

THE IMPORTANCE OF PREDATORS

Animals that occupy the top of food chains are predators. These include here in NH. black bears, mountain lions, bobcats, lynx, coyotes, and humans. Predator populations may be controlled by three factors: Starvation, Disease, and Trauma, both intra-species and inter-species induced.

The wildlife predators are very important in controlling a wide variety of smaller animals that if left unchecked can present considerable problems for humans. Among these are a wide variety of rodents.

Rodents have very high reproductive capacity and form, as a group, the base of a large number of food chains. They are also hosts for a number of infectious agents that can be transmitted to other species via ticks and mosquitoes.

The white footed mouse, *Peromyscus leucopus*, is a very common rodent here in NH. And is host to some infectious agents that can be transmitted via ticks to many other species. Among these the Lyme spirochete, the cause of Lyme disease, *Rickettsia rickettsia*, the cause of Rocky Mountain Spotted fever which in spite of the name is also found on the East Coast and Anaplasmosis and ehrlichiosis to name a few. All of these agents may be transmitted by ticks and these ticks feed on white footed mice where they can acquire the agent because the white footed mice can be infected with these agents without experiencing disease itself. They and the ticks maintain the agents in nature. The types of ticks that transmit these organisms are collectively known as Hard Ticks, because of a hard exoskeleton. These ticks have life cycles that include three stages, larva, nymph and adult. Some of these are "one host ticks" that get on their host as larvae and feed on that individual for all three stages. *Dermacentor albipictus*, the winter tick, is of this type and it has been reported on moose in such numbers that the moose died from blood loss. Most of the hard ticks however are 3 host ticks, feeding on one individual as a larva then detaching from that host, dropping to the ground and molting to a nymph, then attaching to a second animal to feed, detach, molt to the adult and find a third individual to feed on as the adult stage. After the adult female tick feeds and mates with a male it detaches from the third host, drops to the ground and after a period will lay up to three thousand eggs. After she has laid her eggs she dies. The agents however may be transmitted to her eggs and the larvae that hatch from those eggs will be able to transmit the agent to the very first host they feed on. The agents noted above can also be transmitted from stage to stage, so if a tick is infected as a larva or a nymph the agent will pass on to the next stage. As you can see because of this stage to stage and ovarian transmission the amplification of infective ticks in an area may become quite high. Controlling tick vectors of these agents in the wild is not possible, but controlling the rodent hosts of these agents is possible if we encourage predators to inhabit the area.

While predators feed on a wide variety of prey species coyotes and bobcats have been reported to consume a large number of rodents during a single year, here in NH the white footed mice, voles and field mice are abundant and form a good deal of the prey species used by these predators. I have seen a coyote catch and consume 4 voles in less than 30 minutes. Each mouse and vole eaten is one less to provide a host for the ticks and the tick transmitted agent.

The Public Health Dept here in NH warns people every year about Lyme disease and tick vector exposure. It can be a serious infection in humans as can ehrlichiosis and anaplasmosis. By encouraging predator populations of bobcats and coyotes to flourish we can use these animals to control the primary hosts of these disease causing agents thus interfering with the reproductive success of the agent. Smaller rodent populations means fewer hosts to support the agent, fewer rodents means the ticks will have to feed on other wild life, many of which do not support the disease agents of concern. The fewer ticks feeding on infective mice the fewer ticks infected and the less transmission of these agents is going to occur. Parasites, whether they are viruses, bacteria, protozoa, or helminthes do not survive because they produce disease, they survive because they have developed life cycles that makes them REPRODUCTIVELY successful. Break that life cycle and the parasite cannot reproduce. Predators can help to break the cycles of a large number of disease agents that involve rodents and ticks. Therefore predators are worth protecting.

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Enfield Conservation Commission