

Hemlock Woolly Adelgid

Phenology Monitoring Protocol: Egg Laying

HWA Egg Laying: In early January, it is time to begin looking for HWA to begin to lay its eggs.

- Observations should be made at least once per week (the more the better)
- It can be helpful to have volunteers pick monitoring days that are convenient for them, and have volunteers check on different days. The more often we look, the more accurate our data.

Suggested sample size: 2-3 trees -> 2-3 branches per tree -> 1-3 twigs per branch -> ****ONLY LOOK AT NEW GROWTH****

- It is helpful to locate trees with ample HWA ahead of January and flag them. This will make finding and observing the HWA easier. If possible, try to choose trees with different levels of sun exposure (edge trees vs. forest interior) and collect from different aspects of the tree (north vs. south).
- HWA will begin to become obvious in late October, so look for fluffy woolly/cottony balls at the base of needles—these are the ovisacs that house the eggs. Try to find trees with moderate (5-10 ovisacs/twig) to heavy (11-20+ ovisacs/tree) infestations for observations.
- Recording temperature, precipitation, and other abiotic factors can help to provide a clearer picture. Volunteers can record temperatures, etc. on the days they observe. Daily high and low temperatures can also provide valuable information.



^ An adelgid (left) and HWA eggs (right) with wool cleared away.

Timeline and Instructions:

- Begin monitoring in early January (or earlier if possible) and monitor until you observe the first eggs being laid. Use one of the monitoring procedures (dissecting scope or hand lens) to make observations.
- If monitoring site is large and there are ample hemlocks and volunteers, it is helpful to have more than one observation site, which helps represent the diversity of the landscape to provide an in-depth picture of HWA development.
- When you are finished with observations for the season, report your findings to us.



^ Mature, woolly HWA on hemlock twig

Reporting Protocol: Use the Nature's Notebook app

Look for: tiny brownish-orange eggs are present when the white, woolly sac around an adult female appears puffy, generally starting in early spring, and can be seen by gently scraping the "wool" aside.

Select: Confirm presence of eggs by selecting "Egg-laying adults" in Nature's Notebook.

Observation Methods: Choose the method that works for you

Dissecting Scope (more accurate):

Materials:

- Dissecting scope
- Garden pruners
- Plastic zip seal bags
- Dissecting needle
- Rubbing alcohol or bleach

Procedure:

- Collect samples based on sampling suggestions and place samples into plastic zip bags for transport. Try to keep samples cool while transporting, and if not processing immediately, store in refrigerator.
- Use dissecting needle or fine-tipped forceps to gently remove woolly covering from adelgid, looking for eggs under and within wool as you go.
- TO PREVENT SPREAD OF HWA: Treat all samples by saturating with 10% bleach or 70% ethanol solution to kill any adults, eggs, and crawlers. Seal in bag and dispose of samples in trash.

Hand Lens (less accurate, still good!):

Materials:

- Hand lens (7x-10x magnification)

Procedure:

- Locate twigs with ample HWA, NEW GROWTH ONLY
- Firmly grasp base of sample twig and gently wipe away HWA wool using your hand or edge of hand lens
- Use hand lens to observe exposed adelgids and wool. Eggs will appear as small, golden, oval-shaped balls in woolly ovisacs.
- Record the presence or absence of HWA eggs.
- TO PREVENT SPREAD OF HWA: Be sure to clean any tools used in the field including gloves, hand lens, pruners, etc. HWA crawlers are extremely small and mobile at this time of year and could easily spread to healthy trees.

Best Practice: Don't give HWA a free ride!

Winter-Spring is the time of year that HWA is reproducing, so there is a possibility of being contaminated with HWA eggs and/or crawlers during these seasons. Eggs and crawlers are very small and can easily fall onto and become attached to clothing/tools. When you spend time in an infested area, be sure to wash all clothing and tools to prevent spread to other areas with hemlock trees!

Reference Photos:



^ HWA eggs, wool removed



^ HWA crawler on ovisac