



MinnAqua Moments



March 2012

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Flexing Your Freshwater Mussels

by Nadine Meyer, Newsletter Editor

In May of 2011 I was working with a Grand Rapids school at the 2011 Minnesota Governor's Fishing Opener. It was a chilly day and the fishing was lack-luster. The slow bite gave us the opportunity to scrutinize the soft, mucky bottom of the lake surrounding the boat docks we were on; allowing the students I was working with to view freshwater mussels flexing their muscles.

At first we observed strange "trails" in the muck that were sometimes square, spiral, or a long line that mysteriously ended. Eventually the students spotted the not-so-speedy creators of these mucky designs - freshwater mussels. Many students said they observed the mussels moving, though it could have been a trick of the sun. But we absolutely saw at least one freshwater mussel hunker deeper in the muck becoming invisible in the lakebottom at the end of a bizarre-shaped trail that was a couple feet long.

In this issue of MinnAqua Moments we are spotlighting native freshwater mussels in our [Species Profile](#) and [Featured Lesson](#) as we also highlight aquatic invasive species. To learn more about how to prevent the spread of invasives check out our [Piers & Places](#) and [Mentoring](#) articles. We also reviewed three more trade books in our [Book Reviews: Invasive Species Part 2](#) that are focused on preventing the spread of invasive species to provide literacy connections to your science education activities.

Finally, our [Community Connections](#) article features an annual event on Lake Calhoun called Mde Maka Ska that brings Native American youth in the Twin Cities area together to celebrate their cultural connection to the lake and each other. To help you plan your own lakeside or pierside event, our [Fishing Equipment & Tips](#) article discusses how to find fishing equipment for your classroom and our [Featured Fishing Spot](#) now includes Sallie Lake in Becker County; a good place to take your group fishing. Don't forget to check out the [Updates & Opportunities](#) section for links to grants, programs, and other local offerings available this early winter.

In This Issue

[Featured Lesson:](#) Mussel Mania

[Species Profile:](#) Closeup on Freshwater Mussels

[Fishing Equipment & Tips:](#) I need how many fishing poles??

[Piers & Places:](#) Preventing the Spread

[Book Reviews:](#) Invasive Species Part 2

[Community Connections:](#) Mde Maka Ska, or "What's in a name?"

[Mentoring & MinnAqua:](#) Mentoring and Invasives; what an odd couple! Or is it...

[Updates & Opportunities](#)

[Featured Fishing Spot:](#) Lake Sallie, Becker County

The Bottom Line - Recreation Worth Paying For!

Minnesota's Game and Fish Fund is in dire condition. It is projected to be in the red by as early as July 2013. This means the DNR will need to make significant cuts that affect the quantity and quality of hunting, fishing and natural resources law enforcement unless the state Legislature approves license fee increases during the 2012 session.

MinnAqua's funding comes from the Game and Fish Fund. Potential cuts will impact how we are able to provide programming and support for aquatic stewardship and fishing education in Minnesota.

To learn more, please visit the [Fish and Wildlife Heritage Website](#).

Featured Lesson

Lesson 3:7 - Mussel Mania

by Nadine Meyer, Aquatic Education Specialist

February 2012

[Download this article](#) 



Chapter 3 of the MinnAqua ***Fishing: Get in the Habitat!*** Leader's Guide contains seven lessons, all pertaining to understanding different concepts relating to water stewardship. This chapter covers topics from the water cycle, to role playing citizen action groups, to the impacts of invasive species in Minnesota. As humans have become more global in our travels, so have other organisms as they hitchhike along for the ride. **Lesson 3:7 – Mussel Mania** demonstrates how Freshwater Mussels survive and what happens to them when Zebra Mussels are introduced into their habitats.

[Download the Lesson](#) 

Lesson Summary

Students become native mussels, invasive zebra mussels, perch, walleye, or “plankton movers” in a game designed to help them understand how harmful invasive species can affect the balance within aquatic ecosystems.

Tips & Tricks

- Students may have a lot of questions about the differences between a freshwater mussel and a zebra mussel. One major difference is each of their life cycles. Freshwater mussels need a host (fish or salamander) for their glochidia, or immature stage. Zebra mussels do not need a host for their veligers or immature stage.
- A variety of soft materials can be used for plankton. We suggest balled up paper in the lesson. You can also use practice golf-balls, foam balls, golfball sized pom poms, or other soft objects that are no bigger than a golf ball.
- This activity can be done indoors or outdoors. Be sure the space you choose has enough room for your participants to move around freely and for participants to be on the outside of the designated playing area.



Diving Deeper

- You can find a variety of videos online that show the life cycles of different freshwater mussels. They are incredibly varied and fascinating to see. Our [Species Profile](#) on freshwater mussels highlights one such video.
- Have students research which Minnesota fishes are used as hosts for freshwater mussels.
- The St. Croix River is home to many endangered freshwater mussel species. The [Minnesota DNR](#), [US Fish and Wildlife Service](#), and the [National Park Service](#) study and protect the mussel populations in the St. Croix River and provide excellent information about the different species found there.

MinnAqua Lesson Connections

Lesson 1:4 - Water Habitat Site Study [PDF](#) (43 pages | 8.3 MB) gives participants the opportunity to observe aquatic life close-up. Other invasive species are identified in this lesson along with zebra mussels. This lesson also provides information in the instructor's background on how to prevent the spread of aquatic invasive species.

Lesson 1:5 - Habitat Hideout [PDF](#) (32 pages | 3.9 MB) discusses how fish utilize different parts of a lake or river for shelter and provides background on what fish eat. Connections to freshwater mussels and zebra mussels can be discussed along with healthy fish habitats.

Lesson 4:5 - Fisheries Management and You [PDF](#) (36 pages | 4.5 MB) provides the opportunity for participants to think like a fisheries manager and a concerned citizen and see how their decisions impact aquatic habitats.

Suggested Online Student Resources

Have your students access these online resources to engage in these concepts further.

- [Videos of Freshwater Mussels Spawning](#) - Google
- [Freshwater Mussels of the Upper Mississippi River System](#) - USFWS
- [Stop Aquatic Hitchhikers](#) - MNDNR
- [Freshwater Mussel Quiz](#) - USFWS
- [Russel the Mussel Book](#) download opportunity - USFWS
- [Freshwater Mussel Activity Book download](#) - USFWS
- [Reproductive Cycle of Freshwater Mussels](#) - animated video - USFWS

Species Profile **

Freshwater Mussels, Sentinels of the water

by Michelle Kelly, Aquatic Education Specialist

March 2012

[Download this article](#) [PDF](#)

Freshwater Mussels

Phylum Mollusca - From the Latin word *molluscus* (mol'-us-kus): means soft of body



Identification

Freshwater mussels, also called naiads or unionids [EXT](#) by scientists, consist of a soft body enclosed by a hard shell made up of two shell halves called valves. Inside the shell a thin tissue called the mantle completely surrounds the soft body. This mantle is also the part of the body that secretes the two valves of the shell. The valves, which are held together by an elastic-like hinge, have

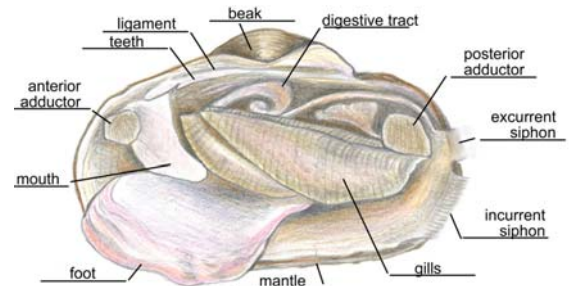
the ability to be closed by two strong adductor muscles whenever the animal senses a threat.

Mussels are closely related to other bivalves [EXT](#) (marine mussels and clams), as well as snails [EXT](#) and even octopuses. [EXT](#)

Food

Mussels living in our lakes and rivers filter oxygen and tiny plankton [EXT](#) and nutrient particles from the water, cleansing the water in the process and absorbing what they consume into their bodies and shells.

They do this by drawing water in through their incurrent siphon, moving the water over their gills, and then passing the water out through their excurrent siphon. Oxygen is absorbed through the gills, and food in the water, mostly particulate organic matter and phytoplankton, is carried to the mussel's mouth by tiny hair-like cilia located on their gills.



Freshwater mussel anatomy

Habitat

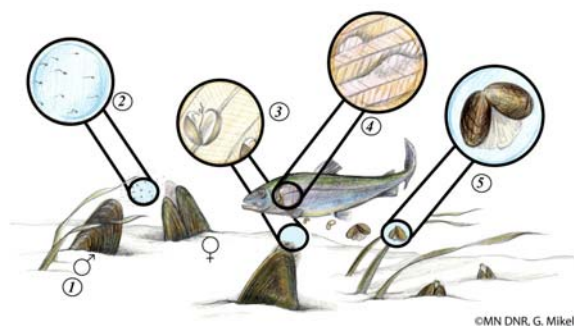


Freshwater mussels on the St. Croix River

They may be eye-catching, but mussels remain unfamiliar to most people because they spend their lives partially buried in river and lake bottoms, where they can be mistaken for rocks. Most people are not aware of the many different kinds of animals that live under the water of our lakes and streams. Mussels are one of these often overlooked animals

Freshwater mussels inhabit lakes and rivers throughout the world, but they reach their greatest diversity in North America, where about 300 species are found. They often live in multi-species communities called mussel beds. These beds can support 30 or more species and are generally more diverse in rivers and streams than in lakes.

Reproduction



Freshwater mussel life cycle

Freshwater mussels have a complicated life history that is tightly linked to freshwater fishes. Males release sperm, (in illustration: 1, 2), into the water that are drawn in by the females. The fertilized eggs are brooded in the female's gills (in illustration: 3), where they develop into tiny larvae called **glochidia** [EXT](#). The glochidia are then released by the female mussels and attach to fish gills (in illustration: 4) or skin as temporary parasites.

Over a few weeks to several months the glochidia develop, or **metamorphose** [EXT](#), into juvenile mussels while attached to the host fish. When this process is complete the juveniles detach from the host (in illustration: 5), fall to the lake or

stream bed, and begin their lives as free living mussels. Some freshwater mussels require one particular species of fish as a host for their larvae whereas others may use many. One mussel species, the **salamander mussel**, is very specialized in that it only uses the gills of an amphibian, the **mudpuppy**, as its larval host. Attaching to a host is also the primary way that mussels are distributed throughout a water body; therefore, a mussel species' distribution is directly related to the host fish's distribution.

To improve the larvae's chances of contacting a suitable host, many mussel species have evolved elaborate methods to lure fish to the pregnant females. Females display and actively move their mantle lures to attract the host. When a fish strikes the lure, glochidia are released and attach to the fish.

The **plain pocketbook** [EXT](#) mussel has a modified mantle flap that mimics a minnow to attract predator fish like the largemouth bass (see video).

Other mussel species package their developing glochidia into cases called "conglutinates." These conglutinates may resemble insects on which fish normally feed. When a fish attempts to eat this "imposter insect" the fish becomes infected with the mussel's glochidia.

Plain pocketbook (Lampsilis cardium) mantle display

Predators

Primary predators of freshwater mussels are muskrats, otters, raccoons, geese, ducks, flatworms (on juvenile mussels), fish, and humans.

Ecological Role

Mussels play a key role in aquatic environments. As filter feeders, mussels, often spending their entire life in a small area of the stream bed, are sensitive to changes in their environment and serve as indicators, or sentinels of the health of our lakes and streams.

As sentinels of a river's health, Minnesota's native freshwater mussels provide us with an important measure of our society's impacts on rivers.

Freshwater mussels are also considered to be "ecosystem engineers" because they modify aquatic habitat, making it more suitable for themselves and other organisms.

Fun Facts

- The Minnesota Department of Natural Resources has initiated a **statewide mussel survey** project. The information gained about the distribution and abundance of our mussel resources will be used to protect remaining areas where mussels and the water

Threats to Freshwater Mussel Survival

- Dams that fragment river connections and form silt-laden impoundments
- Stream channelization or ditching, stream dredging, wetland drainage and field tiling that leads to rapid water runoff, bank erosion, and streambed destabilization
- Commercial harvesting
- Water Pollution
- Zebra mussels

resources that sustain them are healthy, and to target areas where conditions indicate that improvements are needed.

- No live mussels may be collected in Minnesota. If you pick up a live mussel, return it to the water immediately. Currently, with a [fishing license](#), a person may possess up to 24 whole or 48 half shells of dead mussels. However, it is illegal to collect state listed species. Since many common species look like listed species, and even experts can sometimes confuse them, it is best to leave mussels where you find them.
- Minnesotans often mistakenly use the term clam when referring to a freshwater mussel. Have you ever heard of a [fat mucket](#) [EXT](#), [purple wartyback](#), [pink heelsplitter](#) [EXT](#), [black sandshell](#), or [lilliput](#) [EXT](#)? All are Minnesota mussels.
- Mussels are long-lived animals meaning they can live for several decades and in some instances a century or more.
- Freshwater mussels live on every continent except Antarctica. North America has the most - nearly 300 species, including 48 in Minnesota.

See [Lesson 3:7 - Mussel Mania](#) [PDF](#) (25 pages | 2.6 MB) for more information and an activity on the impacts of Zebra Mussels on Freshwater Mussels in Minnesota.

Resources

[Mussel Bound in Minnesota](#) - July-August 2000 [Young Naturalist](#) Article, [Minnesota Conservation Volunteer](#)

[Field Guide to the Freshwater Mussels of Minnesota](#) - available for purchase from [Minnesota's Bookstore](#) [EXT](#)

[Freshwater Mussels](#) - by the Minnesota DNR

[Glossary of Terms](#) related to freshwater mussels - by the Minnesota DNR

[Links to other freshwater mussel resources and scientific references](#)

Fishing Equipment & Tips

Fishing Equipment - I need how many fishing poles??

by Roland Sigurdson, Aquatic Education Specialist

March 2012

[Download this article](#) 



Getting fishing equipment can be a challenge for many schools and youth groups. Funding is tight these days and writing grants takes time, effort and a bit of

good luck.

So how can you move forward with a fishing program on the cheap? Purchasing rods and reels is the single biggest piece of your fishing program budget. While you might be able to get by making pop can fishing rigs for a year or two, ultimately you want to introduce your kids to rods and reels. We've got a few ideas and outlets to let you know about.

- You can put out a request to your community for used equipment. Many garages and basements have a special corner where old, unused fishing poles hide. Many times they can be yours simply for the asking.
 - *The only down side here is that the equipment will typically arrive in various states of disrepair. Now you can certainly request that only 'new equipment in good working condition' be donated and I would suggest that you do that in your request. The other part of your request is for volunteers to assist you in replacing old fishing line, cleaning/oiling reels and getting the equipment field ready.*
- Another option is making a request to local groups like conservation clubs, sportsman groups, fraternal organizations (Legions, VFW, Eagles, Moose Lodge, Knight of Columbus, Shriners, Elks, Masons, etc), or PTA/PTO for funds to purchase.
- Donated funds can really go a long way if you take advantage of the educational discounts available through Pure Fishing (Shakespeare) or Zebco. We've gotten rod/reel combos for as little as \$8.00/each, contact a [MinnAqua Specialist](#) for more information on ordering rods & reels.

 Hooks, bobbers and sinkers may often be obtained for very little money. Donations are worth asking for from the community. Local tackle shops or big box stores will often give you 'a handful' which is usually enough to get you started. Don't let a lack of these simple tools be a barrier to getting started.



- It can also be advantageous to create a local collaborative to purchase the equipment. Consider partnering with your physical education or biology teachers, park & recreation department, libraries, scout troops, 4-H fishing sports clubs, or community education.
- We do encourage everyone to use [lead-free tackle](#) whenever possible and we do know this can be a bit challenging to find in some communities. However, don't forget the on-line resources out there. There are many outlets for these products on the internet.
- Finally, if you get stuck on finding equipment please give us a call. We are happy to help you figure out alternative outlets for materials, brainstorm resources and even send a couple sinkers your way if you just can't locate any or get them donated.



The MinnAqua staff strives every day to help you be successful in introducing kids to aquatic stewardship and fishing. It's in our mission, in our passion and sometimes, in our tacklebox.

Piers & Places

Preventing the Spread

By Roland Sigurdson, Aquatic Education Specialist

March 2012

[Download this article](#) [PDF](#)



You finally pulled it off! The first annual 3rd Grade fishing extravaganza in your schools history!

You jumped through all the hoops of the school board, you got the parents on board to help out, you got 98% of the field trip permission slips returned (a new personal record) and you even remembered to pick up the bait.

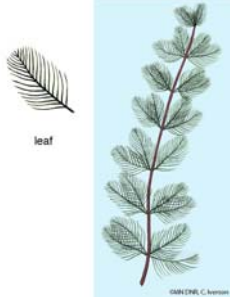
The bus was on time, the weather was perfect and a local reporter even stopped by the snap a few photos of the kids

catching some spring crappies. Congratulations!!

As the day wrapped up, you remembered your minnow bucket and the left over worms. Now you could go home to your own dock on your lake home, kick up your feet and try a bit of peaceful fishing yourself.

First things first when you get home though, you get those minnows back into the water. Completely forgetting that the lake you just came from had zebra mussels, Eurasian water milfoil and spiny water flea!! The lake association probably won't figure out who's to blame when your lake becomes infested with these aquatic invasive species, right? At least you had the good sense not to dump the night crawlers in the State Forest that runs along the back of your property...right? Right??

Aquatic Invasive Species

			
zebra mussel	Eurasian water milfoil	spiny water flea	round goby

It's just that easy. **Invasive species** are a huge threat to Minnesota's aquatic and terrestrial ecosystems.

Invasive plant and animal species have caused severe habitat alteration and degradation, competition with native species, and a major loss of biological diversity throughout the world. *Did you know that northern pike are a major problem in California and that largemouth bass are causing huge problems in China?*

Invasive species populations can often explode allowing them to disrupt native plant communities and crowd out native species. They can cause problems for those who use natural resources, whether for recreational use of land or waters or industrial use of public waters. Once established, invasive species rarely can be eliminated.

Minnesota anglers play a critical role in making sure we don't give them a hand in spreading around the state. Those of us that introduce youth to angling have an even higher calling to model good

stewardship behaviors during our events or field trips.

Here are some steps that every angler must do.

- Inspect all watercraft, trailers, and water-related equipment; remove any visible aquatic plants, zebra mussels, and other prohibited invasive species before leaving any water access.
- **Tip for Educators:** Inspect all the equipment you used at the water's edge and in the water; remove any visible aquatic plants, zebra mussels, and other prohibited invasive species before leaving any water access, shoreline or pier.
- Drain water from boat, livewell, bilge, impellor, bait containers and other equipment holding water before leaving any water access. If you want to keep your live bait after draining bait containers, you must replace water in bait containers with tap or spring water.
- **Tip for Educators:** Drain water from any containers including bait containers and other materials holding water before leaving the fishing area.
- Dispose of unwanted bait in the trash. It is illegal to release live bait into a waterbody or release aquatic animals from one waterbody into another.
- **Tip for Educators:** It is possible to keep worms/nightcrawler in the refrigerator for extended periods of time between fishing outings.

There are a few other good behaviors that will help reduce spreading these species:

- Shore and fly-fishing: Remove aquatic plants, animals, and mud from waders and hip boots. Drain water from bait containers.
- **Tip for Educators:** Bring a scrub brush and wash pan with you so that students can remove mud, seeds and other hitchhikers from their shoes before leaving the site. Lake/river/stream water onsite can be used for this purpose.
- Rinse your boat and boating equipment with hot tap water (over 120° F); or spray your boat and trailer with a high-pressure sprayer. (The hot water sprayers at a car wash can be used); or Dry your boat and equipment for at least 5 days.
- **Tip for Educators:** Drying out fishing rod/reel combos for 5 days or more will allow for any water/plants/organisms inside the reel housing to die. Do not rinse hot water through the reel housing since this will flush out the gear lubricants. However, opening the reel cover and brushing out materials with a brush is a good practice.
- Report new sightings of aquatic invasive species. If you suspect a new infestation of an invasive plant or animal, save a specimen and report it to a local natural resource office.
- **Tip for Educators:** Reporting new sightings or infestations can be an excellent learning experience for youth. Mentoring this good stewardship behavior through a group activity will return dividends for future generations.

Before you head out with your classroom or youth group, there are a couple good lessons from the **Fishing: Get in the Habitat!** leader's guide that will help the kids understand why its important to stop the spread and how they can easily be responsible for making sure aquatic invasives don't get a helping hand.

Lesson 3:7 - Mussel Mania^{PDF} (25 pages | 2.6 MB), our **Featured Lesson**, will help your students understand how aquatic invasive species out compete native species and can drive them to extinction in a local lake or river.

Lesson 6:3 - Planning a Fishing Trip^{PDF} (19 pages | 2.4 MB), gives students an opportunity to use the **MN DNR LakeFinder** to learn more about the lake they are going to visit and if that lake has any established invasive species populations that you need to be aware of on your trip.

It only takes a few moments to change a lake forever, it also only takes a few moments to follow best practices to make sure it doesn't happen.

Featured Fishing Spots

Shoreline Fishing Across Minnesota

We are starting a new feature in the MinnAqua Moments eNewsletter called Featured Fishing Spots. We are compiling a list of fishing piers & other shoreline accesses across Minnesota complete with fishing tips, notes for group sizes, and photos to help you plan your fishing trip with your students.

If you have a favorite fishing pier or shoreline fishing spot you would like to share with others, please contact the [newsletter editor](#) for more information on how to submit your photos and details.



Take your students fishing at local fishing piers.

Find your nearest fishing spot

Pier Name	County	City	Date Reviewed
<u>Fountain Lake</u>	Freeborn	Albert Lea	9-1-10
<u>Lake George</u>	Stearns	St. Cloud	9-1-10
<u>Lochness Lake</u>	Anoka	Blaine	9-1-10
<u>Sallie Lake</u>	Becker	Detroit Lakes	3-22-12

For descriptions of fishing accesses in the Twin Cities Metro Area go to [FiN](#). For a complete listing of fishing accesses in Minnesota go to the MN DNR [Public Water Access](#) webpage.

Book Reviews

Invasive Species Part 2

by Nadine Meyer, Aquatic Education Specialist

March 2012

[Download this article](#) [PDF](#)



What Can We Do About Invasive Species, 2010

by Lorijo Metz, the Rosen Publishing Group, INC

Grades: 1-5 ISBN: 9781435824874

This book combines full-color photos with just enough scientific text to engage your students in a discussion about invasive species and their impacts. There is a treasure-trove of content that should inspire more questions and a desire to learn more. Species highlighted are all found in the United States. The photos can be used with students younger than grade 1 to help with identifying invasive species.

Available in hardcover and paperback.

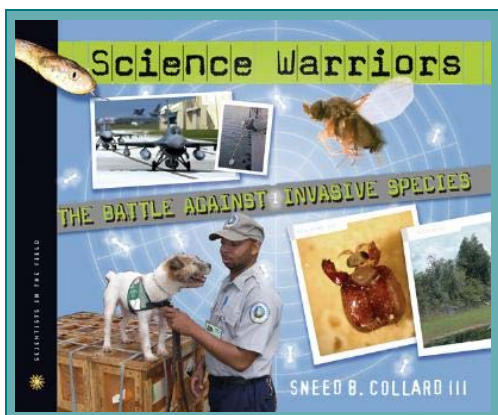
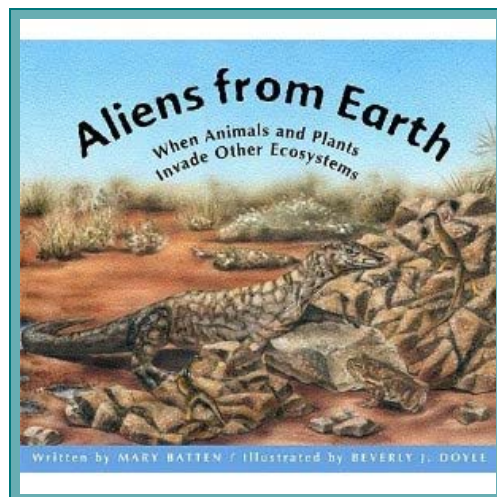
Aliens from Earth, When Animals and Plants Invade Other Ecosystems, 2003

by Mary Batten, Illustrated by Beverly J. Doyle, Peachtree Publishers LTD

Grades: 3-6 ISBN: 1561454508

This book travels around the world showing how plants and animals have moved along with Humans into new habitats where they don't belong. The full-spread illustrations highlight native and non-native plants and animals with a clever key along the bottom of the pages giving the ID of each species and indicating if it is native, non-native, endangered or extinct. The book uses the term "alien" regarding non-native species, which will hopefully lead students to inquire about and research the various terminology used to describe non-native species that are considered invasive in their new homes.

Available in hardcover and paperback.



Science Warriors, the Battle Against Invasive Species, 2008

By Sneed B. Collard III; Houghton Mifflin Company

Grades: 6 and up ISBN: 9780618756360

Science Warriors featured real scientists in action as they work towards solving problems associated with invasive species. Using four major invasive species found in the US and its Territories, (brown tree snakes, melaleuca trees, red imported fire ants, and zebra mussels) this book provides a very rich and deep depiction of the science and the work of the scientists as they try to combat this global issue. Minnesota's Sea Grant Invasive Species Staff and the Minnesota Department of Natural Resources Aquatic Invasive Species Program are featured in the fourth chapter that highlights zebra mussels.

Available in hardcover.

Community Connections

Mde Maka Ska, or “What’s in a name?”

by Michelle Kelly, Aquatic Education Specialist

March 2012

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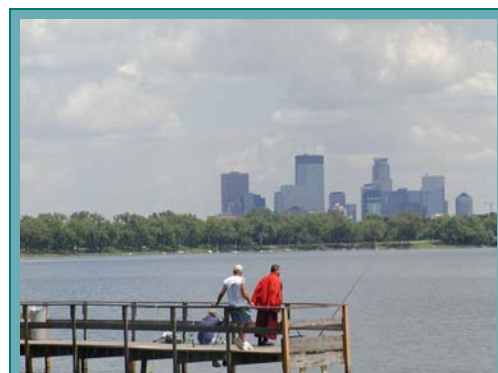


In 2008, [Nawayee Center School](#)¹ in Minneapolis initiated a partnership with a variety of community organizations² to mobilize area schools and organizations in launching the first annual [Mde Maka Ska Canoe Nations Gathering](#). The community partners envisioned an indigenous and water resources-based education and recreation event that celebrates water-based traditions of canoeing and fishing and promotes and demonstrates a healthy lifestyle for Native youth and the broader community. They accomplished this through creating a linguistically, culturally and historically infused initiative called "Mde Maka Ska" generated by indigenous Dakota precepts regarding water and the sacred craft it inspired: the canoe. [Anishinabe](#) views and traditions are also included.

The inaugural event on [Lake Calhoun](#) in August 2009 drew approximately 400 participants from Minneapolis area schools and community. [Here is a short video of the event](#).

The [MinnAqua Program](#) participates in Mde Maka Ska events by teaching fishing skills, aquatic ecology and water safety. We also

provide [Fishing: Get in the Habitat!](#) curriculum and resources to support teachers and students.



Calhoun Lake combines great fishing with great views of Minneapolis, The City of Lakes.

Mde Maka Ska:

The Historical Name

Lake Calhoun has a long history of connecting people to the outdoors. The original Dakota name for Lake Calhoun is “[Mde Maka Ska](#)”, a Dakota word that means White Earth Lake.

In the mid-19th century (through 1830s), a Dakota Mdewakanton village was located on the west shore of this lake that would come to be known as Lake Calhoun in the area that would become Minneapolis. [Cloud Man](#), also known as Man-of-the-Sky (Ma-hpi-ya-wi-ca-sta), was the renown chief of this village, known as Reyataotonwe (Inland Village). For generations Dakota people lived an active, healthy, outdoor lifestyle: hunting, gathering, and fishing, using birch and dugout canoes to move between the village and Haha Wakpa (Mississippi River).³

A Name That Holds Meaning for the Present and Future

For today’s Minneapolis-St. Paul Native American community, Lake Calhoun’s proximity and the cultural stories and heritage grounded in the name “Mde Maka Ska” inspire a traditional means to return to cultural, emotional, mental, physical, and spiritual health. “As water does for the finned nation, “Mde Maka Ska” provides an appropriate environment in which to implement visions of healthier indigenous nations and healthier communities.”

The Event

At 2011’s event, 500 middle and high school students participated from five Minneapolis schools, as well as native elders, community environmentalists, teachers and school administrators. The event has grown to include Dakota language development and water activities: canoeing, canoe and water safety instruction; fishing fundamentals, species identification and fish consumption safety; aquatic/shoreline



Students preparing to canoe on Lake Calhoun

plant identification; environmental conservation/stewardship; songs and drumming about paddling and Mde Maka Ska; birch bark canoe construction; and paddle design, construction and painting.

Outcomes

All participants experience firsthand the values learned by the occupants of a canoe – which are that, *no matter what your skin color – communication, cooperation, teamwork and trust are necessary to achieve a healthy and well-balanced craft.*

Mde Maka Ska efforts are inspiring a growing resurgence of the canoeing and fishing traditions among urban students and native communities in Minnesota. The event planners are

working to expand Mde Maka Ska from an annual event into a year-round opportunity for Native American youth, parents, students, teachers and the entire community to genuinely re-engage with the sacredness of water or **nni wakan**; in **learning that is centered in place**, in the outdoors, and in community; and with the traditional, healthy activities of canoeing and fishing in and around our Minnesota neighborhood lakes, rivers and streams.

*"But that is the beauty of the best geographic names. Whether they derived from careful observation, thorough knowledge of the landscape, or complete misinterpretation of cultural cues, they tell a story and, with patience, provide greater understanding of the land. The next time you hear "What's in a name?" remember the answer might be, 'More than you think'." – Greg Brening, **A Sense of Place, The Legacy of Names**, Conservation Volunteer MN DNR⁴*

Mde Maka Ska - May 25, 2012

This year's **Mde Maka Ska Canoe Nations Gathering** event will be May 25, 2012 at Lake Calhoun (near Thomas Beach) in Minneapolis. To get involved or to learn more about Mde Maka Ska call 612-879-1744 or 651-230-4161; or **email**.



Students observing aquatic invertebrates found in Lake Calhoun

Notes:

¹**Nawayee Center School** provides transformative education, grounded in indigenous life-ways and love of learning to American Indian youth in grades 7-12. Cultural values, core academics and experiential education are integrated throughout its curriculum.

²Many educational, recreational, environmental, business and other public/private partners include the **Phillips Indian Educators**, Minneapolis Public Schools, Outward Bound Twin Cities, **DNR's MinnAqua Program**, Minneapolis Police Dept, Philadelphia Community Farms, REI, Public Allies, **Migizi Communications** and the **Minneapolis American Indian Center** (MAIC), and Minnehaha Creek Watershed District.

³**Minnesota Place Names**, Warren Upham, Minnesota Historical Society

⁴**A Sense of Place, The Legacy of Names**, Greg Brening, Conservation Volunteer, 2001 Jan. – Feb., MN DNR

Mentoring & MinnAqua

Mentoring and Invasives; what an odd couple! Or is it...

by Michael Kurre, Mentor Coordinator

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What's the big deal? Well, the big deal is invasive species are sitting at the door step of our lakes, woods and in general, our ecosystem. And not only have they knocked on the door...they kicked the door in.

The list of invasives like: [zebra mussels](#), [spiny water fleas](#), [emerald ash borer](#), [Eurasian water milfoil](#), [common buckthorn](#), [earthworms](#) and [silver carp](#), are on a list that goes on and on and on like a bad movie. Every day in the headlines it seems another exotic species escaped, was released on purpose or by accident.

"What's the harm of these aquatic and terrestrial species to me?"

Therein lies part of the problem, 'if it doesn't affect me, I don't care'. Well we're telling you that it does make a difference and we all have a stake in the outcome of our environment. All parts of the ecosystem depend on one another and changing any one part will set off a chain reaction and not in a good way.

The balance of life in the outdoors as we know it in Minnesota could change drastically if we don't counsel our mentees!

Walleye, the number one angling experience in the region could be devastated by the [silver carp](#) who are voracious eaters and these carp would tip the scales in their own favor by devouring baitfish to a massive extent. Not to mention the economical impact on tourism and jobs if the quality of fishing were to take a nose dive and carp instead of walleye were king of waterways. Besides this leaping invasive would all but shut down water skiing and pleasure boating as we know it.



Silver Carp

[Zebra mussels](#) filter enough algae to devastate the cycle-of-life for most minnows and popular game fish. And zebras would create a major maintenance issue each and every day in infested waters such as: scraping dock posts, props, boats and equipment. The damage will be extensive!



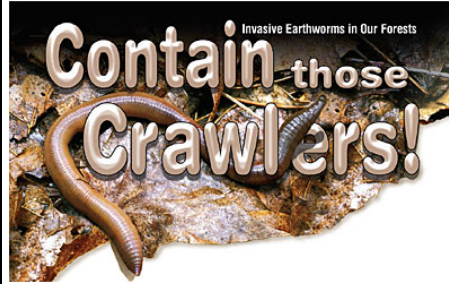
Zebra Mussel

The **emerald ash borer** will eat its way through the landscape of Minnesota and change the forests for decades to come.



Emerald Ash Borer

There are no native **earthworms** in Minnesota; glaciers took care of that! With that said, at least 15 different earthworms have invaded our state including night crawlers, Canadian crawlers, leaf worm and angler worms. Studies conducted by the University of Minnesota and forest managers show that at least seven species are invading our hardwood forests and causing the loss of tree seedlings, wildflowers, and ferns.



The problem is a mentoring one and the definition of mentoring is: somebody who teaches a less experienced person about their job or a particular subject. This particular subject is invasive species and being a good steward of the lands and waterways.

As mentors and stewards of the state of Minnesota and Earth, we should be sharing information and projects with students, fellow educators and the public so we can slow down the spreading of these non-native species to give ourselves time to develop scientific resources to eradicate or at least keep-in-check the infestations as it relates to invasive species. Over time by mentoring our stakeholders about invasives; we will be able to create a better educational process, awareness, habits and understanding of how each and every one of us affect our environment.

We'll never make the connection to stewardship if somebody doesn't mentor the relationship. So, mentoring does play a part and goes hand-in-hand-in-hand with invasives and being a good steward. We each have a duty to take better care of the outdoors. For if we don't who will?

Here are some MNDNR links for more information on:

[Stewardship in your backyard](#)

[Invasives Species](#)

[Discovering Your Outdoors](#)

Updates & Opportunities

March 2012

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For upcoming events go to the [DNR Calendar](#).

The Bottom Line - Recreation Worth Paying For!

Minnesota's Game and Fish Fund is in dire condition. It is projected to be in the red by as early as July 2013. This means the DNR will need to make significant cuts that affect the quantity and quality of hunting, fishing and natural resources law enforcement unless the state Legislature approves license fee increases during the 2012 session.

MinnAqua's funding comes from the Game and Fish Fund. Potential cuts will impact how we are able to provide programming and support for aquatic stewardship and fishing education in Minnesota.

To learn more, please visit the [Fish and Wildlife Heritage Website](#).

The Explore Fund

Application Deadline: April 6, 2012

The Explore Fund will support organizations that encourage youth outdoor participation, focusing primarily on creating more connections of children to nature, increasing access to both front & backcountry recreation, as well as providing education for both personal & environmental health. Grants will be given up to \$2,500, and to maximize the impact of The Explore Fund, we limit our grants to those applications that comply with the following guidelines:

- Organizations that have 501(c)(3) status.
- Projects that include community demographics, estimated number of participants, and anticipated outcomes.
- Proposals that encourage community involvement.
- Programs that focus on breaking down barriers to getting youth outdoors.
- The project or program should seek a specific audience and reach out to a specific community or place of interest.
- All funding requests should be quantifiable with specific goals, objectives, and action plans, with a clear measure for evaluating success.
- Your program should have a good chance of significant measureable results & momentum over a fairly short term (one to three years).
- Potential grantees should include a specific communications plan in the application that demonstrates how you plan to disseminate information about your program, as well as maintain visibility of your program & organization on PlanetExplore™.
- Applications that come with matching dollars will be viewed favorably & this will be taken into consideration during the granting process.
- Organizations are allowed to apply for more than one grant as long as the funds would be used for unique programs.

Scholarships for the 2012 MAEE Conference

MAEE is pleased to offer scholarship assistance to attend the 2012 MAEE Conference June 21-22, 2012 at Itasca State Park in Park Rapids, MN. Funds may be used to cover conference fees, meals, or lodging.

Ten scholarships for \$100 are available. Due dates are as follows:

- **May 4, 2012: scholarship deadline**
- May 18, 2012: scholarship awards announced

National EE Week 2012

This year, National Environmental Education Week is April 15-21 and the theme is Greening STEM: The Environment as Inspiration for 21st Century Learning. You can participate in EE Week by teaching lessons in your classroom or community on this topic.

The EE Week website has resources to help you: toolkits, webinars, and other promotions.

Annual Minneapolis Earth Day Watershed Clean Up

On Saturday, April 21st, from 9:30am to Noon thousands of volunteers venture into Minneapolis Parks and neighborhoods for an annual watershed clean up education event. We're seeking help to educate those volunteers.

The Minneapolis Park and Recreation Board's Earth Day Watershed Clean Up is assembling a team of high quality volunteer educators to increase the knowledge of those who show up to clean up. Any environmental topic can be proposed, especially if the volunteer educator can relate it to healthier local bodies of water. Education format can include everything from leading a field hike to offering a game for kids staffing an information booth/table.

List of Clean Up Sites

Interested individuals can email [Jamie McBride](#) or call 612-313-7725

Participate in [World Water Monitoring Day](#)

World Water Monitoring Day™ is an international education and outreach program that builds public awareness and involvement in protecting water resources around the world by engaging citizens to conduct basic monitoring of their local water bodies. In 2010, over 200,000 people in 85 countries monitored their local waterways. Celebrate with us on September 18, or host your World Water Monitoring Day anytime from March 22 until December 31! Find out more [here](#).