

Hemlock Woolly Adelgid (*Adelges tsugae*) Life Cycle



sped-up springtime "progreadiens" generation



What to look for:

- White “woolly” masses resembling cotton balls along the underside of the branch where the needles connect to the stem (photo left)
- Best time of year to observe: December-April
- Removing the “wool” reveals adult adelgids (photo right) and/or eggs of the next generation (not pictured)



Don't be fooled by HWA Look-alikes:



A: Spider ovisac

B: Pine sap from an overhanging white pine

C: Oak skeletonizer on hemlock needle

D: Elongate hemlock scale *Fiorinia externa*

E: Froth from a spittle bug

F: Wool from white pine aphids blown from a neighboring tree

(Excerpt from 2006 FHTET "Standardizing Sampling for Detection & Monitoring of HWA in Eastern Hemlock Forests," by S. Costa & B. Onken; photo credits – D. Ouellette, Maine Forest Service, for A, B, C, and F; Eric R. Day, Virginia Polytechnic Institute and State University, www.forestryimages.org for D; and S. Costa, University of Vermont, for E).

Other Pests:



Larval gallery of hemlock borer. Forest Pest Alert. (Photo: USDA Forest Service)



Spider mite damage on hemlock branchlets. (Photo: Donna Shearer)



Fungal pathogen on root collar (Photo: Margot Wallston)