The Trickle-Down Effect of Forest Fragmentation:

How Fragmented Forests Increase the Spread of Lyme Disease within The Land Between

By MaryJane Proulx

The Land Between is a rich ecotone, holding an abundance of glittering lakes, rivers, fens, wetlands, granite ridges and forests. The resources and diversity of the region provide key services and shelter to many different species. Despite the valuable ecological benefits that The Land Between ecotone embodies, it is becoming endangered and threatened by habitat and forest fragmentation. Forest fragmentation is defined as "the breaking of large forested areas into smaller pieces of forest, typically separated by roads, agriculture, or other human development" (Northern Woodlands, 2019). An obvious impact of forest fragmentation includes the loss of biodiversity through habitat isolation resulting in decreased forest health. Increasing development pressures within The Land Between and expanding back country lots has resulted in forest fragmentation as realtors and cottagers

FIGURE 1 THE WHITE-FOOTED DEER MOUSE IS A PROMINENT CARRIER OF LYME DISEASE AND THRIVES IN ISOLATED HABITATS (SOURCE: GLOBAL LYME ALLIANCE)

scramble to eat up the last bits of forest. This has resulted in a decrease in wildlife corridors allowing for animal movement, migration, and dispersal. One of the consequences that makes The Land Between particularly vulnerable is the spread of pathogens in host populations.

More specifically, the number of mammalian hosts for zoonotic infections, such as Lyme disease, increases with species richness among mammals. Thus, as developments increase, human encroachment into species-rich habitats may increase exposure to these diseases. The University of Minnesota notes that "habitat fragmentation may promote disease outbreaks". From a disease control perspective, the study results suggest that the desirable level of habitat connectivity will vary for specific host-pathogen systems. White-footed mice, which are a prominent species of The Land Between, and main carrier of Lyme disease, are particularly abundant in fragments smaller than five acres (Society for Conservation Biology, 2003). Increased white-footed mice leads to increased concentrations of black-legged ticks, which are most likely to spread the disease through human contact. White-footed mice thrive in isolated habitats, meaning that fragmented forests have the ability to increase population abundance and the spread of Lyme disease.

There are actions that can be taken to respond to the threat of forest fragmentation within The Land Between:

- Protect existing high-quality wildlife greenspace
- Manage and improve degraded greenspace
- Restore sites of particular value that have been destroyed (such as wetlands)
- Avoid fragmenting habitats or forests through developments
- Reach out to your municipality to voice your concerns

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