

No Limits

An Activity About Invasive Species



Background

What do Japanese Honeysuckle and Starlings have in common? They're everywhere, they're everywhere - and that's the way it is with most introduced species. One-hundred pairs of Starlings were released in New York in 1890 and now it is one of the most abundant birds in North America. Similarly, Japanese Honeysuckle was introduced in Long Island, New York in 1862 and has spread throughout most of the Eastern United States. These two organisms are examples of what can happen when foreign species are introduced and released.

More than 4000 species of plants and 2300 species of animals have been introduced into the United States. About fifteen percent of these are considered harmful. These invaders are displacing native species (many of which are already threatened or endangered) and upsetting ecosystem balance. Once established, a foreign species can out-compete native species for food, space and other resources. Because they are foreign, there may be few if any natural controls to keep populations in check. Thus, they are a nuisance species and a management challenge for park and natural area personnel, who try to maintain the native plant population.

During the early 1900's people could order Johnson Grass seed from the Sears and Roebuck Catalog. It was planted all over the country as a "wonderful" cattle feed. Today it is an aggressive weed that is difficult to control. Kudzu was imported from Japan in 1876 and promoted for cattle feed and erosion control beginning in the 1920's. Multi-floral Rose has been planted for wildlife cover, wind-break and as a highway divider since the 1930's. Autumn Olive, introduced in the 1830's, was promoted as beneficial for wildlife and was often given away. These are all introduced species (originally from another country or region). Because there is no natural control for their populations, they have greatly multiplied, displacing native species and upsetting the balance in the natural environment. Some of Virginia's most aggressive invaders include the plants Phragmites, Purple Loosestrife, Multiflora Rose, Tree-of-Heaven, Eurasian Milfoil, Hydrilla, and Kudzu; and aquatic animals such as Eurasian Clam and the Flathead Catfish.

Preparation

- 1) Label five 3x5" cards for each of the following eight population control factors: Pest/Parasite, Disease, Herbivore/Carnivore, Reproductive Control, Growth Rate, Limited Resources, Competition, Special Requirements.
- 3) Label five 3x5" cards INVASIVE SPECIES. Shuffle the cards to mix the order.

Grade Levels: 3-6

Science SOLs: 3.4, 3.6, 3.9, 4.5, 4.8, 5.6, 6.9, 6.11

Materials Needed:

r 45 3x5" cards and marker, or
r computer-generated cards
r pictures or specimens of
invasive species (optional)

Objective:

Students will learn why some introduced plants and animals (invasive species) are able to take over and out-compete native organisms.

Setting: indoor or outdoor

Group Size: 10 - 30

Duration:

15 minutes for prep;
5 minutes for setup and
instructions;
15 minutes for play and discussion

Precaution:

If outdoors, keep students in a safe part of the trail. Be aware of noxious plants.

Vocabulary Words:

competition
disease
growth rate
herbivore, or carnivore
invasive species
limited resources
pest, or parasite
reproductive control
special requirements

Warm-up

Ask students if they have ever seen an animal or plant that appears to be “taking over.” Show pictures of several invasive species or pass around specimens of invasives such as Japanese Honeysuckle, Johnson Grass or Kudzu. Ask students what the terms “invasion” and “invasive” mean. Tell them that they are going to learn how foreign plants and animals can become “invaders.” Plants and animals that are naturally found in an area are called native species. Plants and animals introduced from other areas are called exotic species. Sometimes we introduce plants and animals from other areas that can out compete our native species. These organisms are called exotic, invasive species. Japanese Honey Suckle is an example of an exotic, invasive species. Native species can be invasive if the right conditions exist. Tear thumb is an example of a native, invasive species.

Procedure

Establish a safe play area with plenty of room for students to move around. Set out-of-bounds limits to keep students in a designated area.

Give the following instructions:

1. We're going to play a game that shows how invasive species can take over. Can you think of some factors that help keep plant and animal populations under control? Briefly discuss these factors with students:

- u Pests, parasites and diseases - kill, weaken or disable organisms.
- u Herbivores/carnivores - eat some of the organisms.
- u Reproductive controls- limit how many offspring the organisms will produce.
- u Growth rates - control how fast and large organisms grow.
- u Limited resources - increases competition for food, shelter, sunlight and other resources.
- u Competition - prevents organisms from out-growing and out-reproducing others.
- u Special requirements - keep organisms from living everywhere.

This activity illustrates how normal population control factors may not affect invasive species.

2. During this game all but a few of you will represent a native plant or animal found in Virginia. Can you name some of our native plants and animals. (Let students give a few examples such as deer, raccoon, opossum, bluebird, white oak, sassafras, etc.) The others will represent an invasive species. I'm going to give each of you a card that has one of these control factors written on it.

3. Some of you will get a card labeled “INVASIVE SPECIES.” Don't show your card to anyone at this time.

4. Explain that they will mill around in the play area, and then pair up with another student and compare cards. If both of you have a “control factor” card, then nothing happens. However, If one of you has an INVASIVE SPECIES card, then that person takes the other person's “control factor” card. The student who loses their card then gets another card and can return to the game. If you lose your card and all of the replacement cards are gone, you're out of the game. You've been displaced by an INVASIVE SPECIES. Remember to stay within the play area. You can not run away to avoid the INVASIVE SPECIES.

5. Pass out the cards. Be sure that one or more students gets an INVASIVE SPECIES card.

* Does everyone have a card?

6. Ask students to “mill around” this area for a minute. Give a signal. Students should look at each others' cards. If you lost your card, come get another one.

7. Give the students time to pair up, compare cards, and get another card before starting another round. The game will continue smoothly for the first few rounds until students learn who the INVASIVE SPECIES are. They will then try to avoid the "INVASIVE SPECIES". Continue the game until all of the cards have been handed out and at least half of the students have succumbed to the INVASIVE SPECIES.

8. Collect the cards and review the activity with the following questions.

- u What were some of the population control factors used in this activity?

- u Why do you think invasive species are so successful?

- u What do you think it would take to control invasive species like Kudzu or Japanese Honey Suckle?

- u What can we do to keep invasive species from getting established?

Extension

After conducting the activity, have students study an area where an invasive species has taken control.

Ask students to describe the results, including:

- u Why do they think the invasive is successful?

- u What is its effect on other species?

- u What is its effect on diversity?

- u How can the invasive be controlled?

Evaluation

Use the questions and review questions to determine how effective the activity has been. Ask students to explain why they lost their cards to the INVASIVE SPECIES.