

Asian Longhorned Beetle Educational Activities

For The Classroom (Or Anywhere!)

Below is a list of activities developed by the Mass. Department of Agricultural Resources for use in Asian Longhorned Beetle (“ALB”) outreach programs. These activities can also easily be adapted for use in programs about other forest pests or invasive species.

Elementary - Grades PreK through 4, ages 4-9

Campfire Story

Tell students a simple story (such as the “ALB Campfire Story”) that depicts how an uninformed person accidentally brings an invasive species to a new area and then describe what happens.

Story Jar

Put some “story starter strips” in a plastic jar. In pairs, groups or individually, students make a story based on the starter. This can be done verbally or the students can write their own stories.

Sample story starter strips:

- “There once was a woman who went camping in the forest.”
- “One day Marcus was chopping up wood when he spotted something strange.”
- “Once upon a time a beetle landed on the deck of a ship to sit in the sun.”

Build-a-Tree (“Tree Factory”)

This activity requires at least 20-30 students and may be done indoors or outdoors.

Students are each assigned a role, such as “heartwood”, “root”, “leaf”, etc. Bit by bit they form a “tree” with the heartwood at the center surrounded by the sapwood, cambium/phloem, bark, etc. and each part says what it does (ex. Students playing heartwood say “We support!”). Then the tree is “attacked” by some students who play the role of Asian longhorned beetles. The beetles tap the relevant parts of the tree, who then fall silent. When the tree no longer has enough voices to survive, the game is over.

Suggestion: Use our Build-a-Beetle activity to mark the “beetles” in the group with their black and white banded antennae headbands.

To Be A Tree

Students use available materials to design tree costumes. They can also make costumes or crafts of ALB or parts of the ecosystem that ALB harms.

How Puzzling

Students make a jigsaw puzzle. These can be made easily by photocopying a blank puzzle template onto cardstock, or by purchasing small, blank puzzles from a craft supplier. Kids draw their own representation of ALB and then cut or break apart the pieces and solve the puzzle.

Middle School – Grades 5-8, ages 10-13

(See below for activities suitable for either middle or high school)

Name that Tree

Students identify trees using their physical characteristics, and then play a relay game using leaves or leaf shapes.

Suggestion:

- As a follow-up assessment, have the students make their own field guides.

Memory Game

Use our matching game or develop your own, using identical pairs of images arranged in a grid. Students work in teams or individually to match the pairs in order to remove them from the game board.

Suggestions:

- Instead of using identical pairs of images, have students match the invasive species to the host species, or the invasive to the damage caused, a name to a look-alike species, etc.
- Use the memory squares to cover up an image of ALB, a tree type, etc. Let the students see who can guess what the picture is as they remove squares from the board.

Don't Move Firewood Board Game

This board game shows what can happen when firewood gets moved by a family that is camping. Requires a stick or pencil to be used as a spinner.

Catch that Bug!

Using an overhead or LCD projector, post several pictures of ALB, ALB look-alikes, important elements of the ecosystem, etc. on a wall. With a net, students “catch” the correct element as you call it out.

Suggestions:

- Play this game outside by printing out photos, then placing them on the ground in a play area or other suitable location. Use clips and golf tees to keep the photos in place.
- Aquarium nets are a relatively cheap alternative to actual insect nets and are small enough that the kids won't be trying to “capture” each other!

High School – Grades 9-12, ages 14-17

(See below for activities suitable for either high or middle school)

Alien Invaders Board Game

Students learn the life history of ALB or other invasive species in their area, and find out about their impacts on local ecosystems, by reading related articles. They then play a board game to explore how invasives affect the environment and how to manage them.

Things Aren't Always What They Seem

Students identify their perception of the risks associated with the technologies and environmental hazards related to the control of Asian longhorned beetle, and consider how their perceptions may be influenced by the media and the opinions of family and friends.

Weighing the Options

A two-part program involving a sample activity and then an applied one. In the first part, students make a grocery list and compare what it looks like when based on budget vs. nutrition and taste. This concept is then applied to a debate about the cost/benefit analysis of controlling Asian longhorned beetle.

Both Middle and High School

Flash Cards

Students make flash cards of Asian longhorned beetle, elements of the ecosystem, look-alike species, etc.

Suggestion:

- Be creative and let students draw their own image of ALB, host trees, tree damage, etc. Or use images from <http://massnrc.org/pests/alb> or <http://www.beetlebusters.info> to print and affix onto the cards.

Field Guide

Students make up a dichotomous key or a field guide after learning about Asian longhorned beetle and its look-alikes, its host trees, or the elements of the ecosystem that ALB infests.

Investments in Diversity

An activity similar to “Capture the Flag.” For the first round, half of the students, representing an ecosystem consisting mainly of maples, will each carry a single color of flag, and the other half will represent the Asian longhorned beetles, who will attempt to “capture” the ecosystem flags. Even if each ALB only captures one flag, the “ecosystem” will eventually be decimated. For the second round, split the “ecosystem” group into two or more “species” (one host tree like maple, another non-host like pine) with two different flag colors, and only allow the ALBs to capture the maple color flags. This demonstrates the value of biodiversity to the resilience of a diverse ecosystem when facing invasive pests.

Suggestion:

- “Flags” can easily be made by tearing strips off a towel or sheet.

ALB Jeopardy!

This game may be either played hi-tech with PowerPoint (use MDAR's ALB Jeopardy! game, available at <http://massnrc.org/pests/alb/albmedia.htm#presentations>, or use our template to make your own) or low-tech, where point values are simply written on the board and questions are asked verbally.

Interview an Invasive

Students make up interview questions and answers as if they were conversing with the Asian longhorned beetle or part of the ecosystem it impacts. They first do research on their subject so they can come up with appropriate, accurate answers.

Suggestions:

- Have the students write a newspaper article or blog post, or orally present the interview.

Any Ages – Adaptable

(These may be adapted for use with all but the youngest children.)

“Metaphor-ests” (Forest Metaphors)

If students are unfamiliar with the concept of metaphors, explain it. In a non-see-through bag (pillowcase, etc.) place several items that represent your ecosystem. Each student pulls out an item and tells how it represents the ecosystem. There are no truly “wrong” answers and students will come up with all sorts of other metaphors you hadn’t even thought of.

Some sample items for the bag:

- A maple syrup jug
- A mini baseball bat (made from wood)
- A fan (represents the cooling effect of trees)

Tree Tag

For younger students, find a host tree and review its characteristics. This could be simple (observing color and texture) or more complex (explaining about how its leaves are shaped). Use the real name of the tree (like “maple”) or give it a made-up or descriptive name (like “syrup tree” or “rough-bark”). For older students, go into more detail describing the tree; one option is to identify it by its scientific as well as common names.

Do this for several types of trees or plants. Then start calling out the names that you and the students have decided on. The students must run to and touch the tree that matches the name. Do this several times. Any student NOT touching a tree, or touching the wrong one, gets a letter in the word “T-R-E-E.” Students who spell the entire word are “out.”

Suggestions:

- Adapt this activity for different grade levels by using the descriptive name for younger students vs. common or scientific name for older ones.

Trees for Many Reasons

Have the students use fictional stories to learn about conservation. Read and discuss the stories or as an extension, have students make up a sequel involving invasive species.

Suggested stories:

- The Lorax
- The Man Who Planted Trees

Build a Beetle

Students use headbands and black and white pipe cleaners to make antennae representing the Asian longhorned beetle. Students could also make ALB puppets or models using clay or other materials.

Suggestions:

- Incorporate Build-a-Beetle into some of the other activities in this booklet where the students must act as ALBs
- For younger kids, build model ALBs by painting clothespins black and white and attaching pipe cleaner antennae. Or use toilet paper tubes and cover them with round white stickers (use hole punch reinforcement rings!)

Creative Arts

Students can make a poster, draw a cartoon strip, design a bumper sticker, write a poem, write a song... the possibilities are endless.

We All Need Trees

Similar to “Metaphor-ests,” but slightly more limited; students explore wood, food and paper products that come from the host trees of Asian longhorned beetle, discussing the products and categorizing them.

Environmental Exchange Box / Forest Exchange Box

Students discover the characteristics of their local forested areas, collecting information and materials, and exchange them with another group of students from a different site. Include information about ALB and other invasive plants, animals and insects that may be in their area. While waiting for their partner’s exchange box to arrive, the students research each other’s region and its ecosystems what will be in the box. Note that Project Learning Tree has an exchange form and will coordinate these exchanges. Find out more at: http://plt.org/curriculum/Activity_20_Environmental_Exchange_Box.pdf

Three Cheers for Trees

Students make a drawing or mural of an area, minus the trees, then add them in after discussing the benefits that trees provide.

Forest Resources – Who Works in this Forest?

Students identify the resources that forests provide, and as an extension can discuss the impact and loss of trees caused by ALB. Have students interview people whose work relates to the forest in some way.

Resource List / Bibliography

- Project WILD: K-12 Curriculum & Activity Guide. Council for Environmental Education, Houston, TX. 2008 www.projectwild.org, info@projectwild.org, (713) 520-1936
- Project Learning Tree: PreK-8 Environmental Education Activity Guide. American Forest Foundation, 5th printing. 2006- 2011. www.plt.org, information@plt.org, (202) 463-2475
- Project Learning Tree: Secondary Environmental Education Program(s): The Changing Forest: Forest Ecology; Exploring Environmental Issues: Focus on Risk
- Natural Inquirer: Ecosystem Services Edition (2010, v. 12 #1), Urban Forest Edition (2005 v. 6 #1), Invasive Species Edition (2006, v. 8 #1)
- BeetleBusters: An Educator's Guide to Stopping the Asian Longhorned Beetle (All Levels). USDA 2011. http://www.beetlebusters.info/beABeetleBuster_educators.php

More Info about ALB:

- Massachusetts Asian Longhorned Beetle Cooperative Eradication Program Website: <http://massnrc.org/pests/alb.htm>
- USDA Beetle Busters Website: <http://beetlebusters.info>

Have you adapted any of these activities for your own use? If so, let us know! We're happy to provide feedback and send out free educational materials for your students!

Contact:

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Asian Longhorned Beetle Sample Lesson Plan

Below is a sample lesson plan that can be used to teach kids about Asian Longhorned Beetle. You can adapt this to your needs, or contact MDAR and we can work with you to develop your own plan.

Goals

Students should...

- Understand why we need trees and how their loss would impact the environment, the economy and the students themselves.
- Be aware of and be able to recognize Asian Longhorned Beetle (“ALB”) and the damage it causes.

Objectives

Students will...

Cognitive

- List three “services” provided by trees that we would lose if ALB is allowed to spread
- Correctly identify three types of host trees
- Identify the three main characteristics of ALB:
 1. shiny black with white spots
 2. long banded antennae
 3. blue feet
- Identify three signs that ALB is damaging a tree:
 1. exit holes
 2. oviposition sites
 3. frass
- List three actions being taken to ensure eradication:
 1. survey
 2. infested tree removal
 3. delimiting restricted areas
- Explain why it is important not to move wood out of these areas and describe other actions they can personally take to prevent the spread of ALB

Emotional

- Feel a connection to and a sense of ownership of the trees in their lives and the contributions that trees make
- Be inspired to further explore invasive species and what they can do to help curb their spread

Objectives (cont.)

Behavioral

- Perform a tree survey (maybe in conjunction with other activities) at least once more after this lesson
- NOT move firewood and will discourage others from doing so
- Call the hotline or go online to report a suspicious beetle or tree damage

Standards Addressed

- Will depend on activities chosen

Prerequisites

(May be covered in lesson if no prior knowledge)

- Knowledge of ecosystems and the impact invasive species have on them
- Knowledge of the manner of spread of invasive species

Materials

- Interactive PowerPoint Presentation, or Printed Illustrations/visuals
- Mounted or acrylic case specimens of ALB
- Wood samples and photos of ALB damage
- ID Cards, bookmarks, temporary tattoos, pins, etc.
- Bag with “Metaphor-ests” items
- “Lurking in the Trees” DVD

Procedure

Lesson

1 min: Introduction

- MDAR, ALB Outreach Coordinator

5 min: Solicit prior knowledge

- Brief review of ecosystems and invasive species*
- Discuss what students may know about ALB already

* If students are unfamiliar with the concepts of ecosystems and/or invasive species, you can include a brief overview here

35-40 min: PowerPoint presentation or interactive lesson

- What is “ALB”?
Discuss invasive species, ALB and the damage it causes, and how to identify it. Show specimens of ALB and hand out ID cards & book marks.
- Why should you care?
Do “Metaphor-ests” Activity: Students pull items out of a bag and tell how they represent trees/forests or something trees do for us (or for animals or for the environment)
- What are the origins of ALB?
Briefly explain how it came over in wood packing material and how infestations have spread (movement of wood)
- What is the beetle’s biology?
Review the life cycle of the beetle and damage it causes at different stages
- What are the host trees of ALB, and how do you recognize tree damage?
Present further information on tree damage; pass around samples of damaged wood
- What are some examples of look-alike species and look-alike tree damage?
POP QUIZ! (You can say that and then tell them it isn’t being graded)
- What is the Massachusetts ALB Eradication Program?
Outline what the government is doing to eliminate the beetle
- How can you report a possible sighting?
Explain how to survey and what else students can do to stop the spread. They should brainstorm their own ideas first.

Activities

Choose an age-appropriate activity from the list at the beginning of this document as time allows.

Assessment/Follow Up

- 5 min: Do a “ball toss” to spot-check student knowledge for facts about host trees, tree damage, and ALB identification. May be done outside. Pass out worksheets or additional materials for students.
- Give students “homework” of organizing a tree survey or informally surveying trees near them. Provide a time frame and check back when they should be complete.
- Forest Exchange box – See Project Learning Tree teacher handout. Please use contact info below to let MDAR know if you participate.
- Make a mnemonic device for remembering the types of host trees (MDAR would love to hear from you if you do!)
- DVD: Lurking in the Trees

For more information, contact:

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