COMPARISON OF *LARICOBIUS NIGRINUS* SAMPLING METHODS AND PREVALENCE IN NATIVE AND INTRODUCED HABITATS

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ABSTRACT

Beatsheet and branch clipping sampling were compared to determine which method best determined the presence or absence of *Laricobius nigrinus* Fender (Coleoptera: Derodontidae), which is being released for biological control of the hemlock woolly adelgid (HWA) (*Adelges tsugae* Annand) (Hemiptera: Adelgidae) in the eastern U.S. The total numbers of *L. nigrinus* adults collected with beatsheets or eggs and larvae by clipping branches of hemlock trees were recorded and compared with a χ^2 test or a paired t-test if abundant (n = 10 or 25). Branch clipping required the dissection of sistens HWA ovisacs to count the predator immature stages. Sites included forested release sites in Virginia, Tennessee, and North Carolina, and forested and urban forests in Washington State, within the predator's native range. *Laricobius nigrinus* presence was determined significantly more frequently or in greater absolute numbers with branch clipping than with beatsheets. At two urban forests in Washington *L. nigrinus* adults were collected from 88 and 96% of trees, eggs and larvae were collected from 100% of the trees; and eggs and larvae were collected from 44% of the ovisacs dissected. In the East, *L. nigrinus* was much less prevalent due to its recent release. In Washington, predator: prey ratios ranged from 1:2 to 1:3 in urban forests and 1:7 to 1:22 in natural forests. At release sites in the East, ratios ranged from 1:37 to 1:387. Beatsheets yielded false negatives for *L. nigrinus* presence in the East, and branch clipping is recommended. However, branch clipping required more time, and immature stages had to be identified to species by rearing, due to our inability to differentiate between *L. nigrinus* and *L. rubidus* immatures. Because each method has positive and negative aspects, we recommend using both methods at eastern release sites until *L. nigrinus* populations increase and beatsheet sampling successfully collects the predator.