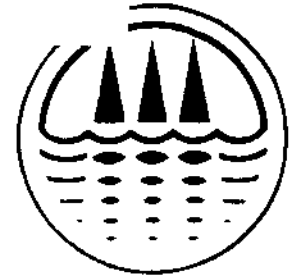


SUPERIOR ADVISORY NOTES



Minnesota Sea Grant Extension Program

University of Minnesota

THE LAKE GAME

FOR ADULTS

by

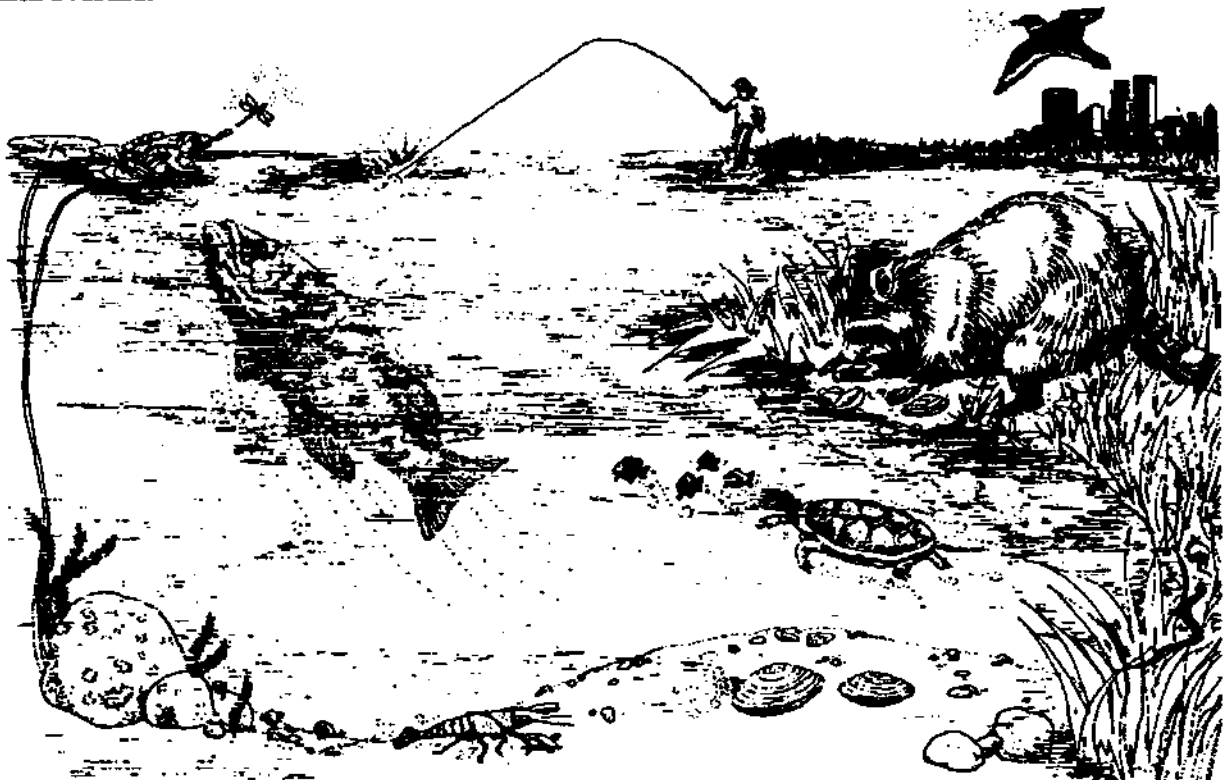
Barbara Liukkonen

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INTRODUCTION

Minnesota is well known as the Land of 10,000 Lakes. Our lakes are found in environments ranging from developed urban settings to remote, pristine waters. Lakes face a variety of threats such as overuse, pollution, and the introduction of exotic species. Minnesota's lakes serve many purposes so there are probably as many viewpoints on how lakes should be used or managed as there are people and agencies in the state.

Minnesota's lakes are "public waters." That means we are all responsible for working together to better protect and preserve our water resources as they face increasing pressure from development and overuse.





PURPOSE

Throughout Minnesota counties are developing water management plans and citizens are forming lake associations. Individuals and groups involved in these processes may have very specific ideas about how our water resources should be used or managed. The following role-playing exercise introduces them to differing viewpoints and helps them consider the challenges of developing a lake management plan.

GOALS

The goals of this game are:

- to have participants realize how many people in the community depend on their lake for drinking water, recreation, and employment;
- to help participants better understand the economic complexity of decisions facing polluters of their lake;
- to help participants understand how they as individuals can change their own actions to minimize impact on the lake.

PROCESS

The game takes about 45 to 50 minutes, depending on the size of the group and the amount of discussion during play. It is ideally played with 10 to 30 players and may be used with adults as part of a public organizational meeting or with youth groups in schools, 4-H, scouts, or camps. There are some roles that are more appropriate for adult audiences since they involve more complex choices and greater reading skills. Selection of appropriate roles should be based on the age and experience of group members and your geographic region of the state. A Lake Game for Youth is available from Sea Grant.

Some roles describe activities that do not commonly occur in every region of the state (e.g. agriculture, industry, tourism). They may be included to broaden the perspective of your game or replaced with more appropriate situations.

A bucket of water represents the lake. Participants assume the role of a lake user and make choices for actions appropriate to that role. The water becomes polluted and depleted as the game progresses. Participants make and respond to decisions made by individuals to pollute or protect the lake.

ADVANCE PREPARATION

Before beginning play, you should:

- contact resource people and leaders in your community;
- gather maps and factual information about your lake; and
- identify key issues relating to the lake and land use in your area.

Key resource people might include representatives of state agencies such as the Department of Natural Resources, the Board of Water and Soil Resources, the Pollution Control Agency, and the Department of Health. Other important contacts include: representatives of local government such as city, county or township board members; and local officials from the departments of zoning and planning, solid waste, highways and bridges, and public health. Other local resources include the Minnesota Extension Service, Soil and Water Conservation districts, and University departments. Ask these people to attend to provide information and to participate in the game.

You also need to identify key people involved in managing and protecting the lake. Is there a lake association already in existence or a core group interested in forming one? Has friction developed between user groups such as swimmers and boaters, urban and rural users, or new and long time residents? If so, be sure to involve key players from each of the groups, in advance.

Get a topographic map of the area; USGS maps at a scale of 1:24,000 are available for most of the state. It is also helpful for players to see the drainage area or watershed of the lake since it shows how land use affects the lake. Try to get copies of maps to hand out or make a large version to display. A bathymetric (bottom contour) map of the lake is also helpful.

Before playing the lake game, find out as much as you can about your lake and surrounding land use. Possible questions include:

- How is land in the watershed area used (agriculture, residential, industrial, forestry)?
- How many streams flow into the lake, and is there an outlet?
- How much of the lakefront is developed?
- Are lake levels or fishery resources managed?
- Do individuals or communities use the water for drinking?
- Are roadways near the lake salted in the winter?

Finally, identify the areas of concern related to your lake and surrounding area. Are people concerned about individual point source polluters or non-point sources in general? Are they worried about use of the lake for specific purposes such as swimming, fishing, or boating? Does the lake have problems with exotic plants or animals? What are the main issues you need to address during the role-playing game? You may need to create some additional roles to fit the issues relevant to your situation.



PREPARATION/MATERIALS

Before playing the game...

1. To set-up you will need:

- a large container nearly filled with clean water to represent your lake
—aquariums, large buckets and wading pools have all been used successfully;
- an extra bucket or sink for dumping water removed from the lake;
- an extra bucket of clean water for rain;
- a small container of water colored bright red with food color to represent pollution.
- a similar solution of yellow food color;
- an eye dropper to dispense the pollution, one eye dropper full equals one unit of color;
- a plastic container with a perforated lid, filled with muddy water for the participants to add "shakes" of turbidity to the lake.
- a roll of toilet paper;
- a clear container for withdrawing municipal supplies; a plastic cup works well;
- at least three fish made from plastic or plexiglass weighted to stand on the bottom of the lake (see Figure 1);
- a fishing pole to catch the fish;
- a tangle of yarn to represent Eurasian Water Milfoil
- a die for Mother Nature to roll

2. Silhouettes of fish may be cut from plexiglass or a plastic coffee can lid and inserted into a slit in another piece of plastic serving as a base (Figure 1). The base may have to be weighted to allow the fish to "stand" on the bottom of the lake.

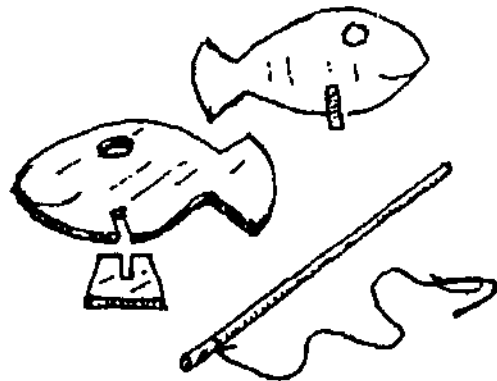


Figure 1

Red plastic or clear plastic edged with indelible red magic marker makes it more difficult to see the fish once the water becomes polluted. The fish should have a hole on their backs so they can be easily hooked with the fishing pole. The pole can be constructed from a short length of cord tied to a dowel, with a bent paper clip as a hook.

3. If possible, prepare a large-scale map of your lake, traced on plastic or chalked on the ground. Indicate cities with dots and township or county borders with lines, but don't necessarily identify them by name. If roles have been assigned to specific locations, finding their "home" becomes part of the experience for participants unfamiliar with the entire lake. The map should be large enough for participants to sit around while they play.

4. For each role-playing option you choose, paste the role on one side and the leader discussion text on the back of a tagboard card. Cards should be flexible and durable, with large text. Cover the cards with clear contact paper to make them waterproof.

5. You can number the cards with indelible pen in the order in which they are listed below. This playing order ensures some pollution of the lake before participants remove drinking water and go fishing.

Playing the game...

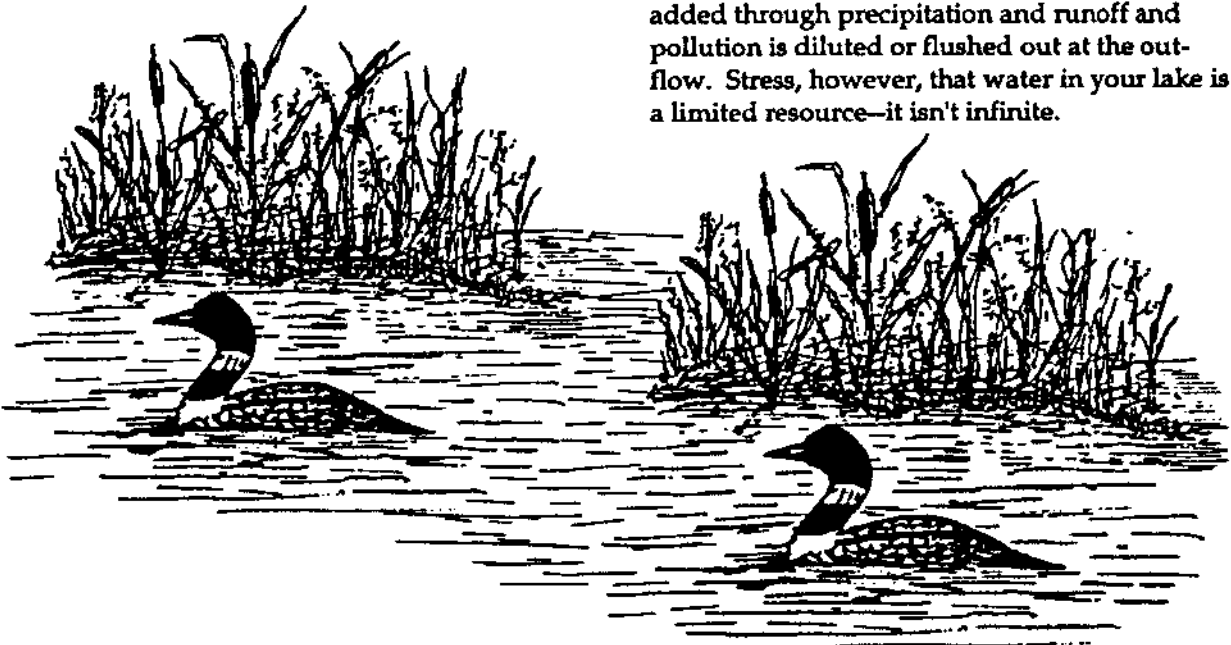
1. Place the container representing your lake in the center of the map. Stand the fish on the bottom. If they tip over when water is added, leave them lying down.

2. Arrange the pollution solutions, eye dropper, turbidity shaker, and the container for with drawing water near the bucket. Retain the fishing pole, die, toilet paper, yarn, etc. until that particular role is read.

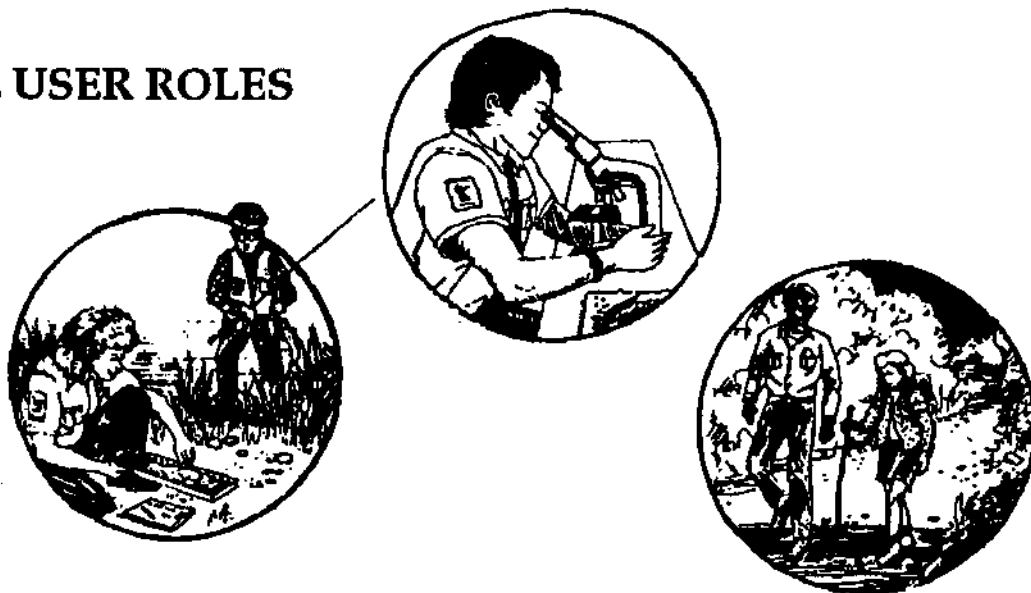
3. Distribute the role cards. Encourage participants to role play and act as they think the person described on their card would act. As each participant's turn comes, have her/him read out the role and what choice s/he has made, if a choice is indicated.

4. Discuss decisions as you play. Balance economic considerations against idealism. If no one opts to pollute, ask how realistic that situation is. Compare the multi-million dollar decisions participants may not feel they can influence with what they can do as individuals to reduce or prevent pollution. Discuss how they really can have an impact on corporate decisions through letter writing, campaigns, boycotts, etc.

5. Review that the bucket is a simple model of your lake. In reality, water is constantly being added through precipitation and runoff and pollution is diluted or flushed out at the out-flow. Stress, however, that water in your lake is a limited resource—it isn't infinite.



LAKE USER ROLES



● Erosion

I am a careless tourist driving along the lake. I throw a burning cigarette out my window and start a major forest fire. Many trees are destroyed and erosion is increased.
[Add five big shakes of turbidity.]

Discussion:

Not only do fires destroy wildlife habitat, but they also destroy the trees and shrubs whose roots prevent erosion. Without roots to hold it, soil is carried by runoff down slopes and into lakes and rivers. Besides the loss of valuable topsoil, erosion carries nutrients that are added to our lakes. This can cause algae blooms or excessive weed growth that make our lakes unattractive and unhealthy.

● Life-style Decisions

I am a homeowner with a dirt road. I like to dump the oil along my dirt road to keep down the dust. This can pollute the lake. When I change oil in my truck, I have to choose whether to dump it along the road or take a few minutes to dispose of it properly.
[If you choose to dump it along the road, add two units of red color.]

Discussion:

In Minnesota it is illegal to dump used motor oil. Used oil runs off into ditches and can get into groundwater or lakes and streams where it is harmful to plants and animals (including humans). Used oil also contains heavy metals (from engine wear) that pose a health risk. By law, the place where you bought the new oil must accept used oil or post a notice of where you can recycle it.

● Economics

I run an industry on the lake, but none of the company officers live in the region. They don't care if they pollute the lake.
[Add three units of red color.]

Discussion:

How could we convince the company that we don't want them polluting our lake? Your voice counts! By boycotting products, writing letters to elected officials, and focusing media attention on unresponsive industries, you can make a difference.

● **Recreational Activities**

I go fishing with my friend. When we clean our fish we dump the guts in the lake instead of wrapping them up and throwing them away. We think this is okay because they are biodegradable or birds will eat them.

[Add one unit of yellow color.]

Discussion:

In Minnesota it is illegal to dump fish guts into the water. Although they are degradable, they stink and attract pests (flies, gulls). Dumping the guts makes using the area unpleasant for others and can pass along disease to other fish. You should take the guts home to either compost or dispose of with your garbage. If you're out camping, bury them in a hole at least one foot deep and 100 feet away from the water's edge.

● **Life-style Decisions**

I live near the lake and I know I should take my solid waste to the landfill, but it's cheaper and easier to dump the garbage in my backyard. I have to choose whether to continue to use the creek in my backyard as a dumping ground for my household waste or to pay \$5 a month and haul my waste to the landfill.

[Pay or add one unit of red color.]

Discussion:

Is it okay for him to use his backyard in whatever way he wants? Why not? If you lived next to him, how could you convince him not to dump there?

● **Economics**

I am a logger who is cutting timber in the area. If I clear cut an area too close to a stream, it will cause erosion and streambank collapse, but I will earn \$1,000 extra. The erosion would cause turbidity in the stream, damaging fish spawning grounds and polluting the lake.

[Add five big shakes of turbidity.]

Discussion:

Many fish lay their eggs on clean gravel beds in streams and lakes. Fish eggs that are covered with silt may never hatch. We have to be able to harvest our forest products, but there are ways to do so without damaging our lakes and streams. Loggers should use "Best Management Practices" (BMPs) when they cut and haul trees. These BMPs include not driving equipment through streams and leaving a buffer strip of uncut vegetation near water bodies.

● **Recreational Activities**

We have a fishing boat and often spill gasoline into the lake when we are filling the tank. I don't think it matters because the lake is so big that a little gasoline won't hurt it.

[Add two units of red color.]

Discussion:

That little bit spilled into the lake shouldn't hurt, right? What if everybody spilled "just a little bit"? Gasoline is easily dispersed through the lake and affects many plants and animals. One gallon of gasoline can contaminate one million gallons of water. Some components of gasoline (benzene, for example) cause cancer in humans and other animals. Another source of gasoline contamination in the environmental, are the "last few drops" that fall out of the pump handle when people fill the tank on their car.

- **Life-style Decisions**

My friend and I go to the Dairy Queen for treats. On the way home my friend throws his garbage out the window. I tell him he shouldn't litter, but he doesn't care. I can choose to stop the car and pick up his garbage or leave it.

[If you leave the litter, add one unit of red color.]

Discussion:

Each American throws away four pounds of solid waste a day. That equals 1460 pounds a year. Minnesota's garbage would fill the Metrodome to the roof, twice a week! How many of you avoid littering? How many would tell a friend not to litter? How many would actually stop the car and pick up the litter?

- **Economics**

I own an industry near the lake. It would cost us \$10 million to clean up our effluent. If we have to pay that much we will go out of business and 300 people will lose their jobs. I have to choose whether to clean up or continue to pollute the lake.

[Pay or add four units of red color.]

Discussion:

This game is like real life. Often the choices aren't this dramatic, but there are hard economic choices that have to be made when we want to reduce pollution. What kind of compromise could be worked out to avoid losing 300 jobs, but stopping pollution of the lake?

- **Economics**

I own a home with a well. My septic system is old and needs repair, but the upgrade will cost me \$500. I'd rather use the money for a vacation. I have to choose whether to pay to have the tank replaced, or continue to let my system pollute the lake.

[Pay or add one unit of yellow pollution and one torn up sheet of toilet paper.]

Discussion:

Most cities have sewage treatment plants that take your household water and clean it before returning it to the environment. Country homes rely on septic systems and drainfields filled with soil bacteria that eat up wastes before they get into lakes or wells. These work okay, if they are constructed properly and maintained, and if people are careful about how much water they use at home. How many of you have septic systems at home?

- **Government**

I represent the Highway Department. We salt the highway during the winter. This makes the road safer, but when the salt runs off in the spring it pollutes the lake.

[Add two units of red color.]

Discussion:

Although salting our highways does make them safer for winter travel, the salt can run off and enter our lakes and rivers where it can be harmful to plants and animals. We don't want to have more accidents, but we need to consider our environment. There are alternatives to salt. What are some of them? Minnesota is experimenting with an environmentally safer road de-icer called urea. It is expensive but pollutes less than salt.

- **Economics**

I am in charge of a plant that uses water to make paper. Most of the water is supposed to be returned to the lake clean, but I know there is a problem with the equipment. If I report the problem, I will lose my job. If I don't report it, pollution of the lake will continue.
[Give up job or add two units of red color.]

Discussion:

Most people can't really afford to give up their jobs—even if they really believe in protecting the lake. How could she solve the pollution problem, without losing her job?

- **Life-style Decisions**

I want to build a sauna near the lake so we can jump in the water to cool off. Installing a drainage system to carry our soapy wastewater back up into our septic system will cost me an additional \$500. Nobody will ever know if I just bury the pipe and let it run into the lake.
[Pay or add one unit of color.]

Discussion:

Even though no one may know you're draining your sauna into the lake, you'll be hurting yourself by lowering water quality. The amount of wastewater may be small, but the added nutrients can increase algal growth and the soaps and oils from the sauna aren't good for the lake. Besides, you'll affect the water quality in front of your property—just where you want to enjoy the lake!

- **Wetlands/Erosion**

I own property away from the lake. I figure what I do with my own land is my business. I choose to drain a wetland to give me a better area for hiking and ski trails. This area used to serve as a holding area for spring meltwater. Now this water pours down a nearby creek, causing erosion and carrying sediment into the lake.
[Add five big shakes of turbidity.]

Discussion:

Wetlands are valuable. They serve for flood protection, soaking up and retaining extra water during peak flow periods. They also serve as recharge areas by releasing that water slowly over time. They offer unique plant and wildlife habitat. In fact, there are many species you'll never see anywhere else. Importantly, wetlands also improve water quality by trapping or filtering out nutrients and other pollutants. We lose about 500,000 acres of wetlands every year in the U.S. to development; it's time we start recognizing they are important.

- **Ethics**

I am a newspaper reporter. I have information about a company that is polluting the lake. Company officials have offered me \$10,000 not to tell. I have to choose whether to take the bribe or write the story.
[If you take the money, add two units of red color.]

Discussion:

Is the pollution of the lake worth only \$10,000? How much would it have to be to get you to clam up about the story? \$20,000? Only \$500? Is your personal gain worth damage to the lake that ruins everyone else's use?

● Water Cycle

I am Mother Nature. I supply water to the lake by rain.

[Roll the die. Add water to the lake according to the following:

- 1 = "slightly dry year," add one cup
- 2 = "normal year," add two cups
- 3 = "slightly wet year," add three cups
- 4 = "drought year," add no water
- 5 = "second drought year in a row," remove one cup
- 6 = "very wet year - FLOOD," add six cups]

Discussion:

We can't expect the recharge to our lake to be the same every year. Recharge occurs through precipitation directly onto the lake surface and through runoff from precipitation over the land around the lake. That runoff can be by rivers or streams or right over the land surface. The land area that drains into a lake is called its "watershed" or drainage basin. Recharge can also occur from groundwater seeping into the bottom of the lake. Water leaves the lake through evaporation, rivers draining out, groundwater seepage, and diversions by humans. Much of the water that we divert is returned to the lakes after our use--that's called non-consumptive use. If the water doesn't get back to the lake, it is called consumptive use.

● Government

I am head of the parks and recreation department in the city. We have been losing sand from our public beach due to erosion. I have to find a source to replace it. I have found a cheap source of sand that is slightly contaminated with salt. Clean sand would cost so much that we would not be able to replenish our public beach this year and would have to close it down for the summer. I have to choose whether to purchase the cheaper, contaminated sand or close the beach.

[If you use the sand, add one unit of color.]

Discussion:

What do you think the public would say if you closed the beach? What about the local tourism industry? Many people think environmental concerns are fine until they themselves are put out. How would you respond when they asked, "Just how much damage can a little salt cause, anyway?"

● Life-style Decisions

I own lakeshore property and want to have a nice green lawn running down to the lake. I can choose to use chemicals on my lawn or pull the weeds by hand. Chemicals could pollute the lake, but would save me work.

[If you choose to use chemicals, add one unit of red color.]

Discussion:

The best kind of lakeshore environment--for water quality, for animals, and also for people--is one that includes vegetation other than mowed grass. Buffer strips of weeds, aquatic plants, shrubs, or trees help protect the lake by preventing runoff of soil and nutrients or chemicals, and by providing habitat for animals. One of the worst things lakeshore owners can do to their lake is use fertilizer or herbicides (chemicals to kill weeds) on mowed lawns next to the lake.

● **Recreational Activities**

I have a motor boat that I use all over the state at different lakes. I went to Lake Minnetonka, near Minneapolis, and then came to boat here. I didn't wash off my trailer or boat and Eurasian water milfoil was on my propeller when I put my boat in this lake.

[Add a tangle of yarn to the lake.]

Discussion:

Eurasian water milfoil was first discovered in Minnesota (in Lake Minnetonka) in 1987. By 1991, it had spread to 31 lakes in the state. It is a nuisance weed that is spread by people carrying it from one lake to another on their boats or trailers or in their live wells or minnow buckets. It grows rapidly and crowds out beneficial native plants. It doesn't provide good habitat and is a nuisance for boating, swimming, water-skiing, or fishing. Its spread can be slowed if people take a few extra minutes to make sure they are not transporting it to another lake.

● **Recreational Activities**

I am going to build a new dock. I know that treated lumber will last longer and save me money and time in the future, but the chemicals used to treat the wood may be bad for the lake. I have to choose whether to build a long-lasting, treated dock, or to protect the lake.

[If you choose the treated lumber, add one unit of red color.]

Discussion:

The chemicals used to treat lumber to make it resist rotting can be harmful for plants and animals in our lakes. What would be some options instead of using treated wood? Using non-treated wood like cedar or redwood, metal, or plastic materials are more expensive, but better for the lake.

● **Ethics**

I am a very good lawyer who wins all my cases. I have been asked to defend a company that pollutes the lake. If I decide to take this case, I will make lots of money, but pollution of the lake will continue.

[If you take the case, add three units of red color.]

Discussion:

Would earning \$10,000 from the case be worth continued pollution? Would \$5,000 be worth it? Would \$500 be worth the pollution? Is earning this fee worth the damage to the lake?

● **Economics**

I own a dairy operation along the lake. My cows are free to wander down to the lake to drink and escape from the heat and bugs. Some people across the lake want me to restrict my "feedlot" and not let my cows in the water. To run fencing along my two acre frontage would cost me \$20,000 and I'd need to install pumps and line to get water for them to drink. If I paid that much for improvements, I'd have to close down my operation.

[Pay or add two units of color.]

Discussion:

There are clearly no easy answers in this situation. Although the dairy herd is harming the lake, shutting down the operation is not an easy solution. The MPCA handles feedlot complaints and violations and will work with livestock operators to reduce or eliminate environmental damage. One question to ask about a lakeshore feedlot, "How does pollution from the feedlot compare with pollution from other sources such as septic systems, runoff, and lawn chemicals?"

- **Government**

I am in charge of mosquito control for the city. Every year we spray near the lake. I have been asked to increase the area we spray to kill more mosquitoes. Some people don't want any spraying. I have to choose whether to spray more, less, or the same as in past years. [If more, add two units of red color; if less, add no color; if the same, add one unit of red color.]

Discussion:

Chemicals approved for mosquito control are safe if applied correctly. But some may have long-term effects on birds and other animals. Do we really need to get rid of all the mosquitoes? How is local tourism affected by lots of bugs? Is that important, too?

- **Recreational Activities**

I am a great water skier. I like to ski near shore so people can see how good I am. This causes erosion of the shoreline. I have to choose whether to quit skiing near shore to protect the lake or to keep showing off. [If you continue to ski near the shore, add three big shakes of turbidity.]

Discussion:

Sometimes little things make a big difference in a lake. The addition of turbidity not only makes the lake less pleasant for us, but it also damages plant and animal habitat. It decreases the amount of light that reaches deep into the lake, which can affect the temperature and ability of predators to see prey. It can also cover fish spawning grounds.

- **Recreational Activities**

I am a fisherman who just spent \$700 on equipment. I can catch a fish if there isn't too much pollution. [Try to catch fish. 15 seconds will be allowed for fishing.]

Discussion:

Would you want to eat a fish that came out of water polluted like our lake? When pollutants get into lakes they can build up in sediments, in insects, and in small fish. When bigger fish eat them, pollutants accumulate in their flesh (particularly fatty tissue). This is called bioaccumulation. The Minnesota Department of Health has issued guidelines for eating fish from 260 lakes in Minnesota. There are health risks for young children and pregnant women who eat fish contaminated with mercury and PCBs.

- **Government**

I represent a city on the lake. We need 400,000 gallons of clean water from the lake each day for our city water supply. [Remove four cups of water; show everyone how polluted the water is.]

Discussion:

How many of you would want to drink that water? Many communities in Minnesota use surface water for their municipal water supply. Before the city could send that water out to homes. Now what will they have to do to it? What will that mean in terms of the cost of using water?

- **Government**

I am in charge of the sewage treatment plant for a city on the lake, but I don't think people who live in the city will agree to pay higher rates for wastewater treatment. Rates only \$3.00 a month higher would help prevent pollution of the lake.

[Take a vote. If the majority say they would pay more, add no color. If they vote no, add three units of yellow color and two sheets of torn up toilet paper.]

Discussion:

Most treatment systems do secondary treatment of sewage before it is returned to the lake. Tertiary treatment produces even cleaner water, with fewer nutrients to affect the lake. It is more expensive and many small communities have a difficult time financing improvements. How much would you be willing to pay? \$5 per month? \$10 per month? \$20 per month?

- **Recreational Activities**

I want to get rid of the weeds in the water near my beach. I could cut the weeds or use a chemical weed killer. Chemicals would be easier and would take a lot less time, but could cause problems in the lake. I have to choose whether to cut the weeds or use chemicals.

[If you choose chemicals, add two units of red color.]

Discussion:

Using chemicals in the lake to kill weeds is not as easy as it seems. You must have a permit from the DNR to use chemical herbicides. When chemicals are applied at the wrong rate or at the wrong time of day they can harm fish and other animals. Wind or current can cause the chemicals to travel away from where you want them to work. If there are weeds in the rest of the lake, they'll continue to come back to your beach area. Besides, emergent vegetation (the weeds that stick out of the water) can help reduce bank erosion and can actually help improve water quality.

- **Government**

I work for the Department of Natural Resources. I am in charge of controlling purple loosestrife, an aquatic plant that is taking over in our region's wetlands. I have to choose whether to use crews to remove the weed by hand (not as effective and very time-consuming) or use a herbicide to poison the weed. If I use a crew, the weed may spread farther, but using herbicides improperly could pollute the lake.

[If you choose to use herbicide, add one unit of color.]

Discussion:

Purple loosestrife is a serious threat to our wetlands and lakeshore areas. A single plant can produce up to 10,000 seeds annually. Currently only one herbicide is approved for chemical control, and when used correctly, it is safe and effective. However, any chemical may cause problems if it is mishandled and some environmentalists want to ban all pesticides. Is allowing the spread of loosestrife an acceptable trade-off for eliminating any risk from pesticide use?

● **Life-style Decisions**

I don't live by the lake, but I know that when I waste electricity it increases air pollution that affects the lake. I have to decide whether to conserve electricity at home.

[If you continue to waste electricity, add one unit of red color.]

Discussion:

Many electrical generating plants in Minnesota burn coal. Coal contains an impurity called sulfur. Sulfur dioxide and nitrous oxides (from automobile exhaust) combine with moisture in the atmosphere to form acid rain. Acid rain is a problem for our aquatic and forest resources as well as for man-made materials. "Scrubbers" can be installed on power plants to reduce sulfur emissions, but they are expensive. How much would you pay to reduce acid rain?

● **Life-style Decisions**

I live by the lake and can choose to spend five minutes a day making sure that my family recycles our aluminum cans, newspapers, and glass. Do I choose to recycle?

[If you choose not to recycle, add one unit of red color.]

Discussion:

Each person in Minnesota throws away 600 pounds of paper, 60 pounds of aluminum cans, and 200 glass containers each year. Recycling would not only save space in our landfills, or prevent air pollution from incineration, but it would also reduce the amount of natural resources that are used up making new products. People in Minnesota are getting better about recycling. How many of you recycle?

● **Life-style Decisions**

I live along the lakeshore. I cut down all my trees and paint my house with hot pink and green stripes. I like the effect, but some people says it makes boating past my property less enjoyable for other people.

[Add one unit of yellow color.]

Discussion:

Although painting the house a bright color wouldn't actually pollute the lake, it does make the area less pleasant for people who don't happen to like pink. Should people be able to do whatever they want to with their own property? Why? Why not? In Minnesota, the DNR has shoreland regulations on how close buildings may be to the water, how large or tall they can be, and how wastewater is treated near the water.

CREDITS:

Barbara Liukkonen is interim program leader for Minnesota Sea Grant.

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Minnesota Pollution Control Agency annual summary of lake water quality.

SEA GRANT EDUCATION PUBLICATIONS

Lake Games: Three versions of the game are available. **Lake Superior Game: Use Versus Abuse** is best for upper elementary and secondary students. It is specific to Lake Superior. **The Lake Game for Adults** is generic and can be used for any inland lake. It is ideal for lake associations and other groups that are trying to make decisions about lake management. **The Lake Game for Youth** is similar to the adult version but has roles more appropriate for young people. Both youth games work well with other parts of a school curriculum, including geography, economics, and civics. Single copies are free from Sea Grant. Multiple copies cost 50 cents each.

Superior Pursuit: Facts About the Greatest Great Lake. All about the big lake: geology, water quality, and fish. Single copies are free. Multiple copies cost 50 cents each.

Marine Education: A Bibliography of Educational Materials from the Nation's Sea Grant Programs; 43 pages of educational and curriculum materials from 31 programs. Publications cover a broad range of topics on freshwater and saltwater. Included are lesson plans, posters, fact sheets, videos, and educational games. Materials cover the Great Lakes, estuaries, groundwater, shorelines, and the oceans. \$4.00 from Sea Grant.

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Minnesota Sea Grant is a statewide program that funds research, extension, and education projects related to Lake Superior and Minnesota's water resources. It is funded by NOAA, the University of Minnesota, the Minnesota Extension Service, and the state legislature. Sea Grant offices are located on the Duluth and Saint Paul campuses of the University of Minnesota.

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