

We're the Future of the Great Lakes

Trip at a Glance

This rap demonstration was developed in a style and language relevant to inner city students. It provides a creative approach to teaching how nonnative species have disrupted the ecosystem. Students are involved in both research and group problem-solving activities.

Destination

Students will be able to

- ✿ Identify several native species, the nonnative species that cause impacts to them, and how this takes place.
- ✿ State what comprises a healthy, balanced food chain or ecosystem, and what is not a normal balance.
- ✿ Identify human causes of exotic species invasion, which disrupt the normal Great Lakes food chain.
- ✿ Generate alternate solutions, given problem situations and current solutions.
- ✿ Read with improved fluency and motivation.

Adventure Levels

Grades 4–7

Areas of Interest

Science, Music, and Social Studies

Locale

Classroom, computer lab, and library

Length of Stay

Several weeks for doing all components

One week for learning and practicing the rap

Invader Background Check

The topics of food chains and natural environment destruction are salient to the lives of students for several reasons.

First, students need improved connection with and understanding of what is and is not a healthy ecosystem. They need improved understanding of how human beings impact the environment negatively and the consequences of that impact so they can respond, as future stewards of that environment, with informed and wise planning to make good decisions. The actions of human beings to advance trade and industry at the expense of the natural environment have been the primary cause of the ecosystem's disruption.

Furthermore, inner city students with limited experience of wetlands, the Great Lakes, and causes of exotic species invasion, such as boating, can relate more readily to a rap song with colloquial vocabulary about a neighborhood than a more remote scenario such as boating on Lake Michigan.



Foreign Language

Alewife
Dam
Food chain
Forager
Industry

Native species
Nonnative species
Parasite
Plankton
Predator

Sea lamprey
Spiny water flea
Trade

Amenities Provided

We've Gotta Survive Rap (song sheet) 3.1–3.2
We've Gotta Survive Rap on *ESCAPE Song and Game CD-ROM*

Things to Pack

Background information on exotic species
CD player
Cassette tape player or videotape recorder (optional)
Zebra Mussel Mania Traveling Trunk (optional, see "Places to Go")



Passport for Success

For reading the rap, students should be able to read at least at the fourth-grade level. Students need background and guidance in research skills and use of resources including the Internet, glossaries, and encyclopedia indexes. Students need to be able to speak with clarity and correct pronunciation and to read aloud with a sense of the beat or rhythm.

Itinerary

- Using research materials and resources, students should learn about the native Great Lakes food chain and how exotic species affected this chain. Students should also find out what some of these species are, what impacts they have had on the Great Lakes, and the approaches taken to help solve the problem of this invasion. Questions such as the following could be assigned:
 - What is the basic structure of the native Great Lakes food chain? List the representative creatures from each level.** *Students can write, verbalize, or diagram the basic components of the food chain including flora and fauna (e.g., plankton and algae), foragers (e.g., chub), and predators (e.g., lake trout and burbot).*
 - What main exotic species have disrupted this food chain? Show how they have disrupted it. You may use diagrams.** *Students can write, verbalize, or diagram takeovers at the flora and fauna level such as the spiny water flea (plankton not good for native foragers), the forager level such as the alewife overpopulating and outcompeting native foragers, and the lamprey killing so many of the native predators.*
 - What makes a food chain healthy and balanced? What is not a healthy, balanced food chain? Use compare/contrast strategies.** *A food chain is healthy when each level survives and thrives, even though its population is eaten by the level above it. It is healthy when that balance is not unnaturally disrupted by any level becoming endangered or extinct from invaders. An unhealthy food chain is one in which there is a disruption in the natural balance and extinction or endangerment of species at any or all levels.*
 - What are two negative effects humans have had on the Great Lakes native species? Research, analyze, and explain your answer.** *Many examples are possible. Zebra mussels and lamprey invaded by attaching themselves to European trading boats. The lumber industry caused unnatural conditions in the Great Lakes in which nonnatives multiplied and natives decreased in numbers. Attempts at controlling exotics through chemicals have only further polluted the Great Lakes.*
 - How can you determine the effectiveness of one approach to solving an exotic species problem? Use evaluation strategies to determine your answer.** *There are many possible approaches to evaluate (e.g., using chemicals to control lamprey, building dams, and using beetles to destroy purple loosestrife). Evaluations should include reasons why student thinks an approach is effective or not.*

2. Learn and practice the rap. Then enhance the rap with such things as music, additional group or individual parts, dance, or artistic components (e.g., costumes, masks, props, scenery, or posters).
3. Present the rap and make an audiotape and/or videotape.
4. Students can write sequels or expansions of the rap, or write new raps based on what they have learned.
5. Students can engage in problem-solving cooperative groups. Given a particular exotic species and given their assigned roles (e.g., scientist, industry manager, or politician), they must arrive at a consensus on a solution to controlling or eliminating that species.
6. Another group activity could involve planning an approach to solving an exotic species problem and justifying the reasons for choosing this approach. Each group is given a problem and possible solutions. Students are assigned their roles. They must decide on one of the given solutions or generate a new one and give their reasons for choosing their solution.

Travel Tips

- ✿ If you're not familiar with rap music, listen to a lot of it before trying to teach this rap. Students will need to practice it at a slow tempo first, as certain words are stumbling blocks if they try to say them too fast.
- ✿ The rap could be learned and performed in the classroom and presented in other classrooms or in a gym or auditorium as part of an all-school program about the environment or ecosystems.
- ✿ In the problem-solving part of this activity, it is recommended that each member of the group be given a responsibility for ensuring that communication flows smoothly (e.g., timekeeper, secretary, and discussion manager).
- ✿ Many good materials are available from the *Zebra Mussel Mania Traveling Trunk*. It includes illustrations and information cards, fact sheets on species, videos, and laminated zebra mussel and native species ID cards that would be helpful for each character in the rap to wear. See "Places to Go" for information on how to obtain this resource.
- ✿ The population target for this activity is adaptable. Primary students can memorize the rap by listening to it on the CD and then reciting it. Intermediate and junior high school students can do the rap as a reader's theater and read it themselves. Many schools have vocal arts groups that learn and perform rap music. Special interest groups of students could also participate in this activity.

Debriefing

The evaluation can be based on many assessments, including participation in learning and presenting the rap, enhancing the rap with talents in the arts, answering questions through oral presentations, discussion participation, charts, graphic organizers, diagrams, participation in problem-solving groups, and presentation of solutions to problems.

Extending the Visit

- ✿ This activity can tie in with art projects, such as use of art in theater, by creating masks for the characters, building props, and designing sets. It can connect with music in the teaching of rhythm as students play percussion instruments as accompaniment, learn to count out a beat/meter, and express themselves in a spoken song. The activity can connect with drama in a focus on reader's

theater used to increase awareness and change people's thinking or actions. In social studies, the activity connects with learning about the impact of European migration/settlement, trade, and industrialization on the natural environment.

- ✱ Students could generate solutions to a local or neighborhood environmental imbalance or destructive invasion. A community service project could include assisting in loosestrife control at a pond or lake. In association with the exotic species focus on the environment, students could be involved in an environmental problem at their school by cleaning up can, bottle, and garbage pollution strewn in the area around the school. They could write to congressional representatives about improving laws against factories polluting air in their local neighborhood.
- ✱ Students could research and report current problems involving the Asian long-horned beetle invasion.

Places to Go

Web Sites

Sea Grant Nonindigenous Species (SGNIS) Web site: <http://www.sgnis.org>



Kits

Zebra Mussel Mania Traveling Trunk, a hands-on, inquiry-based kit and curriculum that contains simulations, experiments, videos, games, stories, and a CD-ROM; plus includes ideas for student-led community action projects. Available at 32 lending centers across the United States and Canada. Contact Robin Goettel, Illinois-Indiana Sea Grant, 217-333-9448; e-mail: goettel@uiuc.edu or visit the Web site: <http://iisgcp.org>

Multimedia

Zebra Mussels: Lessons Learned in the Great Lakes Region videos, set of four videos—Biology, Spread and Impact, Control, and Outreach Tools. Purchases of videos can be made through the Illinois-Indiana Sea Grant's Web site: <http://iisgcp.org> or contact Susan White, 217-333-9441; e-mail: white2@uiuc.edu

Travel Agent

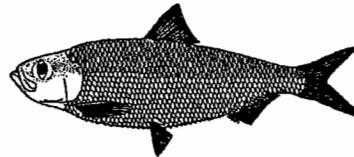
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We've Gotta Survive Rap

By Laura Brodsky

Narrator

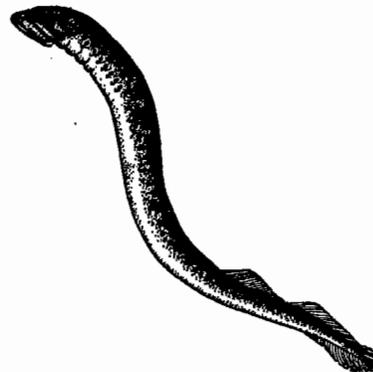
I'm shootin' to you straight 'bout hoods in the lakes
Where the food chain's been disturbed
By some species I'll call "fakes"
Cause they weren't from the Great Lakes
They hitched rides from other waters
They're the reasons why my homies lost
Their mothers and their fathers.



Now since at least one hundred years back
This food chain once balanced has been under attack
Native plankton and plants were the first in the chain
On them fed the foragers, so few which now remain
Native predators ate foragers like the chub
Those lake trout and burbot once had plenty of grub
One hundred native predators kept our ecosystem right
Soon to be victims of the future fight.

Lamar Lake Trout

A part of that fight I can tell you about
Is what almost has wiped out my species lake trout
My grandpa told me 'bout the lamprey, bad guy in the fight,
A bloodsucking eel-like fish, it's called a parasite
These lamprey did kill or wound so many of my kind
Now mostly just us shorties are all that's left behind
The top native predators now no longer thrive
In fact it's gotten difficult just to survive.



Charise Chub

About that fight I too can relate
Native forage fish like chubs suffered similar fate
When the lamprey killed off species like Lamar's
Nonnative foragers like alewives beat out ours.

Pete Plankton

Before the nonnative foragers took over our hood
We had the right balance, our lives were so good
There were enough of us to continue the race
But then nonnative plankton also overran the place
This invasion has destroyed our healthy population
Native foragers remaining now perish of starvation.

Student

From what I understand of the sad event I'm seein'
The wrong is mostly caused by the thoughtless Human Bein'
Who when he doesn't care 'bout the effects of his actions
Hurts the lakes and native species with business transactions
Bringin' nonnative species in on great big trading* boats
Blockin' waters with those huge lumber industry floats
Most everything they've tried just has caused more pollution



*could substitute fishing for trading

Come on y'all, think, let's find some better solutions!
We're the future of this world, its scientists and teachers
Let's improve the Great Lakes for its water and its creatures.

Optional refrain for native fish chorus to say between each part:

We're dyin' out, we're cryin' out
We've gotta survive
We've gotta get some help
So we can live and thrive

