



A red squirrel in Juneau has several ticks feasting on its blood. Note that the ticks are attached in places where it would be hard for the squirrel to remove them. (Courtesy Photo| Gus Van Vliet)

This October, think about blood-sucking ticks

This tick is very rare in Alaska, but that could change.

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I was recently shown two photos of local animals beset by ticks. One was a red squirrel, whose head and neck were laden with ticks (see photos); the other was a young porcupine with two similar-looking ticks next to an eye. That got me thinking about ticks: how they live, how they do what they do, as well as diseases they may carry.

The ticks in those photos belong to the genus *Ixodes*. They are probably *Ixodes angustus*, but one would need a close look at a specimen to make certain identification. This tick is native to Alaska; it is sometimes called a squirrel tick (but common names are confusing, often applied to more than one species), although it also occurs on other small mammals such as mice, voles and shrews. Another known native tick is called the hare tick (*Haemophysalis leporispalustris*), found on hares, rabbits and sometimes ground-feeding birds.

A typical life cycle for these ticks takes two years, but it sometimes takes longer. A female tick lays eggs on a host animal. The eggs hatch, producing a tiny four-legged juvenile, which molts into a slightly larger six-legged nymph, which then molts into a bigger eight-legged adult. No matter how many legs are present, the ticks feed on blood, often changing hosts between life-history stages. Female nymphs are reported to feed longer than males, and as adults, the females are said to blood-feed more than males, presumably to fuel egg production. *Ixodes angustus* is said to hang out in the nests of its hosts much of the time, but clearly they appear outside of nests when their hosts come out. In Alaska, a male was found mating with a female (and simultaneously parasitic on her!) that was feeding on a squirrel.

This tick (and several others) can carry and transmit Lyme disease, which is caused by a spirochaete bacterium called *Borrelia burgdorferi*. Lyme disease in humans is well-known and well-studied across North America. A number of confirmed cases are reported for Alaska, but they are thought to have come from outside the state when travelers (and their pets) return. This bacterium can also infect domestic animals such as dogs, cats, and horses. A human or other animal (including birds) can carry the bacterium without showing signs of illness, but sometimes very serious symptoms develop. Early treatment with antibiotics (which are effective against bacteria but not viruses) can be helpful. *Borrelia burgdorferi* in humans, deer, and domestic animals reportedly does not build up to high levels, so these critters are not good sources for further transmission of the organism. However, it can build up large populations in some wildlife hosts (mostly small mammals), so those wildlife species can serve as good sources for infecting a feeding tick and furthering transmission of the disease. However, despite the sometimes high populations of *Borrelia burgdorferi* in some wildlife species, in most cases there seems to be (surprisingly!) little effect on those hosts.

Ixodes ticks, hare ticks and other species of tick can also carry the tularemia bacterium, which transmitted to humans when they handle infected animals, such as hares and rodents. In addition, infection can occur from drinking water that has been in contact with an infected animal or eating under-cooked meat from an infected animal (or even from inhaling the bacterium after a mower has torn up a carcass, sending bits into the air!). So ticks are only one of the many ways to get infected with this unpleasant disease. Several instances of this disease in humans and hares are known from Alaska, mostly in the Interior. In addition to humans, domestic pets and wild animals can be exposed to the disease in the same ways and become very sick from this bacterium.

Ixodes ticks can also carry a nasty virus, called the Powassan virus. Many birds and mammals are reported to carry this virus, often without showing symptoms. In humans, it may sometimes cause serious central nervous system trouble, such as encephalitis or meningitis; there is no known treatment for the virus at this time (2018). It is considered to be an emerging public health problem in several parts of North America. Does it occur in Alaska? Possibly. The thing called Powassan virus is really two closely related, very similar strains of virus. One of them has been found in voles in central Alaska and might turn up in other small mammals, as it is known to do in other places. So far, it is not recorded from Southeast.

However, for various reasons including climate change, transport on domestic pets, etc., several non-native ticks have recently been found in Alaska. One of them (*Ixodes scapularis*, sometimes called the black-legged tick or deer tick) is a superb carrier of Powassan virus and is the main vector in some other parts of North America. At present, this tick is very rare in Alaska, but that could change. And if additional tick-borne diseases should reach Alaska, the native ticks are likely to become vectors too.

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• Mary F. Willson is a retired professor of ecology. “On The Trails” is a weekly column and appears every Friday. Her essays can be found online at onthetrailsjuneau.wordpress.com.

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