

North Carolina Tickborne Disease Annual Report 2025

- 4 Tick surveillance activities
- 6 Lyme Disease
- 9 Anaplasmosis
- 11 Babesiosis
- 12 Blacklegged Tick (*Ixodes scapularis*) Surveillance
- 15 Ehrlichiosis
- 17 Lonestar Tick (*Amblyomma americanum*) Surveillance
- 19 Spotted Fever Rickettsiosis
- 21 American Dog Tick (*Dermacentor variabilis*) Surveillance
- 23 Gulf Coast Tick (*Amblyomma maculatum*) Surveillance



NC DEPARTMENT OF
**HEALTH AND
HUMAN SERVICES**
Division of Public Health

Tickborne Diseases Reported in North Carolina, 2025

Several tick species in North Carolina can transmit diseases to humans. Effective prevention of tickborne diseases requires implementing personal protective measures, such as conducting regular tick checks after spending time outdoors and using EPA-registered insect repellents and permethrin-treated clothing. Health care providers should also be aware of the symptoms and appropriate tests for tickborne diseases, as well as the risk of transmission in their region. This annual surveillance report summarizes tick surveillance activities conducted in North Carolina, as well as the five reportable tick-borne diseases – Lyme disease, anaplasmosis, babesiosis, ehrlichiosis, and spotted fever rickettsiosis – reported in the state during 2025. Detailed statistics and surveillance data for each disease are provided on the following pages.

2025 Surveillance Highlights

- Spotted fever rickettsiosis was the most frequently reported tickborne disease in NC in 2025, with 369 cases.
- Lyme disease was the second most reported tickborne disease in NC in 2025, with 365 cases, a significant increase from 257 in 2024. Most cases were reported in the northwestern region of NC.
- Anaplasmosis cases surged in 2025, rising from 13 in 2024 to 31 in 2025, likely due to increased testing and recognition.
- Reported cases of ehrlichiosis increased significantly from 278 in 2024 to 318 in 2025. Although this trend may represent an increase in disease occurrence, it may also be influenced by changes in testing practices and improved identification of cases.
- In 2025, active tick surveillance was conducted in 15 NC counties, and 4,399 ticks from eight tick species were collected. Additionally, 293 ticks from seven species were submitted through the NC Tick Identification program across 18 counties.

Medically Important Tick Species of North Carolina												
Tick Species	Blacklegged Tick/Deer Tick (<i>Ixodes scapularis</i>)			Lone Star Tick (<i>Amblyomma americanum</i>)			American Dog Tick (<i>Dermacentor variabilis</i>)			Gulf Coast Tick (<i>Amblyomma maculatum</i>)		
Disease(s)	Lyme disease, Anaplasmosis, Babesiosis			Ehrlichiosis			Spotted fever rickettsiosis			Spotted fever rickettsiosis		
Tick Life Stages Image												
Tick Life Stages	Larvae	Nymph	Adult	Larvae	Nymph	Adult	Larvae	Nymph	Adult	Larvae	Nymph	Adult
Human Tick Bite Risk (Spring)*	Low	Low	High	Inactive	Low	Low	None	None	High	None	None	High
Human Tick Bite Risk (Summer)*	High	High	Inactive	High	High	High	None	None	High	None	None	High
Human Tick Bite Risk (Fall)*	Low	Inactive	High	Low	Inactive	Low	None	None	Low	None	None	Low
Human Tick Bite Risk (Winter)*	Inactive	Inactive	Low	Inactive	Inactive	Inactive	None	None	Inactive	None	None	Inactive

*Estimated Human Tick-Bite Risk in the Southeast U.S. For August to October Based on Historical Data^{1,2,3,4}

High: The risk of getting bitten by a tick is high due to high tick activity.

Low: The risk of getting bitten by a tick is low due to low tick activity.

Inactive: This tick life stage is not expected to be active during this time.

None: These tick life stages do not bite humans.

*The human tick-bite risk shown here does not represent the risk specific to North Carolina. Instead, it reflects risk estimates based on overall tick activity patterns observed across the eastern United States. Ticks can be active whenever temperatures exceed approximately 58°F (14°C), although activity depends on additional factors such as humidity and vegetation. This table depicts the periods associated with the highest likelihood of human tick-bite risk, based on regional tick activity patterns and whether the life stage is known to bite humans.

Tickborne Diseases Reported in North Carolina, 2025

Number of Cases of Tickborne Diseases Reported in North Carolina, 2021 - 2025

Disease	2020	2021	2022	2023	2024	Previous 5-year average	2025	Significant Change*
Lyme Disease	275	347	283	234	257	279	366	↑
Anaplasmosis	7	12	9	8	13	10	31	↑
Babesiosis	0	0	0	3	1	0.8	3	--
Ehrlichiosis	107	135	90	115	278	145	318	↑
Spotted fever rickettsiosis	186	188	202	229	195	200	369	↑

↑ = significant increase (≥ 2 standard deviations above average) ↓ = significant decrease (≥ 2 standard deviations below average) -- = No significant change

Notable information about this report includes:

- Cases include those categorized as confirmed or probable, according to the [surveillance case definitions](#), and are only among North Carolina residents.
- County data are based on the patient's home address at the time of reporting, not necessarily the county or state where they were infected.
- Cases are counted using the earliest date of illness identification. This is most frequently the symptom onset date. Therefore, case counts in this report may differ slightly from those published in national summaries or state dashboards, which can be based on other dates such as the date of initial report or the date when cases were closed and reported to the Centers for Disease Control and Prevention (CDC).
- Cases with an earliest illness onset date in 2025 and that were closed as of March 1, 2026, are included.
- Case counts from previous years may also vary slightly from earlier North Carolina surveillance reports because of disease reports received after annual case counts were finalized.
- Ages are determined by the date the case was entered into the North Carolina Electronic Disease Surveillance System (NCEDSS).
- Incidence rates are based on data obtained from the U.S. Census Population Estimates Project. Note that estimates of rates based on a small number of cases are unstable and can fluctuate widely. Therefore, these estimates should be interpreted with caution.
- Only tickborne diseases are included in this report. Data for locally transmitted and travel-associated mosquito-borne diseases in North Carolina are summarized in separate reports. Additional data can be found on the [North Carolina Disease Data Dashboard \(NCD3\)](#).
- Please note that case classification criteria may be updated through the Council of State and Territorial Epidemiologists (CSTE) case definition review and revision process.
- Population data were obtained from the U.S. Census Bureau. For statewide population totals, annual North Carolina population estimates as of July 1, 2025, were used. For county-level and demographic-specific population totals, 2025 estimates were not available at the time of this analysis; therefore, annual North Carolina population estimates as of July 1, 2024, were used.
- Active tick surveillance activities from 2018 to 2025 were conducted through university partnerships with Appalachian State University, North Carolina State University, and the University of North Carolina at Greensboro under an Epidemiology and Laboratory Capacity (ELC) cooperative agreement funded by the CDC.
- The tick establishment criteria used in active tick surveillance data uses the CDC definitions^{5,6} which are as follows: **^aEstablished:** > six ticks from any life stage, or two ticks from at least two different life stages, detected within a calendar year; **^bReported:** detection of at least one tick from any life stage in one year; **^cNot detected:** surveillance was conducted, but ticks were not detected; **^dNo data/records:** No information about the presence or absence of ticks.

¹Morris et al. Tick Species Composition, Collection Rates, and Phenology Provide Insights into Tick-Borne Disease Ecology in Virginia. *Journal of Medical Entomology*. 2022; 59(6): [10.1093/jme/tjac121](#).

²Ogden et al. Evidence for Geographic Variation in Life-Cycle Processes Affecting Phenology of the Lyme Disease Vector *Ixodes scapularis* (Acari: Ixodidae) in the United States. *Journal of Medical Entomology*. 2018; 55(6): [10.1093/jme/tjv104](#).

³Vandegriff et al. County-level surveillance for the American dog tick (*Dermacentor variabilis*) and *Rickettsia* species in Kentucky. *Sci Rep*. 2026; 5(16): 10.1038/s41598-026-37422-0.

⁴Teel et al. County-level surveillance for the American dog tick (*Dermacentor variabilis*) and *Rickettsia* species in Kentucky. *Journal of Medical Entomology*. 2010; 5(1): [10.1093/jmedent/47.5.707](#).

⁵Dennis et al. Reported Distribution of *Ixodes scapularis* and *Ixodes pacificus* (Acari: Ixodidae) in the United States. *Journal of Medical Entomology*. 1998; 35(5): [doi.org/10.1093/jme/tjv237](#).

⁶Eisen et al. County-Scale Distribution of *Ixodes scapularis* and *Ixodes pacificus* (Acari: Ixodidae) in the Continental United States. *Journal of Medical Entomology*. 2016; 53(2): [10.1093/jme/tjv237](#)

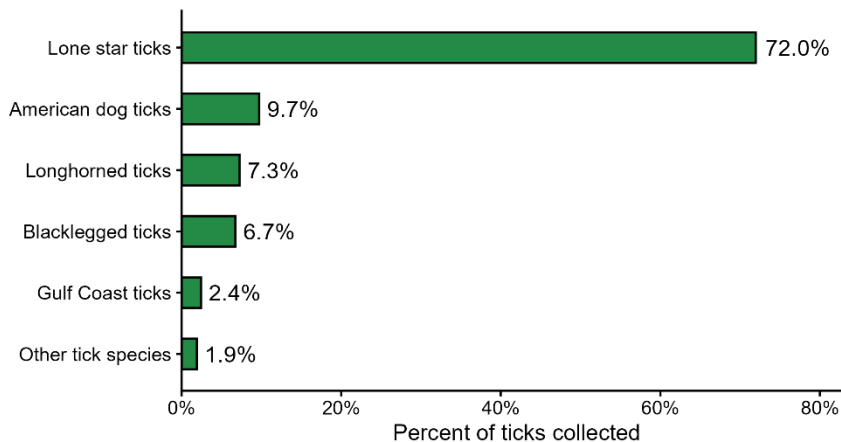
Tick surveillance activities

2025 Key Points

- Active tick surveillance was conducted in 15 counties, including four that had never been sampled before.
- 4,399 ticks from eight different species were collected through active surveillance.
- 293 ticks were submitted from 18 counties through the NC Tick ID Program.
- The top five tick species identified through both active and passive surveillance were blacklegged ticks, lone star ticks, American dog ticks, Gulf Coast ticks, and longhorned ticks.

Both active and passive tick surveillance are conducted in NC to characterize the distribution of medically important ticks and the pathogens they carry. Tick surveillance helps identify where ticks are found, spot risks early, and help communities take steps to prevent tickborne illnesses. Active tick surveillance in NC involves dragging a 1 m² cloth across the forest floor in typically wooded, high-traffic areas. Public lands are often chosen because they pose a higher risk for tick encounters and bites. The cloth is then checked every 10–20 meters for ticks, which are collected for identification and pathogen testing. Usually, at least 800 meters of dragging is conducted at each site. Any *Ixodes* species are sent to the CDC for pathogen testing, including *Borrelia burgdorferi* (Lyme disease), *Anaplasma phagocytophilum* (anaplasmosis), and *Babesia microti* (babesiosis). Passive surveillance involves submitting ticks found on animals or people through the [NC Tick ID program](#) (via [animal](#) or [human](#) submission forms). All submitted ticks are identified by the state public health entomologist, and submitters are informed of the results. These ticks are not tested for pathogens. Tick submissions do not necessarily reflect where the animal picked up the tick but rather where the submitter is from. More detailed surveillance data for medically important ticks are presented in other sections of this report.

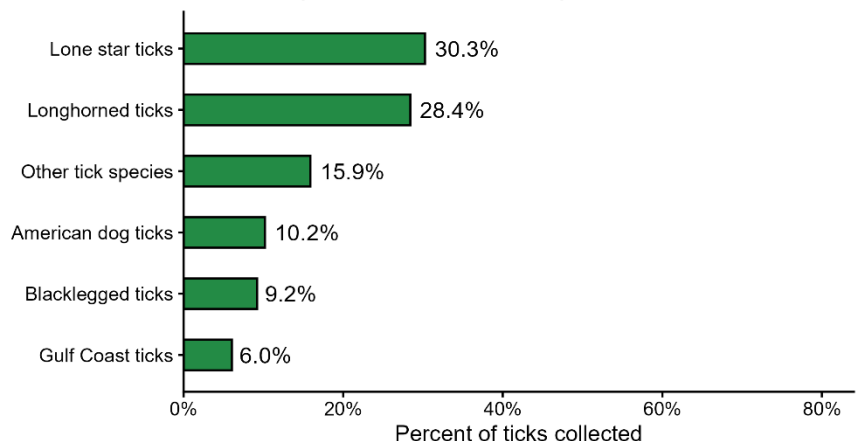
**Ticks Collected by Species in NC, 2004–2025
(Active Surveillance)**



As of 2025, through active surveillance, lone star ticks were the most collected tick species (72%), followed by American dog ticks (10%) and the invasive longhorned tick (7.3%). About 6.7% of the ticks collected were blacklegged ticks.

From 2018 to 2025, lone star ticks were the most submitted species to the NC Tick ID program (30%), followed by the invasive longhorned tick. Longhorned ticks accounted for 28% of submissions, compared with only 7% of ticks collected through active surveillance. Tick species were more evenly represented in passive submissions than in active surveillance collections because animals can acquire ticks more readily.

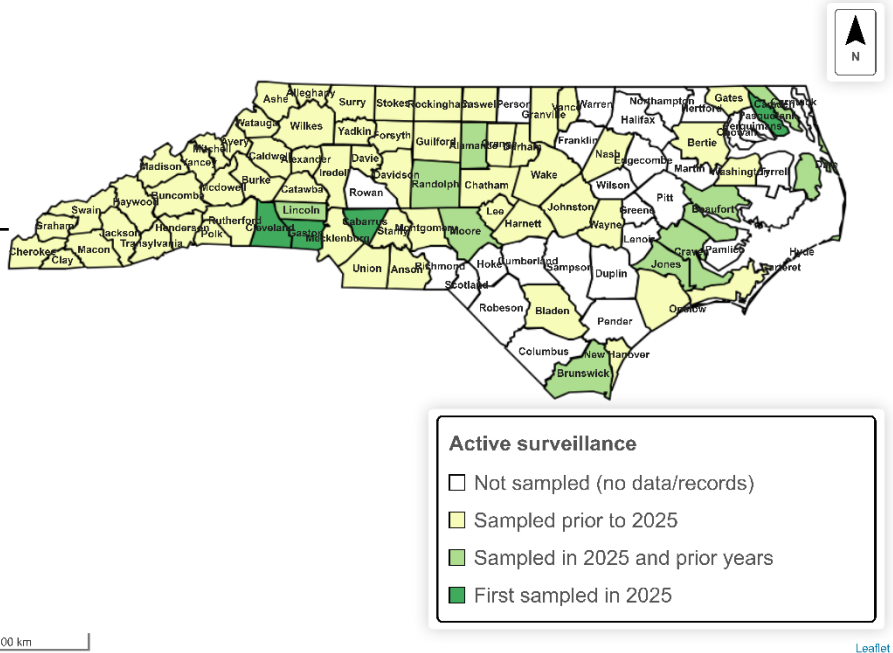
**Ticks Species Submitted to the NC Tick ID Program, 2018–2025
(Passive Surveillance)**



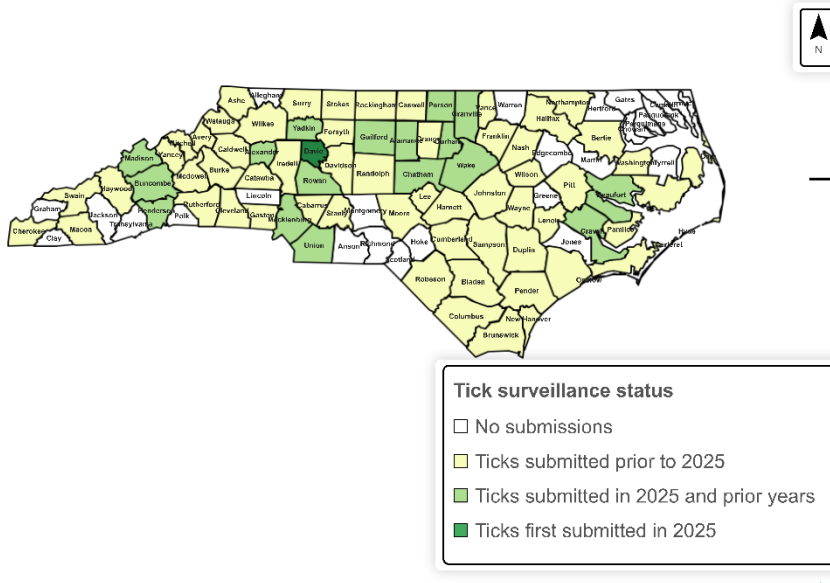
Tick surveillance activities

Counties Active Tick Surveillance was Conducted in NC 2004 - 2025

Since 2004, more than 550 miles (~93,000 meters) have been actively sampled across 280 sites in 68 of NC's 100 counties. In 2025, active tick surveillance was carried out in 15 counties. Of those, four counties (**Cabarrus, Cleveland, Gaston, and Pasquotank**) had no previous tick records or data. In 2025, approximately 36 miles (~58,000 meters) were dragged across 45



Tick Submissions by County: NC Tick ID Program 2018 - 2025 (Passive Surveillance)



Since the NC Tick ID program began in 2018, over 90 unique submitters – including veterinary clinics, animal shelters, farms, and NC residents – have submitted ticks from 71 counties. In total, about 4,500 ticks have been submitted and identified, representing 13 tick species across all three life stages (adults, nymphs, and larvae). In 2025, 293 ticks were submitted from 18 counties, including one new county (Davie County) that had not previously participated, representing six species across all three life stages. Submissions from animal shelters across NC increased compared with prior years.

Longhorned ticks (*Haemaphysalis longicornis*)

- The [invasive longhorned tick](#) was first reported in the US in New Jersey in 2017 and was first detected by passive surveillance in NC in 2018 and by active surveillance in 2019.
- Active surveillance first detected the longhorned ticks in Surry County. By 2025, longhorned ticks were detected in eight counties through active surveillance efforts.
- Through passive surveillance the longhorned tick was first detected in Rutherford County; and now has a wide distribution detected in 26 counties, including four counties – **Alexander, Craven, Davie, and Person** – added in 2025.
- Currently, there is no evidence of disease transmission to humans in the U.S., but they pose a [veterinary risk by transmitting parasites to cattle](#).

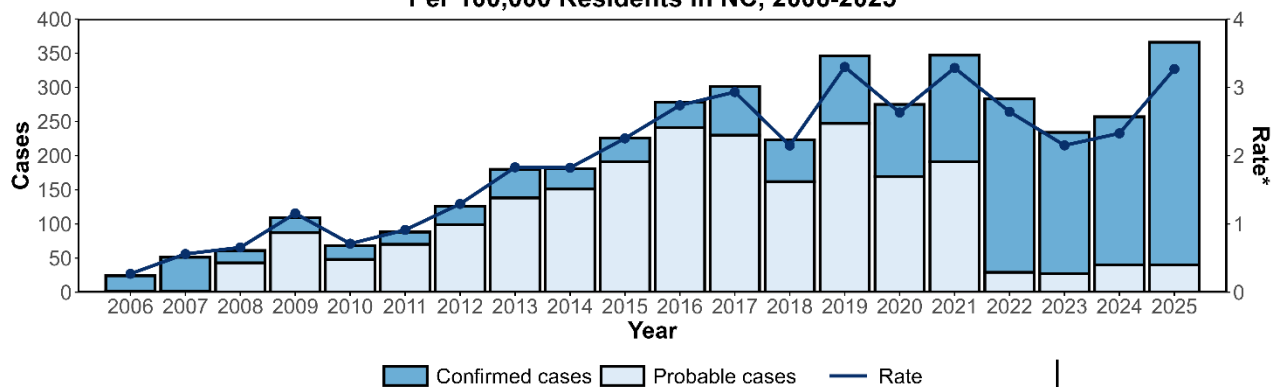
Lyme disease

2025 Key Points

- Lyme disease was the second most reported tickborne disease in 2025, with 365 cases recorded across the state.
- Most cases occurred in June and July, with the highest county-level incidences observed in northwestern NC.

Lyme disease is caused by the bacteria *Borrelia burgdorferi*, which is transmitted through the bite of an infected blacklegged tick (*Ixodes scapularis*). Historically, the Northeastern and Midwestern U.S. have been hotspots for Lyme disease transmission, but its range has expanded alongside the geographic expansion of blacklegged ticks. Since the early 2000s, cases have increased in western NC.⁷ Early symptoms of Lyme disease typically include nonspecific, flu-like symptoms such as fever, headache, chills, muscle and joint pain, along with a distinctive “bull’s-eye” rash (erythema migrans) at the tick bite site. If Lyme disease is left untreated, the disease can progress to more severe forms, including heart complications.

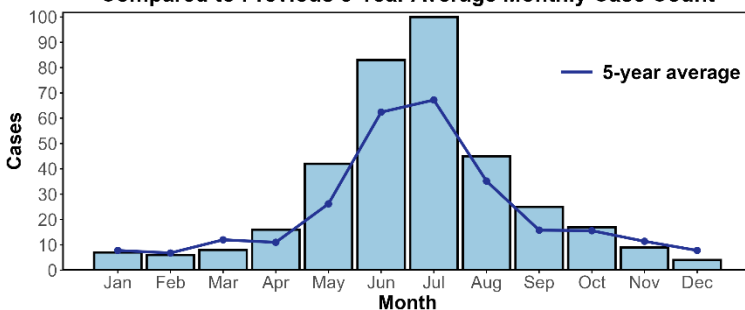
Confirmed and Probable Cases of Lyme Disease and Rates of Lyme Disease Per 100,000 Residents in NC, 2006-2025



*Rate calculated per 100,000 residents

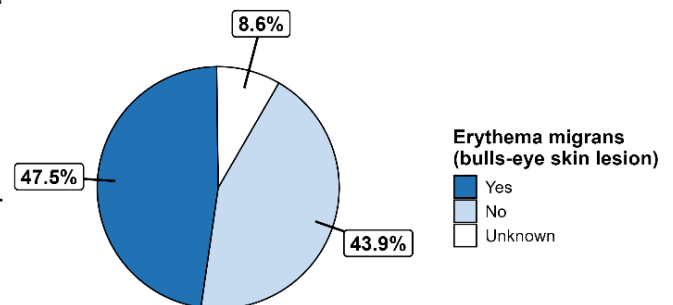
Lyme disease cases and rates have significantly increased in NC over the past 20 years. A decline in reported Lyme disease cases was observed from 2021 to 2024, likely due to a change in the surveillance case definition in 2022. Additionally, with greater adoption of the modified Two-Tier Testing (mTTT), most reported Lyme disease cases have been classified as confirmed rather than probable since 2022. Notably, the number of confirmed Lyme disease cases rose sharply in 2025 compared with 2024. This may be due to increased disease recognition and testing but could also demonstrate increased transmission.

2025 NC Lyme Disease Cases by Month of Illness Onset, Compared to Previous 5-Year Average Monthly Case Count



Lyme disease cases were reported throughout 2025, with a peak in July – one month later than the June peak observed in 2024.

2025 NC Lyme Disease Cases by Reporting of Erythema Migrans Rash (N = 366)

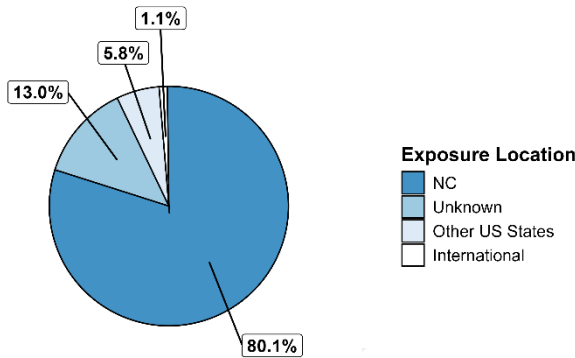


In 2025, about 48% of NC Lyme disease cases reported the erythema migrans (EM) rash, an early symptom that typically occurs in 70-80% of cases. This may reflect either the absence of an EM rash or the failure to recognize the EM rash.

⁷Mokashi NV et al. Spatiotemporal patterns of Lyme disease in North Carolina: 2010–2020. *Lancet Reg Health Am.* 2024; 35. <https://doi.org/10.1016/j.lana.2024.100792>

Lyme disease

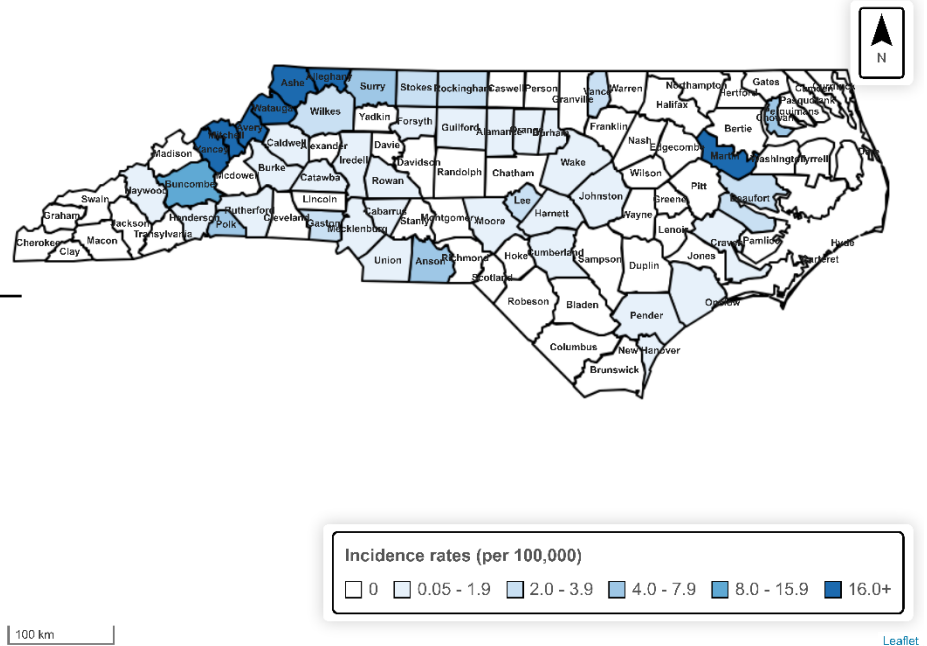
Reported Location of Exposure Among Lyme Disease Cases in NC 2025
(N = 366)



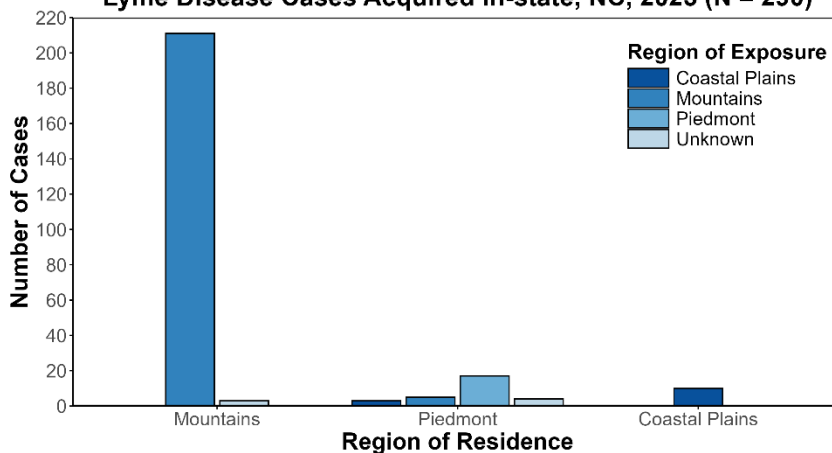
Approximately 80% of reported Lyme disease cases in 2025 were likely acquired in NC, based on patient travel histories. About 6% of cases were likely acquired out of state, a decrease from 12% in 2024. There were a small number of cases (1.1%) suspected to have been acquired internationally.

In 2025, Lyme disease was reported in 44 counties, mainly in the northwestern region near Virginia and Tennessee. **Yancey, Alleghany, Mitchell, Martin, and Watauga** counties had the highest incidence rates. In 2025, county-level incidence ranged from 0.3 cases per 100,000 in **Durham** to 305.4 cases per 100,000 in **Yancey**. Notably, **Yancey, Alleghany, Watauga, and Ashe** Counties saw their case numbers more than double from 2024 to 2025.

Lyme Disease Incidence by County in NC, 2025



Region of Residence and Region of Reported Exposure Among Lyme Disease Cases Acquired In-state, NC, 2025 (N = 290)



Most of the 290 locally acquired Lyme disease cases in NC occurred among residents of the Mountains region, where high densities of blacklegged ticks with elevated *B. burgdorferi* infection rates increase exposure risk.⁸ Although Lyme disease risk is highest in the Mountains, locally acquired cases occur across all regions of the state. Most of the cases reported were exposed in their region of residence.

⁸Garshong RA et al. Expanding range of *Ixodes scapularis* Say (Acari: Ixodidae) and *Borrelia burgdorferi* infection in North Carolina counties, 2018–2023. *PLOS One*. 2025; 20(8): e0329511.

Lyme disease

2025 Annual Summary Key Points

Annual Summary					
	2021	2022	2023	2024	2025
Cases	347	283	234	257	366
Rate*	3.28	2.64	2.15	2.32	3.27
Case Statistics, 2025					
Sex	Category	Cases	%	Rate*	
	Female	158	43.65	2.80	
	Male	204	56.35	3.84	
Age Group	Category	Cases	%	Rate*	
	<5 yrs	5	1.39	0.81	
	5 – 17 yrs	60	16.62	3.44	
	18 – 24 yrs	24	6.65	2.38	
	25 – 34 yrs	28	7.76	1.92	
	35 – 44 yrs	34	9.42	2.41	
	45 – 64 yrs	114	31.58	4.17	
	65 – 84 yrs	95	26.32	5.31	
	85+ yrs	1	0.28	0.54	
Race	Category	Cases	%	Rate*	
	White	229	63.26	1.49	
	Black or African American	7	1.93	0.14	
	American Indian/Alaskan Native	0	0.00	0.00	
	Asian or Pacific Islander	1	0.28	0.11	
	Multiple Races	2	0.55	0.33	
	Other or Unknown	123	33.98	NA	
Hispanic Ethnicity	Category	Cases	%	Rate*	
	Yes	12	3.31	0.45	
	No	94	26.97	0.48	
	Unknown	256	70.72	NA	
Hospitalization	Category	Cases	%	Rate*	
	Yes	24	6.63	NA	
	No	330	91.16	NA	
	Unknown	8	2.21	NA	
Death	Category	Cases	%	Rate*	
	Yes	0	0	NA	
	No	355	98.07	NA	
	Unknown	7	1.93	NA	

*Rate calculated per 100,000 residents

- North Carolina saw a notable increase in Lyme disease cases in 2025, with an incidence rate of 3.3 cases per 100,000 residents, compared to 2.3 cases per 100,000 residents in 2024.
- More males were reported with Lyme disease than females, a pattern also observed in 2024.
- Lyme disease typically affects adults aged 45 to 84, with over half of the 2025 cases occurring in people over 45. Cases were also reported across all age groups, although the incidence rates were lower.
- Most cases were reported among white NC residents (63.2%), consistent with data from 2024. White residents had an incidence rate of 1.49 cases per 100,000 residents – more than 4.5 times higher than rates in other racial groups.
- 27% of cases were reported among non-Hispanic individuals, while ethnicity was unknown among over 70% of reported cases. Incidence rates among Hispanic and non-Hispanic NC residents were similar.
- In 2025, no Lyme disease-related deaths were reported; however, 6.6% of cases needed hospitalization. Quick diagnosis and treatment are vital to avoid severe illness.

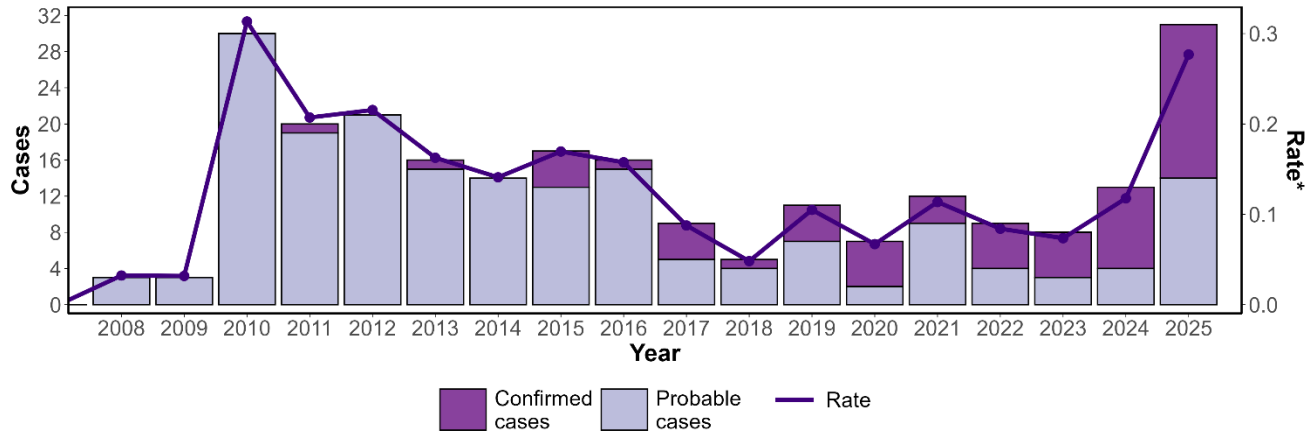
Anaplasmosis

2025 Key Points

- Reported anaplasmosis cases increased significantly from 13 in 2024 to 31 in 2025.
- Over half (51.6%) of the reported cases in 2025 were locally acquired in NC.
- Most cases of anaplasmosis were reported between July and August 2025.

Anaplasmosis is a disease caused by the bacterium *Anaplasma phagocytophilum*. In NC, it is transmitted by the blacklegged tick (*Ixodes scapularis*). Early symptoms are often mild and nonspecific, such as fever and muscle aches. If left untreated, the infection can lead to more serious health problems.

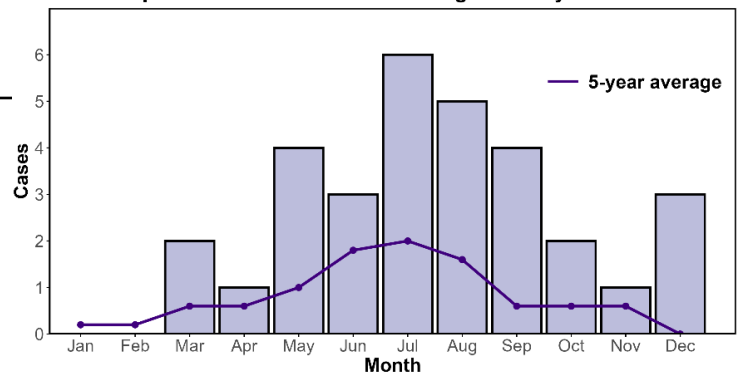
Confirmed and Probable Cases of Anaplasmosis and Rates of Anaplasmosis Per 100,000 Residents in NC, 2006-2025



*Rate calculated per 100,000 residents

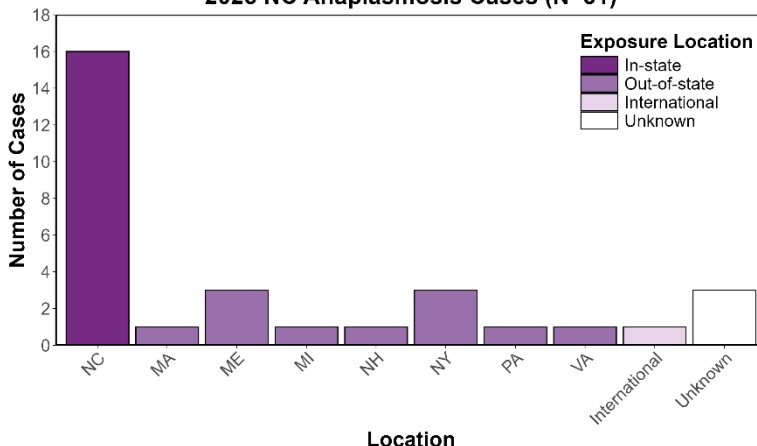
Historically, anaplasmosis has been rarely reported in NC, with 30 or fewer cases identified annually since it became reportable in 2008, and fewer than 15 cases each year since 2017. However, reported cases rose sharply from 2024 (n=13) to 2025 (n=31). This increase highlights the importance of ongoing surveillance. A change to the surveillance case definition in 2024 may partly explain the rise in reported cases.

2025 NC Anaplasmosis Cases by Month of Illness Onset, Compared to Previous 5-Year Average Monthly Case Count



In 2025, anaplasmosis cases were reported from March through December, with the highest number of cases in July. The five-year average peaked in July as well.

Location of Most Likely Exposure Among 2025 NC Anaplasmosis Cases (N=31)

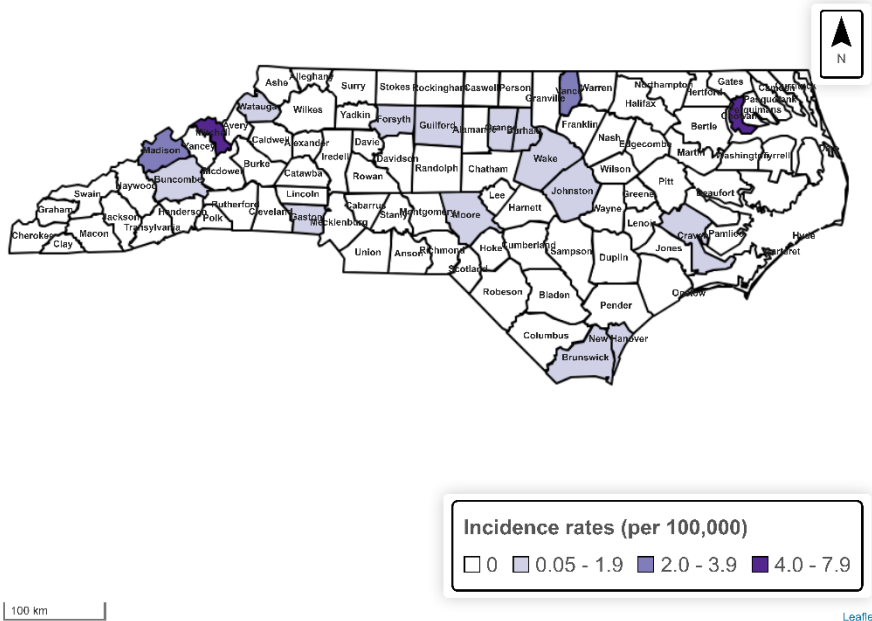


Over half (~52%) of reported anaplasmosis cases in 2025 were likely contracted in NC. Based on travel histories, about 36% of cases were likely acquired out of state, most commonly from the Northeastern U.S., and a few from Midwestern states where anaplasmosis is endemic. A small number of cases were suspected to have been acquired internationally (3.2%).

Anaplasmosis

In 2025, anaplasmosis cases were reported in 17 counties across NC, with the highest incidence in the Mountains region. **Chowan, Mitchell, Madison, Vance, and Watauga** had the highest rates of anaplasmosis in NC. The incidence ranged from 0.16 per 100,000 in **Wake** County to 7.2 per 100,000 in **Chowan** County.

Anaplasmosis Incidence by County in NC, 2025



Annual Summary					
	2021	2022	2023	2024	2025
Cases	12	9	8	13	31
Rate*	0.11	0.08	0.07	0.12	0.28
Case Statistics, 2025					
Sex	Category	Cases	%	Rate*	
	Female	7	22.58	0.12	
	Male	24	77.42	0.45	
Age Group	Category	Cases	%	Rate*	
	< 5yrs	0	0.00	0.00	
	5 – 17 yrs	2	6.45	0.11	
	18 – 24 yrs	2	6.45	0.20	
	25 – 34 yrs	3	9.68	0.21	
	35 – 44 yrs	2	6.45	0.14	
	45 – 64 yrs	6	19.35	0.22	
	65 – 84 yrs	14	45.16	0.78	
	85+ yrs	2	6.45	1.08	
Race	Category	Cases	%	Rate*	
	White	25	80.65	0.16	
	Black or African American	0	0.00	0.00	
	American Indian/Alaskan Native	0	0.00	0.00	
	Asian or Pacific Islander	0	0.00	0.00	
	Multiple Races	0	0.00	0.00	
	Other or Unknown	6	19.35	NA	
Hispanic Ethnicity	Category	Cases	%	Rate*	
	Yes	2	6.45	0.07	
	No	16	51.61	0.08	
	Unknown	13	41.94	NA	
Hospitalization	Category	Cases	%	Rate*	
	Yes	10	32.26	NA	
	No	21	67.74	NA	
	Unknown	0	0	NA	
Death	Category	Cases	%	Rate*	
	Yes	0	0	NA	
	No	31	100.00	NA	
	Unknown	0	0	NA	

Annual Summary Key Points

- The incidence of anaplasmosis in NC has remained consistently low since 2020, at about 0.1 cases per 100,000 people. However, in 2025, the rate rose to 0.28 cases per 100,000, potentially demonstrating increased transmission or improved recognition and diagnosis. A change to the surveillance case definition in 2024 may also have contributed to the increase.
- In 2025, over 75% of reported cases were among males, a trend also observed in 2024.
- The highest rates of anaplasmosis were observed among adults over the age of 64, a group at higher risk of severe illness than younger individuals.
- Over 80% of reported cases were among white residents of NC, although race was unknown in more than 19% of cases. Over half of the cases were non-Hispanic, but in about 40% of cases, ethnicity was unknown.
- In 2025, about one-third of reported anaplasmosis cases required hospitalization, and no deaths were reported.

*Rate calculated per 100,000 residents

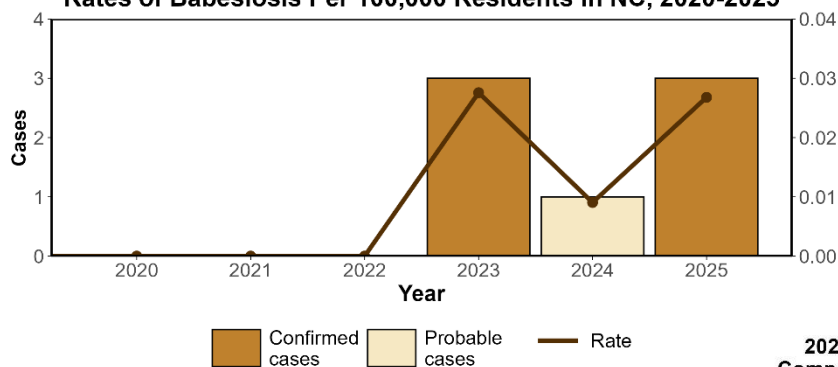
Babesiosis

2025 Key Points

- Babesiosis is a rare tickborne disease in NC, with fewer than four cases reported annually since 2020.
- In 2025, three cases of babesiosis were reported, up from a single case in 2024.
- All three cases in 2025 were reported mid-summer, during June and July.

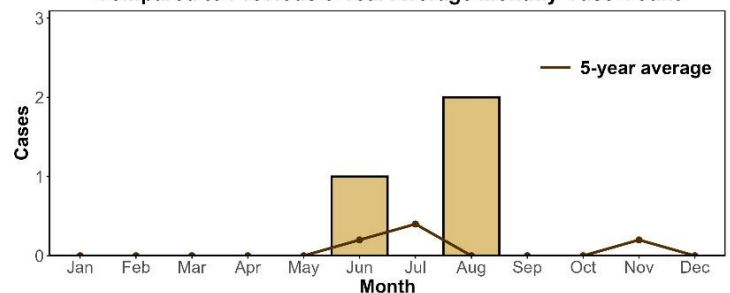
Babesiosis is a tick-borne disease caused by *Babesia* parasites. In the U.S., the most common *Babesia* species infecting humans is *B. microti*. *Babesia* species are transmitted by the blacklegged tick (*Ixodes scapularis*). The parasite damages red blood cells, which can lead to anemia. Many people may remain asymptomatic, while others experience mild flu-like symptoms such as fever, chills, and body aches. In some cases, especially among immunocompromised individuals, more severe symptoms can develop. Most U.S. cases of babesiosis are reported in the Northeast and Midwest regions.

Confirmed and Probable Cases of Babesiosis and Rates of Babesiosis Per 100,000 Residents in NC, 2020-2025



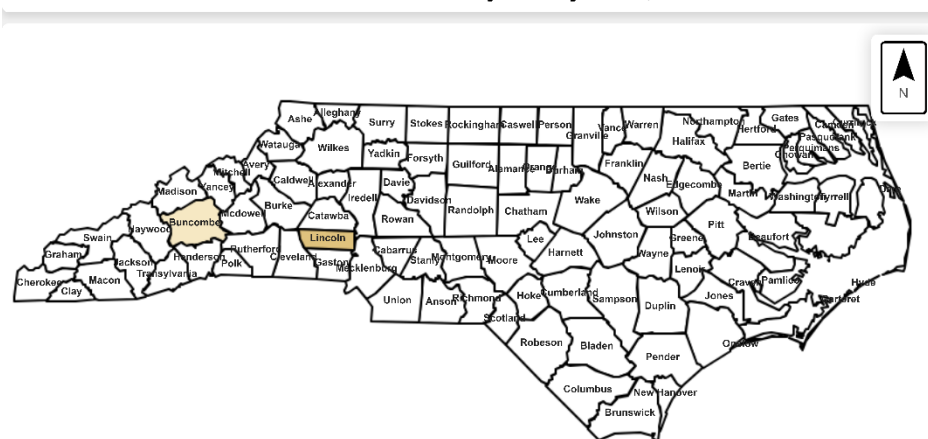
Babesiosis is a rare tickborne disease in NC, with seven cases reported since it became reportable in 2020. Three babesiosis cases were reported in 2025, an increase from 2024 but consistent with 2023.

2025 NC Babesiosis Cases by Month of Illness Onset, Compared to Previous 5-Year Average Monthly Case Count



In 2025, one babesiosis case occurred in June and two in August. In 2024 the single case was reported in November.

Babesiosis Incidence by County in NC, 2025



In 2025, babesiosis cases were reported from two counties: **Buncombe** (two cases) and **Lincoln** (1 case). In 2024, a single case of babesiosis was reported in **Mecklenburg** County.

Incidence rates (per 100,000)



Blacklegged tick (*Ixodes scapularis*) Surveillance

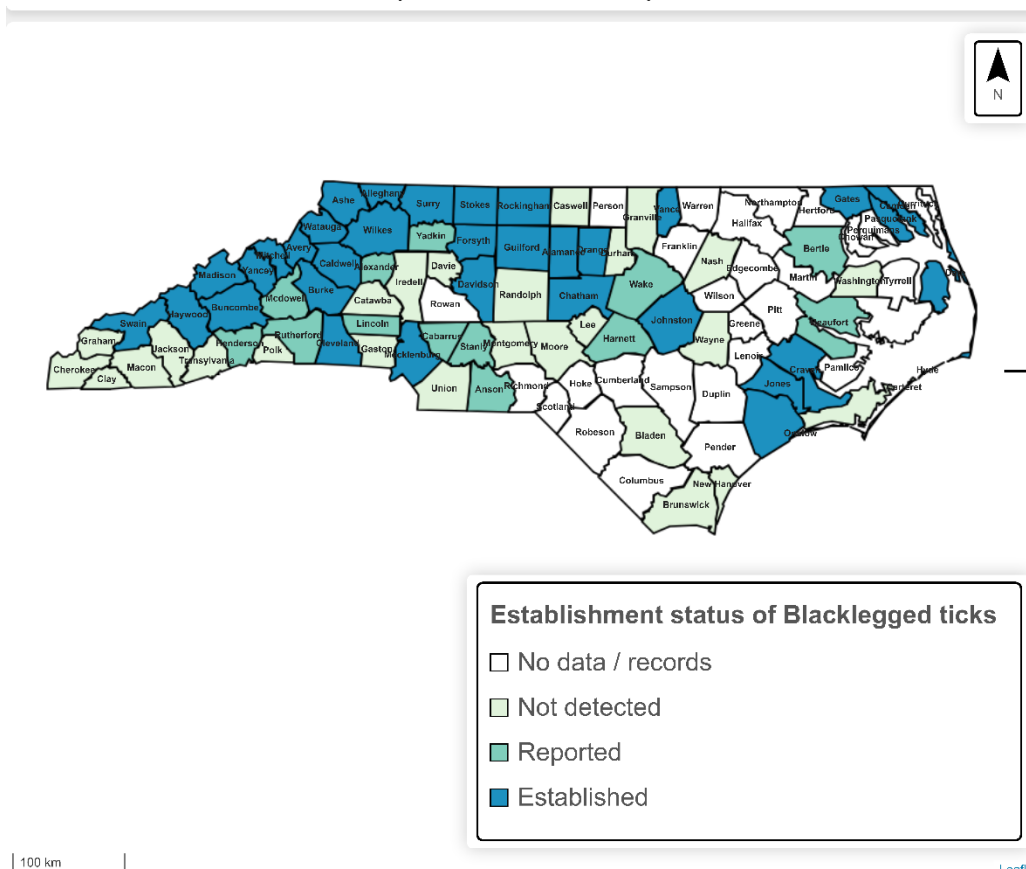
2025 Key Points

- 186 blacklegged ticks were collected through active surveillance. Two counties were newly identified as having ^aestablished populations, and a new population was ^breported in one
- 98 blacklegged ticks collected through active surveillance were tested for pathogens. Only *B. burgdorferi* was detected in adult ticks collected from **Gates County**.
- Passive surveillance collected 12 adults from 7 counties, with blacklegged tick submissions from two new counties.

Blacklegged ticks are frequently found in western NC but also occur in other parts of the state. They can be found in various habitats but are common in shady, wooded areas with abundant leaf litter. Adults are most active in NC during fall and spring, nymphs are active throughout the summer, and larvae are active from mid- to late summer. Only adults and nymphs transmit the pathogens discussed in this surveillance summary.



Blacklegged Ticks (*Ixodes scapularis*) Establishment Status in NC, 2004 - 2025 (Active Surveillance)



Among the 72 counties with active surveillance, 33 (45%) had ^aestablished blacklegged tick populations, and 13 (18%) had ^breported blacklegged ticks. In 2025, 186 blacklegged ticks across all three life stages were collected. ^aEstablished blacklegged tick populations were detected in five of the 15 counties surveyed. **Cleveland** and **Pasquotank** counties had newly documented ^aestablished population in 2025. Additionally, **Cabarrus** County ^breported blacklegged ticks for the first time.

Leaflet

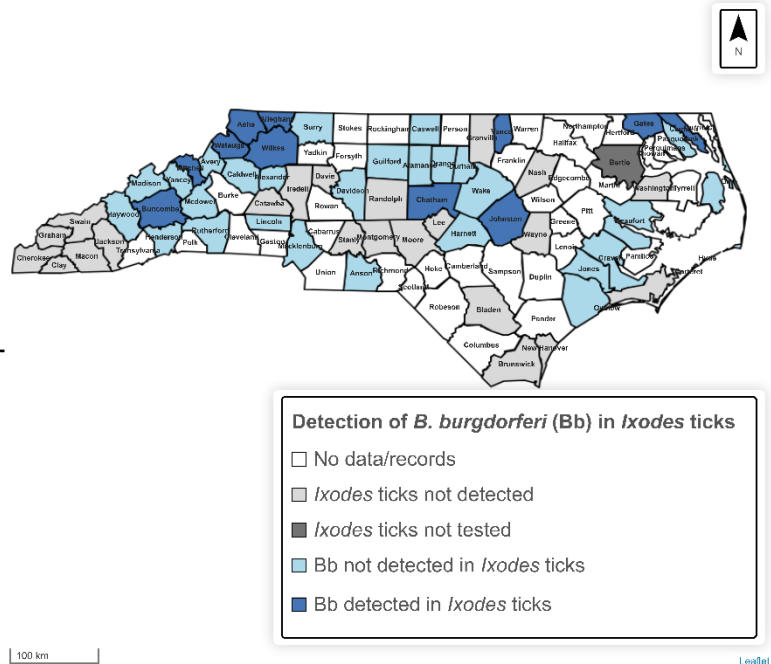
Blacklegged tick (*Ixodes scapularis*) surveillance

Tick Pathogen Testing Summary Key Points

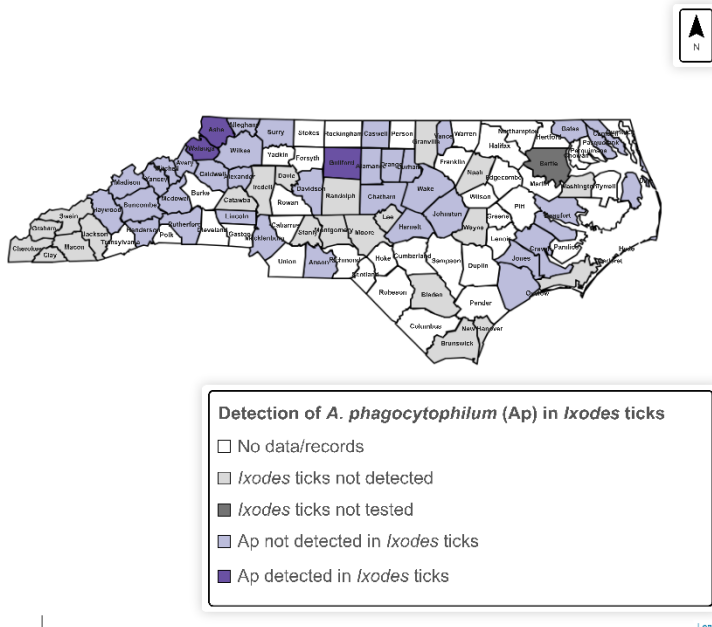
- Between 2004 and 2025, 412 adults and 1,099 nymphal blacklegged ticks were tested for *B. burgdorferi* (Lyme disease pathogen), *A. phagocytophilum* (anaplasmosis pathogen), and *B. microti* (babesiosis pathogen).
- Historically, most pathogen detections in blacklegged ticks were concentrated in western NC. This pattern may reflect higher tick densities in that region and more frequent active surveillance.
- B. microti* has not been detected in any of the blacklegged ticks tested.

Borrelia burgdorferi Detection in *Ixodes* Ticks in NC, 2004 - 2025 (Active Surveillance)

By 2025, *Borrelia burgdorferi*-infected blacklegged ticks had been detected from 11 counties across NC, with most detections occurring in western NC. In 2025, one infected tick was detected in **Gates County** among the 98 ticks tested. Furthermore, [additional surveillance conducted](#) by NC researchers in 2024 and 2025 showed a high prevalence of *B. burgdorferi*-infected blacklegged ticks in Buncombe County.



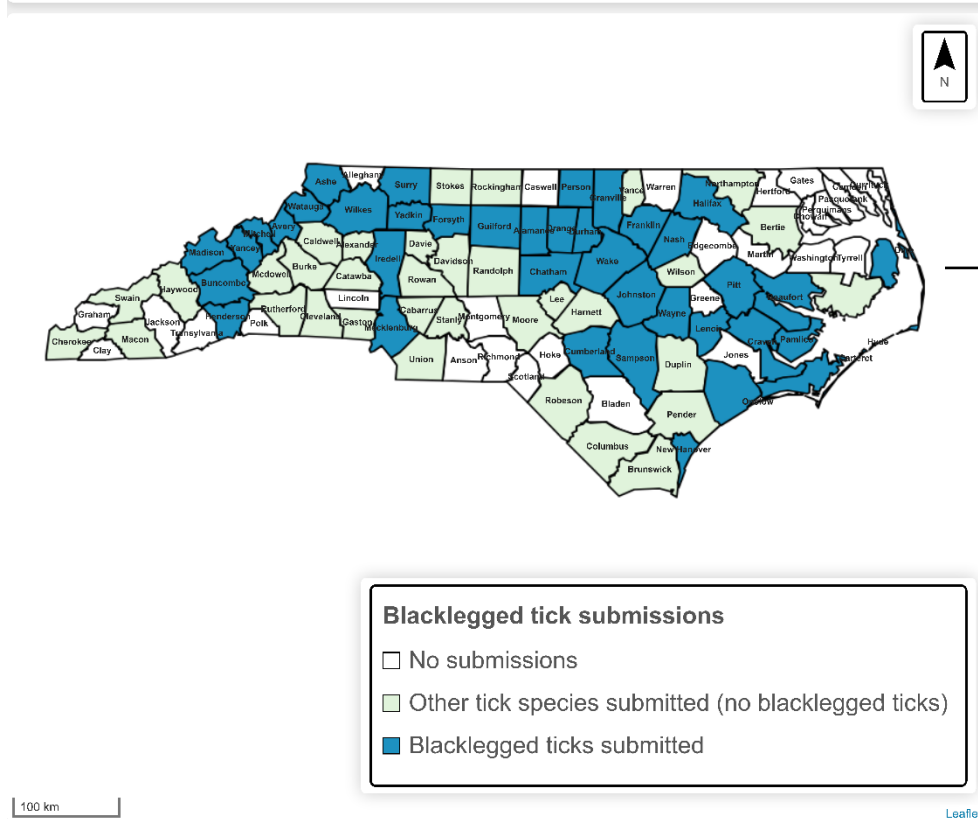
Anaplasma phagocytophilum Detection in *Ixodes* Ticks in NC, 2004 - 2025 (Active Surveillance)



Anaplasma phagocytophilum was identified in three counties, with two—**Ashe** and **Watauga**—in the northwestern corner of the state bordering Virginia and Tennessee. Both counties also had *Borrelia burgdorferi*-infected blacklegged ticks detected. In 2025, no *A. phagocytophilum* infected blacklegged ticks were detected.

Blacklegged tick (*Ixodes scapularis*) surveillance

Blacklegged Tick (*Ixodes scapularis*) Submissions in NC, 2018 – 2025 (Passive Surveillance)



As of 2025, blacklegged ticks were submitted from 38 of 72 counties that submitted at least one tick to the NC Tick ID program. From 2018 - 2024, a total of 248 blacklegged ticks across all three life stages were submitted, whereas in 2025, only 13 adult ticks were submitted from seven counties. In 2025, ticks were submitted from three counties (**Craven, Person, and Union**) where surveillance had not previously detected blacklegged ticks. Approximately 70% of the submitted blacklegged ticks were found on cats and dogs, with about 25% on wildlife and the other 5% on humans.

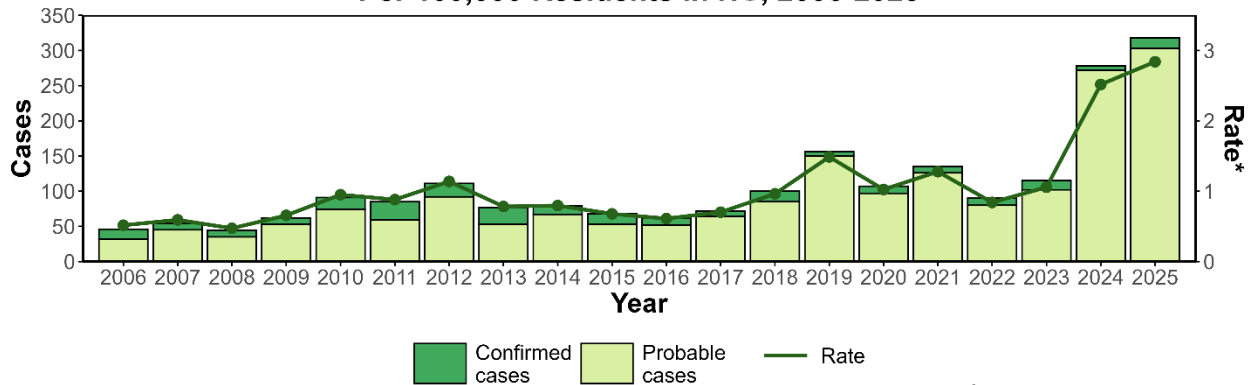
Ehrlichiosis

2025 Key Points

- Reported cases of ehrlichiosis increased significantly from 278 in 2024 to 318 in 2025.
- County-level incidence was highest in the upper Piedmont and Mountains
- 28% of cases were hospitalized, and two deaths were reported.

Ehrlichiosis is caused by related *Ehrlichia* bacteria, including *E. chaffeensis* and *E. ewingii*. These bacteria are transmitted through the bite of infected lone star ticks (*Amblyomma americanum*), which are common throughout NC. Early symptoms may be mild and nonspecific, including fever, chills, muscle aches, and rash. If untreated, the disease can worsen and lead to serious complications, such as neurological damage and organ failure.

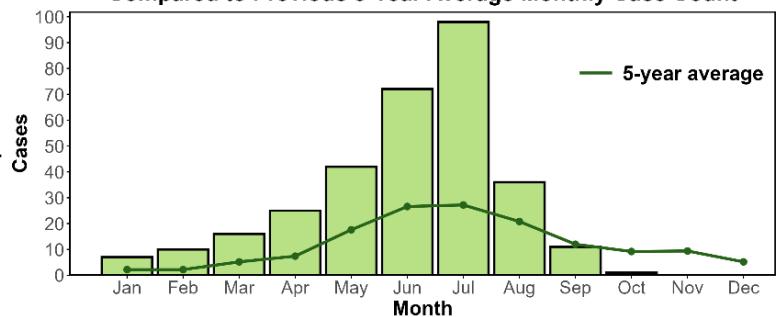
Confirmed and Probable Cases of Ehrlichiosis and Rates of Ehrlichiosis Per 100,000 Residents in NC, 2006-2025



*Rate calculated per 100,000 residents

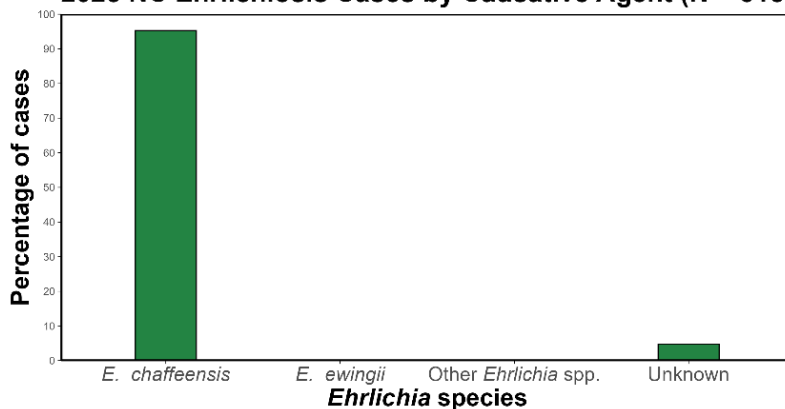
Cases of ehrlichiosis increased in NC from 2024 to 2025, reaching a 20-year peak. The sharp rise in cases in 2024 and 2025 compared with previous years is likely linked to the updated, less stringent surveillance case definition introduced in 2024. Because most cases are diagnosed based on evidence of elevated antibody levels in a single serum specimen, the majority are classified as probable rather than confirmed.

2025 NC Ehrlichiosis Cases by Month of Illness Onset, Compared to Previous 5-Year Average Monthly Case Count



Ehrlichiosis cases predominantly occurred during the summer months, peaking in July, consistent with the seasonality observed over the previous five years.

2025 NC Ehrlichiosis Cases by Causative Agent (N = 318)

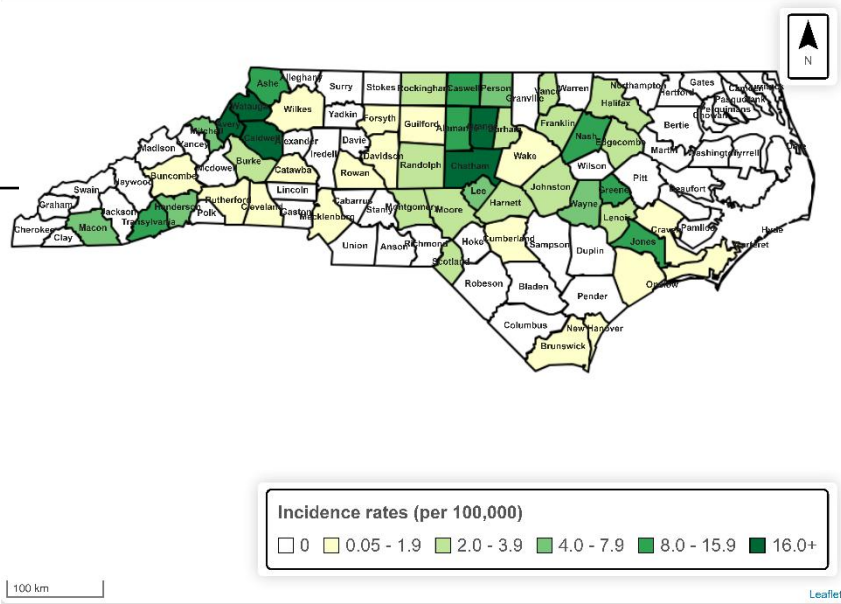


Several species of *Ehrlichia* bacteria can cause ehrlichiosis. In 2025, approximately 95% of reported cases were attributed to *E. chaffeensis*, with some cases involving unspecified *Ehrlichia* species. However, because most cases are diagnosed through serologic testing and there may be cross-reactivity between *Ehrlichia* species, misidentification of the causative agent is possible. In 2024, all reported cases were attributed to *E. chaffeensis*.

Ehrlichiosis

In 2025, ehrlichiosis cases were reported throughout NC, with a higher incidence concentrated in western and central NC. A similar pattern was observed in 2024. While this may suggest increased transmission in these areas compared to other parts of the state, it may also reflect improved recognition and diagnosis by health care providers in these regions.

Ehrlichiosis Incidence by County in NC, 2025



Annual Summary					
	2021	2022	2023	2024	2025
Cases	135	90	115	278	318
Rate*	1.28	0.84	1.06	2.52	2.84
Case Statistics, 2025					
Sex	Category	Cases	%	Rate*	
	Female	140	44.03	2.48	
	Male	178	55.97	3.35	
Age Group	Category	Cases	%	Rate*	
	< 5 yrs	2	0.63	0.32	
	5 – 17 yrs	17	5.35	0.98	
	18 – 24 yrs	26	8.18	2.58	
	25 – 34 yrs	36	11.32	2.47	
	35 – 44 yrs	53	16.67	3.75	
	45 – 64 yrs	96	30.19	3.51	
	65 – 84 yrs	83	26.10	4.64	
	85+ yrs	5	1.57	2.70	
Race	Category	Cases	%	Rate*	
	White	253	79.56	1.65	
	Black or African American	30	9.43	0.62	
	American Indian/ Alaskan Native	1	0.31	0.28	
	Asian or Pacific Islander	4	1.26	0.44	
	Multiple Races	0	0.00	0.00	
	Other or Unknown	30	9.43	NA	
Hispanic Ethnicity	Category	Cases	%	Rate*	
	Yes	24	7.55	0.90	
	No	275	86.48	1.41	
	Unknown	19	5.97	NA	
Hospitalization	Category	Cases	%	Rate*	
	Yes	89	27.99	NA	
	No	226	71.07	NA	
	Unknown	3	0.94	NA	
Death	Category	Cases	%	Rate*	
	Yes	2	0.63	NA	
	No	312	98.11	NA	
	Unknown	4	1.26	NA	

*Rate calculated per 100,000 residents

Annual Summary Key Points

- 2025 recorded the highest incidence rate of ehrlichiosis in NC over the past five years.
- Males accounted for 56% of reported 2025 cases and had a 1.4-fold higher incidence rate than females. This pattern was similar in 2024.
- Most cases (58%) occurred among adults ages 35 to 84. The incidence rate was highest in the 65-84-year age group, at 4.64 cases per 100,000 residents.
- Most cases occurred among white NC residents, whose incidence rate was at least 2.7 times higher than that of any other racial group. Ehrlichiosis was more common among non-Hispanic residents than among Hispanic residents.
- Approximately 71% of cases did not require hospitalization, while 28% were hospitalized.
- In 2025, there were two reported deaths from ehrlichiosis, down from four deaths in 2024.

Lone Star Tick (*Amblyomma americanum*) Surveillance

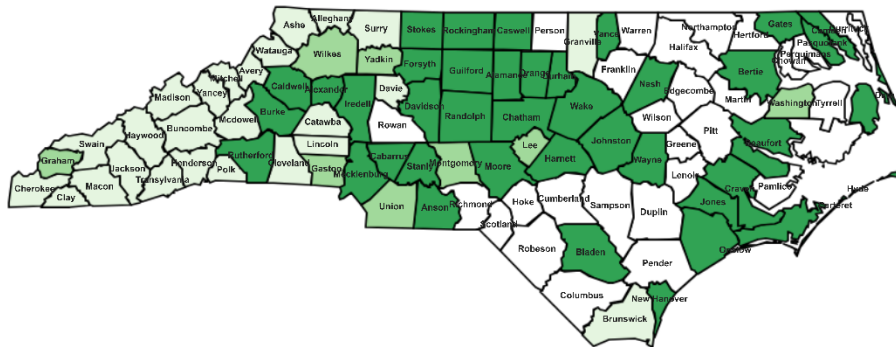
2025 Key Points

- 3,541 lone star ticks were collected through active surveillance. Two new counties were found to have ^aestablished lone star tick populations, and a new population was ^breported in **Gaston County**.
- Passive surveillance collected 72 adult lone star ticks from eight of the 18 counties that submitted ticks to the NC Tick ID program. No new county with lone star tick submissions was identified in 2025.

Lone star ticks are widespread in NC and across the Southeastern U.S. They are found in many environments, including wooded and grassy areas. They are significant vectors of various pathogens, including *Ehrlichia* spp. They are also linked to alpha-gal syndrome, a red meat allergy caused by bites from these ticks. All three life stages—adults, nymphs, and larvae – are active from late spring through summer.



Lone Star Tick (*Amblyomma americanum*) Establishment Status in NC, 2004 – 2025 (Active Surveillance)



Establishment status of lone star ticks

- ☐ No data / records
- ☐ Not detected
- ☒ Reported
- ☒ Established

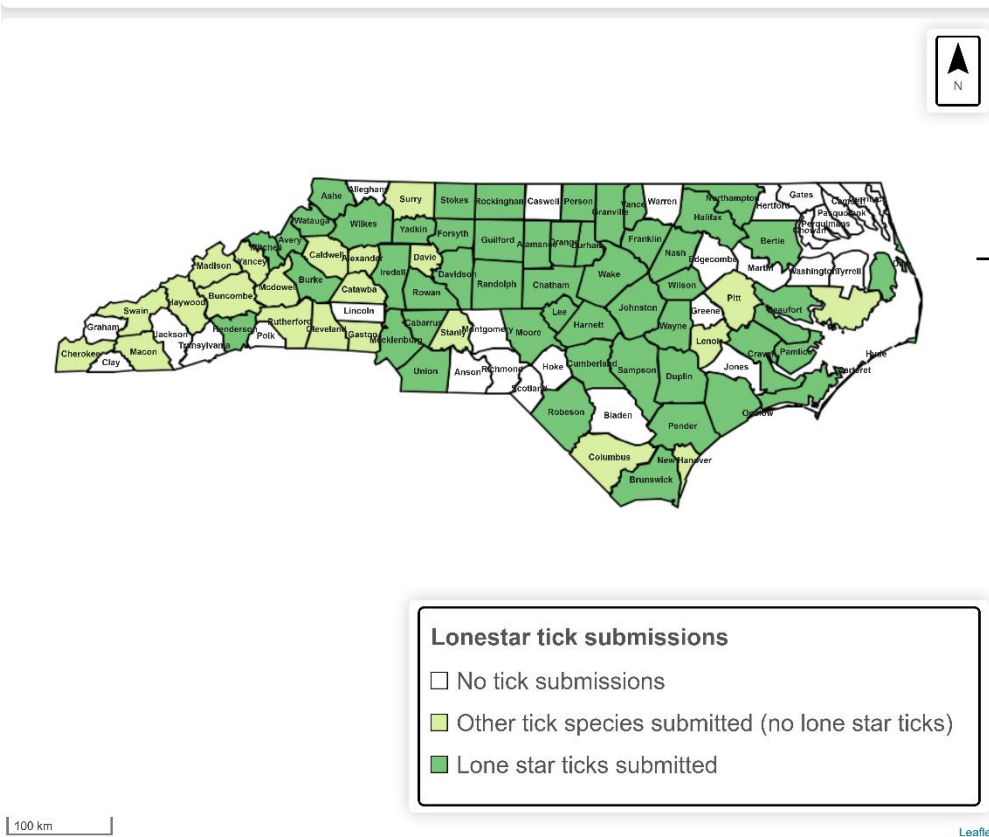
^aEstablished lone star tick populations are present in 47 of 72 (65%) NC counties where active surveillance was conducted. Additionally, ^aestablished populations were detected in 39 counties (~54%), and lone star tick populations were ^breported in eight counties (12%). In 2025, 3,541 lone star ticks across all three life stages were collected, and populations were detected in 11 of 15 counties where surveillance was conducted. Among these, **Cabarrus, Jones, Moore, and Pasquotank** counties documented newly ^aestablished lone star tick populations, while **Gaston** County ^breported lone star ticks for the first time.

100 km

Leaflet

Lone Star Ticks (*Amblyomma americanum*) Surveillance

Lone Star Tick (*Amblyomma americanum*) Submissions in NC, 2018 - 2025 (Passive Surveillance)



Lone star ticks were submitted from 50 of the 72 counties that submitted at least one tick for the NC Tick ID program. From 2018 - 2024, there were 1,400 lone star ticks across all three life stages submitted to the program, whereas in 2025, only 72 lone star ticks (adults and nymphs) were submitted from eight counties. Since 2018, most lone star ticks have been submitted from the Piedmont and Coastal regions of NC. As with blacklegged tick submissions, 72% of lone star ticks were found on cats and dogs, with about 22% on wildlife.

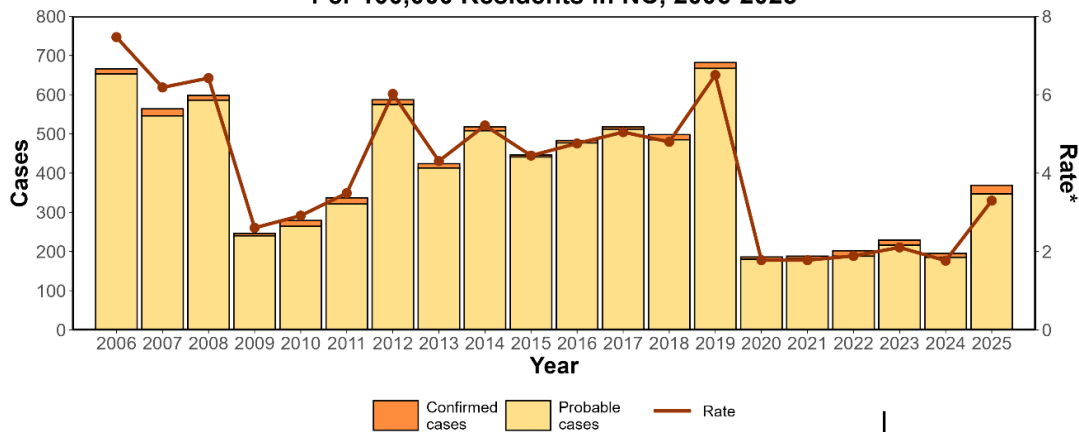
Spotted Fever Rickettsiosis (SFR)

2025 Key Points

- Reported cases of SFR increased significantly from 195 in 2024 to 360 cases in 2025.
- Cases were reported across all regions of the state.
- There were no reported deaths due to SFR, but about 21% of cases required hospitalization.

Spotted fever rickettsioses are a group of diseases caused by closely related bacteria in the genus *Rickettsia*. Rocky Mountain Spotted Fever (RMSF), caused by *Rickettsia rickettsii*, is the most severe of these illnesses, whereas infections with bacteria such as *R. parkeri* generally cause milder symptoms. In NC, the American dog tick (*Dermacentor variabilis*) is likely the primary vector for *R. rickettsii* transmission, and the Gulf Coast tick (*Amblyomma maculatum*) is the primary vector for *R. parkeri* rickettsiosis. Early RMSF symptoms, such as fever, headache, and muscle pain, are often nonspecific. A rash that often begins on the wrists and ankles and spreads across the body typically develops later in the course of illness. If untreated, RMSF can cause severe complications, including organ failure, making early detection and prompt antibiotic treatment vital. *R. parkeri* rickettsiosis usually presents with a dark scab (skin eschar) at the bite site, which may be followed by fever, headache, rash, and muscle aches. Historically, NC has been among the top five US states for SFR cases.

**Confirmed and Probable Cases of SFR and Rates of SFR
Per 100,000 Residents in NC, 2006-2025**

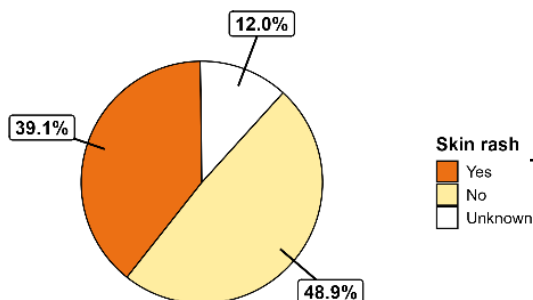


*Rate calculated per 100,000 residents

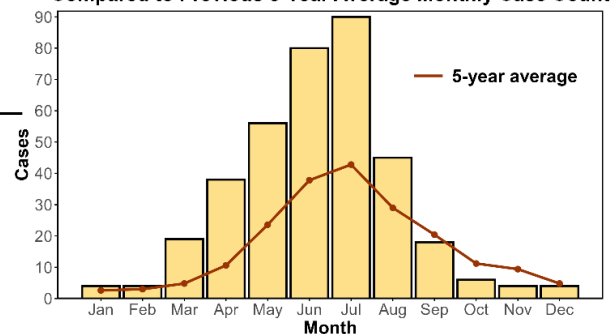
Reported cases of SFR have remained consistently lower since 2020 than in previous years. The decrease in reported cases in 2020 is likely due to a change in the surveillance case definition. In 2025, case counts increased significantly compared with the prior five years, which may reflect increased transmission or improved recognition and diagnosis by health care providers.

Although cases were reported throughout the year, 2025 SFR cases peaked in July, consistent with the previous five years. Cases consistently increase during the summer months, likely due to increased activity of American dog ticks and Gulf Coast ticks, as well as greater outdoor recreational activity.

2025 NC SFR Cases by Reporting of Skin Rash (N = 369)



**2025 NC SFR Cases by Month of Illness Onset,
Compared to Previous 5-Year Average Monthly Case Count**

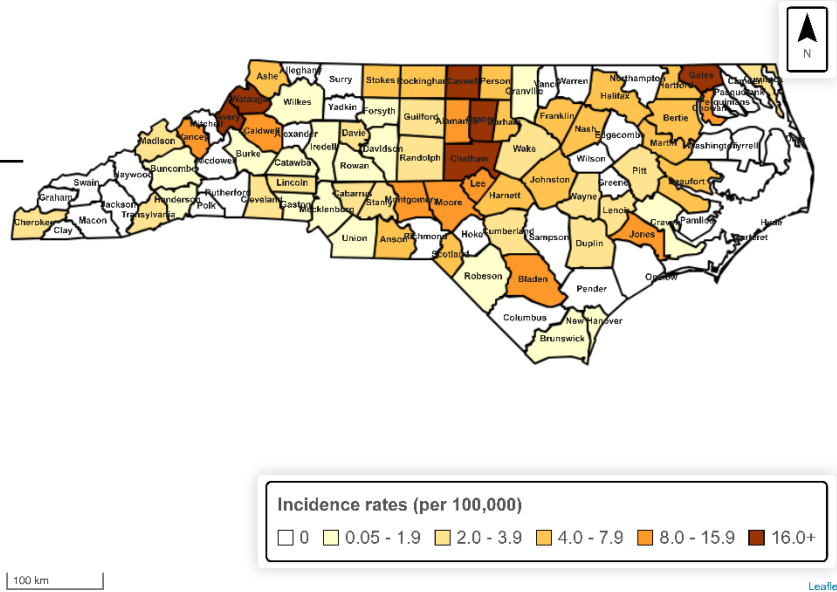


While a splotchy or pinpoint rash is a common symptom of RMSF and other spotted fevers, it was reported in only 39% of cases in 2025, with a similar pattern observed in 2024. This lower reporting rate may reflect clinicians not recognizing the rash, diagnosis occurring prior to rash onset, or incomplete reporting.

Spotted Fever Rickettsiosis (SFR)

SFR Incidence by County in NC, 2025

In 2025, as in 2024, the counties with the highest SFR incidence were **Chatham, Avery, Watauga, Orange, and Gates**. The county-level incidence ranged from 0.4 per 100,000 in **Union** to 39.3 per 100,000 people in **Chatham**. Cases were reported across all regions of the state.



Annual Summary					
	2021	2022	2023	2024	2025
Cases	188	202	229	195	369
Rate*	1.78	1.89	2.10	1.77	3.30
Case Statistics, 2025					
Sex	Category	Cases	%	Rate*	
	Female	140	38.15	2.48	
	Male	227	61.85	4.27	
Age Group	Category	Cases	%	Rate*	
	< 5yrs	1	0.27	0.16	
	5 – 17 yrs	22	5.98	1.26	
	18 – 24 yrs	19	5.16	1.88	
	25 – 34 yrs	60	16.30	4.11	
	35 – 44 yrs	47	12.77	3.33	
	45 – 64 yrs	138	37.50	5.04	
	65 – 84 yrs	78	21.20	4.36	
	85+ yrs	3	0.82	1.62	
Race	Category	Cases	%	Rate*	
	White	285	77.45	1.86	
	Black or African American	31	8.42	0.64	
	American Indian/ Alaskan Native	1	0.27	0.28	
	Asian or Pacific Islander	8	2.17	0.87	
	Multiple Races	2	0.54	0.33	
	Other or Unknown	41	11.14	NA	
Hispanic Ethnicity	Category	Cases	%	Rate*	
	Yes	25	6.79	0.94	
	No	246	66.85	1.27	
	Unknown	97	26.36	NA	
Hospitalization	Category	Cases	%	Rate*	
	Yes	77	20.92	NA	
	No	284	77.17	NA	
	Unknown	7	1.90	NA	
Death	Category	Cases	%	Rate*	
	Yes	0	0	NA	
	No	351	95.38	NA	
	Unknown	17	4.62	NA	

Annual Summary Key Points

- In 2025, the SFR incidence rate rose to 3.3 cases per 100,000 residents, the highest rate since the 2020 case definition change.
- The SFR incidence rate was 1.7 times higher among males than among females.
- Most cases occurred in adults 25 and older (88%), with the highest incidence among those aged 45–64 years.
- Most cases were among white NC residents (77%), consistent with 2024. However, the proportion of cases among Black or African American residents rose from 4.1% in 2024 to 8.4% in 2025. The incidence rate remained highest among white NC residents, at 1.86 cases per 100,000.
- About 67% of cases were not Hispanic, but ethnicity was unknown in more than a quarter of cases.
- In 2025, most cases (77%) did not require hospitalization, and no deaths were reported from SFR.

American Dog Tick (*Dermacentor variabilis*) Surveillance

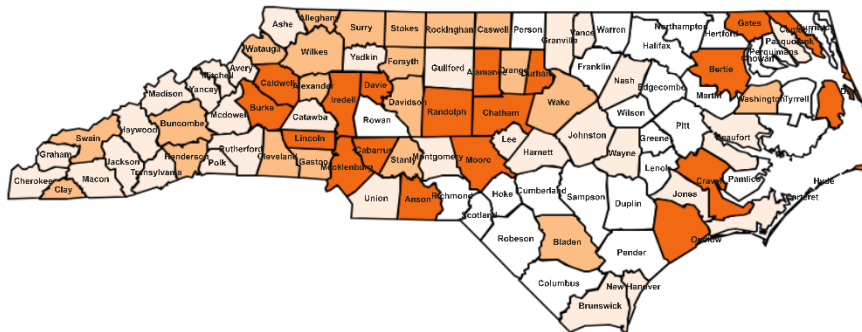
2025 Key Points

- 566 American dog ticks (adults and nymphs) were collected through active surveillance. Two new counties were found to have ^aestablished American dog tick populations, and new populations were ^breported in two additional counties.
- Passive surveillance collected 59 adult American dog ticks from 10 counties across NC, and 4 counties submitted American dog ticks for identification for the first time.

American dog ticks are widespread throughout NC and are found across the eastern US. They occupy many environments but are commonly found in grassy areas and around forest edges. Both adult and nymphal stages of American dog ticks can transmit the bacteria that cause various spotted fever rickettsioses, primarily Rocky Mountain spotted fever. All three life stages – adults, nymphs, and larvae – are active from late spring through summer. Of these, adult ticks are most frequently reported to bite people.



American Dog Tick (*Dermacentor variabilis*) Establishment Status in NC, 2004-2025 (Active Surveillance)



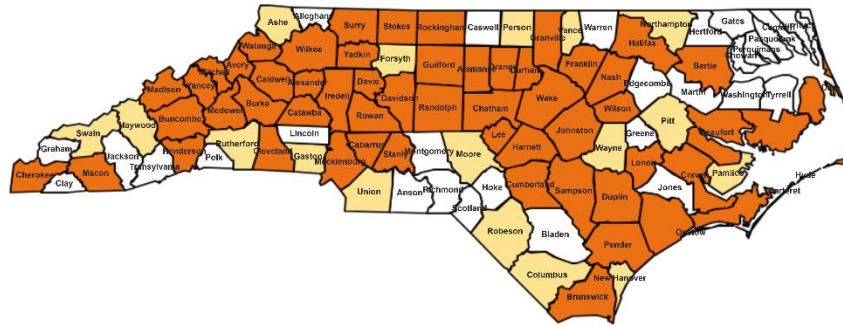
Establishment status of American dog ticks

- ☐ No data / records
- ☐ Not detected
- ☐ Reported
- ☒ Established

^aEstablished American dog tick populations were present in 19 of 72 (26%) counties across NC, while 21 (29%) counties had ^breported populations. A significant concentration of American dog tick populations occurs in the central Piedmont and Coastal regions. In 2025, 566 American dog ticks were collected from 10 counties, including two newly ^aestablished counties – **Moore** and **Randolph** – and two newly ^breported counties – **Cleveland** and **Gaston**.

American Dog Tick (*Dermacentor variabilis*) Surveillance

American Dog Tick (*Dermacentor variabilis*) Submissions in NC, 2018–2025 (Passive Surveillance)



American dog ticks (adults and nymphs) were submitted from 55 of the 72 counties that submitted at least one tick for the NC Tick ID program. Most ticks were found on dogs (~70%), while ~17% were found on wildlife.

American dog submissions

- ☐ No tick submissions
- ☐ Other tick species submitted (no American dog ticks)
- ☒ American dog ticks submitted

100 km

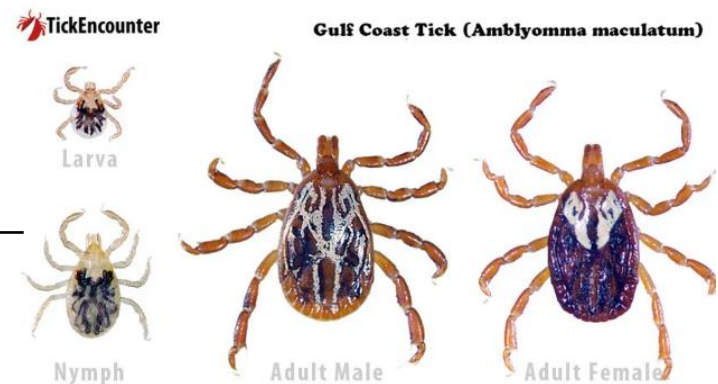
Leaflet

Gulf Coast Tick (*Amblyomma americanum*) Surveillance

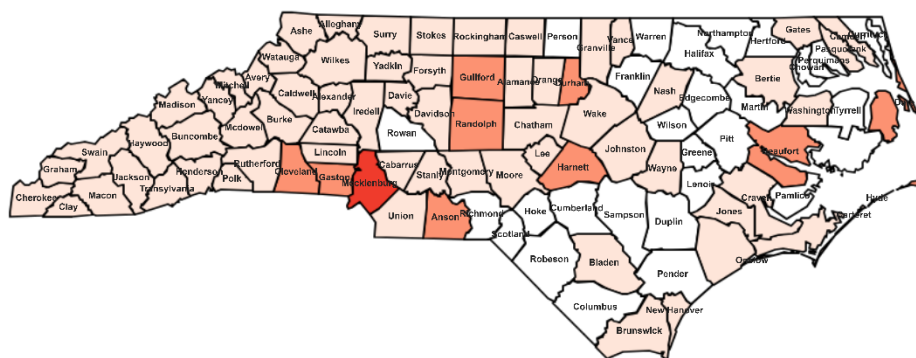
2025 Key Points

- Five Gulf Coast ticks (adults and nymphs) were collected from four out of the 15 counties where active surveillance was conducted. While no ^aestablished populations were detected, four counties had newly ^breported populations.
- Through passive surveillance, 69 adult Gulf Coast ticks were submitted from four counties to the NC Tick ID program.

Gulf Coast ticks (*Amblyomma maculatum*) are common along the Atlantic Coast. In NC, they are especially prevalent in Coastal counties, but their populations have since expanded into inland areas. Like the American dog tick, Gulf Coast ticks are typically found in grassy areas such as meadows and pastures, as well as forest edges. All three life stages – adults, nymphs, and larvae – feed on different hosts. Adult ticks can bite humans and transmit *R. parkeri* rickettsiosis, a form of spotted fever rickettsiosis. While most adults feed on cattle, the immature stages mainly feed on rodents and are rarely found on people. Adult ticks are commonly active June – October while the immature stages are typically active December – March.



Gulf Coast ticks (*Amblyomma maculatum*) Establishment Status in NC, 2004–2025 (Active Surveillance)



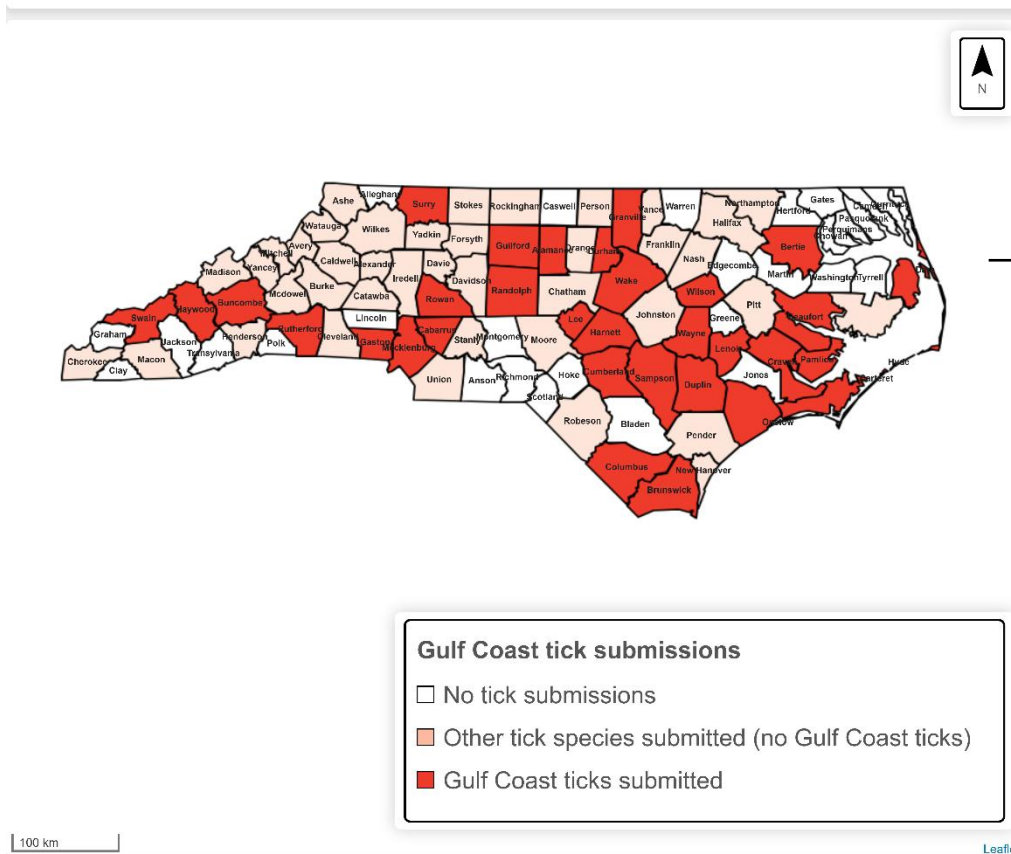
Establishment status of Gulf Coast ticks

- ☐ No data / records
- ☐ Not detected
- ☐ Reported
- ☒ Established

Active surveillance has collected a total of 1,370 Gulf Coast ticks across all three life stages from ten of the 72 counties (~14%) where surveillance was conducted, primarily in NC's Piedmont and Coastal regions. There is only one county, Mecklenburg, with an ^aestablished population of Gulf Coast ticks. In 2025, only five Gulf Coast ticks were collected from four counties—**Cleveland, Dare, Gaston, and Randolph**—all of which are newly ^breported for Gulf Coast ticks.

Gulf Coast Tick (*Amblyomma americanum*) Surveillance

Gulf Coast Ticks (*Amblyomma maculatum*) Submissions in NC, 2018–2025 (Passive Surveillance)



294 Gulf Coast ticks (adults and larvae) were submitted from 31 of 72 counties that submitted at least one tick to the NC Tick ID program. Most submissions came from the Coastal regions, where these ticks are commonly found. In 2025, 69 Gulf Coast ticks were submitted from four new counties – **Craven**, **Mecklenburg**, **Rowan**, and **Granville**. As of 2025, most submitted ticks were collected from wildlife hosts (~45%), while about 28% were collected from dogs.