

NEW YORK STATE
Conservationist

for
WILDS!

**ALIEN
INVASION**



Insect image not to scale

This is

NEW YORK STATE Conservationist

for
Kids!

In this issue we'll take a look at some invasive species. Having lots of variety in an ecosystem helps to keep things in balance. Invasive plants and animals limit the variety and upset the balance. Join us as we explore the challenges of invasive species, and learn why and how to help stop them from spreading.

Meet Brandon!

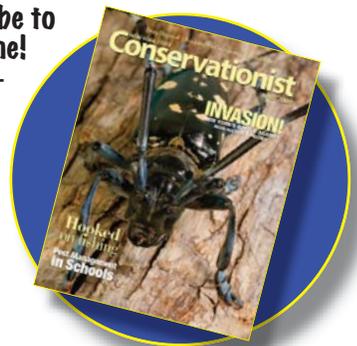
He sent us this photo of himself and the 42-pound carp (an introduced species) he caught in Seneca Lake. You could be a page number kid, too. Send us a photo of yourself enjoying the outdoors. We'll send you the details about what's required for us to print your photo or use it on our website.

Contact us at
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625 Broadway, 2nd Floor
Albany, NY 12233-4500

or e-mail us at
cforkids@gw.dec.state.ny.us

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Visit www.dec.ny.gov for links to lots of information about the outdoors. Check out DEC's online newsletter for families, *Outdoor Discovery*. Every two weeks readers receive articles about nature with fun activities for kids, plus lists of upcoming events at nature centers near you. Go to www.dec.ny.gov/public/43355.html to sign up and have it e-mailed directly to you.

We call them alien, exotic and non-native.

They are the plants and animals that have arrived here from somewhere else and established a new home. Some cause no serious problems and live in harmony with our native species. Others create major challenges for native plants and animals, and for people.

Plants and animals arrive here in many ways. Sometimes they arrive by accident,

such as when an insect is in the wood of a packing crate or aquatic animals are carried in the ballast water of ocean-going ships and unintentionally released into waters around the world.

Alien, Exotic or Non-native:

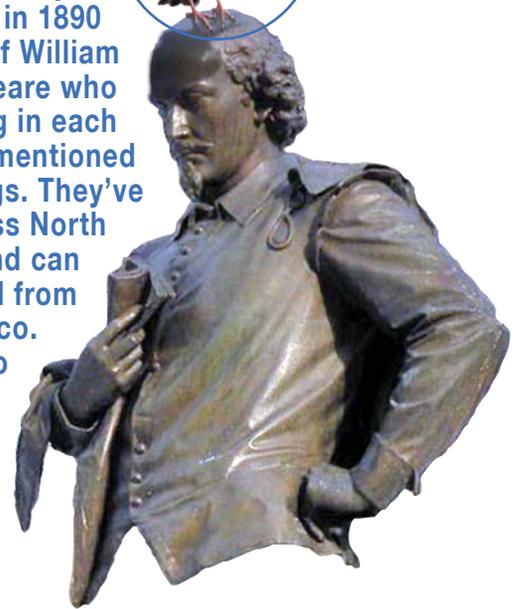
a living species originating from somewhere else



Some non-native species, like **honeybees**, can be very helpful. Some, like **dandelions**, are considered to be a nuisance but do no real harm. Others are like biological bullies. They arrive and take over, out-competing local species for space, or causing great damage. They don't bring their natural predators with them, so their numbers can get out of control. These bullies are the ones we call "invasive." They are very good at competing with our native organisms and winning. They take over and offer little or no benefit. They may even cause a great deal of harm.

European starlings

were **introduced** (released on purpose) in New York City's Central Park in 1890 by fans of William Shakespeare who wanted to bring in each kind of bird mentioned in his writings. They've spread across North America, and can now be found from Alaska to Mexico. Starlings are so well established now, it's as if they are native. We say they are **naturalized**.



Invasive:

an alien species that causes problems in its new environment

Purple loosestrife and Norway maple are non-native plants that have been sold at garden centers for use in landscaping. Their seeds traveled away from the gardens and the plants "**escaped**" and spread into wild areas. They crowd out native plants and don't provide food for native wildlife.



Tim Daly, PA DEP

ROCK SNOT



Rock snot cells are microscopic and can be spread in a single drop of water carried from one stream to another.

(Enlarged image: actual size is about the width of a human hair)

Didymo, also known as "rock snot," is an alga native to northern Europe and northern North America.

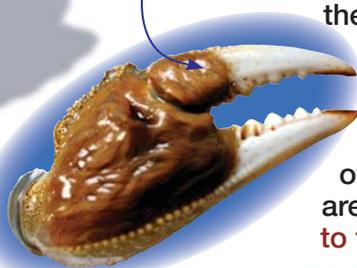
Its range is expanding, and as it expands it is acting as an invasive. Rock snot is becoming plentiful in areas where it was known before only in low amounts, and in new areas too. It forms long stalks attached to rocks on the river bottom. As the stalks grow longer, especially during a growth spurt called a "bloom," they can form into wavy mats that cover the stream bottom. The mats smother the aquatic insects living there. These insects are food for fish, so the effects are felt up the food chain. To limit the spread, people should completely dry and disinfect their boat and all of their gear before moving from one waterbody to another.

A handful of didymo feels like wet wool, not slimy.



CHINESE MITTEN CRAB

Hairy claws make these crabs look like they're wearing mittens.



Chinese mitten crabs have been found in the Hudson River. They may have arrived here in ballast water of ships, or been released on purpose by people hoping to establish them here as a food source. Chinese mitten crabs burrow into stream banks and cause erosion and habitat loss. They are aggressive and may out-compete our native crabs and crayfish. They can travel over land to go around barriers and reach new areas upstream. If you find one, do not return it to the water. Instead, freeze it and contact DEC immediately to report your finding.



The adult's body is about three inches wide. The eight sharp, pointed walking legs are twice as long as the body is wide!

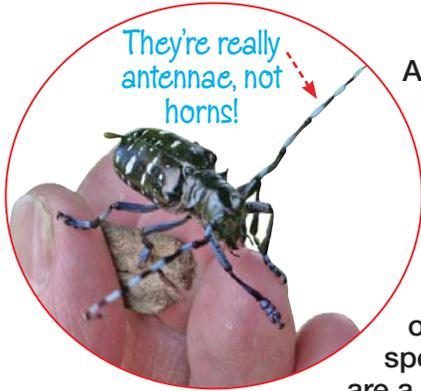
NORTHERN SNAKEHEAD

These fish, native to Asia, have been found in two ponds in New York City and in Orange County. If left unchecked, the population in Orange County could spread throughout the Hudson River system. What sets these fish apart is their ability to breathe air. They are primitive lung fish and can survive in waters with very low oxygen levels. Adults can grow to three feet long and females can produce many young by spawning up to five times per year. They are voracious predators that prey upon our native fish as well as compete with them for food.

EXCELLENT PREDATORS!

With their sharp teeth, they eat fish, frogs, crayfish and aquatic insects.

If you catch a snakehead fish, do not return it to the water. Freeze it and report your catch to your DEC Regional Fisheries Office.



They're really antennae, not horns!

Asian longhorned beetles have been found in New York City and on Long Island. Adults are up to 1 1/4 inches long. Females lay eggs on a variety of tree species, but maples are a favorite. The

larvae hatch, burrow into the tree, and feed on the inner bark and the sapwood. They can do enough damage that eventually the tree dies.

Adult ALB emerge through holes almost the size of a dime. They make a perfectly round hole by rotating their body as they chew their way out of the tree.

ASIAN LONGHORNED BEETLE (ALB)



Pennsylvania Dept. of Conservation & Natural Resources- Forestry Archive, Bugwood.org



DON'T MOVE FIREWOOD!

The larvae of **EAB** and **ALB** can travel great distances and infest new areas when people move firewood. It's illegal to bring untreated firewood into New York State and to move untreated firewood more than 50 miles from where it was cut. Check out www.dontmovefirewood.org to learn more.



Did you know...

There are more than **900 million** ash trees in New York, about seven percent of all the trees in the state.

Many baseball bats are made from New York-grown ash trees.

Foresters set traps to catch and study **EAB**. If you see a trap, leave it alone!

It's really only this big!



After the larvae pupate, **EABs** emerge as adults.

EMERALD ASH BORER (EAB)

Leaf and seeds of an ash tree



The name says it all: it's emerald green and it eats ash trees. Adult emerald ash borers are about 1/2 inch long. Females lay their eggs on ash trees. When the eggs hatch the larvae chew through the bark and live between the bark and the wood, eating the inner bark, disrupting the flow of water and nutrients. Eventually they cause enough damage that the tree dies. In June 2009 EAB were found for the first time in New York State, in Cattaraugus County.

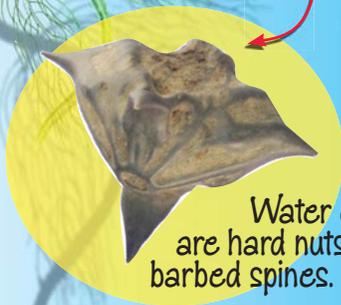


WATER CHESTNUT

The roots of this plant anchor it in the mud at the bottom of waterbodies while a long stem stretches to a clump of leaves floating on the surface of the water. Water chestnut can become so plentiful that their leaves limit sunlight from reaching underwater plants that need it for photosynthesis. To help limit water chestnut from spreading, people should completely clean their boats and all of their gear before moving from one waterbody to another.



John M. Randall, The Nature Conservancy, Bugwood.org



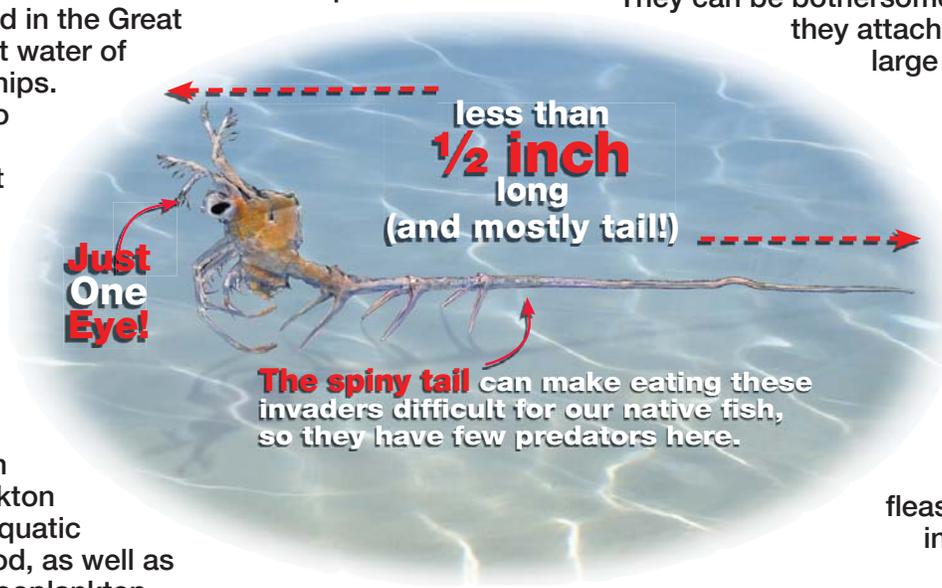
Water chestnut seeds are hard nuts with four 1/2-inch barbed spines.

Thick floating mats make it difficult for boaters and swimmers to enjoy the water.

SPINY WATER FLEA

This tiny crustacean from northern Europe and Asia arrived in the Great Lakes in ballast water of ocean-going ships. It has spread to inland lakes, including Great Sacandaga Lake. Spiny water fleas disrupt the natural food chains in the areas they invade by competing with native zooplankton (microscopic aquatic animals) for food, as well as eating native zooplankton.

They can be bothersome to anglers when they attach to fishing lines in large numbers. To limit the spread, people should completely dry and disinfect their boats and all of their gear before moving from one waterbody to another. Spiny water fleas are similar to fishhook water fleas, another invader in the Great Lakes.



To report an invasive species, contact: NYSDEC, Office of Invasive Species Coordination, 625 Broadway, Albany, NY 12233-4756; Phone 518-402-8924; e-mail fwhabtat@gw.dec.state.ny.us



GIANT HOGWEED

WOW!

This plant can grow up to 14 feet tall and has huge leaves and large showy clusters of white flowers. It spread from the gardens in which it was planted and it now also grows in the wild in Western and Central New York.

If you see this plant, DON'T TOUCH IT!

Tell an adult where it is and ask them to call the Giant Hogweed Hotline at 1-845-256-3111. If you get the sap on your skin and your skin is exposed to sunlight before you wash it off, it causes painful blisters. If it gets in your eyes, it can cause blindness.

GOT SHEEP?

Scientists looking for natural ways to control invasive species have found that sheep will eat giant hogweed, often with no harm to themselves.



JAPANESE KNOTWEED

If it would stay in the garden, like those who brought this shrub here in the 1880s intended, we might love Japanese knotweed for its green foliage and August-blooming flowers. Instead, it spreads like crazy, growing quickly along forest edges, stream banks and disturbed areas. Growing to 10 feet tall, it spreads over large areas with dense growth and crowds out native plants. To control its spread, remove Japanese knotweed when you find it in the wild and don't use it in gardens.



To limit its spread,

teams of people cut garlic mustard down or pull it up before the seeds form each year.

GARLIC MUSTARD

Garlic mustard was brought here from Europe in the 1860s to be used for food and medicine.

It escaped from garden plantings into nearby woods.

It comes out early in the spring, getting the jump on native plants, and shades them, growing 2-3 1/2 feet tall.

The native plants have trouble getting enough sunlight to grow.

Garlic mustard produces many seeds, so the plants can spread far in just a few years.



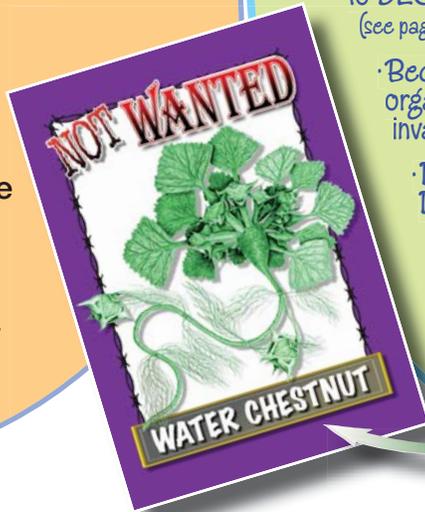
Become an

Invasive Species DETECTIVE



Not Wanted Poster

Make a "**NOT WANTED**" poster about an invasive species in your area. Include a picture or drawing of the invasive. Describe what the plant or animal looks like, where it came from, and how to prevent it from spreading further. Use your poster to let your friends and neighbors know how they can help stop the spread of invasive species.



An outdoor detective does many things. They observe the world around them. They investigate things they're curious about and record their observations. Become an invasive species detective and go a step further. Share your findings with others and work to combat invasive species. Here are some ideas to get you started. What else can you do?

- Watch for invasive species in your neighborhood. Learn what to be on the lookout for, including native look-alikes. If you find something suspicious, report it to DEC's Office of Invasive Species Coordination (see page 6).
- Become a Weed Warrior and help organized groups in your area to remove invasive plants.
- Don't spread invasive animals and plants. Don't move firewood. Clean and dry your equipment (boats, fishing gear, boots, etc.) if you've been in or near water.
- Use native plants in the garden instead of non-native species.
- Make a "Not Wanted" poster to teach others about invasive species.

For more information:

Alien Invaders: Species That Threaten Our World by Jane Drake and Ann Love (Tundra Books, Toronto, Canada, 2008)
Science Warriors: The Battle Against Invasive Species by Sneed B. Collard III (Houghton Mifflin Co., Boston, 2008)
"Intruders! New York's Battle to Stop the Spread of Invasive Species" by Leslie Surprenant, in *Conservationist*, April 2009, pg 9-13. (available at www.dec.ny.gov/pubs/53542.html)

Also visit our web page at www.dec.ny.gov/education/40248.html for links to websites about invasive species, including one with songs about how you can prevent their spread.

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

New York State CONSERVATIONIST FOR KIDS Volume 3, Number 1, Fall 2009

David A. Paterson, Governor of New York State



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Alexander B. Grannis
Commissioner

Conservationist for Kids

Supplement for Classroom Teachers

"Alien Invaders"

Investigating Invasive Species

Invasive species are non-native plants and animals that adversely affect the natural ecosystems in the places they invade, and often affect human populations as well. Invasives are great competitors and have few, if any, natural predators in their new-found homes. They take over with ease, making the struggle to survive that much more difficult for native species. These characteristics make it easy for invasive species to quickly become the dominant species while crowding out native species. Loss of biological diversity due to invasive species is a serious threat to natural ecosystems. This issue of *Conservationist for Kids* (C4K) opens the discussion about invasive species in New York State and suggests ways for students to learn more and become active in efforts to combat them, including by educating others.

Many species of animals and plants in New York State originated elsewhere. Some are harmless, some are beneficial, and some are real troublemakers. Some of the invasive species in our state are widely distributed, while others are concentrated in distinct areas. No place is immune from invasive species, from wilderness to the hearts of our largest cities. As we import and export goods, and as we travel, people are major players in the spread of invasives. Whether intentional or accidental, we import living plants and animals, potential invasives. When we export, our native plants and animals may become invasives in other lands. We can begin to address concerns about invasive species by learning more about them, including how they spread, where they're found, and how to keep them from spreading further.

MST Curriculum Connections

The activities in this issue of C4K correlate to the New York State Learning Standards for Math, Science and Technology for fourth grade, as shown below. Connections to other learning standards are also valid.

Become an Invasive Species Detective:	MST4. <i>The Living Environment 1, 3, 5</i>
Not Wanted Poster:	MST4. <i>The Living Environment 7</i>
	MST6. <i>Equilibrium & Stability</i>
	MST7. <i>Connections</i>

Teacher Workshops

For teachers who have participated in a Project Learning Tree or Project WILD workshop, the activities listed below complement the fall 2009 issue of C4K. Visit www.dec.ny.gov/education/1913.html for information about workshops and about how to obtain these curriculum and activity guides.

Project Learning Tree:	Invasive Species
Project WILD:	World Travelers
Aquatic Project WILD:	Aquatic Roots

Conservationist for Kids (C4K) and an accompanying teacher supplement are distributed to public school fourth-grade classes three times each school year (fall, winter, spring). If you would like to be added to or removed from the distribution list, or if your contact information needs to be changed, or if you have questions or comments, please e-mail the editor at cforkids@gw.dec.state.ny.us.

Visit www.dec.ny.gov/education/40248.html. Printable activity sheets and links to other resources are on the website. You will also find back issues of C4K and the activity sheets and teacher supplements associated with each of them.

Visit http://lists.dec.state.ny.us/mailman/listinfo/conservationist_for_kids to keep in touch by joining our new e-mail list. Members of our e-mail list receive messages from the editor about the magazine, plus supplementary materials for educators using the magazine in classrooms and non-traditional settings. In addition, list members receive notification about resources and training opportunities for connecting youth to the outdoors and to environmental issues.

Supplemental Activities for the Classroom



Invasive Species Explorers – Take your class for a walk and explore the schoolyard or neighborhood in search of invasive species. With notepaper, sketch books and/or cameras, build a collection of information and images of the plants and animals you see. Using guidebooks and the internet (see the links below), identify the species and determine whether they are native or non-native. Are any of them invasive? (Check at www.invasive.org) If you have invasive plants in your schoolyard (and they are safe to touch) form a “plant posse” to remove them. Local garden clubs with “weed watcher” groups may be helpful.

Be the Beetle – Create emerald ash borer (EAB) and Asian longhorned beetle (ALB) masks, like the EAB mask being modeled in the photo on the left. Visit www.dec.ny.gov/docs/lands_forests_pdf/eabmaskcraft.pdf for instructions.

Invasives on Stage – As a class, write and perform a play about an invasive plant or animal. Make it a musical by re-writing the words to familiar songs and including them in your play. Present your show to other classes in your school or to groups in your community. (If your theme is “Don’t Move Firewood,” you can use the EAB and ALB masks from the activity described above.)

Print Resources

Alien Invaders: Species That Threaten Our World by Jane Drake and Ann Love (Tundra Books, Toronto, Canada, 2008)

Science Warriors: The Battle Against Invasive Species by Sneed B. Collard III (Houghton Mifflin Co., Boston, 2008)

“*Intruders! New York’s Battle to Stop the Spread of Invasive Species*” by Leslie Surprenant, in *New York State*

Conservationist, April 2009 pp9-13. Available at www.dec.ny.gov/pubs/53522.html

Nature New York magazine, published by The Nature Conservancy, 322 8th Avenue, 16th Floor, New York, NY 10001 (Spring/Summer 2007)

Internet Resources

Go to www.dec.ny.gov/education/40248.html for internet links to many resources about invasive species, including photos and videos. Some will provide excellent background information while others are great sources of curriculum and classroom materials. An abbreviated list is provided below.

www.dec.ny.gov/animals/265.html DEC’s Nuisance & Invasive Species web page

www.epa.gov/owow/invasive_species/ EPA’s invasive species web page

<http://nyisri.org/Default.aspx> New York Invasive Species Research Institute (Cornell University)

www.invasive.org/ Clearinghouse of information and photos of invasive species in North America

www.invasivespeciesinfo.gov/ USDA’s National Invasive Species Information Center

www.nature.org/initiatives/invasivespecies/ The Nature Conservancy’s invasive species web page

www.adkinvasives.com/ Adirondack Park Invasive Plant Program

www.dec.ny.gov/animals/48199.html Emerald ash borer and Asian longhorned beetle media and educator information

www.dec.ny.gov/docs/lands_forests_pdf/eabedpacket.pdf Emerald ash borer curriculum from Michigan

<http://dnr.wi.gov/org/caer/ce/ee/teacher/invasiveplantguide.htm> “Invaders of the Forest” teacher guide from

Wisconsin (Many of the activities in this guide are well suited to New York State, or can be easily adapted.)

www.weedinvasion.org/weed_home.php “Alien Invasion: Plants on the Move” (K-12 weed curriculum)

www.uwex.edu/erc/music/ Songs about preventing the spread of invasive species

www.dec.ny.gov/dectv/dectv59.html DEC’s Asian longhorned beetle video

www.dec.ny.gov/dectv/dectv127.html DEC’s emerald ash borer video