative. To date, none of the *Dermacentor* ticks have tested positive for either *Rickettsia rickettsii* or *Francisella tularensis*.

This past year we worked with two individuals who were experiencing serious brown dog tick (*Rhipicephalus sanguineus*) infestations. In both instances, getting the infestation under control was made more difficult because of apparent insecticide resistance in the ticks. Although both cases had travel in southern states (where this tick is very common) associated with their infestations, it's worth noting that we do see a number of brown dog ticks submitted each year. Brown dog ticks are vectors of several pathogens, including those that cause Rocky Mountain spotted fever, canine ehrlichiosis, canine babesiosis, and canine hepatozoonosis.

Funding availability continues to limit the number of ticks we're able to test. All ticks that are in good condition and have not been tested are stored in 95% ETOH in case future testing opportunities arise.

For those of you who are still willing to collect ticks for our project, we have again received funding to continue tick surveillance and testing through July 2016 as well as to continue our collaboration with BC-CDC. So please continue to collect any ticks whenever you find them. Although winter is generally a quiet time for most tick activity, please note that two of our positive *I. pacificus* ticks this year were collected in December and February. If you have any questions, or if you need additional supplies, please don't hesitate to contact either myself or Dave at zd@doh.wa.gov.

I hope you find this summary an interesting and useful reference relative to the current status of tick distribution and pathogen prevalence in Washington's tick population. These data would not have been possible without your participation and support. Thank you for partnering with us to make this project possible!

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Table 1. Pathogen prevalence of *Anaplasma phagocytophilum*, *Borrelia burgdorferi*, *B. miyamotoi*, and *Babesia* species in *Ixodes* ticks collected from 2011-2015.

Tick Genus	Year	Number Ticks Tested	Ap+	Bb+	Bm+	Bab+
<i>Ixodes</i>	2011	111	3 (2.7%)	2 (1.8%)	-	0
<i>Ixodes</i>	2012	380	0	2 (0.5%)	-	0
<i>Ixodes</i>	2013	346	2 (0.6%)	8 (2.3%)	-	0
<i>Ixodes</i>	2014	300	3 (1.0%)	3 (1.0%)	1 (0.3%)	0
<i>Ixodes</i>	2015	268*	2/168 (1.2%)	1 (0.2%)	0	0
Total <i>Ixodes</i>	-	1,405	10 (0.7%)	16 (1.0%)	1/468 (0.2%)	0
<i>Ixodes</i> Species	Year	Number Ticks Tested	Ap+	Bb+	Bm+	Bab+
<i>Ix. pacificus</i>		791	9/692 (1.3%)	11 (1.5%)	1/251 (0.4%)	0
<i>Ix. angustus</i>		422	0	2 (0.6%)	0	0
<i>Ix. spinipalpis</i>		168	1/167 (0.6%)	2 (1.3%)	0	0
<i>Ix. auritulus</i>		1	0	0	0	0
<i>Ix. texanus</i>		10	0	0	0	0
<i>Ixodes</i> sp.		13	0	1	-	0

Bb – *Borrelia burgdorferi*; Ap – *Anaplasma phagocytophilum*; Bm – *B. miyamotoi*; Bab-*Babesia* species.

*100 live ticks (99 *I. pacificus* & 1 *I. spinipalpis*) were tested at BC-CDC in 2015 for *B. burgdorferi* only; 168 ticks (90 *I. pacificus*, 75 *I. angustus*, and 3 *I. spinipalpis*) were tested at UMass for multiple pathogens.

Table 2. Pathogen prevalence of *Rickettsia rickettsii* and *Francisella tularensis* in *Dermacentor* ticks collected from 2013-2015. A one-time testing on 140 ticks for non-pathogenic *Rickettsia* was conducted in 2013 – results are shown in bottom half of table.

Tick Genus	Year	Number Ticks Tested	Rr+	Ft+	NP <i>Rickettsia</i> +	
<i>Dermacentor</i>	2013	280	0	0/140	29/140 (20.7%)	
<i>Dermacentor</i>	2014	220	0	0	-	
<i>Dermacentor</i>	2015	132	0	0	-	
Total <i>Dermacentor</i>	-	632	0	0	29/140 (20.7%)	
<i>Dermacentor</i> Species	Year	Number Ticks Tested	Rm+	Non-Pathogenic <i>Rickettsia</i>		
				Rp+	Rrh+	R-lp+
<i>D. andersoni</i>	2013	52	0	13 (25.0%)	3 (5.8%)	0
<i>D. variabilis</i>	2013	88	2 (2.3%)	10 (11.4%)	0	1 (1.1%)

Rr – *Rickettsia rickettsii*; Ft – *Francisella tularensis*; NP – Non-Pathogenic *Rickettsia*; Rm - *R. montanensis*;

Rp - *R. peacocki*; Rrh - *R. rhipicephali*; R-lp - *Rickettsia, I. pacificus* endosymbiont

Table 3. Location and date of collection for each positive tick collected from June 2014 through May 2015.

Pathogen	Species	Life Stage	County	Collected From	Date Collected
<i>B. burgdorferi</i>	<i>Ixodes pacificus</i>	Adult	Klickitat	Drag	4/22/2015
<i>A. phagocytophilum</i>	<i>Ixodes pacificus</i>	Adult	Pierce	Dog	2/20/2015
<i>A. phagocytophilum</i>	<i>Ixodes pacificus</i>	Adult	Thurston	Dog	12/8/2014

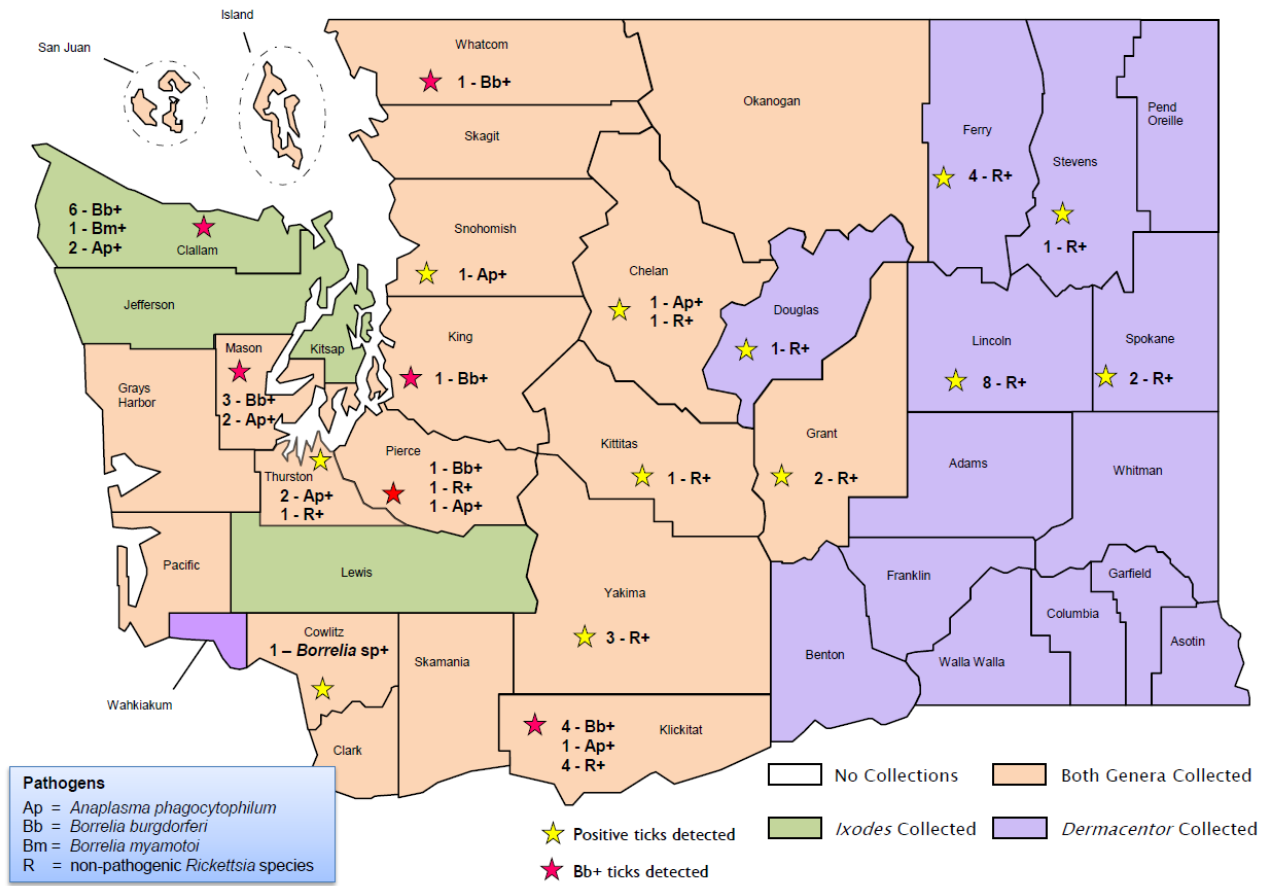


Figure 1. Map of Washington showing counties where positive ticks have been collected and distribution of tick genera by county.

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Table 4. Most commonly collected tick species by County from June 2014 through July 2015.

County	<i>D. albipictus</i>	<i>D. andersoni</i>	<i>D. variabilis</i>	<i>I. angustus</i>	<i>I. pacificus</i>	<i>I. spinipalpis</i>	<i>Otobius megnini</i>	<i>R. sanguineus</i>	TOTAL
Adams	0	0	0	0	0	0	0	0	0
Asotin	0	0	37	0	0	0	14	0	51
Benton	0	3	23	0	0	0	0	0	26
Chelan	0	4	4	0	1	0	0	0	9
Clallam	0	0	0	20	119	37	0	0	176
Clark	0	0	5	6	8	0	0	0	19
Columbia	0	4	44	0	0	0	0	0	48
Cowlitz	18	0	0	12	13	0	0	0	43
Douglas	0	1	0	0	0	0	0	0	1
Ferry	12	46	116	0	0	0	0	0	174
Franklin	0	1	1	0	0	0	0	0	2
Garfield	0	0	17	0	0	0	0	0	17
Grant	0	0	16	0	0	0	0	0	16
Grays Harbor	11	0	1	7	1	0	0	0	20
Island	0	0	0	2	1	0	0	0	3
Jefferson	0	0	3	11	31	3	0	0	48
King	0	5	13	145	14	0	0	24	201
Kitsap	0	0	4	73	43	5	0	13	138
Kittitas	0	9	65	1	6	0	0	0	81
Klickitat	0	3	41	0	113	0	0	0	157
Lewis	0	0	4	9	13	1	0	0	27
Lincoln	4	54	36	0	0	0	0	0	94
Mason	28	0	0	10	75	4	0	0	117
Okanogan	2	10	57	0	1	0	0	0	70
Pacific	1	0	0	8	0	0	0	0	9
Pend Oreille	3	1	2	0	0	0	0	0	6
Pierce	4	1	1	28	33	1	0	1	69
San Juan	0	0	2	0	27	0	0	0	29
Skagit	0	0	0	2	6	0	0	0	8
Skamania	0	0	1	3	2	0	0	0	6
Snohomish	0	0	3	25	4	0	0	3	35
Spokane	21	170	94	0	0	0	0	2	287
Stevens	4	21	261	0	0	0	0	0	286
Thurston	6	0	2	23	88	9	0	3	131
Wahkiakum	2	0	0	0	0	0	0	0	2
Walla Walla	0	0	82	0	0	0	28	0	110
Whatcom	0	1	2	7	11	1	0	0	22
Whitman	0	0	33	0	0	0	3	0	36
Yakima	0	5	57	0	3	0	0	0	65
TOTAL	116	339	1,027	392	613	61	45	46	2,639