# The Problem With Invaders

STANDARD COURSE OF STUDY CORRELATIONS:

*Science, Grade 6, Goal 7:* The learner will conduct investigations and use technologies and information systems to build an understanding of population dynamics.

**7.01** Describe ways in which organisms interact with each other and with non-living parts of the environment:
- Coexistence/Cooperation/Competition.
- Symbiosis.
- Mutual dependence.

**7.02** Investigate factors that determine the growth and survival of organisms.
- Light.
- Temperature range.
- Mineral availability.
- Soil/rock type.
- Water.
- Energy.

**7.05** Examine evidence that overpopulation by any species impacts the environment.

**7.06** Investigate processes which, operating over long periods of time, have resulted in the diversity of plant and animal life present today:
- Natural selection.
- Adaptation.

*Biology, Goal 5:* The learner will develop an understanding of the ecological relationships among organisms.

**5.03** Assess human population and its impact on local ecosystems and global environments:
- Historic and potential changes in population.
- Factors associated with those changes.
- Climate change.
- Resource use.
- Sustainable practices/ stewardship.

## MATERIALS & PREPARATION

- Print copies of the brochure template (page 3) for students to use as a guide. Students may choose to use design software, if available.
- Students will be collecting and compiling facts from brochures their classmates produce. You may wish to make simple charts on which they can record their findings.
- Make copies of Viewing Guide, one per group of two or three.

INTRODUCTION TO LESSON: Students will work individually or in groups to research various invasive species. They will create brochures that describe selected species and how they have changed environments in which they are not native. Classmates will examine one another's brochures to collect information for a summary chart.

BACKGROUND FOR TEACHER: Whether accidentally or intentionally introduced into the environment, many non-native species seriously disrupt native ecosystems. Some non-native species, however, are valued and cause little or no impact — a North Carolina example is rainbow trout, which are stocked in mountain streams for sport fishing. There is an active debate on which non-native species are beneficial and which are destructive.

***engage*** ➢ Show the video, which will introduce students to the concepts that are the focus of this lesson. Ask students to reserve any questions they have while watching the video, as they'll be discussing them in small groups later.

***explore*** ➢ Hand out Viewing Guides and have students work in groups of two or three to answer the questions. Afterward, lead a class discussion on the effects of non-native species on native ecosystems.

*For a follow-along viewing guide for students, see Viewing Guide 15.*

*Rainbow trout photo from istockphoto.com.*

***explain*** ➢ Have students work individually or in groups of two or three to create a brochure about an introduced species of their choice. Students may profile a species from the video or choose a species from *Additional Resources*. They may use the brochure template or design their own (see page 3 for printing and folding instructions). Explain that the following information must be included:

- Species name with photo and/or illustration.
- Description of native habitat/distribution and the non-native environments the species has populated.
- Explanation of why/how/when the species was introduced into the non-native environment; description of any effects, existing or potential, of the non-native organism on native ecosystems. (If the non-native organism is fairly harmless, this should be discussed and explained.)
- Life history, including methods of reproduction and any special adaptations for survival.
- Control strategies, if necessary, and proposed solutions. This section should also contain students' ideas about how to reduce or eliminate negative impacts.
- Author (student) information.
- References/resources cited.

***elaborate*** ➢ Have students display brochures on tables and desks around the classroom. Have everyone peruse the brochures, noting relevant information on a chart. They should focus on the species they think are most problematic.

***evaluate*** ➢ Lead a class discussion in which students rank the species they think are most and least harmful.

## *Teacher's Notes:*

**BEYOND THE CLASSROOM**
Have students walk around the campus or elsewhere to identify native and non-native species. Many introduced species, such as Bradford pears and crape myrtles, are easy to find in landscaped areas.

### *Additional Resources:*

***Cane Toads: An Unnatural History.*** To complement this lesson, you might show this video produced by Mark Lewis. With a humorous slant, it addresses the serious impact of *Bufo marinus* in Australian ecosystems. Clips are available on YouTube.

**USDA National Invasive Species Clearinghouse** • http://www.invasivespeciesinfo.gov/ • Searchable database of species and current news about invasive organisms.

**http://www.invasivespeciesinfo.gov/unitedstates/nc.shtml** • Invasive species information specific to North Carolina, including current and proposed control measures/strategies, regulatory actions, names of local/regional experts and organizations.

**North Carolina Native Plant Society** • http://www.ncwildflower. org/invasives/invasives.htm • Information about invasive species and how individuals can help manage them.

**Southern Appalachian Regional Node Invasive Species Page** • http://sain.nbii.gov/portal/community/Communities/Geographic_Perspectives/Southern_Appalachian/SAIN_Special_Focus_Areas/Invasive_Species/ • Includes names of various invasive species all over the world, including North Carolina.

**Global Invasive Species Database** • http://www.issg.org/database/welcome/ • Information on invasive alien species that threaten native biodiversity. Covers all taxonomic groups from microorganisms to animals and plants in all ecosystems. Includes the list: "100 of the World's Worst Invasive Alien Species."

**How to Create a Tri-fold Brochure:**

Have students design the front and back of their brochure.

Print both sides (2 pages = 1 brochure).

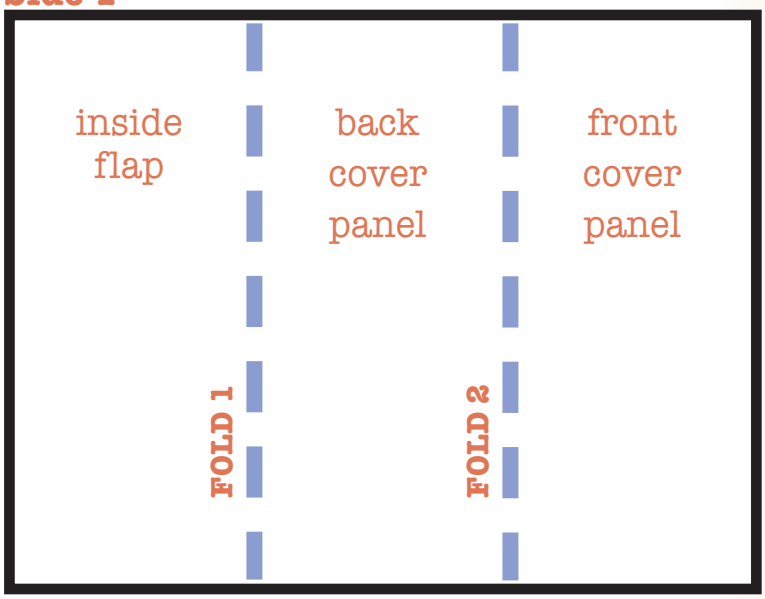
Photocopy the two pages back-to-back and make as many copies you will require.

Tri-fold the brochure along folds "1" and "2" as shown.

Make fold "1" first, then make fold "2."

When brochure is folded, look at Side 1. The front cover panel should be on the front, back cover panel on the back, and inside flap tucked inside. Open the brochure completely to Side 2. The panels should read: left, center, right.

## Side 1




## Side 2