

Protecting North Idaho's Lakes

A Citizen Handbook

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Introduction

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North Idaho has always been famous for its beautiful, clear lakes, and we've always been proud that our lakes have remained relatively unpolluted while other lakes across the country have become unfit for drinking or swimming. But people generally cause pollution, and as North Idaho's population grows we can expect our lakes to become more polluted. We can expect pollution, that is, unless people--especially lakeshore owners--learn about what causes water pollution. And, most important, people must learn what we can do to prevent pollution. Pollution can, of course, be prevented--all it takes is a little knowledge and a little effort. Take a few minutes to read this handbook. Our lakes are worth saving.

What is Water Pollution?

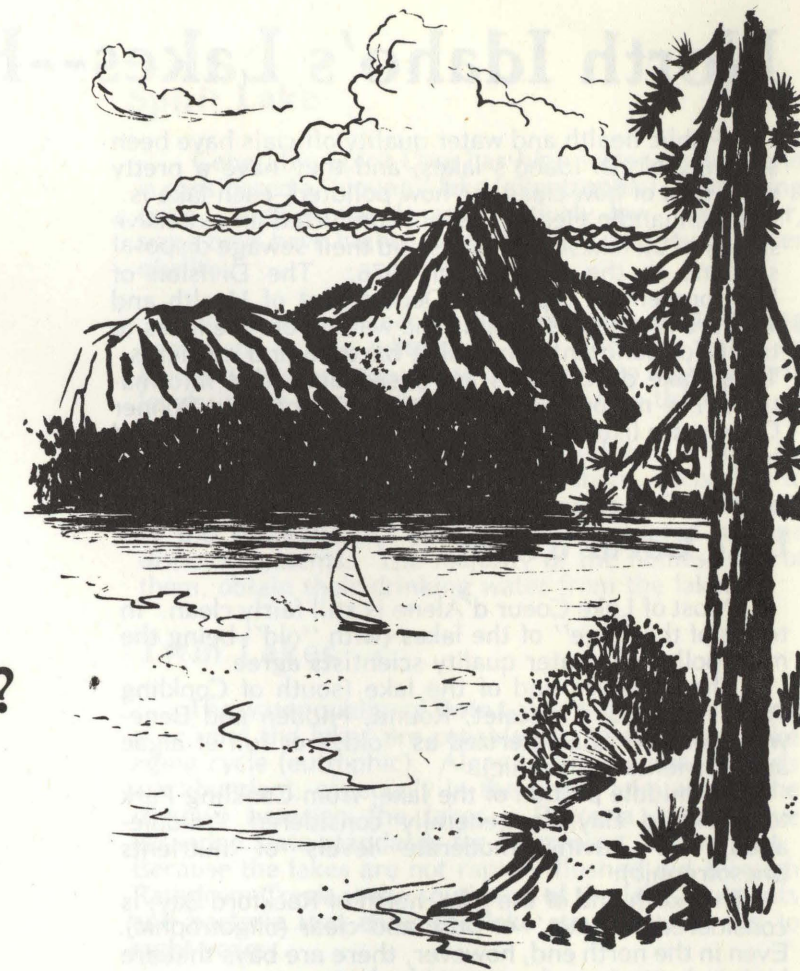
Scientists generally use two factors as indicators of water pollution: the "age" of a lake, and the amount of bacteria in the water. All lakes go through a natural aging process, called "Eutrophication." They start out deep and clear and gradually fill in until they become meadows. In the aging process, natural erosion carries nutrients, or fertilizers, into the lakes along with the eroded soil. These nutrients allow more water weeds and more aquatic animals to grow. These plants and other aquatic life die, settling to the bottom and making the lake shallower and shallower, until it becomes a swamp and then a meadow.

Nutrients entering a lake cause that lake to "age." Under natural conditions, this process takes thousands of years. But human activities around the lakes are greatly accelerating their aging.

In discussing the "age" of lakes, scientists characterize the lakes as young, or "oligotrophic;" middle-aged, or "mesotrophic;" or old, "eutrophic."

Pollution of a lake is a direct result of the way the land is being used around that lake. Houses along the shoreline often have improperly functioning septic tanks or other sewage disposal systems that can pollute the lake, both with bacteria and nutrients. Erosion is a pollutant, because the soil carries natural fertilizers, or nutrients, into the lake and allows rapid algae and water weed growth. Anything that causes erosion--grading for construction, road building, logging, etc.--pollutes the lakes by causing algae and other water weeds to grow.

What's wrong with algae in a lake? Most lake users find the presence of algae unpleasant. But it can also present a problem for fish, by using the oxygen that fish need. Algae has also been a hazard to people's health, especially in Long Lake, Washington, where a type of blue-green algae has killed dogs and cattle that have swallowed lake water. Other strains of algae can cause a skin rash, known as "swimmer's itch."



Creeks can bring nutrients and pollutants into the lakes from the surrounding watershed land. Activities in the watershed area that can cause water pollution are:

- Logging, by removing vegetation and building roads, thus exposing soil to erosion.
- Farming, because fertilizers, herbicides and pesticides can get into creeks and lakes, and because tilled, bare fields can erode.
- Grazing, because manure and bacteria are carried into the water. Overgrazing can cause erosion, because livestock leave bare soil behind them.
- Mining, from waste mineral material that can get into nearby waters, and from dredge mining operations that remove natural vegetation and cause erosion.

One of the most serious contributors to lake pollution, though, is sewage from faulty home sewage disposal systems. Fortunately, this source of pollution is also one of the easiest to correct, with a little knowledge on the part of the homeowner. Correcting sewage disposal systems is particularly important to lake homeowners because of the many lake homes which rely on lake water for drinking water. No one wants to feel that he or she is drinking sewage.

This Lake Protection Guide explains in detail what lake homeowners can do to keep their sewage disposal systems functioning properly, and to keep the lakes clean. Other sources of pollution, and solutions to cut down on pollution, are also discussed in this handbook. The major lakes in Kootenai County and Bonner County are profiled, with an explanation of each lake's pollution level and particular problems. Citizens who are concerned about protecting the lakes from pollution can use this handbook to learn about lake problems and solutions.

North Idaho's Lakes--How Clean Are They?

Public health and water quality officials have been studying North Idaho's lakes, and they have a pretty good idea of how clean--or how polluted--each lake is. The Panhandle Health District conducted an extensive survey of all lakeshore homes and their sewage disposal systems in the summer of 1976. The Division of Environment of the Idaho Department of Health and Welfare has been sampling the water from the lakes to test it for pollutants, including bacteria and nutrients. These lake descriptions are based upon this information. The major lakes in Kootenai County and Bonner County are listed; look for the lakes you are interested in.

Lake Coeur d'Alene ✓

Most of Lake Coeur d'Alene is still fairly clean. In terms of the "age" of the lakes (with "old" being the most polluted), water quality scientists agree:

-- The southern end of the lake (south of Conkling Park, including Chatcolet, Round, Hidden and Benevah Lakes) is characterized as "old," or full of algae and nutrients (eutrophic).

-- The middle portion of the lake, from Conkling Park to Rockford Bay, is generally considered "middle-aged," or having moderate levels of nutrients (mesotrophic).

-- The north end of the lake, north of Rockford Bay, is considered "young," or pure and clear (oligotrophic). Even in the north end, however, there are bays that are high in bacteria and green with algae.

Human sewage and wastewater from residential development cause part of the problem. In addition to septic tanks and other sewage disposal systems which may pollute the lake, there are quite a few treated sewage discharges from towns near the lake. Sewage from boats can also be a problem.

Agriculture is also a source of nutrients in Lake Coeur d'Alene. The Palouse soils to the west of the lake are one of the most erodible in the country. Tests have shown that soil erosion rates of 24-40 tons per acre annually are not uncommon.

Mining wastes have been the most significant source of pollution to Lake Coeur d'Alene in the past, from the Coeur d'Alene River which flows into the south end of the lake. In recent years, mining companies have cleaned up their operations, but mining wastes from the past remain in the lake.

What kind of residential development exists on Lake Coeur d'Alene? The lake has 109 miles of shoreline. The Panhandle Health District shoreline survey found that there are 1688 houses within ¼ mile of the shoreline, excluding Coeur d'Alene and Harrison. About 875 of these are lakefront lots, and the houses are within 300 feet of the shoreline. In addition, there are 1389 subdivided shoreline lots which have not yet been built upon. The Kootenai County Comprehensive Plan suggests higher densities along the shoreline than presently exist, to allow the eventual construction of sewage collection and treatment systems. Many of the homeowners around Lake Coeur d'Alene rely on it for drinking water. The shoreline survey found that 877 homes use the lake for household water.



Hayden Lake ✓

Except for some bays, the water quality of Hayden Lake is generally good, and clarity of lake water is generally excellent. Scientists characterize the lake as early middle-aged (early mesotrophic). High counts of bacteria, especially coliform, have been found during the summer, near high density shoreline development and in recreation areas. This has resulted in some beaches being closed to swimming during parts of the summer several years ago.

The creeks entering Hayden Lake are a major source of nutrients, or fertilizers, that cause algae growth in the lake. Hayden Creek, the main tributary to the lake, drains a watershed that has several different uses, including cattle ranching, some cultivated agriculture, and logging.

Shoreline construction also contributes some nutrients, from the erosion which occurs from barren slopes near the lake. In addition, septic tanks and other sewage disposal systems from lakeshore homes contribute to the lake's pollution.

Due to its location in the fast-growing Kootenai County, Hayden Lake is rapidly becoming a year-round residential area. Population densities are presently highest at the west end of the lake where access is easiest.

The Panhandle Health District shoreline survey found that there are 627 houses on the lake. Eighty-five percent of these houses draw water from the lake for household use. There are 748 lots on the lake that do not yet have houses on them.

The vast majority of the homes use outdated sewage disposal systems that could be polluting the lake. Correction of this problem is discussed in the chapter on sewage disposal.

Hauser Lake

Hauser Lake is generally considered to be of poor water quality. Its "age" is very old (eutrophic), and the lake is not far off from becoming a swamp and then a meadow. Nutrient concentrations are generally quite high, and algae and other water weeds grow rapidly. Bacteria levels have exceeded state standards for swimming waters in the past, especially during the warmer months.

Contributors to pollution include West J.M. Creek and J.M. Creek. Livestock have direct access to both streams, and create very high bacteria levels in the water. Agriculture along the streams, including fertilization, contribute to the nutrients in the lake and therefore add to pollution. Past logging operations contribute eroded soil and accompanying nutrients. Sewage disposal systems from shoreline homes also contribute to the problem, because much of the shoreline has very poor soils for proper functioning of these systems.

The shoreline survey found 77 houses within ¼ mile of the lake, and 51 houses within 300 feet of the shore. There are 126 subdivided lots that are not yet built upon. Of the shoreline homes, 78 percent have outdated sewage disposal systems that could be contributing to lake pollution.

Unless some corrective and preventive action is taken, Hauser Lake could become so polluted that it would not be a pleasant place to live. The population around Hauser Lake can be expected to grow rapidly in coming years, as new industrial development occurs near the state line, providing new jobs in the area.

Fernan Lake

Fernan Lake is considered to be "old," or eutrophic. It has supported dense algae blooms in the summer. Bacteria counts vary depending on the weather, but total bacteria counts (especially coliform) have exceeded state standards for swimming on some occasions.

The tributary creeks are sources of considerable amounts of nutrients to the lake, water quality monitoring indicates. Local water quality officials suspect that cattle grazing adjacent to Fernan Creek contributes a large amount of nutrients. Sewage disposal systems around the lake are also believed to contribute nutrients.

Action has been undertaken to provide sewers to the developed area on the west end of the lake. This may provide some relief from sewage pollution, but water quality officials believe that most of the nutrients that have reached the lake in the past will remain there for several years, because there is little flushing action of the lake. Because Fernan Lake is very small (450 surface acres) and shallow (maximum depth 25 feet), any development on its shoreline or in its watershed should be carefully undertaken to prevent serious lake pollution problems.

Spirit Lake

Generally, Spirit Lake has high water quality, and is considered a "young" lake (oligotrophic) in the aging cycle. Nutrient levels are relatively low. However, some bays have higher nutrient levels and lower water quality.

Some erosion reaches the lake from past logging operations in the watershed. In addition, cattle in Brichel Creek are thought to contribute to high bacteria levels in the creek, which then flows into the lake.

There are 570 subdivided lots within ¼ mile of the lake, 301 of which have houses on them, according to the shoreline survey. Of the 196 houses within 300 feet of the shoreline, 72 percent have outdated sewage disposal systems. The majority of the homes, 126 of them, obtain their drinking water from the lake.

Twin Lakes ✓

The water quality of Twin Lakes is generally rather poor, and the lakes are considered "old" in the lake aging cycle (eutrophic). Algae and other water weeds are abundant, especially in the upper lake and in the narrows between the lakes. Bacteria levels have exceeded state standards for swimming in the past. Because the lakes are not rapidly flushed out through Rathdrum Creek at the south end of the lake, nutrients and bacteria that enter the lake stay there for up to eight years.

Contributors to pollution in the lake include household sewage disposal systems, erosion from logging in the watershed, and cattle grazing in the tributaries.

The Panhandle Health District's shoreline survey identified 272 residences on the lower lake and 141 on the upper. More than 70 percent of these homes have outdated sewage disposal systems that could be causing pollution problems. There are also 754 lots that are subdivided but presently vacant. Eighteen houses rely on the lakes for domestic water.

Lake Pend Oreille ✓

Lake Pend Oreille is characterized as a young (oligotrophic) lake. It remains clear and clean, with nutrient levels below those needed for rapid algae growth. Bacteria levels have been consistently low, even in developed areas such as Bayview. The tremendous volume of Lake Pend Oreille helps prevent it from becoming polluted.

During spring runoff periods, much silt is carried into the lake by the Clark Fork River. Erosion is probably the source of this silt. The Clark Fork River is also used for several sewage discharges in Montana.

Most development on Lake Pend Oreille is of an older nature. The shoreline survey found that there are 644 houses and 742 undeveloped lots within 200 feet of the lake. Of these, 386 houses rely on the lake for drinking water. There are 210 outdated sewage disposal systems. In the 35 bays surveyed, the average sewage disposal system was 114 feet from the lake, which is much closer than present regulations allow.

Priest Lake

Both Priest Lake and Upper Priest Lake are considered young (oligotrophic) lakes. They have low nutrient levels and low bacteria levels. Occasionally, higher bacteria levels have been found in bays with relatively heavily developed shorelines.

There is also some erosion that has occurred from shoreline construction, logging and logging road construction. The large volume of the lake provides a buffering capacity against significant changes in nutrient and bacteria levels.

From a development standpoint, 87 percent of the shoreline is in public ownership. The shoreline survey found that there are 1752 lots, and 1006 of these have been built upon. Added to this are over 300 campsites and numerous resorts. Most of the lakeshore homes depend on the lake for drinking water.

The average length of ownership or lease is 21 years. Most of the existing sewage disposal systems are old. Because of the threat to lake water quality from these old sewage disposal systems, sewer districts have been formed in some areas of the lake. Some sewage treatment systems have already been built, and others are in the planning stages.

Sewage Disposal Around the Lakes

The Problem

One of the most serious sources of pollution to North Idaho's lakes is household sewage. This is also the area where each lake homeowner can make the greatest contribution to lake clean-up efforts, by learning about sewage disposal problems and solutions. Cleaning up existing sewage contamination and preventing future sewage problems are especially important considering the number of people that rely on the lakes for household water.

What Happens After the Flush?

Sewage leaves the house and flows into a waste disposal system. Most homes use septic tanks for sewage disposal, but many lakeshore homes are still hooked into outdated sewage disposal systems that could be polluting the lakes. The following discussion will concentrate first upon septic tanks, and then upon the outdated sewage disposal systems.

How Does a Septic Tank Work?

Sewage flows by gravity from the house into the septic tank. The larger and heavier particles sink to the bottom of the tank, forming a layer of sludge. Bacteria living in the septic tank break down some of the sludge into liquid. Lighter materials, including fat and grease, float to the surface and form a scum layer. The sludge and scum are stored within the septic tank, and the wastewater flows out a pipe to one or two lines of perforated pipe called a "drainfield," where it sinks into the soil.

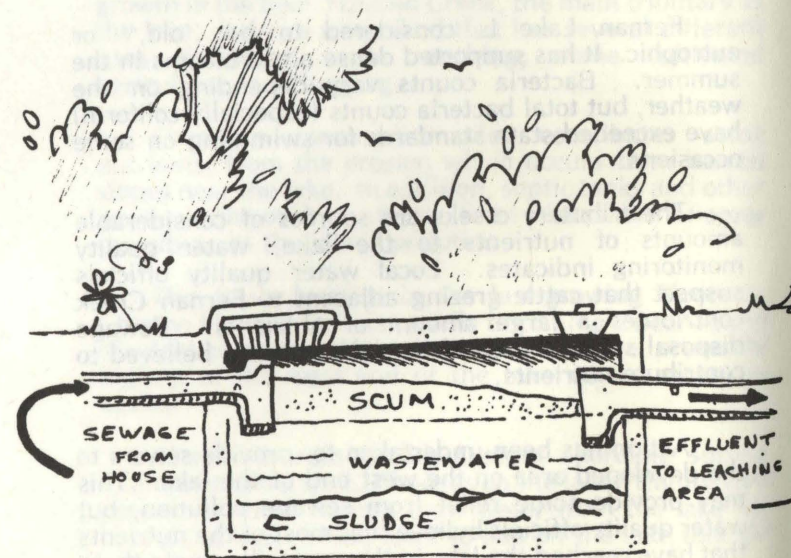
Lake Cocolalla

Lake Cocolalla has aged to the point where it is the oldest (most eutrophic) of North Idaho's lakes. It has high nutrient levels which have resulted in algae "blooms," or rapid growth. There are often high bacteria levels in the summer and fall.

Water quality studies indicate that Westmond Creek and Cocolalla Creek are contributing the greatest concentration of nutrients to the lake. The nutrients enter these creeks from heavy grazing (especially on Cocolalla Creek), erosion from unstable stream banks, and lack of streamside vegetation to catch erosion on other tributaries.

The shoreline survey identified 135 lots within 300 feet of the lake, 83 of which have dwellings on them. To date, 74 percent of the dwellings have been of a seasonal nature, but good access exists and year-round living is possible in the future. Forty-eight percent of the sewage disposal systems are outdated varieties, either cesspools or septic tanks with drywells.

In the soil, some small particles and disease-causing organisms are filtered out as the wastewater seeps into the ground. Some of the nutrients are taken up by roots of plants. But some pollutants can reach the groundwater below or the lake, especially when drainfields are installed close to the shore, or over very sandy soils. The Panhandle Health District requires that new septic tank drainfields be installed 300 feet back from the lake, and recommends that they be within two feet of the ground's surface where there are plant roots and soil bacteria present to break down the harmful sewage.



A typical septic tank.

The sludge layer builds up over time, and must be regularly pumped out.

The sludge layer in the bottom of the septic tank gets deeper and deeper as more sewage is added year after year. The sludge should be pumped out approximately every three years, depending on the use. If it is not pumped out, it will flow into the drainfield pipe and clog the soil so that no wastewater can seep out. The septic system then stops working correctly, and sewage can back up into the home or puddle on the ground, eventually flowing into the lake.

The septic tank can also stop working properly if there is a high water table. During wet seasons, the groundwater table rises. If the water table rises into the leaching area, sewage may be forced up toward the ground surface. This problem is the result of improper installation of the drainfield system, and can only be corrected by relocating the drainfield system at least four feet higher than the maximum high water table.

Septic systems can also have problems if the sludge or scum from the septic tank area overflows into the drainfield area. The soil will quickly become clogged with organic matter. This situation can often be corrected by allowing the system to rest for six to twelve months. Often this means a new drainfield system must be installed. This problem, however, can be avoided by pumping the tank every three years or so.

Outdated Sewage Disposal Systems

Many of the sewage disposal systems around the lake were installed years ago when little was known about proper sewage treatment. The Panhandle Health District's shoreline survey found hundreds of these outdated, potentially polluting sewage systems on North Idaho's lakes.

One of the most common of these outdated sewage systems uses a septic tank, but the wastewater, instead of flowing into the shallow, long perforated pipes of a drainfield, flows into a pit known as a "drywell." Drywells do not work well for treating wastewater. They are usually buried deep in the ground, six to ten feet below the surface, where there are few soil organisms to break down the harmful wastewater particles. That far below the ground, there are no roots to use up the fertilizers present in sewage. Instead, the wastewater can flow directly into the lake, under the ground. This is especially true when the drywells are located close to the lake, as many of them are.

Another outdated sewage system is known as a "cesspool." A cesspool is essentially a large pit, lined either with bricks or concrete with holes in it. Sewage flows directly from the house into the cesspool. There, the heavier particles settle to the bottom, similarly to what happens in a septic tank. The wastewater moves into the ground through the holes in the cesspool's walls.

In cesspools, the sludge builds up over the years if it is not pumped out. It eventually flows out the sides of the cesspool into the soil, but since it is so thick it clogs up the soil. Soon, no more wastewater can seep through the cesspool's walls, and the sewage either puddles on top of the cesspool, where it can eventually flow into the lake, or it backs up into the home. Most of the cesspools at lakeshore homes are located very close to the lake, increasing the likelihood that they are causing lake pollution.



Many lakeshore homes have outdated sewage disposal systems that may be polluting the lake. These should be replaced to protect the lakes.

Disposal of water from kitchen sinks can also be a problem for the lakes. Some lakeshore homes let their kitchen wastewater run directly into the lake, rather than into a sewage disposal system. Kitchen wastewater often contains nutrients from detergents, grease and fats, and organic matter such as plate scrapings that all add to lake pollution.

Many lakeshore homes are still using these outdated sewage systems, as the table shows. These sewage systems will continue to threaten the lakes as long as they continue to operate.

OUTDATED SEWAGE DISPOSAL SYSTEMS WITHIN 300 FEET OF THE SHORELINE

LAKE COEUR D'ALENE
425 Septic Tank/Dry Wells
142 Cesspools
40 Direct Discharges of Sink Waste
877 Domestic Water Connections From the Lake
LAKE PEND OREILLE
114 Cesspools
65 Septic Tank/Drywells
15 Direct Discharges of Sink Waste
16 Kitchen Sumps
386 Domestic Water Connections from the Lake
HAYDEN LAKE
300 Septic Tank/ Dry Wells
123 Cesspools
39 Kitchen Sumps
17 Direct Discharges of Sink Waste
498 Domestic Water Connections from the Lake
PRIEST LAKE
156 Privies
2 Cesspools
7 Septic Tank/Drywells
286 Domestic Water Connections From the Lake
TWIN LAKES
216 Cesspools
122 Kitchen Sumps
75 Septic Tanks/Drywells
22 Direct Discharges of Sink Waste
18 Domestic Water Connections From the Lake

Sewage Disposal Around the Lakes

The Solution

REGULAR PUMPING

One of the most important steps that lake homeowners can take to help reduce pollution is to regularly pump their septic tanks or cesspools. Maintenance makes sense, both to save money and to save the lakes. A new septic system costs about \$1500 to \$2000 to install. If it is not taken care of properly, it will become clogged and will overflow, adding to lake pollution. Rebuilding the system to put it back into operation may cost \$600 to \$1500. It is cheaper and easier to prevent septic system failure than it is to correct it. Septic tanks should be pumped out approximately every three years, depending on use, to help protect them against failure. The \$50 investment to have the tank pumped is cheap insurance to protect an investment worth \$2000.

Septic systems generally give little warning that they are about to fail. However, these symptoms often indicate that the leaching area is becoming clogged:

-- Wetness or dampness on the ground over the leaching area, or sewage odor near the septic tank or leaching area.

-- Slow-running or clogged drains and toilets.

If any of these symptoms develop, have the septic tank pumped. Waiting until the system becomes completely clogged can mean an expensive repair bill, and possible lake pollution.

Do not wait until your septic system shows signs of failure to have your septic tank pumped out. Call a licensed pumper to inspect your septic system once every three years or so. For a list of licensed operators, call the Panhandle Health District or check the yellow pages under "Septic Tanks."

To find your sewage disposal system, check where and in what direction the sewer pipe goes out through the basement wall. Check the yard in that area for places that are slightly depressed or mounded. Any likely spot can be probed with a thin metal rod.

If this doesn't work, ask someone who may have seen the tank installed or pumped--a neighbor, the builder or the previous owner. The Panhandle Health District should also have a record of both the type and the location of your sewage disposal system.

PREVENTING SYSTEM FAILURE

To help protect a septic system against failure, the homeowner should follow these simple procedures:

1. Inspect the septic tank regularly, once every three years or so. Have it pumped if necessary.

2. Minimize water use in the home. Excess water will decrease the effectiveness of the septic tank and lead to flooding of the leaching area. Never empty basement sumps or other sources of clear water into the septic system. Use water-saving pumping fixtures where possible (faucet aerators, low-flow showers, low-flow toilets, etc.) and run dishwashers and washing machines only with full loads. Fix leaky faucets and toilets promptly.



Septic tanks must be pumped every three years or so.

3. Although small amounts of these materials may be acceptable, whenever possible do not dispose of these substances in the septic system (recycle them or put them in the trash):

-- Coarse organic matter. Vegetable trimmings, ground garbage, sanitary napkins and coffee grounds will clog the septic tank with sludge and require frequent septic tank pumping.

-- Fats and grease. Automotive oil should never be put into the septic system. Cooking oil and bacon grease, etc., may pass through the septic tank and clog the leaching area, causing the system to back up.

-- Chemicals. Pesticides, disinfectants, acids, medicines, paint, paint thinner, etc., will kill the bacteria which decompose organic matter in the septic tank, thereby causing increased sludge accumulation. As a result, more frequent pump-outs will be required to keep the system operating properly.

4. Never dump the waste from chemical toilets of boats into the septic system. The chemicals used to treat the waste in these toilets are harmful to septic tank bacteria, and can cause failure of the system.

5. Keep heavy vehicles off of the leaching area, as their weight could lead to crushed pipes and expensive repairs.

REPLACING OUTDATED SEWAGE SYSTEMS

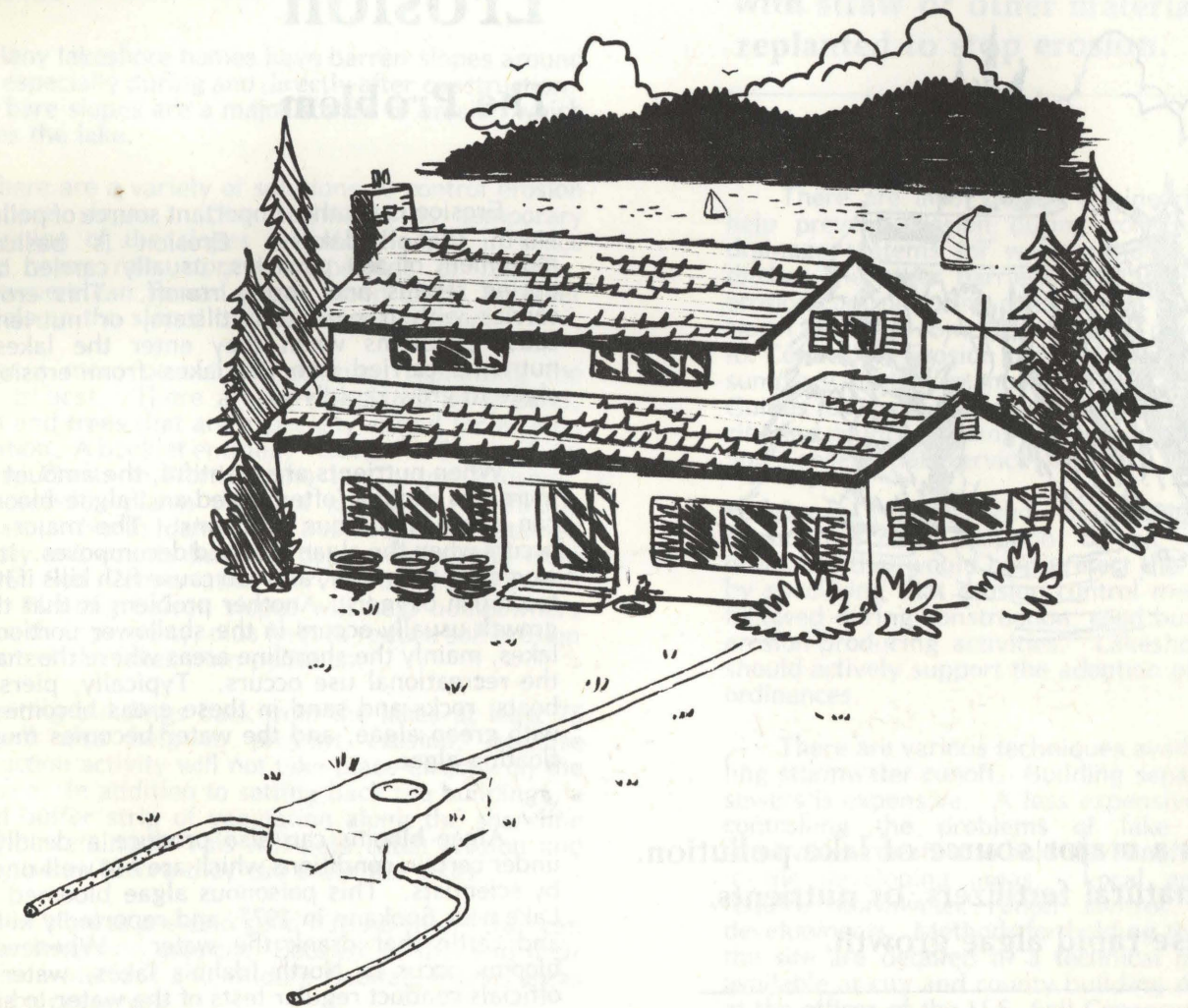
Many lakeshore homes have outdated sewage disposal systems that are contributing to lake pollution. The best solution to this problem is replacing the old systems. Replacing these systems as soon as possible makes financial sense, both because new systems are not going to get any cheaper, and because a polluted lake can mean an expensive new water system for homeowners who depend on the lake for household water. Decreased property values can also result from a failing outdated sewage system.

There are several alternatives in new sewage disposal systems. A septic tank and drainfield is one possibility, if the lot extends far enough back from the lake to keep the drainfield away from the shoreline. The Panhandle Health District can help homeowners decide which type of sewage disposal system is best for them.

Some new types of sewage systems are also being tested. One is known as a sand filter, and consists of carefully designed and constructed beds of sand and gravel, where the wastewater flows after it leaves the septic tank. This alternative is typically used as a replacement system in areas that have soils which are not good for wastewater treatment. Sand filters are relatively expensive.

A promising alternative to the sewage disposal problem is that of waterless toilets. A good guide to the variety of waterless toilets now available is "Goodbye to the Flush Toilet: Water Saving Alternatives to Cesspools, Septic Tanks and Sewers," edited by Carol Stoner, Rodale Press, 1977. One of the most promising waterless toilets, especially for seasonal use, is the composting toilet. Composting toilets work on a very simple concept: decomposing human waste slowly, silently, and with no odor (really!) into humus that can be used for outdoor landscaping.

Composting toilets work well for toilet waste, but they do not solve the problem of sink, shower and laundry wastewater, often called "greywater." Recent studies have shown that this type of wastewater may be as harmful as toilet waste, so it requires some kind of treatment. Research and experimentation on greywater disposal is still going on. The best method to date is a separate septic system for greywater, which can be smaller and less expensive than a full-fledged septic system. The Panhandle Health District has information about these new sewage disposal systems. All of these systems require regular maintenance to insure proper long-term operation.



Septic tanks and drainfields should be located at least 300 feet from the lakeshore.

SEWAGE TREATMENT FOR A COMMUNITY

LARGE SCALE SEWAGE COLLECTION AND TREATMENT SYSTEMS:

The Panhandle Health District concluded after their shoreline survey, "Large scale conventional collection and treatment methods do not appear to be an economical alternative due to the low density 'summer home' character of existing shoreline development." In addition, these large sewage systems can have quite an impact on the overall lake environment. They are usually built to accommodate many new homes, which can create a "building boom" around the lake. The increased construction causes erosion, which adds to lake pollution.

The Panhandle Health District is instead encouraging several small scale sewage disposal systems as an alternative to costly large scale collection and treatment systems.



SMALL SCALE SEWAGE TREATMENT SYSTEMS:

The types of community sewage systems being proposed for lakeshore communities range in size, depending on the number of homes being served, and whether those homes are year-round or seasonal. These small-scale community systems are simpler and less expensive than large scale collection and treatment.

In some cases, the best alternative is to continue the use of septic tanks for removal of the solids in sewage, with several homes connecting to a common, or "community," drainfield that is located as far away from the lake as possible. Another alternative is septic tanks that are joined to a collection system that takes the wastewater to a lagoon, where some of the wastewater evaporates and the remaining wastewater is sprayed on surrounding vegetation. Its pollutants are broken down by plants and soil organisms. This system is used predominately for seasonal homes, unless the lagoon system is large enough to store the entire flow of the development during winter months. Lagoon systems cannot effectively treat wastewater in the winter, because little evaporation or plant transpiration occurs at that time.

Erosion

The Problem

Erosion is another important source of pollution for North Idaho's lakes. Erosion is basically the movement of soil particles, usually carried by water during storms and spring runoff. This eroded soil carries with it natural fertilizers, or nutrients, that cause problems when they enter the lakes. The nutrients carried into the lakes from erosion cause algae to grow rapidly.

When nutrients are plentiful, the amount of algae increases rapidly (often called an "algae bloom") and can cause numerous problems. The major problem occurs when the algae dies and decomposes. It uses up oxygen in the water, and can cause fish kills if it uses up too much oxygen. Another problem is that the algae growth usually occurs in the shallower portions of the lakes, mainly the shoreline areas where the majority of the recreational use occurs. Typically, piers, docks, boats, rocks and sand in these areas become covered with green algae, and the water becomes murky with floating algae.

Algae blooms can also produce a deadly poison under certain conditions which are not well understood by scientists. This poisonous algae bloomed in Long Lake near Spokane in 1977, and reportedly killed dogs and cattle that drank the water. Whenever algae blooms occur in North Idaho's lakes, water quality officials conduct regular tests of the water to see if the poison is occurring.

Erosion is a major source of lake pollution. It carries natural fertilizers, or nutrients, which cause rapid algae growth.

Where does erosion come from? It can come from quite a few different sources--anywhere that bare soil exists. Clearing sites for lakeshore homes, road construction, farming, and logging can all contribute a considerable amount of erosion to the lakes if proper erosion control techniques are not followed.

Water that runs off during storms not only can carry eroded soil, but it can also contain significant quantities of pollutants. Studies have shown that the pollution load of street surface runoff during the first hour of an intense storm may be much greater than the same city's untreated sewage during the same time period. In some cities, stormwater runoff is channeled into pipes which carry it to the city sewage treatment plant for treatment. But in some areas, the stormwater is run directly into the lakes. Stormwaters entering Lake Coeur d'Alene from the city of Coeur d'Alene have been found to carry high concentrations of pollutants and bacteria. Stormwater runoff from Sandpoint enters Sand Creek and Lake Pend Oreille. It has also been shown to carry pollutants.

► The Solution

Many lakeshore homes have barren slopes around them, especially during and directly after construction. These bare slopes are a major source of erosion which pollutes the lake.

There are a variety of solutions to control erosion from bare slopes. One technique is temporary stabilization of the slopes to hold the soil in place during heavy rain storms or periods of runoff. Homeowners can spread straw, wood chips, or other materials on the slopes to help reduce erosion.

For a more permanent solution, replanting the slopes is best. There are various kinds of grasses, shrubs and trees that are especially suited for erosion prevention. A booklet entitled, "Guide for Successfully Growing Plants in North Idaho to Control Erosion" details specific plants that are known to be highly successful in North Idaho. This booklet can be obtained from city and county building departments, and from the U.S. Soil Conservation Service offices in North Idaho. Planting barren slopes will help homeowners enhance their property, plus help to reduce soil erosion and protect the lakes from pollution.

Setting buildings back from the lakes at least 75 feet will also help to prevent erosion, because construction activity will not take place directly on the lakeshore. In addition to setting back the buildings, a natural buffer strip of vegetation along the shoreline should be retained. This will help catch erosion and trap nutrients before they can enter the lakes.

Marsh areas are also good natural filters that can trap nutrients and erosion. Because of this and their value for waterfowl and wildlife habitat, marsh areas should be preserved.



Soil that is left bare during or after construction should be covered up with straw or other material, and replanted to stop erosion.

There are also various engineering solutions to help prevent erosion during construction, such as drainage systems for water runoff, retaining walls, ditches and other barriers. Detailed information on erosion control during construction can be obtained in North Idaho. A complete technical manual, "Practices for Controlling Erosion and Stormwater Runoff," plus a summary of this manual, called "Water Protection Guides for North Idaho Builders," are available at all city and county building departments, and at the U.S. Soil Conservation Service offices.

Some North Idaho cities and counties are considering the adoption of an erosion control ordinance that would help protect the lakes and rivers by specifying that erosion control measures must be followed during construction, road building and other erosion-producing activities. Lakeshore homeowners should actively support the adoption of erosion control ordinances.

There are various techniques available for controlling stormwater runoff. Building separate stormwater sewers is expensive. A less expensive alternative for controlling the problems of lake pollution from stormwater runoff is to hold the runoff where it occurs in the developing areas. Local governments can require stormwater runoff control plans for new developments. Methods for holding the stormwater at the site are detailed in a technical manual which is available at city and county building departments and at the offices of the U.S. Soil Conservation Service.

Using the Lakes for Drinking Water



Proper sewage disposal systems for lake homes are especially important considering that many people rely on the lakes for drinking water.

The Problem

Many lakeshore residents rely on the lakes for drinking water. The biggest problem with this is the threat of sewage contamination. This could easily occur from the many outdated sewage disposal systems around the lakes, or from septic tank drainfields located too close to the lakeshore.

Farming

The Problem

Agricultural land can contribute to lake pollution if the land is bare during the spring runoff periods. The bare soil erodes away, and ends up in the lakes along with the water which carries it. Fertilizers used in farming can also cause problems for the lakes, especially if they are used in high amounts. Both the eroded soil and the fertilizers contain nutrients that increase the growth of algae in the lakes.

The rolling hills of the Palouse region on the west side of Lake Coeur d'Alene are an important source of erosion to that lake. These soils are especially susceptible to erosion, and are sometimes left bare during the spring runoff period.

The lake water could also fail to meet state standards for drinking water if there are too many nutrients, either from sewage or from erosion. These nutrients would enhance the growth and survival of any bacteria that are present, and the total number of bacteria could increase to a level that would increase public health risks. This is most likely to occur in the smaller, shallower lakes, and in the bays and inlets of the larger lakes where numerous homes and water intake pipes exist.

There is also a potential public health problem from the growth of poisonous algae. Certain algae can produce a deadly poison under some circumstances.

The Solution

The best thing that homeowners can do to keep the lakes safe for drinking is to help reduce lake pollution. Homeowners should have their septic tanks pumped every three years or so, and should replace outdated sewage disposal systems with proper septic tanks and drainfields located at least 300 feet from the lakeshore. Kitchen wastes should never be pumped directly into the lake, but should instead go into the sewage disposal system. Lake residents should also make an effort to reduce erosion by covering any bare soil around the lake.

To be sure that lake water is safe to drink, especially in areas where there are many homes, lakeshore residents should disinfect the water before drinking it, either by boiling it or by chlorination. If the water is muddy-looking, a filtering device should be installed to remove the dirt particles. The Panhandle Health District and the Division of Environment of the Idaho Department of Health and Welfare have the responsibility to test drinking water for the public.

Cattle are one of the biggest sources of lake pollution from farming operations. Pasture lands are adjacent to many North Idaho lakes and their tributaries. During the summer months, these lands are used extensively for grazing, and the potential for water quality problems increases. Many times the lakes and streams are accessible to the cattle, and this is where they usually congregate to keep cool and drink. Consequently, considerable amounts of manure enter the lakes and streams.

The Solution

Farmers should never leave their fields bare during periods of spring runoff, if at all possible. Tilling should be kept to a minimum. Critical areas, especially slopes, should be seeded to reduce erosion. The U.S. Soil Conservation Service has more information about reducing farmland erosion.

Fertilizers should be used only in concentrations that can be utilized by the crop, because any excess fertilizer that is not used by the plants can reach the lakes or the groundwater. Herbicides and pesticides should never be used near streams or lakes. These chemicals are sometimes dangerous, and can cause problems to aquatic life and fish.

Cattle should not be allowed access to streams or lakes. Watering troughs using the water from streams or lakes can be set up, and the lakes and streams should be fenced off from cattle. Low interest loans for fences are available through the Small Business Administration, and cost-sharing of fencing to keep stock out of lakes and tributaries is available through the U.S. Agricultural Stabilization and Conservation Service.



Cattle should not be allowed access to lakes and streams.

Logging Near the Lakes

The Problem

The major lake pollution problem caused by logging activities near the lakes and tributary streams is erosion from poorly-constructed logging roads. Erosion from logging roads is the number one water quality problem related to logging in the Northwest. Improper logging road construction can cause mass movement of soil, and stream channel erosion. The eroded soil that reaches the streams can damage the areas where fish have their young.

Some types of logging, especially clearcutting, result in bare soil being exposed, causing erosion. Erosion also occurs on steep slopes that have been logged.

Some private forest owners use herbicides to control brush and promote the growth of lumber-producing tree species. Although the impacts of herbicides on the lake environment are not totally understood, some research shows that certain herbicides can cause serious damage to fish, aquatic life and humans.

The Solution

The most important rule to prevent erosion from logging activities is "cover up the bare soil." Quick replanting of disturbed soils from road construction is necessary to minimize erosion. The highest volume of soil movement occurs during the first two wet months following road construction. Seeding, mulching and some fertilization should be done prior to fall rains. Buffer strips of natural vegetation between the road fill and the lake or streams will act as sediment traps, and should be provided to reduce the erosion to the lake or streams.

Logging operations should be carried out with a minimum of soil disturbance. If possible, skyline cables should be used on steep fragile soils, rather than skidders. All skid trails should be replanted immediately, and skidding on steep slopes should be avoided when possible.

Selective cutting techniques should be used where possible, so that vegetation remains on the soil. If clearcutting is used, replanting should be done immediately.

Until there is more conclusive research on certain herbicides, their use should be avoided. Brush can be cleared by manual methods, and clearcut areas should be replanted immediately so the trees can grow before brush becomes a problem.

Dredging and Filling

The Problem

Dredging is the removal of lake bottom material with machinery. Dredging disturbs the sediments and mud on the bottom of the lakes. This mud is rich in nutrients, and dredging can therefore add to pollution by disrupting the mud and releasing these nutrients into the water. Dredged material is usually deposited on the shore near the water. This material is highly susceptible to erosion. Consequently, the mud and nutrients usually end up back in the water, contributing to lake pollution.

Filling involves pushing soil and other material into the water to create beach areas or extend homesites. Unauthorized filling operations contribute considerable amounts of pollution to North Idaho's lakes each year. Permits for any filling must be obtained from the Idaho Department of Lands, which often specifies that the fill material must be clean sand, washed gravel or some other harmless substance. However, many lakeshore owners conduct filling operations in the lakes without a permit. The Department of Lands now requires the removal of any filling that has occurred without a permit.

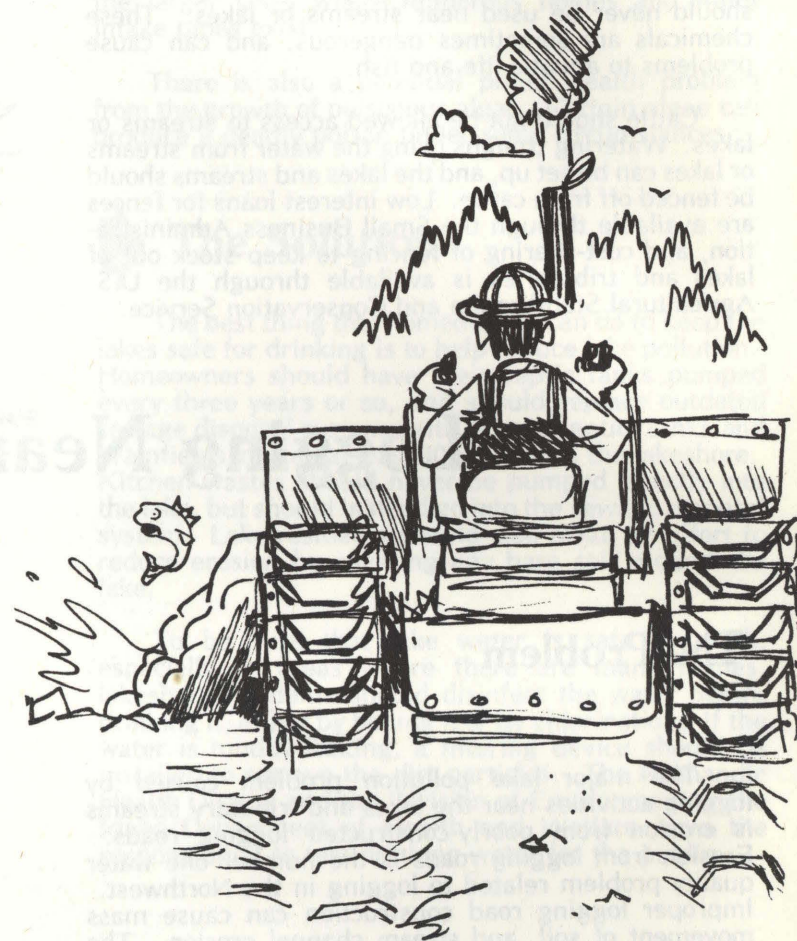
Filling activity also decreases the depth and size of lakes. The smaller and shallower a lake is, the more susceptible to pollution it is.

The Solution

Dredging and filling should be avoided whenever possible. On the smaller lakes, no dredging or filling should ever be done, except where dredging of mud, silt or log debris is the only way that use of an area can be maintained or restored.

No dredging or filling should ever be done without a permit from the Idaho Department of Lands. This permit will specify what kind of clean fill material should be used to help protect the lakes.

Erosion control ordinances that cities and counties should adopt to reduce erosion pollution can also address proper procedures for filling and dredging. Lake homeowners should support this kind of ordinance for lake protection.



A permit from the state must be obtained for any dredging or filling in the lakes. Clean fill material should be used to protect the lakes.

Using the Lakes for Recreation

The Problem

North Idaho's lakes provide an important source of recreation, including boating and swimming. Boats can cause pollution to the lakes, from on-board toilets that are not sealed and that flush into the lake. Toilets on board that are sealed require pump-out stations. In the past there has been a lack of maintenance and subsequent breakdowns of some of these pump-out stations. This can result in boat owners dumping the sewage directly into the lakes, or having to travel long distances to dispose of their sewage.

Boats can also contribute to pollution from their motors. Careless boat owners are often guilty of spilling gas or oil into the lake.

Boat launching facilities can also affect the water quality, because of problems with disposal of garbage or sewage. Some boat launching facilities do not have rest rooms or garbage cans, which can result in people using the lakes for this disposal.



Swimming is a popular activity in North Idaho's lakes. Protecting the lake is important for swimmers.

Swimming in the areas is popular during the summer months. Some swimming areas have become polluted in the past, and have even had to be closed to swimmers. Swimmers are especially sensitive to the various types of pollution already discussed, including sewage, and excess nutrients from many sources, which can increase algae growth. One type of algae can cause an unpleasant reaction in some people, a rash which is often called "swimmer's itch."

There are a variety of conflicts between lake users in the summer when fishermen, boaters, water skiers and swimmers are all using the same water surface area. Historically, there have been numerous accidents when there are a large number of people using the lakes for different activities. There are also conflicts between lake users in the winter, when the smaller lakes freeze over. Snowmobilers, ice fishermen, ice skaters and motorcyclers are sometimes all using the lakes at the same time.

The Solution

Every boat owner should make sure that the on-board toilet is sealed and does not flush directly into the lake. North Idaho's lakes may seem large enough to absorb the sewage from a single boat, but they cannot absorb the sewage from the many boats which dump into them, without showing signs of pollution. The sealed toilets should be pumped out at a regularly-maintained pump-out station.

Waste from any marine toilet that uses chemicals should never be put into a home septic tank, because the chemicals kill the bacteria that break down the sewage in septic systems. The Panhandle Health District has information about the locations of pump-out stations.

The pack-it-in, pack-it-out approach for garbage should be used by all boat owners, especially when boat launch facilities do not have garbage cans.

Swimming areas can continue to be safe to use if all lakeshore residents use precautions so that lake pollution is minimized. If there are no rest room facilities at the swim beaches, lake users should ask county officials to make sure that rest rooms are installed. Swimmers should never bathe in the lakes, because soaps and shampoos always contain nutrients that contribute to lake pollution and cause algae growth.

The conflicts between lake users can be minimized through the development of lake master plans. These plans could specify that certain areas should be used only for some activities at times.

Fishing in North Idaho's Lakes

North Idaho's lakes used to be famous for their excellent fishing, and many old-timers can remember the time when they could catch a fish every time they cast out their line. But fishing has declined in recent years, and it could continue to decline unless positive action is taken to reverse the trend.

The well-being of fish populations in North Idaho is dependent upon the health of the lakes. Fish populations can be greatly affected by changes in their aquatic environment. The aquatic environment is much more susceptible to rapid change than the environment on the land, and these changes can result in drastic changes in fish populations.

The aging, or "eutrophication," of lakes is a natural process which takes thousands of years under natural conditions. But the activities of humans are greatly accelerating that process. In its advanced stages, the aging process of the lakes can be very detrimental to the fish species that are native to North Idaho.

North Idaho's native fish are of what is called the "salmonid" family. This family includes cutthroat trout, Dolly Varden and whitefish. Other popular species which have been introduced in the lakes, such as rainbow trout and kokanee, are also salmonids. Salmonids generally thrive in young lakes (oligotrophic) to middle-aged lakes (mesotrophic).

As the aging process of the lakes is accelerated, the salmonid fish are affected in many ways. Salmonids require water with a high content of oxygen. As the lakes grow older, there is less and less oxygen in the water, especially in the shallow areas. This means that salmonids cannot live in these areas.

High levels of nutrients in the lakes also have a detrimental effect on the salmonid species. The shallow areas become full of water weeds, where non-salmonid fish like to live. Algae grows profusely, and uses up the nutrients which are needed by the small water organisms that kokanee eat.

Shoreline development can also affect fish populations and the fishing public. Fills and other lake encroachments can eliminate fish spawning and rearing areas. The expansion of commercial moorage facilities and private boat docks can eliminate favorite fishing areas, and also lead to increased boating use. Increased boating use of the lakes leads to conflicts among the lake users. Fishermen can be greatly affected by speed boats and water skiers.

LAKE COEUR D'ALENE

Kokanee, sometimes called bluebacks, provide the primary fishing in Lake Coeur d'Alene. Currently, the abundance of small water organisms provide food for a healthy kokanee population. Lake Coeur d'Alene is the most productive of the kokanee lakes in North Idaho.

In recent years, northern pike have been illegally introduced in the Coeur d'Alene River drainage. Pike prefer shallow, nutrient-rich weedy areas, and are not considered to be a threat to Lake Coeur d'Alene kokanee at this time. Increased nutrients in the lake, from septic tanks or erosion or other sources, could eventually lead to the expansion of pike within Lake Coeur d'Alene, to the detriment of kokanee populations.

HAYDEN LAKE

Hayden Lake was once a famous cutthroat lake. Several factors, including over-fishing, led to severe declines in cutthroat populations. The Idaho Department of Fish and Game is now attempting to restore the cutthroat fishery on Hayden Lake. This effort includes restrictive creel limits, closures of the tributaries to fishing, and annual releases of hatchery-reared juvenile cutthroat.

Water quality and lake productivity in Hayden Lake are presently favorable for excellent growth and survival of trout. The success of the cutthroat restoration program depends on maintaining high water quality.

FERNAN, HAUSER, TWIN AND SPIRIT LAKES

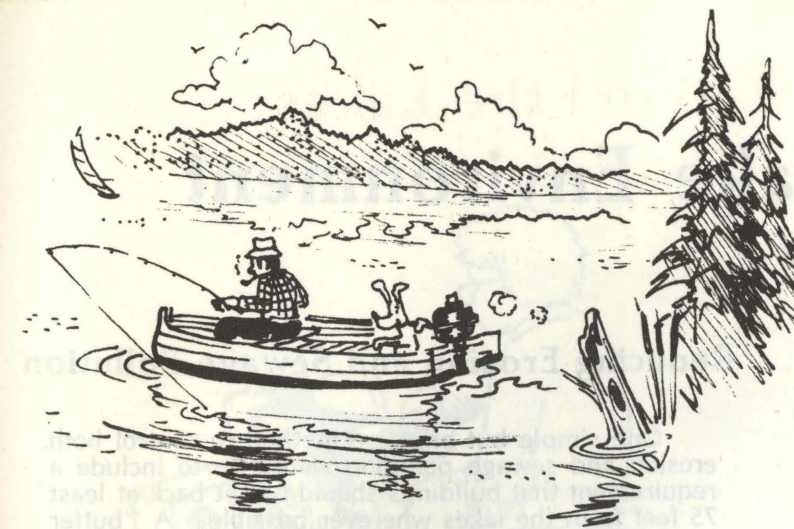
These lakes are all managed by the Idaho Department of Fish and Game as hatchery-supported trout lakes. Each lake receives large releases of catchable-sized rainbow trout annually. All of these lakes also provide excellent largemouth bass fishing, and also contain crappie, sunfish, yellow perch and bullhead (non-salmonid species). The aging process, or eutrophication, of Fernan, Hauser and Twin Lakes has proceeded to the point where conditions favor the non-salmonid species over the salmonid species. Release of catchable-sized hatchery fish is the only means of providing trout fishing in these lakes.

Spirit Lake also receives annual releases of kokanee fry, and in some years produces excellent fishing. The nutrients that reach Spirit Lake must be controlled so the lake will provide a good place for trout to live.

LAKE PEND OREILLE

Lake Pend Oreille was originally a Dolly Varden, cutthroat and whitefish lake. Kokanee entered the lake in the 1920's from Flathead Lake via the Clark Fork River. Pend Oreille has supported the most significant kokanee fishery in the United States. Annual harvests exceeding one million fish were common until the late 1960's.

Kokanee populations are currently half of what they were before 1970. The Idaho Department of Fish and Game believes that the decline is due to exclusion of spawning areas in the Clark Fork River because of construction of the Cabinet Gorge Dam. Lake level fluctuations due to operation of Albeni Falls Dam have resulted in kokanee spawning nests drying out, and have also contributed to the decline. Recovery of the kokanee fishery to former levels will require artificial (hatchery) enhancement.



Lake water quality must be maintained to provide good trout fishing in the lakes.

PRIEST LAKE

Priest Lake, like Lake Pend Oreille, was historically a whitefish, cutthroat trout and Dolly Varden fishery. Mackinaw (lake trout) and kokanee have been introduced. Since the 1940's, kokanee have been the most important species to fishermen.

A dam at the outlet of Priest Lake is operated to maintain the lake levels during the recreational season. The lake is drawn down in the fall following the recreational season. This drawdown occurs after the onset of kokanee spawning, and many nests and embryos are subsequently dried out. In recent years, kokanee numbers and fishing success have drastically declined. Management of the lake level to maximize the success of spawning could greatly enhance fish populations.

Logging in the area has caused erosion, filling up some areas of tributary streams with silt. These streams are used for cutthroat spawning, and the erosion and silt threatens the success of this spawning. Proper erosion control techniques must be used in the logging operations to maintain cutthroat populations in Priest Lake.

LAKE COCOLALLA

Lake Cocolalla has aged to the point where it is the oldest (most eutrophic) or North Idaho's lakes. It contains excellent spiny-ray fish populations (perch, bass, sunfish, crappie, pike). It is managed as a year-round fishery, and supports a popular ice fishery for yellow perch. Lake Cocolalla receives large annual releases of hatchery-reared rainbow trout. An attempt at eradication of non-salmonid species was carried out in 1958, and resulted in an excellent cutthroat fishery for a brief period. Re-infestation of the lake with non-salmonids was rapid, and hatchery support is the only present method of providing a trout fishery.

During the summer of 1978, an "algae bloom," or rapid growth, of a potentially poisonous strain of blue-green algae occurred. Fortunately, the algae bloom subsided before there was evidence of large-scale fish kills. Control of the amount of nutrients reaching Lake Cocolalla is necessary to prevent future danger to fish and human populations from this potentially poisonous algae.

Waterfowl and Wildlife

North Idaho's lakes provide habitat areas for waterfowl, such as ducks and geese, and for wildlife such as beaver, muskrat and otter. All of the lakes provide resting and feeding areas for waterfowl during their migration periods in the fall and spring. The sheltered bays are especially important in providing resting areas for large numbers of migrating waterfowl during spring and fall migration.

Certain areas of North Idaho's lakes provide nesting and rearing areas for ducks and geese. Marshes are used as nesting areas by various waterfowl species, depending on the depth. Deep water marshes (six feet deep) are used primarily by red-headed and canvass back ducks, which are becoming more scarce. This scarcity is partly due to a shortage of deep water marshes. Typically, these areas are suited for marinas or other dock facilities because of their depth and accessibility.

Shallow marshes are used by "puddle ducks," which include mallards, pintails, teals and widgeons. These marshes are relatively shallow (two feet deep) and are sometimes lost as habitat areas because farmers drain and farm these lowlands.

The protection of marshes is very important. Marshes should be preserved not only because they act as natural filters, trapping silt and nutrients, but also because they are important for wildlife and waterfowl habitat. Fur-bearing animals such as beaver, muskrat, mink and otter thrive in marshy areas.

Proper management of waterfowl nesting areas is also important for the continued survival of these species in North Idaho. For instance, during geese nesting periods in May and June, motorboats should be restricted in nesting areas. Motorboats can disturb birds during their nesting. In addition, oil spillage from motors has caused serious problems to waterfowl eggs in other parts of Idaho. The eggs will not hatch if even a small amount of oil gets on them. Geese become flightless during their nesting and rearing periods. No dogs and no motorboats should be allowed near the nesting areas at this time.

Continued wildlife and waterfowl populations at North Idaho's lakes are important to many people, both hunters and non-hunters. Lake master plans can include specific management techniques to insure that these animals and birds continue to thrive in our lakes.

Protecting the Lake Environment

The lakes in North Idaho are facing three different kinds of problems:

-- **Water Pollution Threats.** Algae blooms that are a nuisance and potentially poisonous. Declining fish populations and fish kills. Pollution of swimming areas. Rampant water weeds. More nutrients from erosion and sewage systems.

-- **Deterioration of the Lakes' Scenic Qualities,** especially on the shoreline. Along with this comes disruption of the fish and wildlife habitat areas.

-- **Conflicts Between Lake Users.** Frictions between fishermen, motorboats, water skiers, sailboats and swimmers.

Unless some positive action is taken to solve these problems, they can only get worse. The lakes are important to North Idaho, both environmentally and economically, and they are important to the people who live on their shorelines and who use them. People think of the lakes as being fairly clean, and it is up to people to make sure they stay (or become) that way.

The best way to solve existing lake problems, and to prevent future problems, is by using specific techniques to manage each lake. These techniques should be detailed in a "lake master plan" for each lake, a plan that is prepared with the help of lake users and lakeshore residents.

A lake master plan can help protect the lake from pollution.

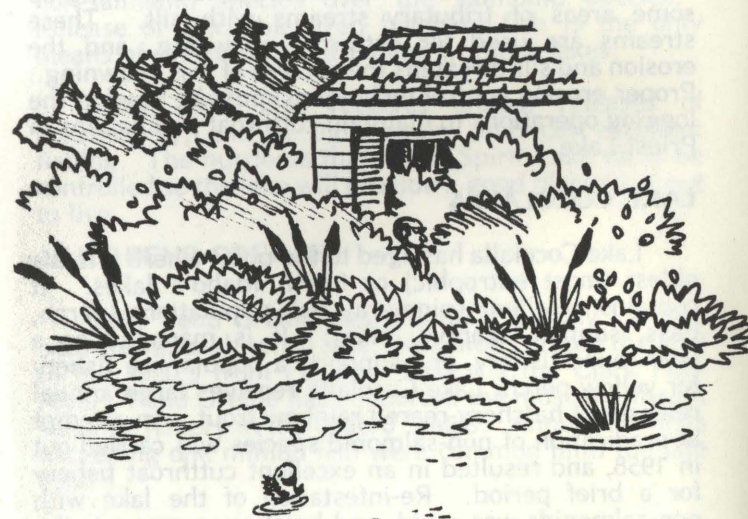
What would be included in a lake master plan? It would be designed to reduce the threat of erosion and sewage pollution, to preserve the scenic quality of the lakes, to protect the fish and wildlife, and to solve conflicts between lake users.

Reducing Erosion and Sewage Pollution

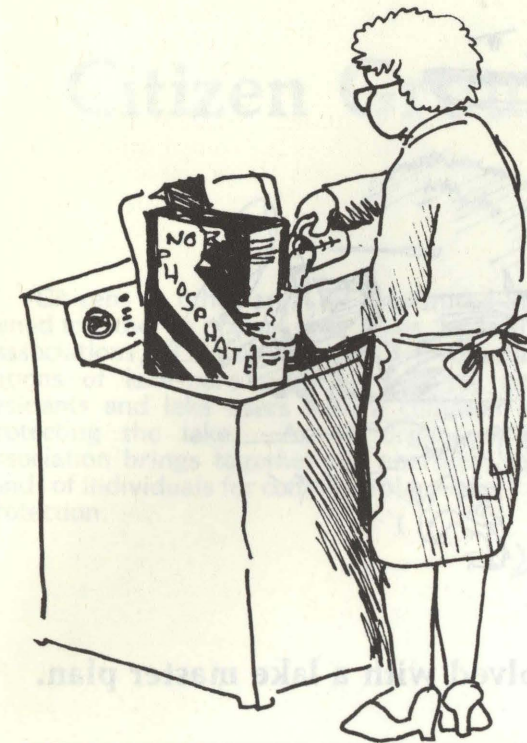
One simple but effective method to control both erosion and sewage pollution would be to include a requirement that buildings should be set back at least 75 feet from the lakes wherever possible. A "buffer strip" of natural vegetation should be retained between the buildings and the lake. This would help stop erosion by catching any soil and trapping nutrients before they enter the lake. It would also help preserve the natural scenic features of the shoreline.

Lakeshore owners could work together with the Panhandle Health District to identify areas that are a particular problem from a sewage disposal standpoint, especially areas with many outdated sewage disposal systems. Different types of small scale community sewage disposal systems should be studied, with recommendations for implementation of these systems included in the lake master plan.

The lake master plan could also specify measures to control erosion, if there is no local erosion control ordinance. This would include covering up bare soils during construction with straw mulch, wood chips or some other substance, and replanting them when construction is complete. Stormwater runoff can also be controlled through proper drainage.



A "buffer zone" of vegetation between buildings and the lakeshore will help trap erosion and nutrients, protecting the lake.



Using no phosphate detergent will help reduce the amount of nutrients, or fertilizers in the lake. These nutrients cause algae growth.

The physical capability of the land to handle development is an important part of a lake master plan. The U.S. Soil Conservation Service has specific information about the soils around the lakes, and local planning offices can use this information to determine which soils are the most susceptible to erosion and which are most stable.

The preservation of marsh areas adjacent to the lakes is important for erosion control. These marsh areas can trap erosion and nutrients before they enter the lake, acting as natural filters.

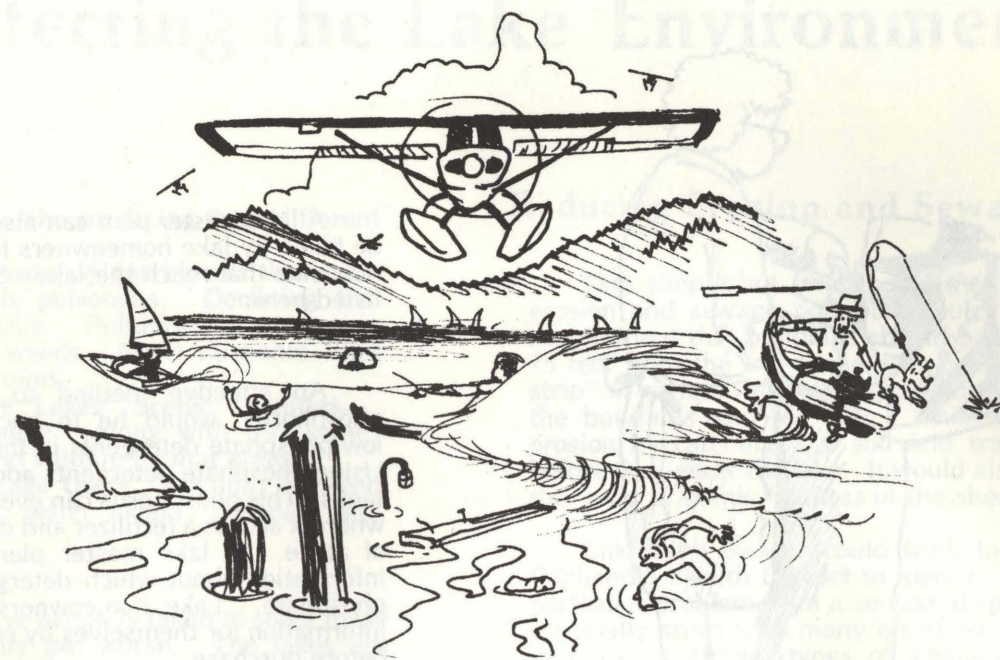
A lake master plan can also specify steps that can be taken by lake homeowners to reduce the amount of nutrients that reach the lake. Some of these steps are listed here:

An effective method to reduce one nutrient, phosphorus, would be to encourage people to use low-phosphate detergents in their washing machines. Using phosphate detergents adds phosphorus to septic tanks. This phosphorus can eventually reach the lakes, where it acts as a fertilizer and causes excessive growth of algae. A lake master plan can include detailed information about which detergents contain the most phosphate. Lake homeowners can also collect this information for themselves by reading detergent boxes before purchase.

Lakeshore homeowners are also sometimes guilty of contributing another nutrient which causes algae growth, nitrogen. Lawn and garden fertilizers are high in nitrogen, and if they are applied too heavily, they can reach the lakes instead of being used up by the plants where they are applied. A lake master plan can include information for homeowners about reducing their contributions to lake nutrient levels.



Dredging and filling should not be done on the smaller lakes, which are especially susceptible to pollution.



Conflicts between lake users could be resolved with a lake master plan.

Protecting the Scenic Qualities of the Lakes

Encouraging the setback of lake buildings at least 75 feet from the lakeshore where possible will help preserve scenic quality. A natural vegetation "buffer strip" is also important for this. In addition, a lake master plan should set limits on the height of lakeshore buildings. Painting lake buildings to blend in with the environment could also be encouraged in the lake master plan.

A lake master plan could identify certain areas around the lakes which could be left as open space, providing park land. These areas could possibly be acquired for public purposes, and retained in their natural scenic state.

Natural areas, especially marshes, can also provide good habitat areas for waterfowl and other wildlife. Preserving them in their natural state will not only add to the scenic quality of the lakes, but will also protect the wildlife and waterfowl. In addition, specific management techniques to insure that nesting ducks and geese are not disturbed will help insure that they continue to thrive in North Idaho.

Scenic quality can also be preserved if lake developments are thoughtfully constructed. Lake developments by a single developer who starts with a large piece of land can be the most effective in maintaining a protective buffer zone around the lakes. Individually-owned lots can be grouped in attractively located clusters, with the lake shoreline remaining undeveloped.

Reducing Conflicts Between Lake Users

As the population grows, the lakes are becoming more and more crowded. Conflicts between lake users can lead to safety hazards, as well as a decrease in some recreational opportunities. A lake master plan can specify that certain areas should be used for certain activities, such as fishing but not speed boat racing. Winter use conflicts on the smaller lakes that freeze over can also be addressed in a lake master plan. In addition, a lake master plan can set noise levels for speed boats.

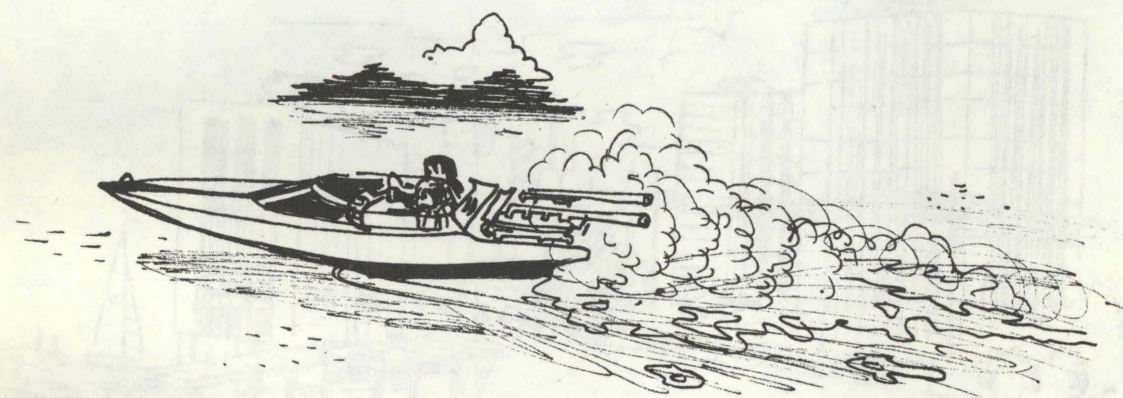
Many of the lakes are witnessing tremendous growth in the demand for large dock facilities. A lake master plan should specify where these large docks should be located.

Citizen Groups for Lake Protection

Citizens in other areas of the United States have joined together to protect their lakes, by forming "lake associations." Lake associations are voluntary organizations of lakeshore property owners, neighboring residents and lake users with a common interest in protecting the lake. As an organization, a lake association brings together the energies, talents and funds of individuals for common, planned efforts in lake protection.

Through lake associations, citizens can influence the decision-making process about their lakes. They can encourage local officials to adopt measures which will help protect the lakes, such as erosion control measures, provisions for building setbacks from the shoreline, and lake master plans. Lake associations can be involved in the formulation of these lake protection measures and lake master plans.

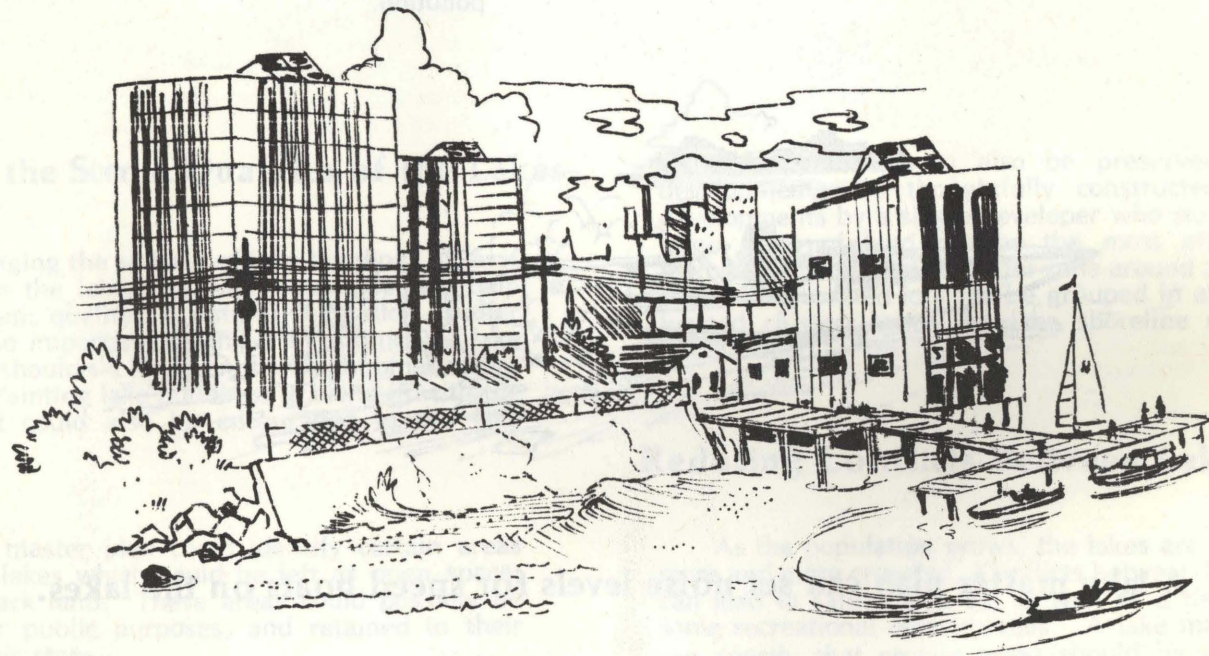
Lakeshore residents can help educate other lakeshore residents through lake associations. These citizen groups can institute a sewage system maintenance program, which would include regular sewage system inspections and pumping to help protect the lakes from sewage pollution. In addition, lake associations can provide information to lake residents about how to reduce their contributions to lake pollution.



A lake master plan can set noise levels for speed boats on the lakes.

In Conclusion

North Idaho's beautiful lakes are an asset to our environment and to our economy. Most of the lakes have remained relative unpolluted so far, although some of the smaller lakes are showing definite signs of pollution. People cause pollution, and lake pollution will get worse as the population grows. But people also stop pollution. The information in this citizen guide should help citizens interested in lake protection learn how to go about stopping pollution. By learning about pollution and how to prevent it, citizens can insure that North Idaho's lakes continue to be a valuable asset to our environment, our economy, and our lives.



A lake master plan can propose standards for lakeshore development to preserve scenic qualities.



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By reading this handbook,
you could help change
the future of North Idaho's lakes.

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Protecting North Idaho's Lakes

A Citizen Handbook