

Harvard Forest Schoolyard Ecology

The Woolly Bully

Dan Guertin

April 11, 2012

Ralph C. Mahar Regional School



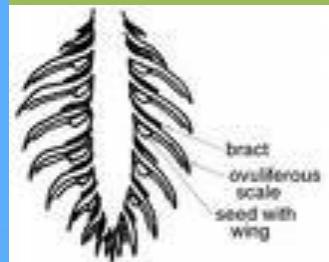
Integration into Curriculum

- Integrated into existing units in my conservation/ecology class
 - Not stand alone project
 - Revisited throughout course
 - Ecosystems, feeding interactions, biological controls, invasive species
 - New major component of Native Tree Study
 - Students construct electronic field guides



Eastern Hemlock

Tsuga canadensis



- **Leaves:**
.6 - .9 inches long
flat
under is blue/green
top is shiny green/yellow
slightly toothed near apex
- **Bark:**
brown
deep narrow openings
scaly
- **Fruit:**
egg shape
.6 – 1 inch long
.4 - .6 inch wide
red/brown
ovate scales
- **Bud:**
egg shape
small, .05 - .1 inch long
blunt
chestnut brown
- **Height:**
100 feet
- **Commercial Value:**
railway ties, pulp, timber, general construction, boxes and crates

Sample from a student field guide

Before going outside, consider...

- Medical complications-
 - Communication
 - Bug Spray list-Mahar
 - Supervision
 - Expectations!
 - School Rules

Research protocol-in classroom

- Students never have heard of Woolly Adelgid
- Provide background knowledge
 - Overview of woolly adelgid
 - Introduction into US
 - Distribution
 - Spread
 - Important to study now!
 - Hemlock identification
 - Pine, spruce, hemlock



Identification of plots

- Dictated with lower level
 - Location vs. risk/trust
- Micro-climates- Advanced level
- Aquatic
- Shade
- Direct sun
- Open area
- Other species
- Age of hemlock



Research Protocol

- Supplies
 - Identification markers
 - Data sheet
 - Writing utensils
- Removal of tags- map the area
 - Compass
 - Multiple measuring devices



Harvard Forest Schoolyard Ecology
Woolly Baily: Hemlock Trees and the Invasive Pest, the Woolly Adelgid

Student Data Sheet

Name(s):			
School:			
Date:	/	/	
Site Name/location:			
Tree ID Number:			
Tree Crown health (0-3):			
0 - Healthy-all green		4 - dead- killed by HWA	
1 - Some bare branches		5 - cut down due to HWA	
2 - Unhealthy-half or more bare branches		6 - cut down due to reasons other than HWA	
3 - Dead- no green needles			
ID Tree/Branch number/letter	White wool present(1) Absent(0)	Number of Egg Sacs Per 10cm segment	New Growth at Branch Tip (cm)
Summary data for Tree Number:	White wool Present(1) Absent (0)	Average Number of Egg Sacs	Average New Growth (cm)

Field notes/Comments: Please write field observations re: field conditions such as climate, wildlife, presence of other insects, and other plants on the reverse of this form. Note what other types of trees are nearby and may replace hemlock if it dies.

Research-Part 1

- Tag branches
- Measurements



Research-Part 2

- Hypothesize
 - microclimates
- Locate
- investigate



Identification of Woolly Adelgid Eggs



Woolly Adelgid Eggs-Identification Problems?



Woolly Adelgid Eggs-Identification Problems?



Woolly Adelgid Year 2

- Continue Research
- Expand measurement areas
- Bring in expert?

