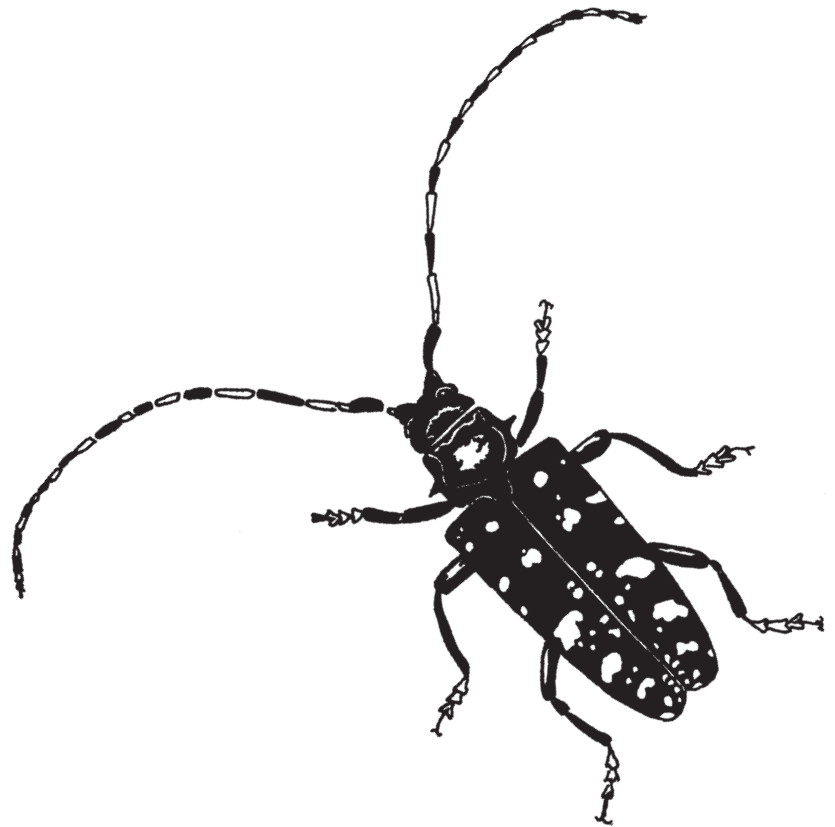


# ~~NNIS~~

## Non-native Invasive Species Learning Kit



*Close the Doors!*



United States Forest Service - Eastern Region

# Non-Native Invasive Species

They're munching our trees, invading our waters, and taking over our favorite natural communities. *They* are invasive species! *They* are plants, animals, and pathogens from other parts of the world – even other parts of our own country! They outcompete, outlast, and outlive our natives. The threat to natural communities posed by invasive species is second only to habitat loss. But before you get too tough on them, remember, they couldn't do it without us! People are the ones who travel around the world, trade with other countries, and transport invasive species to places they could never have gone by themselves.

Everyday, people cross international borders, vacation in pristine natural areas, travel to developing countries, ship materials across the oceans, and obtain plants and animals for fun and profit. Each move, each transaction, each development opens a door.

To stop the invasion, we have to become aware of the threat and become uncomfortable about what we might be losing. This *Non-native Invasive Species Learning Kit* includes four modules designed to take people from awareness of the problem to taking action. Activities in the modules are designed for use by USFS staff, teachers, and non-formal educators with people of all ages.

## Get a Grip on Biodiversity!

Celebrate diversity through story and art, check out what happens when invasives take over an area, and get ready to learn more about invasive species. Activities include: *The Salamander Room*, *Web of Life*, *Freeze Frame*, *There's a Hair in My Dirt!*, and *Jargon Unplugged*.

## Meet the Invaders!

Confront some invasive species, discover their adaptations, and find out why they are such a problem. Activities include: *Ad-libbed Aliens*, *Bioblunder Tribunal*, *Super Alien*, *Outwit-Outplant-Outlast*, and *Meadow in a Can*.

## Close the Doors! - This is the module you have!

Track down invasive species in your own neighborhood, discover how they arrived, and find out how you can prevent further introductions. Activities include: *BioBlitz*, *Means & Modes*, *Sticky Situations*, and *Homeland Security*.

## Do Something!

Measure the spread of invasives, discover how everyday decisions can make a difference, and create invasive species artwork. Activities include: *Biodiversity Index*, *Rival for Survival*, *Pet Detective*, *Miss Rumphius Revisited*, and *Inspired by Wrath*.



Produced by

## United States Forest Service, Eastern Region

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**Writer and Designer:** Beth Mittermaier, EARTH Ltd.

# Close the Doors!

<b>Bioblitz</b> .....	5
Count the species that live in local natural areas. This activity can be quick and simple or a major investigation!	
<b>Means &amp; Modes</b> .....	15
Select items from a grab box and brainstorm how they are connected to the spread of invasive species.	
<b>Sticky Situations</b> .....	19
Discuss what to do when confronted with “sticky situations” concerning invasive species.	
<b>Homeland Security</b> .....	25
Pretend to be inspectors screening potential plant and animal immigrants to the country.	
<b>Activity Crosswalk</b> .....	35
Use these tables to help you find the right activity. Activities are categorized by audience, subject, message, logistics, and level of instructor’s knowledge.	





# Bioblitz

## Description

Armed with extensive checklists, students will tally the number of each type of living thing they encounter. After the BioBlitz, take some time to identify the invasive species and decide how to count them in your biodiversity tally.

## Getting Ready

1. Find an area in which to conduct the biodiversity survey and obtain permission to use it.
2. Identify any hazards in the area. Hazards might include poisonous plants, water, steep slopes, or stinging insects. Check with local specialists and be sure the students are aware of hazards.
3. Locate species lists for your area by searching the Internet or by contacting local nature centers, University Extension staff, museums, or state natural resource agencies.
4. Locate lists of invasive species present in your state or area.
5. Gather any field guides or tools that the students will need. Take a digital camera to record rare plants or animals for later identification.
6. Invite a naturalist or biologist to help with the survey. If conducting the BioBlitz in a national forest, work with the forest biologists to determine what inventories have already been conducted.

## Introduction

*When you hear the word “biodiversity,” what comes to your mind? (Don’t be surprised if students think of tropical rain forests first!) Biodiversity isn’t something that is pristine and far away — biodiversity is right out our back doors! “Bio” means “life” and “diversity” refers to differences. Therefore, biodiversity is the variety of living things.*

*Here’s a great example. Look at the size of your shoe. Imagine placing your foot down on the floor of a healthy forest. Scientists estimate that there would be about a million living organisms under your foot! Of course, it’s an estimate, and the actual number of organisms varies from place to place, but aren’t you impressed?*

*There is a tremendous amount of biodiversity right here. One way to evaluate the health and diversity of an area is to count the number of species present.*



*Non-native Invasive Species Learning Kit* produced by the United States Forest Service - Eastern Region

## Objectives

- List the major groupings of living things.
- Survey the biodiversity of a local area.
- Identify the invasive species present.
- Consider the influence of invasive species on biodiversity.

## Grades

5 - adult. This activity can be adapted by adjusting the time commitment, the degree of identification, and the kinds of organisms surveyed.

## Group Size

5 - 30

## Prep Time

Depends on extent of activity

## Activity Time

Varies with age of participants and commitment. Younger students might be challenged by a one-hour mini-BioBlitz during which they simply tally the diversity of a single group of organisms. Older students can participate in a whole day event as they identify organisms to the family, genus, or species level.

## Setting

Natural area is preferable, but you can also conduct the activity in a park or schoolyard.

## Continued

See next page.

## Materials in the Booklet

- *BioBlitz Checklists* (master for copying)

## Materials Not Included

- writing board for each pair of students
- pencils
- species lists for your area
- state lists of invasive species
- optional: field guides for older students
- optional: hand lenses, binoculars, microscopes, stereomicroscopes, and related supplies
- optional: insect nets, pond equipment, small mammal traps, cover boards

## National Education Standards

### Grades 5 - 8

- Environmental Education: 1.C - Collecting Information
- Environmental Education: 1.D - Evaluating Accuracy and Reliability
- Science: A - Abilities Necessary to do Scientific Inquiry
- Science: C - Populations and Ecosystems
- Science: C - Diversity and Adaptations of Organisms

### Grades 9 - 12

- Environmental Education: 1.D - Evaluating Accuracy and Reliability
- Science: A - Abilities Necessary to do Scientific Inquiry
- Science: C - Biological Evolution

## Doing the Activity

1. **Decide your level of commitment.** Before jumping into this activity, consider these suggestions. You can:
  - Conduct a full BioBlitz. This is a 24-hour intentional search for biodiversity that involves scientists, volunteers, and students. See *Finding Out More* for specifics.
  - Conduct a mini-BioBlitz. See how many species you can find and record in one entire school day.
  - Conduct a one-class-period BioBlitz on a small area of the schoolyard or nearby park.
  - Break your BioBlitz down into sections that are more manageable over a longer period. Conduct an InsectBlitz, a TreeBlitz, a VerteBlitz, and so on. This might be the best option for younger students who will need more structure and guidance.
2. **Talk about what you might find.** Discuss what types of living things students might find in the area they will be surveying. The *BioBlitzChecklists* are divided into convenient sections for the purpose of the survey. Use the box on page 9 to show the connections between these lists and the kingdoms that scientists use. Remember, the taxonomy of living things is always evolving!
3. **Form investigative teams.** Divide students into teams and give assignments. Assigning each team of students to a different page of the checklist is the simplest way to avoid counting the same organism twice. If you assign more than one team to a page, come to a consensus about how the students will avoid duplication. Note: The first page of the checklist (Kingdom Monera and Kingdom Protista) is included to remind students of all types of biodiversity. Don't assign this page to younger students. Upper-class high school students could tackle this page if they are familiar with preparing microscope slides and have the assistance of a science teacher or other specialist.
4. **Prepare for the survey.** Instruct students to find out everything they can about the living things on their checklists. What do the organisms look like? How common are they in this area? What species are most likely to be found in this area or at this time of year? If students arrive at the survey site with some idea of what they are looking for, they will be much more successful!
5. **Agree on a data collection method.** List ways students could collect their information. They could collect specimens (be sure it is permitted), draw sketches, snap photos, or take notes. Decide which method is best for your situation.

6. **Travel to the survey site and get organized.** At the site of the BioBlitz, set boundaries for the areas students are to survey. Establish rules based on your location. Some places might have “no collecting” or “stay on the trails” rules. Wherever you are, respect the area and leave it as you found it. Remind students not to touch things that are unfamiliar, including garbage, animal droppings, poisonous plants, or dead animals. Remind students to wash their hands when you return to the classroom.
7. **Start the BioBlitz.** Set the student teams off to work on their surveys. Assure students that they don’t have to know the name of an organism to count it. Remind them of the data collection methods you established together.
8. **Track progress.** If you are planning a whole day event, have a tally board where teams can post the number of species they have found. A little competition is good!
9. **Tally up biodiversity.** Gather all the data and celebrate the totals. Discuss some of these questions:
  - Does the number of different species that you found surprise you? Why? Why not?
  - Based on your survey, which group is the most diverse? What did you expect?
  - Do you think we would get the same results if we switched teams and did the survey over? Why?
  - What did you learn during the survey that would help you during future investigations?
  - Do you think you missed any species? (Yes!)
  - What would you have to do to ensure that you had accounted for every species in the area? (Conduct numerous surveys at various seasons, times, temperatures, etc.)
  - Could you ever count every species present? (Probably not. Insects are particularly difficult. Scientists haven’t begun to identify all the species of insects. Many insects can only be identified to species level under a microscope. Others live for only a short time. We might accidentally count some more than once as they go through their life cycles. For example, a caterpillar might be counted as one species and an adult as a separate species, even though it is the same species at different life stages.)
10. **Look for invasives on your lists.** After the event, look at the species the students found. Pass out the lists of invasive species to each group. Ask them to cross-reference the two lists and note any invasive species present in the area. If your students drew sketches or took photos to count biodiversity, you will need sketches/photos of the invasives

### Did you know?

There are a lot of insects in the United States and Canada! Scientists haven’t even identified them all! Here is the breakdown:

- 28 orders
- 612 recorded families
- 12,428 recorded genera
- 86,346 recorded species

**NNIS**  
Non-native Invasive Species

so the students can identify them. You can also enlist the help of local naturalists, agency staff, and native plant society members to help identify the invasive plants in the survey area.

11. **Discuss how to count the invasive species.** Talk about some of the following questions:

- Should invasive species be included in a biodiversity count? Why? Why not?
- Do you consider invasive plants and animals to be “desirable” biodiversity? How do they add or subtract from the diversity of an area?
- Should we define biodiversity by quantity of species, quality of species, or both?
- Should we *subtract* points from the biodiversity total for each non-native species?
- Did invasive species dominate any places in the survey area? What happens to the biodiversity of native species in areas that have been invaded? For example, what can you say about the biodiversity of an area that has become a monoculture of one plant?
- What do you think an invaded area might have been like before the introduction of the invasive species?

## Assessing Student Learning

Assess the ability of students to prepare for and conduct research in an outdoor setting. Collect recording sheets and assess completeness of sketches, tallies, and conclusions. Observe participation in discussion time.

## Extending the Learning

**Compare the biodiversity of an uninvaded area to an invaded area.** Facilitate biodiversity surveys in two distinct areas. Ask students to compare the totals for each page of the checklists. Discuss how the presence of an invasive species in one part of the checklists can influence the biodiversity totals throughout the checklists. For example, invasive garlic mustard doesn’t just reduce the biodiversity of herbaceous plants and tree seedlings. It reduces the number of vertebrates and invertebrates that can find food and cover in the area.

**Explore with younger students.** Students in primary grades can still experience the thrill of biodiversity! Take a sensory walk and survey biodiversity with sight, smell, sound, and touch. Conduct a simple scavenger hunt that encourages them to find diversity in a small area. For example, “find five different leaves” or “listen for two different bird calls”.



# Finding Out More!

**Biodiversity** by Dorothy Patent Hinshaw ©1996. By focusing on activities in the United States and on model conservation efforts in Costa Rica, this book gives readers a perspective on the importance of maintaining biodiversity. Grades 5 - 9.

**Connecticut State Museum of Natural History.** Learn how to organize a 24-hour BioBlitz at this Web site.  
 <<http://web.uconn.edu/mnh/bioblitz/BioBlitzLinks.html>>

**enature.** Visit this Web site for online field guides.  
 <[www.enature.com](http://www.enature.com)>

## Tally Up Biodiversity

Add up the tally marks on the *BioBlitz Checklists* and calculate the total biodiversity.

### Kingdom Monera

Strange Stuff ..... \_\_\_\_\_

### Kingdom Protista

Teeny Tiny Things ..... \_\_\_\_\_

### Kingdom Fungi

Freeloading Fungi ..... \_\_\_\_\_

### Kingdom Plantae

Atypical Autotrophs ..... \_\_\_\_\_

Green Giants ..... \_\_\_\_\_

Herbaceous Hodgepodge ..... \_\_\_\_\_

### Kingdom Animalia

Spineless Species ..... \_\_\_\_\_

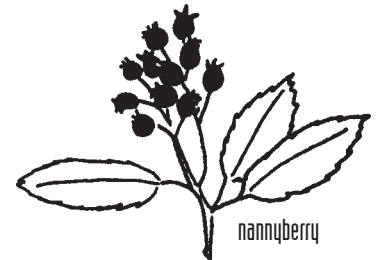
Inestimable Insects ..... \_\_\_\_\_

Varied Vertebrates ..... \_\_\_\_\_

**Total** ..... \_\_\_\_\_



Virginia creeper



nannyberry



poison ivy



# BioBlitz Checklists

Note: These lists include the most common groups of living things that can be found within North America. Wow! Just the lists alone remind us of all the living things that share this space with us. That's a lot of biodiversity! You won't find representatives of each group in the area you survey. (You can't even see some of these living things without a microscope!) Just use these lists to remind you of the categories of living things you might find. Good luck!

## Strange Stuff

(too small to see and almost impossible to find!)

Kingdom Monera



bacteria

\_\_\_\_\_ Bacteria

amoeba



## Teeny Tiny Things

(scientists can't even agree how to categorize them!)

Kingdom Protista



euglena

\_\_\_\_\_ Euglenoids (Phylum Euglenophyta)

\_\_\_\_\_ Amoebas (Phylum Rhizopoda)

\_\_\_\_\_ Parameciums (Phylum Ciliophora)

\_\_\_\_\_ Water molds (Phylum Oomycota)

\_\_\_\_\_ Slime molds (Phylum Myxomycota)

\_\_\_\_\_ Diatoms (Phylum Bacillariophyta)

\_\_\_\_\_ Dinoflagellates (Phylum Dinoflagellata)

\_\_\_\_\_ Green algae (Phylum Chlorophyta)

\_\_\_\_\_ Other algae



desmids (green algae)



chrysophytes (golden-brown algae)



dinoflagellate



brown trout (non-native)

largemouth bass

carp (non-native)



bullfrog



pumpkinseed



toad



painted turtle

## Varied Vertebrates

(animals with backbones)

Kingdom Animalia - Phylum Chordata -

Subphylum Vertebrata

\_\_\_\_\_ Bony fishes (Class Osteichthyes) - trout, bass, chub, and lampreys

\_\_\_\_\_ Amphibians (Class Amphibia) - salamanders, frogs, and toads

\_\_\_\_\_ Reptiles (Class Reptilia) - turtles, lizards, and snakes

\_\_\_\_\_ Birds (Class Aves) - birds of prey, songbirds, waterfowl, shore birds, game birds, and woodpeckers

\_\_\_\_\_ Mammals (Class Mammalia) - carnivores, rodents, bats, deer, and weasels



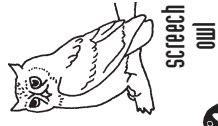
ovenbird



yellowthroat



starling (non-native)



screech owl



Canada goose



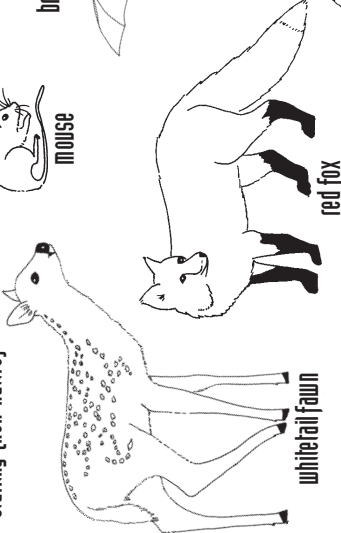
mouse



little brown bat



great blue heron



whitetail fawn

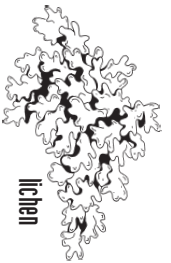
red fox



raccoon



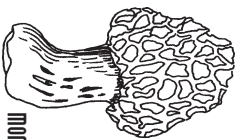
yeast



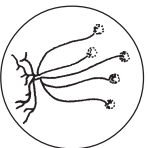
lichen



pixie cup lichen



morel



bread mold

# Free-living Fungi

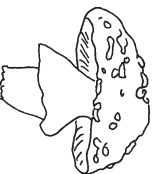
[depend on other things to survive]

## Kingdom Fungi

- \_\_\_\_\_ Yeasts (Phylum Ascomycota)
- \_\_\_\_\_ Mildews (Phylum Ascomycota)
- \_\_\_\_\_ Lichens (Phylum Ascomycota)
- \_\_\_\_\_ Morels (Phylum Ascomycota)
- \_\_\_\_\_ Molds (Phylum Zygomycota)
- \_\_\_\_\_ Plant rusts (Phylum Basidiomycota)
- \_\_\_\_\_ Bracket fungi (Phylum Basidiomycota)
- \_\_\_\_\_ Puffballs (Phylum Basidiomycota)
- \_\_\_\_\_ Mushrooms (Phylum Basidiomycota)

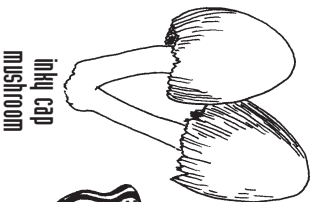
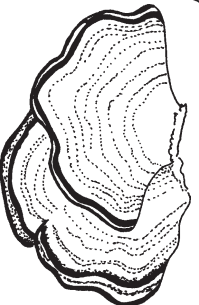


black spot on maple

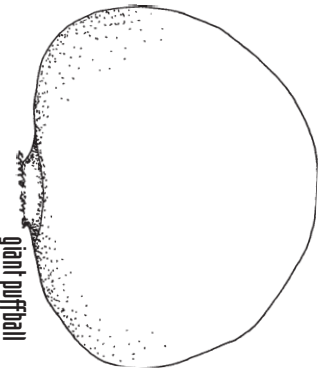


mushroom

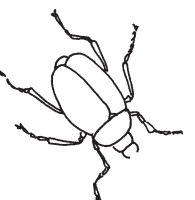
shelf or bracket fungi



tall cap mushroom



giant puffball



June beetle



ant



mayfly



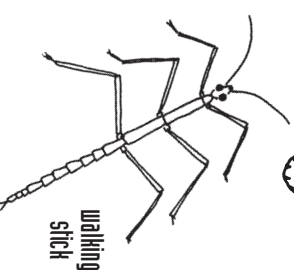
gypsy moth [non-native]



stink bug



mosquito



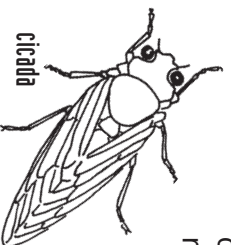
walking stick

# Inestimable Insects

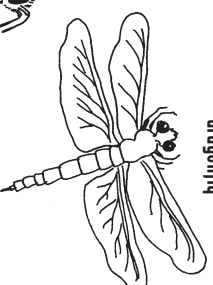
[animals without backbones - invertebrates with 6 legs]

## Kingdom Animalia - Phylum Arthropoda - Class Insecta

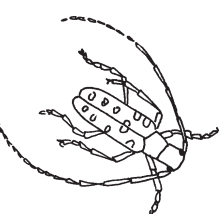
\_\_\_\_\_ Insects (Class Insecta) - grasshoppers, dragonflies, bugs, beetles, butterflies, and many, many more!



cicada



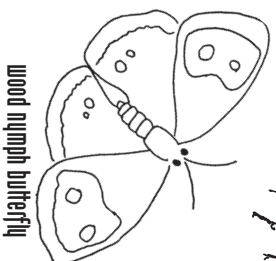
dragonfly



Asian longhorned beetle [non-native]



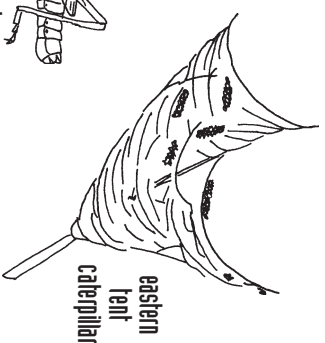
honeybee [non-native]



wood nymph butterfly



grasshopper



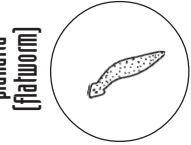
eastern tent caterpillar



freshwater sponge



planaria (flatworm)



hydras



nematodes



moss animal

# Spineless Species

(animals without backbones - invertebrates)

## Kingdom Animalia

Sponges (Phylum Porifera)

Hydras and Jellyfishes (Phylum Cnidaria)

Flatworms (Phylum Platyhelminthes)

Roundworms (Phylum Nematoda)

Moss Animals (Phylum Bryozoa)

Rotifers (Phylum Rotifera)

Earthworms and Leeches (Phylum Annelida)

Snails and Slugs (Phylum Mollusca)

Mussels and Clams (Phylum Mollusca)

Crustaceans (Phylum Arthropoda - Class Crustacea)

Crustacea - fairy shrimps, crayfishes, sowbugs, and water fleas

Arachnids (Phylum Arthropoda - Class Arachnida) - scorpions, daddy longlegs, ticks, spiders

Centipedes (Phylum Arthropoda - Class Chilopoda)

Millipedes (Phylum Arthropoda - Class Diplopoda)



millipede



rusty crayfish (non-native)



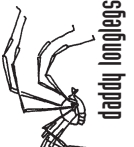
spider



water flea

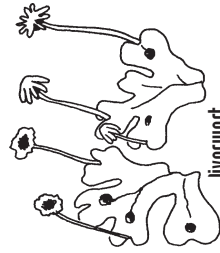


spiny water flea (non-native)

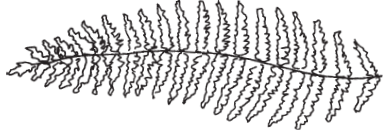


daddy longlegs

liverwort



moss



cinnamon fern



lady fern

# Atypical Autotrophs

(green plants without flowers)

## Kingdom Plantae

Liverworts (Division Hepatophyta)

Mosses (Division Bryophyta)

Ferns (Division Pterophyta)

Horsetails (Division Sphenophyta)

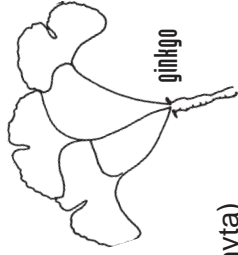
Club mosses and spike mosses (Division Lycopphyta)

Ginkgoes (Division Ginkgophyta)

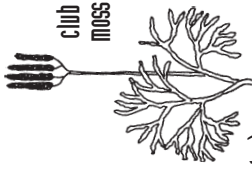
Coniferous trees (Division Coniferophyta) - pines, spruces, firs, hemlocks, cedars



horsetail



ginkgo



club moss



pine



cedar



spruce



hemlock



tamarack





## Green Giants

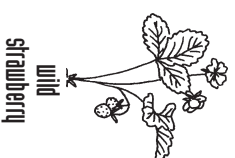
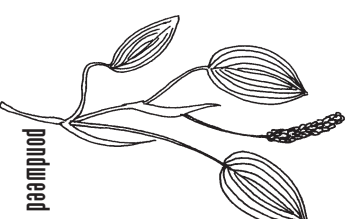
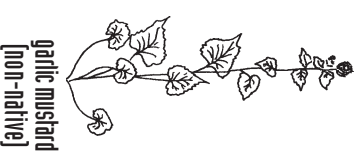
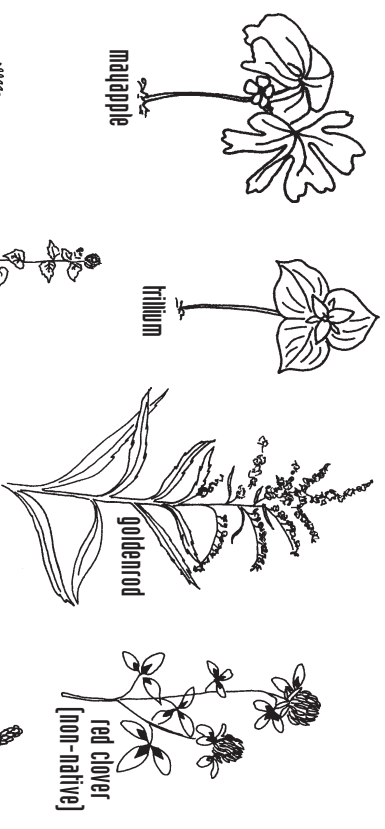
[green plants with flowers and woody stems]

### Kingdom Plantae - Division Anthophyta

Deciduous trees

Shrubs

Vines



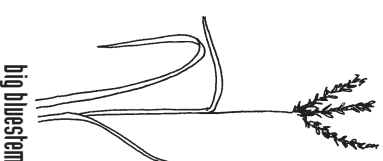
## Herbaceous Hodgepodge

[green plants with flowers, but not woody stems]

### Kingdom Plantae - Division Anthophyta

Wildflowers

Grasses and sedges



# Means & Modes

## Description

Most invasive species are incredibly adaptable and can take advantage of opportunities for invasion. However, they rarely swim across oceans, walk over mountain ranges, or hop continents without help from people! A box full of “teasers” will help students figure out ways that people knowingly and unknowingly assist invasive plants and animals.

## Getting Ready

1. Look through the items in the *Means & Modes* box and choose the ones appropriate to your audience, topic, and personal knowledge level.

## Introduction

*Have you ever been arrested for picking up a hitchhiker, smuggling an alien through customs, or purchasing an illegal substance? Assuming not, you're lucky! No doubt at some point in your life you have, either knowingly or unknowingly, helped a potentially invasive species enter new territory. Let's find out how invasive species get around and how we might stop giving them a hand.*

## Doing the Activity

1. **Select items from the box.** Let students select items from the *Means & Modes* box. If you have more students than items, ask students to work in pairs.
2. **Brainstorm connections.** Ask students to think about their items and brainstorm how they might be connected to the spread of invasive species. The items in the box simply serve as springboards for ideas. There are no right or wrong answers. Encourage them to think creatively!
3. **Share ideas.** Allow students to share how they think their items contribute to the spread of invasives. Note: Refrain from telling everything you know about each item. Keep the activity moving!
4. **Wrap up the activity.** Ask some of these questions:
  - Did this activity help you think of a time when you might have transported an invasive species?

## Objectives

- List everyday activities that can contribute to the spread of invasive species.
- Realize that people spread invasive species both knowingly and unknowingly.
- Analyze personal actions related to the introduction and spread of invasive species.

## Grades

9 - adult

## Group Size

5 - 30

## Prep Time

Minimal

## Activity Time

Varies from a few minutes to an entire class period, depending on purpose

## Setting

Anywhere

## Materials in the Kit

- items (27)

## Materials in the Booklet

- list of the 27 items in the *Means & Modes* box and questions to prompt discussion (pages 17 - 18)

## National Education Standards

See next page.



## National Education Standards

### Grades 9 - 12

- Environmental Education: 2.4.A - Human/Environment Interactions
- Science: C - The Interdependence of Organisms
- Science: F - Environmental Quality
- Social Studies: IX - Global Connections (d and h)

- Would you share the circumstances with the group?
- Now that you know more about how potential invasive species move from place to place, what will you do about it?
- Can any of these pathways of invasion be controlled or stopped? How?
- Do you think it is the job of the government or individuals to control the spread of potentially invasive species? Why?

## Assessing Student Learning

Observe student participation in the discussion. Ask students to choose an item from the box, find out which invasive species might be spread by that item, and suggest ways to prevent the spread. For example, if you wear hiking boots in an area infested with garlic mustard, you are likely to pick up garlic mustard seeds. Thoroughly cleaning the mud off boots before leaving the infested area helps to prevent the accidental spread of seeds into new areas.

## Extending the Learning

**Research unknowns.** Record unanswered questions that come up during this activity. Use these questions to form the basis for further student research. Possible questions include:

- How is ballast water used?
- Why are snakehead fish shipped live?
- Do contractors thoroughly clean construction equipment when it moves from one project to another?
- Does your school have a policy regarding the use of animals in the classroom and their disposal?



# Means & Modes Items

## Aquatic

- Bait container – What do you do with leftover bait? Have you ever dumped store-bought worms on the ground?
- Boat – How do you think a boat could move plants and animals from one body of water to another? Bilge water? Propellor? Ballast water?
- Aquarium fish – What happens to fish when their owners have to move and can't take their fish with them? Can fish survive a toilet flush? Is it more humane to destroy a sick pet fish or "give it a chance" in the local pond?
- Aquarium plant - What happens to these aquatic plants when someone empties an aquarium into a pond or lake?
- Rubber crayfish lure - Have you ever thrown store-bought minnows or crayfish in the water? Did you know that it is illegal in some states to be in possession of live crayfish and fishing equipment at the same time?
- Live frog habitat – What do you think might happen to these frogs when the novelty wears off?
- Bobber – Could fishing equipment transport invasive species? What are fishhook waterfleas?

## Terrestrial

- Shoestring from hiking boot – How could shoestrings spread invasives? Have you ever gotten seeds stuck in your shoestrings? What did you do with them? What do you do with the mud that gets stuck in your boot tread?
- Butterfly release envelope – Where do you buy butterflies for release at weddings and other events? What happens to the butterflies after the release?
- Certified "weed free" hay for pack animals – How could the diet of a pack animal be related to the spread of invasive species? When would you have to start feeding special hay to your pack animal before taking a trip into a restricted area?
- Dirt bike tread – How could vehicles like 4X4s, dirt bikes, and SUVs transport invasive plants? How might an "off road" or "off trail" vehicle damage the landscape? How could this damage increase the number of invasive plants?
- Landscape tag - Does this tree's name indicate that it is a native tree? Why do you think nurseries sell plants that are known invasives?

### Yikes!

Once upon a time, natural barriers like oceans and mountain ranges prevented many potential invasive species from entering the United States. Now global trade, travel, and transportation have removed those natural barriers.

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- Mailable seed packet – What are some problems with picking up seeds on vacation and mailing them to your friends? How can seeds native to one state/country be a problem in another?
- Dog – Do seeds ever get stuck in pet fur? What do you do with the seeds?
- Birdseed bag – What kinds of seeds are in birdseed? Do birds completely digest all the seeds they eat? What problems could undigested seeds cause?
- Tent stake – Have you ever had seeds or soil stuck on your camping equipment? What have you done with the seeds? What kinds of seeds do you think invasive plants might have?
- Military equipment – Military equipment is used all over the world. What kind of species could military equipment transport?
- Plane – How could the inside or outside of a plane transport invasive species?
- Luggage with bananas – People travel all over the world. What could happen if they decide to carry food items, plant specimens, seeds, or wild animals from place to place?
- Firewood – What kinds of invasive species could firewood transport?
- Livestock – How could cattle, sheep, pigs, or other livestock transport invasive species? Think about what happens to the food they ate before they were transported.
- Construction equipment – How does development add to the problem of invasive species? Besides moving invasives on tires, can you think of ways the disturbance caused by construction adds to the problems with invasives?
- Big cat – In what ways could zoos, circuses, private organizations, and individuals contribute to the problem? What kinds of animals can you purchase? How has the Internet influenced the international pet trade?
- Wooden crate – How could wood used for containers harbor invasive species?
- Carabiner – What precautions should people take when they venture into wilderness areas to participate in extreme sports?
- Tractor – How could raising crops encourage invasive species?
- Blaze orange cloth – Could hunters transport invasive species to new areas? How could hunters be sure they don't move invasives?

# Sticky Situations

## Description

We face dilemmas every day. Sometimes we can't realize the long-term repercussions of our decisions. In this activity, students read real-life dilemmas that they might face and discuss possible solutions and consequences.

## Getting Ready

1. Ensure that you have enough copies of the dilemmas for the size of your group.

## Introduction

*Every day we face choices. Some of the choices are easy – like whether to eat hot or cold cereal for breakfast. Some are fun – like whether to go to a movie or just rent a DVD. Other choices seem easy and fun until you think about the consequences. Your lifestyle and the decisions you make can have negative or positive influences on the environment. The influence of one person making one decision might seem insignificant, but one decision times the millions of decisions made over a lifetime times the more than 6 billion people on the earth really adds up.*

## Doing the Activity

1. **Divide into small groups.** Give each group one or more *Sticky Situation* cards. You can:
  - Give each group the same situation and allow time for discussion.
  - Give each group a different situation and allow time for discussion.
  - Give each group several situations and let them work through the dilemmas as a group.
2. **Bring the class together for wrap-up discussion.**

## Assessing Student Learning

**Create your own dilemmas.** How would your friends, family members, or classmates respond to other tough challenges? Create your own dilemmas and think about what you would do. Here are some ideas to get you started:

## Objectives

- Recognize that simple choices we make on a daily basis can have a negative or positive influence on the environment.
- Express personal opinions concerning the choices available and the consequences of those choices.

## Grades

6 - 12

## Group Size

Maximum 30, divided into groups of 3 - 5

## Prep Time

Minimal

## Activity Time

10 - 50 minutes

## Setting

Anywhere

## Materials in Kit

- laminated *Sticky Situation* cards (3 sets of 8 cards)

## Materials in Booklet

- *Sticky Situation* cards to copy if you don't have the kit (pages 21 - 24)

## National Education Standards

See next page.



## National Education Standards

### Grades 6 - 8

- Environmental Education: 2.4.A - Human/Environment Interactions
- Environmental Education: 4.D - Accepting Personal Responsibility
- Social Studies: IX - Global Connections (d)

### Grades 9 - 12

- Environmental Education: 2.3.A - Individuals and Groups
- Environmental Education: 4.D - Accepting Personal Responsibility
- Science: F - Environmental Quality
- Social Studies: IX: Global Connections (d and h)

- Jet skiing is cool – Will you ski right through the hydrilla and break it to pieces? Did you know that fragments of hydrilla can start whole new plants?
- Pets love to wander – Will you keep your pets “on leash” and “on trail” or will you let them run wherever they desire?
- Trails are muddy – Do you walk right through or make a new trail?
- Luck is with you – Your decoys brought in a whole flock of ducks and you had a successful hunt. When you haul in your decoys, will you take the time to clean off the aquatic plants and mud from the lines and anchors?
- Dreams are fulfilled – You’ve always wanted a prairie dog and now your uncle has found a source on the Internet. Will you get this exotic pet, even though they have been made illegal?

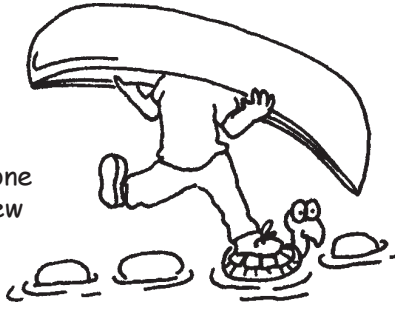
## Extending the Learning

**Investigate low impact recreation.** We need wild places. We also need to care for wild places as if they were our homes . . . for, in many ways, they are. *Leave No Trace* is a nationwide program that helps people know how to take care of America’s public lands. Invite students to visit their Web site and learn more about how they can tread lightly. <[www.Int.org](http://www.Int.org)>

**Continue to explore beliefs and values.** Positions on invasive species issues are closely tied to issues concerning biodiversity. The activity “The Spice of Life” helps students think about their own beliefs about biodiversity. It is part of World Wildlife Fund’s ***Windows on the Wild: Biodiversity Basics***. For more information or to order the education guide, visit the World Wildlife Fund’s publication Web site. <[www.worldwildlife.org/windows/education\\_guides.cfm#4](http://www.worldwildlife.org/windows/education_guides.cfm#4)>

## Sticky Situation 1

Your family loves to canoe camp. Your favorite thing to do is travel from one lake to another. You don't mind the portages, but your dad's obsession with cleaning all the vegetation and aquatic animals off the canoe is driving you crazy. He even makes you clean the mud off your shoes! Now you are old enough to canoe on your own with some friends. You are leaving one lake for a new one. Do you clean the canoe?



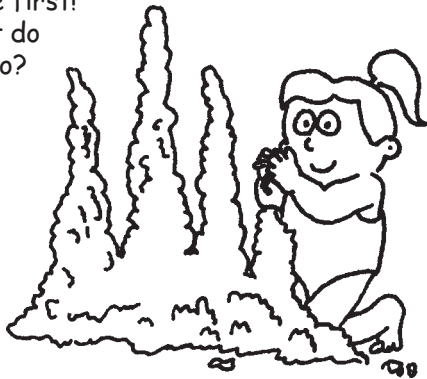
*OK, maybe dads can be a little unreasonable at times, but this time Dad has the right idea. Non-native plants and animals move easily from lake to lake on you, your shoes, clothes, packs, tents, canoes, pets, bait buckets, and anything else you use. If everyone was as careful as your dad, we might be able to control the spread of non-natives like zebra mussels, Eurasian milfoil, and spiny water fleas.*

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## Sticky Situation 2

You can easily see the trail with switchbacks leading down to the shore. The sign says, "Please stay on the trail." Your friends have just taken a well-used shortcut that heads straight for the water. They are going to get there first! What do you do?



*Shortcuts are tempting! But the plants growing on shores protect the area and provide valuable habitat. Taking shortcuts increases shoreline erosion. But that's not all! Once the native plants along the shoreline have been disturbed, the likelihood of invasive plants taking root is much higher.*

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## Sticky Situation 3

You've always wanted to see a desert and now here you are! The colors, shades, and textures are like nothing you've ever experienced. Could the perfect souvenir help you keep this feeling forever? You look around and several things catch your eye: a cactus blooming in the morning sun, a lizard racing across the sand, a spider hanging from a cactus. What should you take home to capture this moment?



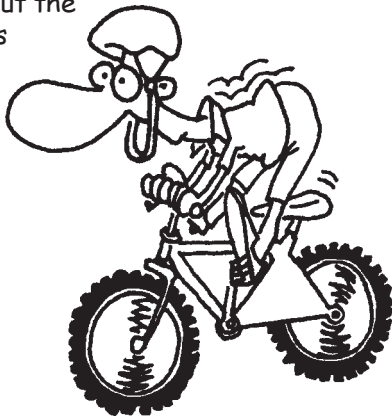
*Whoa, let's think this through. If everyone who visited the desert took "something special" home, what would be left? And that's only half the problem! Fast forward a few months or years. What are you going to do with that plant or animal when you get tired of taking care of it, it gets sick, or it escapes? What might happen if you plant it in your garden or set it free outside? Have you considered a nice photo?*

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## Sticky Situation 4

You're out mountain biking with friends. After that last gravity check, you and your bike are covered with dirt, plants, and blood. You're bonked, so you pack up the bike until another day. You'll go home and do a mud-ectomy on your poor body. But what about the bike? It's covered with mud too!



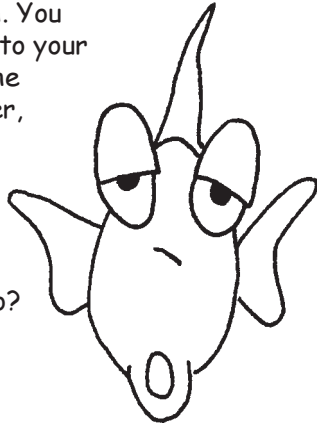
*Bike trails are usually disturbed areas - often with a lot of weedy vegetation. Your bike isn't **just** muddy! It's a moving seed catalog. To avoid carrying seeds and plant parts to other areas, you should clean the bike thoroughly. Even the tread. Be especially careful when moving the bike from one part of the country to another or when traveling into natural areas on bike trails. Oh, and stay on the trails so you don't thrash the surroundings.*

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## Sticky Situation 5

You and your family are moving across the country. While your parents promised that you could restock your aquarium after the move, they won't let you move your fish. You offered them to your best friend, the science teacher, and a dozen other people. No one is interested. Now what are you going to do?



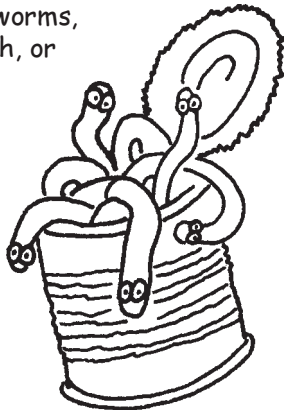
*You might be tempted to release them in a local waterway. At least, you figure, they would have a chance. The truth is that they will either quickly die, or they will survive and pose a risk to the plants and animals already living there. If you can't find a hobbyist, museum, zoo, nursing home, school, or anyone to take care of them, try to return them to the store for resale or trade. If that doesn't work, don't be tempted to bury them at sea! Ask a vet to put them to sleep or place them in water and put them in the freezer. This is considered a humane method of euthanasia.*

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## Sticky Situation 6

Your family likes to joke that you knew how to fish before you could walk. While you prefer lures, you enjoy experimenting with live bait. But at the end of the day, you are never quite sure what to do with leftover worms, larvae, crayfish, or minnows. One friend just dumps them in the water. What will you do?



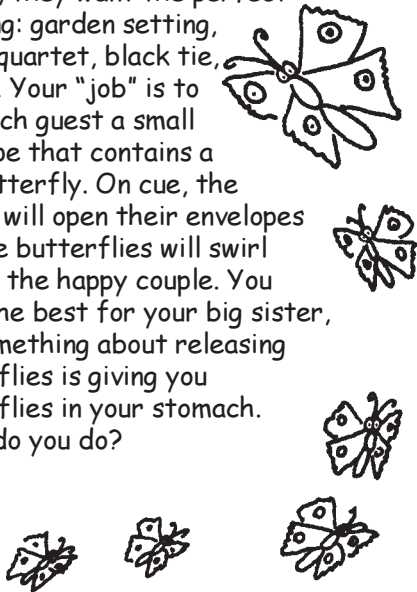
*If your friend jumped off a bridge, would you do that too? First, think about where you got the live bait. If you caught it yourself in the spot where you are fishing, it's ok to return it to the water. If you bought the bait at a bait shop or collected it from any other body of water, then you should dispose of any leftover bait in the trash. Never dump leftover worms on the ground. Improper disposal of live bait is one way that invasive species are spreading.*

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## Sticky Situation 7

Your big sister is finally getting married to that guy she's been dating forever. Of course, they want the perfect wedding: garden setting, string quartet, black tie, sunset. Your "job" is to give each guest a small envelope that contains a live butterfly. On cue, the guests will open their envelopes and the butterflies will swirl around the happy couple. You want the best for your big sister, but something about releasing butterflies is giving you butterflies in your stomach. What do you do?



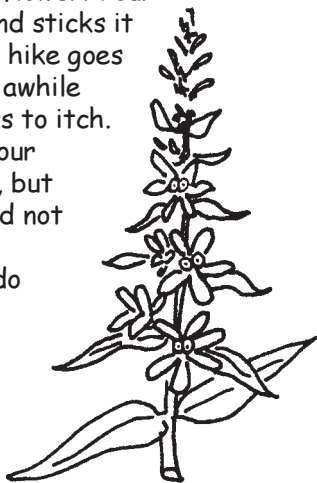
*You have good reason to be concerned. Ask your sister to find out about the butterflies she is planning to release and to read about potential problems with releases. Are the butterflies from a licensed butterfly breeder? Is it likely to be warm and sunny when they are released? Is the butterfly species native to the area? If not, they shouldn't be released. Even species that are native to the area but raised from butterflies collected somewhere else can be a problem. When the released butterflies mate with local butterflies, they introduce genes that are not adapted to local conditions. Is her "perfect wedding" more important than the lives of local butterflies?*

Non-native Invasive Species Learning Hit - United States Forest Service - Eastern Region

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## Sticky Situation 8

You and your family are taking a long hike into the forest. Dad parks at the trailhead and everyone gets ready to go. Just off the parking lot, there is a beautiful purple flower. Your mom picks one and sticks it in your hair. The hike goes great, but after awhile the flower starts to itch. You carry it in your hand for a while, but it's all droopy and not that beautiful anymore. What do you do with it?



*If you guessed that the weed might be purple loosestrife, you could be right. You don't know for sure. It could be invasive; it could be endangered. However, invasives are a lot more common around parking lots where the soil has been disturbed and there is a lot of human activity. Now that you are far from the source, don't drop it on the ground and spread its seeds. Put it in a bag and throw it in the trash when you get home. Remember: It would be best not to pick any wildflower. Period.*

Non-native Invasive Species Learning Hit - United States Forest Service - Eastern Region

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# Homeland Security

## Description

If we had tight security at all borders and the ability to interrogate all species entering the country, could we stop further invasions? Students will participate in skits that will entertain and enlighten them concerning the threat of global bioinvasion and the hidden costs of rapid global travel and free trade.

## Getting Ready

1. Read through the lesson and the scripts.
2. Find staff and/or students to perform the script/s you select.
3. Gather the props you need.
4. Check Internet links for Australia's invasive species awareness campaign.

## Introduction

*Homeland security isn't just about securing the borders of our country from terrorist threats. We should also be concerned about another threat that could prove to be devastating to the ecology and economy of the United States – that is the threat of imported invasive species such as pathogens, plants, insects, and other animals.*

*Bringing new species to America is nothing new! The first settlers brought seeds on purpose and by accident. They opened up the forest, disturbed the ground, and planted crops and weeds from their home countries. Today, about 98% of the foods that we eat are from non-native species such as wheat, corn, cattle, and chickens. Most of these plants and animals are considered beneficial, and they don't pose a threat to natural areas.*

*However, with the huge increases in world travel, tourism, and trade, the chances for foreign plants and animals to arrive in America have skyrocketed. Some invasive species are deliberately introduced. Others are stowaways aboard ships, aircrafts, and containers. However they arrive, invasive species are getting here in record numbers and causing the biopollution of our waters, forests, prairies, rangelands, and agricultural fields.*

## Objectives

- List the entry points and pathways that allow invasive species to enter the country.
- Become aware of government agencies that protect our borders.
- Design an invasive species awareness campaign.

## Grades

6 - adult

## Group Size

Maximum 30

## Prep Time

Minimal

## Activity Time

Depends on number of scripts performed

## Setting

Anywhere

## Materials in Kit

- scripts (2 copies each of 3 skits)
- security badge (2)
- security cap (2)
- clipboard
- snakehead fish headpiece
- cow bell
- Asian longhorn beetle headband
- sunglasses
- sawdust in bag
- package with water stains and hydrilla sticking out of it
- *Suspicious Mail* poster

## Materials Continued

See next page.



## Materials in Booklet

- copies of scripts for use if you don't have the kit (pages 29 - 34)
- *Baggage Surprises* (pages 35 - 36)

## Materials Not in Kit

- optional: folding chairs and cardboard boxes

## National Academic Standards

### Grades 6 - 8

- English Language Arts: 4
- Environmental Education: 2.3.D - Global Connections
- Science: F - Natural Hazards
- Science: F - Risks and Benefits
- Social Studies: VI - Power, Authority, and Governance (a)
- Social Studies: IX - Global Connections (d and e)

### Grades 9 - 12

- English Language Arts: 4
- Science: F - Science and Technology in Local, National, and Global Challenges
- Social Studies: IX - Global Connections (d)

## Doing the Activity

1. **Perform one or more of the skits.** With the help of staff, drama students, or student volunteers, act out one or more of the *Homeland Security* skits included with this lesson.
2. **Talk about the scenarios.** All of these skits are staged at entry points into America. Scientists agree that the best way to handle the invasion of non-native species is to prevent them from ever getting into the country. That is easier said than done! What are some things that make it difficult for us to prevent all non-native species from gaining entrance to the country? (There are numerous entry points and limited staff checking incoming passengers and cargo. Invasives are intentionally smuggled, unintentionally introduced, and unknowingly stowed away. The gaps in our knowledge concerning the invasive potential of new species also contribute to the problem.)
3. **Consider entry pathways.** The three scenarios illustrate the three main entry points for invasive species: passengers, cargo, and mail. Consider these questions:
  - Passengers – Read and discuss the article from U.S. Customs and Border Protection titled *Baggage Surprises* (pages 35 - 36). It does a good job of pointing out intentional and unintentional introductions by global travelers.
  - Cargo – Airports and shipping ports receive millions of packages and shipping containers every day. It is impossible to examine every piece of cargo. Authorities spot check shipments, but most of the time they must rely on paper trails, honesty, and fear of being caught. Find out about the Beagle Brigade and its role at airports and borders. How could we make our ports of entry safer from the intentional and unintentional introduction of non-native species?
  - Mail – The Internet has made it possible for the average consumer to purchase exotic plants and animals from all over the world. Is it the government's responsibility to monitor these purchases? What rights would be violated if the USPS inspected *all* packages? Is it even feasible to inspect every one of the 700 million pieces of mail that are shipped in, out, and around the country every single day?
4. **Check out Australia's invasive species awareness campaign.** Making people aware of the problems that invasive species cause is one way to slow the intentional and unintentional introduction of new species. Australia, with its unique plants and animals, has suffered vast ecological and economic damage from non-native invasive species. They may be way ahead of us when it comes to protecting

their homeland from invasives. They've even enlisted the help of the Crocodile Hunter, Steve Irwin! Ask your students to visit their Web site at <[www.affa.gov.au](http://www.affa.gov.au)> and follow the links to *Quarantine and Export Services*. They have extensive lists of permitted and prohibited items. Find out why a country has no problem with you bringing in fruitcake, but will confiscate your citrus tea! Check out their *Biosecurity Australia* publications page to get an idea of how seriously they take this issue.

5. **Create an awareness campaign for the US.** The United States has also tried media campaigns to raise awareness of invasive species. In the 1960s, the USDA invented a mascot named Pestina. While Pestina was modeled after the wildly successful Smokey Bear, neither the character nor the campaign was very successful. Challenge your students to come up with a strategy for raising awareness of invasive species threats. They can:
  - Create a TV spot.
  - Design a print ad or poster. See Steve Irwin's ad for Australia.
  - Develop a mascot or spokesperson for the issue. See Australia's Quarantine Detector Dogs.
  - Record a radio announcement.
  - Film a video to be used during international flights.
  - Start a PR Campaign (e.g., a take-off of the anti-drug campaign "This is your pond. This is your pond under water hyacinth.").
6. **Present ideas to the class.** Allow class time for groups to present their awareness campaigns. Give students the option of following the reality show format in presenting their ideas. However, base the grade on rubric criteria!

## Assessing Student Learning

Ask students to create a rubric for the awareness campaigns they present. The rubric should include:

- Audience is identified and material is appropriate for the audience.
- An effective media is chosen for the audience and message.
- Information is accurate.
- Information is presented in an attractive, professional format.
- Specific actions are identified that will reduce the number of introductions of non-native species.

### Did you know?

In the 1960s, the USDA introduced *Pestina* to teach people about invasive species. What do you think Pestina looked like?

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## Extending the Learning

**Invent an invasive species detector.** Discuss the methods (e.g., x-ray machines, canines, CO<sub>2</sub> detectors) that inspectors use to detect living organisms in luggage and cargo. Ask students to find out more about how these methods work or to invent a new device that could be employed in the fight against invasives.

**Investigate current laws.** Several legislative acts give authority to exclude certain species from entering the United States. Ask students to find out about current and pending legislation. Discover how authority over border protection has changed since recent terrorist attacks, the passage of the Patriot Act, the formation of the Office of Homeland Security, and the creation of the “Intelligence Czar”. Investigate black lists, white lists, and pied lists. Conduct an Internet search for “white list’ ‘invasive species’” to read about some of the controversy. Discuss with students why so many people are opposed to the adoption of the “white list” approach. Discuss the pros and cons of these different lists, and debate which would best protect America’s biodiversity.

**Visit an international airport.** If your school is close to an international airport, contact airport authorities to arrange a behind-the-scenes class tour or a visit from the Beagle Brigade. Find out firsthand how the airport checks passengers and packages entering from other countries for possible plant or animal pests.

**Map the routes of invasive species.** Use the activity *Where in the World?* from *Exotic Aquatics on the Move* to help your students see the pathways of aquatic invaders on a large map of the world. The lesson plan is available on the Internet. <[www.ag.ansc.purdue.edu/EXOTICSP/](http://www.ag.ansc.purdue.edu/EXOTICSP/)>

### Did you know?

Thomas Jefferson once said, “the greatest service that can be rendered to any country is to add (a) useful plant to its culture.”

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# Snakehead Fish

## Characters

**Snakehead fish (SF)** wears the fish head. Dark brown or black clothing is optional. Walks with a wallowing gait - barely able to walk - maybe even crawling along. It will add a touch of humor if the SF speaks in a quick monotone. If you are familiar with the land shark from *Saturday Night Live*, you can imitate his voice.

**Airport Security (AS)** wears badge and cap. A uniform-like costume would be great, but not necessary.

## Setting/Props

Make a walk-through “screener” by putting two folding chairs back-to-back with enough room for a person to pass between the backs. AS should hold the bell.

## Introduction

Snakehead fish are often shipped live for use in Asian cooking. What would happen if airport security met up with a traveling snakehead?

## Skit

**AS** Excuse me, sir. Over here. Everyone must go right through here, sir. Do you need some assistance? I can call for a courtesy wheelchair.

**SF** Fine, ma’am.

**AS** Empty your pockets, please.

**SF** No pockets, ma’am.

**AS** (*looking confused*) OK, come right through here.

(*AS rings bell loudly.*)

**AS** I’m afraid well have to do a body search since the alarm sounded.

**SF** Hook, ma’am

**AS** Excuse me, did you say hook?

**SF** Yes, last summer. Swallowed a hook. Metal, ma’am.

**AS** We’re going to have to do a strip search. Step over here. I’ll call for a backup to do the search.

**SF** Strip what, ma’am?

**AS** You're going to have to take off your clothes down to your underwear. This is all routine. You have nothing to worry about unless you are hiding something illegal. Just wallow, I mean step, right over here.

**SF** Scales, ma'am.

**AS** No, we won't weigh you. Just checking you for explosives, illegal weapons, and other threats to airline security.

**SF** No clothes, ma'am. (*pointing to body*) Scales.

**AS** Yes, right. This will only take a few minutes, sir. While we wait for that backup, I just have a few questions for you. Don't take this personally, but I'm noticing a very strong odor. What did you eat for lunch?

**SF** Fish, ma'am. Lots of them.

**AS** I see. And how long are you planning to stay in America?

**SF** Forever, ma'am.

**AS** I see, but you have a Temporary Worker Visa - Class 0-1 from China. That classification applies to persons who have extraordinary ability in the sciences, arts, education, business, or athletics, or extraordinary achievements in the motion picture and television field. Frankly, I'm not seeing how that applies to you, sir.

**SF** Culinary arts, ma'am.

**AS** Culinary? You're a cook? A chef?

**SF** Dinner, ma'am.

**AS** Wait a minute. You're that snakehead fish, aren't you?

**SF** I'm just a dolphin, ma'am.

# Asian Long-horned Beetle

## Characters

**Agriculture Specialist (AS)** holds a clipboard and wears a badge and cap. A uniform-like costume would be great, but not necessary.

**Asian long-horned beetle (ALB)** wears dark sunglasses and a headband with long striped antennae. Sprinkle sawdust on the shoulder. The ALB could be dressed in black.

## Introduction

Asian long-horned beetles are a serious forest pest. They can kill healthy trees very quickly by eating away the growing layer inside the bark. The first Asian long-horned beetles arrived in the United States sometime prior to 1996. They were probably stowaways inside the wood of packing crates shipped from China. Listen in as this Asian long-horned beetle tries to get past an Agriculture Specialist working for U.S. Customs and Border Protection at a major U.S. port.

## Skit

**AS** Hello, welcome to America. Can I see your passport please?

**ALB** I think I left it in my crate - I mean suitcase. Can you wait here while I go check?

**AS** I'm sorry. I can't let you leave this area without a passport. Where did you say you were from?

**ALB** China. I'm from China. Could you dim the lights in here? I'm having a hard time adjusting to the light. Overseas transports – I mean – travel overseas is just torture. *(aside)* Especially in the cargo hold.

**AS** China, did you say? Are you here on business or pleasure?

**ALB** *(thoughtfully)* That's an interesting question. I never thought about it that way before. I suppose that in my field, I would consider this type of territory expansion a career move. Yes, I think I would call it business. However, I have heard of your country's wonderful forested areas and I must say that I'm hoping to get a *taste* of their beauty.

**AS** Could you please state the name of your company?

**ALB** *(fumbling for words)* Asian, ah . . . . Long . . . shipping.

Yes, Asian Long-Shipping. I transport . . . eggs around. From one place to another. (*confidently*) We're in the egg-shipping business.

**AS** (*doubtful*) Could I see your ticket?

**ALB** I think it might be in the same place as my passport.

**AS** So, you can't produce a ticket or a passport? Are you here legally?

**ALB** It's legal to ship things, right. Well, I came in on a shipment! Isn't that legal?

**AS** What is that on your shoulders? It looks like dandruff.

**ALB** Well, I never! (*obviously perturbed*) It is *not* dandruff. I'll have you know it's sawdust! (*brushing sawdust from shoulders*)

**AS** Aha! Sawdust! What did you say your name was?

**ALB** My friends in China call me Starry Sky Beetle (*mumble the last two words*)

**AS** Excuse me, your last name again?

**ALB** (*yelling*) Okay, Beetle. My last name is Beetle!

**AS** Excuse me, I need to check that name against a list of aliases we keep on record.

**ALB** Don't bother. You've got me! You'll find me on the list. I'm the Asian Longhorn Beetle. (*defiant*) I was so close to making it. Stupid sawdust! I could have had it all, maples, horse chestnuts, elms, birches. You name it – it was mine. I could have made your life miserable. You thought gypsy moths were bad. I could have wiped out the entire maple syrup industry. I could have ruined tourism! But *no, you* have to see a little sawdust.

**AS** (*calmly*) Guards. Take him/her away.



# Hydrilla

## Characters

**USPS Inspector (PI)** holds a clipboard and wears a badge and cap. A uniform-like costume would be great, but not necessary.

**Inspector in Training (IT)** wears a badge and cap. A uniform-like costume would be great, but not necessary.

## Setting/Props

Set up a simple mailing room scene by stacking cardboard boxes on a table. Hide the box with the hydrilla sticking out of it behind the other boxes. Attach the *Suspicious Mail Poster* to a wall or the front of the table.

## Introduction

In the 1950s, the aquarium industry introduced hydrilla as an easy-to-grow plant for the home aquarium. It probably escaped when people dumped their aquariums into ponds and lakes. Hobbyists can still purchase this plant from aquarium supply dealers and over the Internet even though it is listed on the US Federal Noxious Weed List. Hydrilla fragments also arrive here as contaminants in shipments of other aquatic plants. While mail inspectors must be more vigilant than ever before, they can't watch out for everything.

## Skit

**PI** OK, only four more of these suspicious packages to inspect and your training will be complete. Here, this one looks pretty routine.

**IT** All right, the address label says:

**From:** Sanjeev's Asiatic Ponds and Parks, Sri Lanka  
**To:** Margaret Kinsey, Woonsocket, Connecticut  
**Declared contents:** live water lilies

**PI** Ok, that sounds good. Next.

**IT** I'm not so sure. What about this water stain on the side?

**PI** Does it look oily?

**IT** No, like water.

**PI** Probably something spilled on it. You said water lilies, right. The shipper probably packed them in water. Next.

**IT** But what about these long leafy things sticking out? They don't look like water lily leaves.

- PI** Listen, just look at the poster. Does it match any of the criteria for suspicious mail? (*List some*) It should never have even been brought in here for a second look!
- IT** What if someone is trying to ship an invasive species into the country?
- PI** As long as it's not a bomb, drugs, child pornography, or mail fraud, our hands are tied.
- IT** What about biological threats? Aren't we supposed to protect the American people from biological threats?
- PI** You mean like anthrax and ricin? Of course, we are responsible for investigating that kind of suspicious mail. But I hardly think that water lilies pose a biological threat to anyone!
- IT** Maybe no person is going to die from smelling a water lily, but I think these are the stems of a hydrilla plant. Do you know what hydrilla can do?
- PI** Can it blow up? Can it make people deathly ill? Does it raid people's wallets?
- IT** No, (*annoyed*) but it does invade natural ecosystems and it takes over and –
- PI** Look, we don't have time for this! (*picks up box and chucks it.*)

# Baggage Surprises

If cicadas, the inch-long winged insects with red, beady eyes, recently invading the Eastern seaboard, give you the willies, or if your reaction to tripe is *Eeeuuw*, then don't read any further.

U.S. Customs and Border Protection officers and agriculture specialists are trained to look for goods that are prohibited from entering the United States. But they also need traits that aren't listed as job requirements, like an unflappable nature and a strong stomach.

It is almost impossible to imagine the assortment of things, and the methods travelers' employ to bring in their special brand of contraband. As CBP officers and agriculture specialists look through baggage, they expect to find the usual: swimsuits, sweaters, snakes, pants, parrots, and toiletries. Wait a minute—snakes and parrots?

Wildlife, dead or alive, is popular contraband and is brought into the United States for any number of reasons. Birds, lizards and snakes top the list, but bats, snails and anteaters are not uncommon. While the US Department of Agriculture's (USDA), Veterinarian Services; US Fish and Wildlife Service; and the Public Health Service have responsibilities for establishing policy regarding wildlife or meat importation, CBP officers and agricultural specialists may be the first to find these illegal imports.

Though the prestige of having a unique pet or specimen drives some, money is the ultimate force behind the wildlife trade on the black market. Importing wildlife is extremely lucrative, and many believe it ranks second in profits only to illegal drug traffic. For example, a bird caught in the rain forest and sold there is worth \$20 dollars, but that same bird sells for \$2,000 to \$4,000 in the United States.

## Why regulate?

Regulating the importation of wildlife isn't just an effort to stymie hobbyists. It's intended to keep our livestock and crops safe from contamination by non-indigenous diseases or pests, protect endangered species, and prevent invasive species from entering our country. Controls also exist to preserve the public health.

Wild birds can bring in diseases that are unknown to our geographic area. Exotic Newcastle disease, a highly contagious virus, can spread quickly to poultry and caged birds. Because of their vulnerability to this virus, one infected bird can spread the disease rapidly to others in proximity and then from location to location. From 1971 to 1974, there was an outbreak of exotic Newcastle disease in southern California, which resulted in the destruction of 12 million birds and cost US taxpayers \$56 million to eradicate. USDA epidemiologists studying the disease traced these outbreaks directly to smuggled birds.

Outbreaks of monkey pox and severe acute respiratory syndrome (SARS), both of which can be transmitted from animals to humans, have focused public attention on the health issues that can result from illegal importations. In addition, uncontrolled harvesting of wildlife can have an environmental impact—trees are cut down and nesting areas destroyed resulting in permanent destruction of the habitats.

## Ants in your pants? Or is it monkeys?

Take the case of Californian Robert Cusack. While undergoing a routine inspection at Los Angeles International Airport, a CBP officer opened Cusack's suitcase. Imagine the surprise when a bird of paradise flew out. Careful examination found three more birds slipped inside nylon stockings and 50 orchids of an endangered species.

When asked if there was anything else, he volunteered, “Yes, I’ve got monkeys in my pants.” And indeed, Cusack had a pair of pygmy monkeys inside his pant legs. Cusack defended his actions by saying he was a concerned environmentalist who had purchased the animals in Jakarta, Indonesia and was taking them to a Costa Rican wildlife sanctuary. Nonetheless, he was arrested for smuggling.

Smugglers try every trick in the book to bring in their illicit cargo. Airport x-ray systems have made it harder to smuggle birds and reptiles in baggage or cargo, so smugglers use couriers to move their contraband traffic. Eggs of rare macaws, the largest breed of parrot, can be hidden in a vest or a pocket. Once these eggs, worth several thousand dollars each, reach their destination, it is impossible to tell if they came from a legal captive bird or a wild one.

Stories abound. Fish smuggled in gas tanks of vehicles, reptiles wrapped and taped around a person, birds drugged with their beaks and feet taped in PVC pipes in a suitcase, and the list goes on. Craig Hoover, the Deputy Director of the North America office of TRAFFIC, an organization that monitors trade in wild animals and animal products, says, “I’ve seen everything . . . birds stuffed in tennis ball cans, inserted into false compartments in vehicles. I had someone try to smuggle a live toucan taped to the small of his back. There have been examples of primates—small monkeys—smuggled inside hand luggage.”

### **Grandpa’s family sausage recipe**

Contraband may also be food (bush meat) or animal parts used for religious rituals or medicinal purposes. Travelers carrying the head of an anteater, a dyker, lizard, or rodents in their luggage may be bringing in for friends and family what is considered a delicacy in their country. In fact, non-English-speaking travelers may go to great lengths to show that something they are carrying is food. Jose Estrada, a CBP officer in Baltimore, says, “Travelers who bring in smoked bats will eat them right in front of you to make the point that they are food and thus will not harm anything.” Animals and animal parts are also used as medicines—tiger and rhino skeletons are ground up and used in traditional Chinese medicines, and animal parts hold a place in rituals for many cults and religions practiced around the world.

CBP officers and agriculture specialists must use diplomacy and sensitivity in their interaction with the traveling public. James M. Armstrong, a 13-year veteran of the USDA and now a CBP port canine coordinator for agriculture detector dogs at JFK International Airport, says, “Most passengers bringing in food or meat products are not smugglers and have innocent motives. In our interaction with passengers, we have to be sensitive to the value of food. We confiscate a sausage because it could bring in the organism that causes hog cholera, but for the passenger, it is more than just a sausage. That sausage is granddad’s recipe and uses apples from a generations old family orchard. It represents culture and tradition, areas charged with emotion.”

Whether it is a monkey peeping out from a passenger’s coat, a suitcase full of sheep entrails, or a couple of oranges from the family orchard, CBP officers and agriculture specialists must be steadfast as they protect our agriculture, our livestock and our health from purposeful or inadvertent contamination. *LK*

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# Activity Crosswalk

	Activities	BioBlitz	Means & Modes	Sticky Situations	Homeland Security
<b>Target Audiences</b>	Preschool - Grade 1				
	Grade 2 - 4				
	Middle School	■		■	■
	High School	■	■	■	■
	Adult	■	■		■
<b>Subject Areas</b>	Science	■	■	■	■
	Social Studies		■	■	■
	Math				
	Language Arts				■
	Fine Arts				■
<b>Primary Teaching Methods</b>	Hands-on Investigation	■			
	Game/Simulation				
	Creative Expression				■
	Analysis/Synthesis		■		
	Discussion/Ethics		■	■	■
	Story				
	Dramatic Presentation				■
<b>Logistics</b>	Inside		■	■	■
	Outside	■	■	■	■
	Time	Varies	Varies	10-50 min.	Varies
	Group Size	5-30	5-30	Maximum 30, divided into groups of 3-5	Maximum 30

	Activities	BioBlitz	Means & Modes	Sticky Situations	Homeland Security
Key Messages	Biodiversity	■			■
	Identification/Adaptations		■		
	Prevention	■	■	■	■
	Early Detection/ Rapid Response	■			
	Control/Management/ Restoration				
NMS	Aquatic Ecosystems	■	■	■	■
	Terrestrial Ecosystems	■	■	■	■
	Invasive Plants	■	■	■	■
	Invasive Animals	■	■	■	■
	Species				snakehead fish hydrilla Asian long-horned beetle
Instructor's Knowledge of NMS	Minimal Background		■	■	■
	Average				
	Advanced Knowledge	■			