



# TAKE ME FISHING™

## What Causes Water Pollution?

### Silt Or Sediment

Have you ever seen a stream that looks dirty? This dirty look is usually caused by the excessive erosion of silt or sediments from nearby lands. Silt or sediment is fine particles of soil that end up in our waters. A small amount of sediment reaching the waters is natural.

However, surface mining, timber harvest, construction, and poor farming practices can leave soil unstable. Then, when it rains, the soil is carried off by the water, which eventually runs into a river or lake. There are modern methods of farming, logging, and mining that minimize erosion.



**How can excessive silt hurt water?** When it settles to the bottom it has a smothering effect. It can kill plants or other small organisms. It can smother fish eggs and young aquatic life. It can cover up the rocks where the fish's food lives. If the silt does not settle, the water ends up with a dirty look. This muddy water does not allow light for use by plants and other aquatic life. The result is a ruined body of water that no longer supports the fish we want to catch.

#### What you can do to help stop silt or sediment:

- Help slow erosion in your own yard. Re-seed bare spots in the yard. Put mulch on exposed soil in flower and vegetable beds.
- Don't run bikes or any motor vehicle in streams or on stream banks. This creates silt and causes erosion of the banks.
- Don't cut trees or other vegetation at the water's edge even if you are trying to create fish structure. Vegetation helps to hold the bank in place and prevent erosion. Cutting too much vegetation can also cause loss of shading, leading to an increase in water temperatures.

### Agricultural Wastes

Agricultural wastes include manure, liquid and granular fertilizers, silo liquids and pesticides. Cattle, hogs, sheep and poultry raised on feedlots are a big problem. They concentrate a lot of wastes over a very small area. One cow produces as much waste as 17 people every day. Some of this waste is washed directly into rivers. In addition, farmers spread manure and fertilizer on their open fields that may eventually enter a body of water.



Pesticides are chemicals used to help farmers control pests that ruin their crops. If properly used they generally create little or no problem. However, when they enter a water system through careless use, they usually cause environmental damage by killing fish and other organisms in the water.

#### How you can reduce agricultural wastes:

- Use fertilizers and lawn and flower care chemicals sparingly. Try organic alternatives to harsh chemicals.
- Maintain a compost pile to produce fertile soil from unwanted yard and kitchen waste. Do not dump grass clippings or leaves into the gutter along your street. They will eventually enter a waterway and decay, using up precious oxygen in the water. Instead, put clippings and leaves into a compost pile.

## Acid Rain

Acid rain is one of the biggest problems facing the quality of our water today. Many bodies of water are suffering from the effects of acid rain. Acid rain is a result of industries and autos burning oil and coal (fossil fuels) for fuel. Industry smokestacks and automobile tailpipes send sulfur dioxide and nitrogen oxides high into the atmosphere. These elements can remain in the air for several days and travel hundreds of miles. While in the air they mix with water vapor and turn into sulfuric and nitric acids. Eventually, this harmful acid returns to earth in rain, hail, fog, dew, sleet, snow, or as dry particles. This acid damages plant life and may eventually kill insects, frogs, and fish in our waters.



The amount of acid in liquids is measured on a scale from 0 to 14. This is called the "pH" scale. A pH of 7.0 (distilled water) is in the middle of the scale and is considered neutral - neither acidic nor alkaline. Things below 7.0 such as lemon juice (pH of 2.0) are acidic. Things above 7.0, like ammonia (pH 11.0), are alkaline.

The pH scale is logarithmic. This means that a pH of 6 is ten times more acidic than a pH of 7. A pH of 5 is 100 times more acidic than a pH of 7 and a pH of 4 is 1,000 times more acidic than a pH of 7.

Because carbon dioxide and water found naturally in the atmosphere have a pH of 5.0 to 5.6., natural rain is slightly acidic. However, acid rain

that falls in the northeastern United States often ranges from 4.0 to 4.6 pH. In most regions of the country the lakes and rivers can tolerate this acidity without any loss of water quality. A natural buffering ability present in most soils that contain limestone can neutralize acidity. However, several regions of the country are damaged by acid rain because they have thin soils and granite bedrock. Granite is low in limestone and cannot neutralize (buffer) acid precipitation.

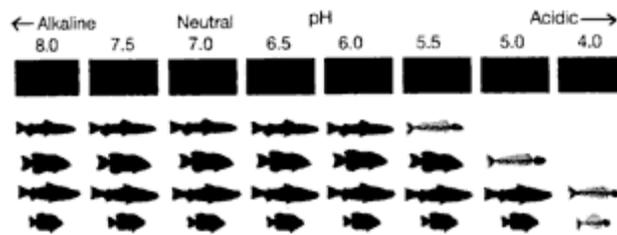
The northeast, the Rocky Mountains, areas of the northcentral and southeastern U.S. and eastern Canada are most affected by acid rain.

Once a body of water contains too much acid, the creatures in the water's food chain begin to die. Eggs and larvae are sensitive to low pH and unable to survive. As water becomes more acid, the fertility of eggs is reduced, fewer hatch, and fish may not grow to adult sizes. Eventually, fish or insects, the fish's food, may no longer be able to live in water with a low pH.

Acid rain is a worldwide problem because it can be carried in the atmosphere for great distances before falling back to earth.

Pollution sources in midwestern states can actually harm waters on the east coast! As a result, thousands of lakes in the United States, Canada, and other countries are suffering from its effects. If steps are not taken to reduce acid rain, many more bodies of water may be ruined forever.

### How You Can Help Reduce Acid Rain:



- Car-pool whenever possible.
- Make sure all vehicles at home have their engines tuned properly.
- Conserve electrical use in the home. Oil and phosphate fuels are used at many power plants and contribute to acid rain.

## Sewage

Sewage consists of human wastes and garbage. It also includes water used for laundering or bathing. Most sewage is treated at a treatment plant that removes the solids and dissolved substances. However, when a treatment plant gets overloaded or has a malfunction, sewage gets dumped into rivers. Today's laws are quite strict, but sewage pollution is still a major problem, especially in large cities.

Sewage depletes the dissolved oxygen in water. Sewage wastes contain nutrients that serve as fertilizers. They cause algae (tiny plants) to bloom in great quantities. When these organisms die, oxygen is used for the process of decomposition, and the fish go without adequate oxygen and sometimes die. If this situation gets bad enough, all the fish in a river below a treatment plant may die. As you have learned, fish must have an adequate supply of oxygen or they will not survive.

Raw sewage can also cause serious diseases in humans who use the water or eat shellfish from polluted areas. Sewage may also make waters unhealthy to swim in.

### **What You Can Do:**

- Don't make sewage treatment harder by dumping chemical or other cleansing agents in drains or in the toilet.
- If your house is on a septic system instead of a city sewer system, it is important to service the system periodically.

## Industrial Waste

Industries produce everything from food products to hazardous wastes. Most industries produce some form of liquid waste that has to be treated before it is released into public waters. These wastewaters contain many toxic chemicals. Although some discharges are treated, some of this chemical waste is still discharged directly into aquatic systems.

### **What You Can Do To Reduce Industrial Waste:**

- Recycle. Some industrial waste can be reduced by recycling.
- Write your legislator and congressional representative. Express the importance of having strong legislation to protect our water resources.
- Never pour anything into a storm drain. Household chemicals, paints, or soaps dumped down the gutter flow into streams untreated.

## Petroleum Products

Accidental oil spills can have disastrous effects on aquatic life. Petroleum products can kill by direct contact with the fish's gills. Oil may also suffocate eggs and young fish, since the young inhabit shallow waters where oil tends to concentrate. Marine birds, sea otters and turtles may also be killed.

### **What You Can Do To Reduce Petroleum Wastes:**

- Recycle used automotive oil. Oil drained from cars and disposed of improperly creates more oil in our waters than a single oil spill from a tanker. Drain the oil from your car into a container and take it down to a service station that recycles oil

# Trash

We have become a throwaway society and are running out of dumps to put our trash. Some people do not even try to dispose of their trash appropriately and throw it along our waters. No one enjoys fishing or swimming when having to contend with broken bottles, sharp cans and other trash. Sinking cans, bottles or other trash in the water may put them out of sight temporarily, but they are still there and it is still wrong.



Plastics are particularly hazardous. They are not easily biodegradable and will be around for a long time, maybe for hundreds of years. Thousands of fish and birds die every year from entanglement in plastic six-pack rings that come from canned drinks. Nylon fishing line discarded by thoughtless anglers can also kill birds by entanglement. Some sea turtles even mistake plastic bags for jellyfish (their favorite food) and choke to death when they eat a plastic bag by mistake.

## **What You Can Do To Reduce Trash:**

- Recycle! Always dispose of your trash properly, especially plastics. If you see trash around your favorite fishing spot, pick it up for recycling or place it in a garbage can where it belongs. Carry a litterbag at all times.
- If you see your friends littering, explain to them that they may be doing a lot more harm than they realize. Don't let them sink cans, bottles or other trash. Even though it goes out of sight temporarily it can cause long-term problems.
- Cut up large tangles of fishing line into short sections before you discard it in a trashcan, or recycle it. Some places collect fishing line for recycling. Also cut up six-pack plastic rings. This little extra effort will help save fish, birds and other aquatic animals and will probably make you feel good too.

# Nuisance Species

Nuisance species are living organisms that upset the delicate balance of a particular body of water. These may be considered biological pollutants.

Not all bodies of water are the same. Even lakes close together may have different characteristics. In some bodies of water a particular type of fish may be part of the balance. However, in a different body of water that same species may throw off the entire balance. The same is true of some types of vegetation and other aquatic life. Some types of vegetation may prove helpful in one lake and a disaster in another.

For example, crappies are excellent sport fish and in many lakes they fit in well with the balance of the lake. However, if put into a different setting the crappie could ruin the entire lake. In the wrong setting the crappie

could populate faster and compete for food and space. You could end up with a lot of little crappie and little else.

Certain kinds of vegetation might be healthy for some water systems. In others, that same vegetation/weed might take over. Too much vegetation can interfere with boating access and protect too many small fish that will then cause an overpopulation of small fish. Also, when weeds die, they decompose removing oxygen from the water. When the oxygen level gets too low, fish will die.

The Great Lakes have had many problems with unwanted species. One problem species introduced by way of ballast water from a ship, was the zebra mussel. The mussel reproduces rapidly. Biologically it is still not known what impact the mussel will have, but it could block spawning grounds for several native fish. The mussel also attaches itself to intakes of water supplies and power plants, causing millions of dollars in damages.

#### **What You Can Do To Prevent Nuisance Species:**

- Never release fish from one body of water into another.
- Never release fish or vegetation from an aquarium.
- Never dump your leftover minnows into a lake or river.
- Remove aquatic weeds from trailers and boats and discard them before moving to another lake.

## Pollution Must Be Stopped

Major sources of pollution must be stopped if quality fisheries are to exist. Even the large oceans and estuaries of the world are fragile ecosystems that require attention and careful use to protect them for our future use and enjoyment.

How will you feel if you go fishing and your favorite river is so polluted that the fish have died?

We can all help. While many of these problems seem out of your hands, there are many problems you can solve in your area by getting your classmates, friends, and neighbors to vocally protest the problem.

Our own actions on a daily basis are important. We each have a responsibility to make sure our own actions are not depleting or polluting the water. An individual action, either positive or negative may seem small. However, when you multiply that by millions of us who live in each state, these actions have a tremendous cumulative impact. Remember we all live downstream of someone.

