



YES, WE DO HAVE TICKS IN WASHINGTON:
WHY THAT'S IMPORTANT AND WHAT YOU
SHOULD KNOW



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Agenda

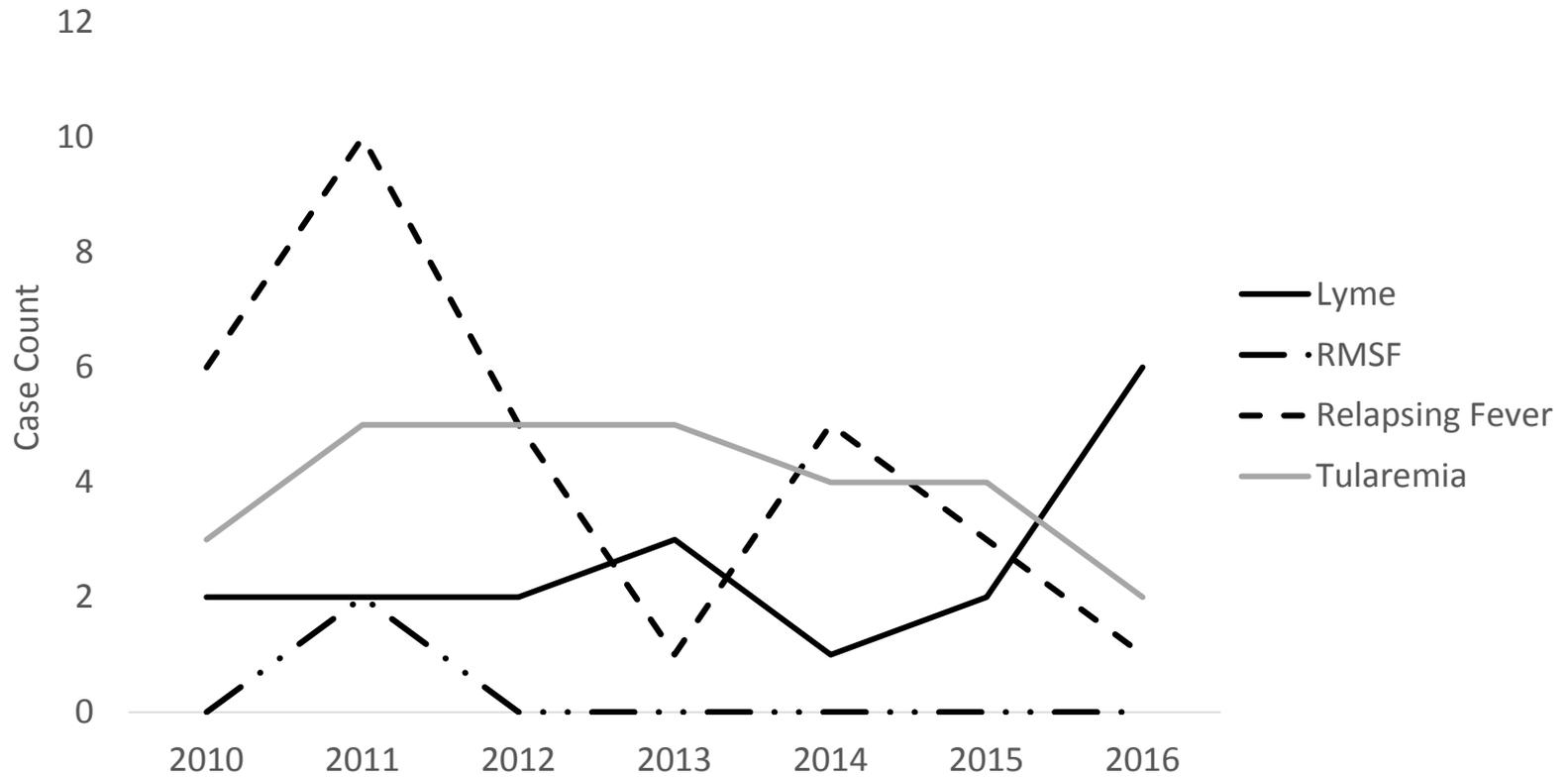
- Tick-borne disease in Washington
- Tick Surveillance in Washington
- Common Species
- Pathogen Findings
- Protective Measures

Historical Pathogen Identifications

- Human and canine case reports of Lyme disease in WA, OR, CA, and BC
- Anaplasmosis reported in canines in WA, OR, CA, and BC; human case reports from CA
- Babesiosis reported in humans in WA and CA
- Rocky Mountain Spotted Fever (RMSF) historically reported in WA
- (Soft tick transmitted) Tick-borne relapsing fever (TBRF) commonly reported in WA*
- Tularemia commonly reported in WA, but not usually thought to be tick-borne
- Clinical under-recognition and under-reporting are suspected

*No reported (hard tick transmitted) TBRF cases (caused by *Borrelia miyamotoi*)

Locally Acquired Cases



Reported Tick-Borne Disease Cases in Humans, Washington, 2018-2019

DISEASE	2018	2019
Tick-borne relapsing fever	2	3
Lyme disease	18	26
Tularemia**	3	3
Spotted Fever Rickettsiosis	0	3*
Tick Paralysis	1	2

*First locally-acquired confirmed case of *R. rickettsii* in ~20 years

**None tick-related

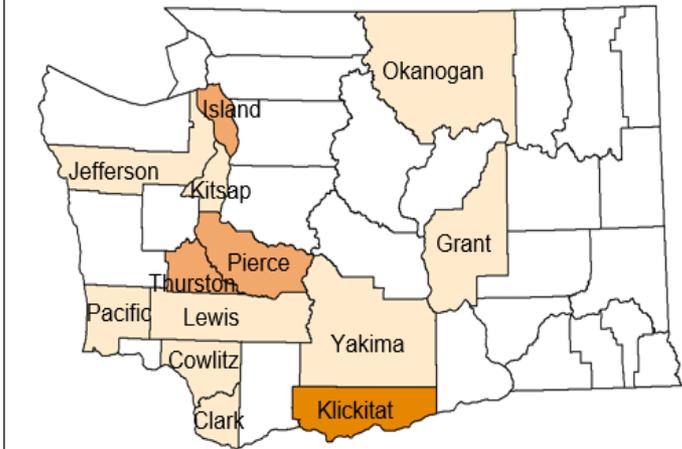
Other Tick-borne Diseases

- Anaplasmosis
 - *Anaplasma phagocytophilum*
 - Only reported in dogs in Washington

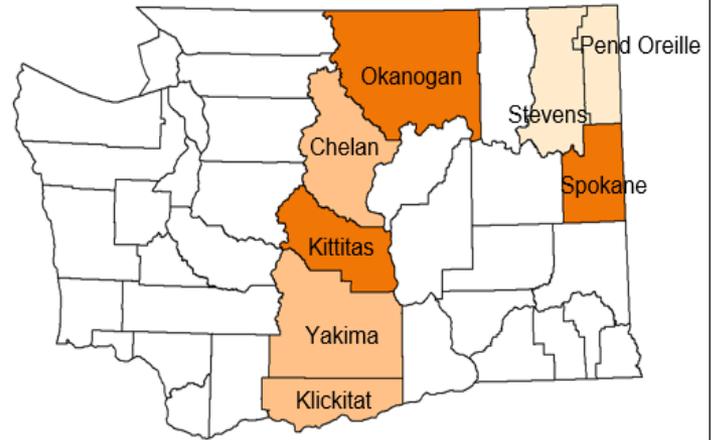
- Hard tick-borne Relapsing fever
 - *Borrelia miyamotoi*
 - No reported cases in Washington



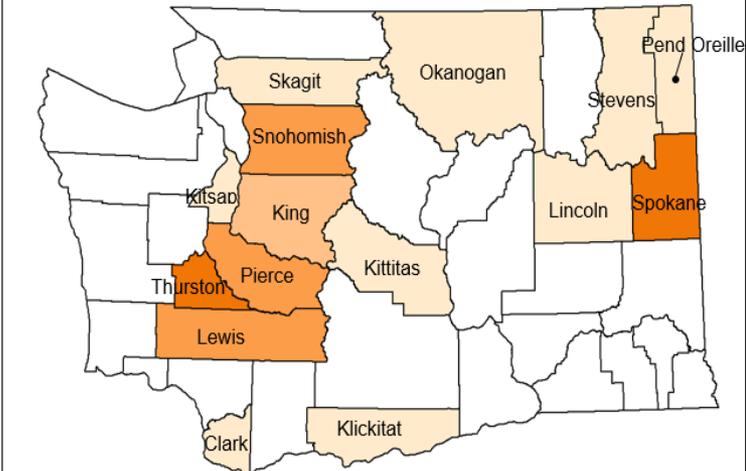
Lyme Disease Cases



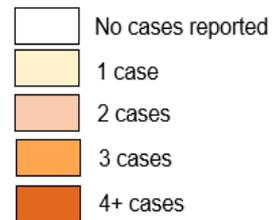
Tick-borne Relapsing Fever Cases



Tularemia Cases



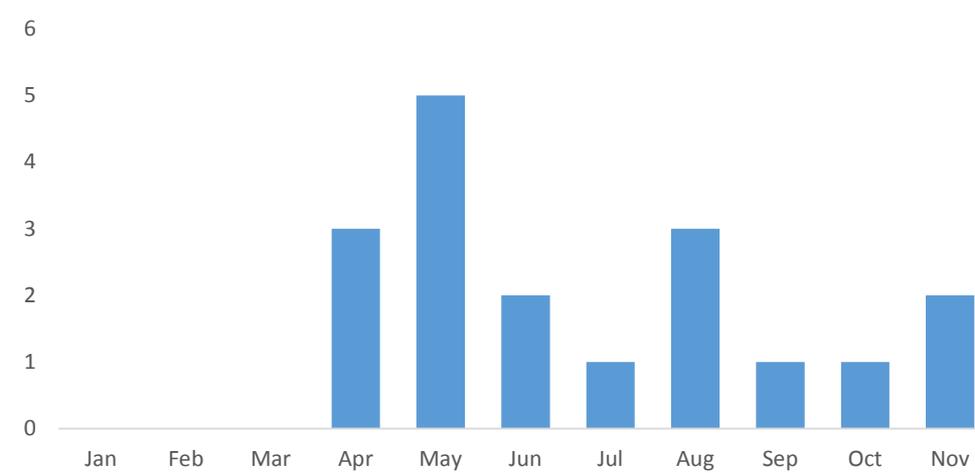
Rocky Mountain Spotted Fever Cases



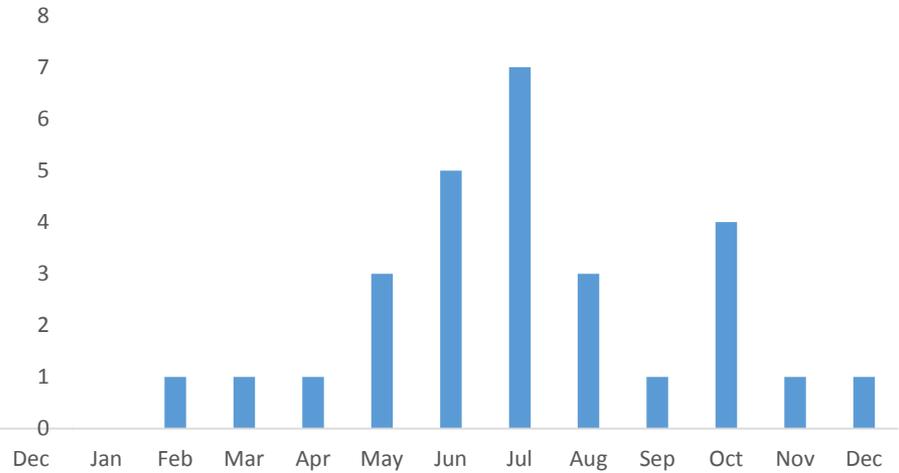
Seasonality



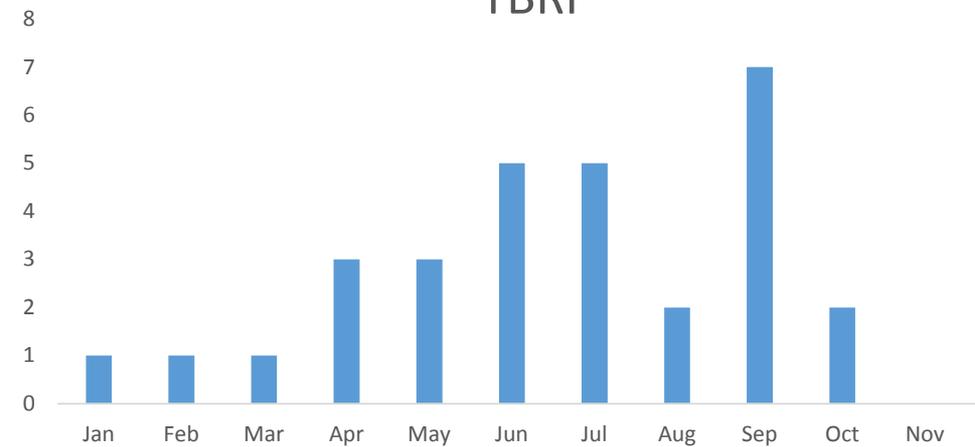
Lyme



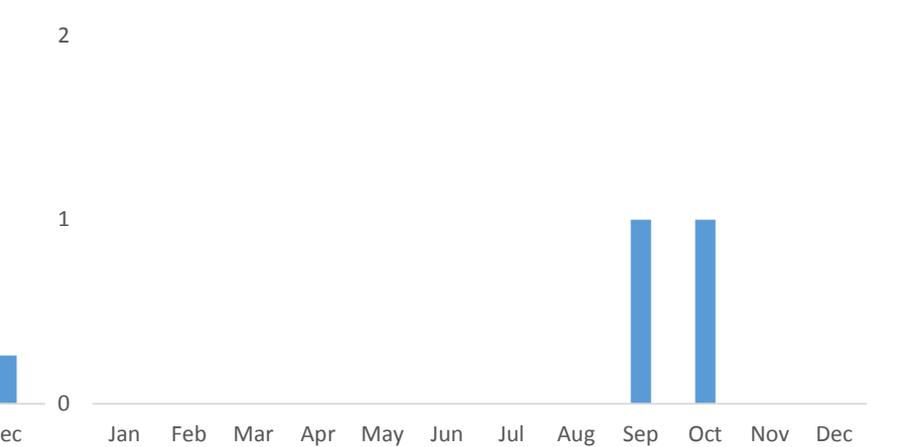
Tularemia



TBRF



RMSF



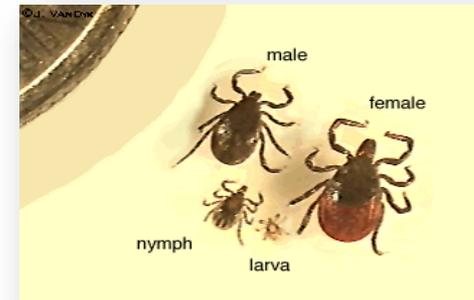
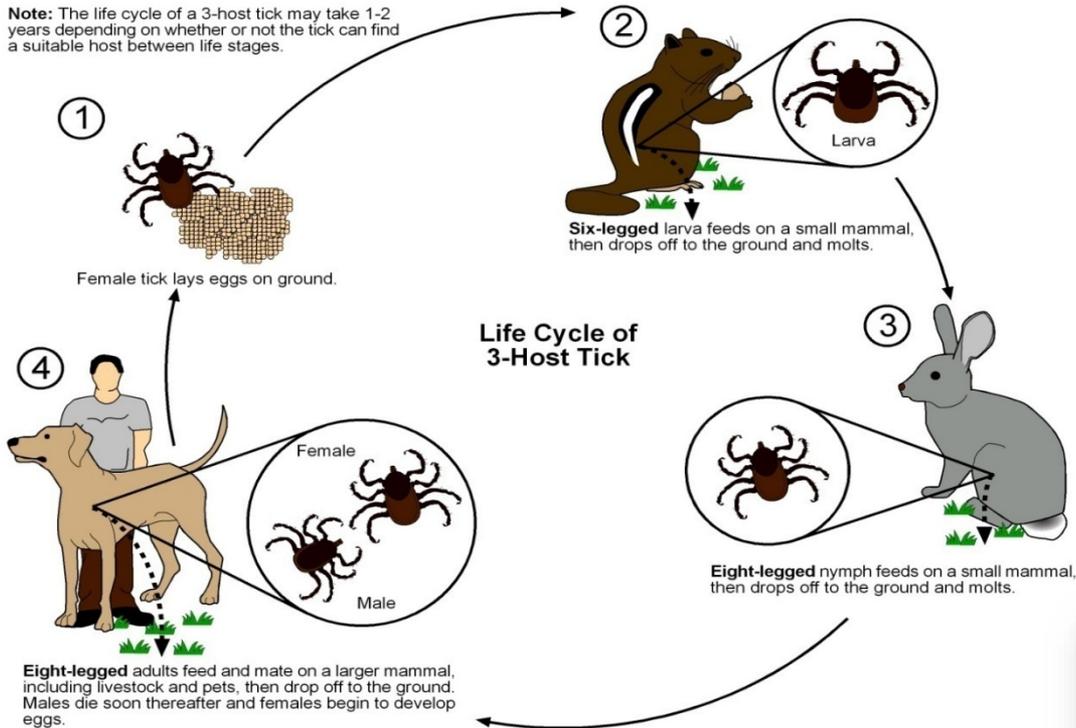
Washington State Tick Surveillance Project

- ▶ Increase our understanding of tick species populations and distribution and risk of tick-borne diseases in Washington through collection, identification, and testing of ticks for pathogens of interest.
- ▶ Raise awareness of tick-bite and tick-borne disease risk.
- ▶ Tick-borne disease case investigations.



Tick-borne Disease Surveillance

Note: The life cycle of a 3-host tick may take 1-2 years depending on whether or not the tick can find a suitable host between life stages.



Tick Surveillance Results 2011 - 2016



>9,000 ticks collected

- 4 genera

- 10 species

>5,400 ticks collected from 38
vertebrate hosts

Results – 2011-2016

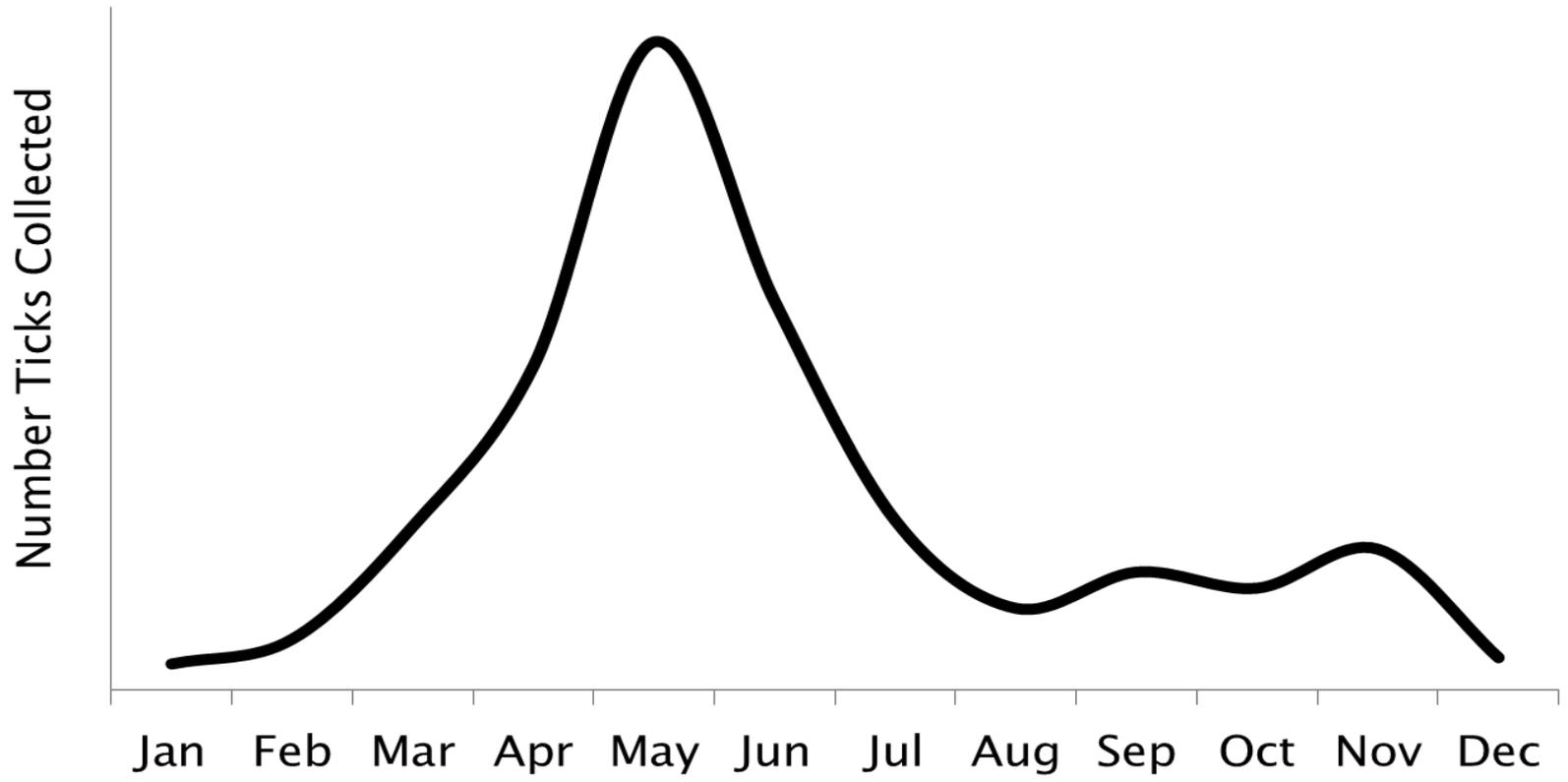
977 unfed, field-collected ticks from 52 sites in 19 counties

- *I. pacificus*
- *D. variabilis*
- *D. andersoni*

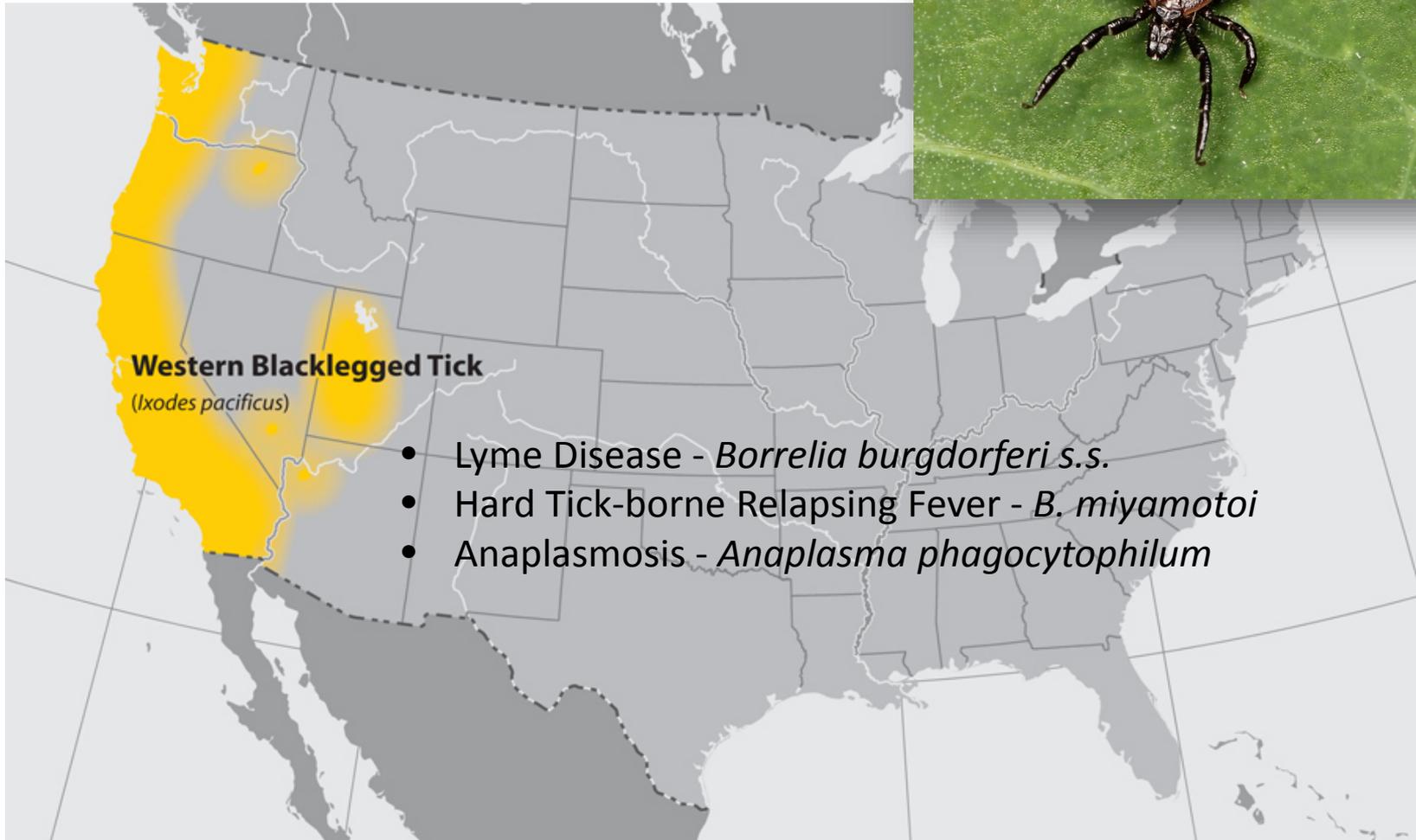
- *I. angustus*
- *I. spinipalpis*
- *I. auritulus*

62% of ticks were collected during March through May

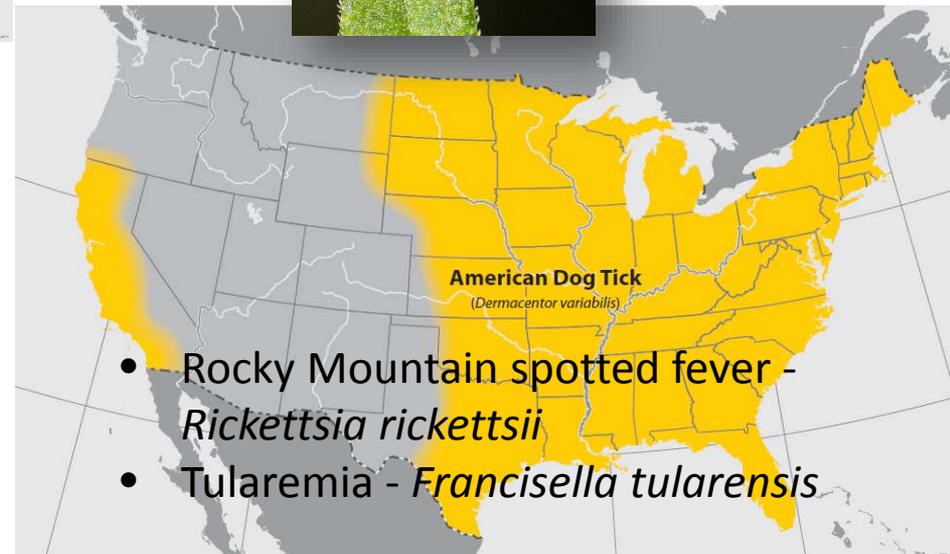
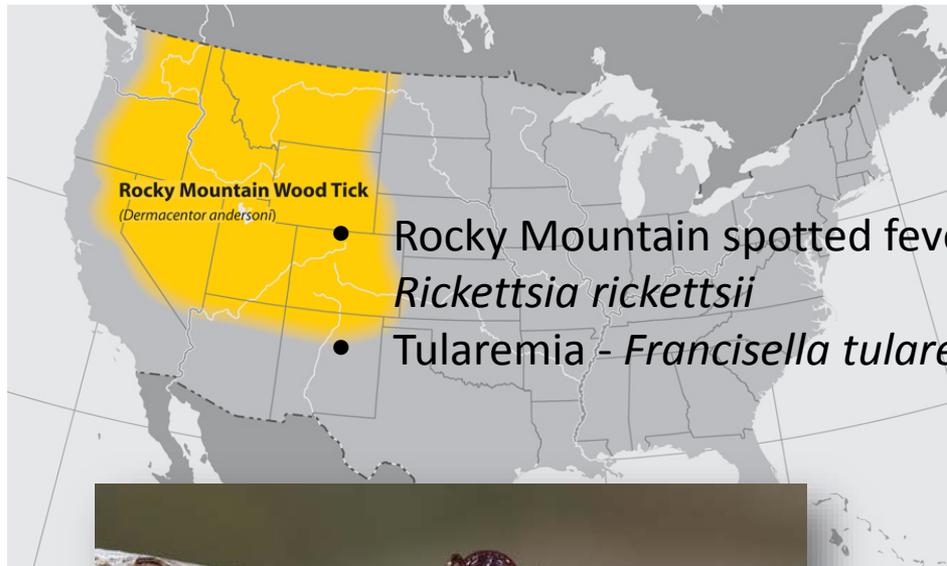
Seasonal Tick Activity



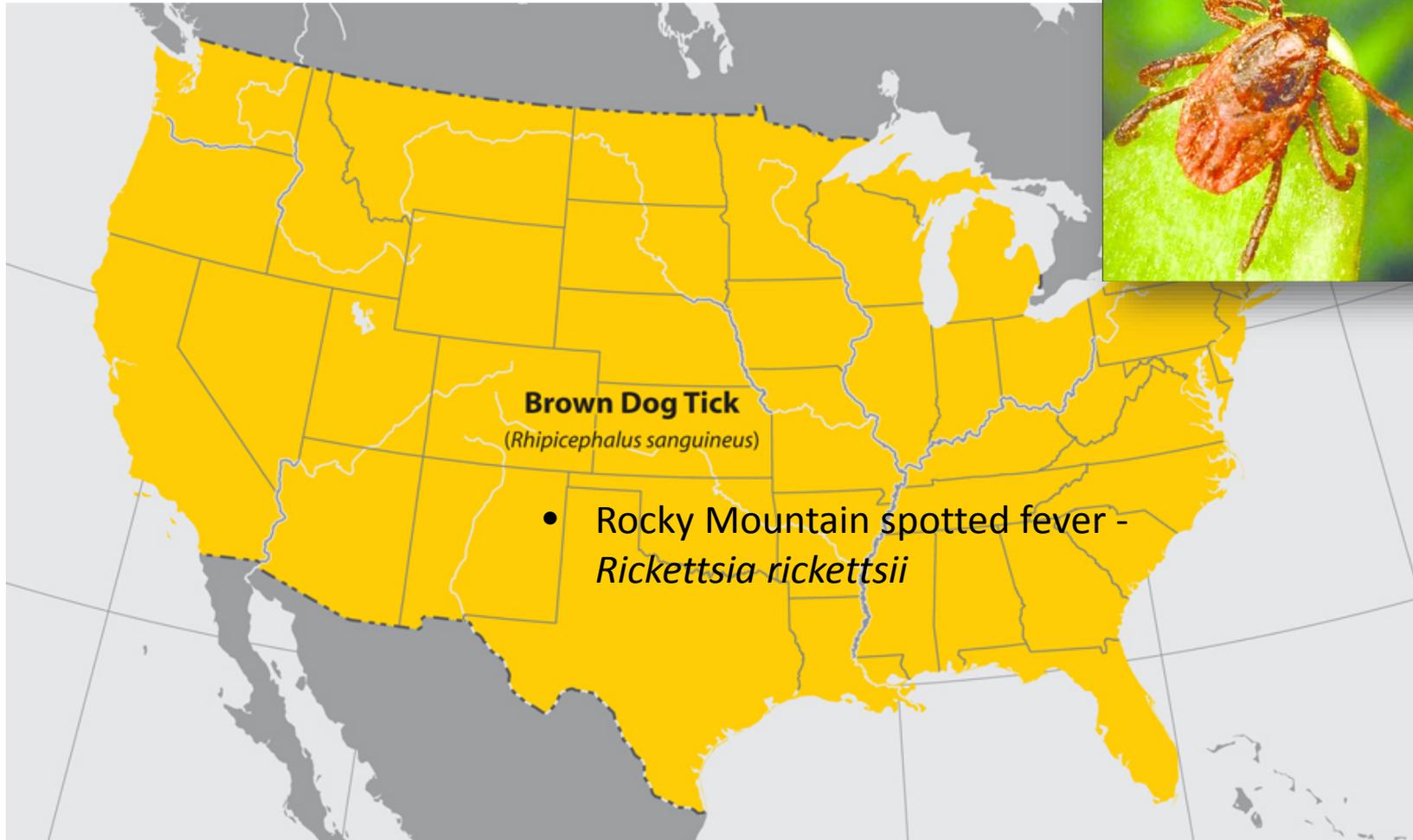
Ixodes pacificus



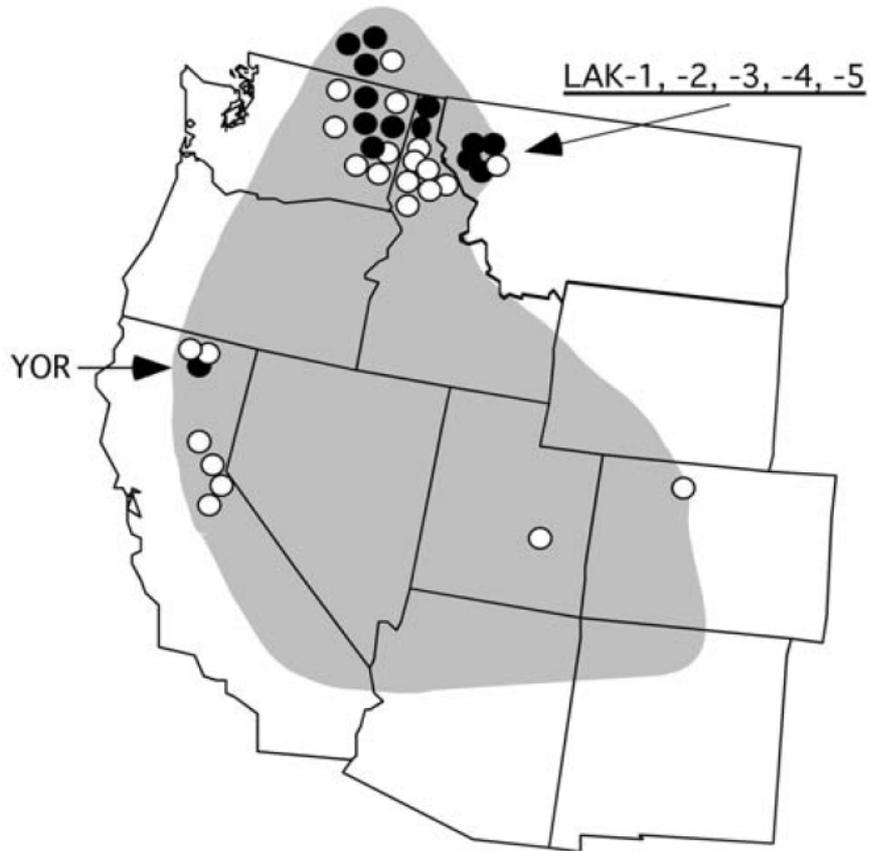
Dermacentor andersoni & *D. variabilis*



Rhipicephalus sanguineus



Ornithodoros hermsi



Ornithodoros hermsi

- Tick-borne Relapsing Fever - *Borrelia hermsii*



Pathogen detections 2011-2016

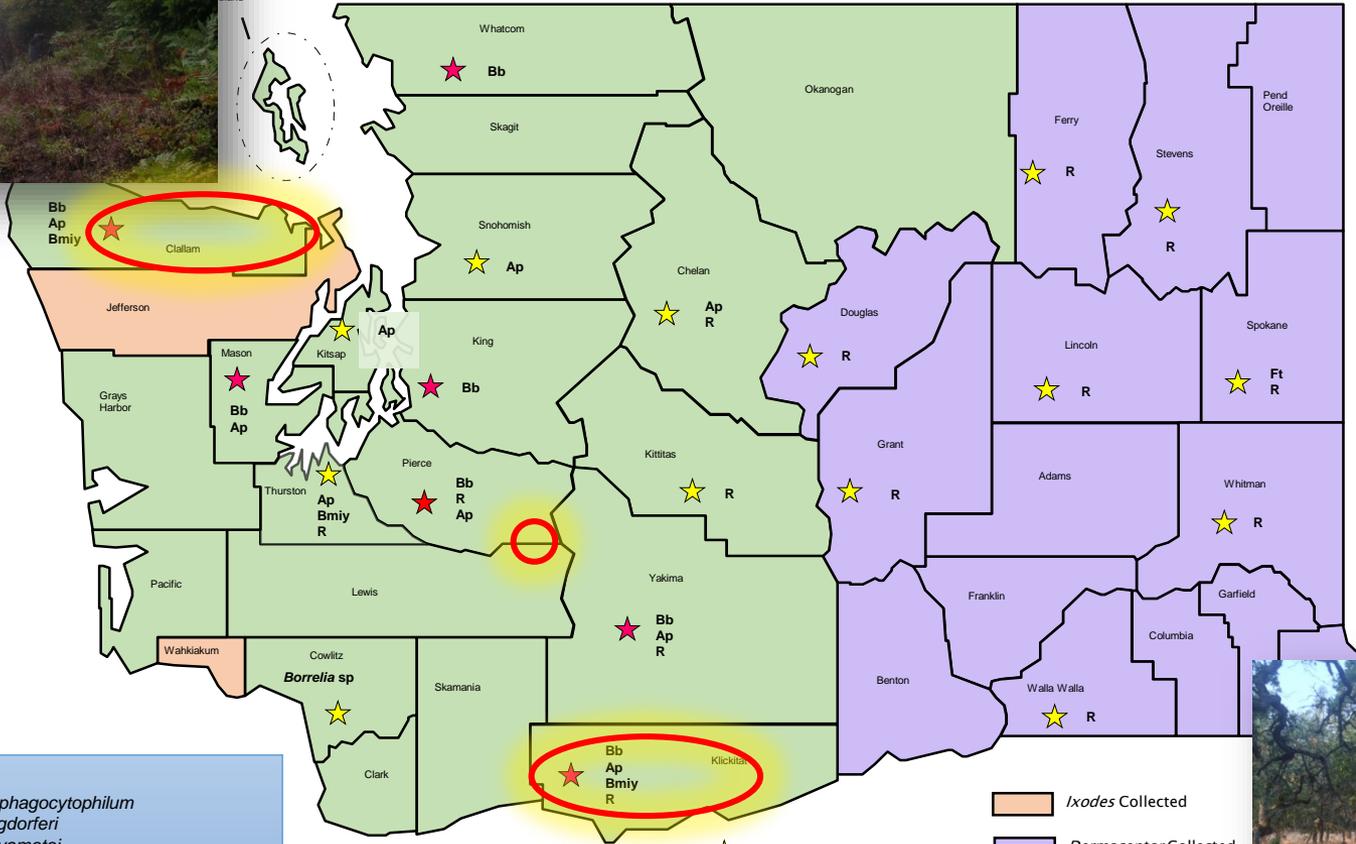


	<i>I. angustus</i>	<i>I. pacificus</i>	<i>I. spinipalpis</i>
Pathogen	#Positive/#Tested	#Positive/#Tested	#Positive/#Tested
<i>Anaplasma phagocytophilum</i>	0/95	5/258 (1.9%)	1/234 (0.4%)
<i>Borrelia species</i>	1/98 (1.0%)	4/379 (1.1%)	2/235 (0.9%)
<i>Borrelia bissettiae</i>	0/41	0/205	1/64 (1.6%)
<i>Borrelia burgdorferi s.l.</i>	1/99 (1.0%)	22/421 (5.2%)	4/235 (1.7%)
<i>Borrelia burgdorferi s.s.</i>	0/45	15/354 (4.2%)	0/66
<i>Borrelia lanei</i>	0/41	0/205	2/64 (3.1%)
<i>Borrelia miyamotoi</i>	0/42	10/227 (4.4%)	0/69

	<i>D. andersoni</i>	<i>D. variabilis</i>
Pathogen	#Positive/#Tested	#Positive/#Tested
<i>Rickettsia species</i>	0/26	2/46 (4.3%)
<i>Rickettsia peacocki</i>	8/22 (36%)	2/42 (4.8%)
<i>Rickettsia rhipicephali</i>	2/22 (9.0%)	1/42 (2.4%)



Island



Pathogens

- Ap = *Anaplasma phagocytophilum*
- Bb = *Borrelia burgdorferi*
- Bmiy = *Borrelia miyamotoi*
- Ft = *Francisella tularensis*
- R = non-pathogenic *Rickettsia* species

★ Positive ticks detected

★ Bb+ ticks detected

Orange box: *Ixodes* Collected

Purple box: *Dermacentor* Collected

Green box: Both Genera Collected



Reservoir Hosts in WA

- *Borrelia burgdorferi* s.s.
 - Deer mice (*Peromyscus maniculatus*)
 - Western gray squirrel (*Sciurus griseus*)
 - *Tamias* spp. Chipmunks

- *Anaplasma phagocytophilum*
 - *Tamias* spp. Chipmunks

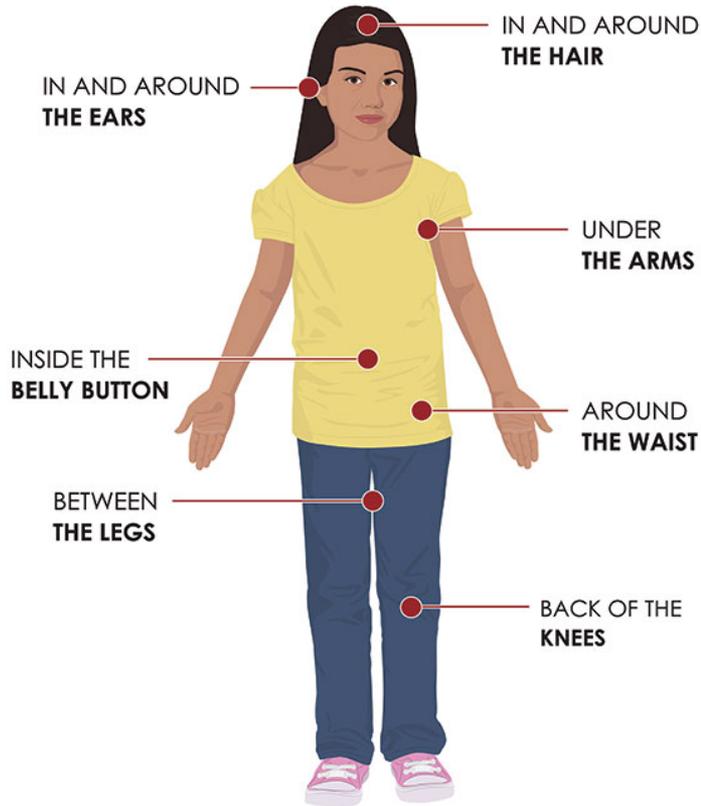


Tick-borne Diseases of WA

Disease	Agent in WA	Ever identified in locally-exposed humans	Ever identified in vectors in WA
Lyme disease	<i>Borrelia burgdorferi</i> s.s.	YES	YES
Tick-borne relapsing fever	<i>Borrelia hermsii</i>	YES	YES
Tularemia	<i>Francisella tularensis</i>	YES	YES
Rocky Mountain Spotted Fever	<i>Rickettsia rickettsii</i>	YES	YES[^]
Babesiosis	<i>Babesia duncani</i> , <i>Babesia divergens</i> -like organism	YES	NO
Anaplasmosis	<i>Anaplasma phagocytophilum</i>	NO	YES
<i>B. miyamotoi</i> infection	<i>Borrelia miyamotoi</i>	NO	YES

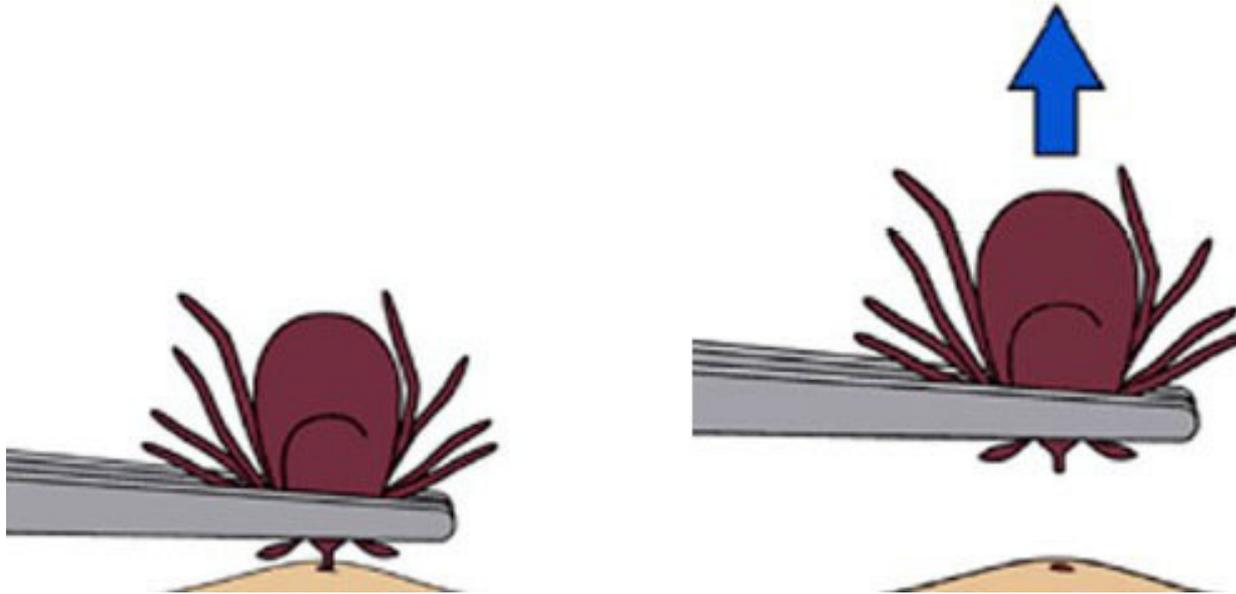
[^]Personal communication only, not confirmed by DOH

Avoiding Tick Bites



- Wear long pants and a long-sleeved shirt. Tuck your pant legs into socks or boots and shirt into pants.
- Wear light-colored, tightly woven clothing.
- Use tick repellent when necessary.
- Check yourself, your children, and your pets thoroughly for ticks
- Shower or bathe (preferably within two hours after being in tick habitat).

Properly Removing A Tick



- After removing the tick, disinfect the bite site and wash your hands.
- Send your tick to DOH for identification using form & directions at www.doh.wa.gov/ticks

Tick Management

- Focus on areas frequently used by your family
- Use brick, paving, decking, gravel, container plantings, and low water requirement plants to encourage bright sunny areas immediately around your home.
- Keep grass mowed and shrubs trimmed.
- Keep dogs and cats out of the woods.
- Widen woodland trails.
- Move swing sets, sand boxes, and other children play areas away from the edge of woods and place them on a wood chip or mulch foundation.
- Use plantings that don't attract deer or exclude deer through fencing.
- Control rodents in and around your home.

Resources

Washington State Department of Health

www.doh.wa.gov

Centers for Disease Control & Prevention

www.cdc.gov/ticks/index.html

Connecticut Agricultural Experiment Station's

[Tick Management Handbook Cdc-pdf](#)

Acknowledgments

WA DOH

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Questions?

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