Photo Credit: Wisconsin DNR

4

TREE PLANTING AND FOREST HEALTH

TREE PLANTING AND FOREST HEALTH

4

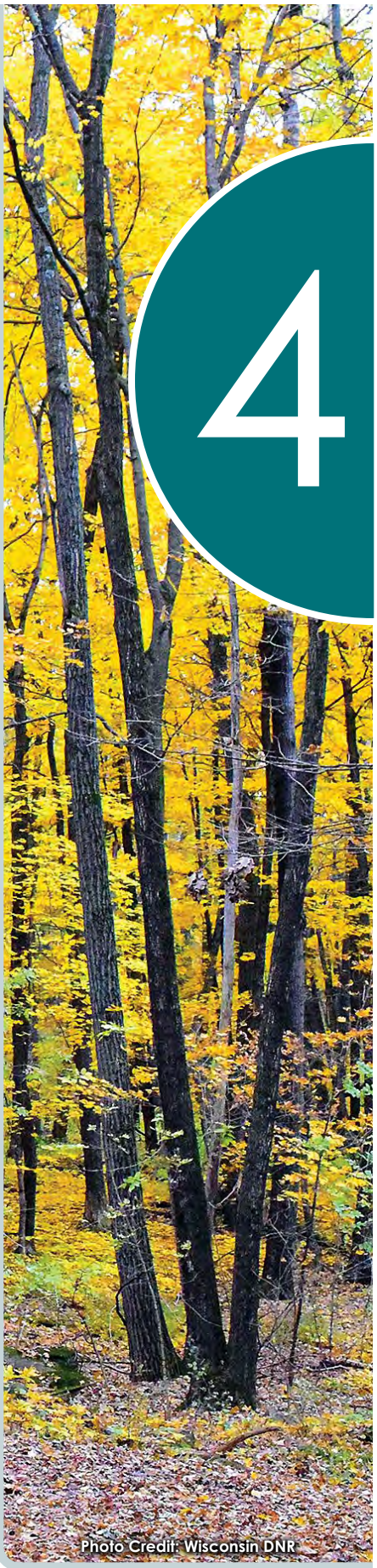


Photo Credit: Wisconsin DNR

IN THIS LESSON YOU WILL FIND:

LESSON WHICH INCLUDES

- Tree Planting (Planting and Caring for Trees)
- Move! Attack of the Invasive Species (USDA Game; see Student Resource ✎6 or the printable Google resource)
- The Great EAB Escapade (USDA Game; see Student Resource ✎7a, Student Resource ✎7b, and Student Resource ✎7c, or the printable Google resources)
- Wisconsin Worm Watch Survey (Student Resource ✎8a and Student Resource ✎8b or the printable Google resources)

LINK TO GOOGLE RESOURCES

OPTIONAL ACTIVITIES RELATED TO THIS THEME

- LEAF Urban Guide Lessons/Activities

LEAF LESSONS THAT SUPPORT THIS THEME

TREE PLANTING AND FOREST HEALTH

PRIMARY OBJECTIVES

- Students will explore WHAT trees need to grow.
- Students will learn WHERE trees should be planted.
- Students will learn HOW to care for planted trees.

SECONDARY OBJECTIVES

- Students will understand what their tree might grow up to be used for.
- Students will examine the impact of invasive species on trees.

WISCONSIN DNR KEY TARGET MESSAGES

- Wisconsin has a plan to sustain the healthy, working forests vital to Wisconsin's well-being. (1)
- Forests are a renewable resource providing products, aesthetics and recreational opportunities important to our everyday lives. (6)
- Everyone can help sustain Wisconsin forests (by being careful with fire, not spreading invasive species, using wood products rather than alternatives, planting and caring for a native tree, enjoying the outdoors responsibly and more). (8)

WISCONSIN STANDARDS FOR ENVIRONMENTAL LITERACY AND SUSTAINABILITY

- Students engage in experiences to develop stewardship for the sustainability of natural and cultural systems. (Strand 3: Engage; Standard 7)

PREPARATION

- Lesson is ideal for GRADES 5-8.
- Read the lesson to familiarize yourself with what you need to explain and where you may need to elaborate.
- If you are presenting indoors and want to use the slideshow:
  - Reach out to the teacher to make sure there is a projector and computer with internet available.
  - Email the slideshow to the teacher and ask them to have it ready for your visit.
  - Select the slides that go with your desired activity.
- You know a lot about trees and forest health. Feel free to make this lesson your own!

Photo Credit: Wisconsin DNR

TREE PLANTING AND FOREST HEALTH

MATERIALS

Google resources to support this theme can be accessed at uwsp.edu/wcee/wcee/leaf/leaf-curriculum/lessons-for-forestry-professionals/. Please share the appropriate grade level slideshow with the educator so they have access to materials used in the activity and other recommended teacher resources.

- Team Level Forester Kit
- Slideshow_Theme 4_Tree Planting and Forest Health

Planting Trees and Tree Care

Gather equipment for tree planting/care if needed.

Move! Attack of the Invasive Species! (USDA)

- Move! Attack of the Invasive Species! (see Student Resource ✎6 or the printable Google resource)
- Pinnies, colored flags, or ID tags to separate invasive species and native plants
- Pest pathway Items: boots, shoes, backpacks, clothing items, gloves, firewood, tires, tents, toy bike, stuffed animals (pets/wild), shovels

Invasive Species EAB Game

- The Great EAB Escapade (USDA Game; see Student Resource ✎7a and Student Resource ✎7b or the printable Google resources)
- Five copies of EAB Investigators (USDA Game; see Student Resource ✎7c or the printable Google resource)
- Five bundles of five sticks that include a mix of long and short sticks

Worm Watch

- Mustard Mix (see activity for amounts)
- Wisconsin Worm Watch Survey (see Student Resource ✎8a and Student Resource ✎8b or the printable Google resources)

Google resources to support this theme can be found at leafprogram.org/fg

MODIFICATIONS

K-4 Audience

- No adjustments from Planting Trees and Caring for Trees.
- For K-2, instead of the "Move" game, consider a simple game of tag where the person who is "it" represents an invasive species and see how fast they can spread (how many people they can tag).
- For K-4 audiences, break down the game instructions into several small steps.

9-12 Audience

- Consider using entire Worm Watch Lesson (Google resource).

Urban Setting

- Make sure students understand that invasive species impact trees in urban and rural forests.

Indoor/Outdoor Setting

- Tree Planting and Worm Watch MUST take place outdoors.
- Games can be modified to take place in a large indoor space.

TREE PLANTING AND FOREST HEALTH

INTRODUCTION: PLANTING AND CARING FOR TREES

Tell students that there are a lot of things to consider when planting and caring for trees.

PLANTING TREES

Why Plant a Tree?

Discuss the various economic, ecological, social, and cultural benefits trees provide.

Things to Consider BEFORE Planting a Tree

(From Wisconsin DNR New Tree Planting Brochure, PUB-FR-261 2003)
Discuss the following considerations with students:

- Where to plant your tree? Look up, look down, look around.
- HARDINESS ZONE: Know your zone AND choose trees adapted to that zone. Consider planting species NATIVE to the area. Explore species and hardiness zones. Use 2023 USDA Plant Hardiness Zone Map (Google resource).
- Determine what type of nursery stock tree is best for your situation: bare-root, containerized, or balled and burlapped.
- Think about what your tree will grow up to be used for.
- Call DIGGERS HOTLINE at 1-800-242-8511 before you dig!

Planting a Tree

Teach students how to plant a tree. Be sure to discuss each step with students and highlight the most important things to remember.

1. Determine where the root collar is located within the root ball.
2. Dig a planting space 2-3 times wider than the root ball, but NOT deeper than the root ball.
3. Determine the depth to plant by measuring the distance from the bottom of the root ball to the root collar.
4. Remove all tags, ribbons, and trunk guard and gently ROLL the tree into its space. DO NOT drag or lift the tree by its trunk.
5. Carefully remove soil from the top of the root ball to expose the root collar. Be sure the root collar is either LEVEL or 1-2 inches ABOVE the surface. Remove burlap, twine, and/or wire.
6. Back fill the planting space with soil.
7. Water to thoroughly eliminate all air pockets – do not pack/tamp.

TREE PLANTING RESOURCES

Wisconsin DNR Resources

- Urban Tree Planting Resources website dnr.wisconsin.gov/topic/urbanforests/treeplantingresources
- New Tree Planting Brochure PUB-FR-184 2016
- New Tree Planting Poster PUB-FR-261 2003

Videos (search titles on YouTube)

- WIDNRTV: Planting a Balled and Burlapped Tree
- WIDNRTV: Planting a Tree from a Container
- Arbor Day Foundation: Planting Bare-root Trees
- Utah State University Extension: How to Plant Bare-root Trees

TREE PLANTING AND FOREST HEALTH

CARING FOR TREES

Caring for a Tree

Teach students how to care for trees after they are planted by sharing these tips.

Watering (Always Check Soil Moisture Before Watering)

- Water daily for 1-2 weeks after planting
  - 1 inch diameter trunk = 10 gallons of water
  - 2 inch diameter trunk = 20 gallons of water
- Water every 2-3 days for 3-12 weeks after planting

Mulching

- Apply 2-4 inches of mulch over the root zone
- Keep mulch 3-6 inches away from the trunk of the tree

Staking

- Most trees do NOT need to be staked
- If staking is necessary, use wide webbing straps and secure webbing to stakes with heavy gauge wire
- Make sure the tree can move

Pruning

- Less is better; new trees need all the leaves they can get
- Prune only dead, broken, diseased, or rubbing branches

Additional Forestry Education Resources

- Find additional resources on the Wisconsin DNR website at dnr.wisconsin.gov/education/forests

DISCUSSION

- What things are important to consider BEFORE planting a tree?
- What things are important to consider WHILE planting a tree?
- What things are important to consider WHEN CARING for a tree?
- Where in your neighborhood/home is a good place to plant a tree?

PRUNING RESOURCES

Activity

- Indoor Pruning Activity: Use markers to draw lines on samples of tree limbs to indicate where and how to make appropriate pruning cuts (get samples from municipality)

Other Resources

- USDA Forest Service Northeastern Area: How to Prune Trees (Google resource)
- Iowa State University Extension and Outreach Videos (look up titles on YouTube)
  - Principles of Pruning: Why and When to Prune
  - Principles of Pruning: Making a Good Cut
  - Principles of Pruning: Included Bark

TREE PLANTING AND FOREST HEALTH

INTRODUCTION: INVASIVE SPECIES

Share with students that INVASIVE SPECIES impact Wisconsin forests, lakes, rivers, and landscapes. Members of the community can help slow the spread of invasive species.

Tell students that to prevent the spread of invasive tree and plant species they should:

- Inspect clothing and equipment for seeds, insects, etc. before moving from one area to another.
- Leave native trees and plants alone.
- Be on the lookout for invasive species and follow specific instructions to remove invasive species from an area.

Explain that Wisconsin forests are also impacted by invasive animal species. Tell students that to prevent the spread of invasive animal species they should always follow Wisconsin's firewood rules.

- Get firewood where you use it.
- Don't move firewood from one location to another (unless it has been processed to eliminate pests and diseases).

INVASIVE TREE AND PLANT SPECIES

- Norway maple
- Amur maple
- Common buckthorn
- Tartarian honeysuckle
- Japanese barberry
- Burning bush
- Siberian elm
- Black locust
- Callery pear
- White mulberry
- Black alder
- Tree of Heaven
- Autumn Olive
- Garlic Mustard

INVASIVE ANIMAL SPECIES

- Emerald ash borer
- Asian longhorn beetle
- Spongy moth
- Jumping worms
- Picnic beetle
- Hemlock woolly adelgid
- Spotted lanternfly

INVASIVE SPECIES PLANT GAME – MOVE! ATTACK OF THE INVASIVE SPECIES

Hungry Pest game developed by the USDA Animal and Plant Health Inspection Service (www.aphis.usda.gov/plant-pests-diseases/hungry-pests/resources/educators)

Goals

- To help students understand how invasive species spread
- To help students understand how invasive species can impact native species

Preparation

In advance of the activity, review Student Resource ✎6 or the printable Google resource. Read the Activity Overview, gather the supplies needed, and prepare the playing field by placing pest pathways in different locations across the playing field.

ATTACK OF THE INVASIVE SPECIES – OUTDOOR/GYM ACTIVITY

Activity Instructions

1. Tell students that they are going to play a tag-like game to learn how pests (invasive species) travel and what people can do to prevent the spread of pests.
2. Divide the students into two teams: Invasive Species and Nature Protectors. Select two-thirds of the students to be on team Invasive Species and one-third of the students to be on team Nature Protectors. Give each team different colored flags or pinnies to wear.
3. Direct students' attention to the playing field. Tell them that each item in the playing field represents a path that can lead to the spread of invasive species.
4. Ask students if they can determine what each item in the playing field represents. Allow students to share their thoughts. Confirm correct answers and help guide students who share incorrect answers to correct answers. If students are struggling, provide examples:
   a. BOOT = Dirt stuck to a boot can carry invasive plant seeds from one area to another.
   b. WOOD = Infested firewood can carry invasive insects from one campground to another.
5. Tell students that during the game, Nature Protectors must tag Invasive Species before they reach a pathway.
6. Explain to students that when Invasive Species reach a pathway they are safe; however, only one Invasive Specie can be at a given pathway at a time. Invasive Species are encouraged to try to move from pathway to pathway – their goal is to spread.
7. Also explain that when a Nature Protector tags an Invasive Species, the Invasive Specie becomes a Nature Protector. For every three Invasive Species the Nature Protectors catch, they can eliminate one pathway from the playing field.
8. Tell students that the game ends when:
   a. all invasive species have been caught.
   b. all pathways are eliminated.
   c. they have reached the time limit (5-10 minutes).

9. Tell students that you are going to play the game again but with different rules that represent different scenarios. After sharing a new rule, ask students what they think the rule change represents. After playing a round with a new rule, discuss the different outcomes.
   a. Have one-third of the students be Invasive Species and two-thirds of the students be Nature Protectors. (This can represent a scenario where invasive species have recently been introduced so their populations aren't as high yet. It should be easier to catch all Invasive Species and remove all pathways in this scenario.)
   b. Play the game with obstacles in an area with trees or have students be the obstacles. (This demonstrates that ecosystems have other species/factors in them that may increase/decrease the ability of invasive species to spread. It should be more difficult to catch all Invasive Species and remove all pathways in this scenario.)
   c. Increase/decrease the boundaries of the playing field. (This can show that if invasive species are confined to a smaller area, they are easier to control. It should be easier to catch all Invasive Species and remove all pathways in this scenario.)
   d. Allow Invasive Species to run while making Nature Protectors walk. (This can show how quickly Invasive Species can spread. You could share how oftentimes we don't have other species that can eat invasive species to keep their populations down. It should be more difficult to catch all Invasive Species and remove all pathways in this scenario.)

DISCUSSION

Ask students the following questions and discuss their answers.

- What factors help invasive species spread?
- What things can people do to prevent the spread of invasive species?
- Why is it important to prevent the spread of invasive species?

Ask students if they know what invasive species can be found in forests in your area and the impacts of them on the forests (urban and rural). Share some of the most common with students. Consider bringing along tools/resources that will help students be able to identify these species. Share with students what they should do if they encounter invasive species. Are there some they should try to remove? Are there some they should report?

INVASIVE SPECIES PLANT ACTIVITY – THE GREAT EAB ESCAPADE

Hungry Pest activity developed by the USDA Animal and Plant Health Inspection Service (www.aphis.usda.gov/plant-pests-diseases/hungry-pests/resources/educators)

Goal

To help students understand that the movement of firewood may contribute to the spread of the emerald ash borer (EAB) beetle.

Preparation

In advance of the activity, review Student Resource ✎7a, Student Resource ✎7b and Student Resource ✎7c or the printable Google resources. Read the overview, gather the supplies needed, and set up locations around the schoolyard or learning space.

- Gather 25 sticks (12 short and 13 long) and prepare five bundles of five sticks.
  - Each bundle should have five total sticks in any combination of short and long.
  - Actual sticks are ideal; however, if none are available you can use different sized popsicle sticks.
- Print and fold five EAB Investigators (see Student Resource ✎7c or the printable Google resources). CIRCLE a different question on each of the five EAB investigators. Questions include:
  - What species of tree does the EAB love to eat? (ASH TREES)
  - Where does the EAB lay its eggs? (ON THE BARK OF ASH TREES)
  - What spreads EAB? (PEOPLE MOVING FIREWOOD)
  - How does the EAB larvae kill a tree? (EAB LARVAE KILL A TREE BY DISRUPTING THE SYSTEMS THAT TRANSPORT FOOD AND WATER IN THE TREE.)
  - What is metallic, green and flies? (EMERALD ASH BORER BEETLE)
  - Guitars, most baseball bats and some furniture are made of what kind of wood? (ASH WOOD)
  - How can you stop EAB from spreading? (DON'T MOVE FIREWOOD)
  - The EAB is only 1/2 inch long. What is the smallest coin an EAB can fit on? (PENNY)
- Choose five locations in the schoolyard (learning space) to represent forest, campground, trail, backyard, and neighborhood park. In advance of the activity, consider making signs with location names for leaders to post.

TREE PLANTING AND FOREST HEALTH

Procedure

1. Read the back story found in The Great EAB Escapade activity (see Student Resource ✎7a and Student Resource ✎7b or the printable Google resources) document or lead a discussion with students about what the emerald ash borer (EAB) beetle is and how it came to Wisconsin. If you opt to have a discussion instead of reading the story, make sure you share the information students need to correctly answer the five questions you circled on the EAB Investigators (see Student Resource ✎7c or the printable Google resources).
2. Tell students that you are going to need five people to be location leaders. Explain that the responsibility of a location leader is to read a quiz question to each team. Ask for volunteers.
   a. Pick a diverse mix of students to be location leaders.
   b. Give each location leader an EAB Investigator (see Student Resource ✎7c or the printable Google resources). Ask them to find the circled question.
   c. Tell leaders that when teams arrive at their location, they must ask them the circled question. If the team gets it correct, the team leaves a stick from their bundle at the location and then moves on to another location. If the team gets the question incorrect, they move on but do not leave a stick.
   d. Send location leaders to one of the five locations you have pre-determined. Tell them what their location represents (forest, campground, trail, backyard, neighborhood park).
3. Divide the remaining students into five teams; give each team a bundle of sticks.
4. Tell students that they are going to participate in a race. Point out the five locations to students and explain what each represents (forest, campground, trail, backyard, neighborhood park). Explain that they need to go to each location as quickly as possible. When they arrive at a location:
   a. Location leaders will ask them a question.
   b. If they answer the question correctly, they will leave a stick from their bundle at the location.
   c. If they answer the question incorrectly, they cannot leave a stick at the location.
   d. As soon as they are done they run to the next location.
   e. Encourage teams to avoid going to locations when other teams are there since only one team may answer a question at a time.
5. Share that the winning team is the first team to visit every location AND have no sticks (or the fewest number of sticks) left in their bundle.
6. Have a countdown to start the race.

DISCUSSION

Once all teams have completed their journey and the winning team has been determined, lead a class discussion. Explain to students that the sticks they were carrying represented firewood and that the long sticks represented firewood that was infested with EAB!

Walk with the class back to each location and see how much EAB firewood was left behind. Discuss the following questions:

- Which locations had firewood at them? (PROBABLY ALL OF THEM.)
- Could you tell when you left the firewood that it had the EAB hidden inside? (NO)
- What do you think will happen to ash trees in any of the locations if the firewood is infested with EAB? (THE TREES IN THE AREA COULD BECOME INFESTED WITH EAB.)
- Who put the infested firewood in the location? (WE DID, BUT WE DIDN'T KNOW WHICH FIREWOOD WAS INFESTED WHEN WE LEFT IT THERE.)
- What does this tell you about the spread of EAB and how it moves from location to location/state to state? (PEOPLE HELPED THE BEETLE MOVE BY MOVING FIREWOOD FROM ONE PLACE TO ANOTHER. PEOPLE CANNOT TELL WHICH FIREWOOD MAY HAVE EAB LARVAE IN IT.)
- What can we do to prevent the spread of EAB? (DON'T MOVE FIREWOOD!)

INVASIVE SPECIES: WISCONSIN WORM WATCH

In this lesson, students participate in a citizen science project and determine if invasive earthworms are present in a forest.

Background

All earthworms in Wisconsin are invasive species! There have been no native worm species in Wisconsin since the last glacial period. Humans have introduced about 20 species of earthworms to Wisconsin from Europe and Asia by accident, or for farming/fishing. Although worms can be good for gardens, they are harmful to hardwood forests.

Materials

- Mustard powder
- Disposable plastic water jugs (one gallon or larger filled with water)
- Earthworm identification book or tools
- Forest site
- Wisconsin Worm Watch Survey (see Student Resource ✎8a and Student Resource ✎8b or the printable Google resources)

TREE PLANTING AND FOREST HEALTH

Preparation

Mix 1/3 cup of mustard powder into one gallon of water and shake well. Do this about 20 minutes prior to conducting this activity. Shake well again when conducting activity.

Instructions

1. Be sure all students have data sheets to record information/ observations (see Student Resource ✎8a and Student Resource ✎8b or the printable Google resources).
2. Select survey sites (approximately 2 feet x 3 feet).
3. Clear any ground covering.
4. Shake mustard mixture and pour half of it over survey area and count and sort worms that emerge for five minutes.
5. Pour the other half of the mixture over the site and count and sort worms for an additional five minutes.
6. Gather all supplies, keep the worms and move to a new location 10 to 20 feet away and repeat.
7. Record all findings and submit to the locations designated on the student sheet.

Extension Activity

Create a graph. Plot the total number of juvenile and adult epigeic, endogeic, and anecic earthworms found in each sample plot.

DISCUSSION

Use the following questions to lead a discussion:

- What type of earthworm was found in the highest quantity? Why do you think that was?
- Would you consider the total amount of earthworms found in your sample plots to be quantified at a low, medium, or high level?
- Based on this data, what conclusions can you draw about the soil conditions or amount of organic layer present in the forest?

Access a complete Worm Watch lesson in the Google resources.

TREE PLANTING AND FOREST HEALTH

REVIEW KEY MESSAGES

- There are many factors to consider when planting trees.
- It is as important to care for trees as it is to plant them.
- Invasive species impact Wisconsin forests.
- Humans contribute to the spread of invasive species.
- There are several things people can do to minimize the impact of invasive species on Wisconsin forests.

OPTIONAL ACTIVITIES RELATED TO THIS THEME

- LEAF Urban Forest Lesson Guide 5-8; Lesson 3: Management Decisions and Biodiversity (Google resource)

RECOMMENDED TEACHER RESOURCES

All recommended teacher resources are included in the Theme 4 Slideshow Presentation (Google resource). Resources can also be downloaded from the LEAF website (uwsp.edu/wcee/wcee/leaf/leaf-curriculum). Please share the slideshow or link to the website with the educators you work with.

- LEAF Urban Forest Lesson Guide K-4 Unit
- LEAF Urban Forest Lesson Guide 5-8 Unit
- LEAF Urban Forest Lesson Guide 9-12 Unit
- LEAF K-12 Forestry Lesson Guides


Photo Credit: Wisconsin DNR

ADDRESS QUESTIONS

- Are there any questions from the presentation?
- Collect notecards/sticky notes and answer questions.

LETTER TEMPLATE – CONFIRMATION LETTER

Theme 1: What Does a Forester Do?
Theme 4: Tree Planting and Forest Health

Dear (Insert Your Name),

This letter confirms that I am scheduled to present "What Does a Forester Do?" and "Tree Planting and Forest Health" to your (insert grade level) class on (insert program date and time).

During my program students will:
- Examine the job of a forester.
- Understand how to become a forester and the skills needed to be a forester.
- Explore forestry-related careers.
- Explore what trees need to grow.
- Learn where trees should be planted.
- Learn how to care for planted trees.
- Understand what their tree might grow up to be used for.
- (OPTIONAL) Examine threats to the health of the planted trees.

Please review the information I have provided above and contact me if anything is incorrect.

If you would like to do any advanced preparation, feel free to have each student write a question for me on a notecard or sticky note. If time permits, I will answer these questions following the presentation.

I will check in at the office when I arrive. Please let someone in the office know that I am coming. I plan to arrive 10 to 15 minutes before the program is scheduled to begin to set up for the activities. I look forward to working with you soon!

Sincerely,

(Insert Your Name)

LETTER TEMPLATE – FOLLOW-UP LETTER

Theme 1: What Does a Forester Do?
Theme 4: Tree Planting and Forest Health

Dear (Insert Your Name),

Thank you for inviting me into your classroom to help students understand the role of a forester and how we can plant trees and keep Wisconsin forests healthy. I hope you and your students enjoyed the program.

If you would like to extend student learning and engagement related to forestry, planting trees and forest health following my visit, please consider these LEAF activities which can be found in the LEAF Wisconsin K-12 Forestry Lesson Guides on the LEAF website.

Link: www.uwsp.edu/wcee/wcee/leaf/leaf-curriculum/

Theme 1: What Does a Forester Do?

- LEAF 2-3 Field Enhancement 1: I Can Be a Forester
- LEAF 5-6 Lesson 6: What Is Management?
- LEAF 7-8 Lesson 3: How Forests Are Managed

Theme 4: Tree Planting and Natural Restoration

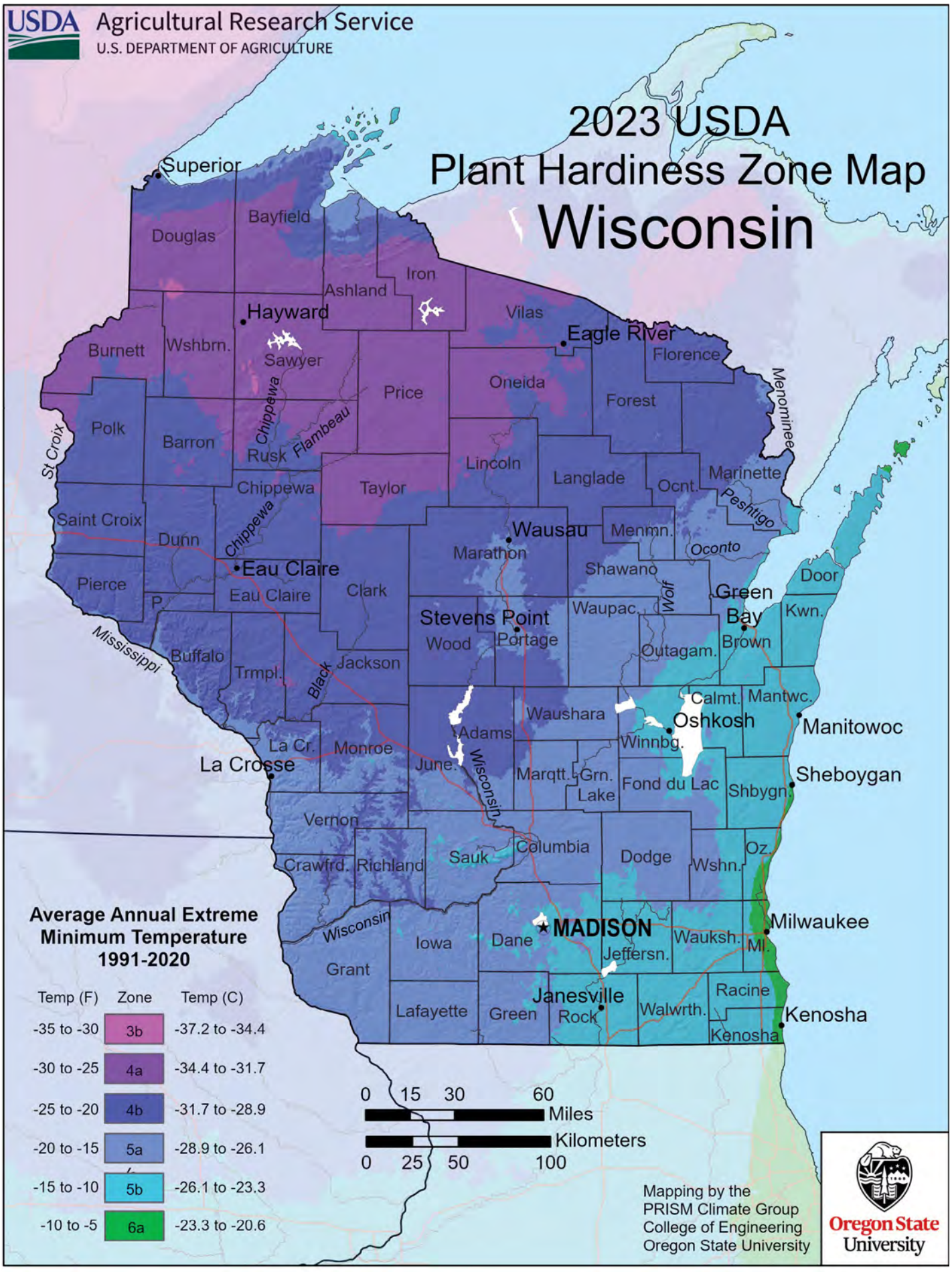
- LEAF Urban Forest Lesson Guide 5-8; Lesson 3: Management Decisions and Biodiversity

I also recommend the lessons from the LEAF Urban Forest Lesson Guide which can be accessed at the link shared above.

Please let me know if I can be of further assistance.

Sincerely,

(Insert Your Name)


USDA Agricultural Research Service
U.S. DEPARTMENT OF AGRICULTURE
2023 USDA
Plant Hardiness Zone Map
Wisconsin
Superior
Douglas
Bayfield
Ashland
Iron
Vilas
Hayward
Eagle River
Florence
Burnett
Wshbrn.
Sawyer
Price
Oneida
Forest
Menominee
Polk
Barron
Chippewa
Flambeau
Rusk
St Croix
Lincoln
Langlade
Ocnt.
Marinette
Peshtigo
Chippewa
Taylor
Saint Croix
Dunn
Chippewa
Wausau
Menmn.
Marathon
Oconto
Eau Claire
Shawano
Door
Pierce
Eau Claire
Clark
Wolf
Green Bay
Kwn.
Stevens Point
Waupac.
Wood
Portage
Brown
Mississippi
Buffalo
Trmpl.
Jackson
Black
Outagam.
Calmt.
Mantwc.
Waushara
Oshkosh
Manitowoc
Adams
Winnbg.
La Cr.
Monroe
La Crosse
June.
Wisconsin
Marqtt.
Grn. Lake
Fond du Lac
Shbygn.
Sheboygan
Vernon
Columbia
Oz.
Crawfrd.
Richland
Sauk
Dodge
Wshn.
Milwaukee
Wisconsin
Iowa
Dane
MADISON
Wauksh.
Ml.
Jeffersn.
Grant
Racine
Janesville
Lafayette
Green
Rock
Walwrth.
Kenosha
Kenosha
Average Annual Extreme Minimum Temperature 1991-2020
Temp (F) Zone Temp (C)
-35 to -30 3b -37.2 to -34.4
-30 to -25 4a -34.4 to -31.7
-25 to -20 4b -31.7 to -28.9
-20 to -15 5a -28.9 to -26.1
-15 to -10 5b -26.1 to -23.3
-10 to -5 6a -23.3 to -20.6
0 15 30 60
Miles
Kilometers
0 25 50 100
Mapping by the
PRISM Climate Group
College of Engineering
Oregon State University
Oregon State University

MOVE! "ATTACK OF THE INVASIVE SPECIES!"

Activity Overview: This active "tag-like" game can be played in an indoor gym or outdoors in a playground, park, or large campground. It gets kids to move while thinking and learning about how pests like to travel and what they can do to prevent their spread. (GROUP—Indoor/Outdoor)

Time Needed: 20+ minutes
Supplies: Color flags, pinnies/scrimmage vests, or T-shirts, a variety of pest pathways (boots, garden plants, firewood, backpacks, fresh produce, tires, hay, lawn furniture, bicycles, foreign souvenirs, barbecue grill, trailers, tents)
Preparation: Place pest pathways in different locations over the playing field.

Activity Steps:

1. Divide kids into two teams: Invasive Species and Nature Protectors. Give them colored flags, pinnies/scrimmage vests, or T-shirts to wear in their teams. For the first round, delegate two-thirds of the group to be on the Invasive Species team. Before starting the game, ask kids to identify all of the pest pathways they can see.

2. To play the game, Nature Protectors must tag Invasive Species before they reach a pathway. Once Invasive Species reach a pathway, they are safe. They can keep moving from pathway to pathway as the game progresses. If tagged, the Invasive Species turn into Nature Protectors. Nature Protectors can eliminate one pathway for every three Invasive Species that they catch.

3. The game ends at time, after all Invasive Species have been caught, or once all pathways are eliminated. Play again and again!

Step Up the Challenge!

- Play the game with obstacles (among trees, shrubs, or in a playground) or over a wider area. If space is limited, or if playing indoors with a large group, assign a few students to act as natural obstacles.
- Add a rule that Nature Protectors have to walk while Invasive Species can run.

The Great EAB Escapade

Outdoor Activity

Primary Objective:

Kids will test their knowledge about the Emerald Ash Borer (EAB) beetle. At the conclusion of the activity, kids will also discover how the movement of firewood may or may not spread the pest and therefore, you should never move it.

Overview:

Use this activity to introduce your campers/scouts/students to the EAB. You can alert them to the EAB's destructive habits, and how they can take action and ***Stop The Beetle***! The activity is fun to play outside … but it can work inside on a rainy day, too! "Location Leaders" will challenge teams with EAB trivia questions during the activity.

Supplies Needed:

- Bundles of sticks, one for each team or individual (5 sticks of *long* and *short* lengths per bundle. Be sure the sticks are easily distinguishable as long or short; quantities of long versus short should vary per bundle.)

- 5 Copies of the *EAB Investigator* (one per "location"), assembled. Circle a different question on each *Investigator*. (This will be the question asked at a specific location.)

Getting Ready:

1. Familiarize yourself with the EAB information in the Leader's Folio, to be able to answer questions.
2. Choose 5 separate spots to serve as imaginary "locations" (they can be outside or inside, but should be within sight distance of each other):
   Note: you may choose to invite Team Leaders to designate their own locations in Activity Step 1; see back page.
   - — Forest
   - — Campground
   - — Fishing area
   - — Backyard
   - — Neighborhood Park

"Back Story"

Introducing the Activity

Gather your group together and tell them: *There's something happening to the ash trees in our state. They're dying! Ash trees are important to both our environment and our economy.*

A beetle called the Emerald Ash Borer beetle (EAB for short) is killing these trees. It's called "Emerald" because it's a beautiful metallic green color. But it's so small that it can fit on a penny – so in fact, you probably won't ever see one. The EAB lays its eggs on the bark of the tree, and when the eggs hatch, the larvae eat into the tree. They hide inside the tree where they develop and grow, disrupting the systems that transport food and water to the tree and eventually killing it.

We think the EAB got to the U.S. from Asia by "hitchhiking" in shipping materials. It was first detected in Michigan in 2002. Now, it has been detected in other States. So we have to wonder: How did it get to so many States?

Today, we'll visit fictional "locations" like the ones we have around our state. These are the types of places that may have ash trees that could be destroyed by the beetle. We're going to learn more about ash trees and the EABs that can harm them!

STOP THE BEETLE: NOW!

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Activity Steps

1. Choose five kids to serve as Location Leaders, one for each fictional location. Give each Leader an assembled *EAB Investigator* (be sure a question is circled), and have him/her go to their "location."
2. Divide the remaining kids into teams of two or three (or, kids can work individually).
3. Give each team (or individual) a bundle of five (long and short) sticks.
4. As fast as they can, each team must go to each "location." (Encourage them to start in different directions, to avoid "crowding" in the closest location.) Once there, the Location Leader will pose his/her circled question from the *EAB Investigator*.

   If answered correctly: The team (or individual) will leave any stick from their bundle at the location, and move on to another location.

   If answered incorrectly: The team/individual can move on, but they can't leave a stick.
5. The winning team (or individual) is the first to visit every location and have no sticks (or the fewest number) left.

Extra copies of the *EAB Investigator* may be downloaded FREE at **www.HungryPests.com**

Wrap-Up

Once all teams have returned to the starting point, explain to them that sticks they were carrying were "firewood." The long sticks represented EAB-infested firewood, while the short sticks were healthy logs. Where did the EAB firewood end up?

Walk with the group back to each location, and see how much EAB firewood was left behind. Ask the group:

- *Which locations had firewood moved to them?* (probably, all of them)
- *Could you tell whether the firewood had the EAB hidden inside?* (NO!!)
- *What do you think will happen to the ash trees in the locations if the firewood is infested with the EAB?* (The trees in the area will become infested with the EAB)
- *Who put the infested firewood in the location?* (The kids did … but they didn't know which firewood was infested!)
- *What does this tell you about how the EAB has moved from state to state?* (People helped the beetle move, by moving firewood from one place to another. Just as the kids didn't know which sticks may be infested with EAB larvae, people can't tell if actual firewood may have EAB larvae in it.)

Closure Message:

Even though they may not realize it, *people* are moving the beetle by moving firewood. If you move infested firewood to a new location, you can cause that location to become infested and ash trees will die. Since you can't tell if firewood is infested, the simple rule is to never move it.

Bottom Line: **Stop the Beetle . . . Now!**
Everyone shouts: **Don't Move Firewood!**

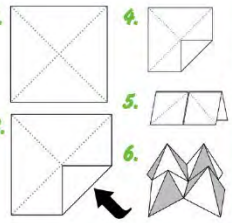
EAB Investigator

www.HungryPests.com

You now know about the Emerald Ash Borer (EAB) beetle: how it hides under bark and destroys ash trees. You've discovered how important it is to stop it, so now *you* can share this news with others, too! Use this *EAB Investigator* to alert your family, friends, and neighbors. First, try to stump them with the EAB "investigation questions." Then, share what you've learned through your own *Stop the Beetle: Now!* exploration: EAB larvae can be hidden under the bark, so you should **never move firewood**. You never know what could be lurking inside!

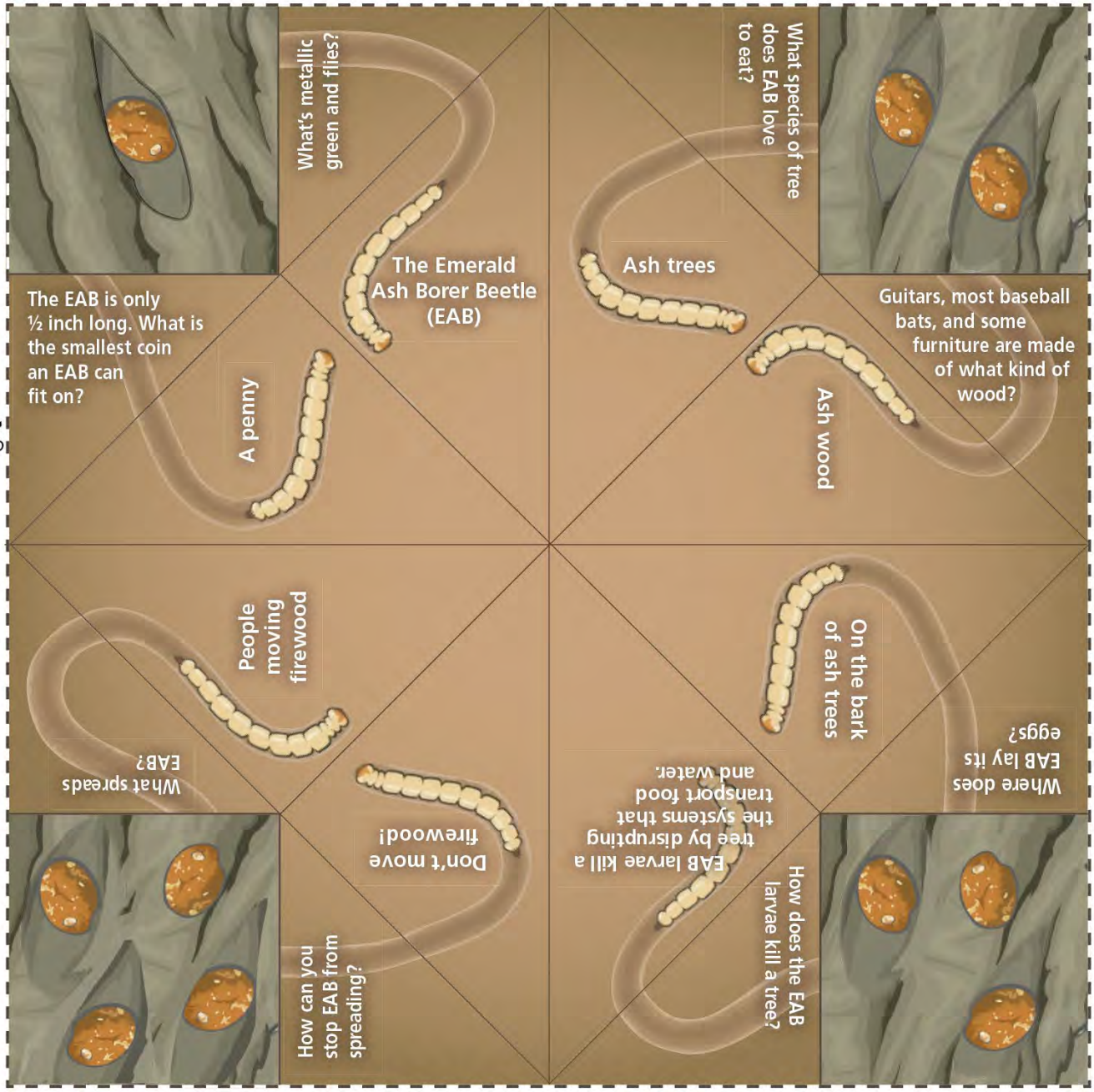
Folding Instructions

1. Cut along the dotted line.
2. Place the *EAB Investigator* image-side down. Fold 2 opposite corners together to form a triangle. Crease and unfold. Now fold the other 2 corners together; crease and unfold. You'll see the "center point."
3. Fold each corner to the center point.
4. Turn the folded paper over and fold each corner into the center.
5. Fold the square in half. Unfold it and fold it in half the other way.
6. Using both hands, place your thumbs and index fingers under the bark flaps.



How to Play

- Have a player pick a number between 1 and 5. Open/close the EAB Investigator that many times.
- Now have the player choose a number on a bark flap (noted by EAB eggs), from 1 to 4.
- Ask the question under the chosen flap.
- Invite the player to answer, then lift the flap to see if correct.
- Be sure to show the player the EAB larvae hidden under the bark!



WISCONSIN WORM WATCH SURVEY

Date of Survey: _____ / _____ / _____

School: _____

Land Type: Public Private Commercial Tribal

Location: _____

Are there any distinctive landmarks? _____

_____

_____

Weather Conditions: Sunny Cloudy Rainy Slightly Overcast

Air Temperature: _____° Soil Temperature: _____°

Is there a duff layer (leaf litter)? Yes No Measure depth? _____

Mustard Extraction Instructions:

1. Select site.
2. Clear any ground covering and lay down frame.
3. Mix a 1/3 cup of mustard powder in one gallon of water and shake well.
4. Pour over area and count and sort worms that emerge for five minutes.
5. Make sure all the worms are gathered then pour the other half over and wait an additional five minutes.
6. After gathering all supplies keep the worms and move on to a new location 10 to 20 feet away and repeat.

SUBMIT FINDINGS TO:

Wisconsin Department of Natural Resources Forest Health Specialists (email) at:
invasive.species@wisconsin.gov

EDDMapS (Early Detection and Distribution Mapping System) for Invasive Species:
www.eddmaps.org/

Remember to take pictures and record survey information on the back of this form.

WISCONSIN WORM WATCH SURVEY

Plot #: ___________		
Type	**Juvenile**	**Adult**
Epigeic		
Endogeic		
Anecic		

Plot #: ___________		
Type	**Juvenile**	**Adult**
Epigeic		
Endogeic		
Anecic		

Plot #: ___________		
Type	**Juvenile**	**Adult**
Epigeic		
Endogeic		
Anecic		

Plot #: ___________		
Type	**Juvenile**	**Adult**
Epigeic		
Endogeic		
Anecic		

Plot #: ___________		
Type	**Juvenile**	**Adult**
Epigeic		
Endogeic		
Anecic		

Plot #: ___________		
Type	**Juvenile**	**Adult**
Epigeic		
Endogeic		
Anecic		

Plot #: ___________		
Type	**Juvenile**	**Adult**
Epigeic		
Endogeic		
Anecic		

Plot #: ___________		
Type	**Juvenile**	**Adult**
Epigeic		
Endogeic		
Anecic		