

Detecting the spread of invasive mosquitoes and disease potential in Nova Scotia

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Shorter, warmer winters linked to climate change in Nova Scotia are inviting the northward expansion of non-native mosquito species and the diseases that they vector. To mitigate the health impacts of mosquito-borne disease, and to understand the ecosystem impacts of these invasions, we must establish regular monitoring of mosquito populations. Using traditional and molecular surveillance methods, alongside vector prediction tools, we can identify at-risk areas for vector-borne disease spread. To assess current risk from mosquitoes in Nova Scotia, we sampled adult mosquitoes using CDC light traps and collected mosquito larvae across all ecozones. To determine if we could detect invasive mosquitoes solely by the presence of trace DNA in the environment, we collected water from larvae sampling sites and will use eDNA detection methods to screen for six species of known medical importance. Of the 4,370 mosquitoes collected using traditional trapping methods, we identified 29 species including four species not previously recorded in the province: *Culiseta minnesotae*, *Culiseta melanura* and *Culex salinarius* (both known vectors of Eastern Equine Encephalitis Virus and West Nile Virus), and *Toxorhynchites rutilus* (an extremely rare species seldom documented in Canada). We have also observed the province-wide expansion of *Aedes japonicus* since the initial detection of the species in Nova Scotia in 2008. Overall, the diversity of mosquitoes in Nova Scotia appears to be increasing, highlighting the potential for increases in vector-borne disease transmission as climate change progresses, furthering the need for continued monitoring.

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