
Watershed:

An Action Guide to Improving Maine Waters



Acknowledgments

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The DEP, SPO, and Cooperative Extension extend special thanks to Jean Farrington for her assistance; to the Citizens Program for the Chesapeake Bay for creating *Baybook*, the publication on which this guide was modeled; and to Lori Stone for providing clerical assistance.

Representatives of the following organizations are gratefully acknowledged for their help in reviewing this guide: Congress of Lake Associations, Friends of Casco Bay, Irving S. Fisher, Lakes Environmental Association, League of Women Voters of Maine, Maine Association of Conservation Commissions, Maine Audubon Society, Maine Coast Heritage Trust, Maine Department of Environmental Protection, Maine Geological Survey, Maine Land Use Regulation Commission, Maine Organic Farmers and Gardeners Association, Maine State Planning Office, Natural Resources Council of Maine, Oxford County Soil and Water Conservation District, Sportsmans Alliance of Maine, University of Maine Cooperative Extension, U.S. Coast Guard, USDA Soil Conservation Service.

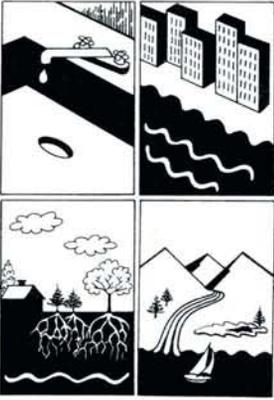
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Printing: This publication was partially funded under a federal Clean Water Act Section 319(h) grant by the U.S. Environmental Protection Agency. Additional funding was provided by the Maine DEP and the Cooperative Extension. April 1990. (reprinted July, 1996)

Publication #: DEPLW-0961



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Table of Contents

| | |
|--|----|
| Introduction | iv |
| Actions Around Home | 1 |
| A. Prevent Erosion and Control Stormwater Runoff | 1 |
| B. Encourage Natural Vegetation | 1 |
| C. Limit Use of Pesticides | 2 |
| D. Reduce Use of Household Toxins | 3 |
| E. Conserve Water | 4 |
| F. Maintain Septic Systems | 5 |
| G. Control Animal Waste | 6 |
| H. Reduce Pollution from Boating and Recreational Activities | 6 |
| I. Reduce Pollution from Motor Vehicles | 7 |
| Actions In Your Community | 8 |
| A. Get Involved in Local Comprehensive Planning | 8 |
| B. Participate in Local and State Politics | 8 |
| C. Promote Public Education and Work with the Media | 8 |
| D. Join Citizen Volunteer Monitoring Programs | 9 |
| Threats to Specific Kinds of Water Bodies | 10 |
| A. Streams and Rivers | 10 |
| B. Lakes | 10 |
| C. Coastal Waters | 10 |
| D. Groundwater | 10 |
| E. Wetlands | 11 |
| Conclusion | 12 |
| Resources/For More Information | 13 |
| A. Erosion Control/Soil Drainage | 13 |
| B. Gardens/Lawns/Farms/Pesticides/Household Toxins | 13 |
| C. Boating/Transportation | 14 |
| D. Comprehensive Planning | 14 |
| E. Streams and Rivers | 14 |
| F. Lakes | 15 |
| G. Coastal Waters/Gulf of Maine | 15 |
| H. Groundwater | 15 |
| Glossary | 17 |



Introduction

The 1990s mark a **watershed*** decade for Maine, a period in which sound stewardship of natural resources must replace harmful environmental practices. Each of us needs to take part in this change if Maine is to avoid severe environmental crises in the years ahead.

The metaphor of a watershed, a divide between two distinct regions, is an apt one because our water resources are among our most valued and most threatened

natural systems. In Maine, we are fortunate to have abundant water resources, with plentiful groundwater reservoirs, countless lakes and rivers, and several thousand miles of coastline. Reserves of freshwater and saltwater sustain us, providing energy, transportation, food, and recreation.

These waterways form a grid covering the entire state, with streams feeding rivers, rivers leading into lakes and **estuaries**, and estuaries mixing with the **Gulf of Maine**.

But in our day-to-day actions, we often damage the very water bodies that support us. To halt and reverse this damage, we need to think in terms of watersheds. We need to look beyond our backyards and consider the impacts that our everyday actions have on those who live downstream. In a sense, we all live downstream: we all will suffer if our waters become contaminated. We all thrive on their health.

Types of Pollution

We are accustomed to thinking of water **pollution** in terms of **point sources**, specific discharge sites like an industry's outfall pipe or a sewage treatment plant. Although these sources still pose problems, Maine has made steady progress over the last 15 years in cleaning up **point source pollution**. One dramatic result has been the return of gamefish to several large rivers along which manufacturing and sewage treatment facilities are located.

Nonpoint source pollution is quite different. It doesn't originate from a specific "point," like a pipe. Instead, it results from everyday human activities like gardening and lawn care, recreational boating, pesticide use, improper septic system maintenance, building construction, and the use and disposal of **household toxins**. The U.S. Environmental Protection Agency estimates that 60 percent of all remaining water pollution in the United States comes from nonpoint sources. And a recent study by the Maine Department of Environmental Protection (DEP) indicates that nonpoint source pollution (or NPS as it is commonly called) affects every watershed in the state.

NPS pollution includes stormwater **runoff** from homes, lawns, driveways, roads, parking lots, and farmfields that flows or is channeled — via ditches, streams, and storm sewers — into larger waterways. As the water runs over ground, it permeates the soil and enters groundwater or is routed into streams and storm sewers. As runoff progresses down the watershed, it collects sediments and chemicals from the surfaces it travels over, carrying them into larger water bodies such as rivers, lakes, and bays.

The excess nutrients, toxic chemicals, sediments, and other contaminants contained in runoff lower water quality and damage sensitive ecosystems. As a result, lakes experience **algal blooms**, coastal shellfish beds are closed to harvesting, certain fish species in inland waters are killed, and our drinking water becomes unsafe.

NPS Pollution and Inland Waters

In Maine, there is growing evidence that nonpoint source pollution is damaging the health and productivity of our inland waters:

- an estimated 187,000 acres of groundwater **aquifers** fail to meet safe drinking water standards due to NPS pollution;
- DEP's Nonpoint Source Pollution Assessment estimates over 1,000 miles of streams are seriously contaminated due to NPS pollution; and
- an estimated 98 percent of the water quality problems in Maine's lakes are due to NPS pollution.

NPS Pollution and The Gulf of Maine

Although more difficult to assess, nonpoint source pollution also threatens the health of Maine's coastal waters.

Huge volumes of water flow into the Gulf of Maine (see map) from four major rivers (the Kennebec, Androscoggin, Penobscot, and St. John) and a host of smaller ones (e.g., the Saco, Piscataqua, Merrimac, and St. Croix). This inflow of freshwater helps support a vast array of species by adding beneficial nutrients and minerals to the Gulf. But this influx of freshwater also carries pollution and sediments collected hundreds of miles inland. Due to the enclosed nature of the Gulf, these harmful contaminants remain there indefinitely, circulating or settling into bottom sediments.

*Words that appear **bold-faced** are listed in the Glossary at the end of this guide.

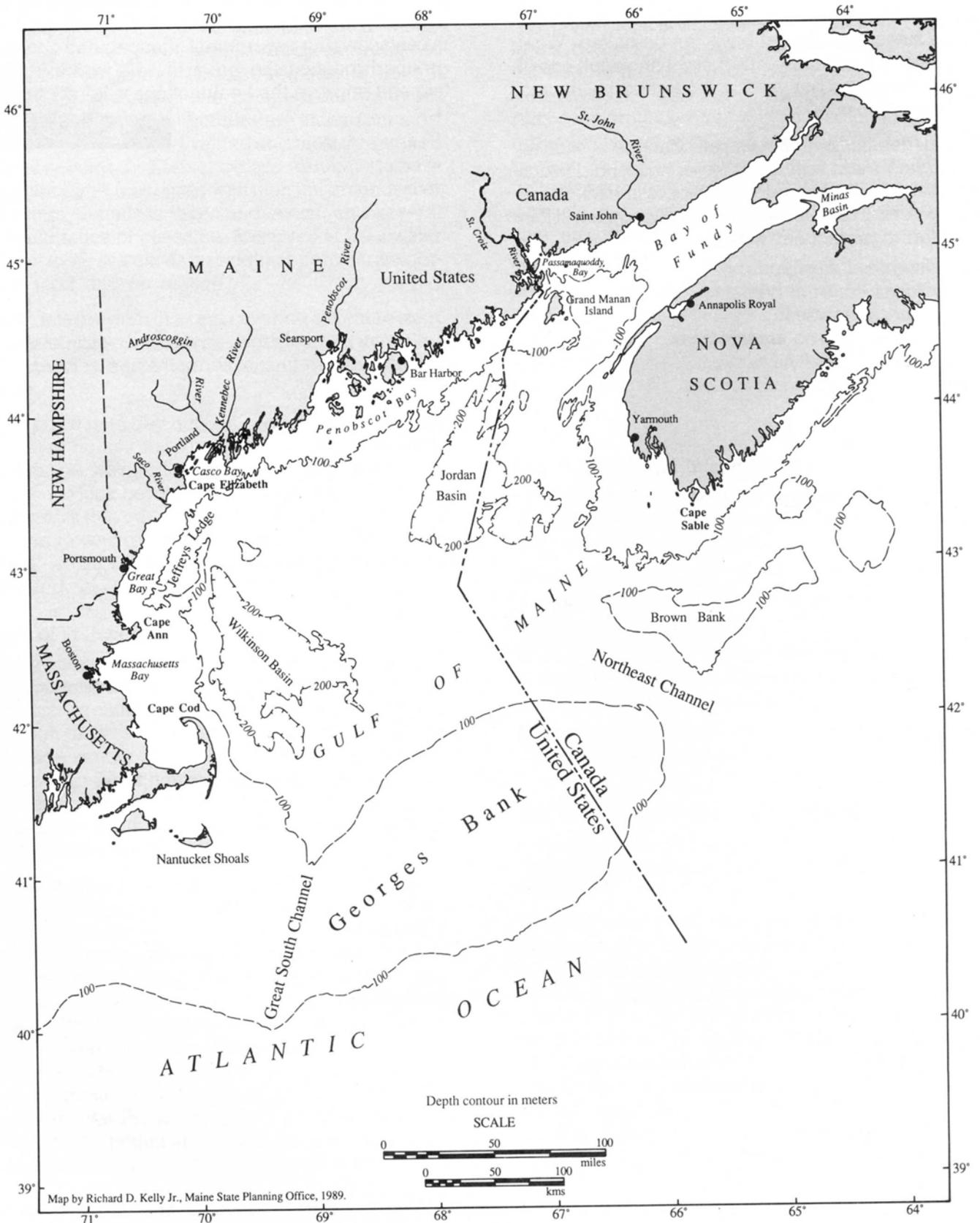
NPS Pollution and You

Fortunately, nonpoint source pollution has not yet caused irreversible damage. Degradation of our rivers, lakes, and coastal bays can be halted. What it will take is a collective effort, involving each one of us — in our homes, our yards, our neighborhoods, and our work places.

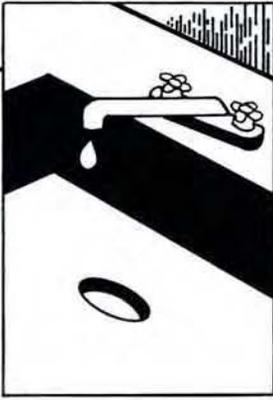
If we all commit to making small changes — such as conserving water and using fewer household toxics — we can have a tremendous collective impact. There is the potential that literally millions of people will join the effort to protect our waters.

So be counted among us. This guide will give you ideas about how you can help. It will also assist you in contacting the government agencies and nonprofit groups throughout the region that are working to sustain and improve the health of our waters.

The Gulf of Maine



Map by Richard D. Kelly Jr., Maine State Planning Office, 1989.



Actions Around Home

This section describes actions we can take at home and at work to improve Maine's water quality.

A. Prevent Erosion and Control Stormwater Runoff

Erosion occurs where bare ground is exposed to wind or moving water (runoff), and loose soil particles are detached, transported, and

deposited farther down the watershed. There they can clog fish gills, smother aquatic life, and destroy **habitat** needed by underwater plants. Runoff containing eroded sediments also carries nutrients, such as nitrogen and phosphorus, into lakes and bays and promotes algal blooms. It may also transport toxic chemicals.

Erosion can be a particular problem in developed areas, at construction sites, and along roadways — wherever pavement, rooftops, compacted soil, or lack of vegetation allows water to flow freely and wash away accumulated debris. When storms occur, sediments, toxics, and nutrients may be washed for miles until they reach the outlet water body. In fact, more than half the annual erosion load can be moved by fewer than 5 to 10 storms.

What You Can Do

- ✓ Keep people, cars, heavy loads, and grazing animals away from streambanks, riverbanks, and lakeshores. If you need access to the water, build steps or a ramp over the bank. (In Maine, under the state's Natural Resources Protection Act (NRPA) and/or municipal shoreland zoning ordinances, permits are required for any such construction.)
- ✓ Leave natural fallen logs and trees in streams. Don't dam up or pump dry small brooks. Don't fill ditches and brooks with trash, slash, or fill. Leave shade-producing vegetation on stream banks. Eliminating shaded areas results in increased water temperature from the heat of the sun and alters the water habitat. Under the NRPA, permits are required for any soil disturbance or work in a stream, river, or pond.
- ✓ Avoid clearcutting the existing trees and vegetation on your house site. (In fact, removal of vegetation in shoreland areas is restricted by law.) Retain (or replant) trees and vegetation along streams, rivers, lakes, and bays (particularly in sloped areas). Use native grasses and shrubs that thrive under natural rainfall conditions. Contact your local Cooperative Extension or Soil and Water Conservation District (SWCD) office for suggestions.

- ✓ Don't build on steep slopes (20 percent or greater). Leave them in a condition as close to "natural" as possible.
- ✓ Immediately stabilize (plant grass and shrubs or **riprap**) and mulch any disturbed soil. Soils that are not ready for final grading within 1 week of disturbance should be heavily mulched.
- ✓ Limit the area of disturbed soil exposed at any one time. Bare soils are easily eroded. This erosion is not continuous, but can be catastrophic during major storms.
- ✓ Place hay bales along the slope of construction sites. Properly installed (embedded and staked) hay bales will filter out the coarser sediments and minimize erosion. Inspect the bales weekly, as well as before and after storms.
- ✓ Install filter fabric fences on slopes below construction sites (preferably, where runoff will be intercepted before it concentrates into a channelized flow). These fences help remove fine, as well as coarse, soil particles from the runoff. Inspect and maintain them regularly.
- ✓ Divert runoff around construction sites.
- ✓ Seed, sod, or riprap artificial waterways and road ditches. (The method you choose will depend on the steepness of the grade, but it should have the capacity to handle any likely flows.) Keep in mind that waterways and ditches too small to handle peak water flows will be washed out during major storms and become chronic erosion problems. If a large area is disturbed, be sure to check with the local SWCD office, a civil engineer, or a city planner to ensure that ditch sizing and side slopes are adequate.
- ✓ Install gravel-filled trenches along driveways and patios to collect water and allow it to filter gradually into soils. (Trenches should be at least 1 foot wide and 3 feet deep.)
- ✓ Restrict the area of surfaces impervious to water (driveways, parking areas, concrete patios). Use untreated wood decking (e.g., cedar or redwood), bricks, or interlocking stones set in sand for walkways and patios. They allow water to infiltrate into soils more than concrete or asphalt.
- ✓ Divert rain from paved surfaces onto level areas of grass, **groundcover**, or woods to permit gradual absorption.

B. Encourage Natural Vegetation

Natural, varied vegetation requires much less care (i.e., water, herbicides, or fertilizer) than lawn. But

Actions Around Home

if you do wish to have a lawn, you don't necessarily need to fertilize it.

If applied at the wrong time or in the wrong amount, fertilizers can pollute local waterways, prompt algal blooms, and harm fish populations. They can also cause disease and poor root growth in your lawn. Remember that **algae** and aquatic plants use the same food your lawn does, so you might be feeding them and not your lawn.

In gardening and landscaping, you can grow healthy, productive plants by preserving the soil's fertility and enhancing its ability to absorb rain. By reducing erosion and eliminating the use of synthetic fertilizers, you will also be protecting local streams, lakes, and bays from excess sediments and nutrients.

What You Can Do

- ✔ Mulch your garden to reduce the need for water, add nutrients, and make soils more workable. Mulch can be straw, grass clippings, wood chips, leaves, or black plastic. Cover crops also serve to reduce erosion and enhance fertility.
- ✔ Compost your yard leaves and food waste for vegetable and flower gardens to minimize the need for artificial fertilizer.
- ✔ If your garden is located on a slope, plant across the slope, not up and down the hill. This way, each row acts as a ridge to trap rainfall, soil, and nutrients.
- ✔ Rotate crops so that the same (or a related) crop does not occupy the same area every year. Repeated plantings can reduce certain nutrients in soil and encourage insects to multiply. Crop rotation minimizes the need for fertilizers and pesticides.
- ✔ Don't overwater your lawn (1 inch of water in dry weather will wet the soil to a depth of 4-6 inches). And don't cut grass too short; "taller" lawns hold water in the ground better and require less watering.
- ✔ Leave your grass clippings on the lawn. Cut grass acts as a biodegradable mulch and dramatically reduces the need for fertilizers. (If fertilizers are needed, use lime or compost rather than synthetics.)
- ✔ Replace large stretches of lawn with different groundcovers that require less maintenance.

- ✔ Leave natural undisturbed wooded areas (buffer strips) between developed areas and any lake shore, stream bed, natural or artificial drainage-way, or road ditch. They act as a sponge, intercepting runoff from disturbed areas and facilitating its absorption or evaporation.
- ✔ If you've removed the natural vegetation, plant a combination of native deep-rooted, woody vegetation and shallow-rooted shrubs and grasses along lake shores, stream sides, and road ditches. Plant roots stabilize the shoreline, prevent erosion, and take up nutrients before they reach a water body. (But remember that plantings usually are not nearly as effective as simply leaving the natural vegetation intact.)

C. Limit Use of Pesticides

Pesticide is a general term that includes **herbicides**, **insecticides**, **fungicides**, and **rodenticides**. Designed to kill "pests," this group of chemicals can also threaten the health of humans and natural **ecosystems**. Pesticides first became an issue of public concern when Rachel Carson's book *Silent Spring* was published in 1962 (see box inset).

Pesticide residues can contaminate fresh- and saltwater ecosystems for generations. For several decades, bald eagles and ospreys could not nest successfully in Maine because their eggshells had been weakened by DDT, an insecticide widely used until the late 1960s. DDT was washed from homes and farm-fields into rivers, lakes, and bays where it was ingested by fish through the **food chain**. When eagles and hawks ate the fish, DDT in the fish tissue accumulated in the birds' bodies causing their eggs to become unnaturally fragile and their chick embryos to die.

Humans may also be affected by pesticide residues in produce, fish, and meat, but the potential health effects have not been thoroughly researched. Pesticides are supposed to be registered with the federal government (a process that includes detailed examination of their potential ecological effects), but the vast majority of active chemical ingredients in commercial pesticides have not been registered or were registered before strict environmental standards were enacted. So don't assume that because a product is readily available, it has gone through extensive environmental and health safety testing.

Silent Spring: Questioning The Use of Pesticides

Rachel Carson, a summer resident of South Bristol, Maine, published a book in 1962 called *Silent Spring* that fundamentally challenged the widespread use of pesticides in homes and on farms. Although efforts are being made today to ensure safer pesticide use — such as encouraging the use of growth regulators, biological pesticides, and Integrated Pest Management — the following passage from *Silent Spring* has relevance today. Here, Carson questions both the practical and ethical implications of pesticide use:

"Incidents [involving chemical] spraying raise a question that is not only scientific but moral. The question is whether any civilization can wage relentless war on life without destroying itself, and without losing the right to be called civilized.

"These insecticides are not selective poisons; they do not single out the one species of which we desire to be rid. Each of them is used for the simple reason that it is a deadly poison. It therefore poisons all life with which it comes in contact: the cat beloved of some family, the farmer's cattle, the rabbit in the field, and the horned lark out of the sky. These creatures are innocent of any harm to men. Indeed, by their very existence they and their fellows make life more pleasant. . .

"By acquiescing in an act that can cause such suffering to a living creature, who among us is not diminished as a human being?"

What You Can Do

- ✓ Don't assume that any insect on your lawn or garden is bad. Ninety percent of insects on your lawn are not harmful and many are beneficial.
- ✓ Handle minor pest problems by **Integrated Pest Management** (IPM) methods, which include:
 - hand-weeding;
 - manually destroying insects;
 - wrapping seedlings in newspaper strips, aluminum foil, or plastic to repel cutworms;
 - properly identifying insects. Contact the Cooperative Extension for assistance. CE will help you put together a specific management plan, if needed;
 - planting borders (e.g., marigolds) that naturally repel insects; and
 - encouraging populations of ladybugs, praying mantises, and other insects that eat garden pests. For more information on IPM, contact your county Cooperative Extension office or the Maine Organic Farmers and Gardeners Association.
- ✓ Buy chemical pesticides only as a *last* resort and purchase only the quantity you need. Choose the

least toxic pesticide available (those with the signal word "caution" on the label are considered less toxic; the signal words "warning" and "danger" indicate greater toxicity).

- ✓ *Read the label carefully:* never apply near wells, streams, ponds, or marshes unless instructions specifically allow for such use. The label is the law: you can be held liable for improper use.
- ✓ Never apply pesticides to bare ground or eroded areas, and do not apply if heavy rain is forecast (unless the label specifies a need for water after application).
- ✓ Never pour pesticides into toilets or storm drains. Look at the label to determine proper disposal methods. Retain all toxic materials in an area inaccessible to children and pets until Maine establishes a hazardous waste collection program. In the meantime, encourage your town to hold a household hazardous waste collection day.
- ✓ In the event of a small pesticide spill, do not hose down the area. Wearing rubber gloves, sprinkle sawdust, cat litter, or some absorbent material over the spill; then sweep the material into a sturdy bag and store the bag until it can be taken to a hazardous waste collection site. In the event of a large spill, call DEP's Bureau of Oil and Hazardous Materials Control at 287-2651 or 1-800-482-0777.
- ✓ Lawn services tend to use many pesticide sprays and fertilizers. If you use such services, ask what chemicals are applied and minimize treatments. Some services advertise the use of environmentally sensitive/biologically based treatments; consider these companies as alternatives.

The following is a partial list of pesticides now banned from sale or severely restricted in use. It is illegal to use these products unless you are licensed or have a permit to do so.

| | | |
|-----------|---------|------------|
| DDT | Aldrin | Dieldrin |
| Chlordane | DBCP | Heptachlor |
| Lindane | Kepon | Mirex |
| Silvex | 2,4,5-T | Toxaphene |

D. Reduce Use of Household Toxins

Pesticides are not the only household chemicals that threaten the health of our rivers, lakes, and coast. Around your kitchen, basement, and garage, you'll find oven cleaners, paint removers, insecticides, solvents, drain cleaners, and other potentially hazardous products.

Because no federal regulations govern the use of these **household toxins**, it is up to each of us to select

Actions Around Home

household products carefully and dispose of them responsibly. By substituting nontoxic alternatives for chemical cleaners, we ensure that harmful chemicals do not travel from our sinks and drains into sensitive groundwater supplies or other aquatic resources.

What You Can Do

- ✓ Purchase the least toxic product you can find and never buy more than you need (see chart listing alternatives to household toxins).

| Product | Alternatives |
|---------------------------|---|
| Silver polish | Soak in boiling water with baking soda, salt, and a piece of aluminum foil. |
| Oven cleaner | Baking soda and water. |
| Bathroom cleaner | Baking soda and water. |
| Drain cleaner | Plunger, flush with boiling water, 1/4 cup baking soda, and 2 oz. vinegar. |
| Rug cleaner | Dry corn starch sprinkled on rug, then vacuumed up. |
| Floor or furniture polish | 1 part lemon juice, 2 parts olive or vegetable oil. |
| Mothballs | Cedar chips, lavender flowers, herbs. |
| Ammonia-based cleaners | Vinegar, salt, and water mixture for surfaces; baking soda and water for bathrooms. |
| Abrasive powder cleansers | Rub areas with 1/2 lemon dipped in borax-rinse. |

- ✓ Read the label of all household toxins: know the potential hazards and the appropriate means of disposal. Store toxins in their original containers so the label can be referred to whenever the product is used. If directions are unclear, contact the manufacturer or an agency listed in the Resources section of this guide before using. Many products have a toll-free phone number listed for the manufacturer.
- ✓ Never dispose of paints, preservatives, strippers, brush cleaners, or solvents down drains or into gutters or storm sewers. These products contain many chemicals, some of which are suspected **carcinogens**, that can contaminate groundwater and septic systems and kill beneficial microorganisms in sewage treatment plants. Many toxic substances are not broken down in treatment systems, so they pass directly into aquatic and marine environments and can harm aquatic organisms.
- ✓ Stuff paint cans and turpentine containers with old newspapers and allow to dry outside before

placing in the trash. You can also filter and reuse turpentine and brush cleaners.

- ✓ Never mix household chemicals (chlorine bleach, for example, when mixed with ammonia can produce deadly chloramine gas).

E. Conserve Water

Maine is fortunate to have abundant reserves of clean water. It is important, however, that we don't use water carelessly because all the clean water we use becomes wastewater. Water from our bathrooms, kitchens, and yards eventually finds its way back into our rivers, lakes, and coastal waters. The less water we use, the less polluted our water supplies will become.

Currently, the average Maine resident uses an estimated 75-100 gallons of water per day. But only about 4 gallons of this is actually needed for survival; the rest is used to carry wastes. Studies have shown that each household could reduce water consumption by 20 to 40 percent without major inconvenience. What we need to do is acquire good water-use habits.

What You Can Do

- ✓ Check for and eliminate any leaks in faucets, toilets, hoses, and pipes. A steady drip wastes 20 gallons a day and a leaking toilet can waste 200 gallons a day without making a sound.
- ✓ If your house or apartment is connected to town water, check your water meter while no water is being used. If the dial moves, you have a leak. If you have your own water system, listen to how frequently the pump operates. Test for a leaking toilet by adding food coloring to the tank. Without flushing, note if any color appears in the bowl after 30 minutes. If it does, you have a leak.
- ✓ Run dishwashers and clotheswashers only when full. Use the cycles with the lowest number of washes and rinses. (Permanent press cycles, for example, generally use an additional 10-20 gallons of water.)
- ✓ Add your garbage to the compost or trash instead of putting it down the garbage disposal. Disposals not only use a great deal of water, they also add solids to already overloaded sewer systems.
- ✓ Place two 1/2-gallon plastic bottles (filled with sand, gravel, or water and sealed) in your toilet tank. This cuts the number of gallons used per flush in most tanks from five to four. (Be sure to place the bottles where they won't interfere with the flushing mechanism.) Bricks may also be used

instead of plastic bottles. In addition, water-saving toilets, which use 40-60 percent less water per flush than a conventional toilet, are available for new construction or renovation.

- ✓ Take short showers instead of baths. Install low-flow showerheads and faucet aerators. Consult your local water district or electrical utility on how to obtain them.
- ✓ Water your garden and lawn only when necessary (during early morning hours is best to avoid rapid evaporation, pest problems, and "burning"). Use trickle irrigation instead of sprinkling. Leaving a hose running for 1 hour uses 375 gallons of water.
- ✓ Consider flushing your toilet "only for solid reasons." People use more water flushing the toilet than by any other means.
- ✓ Don't let the water run down the drain while you are brushing your teeth, shaving, washing or rinsing dishes, washing fruits or vegetables, or waiting for water to get cold to have a drink. (Instead, keep a container of drinking water in the refrigerator.)
- ✓ Wash your car using a bucket. Use a hose with a nozzle attachment for rinsing.
- ✓ Sweep walks and driveways instead of hosing them.

| Home Water Use | |
|---------------------|-----------------|
| Activity | Gallons per Use |
| Toilet flush | 5 |
| Tub bath | 35 |
| 5-minute shower | 25 |
| Brushing teeth | |
| – water running | 5 |
| – water not running | 1/2 |
| Hand-washing dishes | |
| – water running | 30 |
| – using basin | 10 |
| Dishwasher use | 20 |
| Clothes washer use | 30 |
| Meal preparation | 5 |

F. Maintain Septic Systems

According to 1980 census data, nearly one-half of all homes in Maine are served by septic systems. It is essential that septic wastewater does not reach surface or groundwater supplies: it contains bacteria and viruses harmful to human health and nutrients (e.g., phosphorus and nitrate) that fertilize waters.

What You Can Do

- ✓ If you are considering renting or purchasing a home, look for indications of poor soil drainage or a failing septic system (e.g., cracked foundation; bright green spots on the lawn; soft, spongy ground; depressions in the soil surface; water stains on basement walls; or odors). If you see these signs, you may need to improve soil drainage or upgrade the existing septic system.
- ✓ Before installing a septic system, hire a trained site evaluator. This is mandated by law. Make sure that the soil is sufficiently deep, well-drained, and permeable. Check for state and local permit requirements.
- ✓ If you have a septic system, know the location of all its components. Keep heavy vehicles, large shrubs, and trees away from the drain field. Check the sludge level in your septic tank yearly and have a reputable contractor remove sludge and scum every 3-5 years. (Frequency of use of the system will affect this time table.)
- ✓ Dispose of household chemicals properly: do not pour them down the toilet or drain, because they can destroy the bacteria that help decompose sewage and leach into underground water sources such as wells.
- ✓ Do not use garbage disposals: they contribute unnecessary solids and grease to your septic system.
- ✓ Conserve water as much as possible to avoid overloading the system with water.
- ✓ Do not use toilets as trash cans because unnecessary solids reduce the efficiency of the system.
- ✓ Use detergents that have no phosphates. Detergents with high phosphate levels can cause algal blooms in local lakes.
- ✓ Do not use water fresheners in your toilet: they contain synthetic perfumes and dyes. Also, use unbleached, uncolored, and unscented toilet paper if available.
- ✓ Report possible problems with local septic systems to your local code enforcement officer or plumbing inspector.
- ✓ Do not use septic system additives advertised to eliminate the need to periodically pump out the sludge. If anything, these products can cause the system to fail prematurely.
- ✓ Install a separate "graywater system" for laundry to reduce the risk of lint clogging your leachfield, causing it to fail. These graywater systems are more easily (and cheaply) maintained and replaced than septic systems. Contact your local plumbing inspector for more information on graywater systems.
- ✓ If you live in a lake watershed, consider using sandy loam or loam liners when placing septic systems in sandy areas to more effectively remove nutrients.

Actions Around Home

G. Control Animal Waste

Animal waste from pets, farm animals, and wildlife can be a significant source of water pollution in some areas. And diseases such as tuberculosis and salmonellosis can be transmitted to humans by microorganisms in animal feces. Animal wastes are also high in nutrients and can contaminate groundwater with nitrates and fertilize lakes with phosphorus.

What You Can Do

- ✓ If you have a pet, do not allow it to defecate on paved surfaces. Use undeveloped areas to walk pets, avoiding natural or artificial waterways. If you must walk your pet on paved surfaces, use a "pooper-scooper" and dispose of pet waste in the garbage or toilet.
- ✓ Manure from farm animals should be stored and spread carefully to avoid pollution. Store manure on a dry level site. Spread manure only during the growing season and keep it at least 50 feet, and preferably 100 feet, from waterways. Till it in to the soil within a day of spreading, (Contact your local SWCD (see p. 13) office for advice on how best to store and manage manure.)
- ✓ In urban areas, waste from ducks, gulls, and other waterbirds can cause problems in small lakes and estuaries: do not feed the waterfowl. Human feeding of waterfowl can result in overpopulation.

H. Reduce Pollution from Boating and Recreational Activities

Recreational boating and swimming offer us a great opportunity to enjoy our rivers, lakes, and coastal waters. But these activities can damage the health of water bodies unless boat operators and shore visitors understand the effects of their activities. Waters can be damaged by discharge of sewage; overboard dumping of waste and garbage; or release of chemicals associated with boat fueling, cleaning, and maintenance. Although discharge from one boat may not significantly degrade water quality, the accumulated waste of the many boats that frequent Maine's waters can cause serious pollution.

What You Can Do

- ✓ Take all your trash with you at the end of a visit to the shore, including food leftovers and packaging. Collect any trash that other people have left behind.
- ✓ Take children to restrooms as often as needed: do not allow children or pets to urinate or defecate in the water or on the beach.

- ✓ Encourage your municipality to maintain an adequate number of restrooms and trash containers along the shore.
- ✓ Participate in Maine's Coastal Cleanup, held in late September each year, and Lake Week, held in late July. Both events feature "cleanups." To receive more information, call the Coastal Cleanup Coordinator at 287-3261.
- ✓ When boating, do not produce wakes close to shore because they contribute to erosion. Observe posted speed limits.
- ✓ To wash your boat, use phosphate-free soap or detergent. (Avoid using products with warnings on the labels: these can kill or contaminate aquatic life if washed overboard.) It is important to clean your boat's hull, propeller, and trailer if you are using it in different water bodies. This will prevent the accidental introduction of non-native aquatic plants that may reproduce in uncontrolled numbers and consequently alter the water habitat.
- ✓ Use pumpout facilities for emptying **Marine Sanitation Devices**/holding tanks. If you dump untreated sewage into coastal waters, it can be ingested by filter-feeding shellfish. The shellfish then become contaminated and, if eaten, can cause nausea, diarrhea, or infectious hepatitis in humans. If your marina does not already have a pumpout station, encourage them to install one. Note: It is illegal to empty holding tanks in freshwater lakes or U.S. territorial waters.
- ✓ Never throw garbage or plastic trash overboard or leave it at the beach: **marine debris** can harm or kill wildlife. It can also endanger boaters because plastic rings, straps, and bags can foul propellers and clog intake valves. A federal law now prohibits the discharge of plastics anywhere at sea. In addition, any garbage is prohibited from being dumped inside the U.S. 12-mile limit.
- ✓ Do not use any **anti-fouling boat paint** containing **tributyltin** (TBT) on your boat. (In Maine, this is mandated by law.) TBT has been used on boats to discourage growth of barnacles and other organisms on the hull, but it is highly toxic to marine life and may threaten human health, causing cancer and immune system damage. Use copper-based paints instead, and follow manufacturer directions carefully.
- ✓ When your boat is being scraped or sanded, place a drop cloth underneath the boat to catch the old paint scrapings and dust and place them in the trash. Ask your boatyard to follow this procedure if they do the work for you.

What You Can Do

- ✓ Always be careful when using petroleum products around water: even in minute quantities, they can be toxic to aquatic life. Dispose of used oil and antifreeze at a marina, gas station, or recycling center.
- ✓ Whenever possible, use human- or wind-powered boats (e.g., kayaks, canoes, shells, sailboats, and rowboats) and reduce unnecessary use of inboard and outboard motors.
- ✓ Wipe up any spills from oil changes as soon as they occur. A single quart of oil, when spilled, can create a slick of up to 2 acres (a surface area equal to almost three football fields).
- ✓ On shallow lakes, make sure that boat propellers do not stir up sediments. Sediments are rich in phosphorus, which can overfertilize a lake and create water quality problems.

I. Reduce Pollution from Motor Vehicles

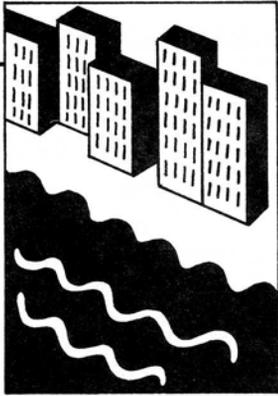
Many products necessary for auto maintenance contain toxic chemicals that can seriously contaminate water. Motor oil, battery acid, gasoline, car waxes, engine cleaners, antifreeze, degreasers, radiator flushes, and rust preventatives all must be carefully disposed of to avoid water pollution. (For example, a single quart of oil poured down a storm drain can contaminate up to 2 million gallons of drinking water. The oil from a car engine (4-6 quarts) can produce an 8-acre oil slick.)

Beyond the risk of chemical contamination, cars can pollute water indirectly through the metals and other pollutants that they emit. Lead and hydrocarbon particles in auto emissions are washed from roadways and parking lots into water bodies. There they accumulate in bottom sediments and can adversely affect aquatic life in that region.

What You Can Do

- ✓ Recycle used motor oil. Contact the DEP's Bureau of Oil and Hazardous Materials Control (287-2651) for information on which service stations in Maine accept used oil for recycling. Pouring used oil on gravel or dirt roads to hold down dust is illegal.
- ✓ Dispose of antifreeze carefully: it contains ethylene glycol, which is toxic to fish, people, and animals. Many cats and dogs have died after drinking sweet-tasting puddles of antifreeze that they find on driveways. Do not pour used antifreeze down drains, storm drains, or onto driveways. When possible, return it to the used antifreeze storage drum at a local service station.

- ✓ Try to reduce the amount that you drive. Share rides, use public transportation, and bike or walk whenever possible.
- ✓ Always buy unleaded gas and keep your car well tuned-up so that it burns fuel efficiently.
- ✓ Drive a fuel-efficient car: the less gas you burn, the less pollutants are emitted into the atmosphere and — eventually — into our waterways.
- ✓ Do not exceed speed limits (driving at 65 MPH, for example, uses 15 percent more fuel than driving at 55 MPH).



Actions In Your Community

The previous section of this guide outlines actions we can take in our home and work environments to improve water quality. This chapter describes how we can work with others in our communities to improve or sustain the health of local waters.

A. Get Involved in Local Comprehensive Planning

In 1988, the Maine Legislature passed a "growth management" law that requires every town in Maine

to develop a **comprehensive plan**, to help communities design appropriate development that also conserves natural resources like lakes, rivers, wetlands, and bays. By getting involved in the planning stage, you can help ensure that your local economy develops without harming the environment.

What You Can Do

- ✓ Find out who is (or will be) working to develop a comprehensive plan for your community. Attend comprehensive plan meetings and make your views on water quality known.
- ✓ Obtain a copy of your local zoning ordinances. To see how they are applied, attend planning board meetings and council or selectmen's meetings. Citizen attendance at planning board meetings is extremely influential and is one of the best ways to assess what your town is doing.
- ✓ Review your community's Natural Resources Inventory, which is available at the town office and/or in the comprehensive plan. If your community doesn't have one, it needs one. Call the Maine Association of Conservation Commissions (MACC) for more information.
- ✓ Elect officials who support environmental protection.
- ✓ Help develop and participate in constructive, creative solutions to your community's water pollution problems:
 - Join your local Conservation Commission. Attend meetings or assist with special projects.
 - Join your local Lake Association. Call the Congress of Lake Associations (COLA) at 846-4271.
 - Join your local Land Trust. Call the Maine Coast Heritage Trust (MCHT) at 729-7366 to help preserve important lands that abut water resources.
 - Join or form a watershed association, wetlands association, etc.

Build alliances with other groups and agencies working in your area.

- ✓ Identify your own special talents and apply them to an environmental problem you feel strongly about.

B. Participate in Local and State Politics

Some of the most important decisions affecting your local water quality may be out of your hands, but not necessarily out of your reach. You can help shape political decisions concerning water use (or land use that affects water quality) by talking to your local and state legislators. Keep elected officials informed about the ecological and economic importance of clean water.

What You Can Do

- ✓ Contact elected officials to find out what has been done to ensure that your local waterways are adequately protected. If you do not feel that enough action has been taken, propose constructive measures your community can take to improve water quality.
- ✓ Take local officials on a "watershed tour" so that they get to know their water resources first-hand. Point out sources of pollution and present ideas for improving water quality in community water bodies.
- ✓ Working with statewide groups listed in the Resources section of this guide, inform yourself about legislative action that is being taken at the state level to protect or enhance water quality. Inform elected representatives of your views.

C. Promote Public Education and Work with the Media

If you are already part of a community group or civic association (e.g., a garden club, service organization, or scout troop), consider working with your group to improve water quality within your watershed.

There is a lot that individuals can do to promote clean water and even more that can be accomplished by motivated, organized community groups. The following list provides just a few ideas: develop some of your own.

What You Can Do

- ✓ Learn about water pollution issues first-hand by going to visit local water bodies. Walk or canoe along a local stream, river, lake, or bay: as you go

along the shore, take note of erosion problems, highway or construction runoff, algal blooms, any dead wildlife, foul smells, or direct discharge. Mark any such sites on a map and inform local officials.

- ✓ Organize a shore cleanup along a local river, lake, or bay. Hold the cleanup at regular intervals (once or twice a year) so that you can trace changes in debris accumulation over time. To join Maine's annual Coastal Cleanup (held in late September), call the Maine Coastal Program at 287-3261.
- ✓ Keep your local and regional media informed about your efforts to improve water quality. Make sure they are invited to special events. Encourage them to report not only on water pollution problems, but also on constructive solutions that community members can act on.
- ✓ Plan activities and events that will focus community attention on the importance of abundant clean water. Show a film, invite a speaker in, or organize a panel discussion with local officials. Be sure to publicize your events well with press releases to the media, posters around town, notices in local calendar listings, and information provided to other interested groups.
- ✓ Work with local schools to develop educational water quality projects that children can work on in the community.
- ✓ Learn about how Maine shorelands are zoned and be a watchdog for violations in your area. Contact the Shoreland Zoning Unit at DEP (287-2111) or your municipality for more information.
- ✓ Working with a reputable hazardous waste company, organize a household hazardous waste collection day. Contact the DEP's Bureau of Oil and Hazardous Materials Control at 287-2651 for further information.

D. Join Citizen Volunteer Monitoring Programs

Another way to educate ourselves and others about the health of local waters is to begin scientific water-quality monitoring. Volunteer citizen monitoring can achieve several objectives:

- document existing water quality;
- identify point and nonpoint sources of pollution;
- involve the public in pollution prevention and reduction;
- assist in land-use planning; and
- educate citizens on water quality.

A number of citizen volunteer monitoring projects are underway in Maine: 275 volunteers work with the Department of Environmental Protection's Lake Monitoring Program; one program monitors a mid-coast bay; and two programs monitor tidal rivers in the midcoast.

Groups or individuals interested in pursuing water-quality monitoring should contact the Marine Program Assistant at the Knox-Lincoln Cooperative Extension Office (594-2104 or 1-800-244-2104) or the Lake Volunteer Monitoring Coordinator at DEP (287-3901). In Cumberland County, contact Presumpscot Riverwatch at 892-4447 or 773-6679.

Threats To Specific Kinds of Water Bodies



Water is our most recycled natural resource. Driven by solar energy and transported by gravity, water migrates through our natural environment, now evaporating from a lake, now condensing in a cloud, now falling as rain on a hillside, now running into a river and out into a coastal bay. It is essential to remember these interconnections if we are to improve water quality — not just in a single lake or bay, but throughout the whole region.

But each water habitat also has special characteristics and needs. As we work to improve water quality throughout Maine, we need to understand the unique value of each water resource.

A. Streams and Rivers

Maine's rivers and streams are our lifeblood. They provide a chance for recreation as well as water to drink, to drive industry, and to generate energy.

Over the years, however, development along rivers and streams has also produced some adverse side effects. Dams and seasonal flow changes have altered habitats for aquatic life and wildlife, prompting the loss of important species. Loss of shoreline vegetation has caused increases in water temperature, destroying the habitat of some fish species and aquatic vegetation. Erosion of fine sediments into water bodies has suffocated vegetation, thereby destroying important fish spawning and nursery habitat. And toxic materials discharged into rivers and streams have been directly toxic to aquatic organisms or have been passed on through the **food chain** to either their human or wildlife predators.

Historically, protection of our rivers and streams has focused on single discharges (point sources) from industrial facilities or municipal treatment plants. Now we need to broaden our focus to include nonpoint sources, which represent an equal or perhaps greater threat to our rivers. Controlling these sources will require changing the way we live.

B. Lakes

Maine's lakes are a precious resource and a critical component of the natural environment. The primary threat to the health of our lakes is changing land use, which has promoted nonpoint source pollution. In a nutshell, the transition from predominantly forested, undeveloped land to low-density residential development increases the amount of phosphorus that runs off the land and into lakes.

Phosphorus is one of the major factors impacting lake water quality. Adding even small amounts to a lake fertilizes the algae, which causes them to multiply and turn the water cloudy and green — a process called **eutrophication**. Fish are killed off (due to lack of oxygen) and dying vegetation causes foul odors. More than 300 Maine lakes are expected to decline within the next 25 years if present development trends continue.

C. Coastal Waters

Our productive near-coastal waters are also threatened by nonpoint source pollution. As growth in the coastal zone increases, excess nutrients and pollutants collect in near-shore sediments where they are eaten by bottom-dwelling organisms. Toxic contaminants are then passed up the food chain and become concentrated in larger predators (e.g., birds, marine mammals, and humans).

Bacterial pollution from nonpoint sources is also a major problem in coastal waters. An estimated 25 percent of Maine's viable shellfish flats are closed to harvesting because of bacterial contamination. In large part, this is due to septic system failure or overboard discharge systems that dump partially treated sewage directly into coastal waters.

Furthermore, although the ocean has long been considered a bottomless pit, capable of absorbing infinite wastes, there is growing evidence that pollution collects in bays and estuaries. These sensitive wetland areas can absorb some pollutants and sediments, but their natural filtration system breaks down if it is overburdened.

D. Groundwater

Groundwater includes all precipitation that percolates into the ground. Depending on the local geology, 10 to 50 percent of annual precipitation in Maine infiltrates the ground's subsurface to become groundwater. Tapped through wells, this water is used for drinking and other domestic uses, for commercial and industrial production, and for livestock and agricultural irrigation. Fifty-seven percent of Maine's people receive their drinking water from groundwater supplies.

Groundwater also helps keep lakes full and keeps rivers and streams flowing. The slow, steady discharge of groundwater into surface water bodies helps keep them from going dry.

Virtually all groundwater in the 11 percent of Maine that is not forested is threatened by contamination. Contamination sources include underground fuel oil and gasoline tanks, sand-salt piles, old landfills and dumps, septic systems, and agricultural chemicals.

E. Wetlands

Twenty-five percent of Maine's surface is covered by **wetlands**. These are made up of more than 5,000,000 acres of freshwater wetlands and approximately 160,000 acres of tidal wetlands. Wetlands have many natural and cultural values and provide important functions such as habitat for fish and other animal and plant species; flood control; nutrient retention and sediment trapping; production of timber and other natural resources; and recreation, education, and research. The wetland-to-upland transition zone is an important wildlife habitat and provides a buffer that protects the wetland from the effects of nonpoint source pollution.

This resource is in great jeopardy.

Many losses of wetland function and value can be attributed to NPS activities in upland areas immediately adjacent to wetlands, such as housing, industrial development, and landfills. (Most regulatory programs deal with the wetland itself and not specific activities on adjacent lands.)

Pollution may not completely destroy a wetland, but it may seriously impair its quality as habitat or its ability to perform vital functions. For example, the discharge of wastewater into or over wetlands may have adverse effects on productivity, pose human health risks, and result in the closure of mudflats to shellfish harvesting. (This kind of threat has been and continues to be most serious in coastal areas, even though the direct discharge of wastewater in coastal wetlands and water bodies is now banned, except for existing systems that are "grandfathered" under the current law.) Additional potential nonpoint sources of coastal wetland pollution are oil pollution from storage terminals and heavy metal pollution from domestic water discharges.

Other land use activities such as the creation of landfills have affected wetlands, both directly by filling them in and indirectly by leaching of toxic or hazardous materials from noncontained landfills into adjacent wetland. There are also many documented cases of hazardous waste disposal in or near wetlands. Such circumstances may require the destruction or filling of the wetland to contain the contaminants or to remove them to a safe disposal site. In total, at least 25 percent of known or suspected hazardous waste sites in Maine contain wetlands affected by these materials.

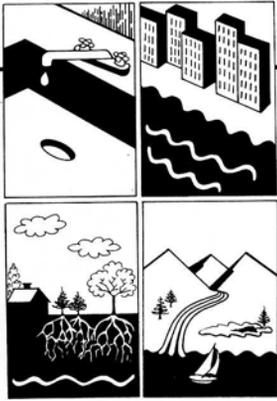


Conclusion

Water quality is at the heart of Maine's quality of life. Its health is ours because it supports our own well-being and that of the state we choose to live in. Anything that anyone of us can do to protect and improve Maine's waters represents an investment in our future.

This guide gives us the tools to make that investment. By acting now we can prevent the threat posed by non-point source pollution from becoming a nightmare. We can make the choices and the changes that will truly make a difference.

And it is one that will have broad ramifications. Like the cumulative image posed by the watershed, our individual actions have even greater impact "downstream." Joining with others, we can bring a huge problem into perspective and under control.



Resources / For More Information . . .

The agencies and organizations listed below are a sampling of those that can provide you with information and/or materials on the topics listed. For further information, consult the *Environmental Resources of Maine* directory published by the Department of Environmental Protection. (Copies may be obtained by calling 287-2811.)

A. Erosion Control/Soil Drainage

- Maine Department of Conservation/Geological Survey: Station 22, Augusta, ME 04333. 287-2801. The MGS conducts research and physical resource inventories of offshore, nearshore, and estuarine areas. Topographic maps and marine geologic environment maps are also available.
- Maine Department of Conservation/Land Use Regulation Commission (LURC): Station 22, Augusta, ME 04333. 287-2631. LURC provides information on controlling erosion on logging roads.
- Maine Department of Agriculture: Station 28, Augusta, ME 04333. 287-3871.
- County Soil and Water Conservation Districts (SWCDs). These offices seek to help conserve soil, water, and related resources through planning, technical assistance, information, and education. They conduct soil surveys, design stabilization and seeding plans, and assist with land use planning. The 16 district offices include the following:

| | |
|---------------------------------------|----------|
| Androscoggin Valley | 783-9196 |
| Aroostook County (Central) | 764-4153 |
| Aroostook County (Southern) | 532-2087 |
| Cumberland County | 839-7842 |
| Franklin County | 778-4767 |
| Hancock County | 667-8663 |
| Kennebec County | 622-8250 |
| Knox-Lincoln County | 273-2005 |
| Oxford County | 743-7019 |
| Penobscot County | 947-6622 |
| Piscataquis County | 564-2331 |
| St. John Valley | 834-3311 |
| Somerset County | 474-8324 |
| Waldo County | 338-2320 |
| Washington County | 255-3995 |
| York County | 324-7015 |

B. Gardens/Lawns/Farms/Pesticides/ Household Toxins

- Maine Organic Farmers and Gardeners Association (MOFGA): 283 Water St., Augusta, ME 04330. 622-3118. MOFGA provides technical assistance and offers publications on organic farming and gardening.
- Maine Nurserymen's Association: 119 Deering Hall, University of Maine, Orono, ME 04469.
- University of Maine Cooperative Extension. The CE helps Maine people improve their lives through an educational process that focuses research-based knowledge on issues and needs. It provides informal education programs; disseminates research-based information; and develops leadership skills among individuals, families, and communities. CE offers programs in agriculture, forestry, marine resources, water quality, environmental education, community and leadership development, families, child care, nutrition, diet and health, 4-H and youth development, economic development, small business development, and public policy decision-making. Regional offices include the following:

| Toll-Free | |
|------------------------|-----------------------------------|
| Androscoggin | 1-800-287-1458 786-0376 |
| Cumberland | 1-800-287-1471 780-4205 |
| Fort Kent | 1-800-287-1421 834-3905 |
| Franklin | 1-800-287-1478 778-4650 |
| Hancock | 1-800-287-1479 667-8212 |
| Houlton | 1-800-287-1469 532-6548 |
| Kennebec | 1-800-287-1481 622-7546 |
| Knox-Lincoln | 1-800-244-2104 594-2104 |
| Oxford | 1-800-287-1482 743-6329 |
| Penobscot | 1-800-287-1485 942-7396 |
| Piscataquis | 1-800-287-1491 564-3301 |
| Presque Isle | 1-800-287-1462 764-3361 |
| Somerset | 1-800-287-1495 474-9622 |
| Waldo | 1-800-287-1426 342-5971 |
| Washington | 1-800-287-1542 255-3345 |
| York | 1-800-287-1535 324-2814 |

Resources/For More Information . . .

- Maine Department of Agriculture/Pesticides Control Board: Station 28, Augusta, ME 04333. 287-3871.
- Maine Department of Environmental Protection/Bureau of Oil and Hazardous Materials Control: Station 17, Augusta, ME 04333. 287-2651.
- Natural Resources Council of Maine: 271 State Street, Augusta, ME 04330. 622-3101.
- University of Maine/Chemical Information Center: Orono, ME 04469-0135.
- Resource Conservation and Development (RC&D) Areas. District offices include the following:
 - Downeast RC&D District (Cherryfield) . . . 546-2368
 - St. John/Aroostook RC&D (Presque Isle) . . . 764-4126
 - Threshold to Maine RC&D (Gray) 657-3131
 - Time & Tide RC&D (Augusta) 621-0934
 - Heart of Maine RC&D (Corinna) 278-7223

C. Boating/Transportation

- Center for Marine Conservation: 1725 DeSales Street, NW, Washington, DC 20036. (202)429-5609. This nonprofit organization works to protect marine wildlife and maintain the health of coastal/marine ecosystems.
- Maine Department of Inland Fisheries and Wildlife: Station 41, Augusta, ME 04333. 287-2043. Regulates boating on inland lakes and handles boat registration.
- U.S. Coast Guard/Marine Safety Office: P.O. Box 108, DTS, Portland, ME 04112-0108. 780-3251. This office is responsible for a variety of marine environmental/safety functions including pollution/hazardous chemical response, port safety and security, waterways management, marine inspection and investigation of commercial vessels including tankers and passenger vessels, and maritime defense operations.
- Maine State Planning Office/Maine Coastal Program: Station 38, Augusta, ME 04333. 287-3261.

D. Comprehensive Planning

- Maine Department of Economic and Community Development/Office of Comprehensive Planning: Station 130, Augusta, ME 04333. 287-8484. OCP provides assistance to municipalities on land use planning, coastal management, and growth management.

- Regional Planning Councils (RPCs) provide technical assistance and community development and planning expertise to municipal governments and businesses. RPC offices include the following:

| | |
|--|----------|
| Androscoggin Valley Council of Governments (Auburn) | 783-9186 |
| Mid-Coast Regional Planning Commission (Rockland) | 594-2299 |
| Hancock County Planning Commission (Ellsworth) | 667-7131 |
| Lincoln County Planning Office (Wiscasset) | 882-6358 |
| Kennebec Valley Council of Governments (Winslow) | 873-0711 |
| Northern Maine Commission Caribou | 498-8736 |
| Penobscot Valley Council of Governments (Bangor) | 942-6389 |
| Southern Maine Regional Planning Commission (Sanford) | 324-2952 |
| Washington County Regional Planning Commission (Machias) | 255-8686 |

- Maine Association of Conservation Commissions (MACC): P.O. Box 222, Belfast, ME 04915. MACC can assist communities with the natural resource inventory section of a comprehensive plan.
- Land Trusts. Contact the Maine Coast Heritage Trust: 167 Park Row, Brunswick, ME 04011. 729-7366. Land trusts can help landowners plan conservation easements as a tool for protecting lands from development or unwise use, thereby improving water quality in their communities.
- Maine Municipal Association: 60 Community Drive, Augusta, ME 04330. 623-8428. MMA works to strengthen the quality of local governments.
- Maine State Planning Office/Maine Coastal Program: Station 38, Augusta, ME 04333. 287-3261. SPO has published a handbook for local officials on coastal management techniques.

E. Stream and Rivers

- Maine Department of Environmental Protection (DEP)/Bureau of Land and Water Quality: Station 17, Augusta, ME 04333. 287-3901. Licenses waste discharges to control discharge of pollutants to rivers and streams, and regulates activities in and adjacent to lakes, rivers, streams, brooks, and wetlands under the Natural Resources Protection Act.

Resources/For More Information...

- Maine Department of Conservation/Land Use Regulation Commission: Station 22, Augusta, ME 04333. 287-2631. Controls certain activities on rivers and streams in unorganized territories.
- Allagash Wilderness Waterway/Maine Department of Conservation: 287-3821. Has special protection of the Allagash River.
- Saco River Corridor Commission: 625-8123. Reviews development and other activities along the Saco River.
- St. Croix International Water Commission: 506-466-9550. Formed by Maine and New Brunswick to develop a recreation and resource management plan for the St. Croix River.
- Municipalities regulate activities in certain shoreland areas under their shoreland zoning ordinances.

F. Lakes

- Maine Congress of Lake Associations (COLA): PO. Box 65, Turner, ME 04282-0065. 225-3035 or 862-5253.
- Lakes Environmental Association (LEA): 102 Main Street, Bridgton, ME 04009. 647-8580.
- Maine Department of Environmental Protection/Division of Evaluation and Assessment: Station 17, Augusta, ME 04333. 287-3901.
- Regional Planning Councils (see listing under Comprehensive Planning).
- Maine Department of Inland Fisheries and Wildlife: Station 41, Augusta, ME 04333. 287-3371.
- Maine Audubon Society: PO. Box 6009, 118 U.S. Rte. #1, Gilsland Farm, Falmouth, ME 04105. 781-2330.

G. Coastal Waters/Gulf of Maine

- Maine State Planning Office/Coastal Program: Station 38, Augusta, ME 04333. 287-3261. Responsibilities include coastal planning; development of policy for Maine's coastal region (which encompasses 152 towns along saltwater or tidal rivers); and work to sustain Maine's traditional maritime industries, manage the Gulf of Maine, and improve coastal water quality. The program seeks to educate the public about coastal issues through publications, videos, slideshows, traveling displays,

and special events (such as Coastweek and the Coastal Cleanup).

- Maine Department of Marine Resources: Station 21, Augusta, ME 04333. 624-6550. Promotes sound harvesting of Maine's marine resources and works to increase public awareness of these resources through workshops, demonstrations, school presentations, publications, and technical assistance.
- Bigelow Laboratory for Ocean Sciences: PO. Box 475, McKown Point, West Boothbay Harbor, ME 04575, 633-9600. A private, nonprofit marine laboratory that researches the biological, chemical, and physical processes that determine ocean productivity. An affiliate of the University of New England-Biddeford.
- Gulf of Maine Marine Education Association: Box 2652, South Portland, ME 04106. An organization of teachers, curators, resource specialists, and interested citizens who share their knowledge of the Gulf and promote public understanding of marine issues.
- University of Maine/University of New Hampshire Joint Sea Grant Program: 22 Coburn Hall, University of Maine, Orono, ME 04469-5715. 581-1440. Kingman Farm, University of New Hampshire, Durham, NH 03824. (603) 749-1565. A cooperative effort in marine research, education, and advisory services. Speakers and publications available.
- U.S. Coast Guard/Marine Safety Office: PO. Box 108, DTS, Portland, ME 04112-0108. 780-3251. Federal entity responsible for pollution response activity in the coastal regions of Maine.
- Maine Department of Environmental Protection/Bureau of Land and Water Quality: Station 17, Augusta, ME 04333. 287-3901.
- Friends of Casco Bay: Box 7785, Portland, ME 04112. 766-2147.

H. Groundwater

- New England Interstate Water Pollution Control Commission: 255 Ballardvale Street, 2nd floor, Wilmington, MA 01887-1013. 508-658-0500. Provides technical assistance in protecting surface and groundwater resources through wetlands protection and underground storage tank programs. Information available (e.g., publications, slideshows, and videos) on topics such as wastewater treatment and acid precipitation.

Resources/For More Information . . .

- Maine Department of Environmental Protection/Bureau of Land and Water Quality: Station 17, Augusta, ME 04333. 287-3901.
- Maine State Planning Office: Station 38, Augusta, ME 04333. 287-3261.
- Maine Department of Conservation/Geological Survey: Station 22, Augusta, ME 04333. 287-2801.
- Maine Department of Human Services/Drinking Water Program: Station 10, Augusta, ME 04333. 287-2070.
- University of Maine Water Resource Program: 11 Coburn Hall, Orono, ME 04469. 581-3244.
- Maine Association of Conservation Commissions: PO. Box 222, Belfast, ME 04915.
- Watershed Associations: For listing, contact MACC at the above address.

Glossary

- algae:** minute floating plants distributed throughout a lake/pond as deep as light penetrates.
- algal blooms:** overgrowth of algae in a water body caused by excessive nutrient inputs; turns water a greenish color and reduces clarity; can cause fish kills.
- anti-fouling boat paint:** a copper- or tin-based paint (containing TBT) that inhibits the growth of barnacles, algae, or other marine organisms.
- aquifer:** a water-bearing layer of earth, gravel, or porous stone, or bedrock.
- carcinogen:** a cancer-causing agent.
- comprehensive plan:** an official document adopted by a town, city, or county that sets forth policies on how future growth should occur.
- ecosystem:** an interactive community of animals, plants, and microorganisms and the physical and chemical environments in which they live.
- erosion:** the wearing away of the land surface by running water, wind, ice, or other geological agents.
- estuary:** a water body that forms a transition zone between freshwater and full-strength saltwater.
- eutrophication:** the process by which dissolved nutrients (such as phosphorus or nitrogen) fertilize a water body, increasing its productivity (often to undesirable levels where the dissolved oxygen level is depleted).
- fecal coliform bacteria:** a strain of bacteria (normally found in the intestines of warm-blooded animals) whose presence is an indicator of pollution of waters by human or animal wastes. High fecal coliform counts lead to closure of shellfish beds (the bacteria do not harm the shellfish, but are an indicator of possible contamination by disease organisms).
- food chain:** an arrangement of the organisms in an ecological community according to the order of predation in which each uses the next, usually lower, member as a food source.
- fungicides:** chemicals designed to kill fungi.
- groundcover:** plants grown to keep soil from eroding.
- Gulf of Maine:** a semi-enclosed sea that stretches from Cape Cod to the Bay of Fundy and is bordered on the east by Georges Bank.
- habitat:** the place where an animal or plant lives; its living and non-living surroundings.
- herbicides:** chemicals designed to kill a variety of undesired plant species.
- household toxins:** any chemicals in the home that, if used, discarded or handled improperly, can threaten human or environmental health.
- insecticides:** chemicals designed to kill a variety of undesired insect species.
- Integrated Pest Management:** an ecologically based approach to pest control that combines the best of all useful techniques — biological, chemical, cultural, physical, and mechanical — into a custom-made pest control system.
- marine debris:** any lost or discarded artificial objects that accumulate in the ocean or along its shores.

Glossary

- Marine Sanitation Device (MSD):** any equipment for installation on board a boat which is designed to receive, retain, treat, or discharge sewage, and any process to treat such sewage. (All vessels with a toilet installed must have an approved, operable MSD.)
- nonpoint source pollution (NPS):** contaminated runoff from many diffuse and/or small-scale sources.
- point source pollution:** pollution discharged directly from a specific site such as a municipal sewage treatment plant or industrial outfall pipe.
- pollution:** the presence of matter or energy whose nature, location, or quantity produces undesired environmental effects.
- riprap:** a foundation or sustaining wall of stones placed or positioned so as to prevent bank erosion.
- rodenticides:** chemicals designed to poison unwanted rodents, such as rats and mice.
- runoff:** the portion of rainfall, melted snow, or irrigation water that flows across the surface or through underground zones and eventually runs into streams.
- tributyltin (TBT):** a tin-based anti-fouling agent that is extremely toxic, especially to shellfish. TBT poses a severe threat to fish, shellfish, and marine birds, and has been associated with a variety of human health problems (e.g., cancer, skin rashes, and immune system damage).
- watershed:** the land area that drains into a given body of water.
- wetlands:** low-lying lands in which the soil is saturated with water at some time during the year (e.g., swamps, marshes and bogs); all tidal and subtidal lands.



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