STATUS OF *HAEMAPHYSALIS LONGICORNIS* IN THE UNITED STATES

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OCTOBER 24, 2018
Our story starts... 2017

- August: A woman in NJ came in to local mosquito control office with some ticks she found on herself after working with her sheep
- Late October/Early November: Upon investigation, many ticks were found on a sheep and in it’s pen that don’t “look normal”
- Molecular ID by Rutgers, followed by confirmation by NVSL indicated the ticks were *Haemaphysalis longicornis*
- First time detected outside of quarantine in the U.S.
Haemaphysalis longicornis

• AKA Scrub, bush, Asian long-horned tick
• 3 host hard tick exotic to the U.S.
• Originally from North East Asia then expanded into Australia and New Zealand
Morphology

- Size of Adult: 2-3 mm
- Engorged: 10 mm
- “Chinese hat” capitulum

- Three other *Haemaphysalis* sp. in U.S.
  - *H. leporispalustris* /rabbit tick (widely distributed)
  - *H. chordeilis* (less common)
  - *H. juxtacoichi* (rare)
Biology

• Invasive form is parthenogenetic tick
  • Don’t need males to lay fertile eggs
  • Create explosive mini populations
    • Animals may die from anemia/exsanguination
  • In Australia, parthenogenesis is obligate and males are rare (1:400 females)
Hosts

• Primarily Cattle

But also: sheep, dogs, humans, yak, donkeys, hedgehogs, horses, pigs, ducks, turkeys, chickens, mynas, magpies, pheasants, budgerigar, thrush, skylark, kiwis, banded rails, sparrows, rabbits, goats, badgers, cats, deer, bears, foxes, raccoons, kangaroos, chipmunks, rats, mice, ferrets, stoats, weasels, brushtail possums, wallaroos, wallabies, bandicoots, etc.

Additional US: coyotes, groundhogs, grey fox

U.S. detections in RED
Some of the Pathogens Worldwide...

- Anaplasma phagocytophilum
- Anaplasma bovis
- Borrelia spp.
- Babesia ovata
- Babesia major
- Babesia gibsoni
- Babesia bigemina and bovis
- Babesia (Theileria) equi
- Ehrlichia chafeensis
- Rickettsia japonica
- Powassan virus
- Khasan virus
- Tick-borne encephalitis virus
- Russian Spring-Summer Encephalitis Virus
- Severe Fever with Thrombocytopenia syndrome
- Huaiyangshan virus hemorrhagic fever
- Theileria spp-US research starting for VA positive of Theileria orientalis group in cattle
New Jersey Detections

• On July 16th, NVSL confirmed a nymphal *H. longicornis* from Bergen County, New Jersey. This detection is the 5th confirmed county in New Jersey after Hunterdon, Union, Middlesex, and Mercer counties.

• First detection backdated to 2013 from a dog in Union County.
Other New Jersey details

• 89 nymphs from Middlesex County and 15 nymphs from Union County have tested negative at the CDC via RT-PCR for Powassan, Bourbon, and Heartland virus.

❖ Testing at Monmouth County, NJ tick lab negative so far (120 samples)
  ❖ Borrelia burgdorferi
  ❖ Borrelia miyamotoi
  ❖ Anaplasma phagocytophilum
  ❖ Babesia microti
  ❖ Ehrlichia chafeensis
  ❖ Ehrlichia ewingii

❖ The sheep tested negative for Babesia bigemina, Babesia bovis, Theileria, Rickettsia, Anaplasma marginale, Ehrlichia ruminantium, Coxiella burnetii, and SFTS virus (Severe Fever with Thrombocytopenia Syndrome, a human disease).
Virginia...

- December 2017: FAD investigation conducted on Albemarle County, VA beef farm. The herd experienced illness with clinical signs consistent with anemia.

- Mortality 7/120 animals.

- NVSL confirmed *Theileria orientalis* in six animals within the herd.

- March 2018: Call from *Theileria* positive farm producer. Tick collection.

- May 2018: NVSL confirmed the finding of HL from an orphaned calf.
June 2018: NVSL confirms HL collected from CO2 trap in Fairfax County from March 27, 2017

Virginia has 16 confirmed counties/ind cities for *H. longicornis*. Ticks have been found from cows (Abermarle, Page, and Pulaski counties), horses (Warren county), a goat (Louisa county), dogs (Russell, Scott, Carroll counties) deer (Staunton City, Rockbridge, Augusta counties) and the environment (Fairfax, Giles, Grayson, Smyth, and Wythe counties).
West Virginia

- On May 21, 2018 NVSL confirmed *Haemaphysalis longicornis* ticks from cattle on two separate premises in Hardy County, West Virginia.

- Now 10 confirmed counties: cows (Hardy county), dogs (Cabell, Putnam, Ritchie, Lincoln, and Mason Counties), White-tailed Deer (Tyler and Taylor counties), a cat (Marion county), and the environment (Monroe county).

- On June 25th, 2018 NVSL confirmed a larval *H. longicornis* upon reexamination of a sample submitted in 2010 from a white-tailed deer from Tyler County, WV.

- This correct identification back dates the first collection of *H. longicornis* in the US to August 31, 2010.
North Carolina

June, 2018: NVSL confirmed a *H. longicornis* upon reexamination of a sample submitted in 2017 from an opossum from Polk County, North Carolina.

August 2018: NVSL confirmed a *H. longicornis* that was previously attached to a human in Davidson County.

August 2018: NVSL confirmed a *H. longicornis* from a dog from Rutherford County.
New York

August, 2018: Molecular ID of *H. longicornis* from the environment in Rockland County, NY.

August, 2018: environmental collections made in June 2018 from two sites on Staten Island, Richmond County, NY.

June, 2018: NVSL confirmed a nymphal *H. longicornis* that had been previously attached to a human from Westchester County, New York. The tick was removed on June 4\textsuperscript{th}, 2018.
Pennsylvania, Maryland, Connecticut

September, 2018: NVSL confirmed *H. longicornis* collected from the environment and crawling on a human in Bucks County, PA. This is the second PA detection after Centre County.

August 2018: NVSL confirmed a nymphal *H. longicornis* collected in July from the environment from Fairfield County, Connecticut.

July, 2018: NVSL confirmed *H. longicornis* collected on June 25th, 2018 from a white-tailed deer from Washington County, Maryland.
Arkansas

❖ *H. longicornis* from a sheep dog in Benton County, Arkansas
❖ Nymphal tick removed May 1\(^{st}\), 2018.
❖ Molecular typing to *H. longicornis* at Oklahoma State
❖ Follow up detected no other longhorned ticks
Acknowledgements

• So many people and agencies...
  ❖ USDA APHIS SPRS
  ❖ USDA APHIS Wildlife Services
  ❖ USDA ARS
  ❖ USDA APHIS STAS CEAH and NVSL
  ❖ AR, NJ, VA, WV, NY, NC Agriculture
  ❖ NJ Dept of Environment
  ❖ NY State Dept of Health
  ❖ SCWDS
  ❖ Rutgers
  ❖ CDC
  ❖ NJ Public Health
  ❖ Monmouth Co Vector Control
  ❖ Hunterdon Co, NJ
  ❖ NJ State Mosquito Control
  ❖ VA Tech
Questions?

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