# Establishment and Impact of the Hemlock Woolly Adelgid predator *Laricobius nigrinus* (Coleoptera: Derodontidae) in the Harrisville New Hampshire area.

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Two adults of the hemlock woolly adelgid (HWA) predator *Laricobius nigrinus* were first detected in the Harrisville New Hampshire area by RZ in June of 2024. Beetles were captured by beat sheet, photographed under a dissecting scope, and preserved in alcohol. The samples were positively identified by RCM in June of 2024 and confirmed by Dr. D. Mausel of the USDA Forest Service. It is possible these beetles had dispersed from prior work done by NH Forestry Service.

The Harrisville Conservation Commission (HW) then initiated work with *L. nigrinus* on this biocontrol project in 2024 with RCM after finding positive beetle presence in their area. In concert with the HCC, we have obtained permits and released over 8,000 beetles that were field collected in NC at a dozen sites in this area. Releases varied from 300 to over 1,000 beetles per site, depending upon the amount and extent of HWA populations. Winter kill of HWA during 2025-2026 in this area was approximately 60%, as the HWA has adapted to this area and the climate of NH has warmed significantly in the past 20 years, making the entire hemlock ecosystem at risk from the HWA. Hemlocks comprise 25% to 50% co-dominant tree cover in this area.

Predation rate studies at release sites were performed by RCM, RZ, and HW during early June of 2026 in the Harrisville area (Table 1). Work was funded by Lee Barnes of the Barnes-Berry Trust. HWA-infested branches were collected from 11 different *L. nigrinus* release sites, labeled and placed into ziplock bags that were refrigerated until examination the same week as collection ($4^{th}$-$9^{th}$ June 2026).

We recorded the number of intact versus predator-torn HWA ovisacs, HWA eggs, and the presence of *L. nigrinus* eggs, larvae, cast skins and glowing orange frass under UV-A light (McDonald and Kok 2014). Our studies showed that peak HWA sistens egg production occured in the area when Rhododendrons/Azaleas are blooming. Two sites (10 &11) were examined initially and 50 intact ovisacs were dissected to determine an average number of HWA per ovisac; this was

found to be 35 eggs per intact ovisac and we found 7 *L. nigrinus* eggs in these samples.

All 11 examined sites were positive for the presence of *L. nigrinus* (Table 1). Of the 1,338 ovisacs examined, 1,306 were torn by predator activity, giving a 97.6% predation rate of ovisacs by L. nigrinus, and a 96.9% reduction in HWA eggs compared to intact ovisacs (0.99 versus 35 eggs/ovisac). Additionally, the adelgid populations at every one of these sites have driven into patch dynamics by L. nigrinus predator activity.

This is 3 years of positive recovery of beetles and beetle larvae in the area (2024-2026), showing that *L. nigrinus* beetles can establish and flourish in interior NH, contrary to the state's conventional narrative. We have shown that beetle releases are effective at establishment at all levels of HWA infestion, contrary to public statements by the NH Forest Service. We also have repeatedly proved that winter and Spring releases of *L. nigrinus* are just as effective, if not more so, than Fall releases, another counter to the narrative that only Fall releases of beetles are viable. We believe we are in the initial stages of a successful biocontrol program against HWA. Our group may make limited collections and redistribution of beetles in the Harrisvill area during the Fall of 2026.

**Table 1. Hemlock Woolly Adelgid ovisac predation rate study around Harrisville NH 4th-9th of June of 2026.** *Laricobius nigrinus* presence was detected at all 11 sites by the physical presence of beetle frass (orange)(McDonald & Kok 2014), beetle eggs, larvae, and larval cast skins. We have a 96.9% reduction in HWA eggs and over 97% of all ovisacs examined were torn from predation by *L. nigrinus* activity. Our data and visual observations at the release sites show that the HWA populations in and around these release sites are being driven into patch dynamics through predation by *L. nigrinus*. Average HWA egg count was 35 per ovisac (n=50). This was used to calculate predation rates and % HWA egg reduction.

| Site | L. nigrinus | Total Ovisacs | # Torn | # Intact | Actual Eggs | Theo Eggs | % egg Reduced | % Ovi Torn | Torn Egg Count |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 2L, 3CS | 202 | 200 | 2 | 105 | 7,070 | 98.5 | 99.0 | 0.225 |
| 2 | 4 CS | 240 | 238 | 2 | 156 | 8400 | 99.7 | 99.8 | 0.65 |
| 3 | 1 CS | 300 | 300 | 0 | 0 | 10,500 | 100.0 | 100.0 | 0.0 |
| 4 | + Frass | 150 | 139 | 11 | 431 | 5,250 | 91.7 | 92.6 | 3.1 |
| 5 | + Frass | 34 | 20 | 14 | 403 | 1,190 | 66.1 | 58.8 | 0.2 |
| 6 | + Frass | 43 | 40 | 3 | 146 | 1,505 | 90.3 | 93.0 | 1.025 |
| 7 | 1 Ln egg | 39 | 39 | 0 | 13 | 1,365 | 99.04 | 100.0 | 0.33 |
| 8 | 1 L | 164 | 164 | 0 | 37 | 5,740 | 99.4 | 100.0 | 0.225 |
| 9 | 2 CS | 166 | 166 | 0 | 30 | 5810 | 99.5 | 100.0 | 0.18 |
| 10 | 2 eggs | dispersal | | | | | | | |
| 11 | 5 eggs | dispersal | | | | | | | |
| Sum | | 1,338 | 1,306 | 32 | 1,321 | 43,830 | 96.9 | 97.6 | 0.99 |

**References:**

McDonald, R.C. and L.T.Kok, 2014. A Simple Method of Detecting Hemlock Woolly Adelgid (Hemiptera: Adelgidae) Predator Activity Using UV-A Light. J. Entomol. Sci. 49(2): 200-205 (April 2014).