

Goldfish in Stone Pond

What To Do About Invasive Goldfish – Town Hall Debate

Grade Level: 6-12;
younger grades with
modifications

Activity Duration: 2-3
class periods

Overview:

- I. Introduce dilemma
- II. Character Development
- III. County Commissioners Meeting
- IV. Vote
- V. Real-life Issue

Literacy Connections

Dorros, Arthur *Follow the Water from Brook to Ocean*. 1991.
HarperTrophy.
ISBN: 9780064451154
Grades 3-6

Animal Invaders Series. 2008 &
2009. Cherry Lake Publishing.
ISBN: varies by book
Grades 3-6

Summary: We are the story makers; our choices change the story of the land and water. This town-hall-style lesson asks students to make a decision that will change the story of the water around Stone Pond, Fisher Creek, and beyond. This activity uses a role-play strategy for studying the importance of water-use planning. By asking students to assume roles, they will learn that different points of view make decision-making very complex. The following water-use dilemma scenario is a dramatized story with imaginary characters based on a real-life conflict. The major purpose of this activity is for students to understand the importance, as well as some of the complexities, of water-use planning and decision-making.

Topic: Water use issues; human impact; invasive species

Theme: Making decisions about water-use is difficult; water-use decisions result in human impacts

Goals: Students will understand multiple perspectives that go into water use decisions and that those decisions have consequences.

Objectives:

1. Students will identify social and ecological considerations regarding human uses of water that are in conflict with each other and with wildlife habitat needs
2. Students will describe the importance of water-use planning
3. Students will hypothesize the impact on water quality and wildlife habitat their decision will enact

Lesson Adapted From:

“To Zone or Not to Zone” *ProjectWild K-12 Curriculum and Activity Guide*. Houston, TX: Project Wild. pp. 321-325.

Minnesota State Standards:

Science:

5.1.3.2.1 – The Nature of Science and Engineering

Benchmark: Describe how science and engineering influence and are influenced by local traditions and beliefs.

5.4.4.1.1 – Life Science

Benchmark: Give examples of beneficial and harmful human interaction with natural systems.

7.4.4.1.2 – Life Science

Benchmark: Describe ways that human activities can change the populations and communities in an ecosystem.

9.4.4.1.2 – Life Science

Benchmark: Describe the social, economic, and ecological risks and benefits of changing a natural ecosystem as a result of human activity.

Social Studies:

3.1.1.1.1 – Citizenship and Government

Benchmark: Identify ways people make a difference in the civic life of their communities, state, nation or world by working as individuals or groups to address a specific problem or need.

3.1.2.3.1

Explain the importance of civic discourse (including speaking, listening, voting and respecting diverse viewpoints) and the principles of majority rule and minority rights.

4.1.1.1.1 – Economics

Describe how people take action to influence a decision on a specific issue; explain how local, state, national or tribal governments have addressed that issue.

4.2.1.1.1 – Economics

Apply a reasoned decision-making process to make a choice.

5.1.1.1.2 – Citizenship and Government

Identify a public problem in the school or community, analyze the issue from multiple perspectives, and create an action plan to address it.

6.1.1.1.1 – Citizenship and Government

Evaluate arguments about selected issues from diverse perspectives and frames of reference, noting the strengths, weaknesses and consequences associated with the decision made on each issue.

6.1.1.1.3 – Citizenship and Government

Address a state or local policy issue by identifying key opposing positions, determining conflicting values and beliefs, defending and justifying a position with evidence, and developing strategies to persuade others to adopt this position.

7.1.1.1.1 – Citizenship and Government

Exhibit civic skills including participating in civic discussion on issues in the contemporary United States, demonstrating respect for the opinions of people or groups who have different perspectives, and reaching consensus.

Environmental Literacy Scope and Sequence

Benchmarks:

- In social and natural systems that consist of many parts, the parts usually influence one another. (3-5)
- Social and natural systems can include processes as well as things. (6-8)
- The output from a social or natural system can become the input to other parts of social and natural systems. (6-8)
- Social and natural systems are connected to each other and to other larger or smaller systems. (6-8)
- It is not always possible to predict accurately the result of changing some part or connection between social and natural systems. (9-12)

Concepts addressed in this lesson: abiotic factors, biotic factors, cause and effect, communication, cycles, ecosystem, function, patterns, predation, population, community, habitat, species

For the full Environmental Literacy Scope and Sequence, see:

www.seek.state.mn.us/eemn_c.cfm

Materials Needed:

- “Water-Use Dilemma” article
- Character cards
- County Commissioner meeting set up in classroom
- Articles from Rock Pond situation

Background:

We Help Make the Story

We are story-makers for our watershed. The choices we make as a community change the story of our water and the creatures who live in and around it. This lesson allows students to get inside the water-use decision process to understand how multiple perspectives are involved in making the story. Because this is based on a real-life scenario, students can then read the articles explaining the choices made regarding the pond and compare those choices to the ones they made in the classroom.

County Commissioner’s Meeting

In this lesson, students enact a pretend County Commissioners meeting. A County Commission is a unit of elected officials charged with administering the county government. Traditionally, state-mandated services performed by counties include: recording of deeds, general governmental administration, property tax assessment and collection, law enforcement and corrections, judicial administration, public welfare, road, bridge, and airport maintenance, and recreation and parks. Many county commissions also deal with areas like: planning, zoning, solid waste collection, mass transit, communications, and parking. The activity in this lesson is a simulated county commissioners meeting. Participants at the meeting will be the four county commissioners and a host of local community members. Outside of that, students will take the roles of journalists, locals, and researchers.

For information on the St. Louis Board of County Commissioners, please visit their website:

<http://www.stlouiscountymn.gov/GOVERNMENT/BoardofCommissioners.aspx>

Rock Pond

The scenario given in this lesson is based on the actual happenings surrounding Rock Pond on the University of Minnesota – Duluth campus. The two articles attached to this lesson explain the methods used to eradicate the invasive goldfish. You can find a report on what they found when they drained Rock Pond in this student report:

<http://www.d.umn.edu/~wint0190/comp%20page/Gold%20Paper/goldpaper2.2%20FD%20web.htm>

Interesting snippets from above report:

“The goldfish (*Carassius auratus auratus*) is closely related to the common carp, and hybridization with other carp species is not uncommon (Scott and Crossman 1973). They are also one of the most wide spread invasive species. Humans have transported goldfish around the world for display in aquariums, bait and to stock as a forage fish. Goldfish are well adapted to be an invasive species, because they are tolerant of degraded ecological conditions, have a high fecundity, and are generalist feeders. They have now established populations in seventy-five countries on six continents. Goldfish now thrive across the globe from the United States and Canada to Saudi Arabia and Pakistan. Their popularity as pets insures that there will always be the threat of goldfish being released into the wild.”

“Goldfish were one of the first aquatic invasive species to reach North America, arriving here in the 1600’s (DeKay 1842). Goldfish became established in ponds in New York by 1842 (DeKay 1842). Goldfish were propagated in Washington D.C. and later distributed to state hatcheries through out the country. State hatcheries raised and used them as forage for large mouth bass (*Micropterus salmoides*). Goldfish were also used as live bait, a practice that is illegal in Minnesota today. Many introductions of goldfish were probably done through accidental release through used as bait fish. Every state except Alaska has reported goldfish as an invasive species (Nico 2005). They are also established in Canada and all five of the Great Lakes. Minnesota has established goldfish populations as well. They have been collected from Duluth Harbor, St. Louis County, Lake Minnetonka, Hennepin County, Minnesota River below Fort Snelling, Dakota County, Dakota-Ramsey and in the upper and lower Mississippi River.”

“Goldfish are a regulated invasive species in Minnesota, which means that they can be bought, sold, transported and possessed but not introduced into the wild. Despite the laws prohibiting their release, goldfish have managed to invade many lakes and streams in Minnesota, including Rock Pond, St. Louis County. Rock Pond is a small spring fed pond that empties directly into Tischer Creek. After the pond’s construction a fish community became established through natural and human aided dispersal of fish. In May of 2004 rock pond was drained in order to replace the outlet and to remove all the fish. At this time it was suspected that goldfish had been established by an aquarium release, and it was feared that they would soon spread to Tischer Creek, a tributary of Lake Superior and serve as a source population for future spreading of this species.”

Procedure:

1. Introduce Dilemma

To connect to previous studies of diatoms, explain that diatoms tell the story of what has happened to a lake. We are part of making that story. But the story isn't simple – lots of people are involved. We are going to imitate the process of making a habitat-altering decision. We're going to look at an issue, debate it, and vote!

Provide the students with copies of "Water-Use Dilemma". Read together as a class.

Explain the idea behind a county commissioners meeting. In class, students will become community members and county commissioners. Community members will provide statements, debate, and solutions in an attempt to persuade commissioners to vote one way or the other. It will be your students' job to make a choice in this "Water-Use Dilemma."

2. Character Development

Ask 20 students to serve as county commissioners, local residents, students, and business people, with each receiving a card describing his or her situation.

- The rest of the students will have roles as news reporters, outside experts, concerned citizens, etc. Those students may ask questions of people testifying at the hearing. They can be required to write letters to the editor or one of the commissioners in support of their particular points of view; write news articles about the hearing; or write personal impact stories describing the potential consequences for local workers, residents, school children, and so on; or prepare technical reports as researchers. Every student should have a role – either as one of the 20 people preparing testimony for the hearing or as active observers who prepare written questions, reports, or news articles.

To set the stage for the simulation, have each of the 20 participants read his or her personal data cards. The other students should each select a role; they do not need personal data cards although they may write their own. (If you'd rather all students participate as characters, you can have duplicates of characters.) Students should research and add information as they see fit. Students should be given time to prepare their presentations/personal statements as community members, or their questions,

letters to the editor, and news stories as public observers. Students should be encouraged to improvise in developing their presentations and questions.

- Writing options:
 - Have students write a paragraph in first person detailing their connection to the issue at hand. This will allow them to have somewhere to start in the discussion.
 - Have students take notes during the hearing and write a newspaper article detailing the sides of the stories. Be sure to emphasize the objectiveness of journalism.
 - Have students write letters to the editors of a pretend newspaper detailing their character's side of the story and what their character would like to see done.

3. County Commissioner's Meeting

On the day of the hearing, the chairperson of the commission is to run the meeting. It is up to him or her to maintain order. All participants must be recognized by the chairperson before they speak. Your chairperson should acknowledge one community member and then open discussion on the point raised before addressing a new point – be sure to pick a responsible student for this role.

After all those presenting prepared testimony have spoken and have been questioned, the reporters, researchers, and concerned citizens will be asked to read their statements (articles, reports, letters to the editor, etc.) and ask questions of other community members.

- Option: As homework, have each community member, or have students in small groups, prepare a written statement of a resolution that they would like the committee to vote on. These statements should include ample reasoning about why an action should be taken and how it should be paid for.

4. Vote

This is an excellent way to start the final day of the simulation: Ask members of the discussion to provide ideas for a solution. Allow time to debate pros and cons of each suggestion. After all testimony, questions, and statements (or as many as you have time for), the commissioners vote and give reasons for their decisions. Tally the results and announce the decision.

Questions to discuss about the result:

- Is everyone happy with the decision? Why or why not?
- What are some things we've learned about water-use decisions?
- What factors influence water-use decision making and planning?
- What differences and similarities were there between how decisions were made in this activity and how they happen in our community? Other areas? Other parts of the world?
- What responsibilities do we as citizens have in helping to make water-use decisions?
- Why are water-use decisions important for people, wildlife, and the environment?

Now that you've made this habitat-altering decision, there are consequences – some good, maybe some not good. With what you know about diatoms, you know there will be some changes in the diatoms in this body of water given the decision you just made – scientists will be able to tell this story based on what they find. Your job now is to hypothesize about the impact our decision will have on the water and the wildlife that inhabits it. You don't have to be specific down to the diatoms, think more broadly about the ecosystem (Option: Have students write a one-paragraph "Future Cast" that answers the following questions):

- What positive impacts might your decision create?
- What negative impacts might your decision create?
- What evidence can you cite that gives your hypotheses weight? Be as specific as possible.

5. Real-Life Issue

The story students acted out in class was based on a true story – that of Rock Pond. Share with the students the two articles written about the Rock Pond goldfish issue.

Have students read the articles. Then discuss the following questions:

- Was their decision the same as ours? What was different?
- What are some of the pros and cons of their decision?
- What do you think the pond looks like now, 8 years later?
- Option: Take a field trip to Rock Pond to do a water habitat study.

Suggested time line for this activity:

- Day 1: read background information, select roles, prepare presentations, and conduct hearing (45 minutes)
 - Homework: Create a written statement of resolution
- Day 2: conclude hearing, including reading of news items and letters to the editor; vote; discuss results (45 minutes)
 - Homework: Future Cast
- Day 3: Discuss Future Casts; share articles and discuss the true story of Rock Pond (20 minutes)

Assessment:

- Students will be able to take the perspective of a local person in regards to a water-use decision.
 - Evidenced by performance in the county commissioner's meeting and written statement of suggested resolution
- Students will understand that water-use issues are complex.
 - Evidenced by discussion of the debate process after a decision has been made
- Students will try to predict how a water-use decision may affect an aquatic habitat
 - Evidenced by discussion and/or written statement about predicting how the habitat will change given the choice made in the meeting

Current Events Extension:

There is currently (as of Summer, 2012) a big debate about how to prevent Asian carp from reaching the Great Lakes. States are demanding that legislature take action fast. Many people believe that the only way to stop the spread is by closing a man-made canal near Chicago that connects the Mississippi basin to the Great Lakes. This canal, however, supports many industries and jobs. Students could research the issue and create characters invested in the decision. Students could then stage a town hall style debate, similar to that of a county commissioner's meeting to share the perspectives.

Water-Use Dilemma: Too Many Goldfish Make Stone Pond a Muddy Place

Salute is a university community along the shores of the great Big Lake. Stone Pond is within a nature center located on the university campus; it has long been a place for recreation and solace for both university students and the greater community. Stone Pond is a man-made lake that feeds into Fisher Creek which eventually feeds into Big Lake. It has come to attention that this once crystal-clear pond has been turning muddier and muddier. Upon further research, it is evident that people have been dumping their aquarium domestic goldfish into the pond. These goldfish are known to muddy water by stirring up the mud at the bottom while looking for their dinners. Many people are concerned that these domestic goldfish will make their way into Fisher Creek, a designated trout stream; once there, they could muddy the water, hybridize with native fish, and possibly even bring diseases into the pristine stream. There is a community of people advocating action be taken to rid the pond of these nonnative gold fish – Charlie Michaelson, a Duluth native and avid fisherman, explains “we want our beautiful Stone Pond back, and we want to make sure these goldfish don’t make it beyond the pond into Fisher Creek for the sake of the trout!” Others in Salute, however, are not so sure. The cost of fixing this problem could run over \$50,000, and many say that the effort is not worth the cost.

The county commissioner will hold a hearing on this issue on _____.

Dumping of Aquarium Fish Causing Trouble in Duluth (or Something's Fishy in Rock Pond)

May 11, 2004

Rock Pond on the campus of the University of Minnesota Duluth (UMD) is filled with hundreds of goldfish. While not as nasty as the snakehead fish found in some Maryland ponds, goldfish are just as illegal to release into local waterways. The problem is that the two-acre pond drains into Tischer Creek, a designated trout stream, which flows into Lake Superior.

“Unfortunately, Rock Pond appears to be the local dump for unwanted fish by aquarium or water garden owners,” said Doug Jensen, Aquatic Invasive Species Information Center coordinator for the University of Minnesota Sea Grant Program. “The goldfish indicate that aquarium releases are going on, and more dangerous species could get into local waters unless we make people aware of the issue,” said Jensen. “Fortunately, there’s a remedy for the Rock Pond situation because it’s a constructed pond with an outflow that needs rebuilding. If similar releases occurred in other area lakes or rivers, attempts to eradicate or control the spread would be extremely costly.”

To eradicate the goldfish, koi, and rusty crayfish, Rock Pond is being pumped dry this week. Fish remaining after the drawdown will be collected for composting. A group worked for a year considering alternatives to this method and how to address possible downstream effects of the pond draining. They investigated giving the fish away or having a local pet store sell them, but ran up against prohibitive regulations.

The effort is costing UMD \$50,000 not including the staff time from eight departments and cooperating agencies. The pond should refill naturally from runoff and rain later in the season. Public awareness of this issue is being communicated to student residents by e-mail, fliers posted in the resident halls, and signs near the pond before the students leave the dorms for the summer.

“Instead of releasing your plants, fish, and other animals, you can give them to another aquarium owner, advertise to give them away, or donate them to a public facility, nursing home, or business that has an aquarium or water garden,” said Jensen.

Rock Pond is serving as the testing ground for a national campaign led by Sea Grant, the US Fish and Wildlife Service, and the Pet Industry Joint Advisory Council. The project seeks to prevent the release of aquarium and water garden fish and plants through an educational campaign that involves large aquarium fish retailers such as PetCo, Wal-Mart, and many private outlets.

The group is finalizing a logo and slogan that will be seen on the bags in which hobbyists carry their fish home, static stickers on new fish tanks, brochures, a Web site, and hobby magazine ads. The informational signs used in the Rock Pond project will serve as templates for similar situations across the county.

From snakeheads to giant salvinia, over 38 species of unwanted fish and dozens of plants, crayfish, and snails have been accidentally released into fresh and marine waters of the U.S. by aquarium and water garden owners. Releases of potentially invasive species can impact the economy, recreation, and the environment. They can cause impaired water quality, clogged waterways, competition and hybridization with native species, and diseases. While environmental and economic consequences for most species are unknown, impacts of some infestations have cost millions of dollars for control and management.

New sightings of exotic species should be reported to Minnesota Sea Grant at (218) 726-8712, the Minnesota Department of Natural Resources (DNR) at 1-888-MINNDNR or (651) 259-5100, or a local DNR fishery office.

“Dumping of Aquarium Fish Causing Trouble in Duluth (or Something’s Fishy in Rock Pond).” SeaGrant Minnesota. 11 May 2004.
<http://www.seagrant.umn.edu/news/2004/05/11> Accessed 3 July 2012.

Don't set Nemo free

by [Chris Julin](#), Minnesota Public Radio
May 13, 2004



These two goldfish were pulled out of a pond in Duluth. They started out as small aquarium goldfish. But when introduced into the wild, they can grow up to 10 or 16 inches. (MPR Photo/Chris Julin)

That little goldfish in the aquarium can be hazardous -- if you set it free. Workers in Duluth have temporarily sucked all the water out of a pond to kill all the pet fish people had released there. This is the first step in a national campaign to get people to quit releasing fish and plants from their aquariums and backyard ponds.

Duluth, Minn. — Rock Pond is in a nature center across the street from the University of Minnesota, Duluth. Now, it's empty. Workers have drawn the water from the pond this week. What's left is a muddy basin, bigger than a couple football fields. There are a few puddles here and there.

Tyler Winter has been catching fish in the puddles. He's wearing hip waders, and he's covered in mud. He's carrying a five-gallon plastic bucket that's half-full of fish. After he studies the fish, they'll become garden compost.

"We got domestic goldfish, of various sizes and colors," Winter says as he pulls a couple fish from the bucket. Each one is the size of his hand.



[Tyler Winter](#)

"These actually started as little aquarium goldfish," he says. "This is the same kind of a thing that you would find at a pet store. But when introduced into the wild and they have more room to grow and they don't die quickly, they can grow up to 10 or 16 inches. I got one out of this pond that's probably a little over 10 inches."

Rock Pond flows into Tischer Creek, and Tischer Creek is a designated trout stream. Trout need clean water, but goldfish stir up muck from the bottom when they feed. Goldfish could pose a threat to the trout in Tischer Creek.

People frequently release goldfish, koi, and other aquarium fish, and Doug Jensen compares those fish to the common carp. Jensen is with Minnesota Sea Grant, one of the groups behind the draining of Rock Pond. Carp aren't native, but they've thrived in the wild, and now they live throughout the United States.

"That has been probably the most devastating non-native, exotic species of fish," Jensen says.

Carp, like goldfish, stir up the bottom and make the water less clear. Jensen says some aquarium fish pose other threats.

"Some of these species can hybridize with our native fish," Jensen says. "And they can also carry diseases which can be transferred to some of our native species."



Jensen says people release a startling variety of animals and plants from their aquariums and backyard water gardens, and he says it's a bigger problem than most people realize. In the Great Lakes region alone, 38 species of animals and plants have reached the "infestation" level after being released into the wild from aquariums.

[Jensen and the pond](#)

So Minnesota Sea Grant is trying to get people to stop releasing fish and plants. Sea Grant has joined with the U.S. Fish and Wildlife Service and companies that make and sell aquariums. They'll be performing projects like the pond-draining in Duluth, and they'll be launching a big public relations campaign across the country in coming months.

"What we're attempting to do is promote a 'don't release' message to aquarium owners and water garden owners," Jensen says.

Some aquarium makers have agreed to put "Don't Release" stickers on their aquariums. The same message will be printed on the plastic bags that people use to bring fish home from the store. The public relations campaign will try to convince people to donate their unwanted fish to someone else with an aquarium instead of turning the fish loose.

In Minnesota it's illegal to release aquatic plants or fish into the wild.

Julin, Chris. "Don't set Nemo free." Minnesota Public Radio. 13 May 2004.

http://news.minnesota.publicradio.org/features/2004/05/13_julinc_fishpond/

Accessed 3 July 2012