

# Tick Surveillance in Washington State



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Office of Environmental Public Health Sciences

State Board of Health Meeting  
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*Public Health – Always Working for a Safer and Healthier Washington*



Human  
Disease



Tick  
Vectors

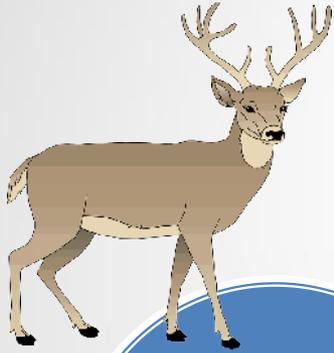
Tick-Borne  
Disease Cycle



Animal  
Disease

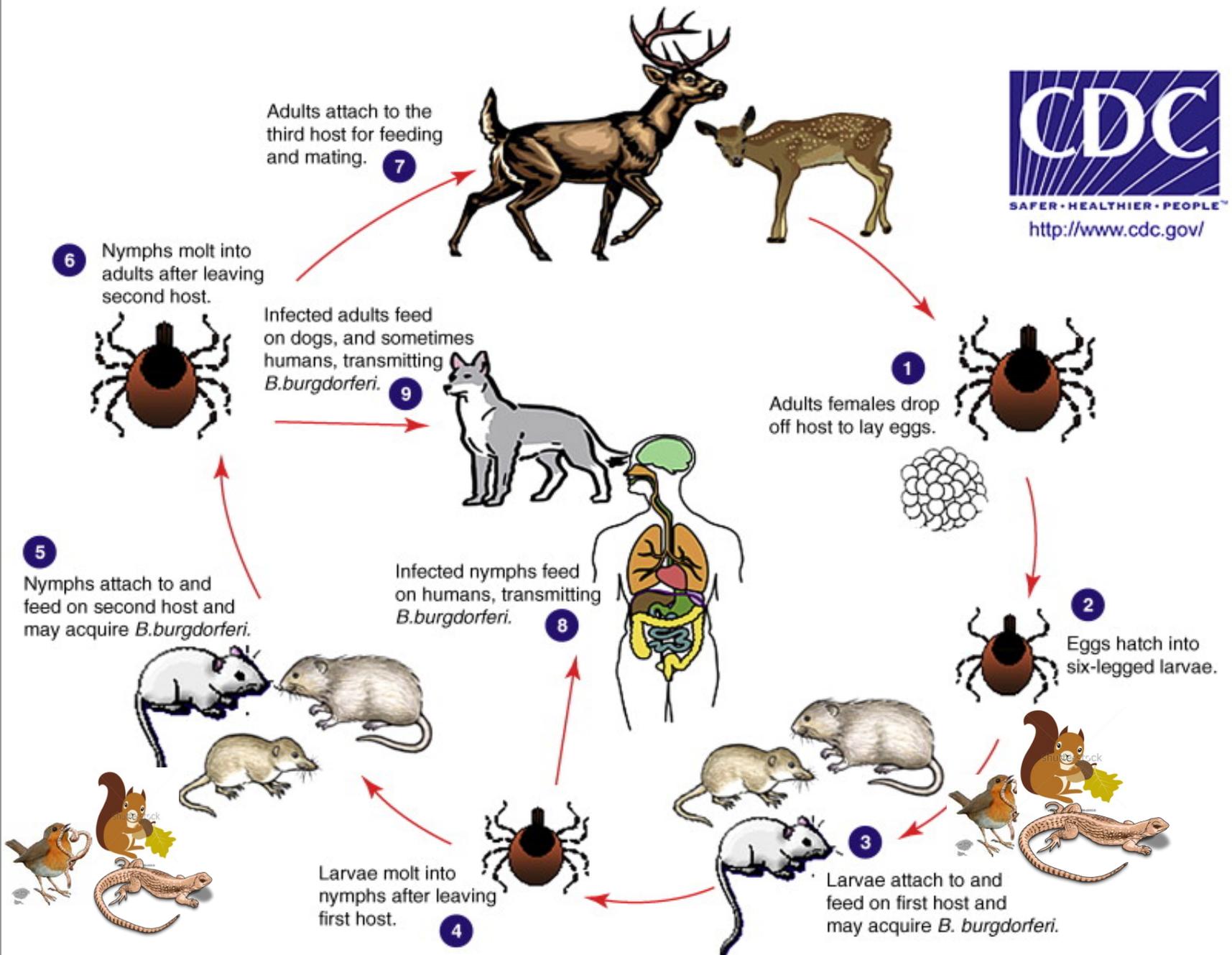


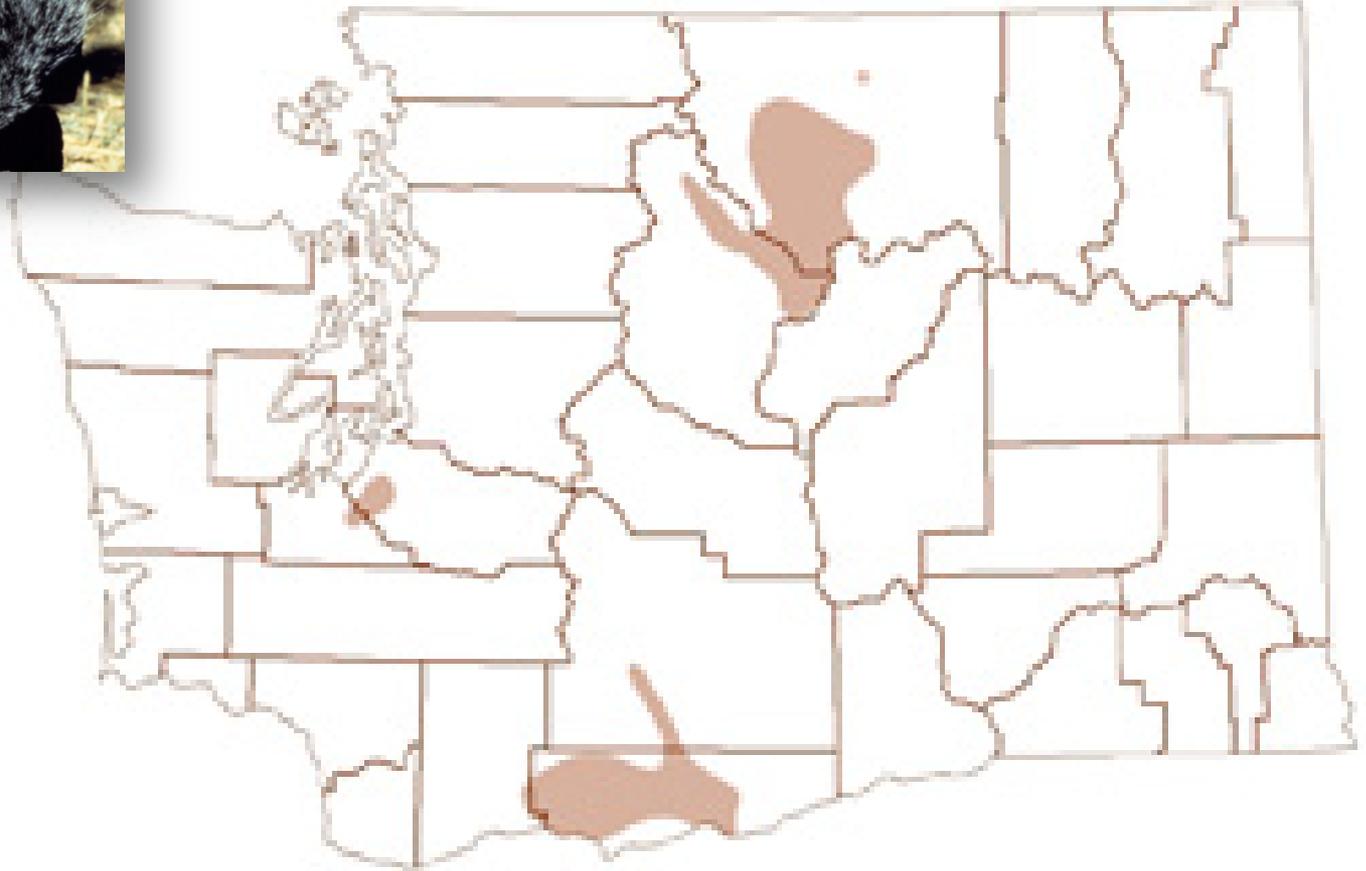
Wildlife  
Reservoirs  
& Hosts



# Project Objectives

- ▶ Increase our understanding of the distribution of the tick vector of Lyme disease and risk of Lyme disease in Washington through collection, identification, and testing of vector ticks.
- ▶ Determine the prevalence of *Borrelia burgdorferi*, the causative agent of Lyme disease, in the vector tick population.

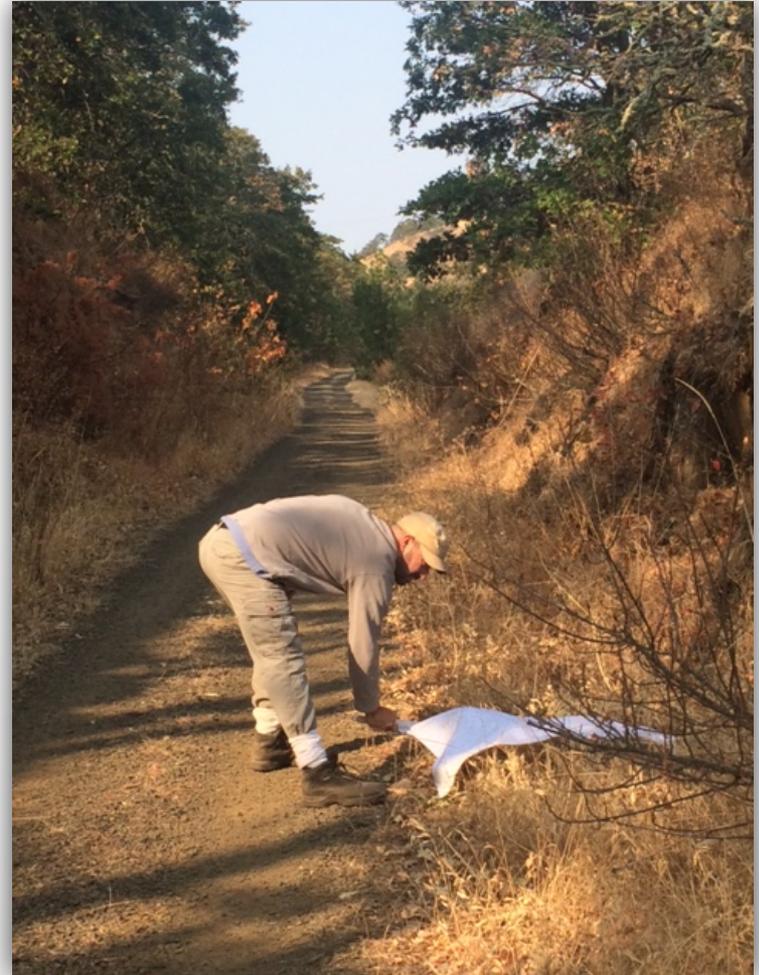




 **Western Gray Squirrel**

# Surveillance Methods

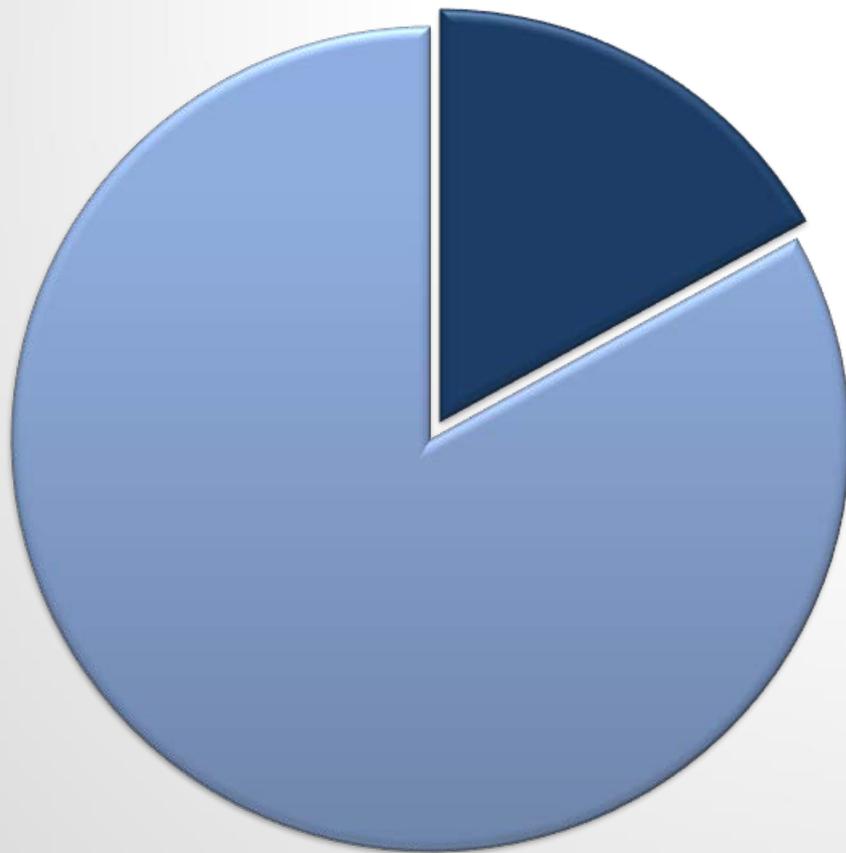
- ▶ Weekly/Bi-Weekly tick drags.
- ▶ Submissions from public (form available on web).
- ▶ Over 100 Partnerships with:
  - Veterinary clinics
  - Wildlife Rehabilitation Centers
  - Local health professionals
  - Wildlife biologists
- ▶ Testing is done at UMass, CDC, and BC-CDC.





# Tick Collections 2011 – July 2015

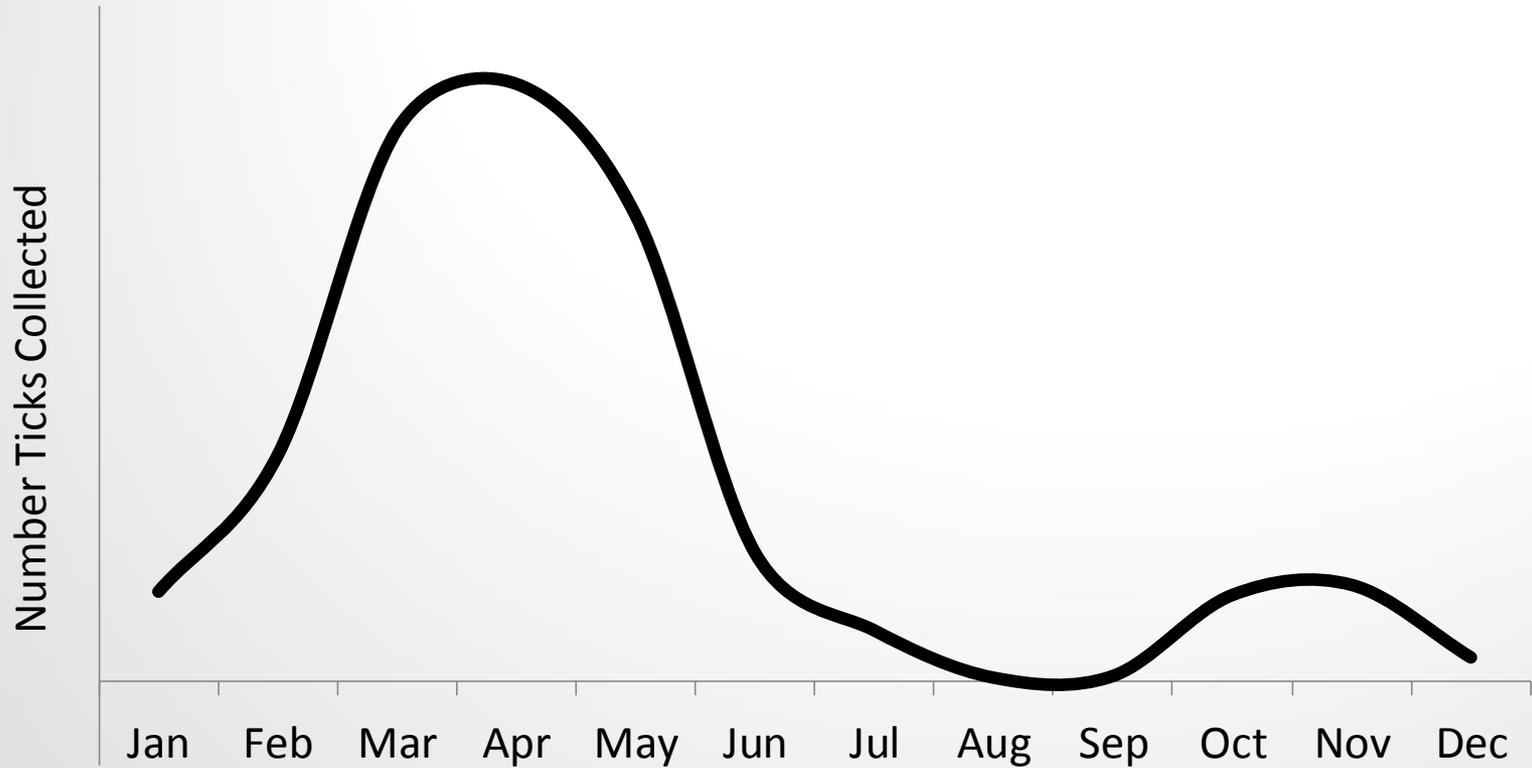
(n=>8,397)



■ *Ixodes pacificus*  
(n=1,425)

■ Other Species  
(n=7,002)

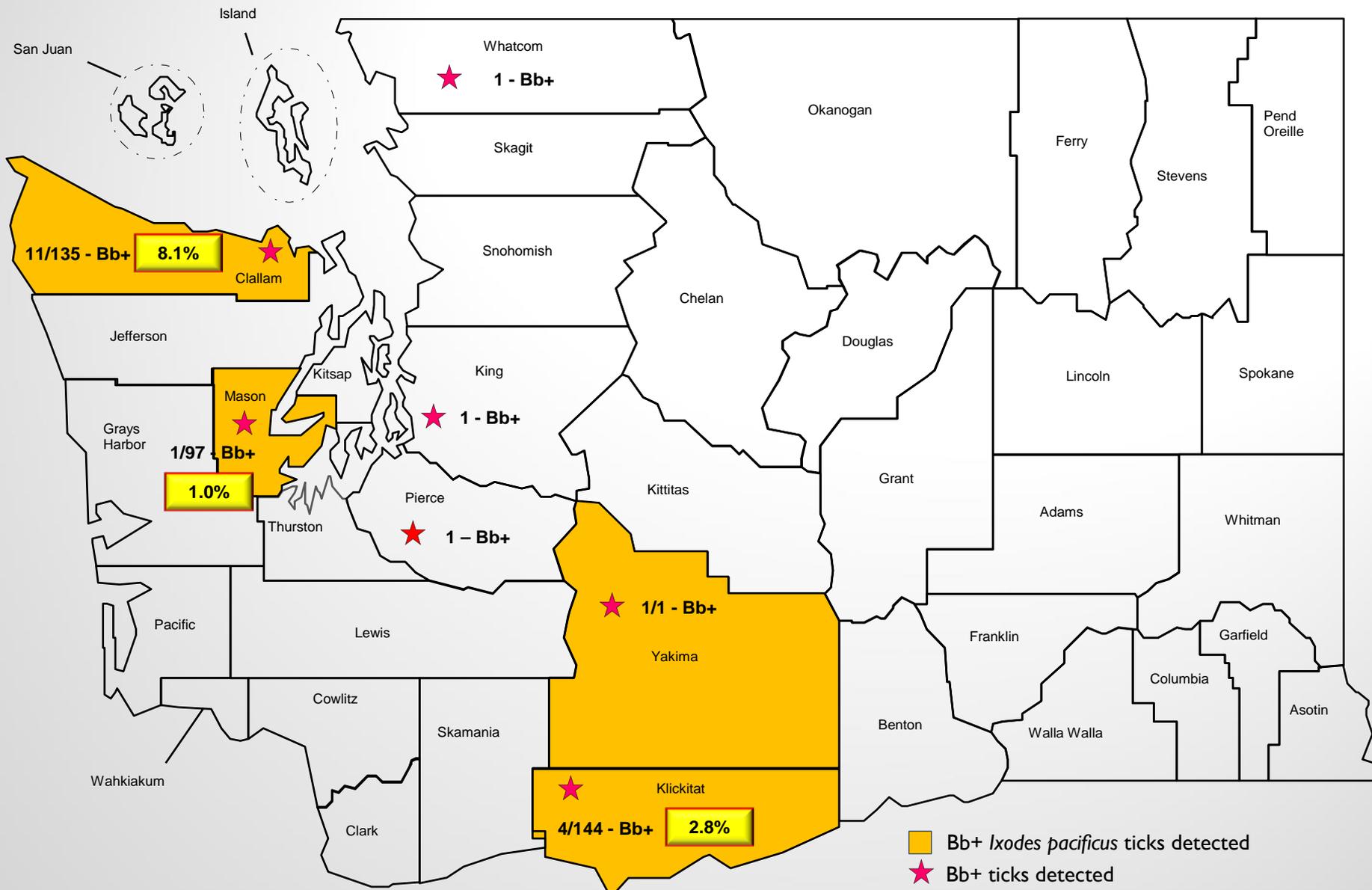
# Seasonal *Ixodes pacificus* Activity



# *Ixodes* Test Results 2011–2015

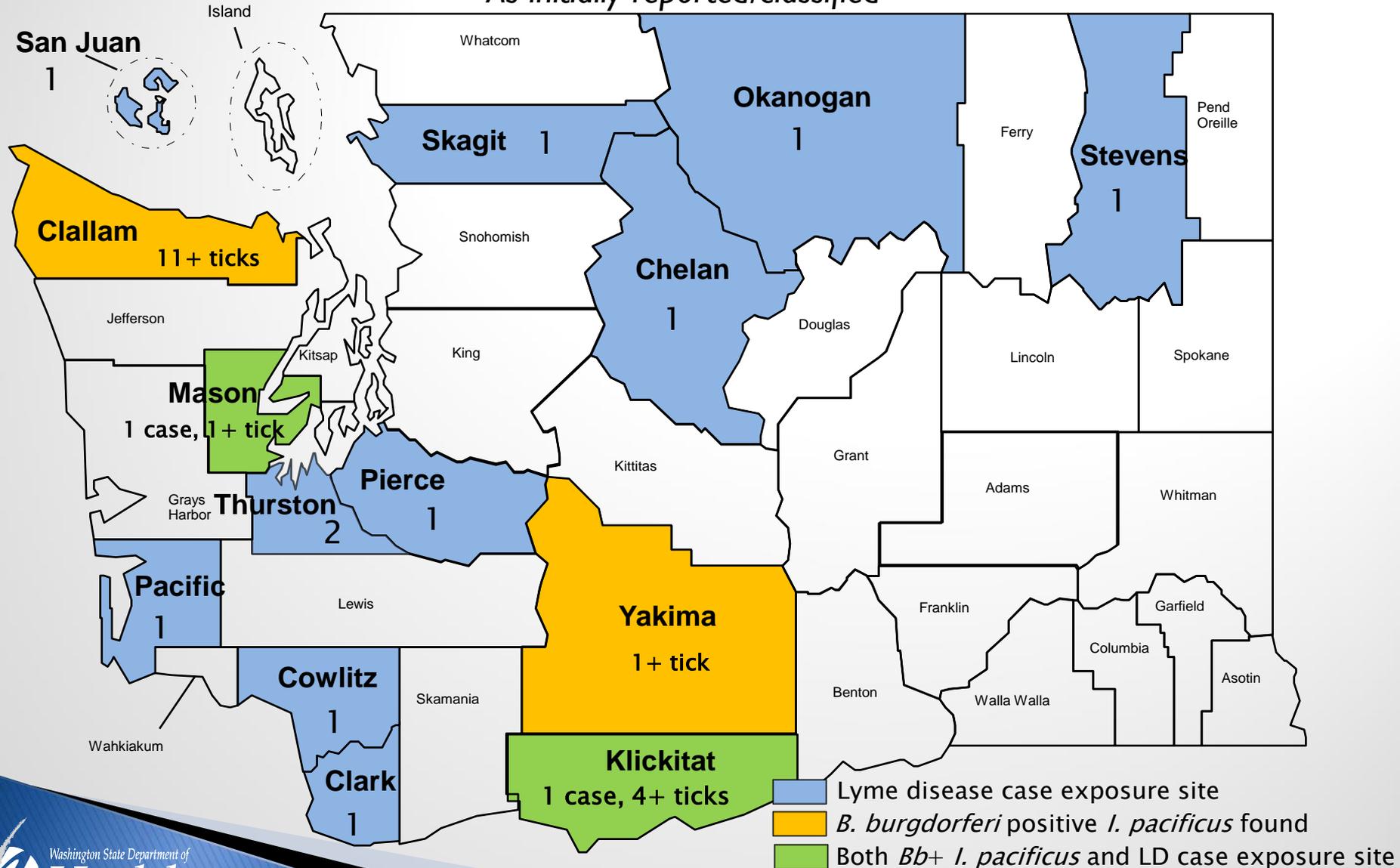
<i>Ixodes</i> species	# Tested	Bb+
<i>Ix. pacificus</i>	917	17 (1.9%)
<i>Ix. angustus</i>	436	2 (0.5%)
<i>Ix. spinipalpis</i>	195	4 (2.1%)
<i>Ix. auritulus</i>	5	0
<i>Ix. texanus</i>	10	0
<i>Ixodes</i> sp.	13	1

# Borrelia burgdorferi Detections in Ixodes pacificus 2011-2015

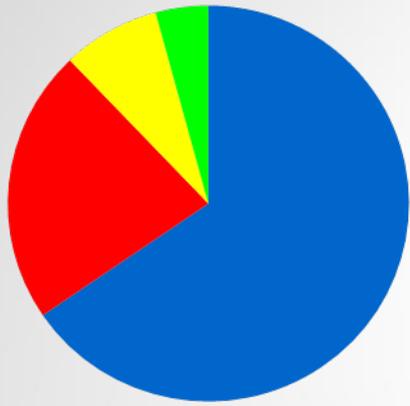


# In-state-acquired confirmed\* Lyme Disease Cases by county of exposure, 1/2005-8/2015 (n=14)

As initially reported/classified



\*Case classification of "confirmed" was assigned at time of report. Data review and cleaning is ongoing



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



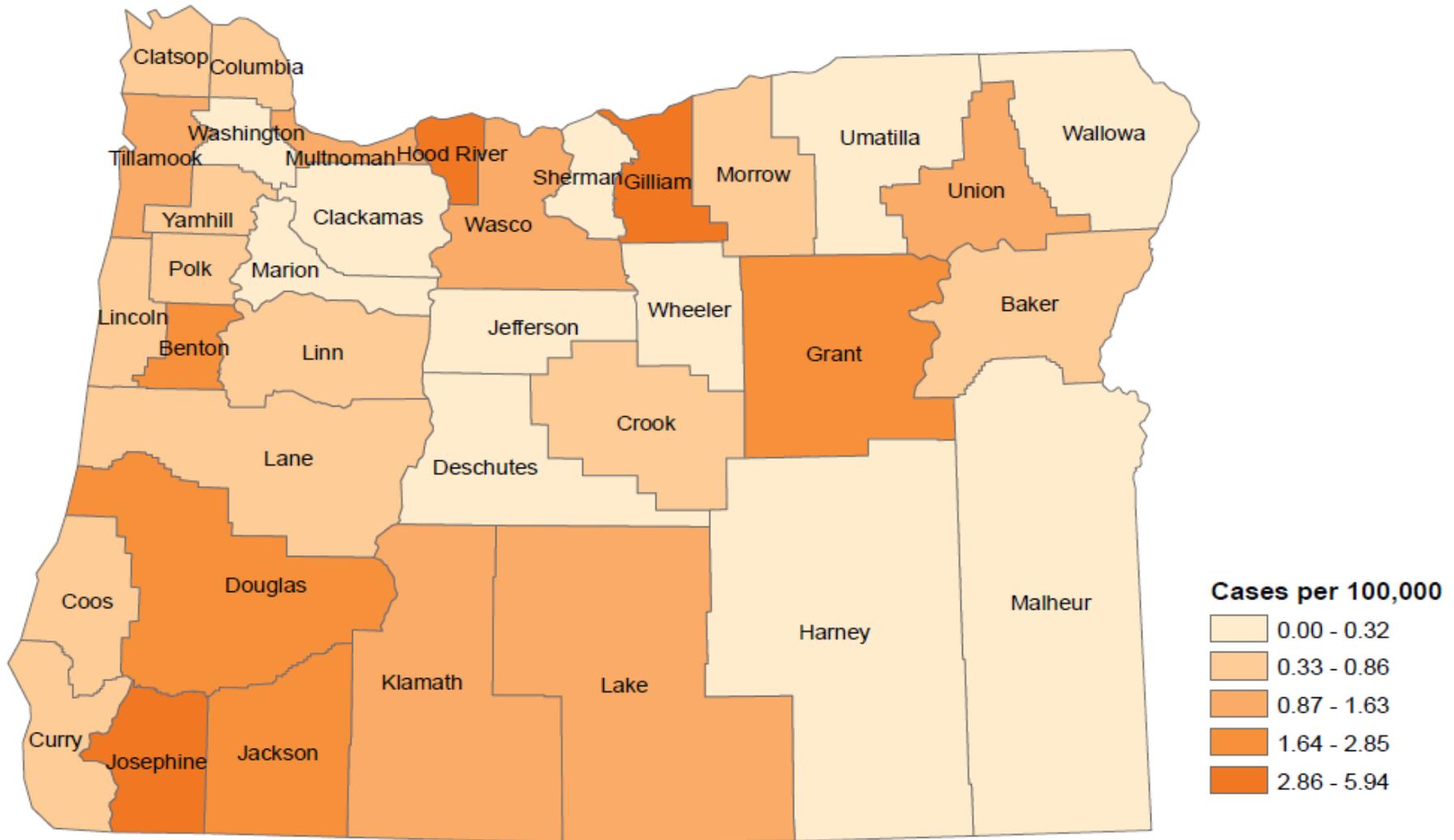


- *I. pacificus*
- *D. occidentalis*
- *D. variabilis*
- *D. andersoni*





# Incidence of Lyme disease by county of residence\*: Oregon, 2004–2013



\*Not necessarily county of acquisition

Ref: State of Oregon 2013 Selected Reportable Communicable Disease Summary



# Lyme Disease in Washington State

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Washington State Department of Health

State Board of Health  
January 13, 2016

# Lyme Disease



- Cause: *Borrelia burgdorferi*
  - Incubation generally 1-2 weeks; can be up to a month
- Early infection: Erythema migrans (EM) rash
  - Localized illness: fatigue, fever, headache, myalgias, arthralgias
- Disseminated infection: Multiple EM rashes, Bell's palsy (facial drooping), meningitis, swollen joints, heart problems
- Laboratory detection: Mainly serology
- Cases classified according to CSTE case definitions
- Treatment: Oral or IV antibiotics



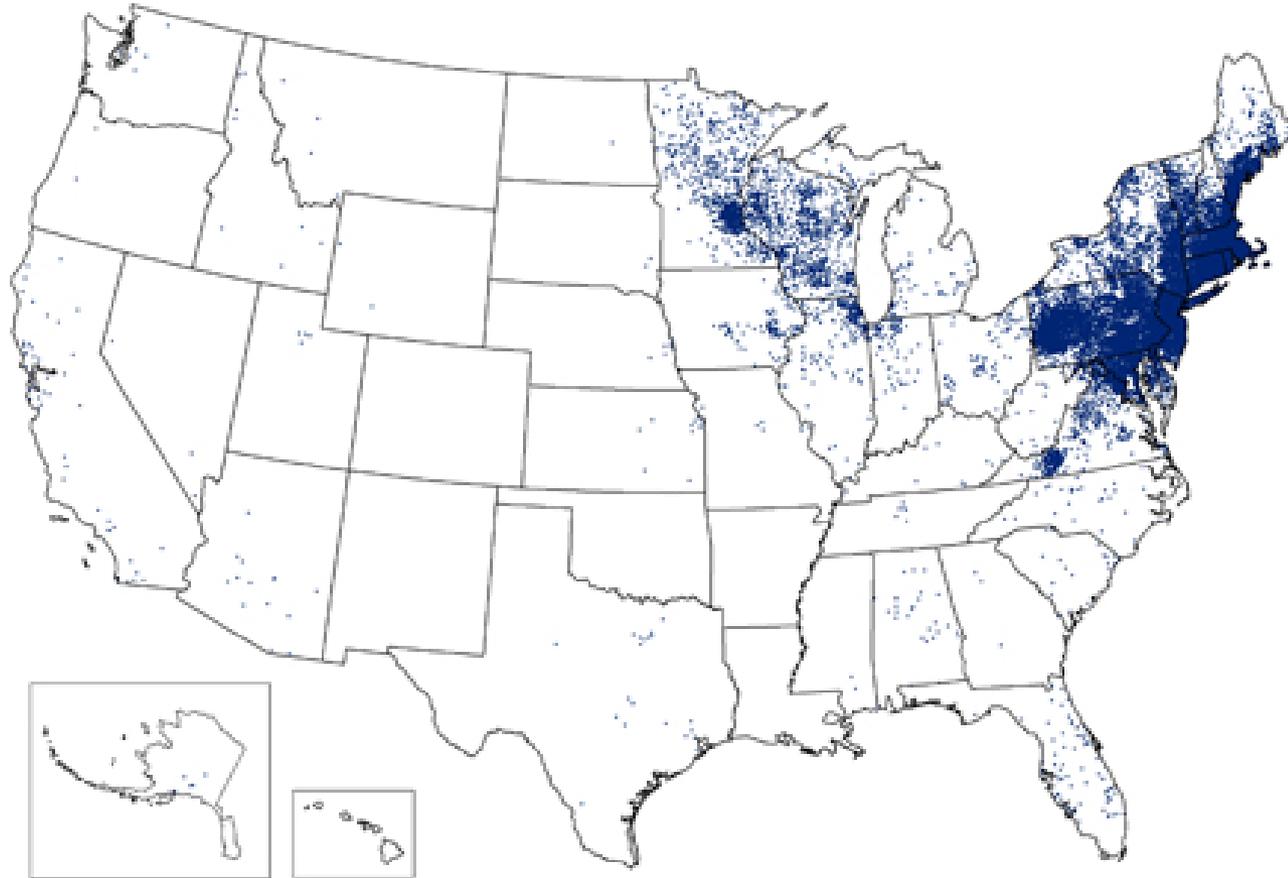
# Persistence of *B. burgdorferi* Infection

- Before appropriate treatment
  - Infection and symptoms can persist for many months
- After appropriate treatment
  - *B. burgdorferi* cleared
  - Patients who are treated early usually recover quickly
- Some people with Lyme disease may experience non-specific symptoms after *B. burgdorferi* are cleared
  - Post-Lyme disease syndrome (PLDS)
  - Possibly due to post-infectious process, like in some other infectious diseases

# Chronic Lyme Disease

- Term applied to a wide variety of contexts; imprecisely defined condition
  - 2007 review paper in NEJM defined 4 predominant categories of disease associated with the term Chronic Lyme Disease
- Active infection with *B. burgdorferi* not evident in persons in any of these categories
- Long-term/ repeated antibiotics for chronic Lyme disease
  - Need or effectiveness unsupported by scientific evidence
  - Risk for adverse side effects, some severe

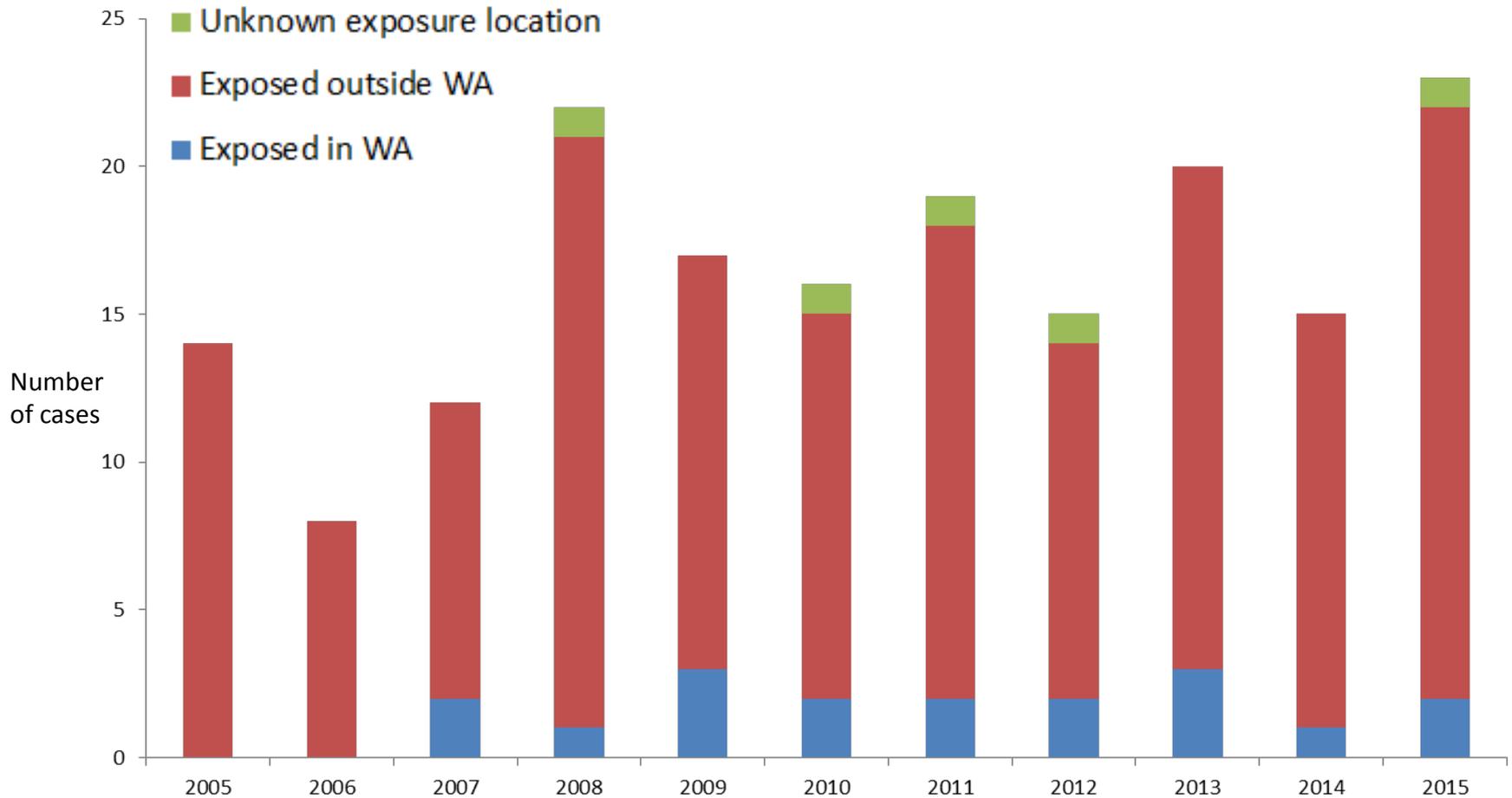
# Reported Cases of Lyme Disease – United States, 2014



1 dot placed randomly within county of residence for each confirmed case

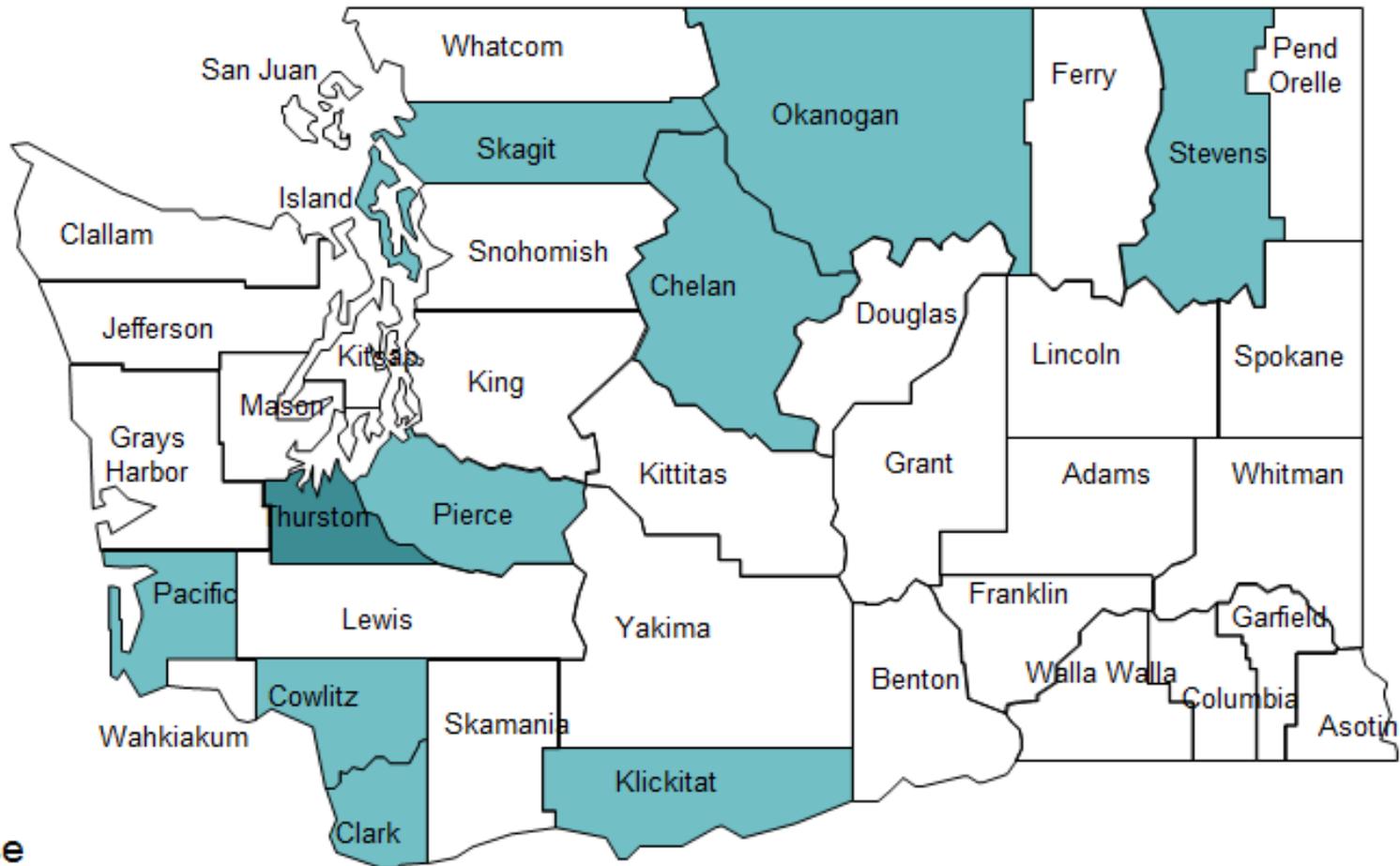
Image: CDC, <http://www.cdc.gov/lyme/stats/maps/map2013.html>

# Confirmed and Probable Lyme Disease by Exposure Location, Washington, 2005-2015 (N = 181)



\*All 2015 data is preliminary. Cases classified in year of report.

# Confirmed Lyme Disease Exposed In-State, Washington Residents, 1/2005 - 12/2015



- 1 case
- 2 cases

\*2015 data is preliminary; cases classified by 2011 case definition

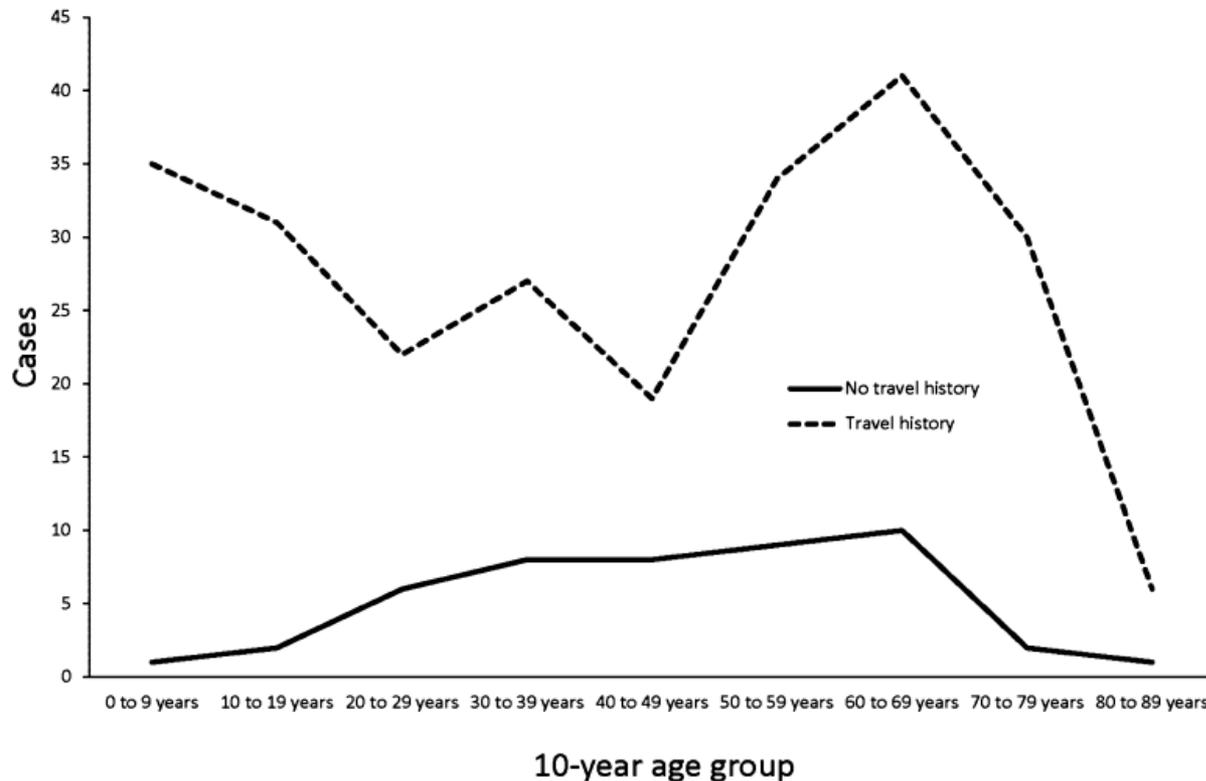
# Comparative Epidemiology of Confirmed Cases

	Locally Acquired 2005-2015 (N=12)	Travel-Assoc. 2005-2015 (N=132)	P-value from Fisher Exact or t- test
Male (%)	2 (17)	82 (63)	0.004
Median age (Range)	47 (7-67)	39 (0-79)	0.7
EM	10 (83)	88 (70)	0.7

# Lyme Disease in Low Incidence States

- Article in Ticks and Tick-borne disease, June 2015
- Descriptive epi of cases in four low-incidence states: FL, SC, UT, and WA, 2005-2009

Lyme disease cases by travel history and 10-year age group - Florida, South Carolina, Utah and Washington, 2005 to 2009



# Conclusion

- There is a stable, very low-level incidence of in-state acquired Lyme disease cases
  - Potential for false positives/misdiagnosis
- *B. burgdorferi* is present in our tick populations, including the known Lyme disease vector
  - Further work needed to confirm pathogenicity
- Healthcare providers should be aware of the possibility for Lyme disease to be acquired locally
  - Order serologic testing for persons with clinically compatible illness and possible tick exposure

# Acknowledgments

- Local health jurisdictions
- U.S. Centers for Disease Control and Prevention
- WA DOH
  - Office of Communicable Disease Epidemiology
    - Melissa Kemperman
  - Environmental Public Health
    - Liz Dykstra