

SEA GRANT

CORNELL COOPERATIVE EXTENSION

Be a Waterfront Winner! A Shoreline Residents Guide for the Northeast

Jennifer M. Pultz

Sea Grant Extension Program, Cornell University

Introduction

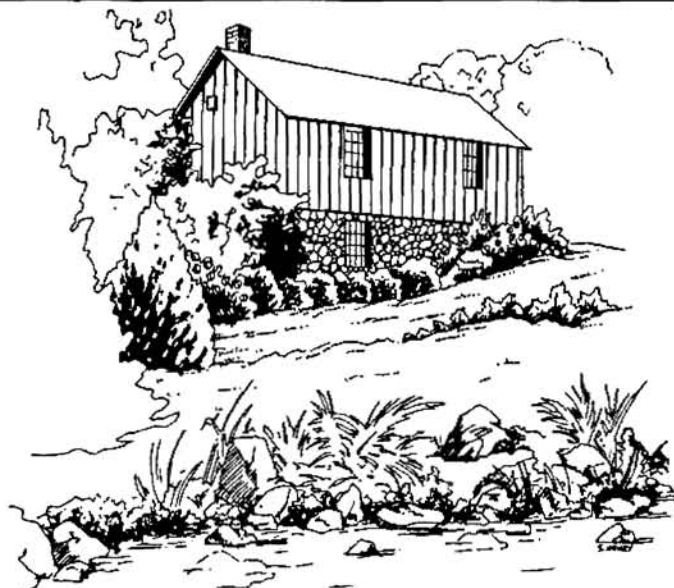
Do you live on a bay or an inland lake, a Great Lake, or a river or a stream? This fact sheet will help you evaluate and implement best management practices for your home and landscape to benefit water quality. Best management practices are simple actions that landowners or residents can take to reduce their impact on water quality.

If we want clear streams and clean lakes, pure drinking water, and abundant healthy fish populations, we must think about the land-use practices that we engage in. We can no longer blame industry or sewage treatment plants for our water quality woes. The residents of each community are unwittingly causing the decline in water quality or preventing full recovery. By following the tips outlined in this fact sheet, you will help protect the environment, reduce waste, improve the look and value of your property, and save yourself time and money. It is clearly a win-win program.

More than 85 percent of all water quality problems are from land run-off (nonpoint sources). Nonpoint source pollution includes fertilizers from farms and lawns, household hazardous waste dumped down storm drains or in back fields, soil run-off during rainstorms, debris and litter from roadways, road salt, and many other pollutants.

Did you ever wonder why noxious weeds grow in ponds and lakes and why some of these water bodies become covered with algae? It has to do with how we manage land use. The source of all water pollution begins on land. If the land is altered (i.e., the slope or vegetation is changed or the soil is exposed) or if it is polluted, then the water quality will also be altered, usually in a negative way.

Three primary threats to water quality are nitrogen, phosphorus, and sediments. Nitrogen poses the most serious and immediate threat to people. Household waste and septic fields can be a major source of nitrates in groundwater. Once in the ground or surface water, nitrates can reach your drinking water, and when consumed by infants and young children, nitrates can build up to toxic levels and cause the condition "blue baby syndrome," which can lead to permanent brain damage or even death. In adults, excess nitrates can cause stomach and intestinal problems.



To reduce your nitrogen loading:

- Have your septic system checked each year and pumped every 3–5 years.
- Avoid using toxic cleaners in toilets and sinks. They kill the microbes that are needed to break down human waste.
- Use slow-release, organic fertilizers on your lawn.

Phosphorus from fertilizers and household items such as detergent makes its way into the water and encourages growth of weeds and microbes. Too much phosphorus interferes with navigation, rocky shoals covered in slime and waving mosses, and water that is clouded with microscopic plant life. This can lead to ecologically dead water bodies because as the oxygen is used up, the fish and other aquatic creatures suffocate.

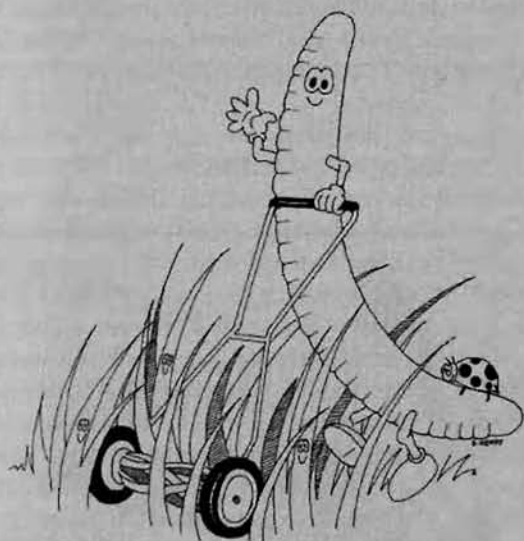
To reduce your use of phosphorus:

- Use phosphate-free laundry detergents.
- Use slow-release, organic fertilizer.
- Test the soil to see if it needs phosphorus before applying it.

Overfertilization with quick-release fertilizer not only damages aquatic ecosystems, but it also damages your grass by not encouraging the roots to grow deep to search for nutrients. These shallow roots are dependent on their "fix" of fertilizer and are very susceptible to drought. This can also lead to a buildup of thatch. A properly watered and fertilized lawn has a deep-rooted system that can tolerate the drought conditions of August typical in our region.

Sediments are the third most serious threat to water. Have you ever seen muddy-colored water running down the edge of a roadway after a rainstorm? This mud is made up of soil and organic material that have been dislodged from the ground and carried away by running water. Culprits include construction sites, newly plowed fields, or even an exposed streambank. Muddy water is the telltale sign of erosion, and erosion can kill aquatic life.

How to Be a Waterfront Winner



- Don't build in a flood plain.
- Keep natural vegetation between the house and the water body.
- Keep your lawn to a manageable size and mow when it reaches 3-4 inches tall.
- Don't try to grow grass under the dense shade of trees.
- Use only slow-release fertilizer.
- Avoid using pesticides.
- Be sure your septic system is built on suitable soils.
- If your land slopes toward the water's edge, don't put a straight or wide path down to the water; instead, curve the path, keep it narrow, and use bricks or other pervious materials.
- For decks, walkways, and driveways, use wood, mulch paths, or porous asphalt.
- Have your septic system pumped every 3-5 years.
- Use water-saving shower heads and toilets and wash only full loads of clothes and dishes.
- Do not use a garbage disposal, especially if you have a septic system.
- Do not pour any household hazardous waste such as solvents and cleaners down sinks or toilets.
- Use environmentally friendly cleaning products such as borax, vinegar, and baking soda. These won't harm the beneficial microbes in your septic system.

How to Be a Waterfront Loser



- Build your house in a flood plain.
- Clear natural vegetation near the water to maximize view and access.
- Keep your lawn short (1/2-1 inch) and try to have at least 10 acres of lawn to maintain.
- Grow grass wherever it will grow, including in hard-to-grow shady spots and steep slopes.
- Use only quick-release fertilizer.
- Use pesticides often and whenever you see a pest.
- Don't upgrade your septic system when you build an addition.
- Put a straight or wide path down to the water.
- Instead of a grassed yard, use concrete all around your home.
- Never or seldom pump your septic system.
- Forget those water-saving devices and wash partial loads of laundry.
- Use a garbage disposal.
- Get rid of any unwanted chemicals by pouring them down the toilet or drain.
- Use bleach and all those over-the-counter cleaners. The more toxic, the better.

To reduce sediments to your water body:

- Never leave soil exposed. Plant vegetation in the soil quickly or use a mulch.
- Urge your town to stop the practice of scraping ditches. Instead, encourage them to have grassed ditches that are mowed.
- Keep vegetation intact around the edge of your water body.
- Require construction sites to cover soil and control run-off.
- Avoid placing impervious straight walkways near or directly to the water.
- Use porous asphalt, or other pervious surfaces for your driveway.

LAWN CARE

Certain turf grasses are more tolerant than others to the Northeast climate. We have droughts in summer and cold, snowy winters. In the Northeast, species that are adapted and have performed well include Kentucky bluegrass and perennial ryegrass. Some varieties of Kentucky bluegrass tolerate poor fertility and acidic soils. A good mixture includes fine fescue (65 percent) with the remainder being a mix of perennial ryegrass and Kentucky bluegrass. This combination works well in both shade and sun. Tall fescue is a very deep-rooted grass and it seems to do well in this state. For lists of grass varieties and species recommended for the Northeast, call your Cooperative Extension county office.

Remember that grass needs to be managed. It must be cut and watered regularly and fertilized at the start. So although we may enjoy the feel and look of a lawn, too much lawn can be time consuming. By reducing your lawn size and following the low-maintenance lawn care system, you can save time, money, and natural resources as well as improve water quality.

If geese are a problem on your lawn, don't plant Kentucky bluegrass. Geese like grass with low ash content and tender leaves. Instead, plant tall fescues or other grasses with tough leaves. Geese dislike common periwinkle, Japanese pachysandra, and English ivy, so those can be planted too. Another hint to keep geese off your lawn is to have hedges rather than grass near the shoreline. Hedges also protect the water from run-off from your property.

1. Test your soil. The first step in caring for your lawn and water body is to have your soil tested for pH and nutrients. By testing your soil, you will know exactly which nutrients are lacking or which are in excess, and by knowing the pH, you can determine which nutrients or minerals are being absorbed. Testing your soil is the most important step in managing your lawn. It would be foolhardy to add soil amendments to your lawn if it didn't need them. Know what your soil needs before you apply anything to it. In New York State, your soil can be analyzed through your Cornell Cooperative Extension county office. In other states, check with your local Cooperative Extension Agent or SWCD.

2. Reduce your lawn area. The United States has more than 30 million acres of lawn. These lawns use precious water resources, diminish fossil fuels when they are mowed, and in many cases absorb huge quantities of chemicals. In addition, a pre-1994 lawn mower releases in 1 hour the same amount of pollution a car emits driving for 7-10 hours. Instead of grass, choose low-care alternatives such as perennial groundcovers. Using natural flora can enhance the character of your landscape, create variety, and will require less maintenance and chemical use than lawns. Many wildflowers, ferns, and even moss gardens are attractive alternatives. By planting ivy, myrtle, or other groundcovers under your trees, you can protect them from mower damage, help retain water, improve aesthetics in your landscape, and reduce mowing time.

Some benefits of ground covers include

- controlling erosion and conserving soil moisture
- spending less time on lawn maintenance such as watering, mowing, fertilizing, and treating
- reducing heat, glare, noise, and dust
- obstructing foot traffic where you don't want it, without impeding your view
- producing interesting patterns with varying heights, texture, and color
- stealing fewer nutrients than grass, especially when placed around trees

3. Avoid watering the lawn. Once a lawn is established and deep roots are present, avoid watering your lawn at all and allow it to go dormant during the dry summer months. It will not harm an established lawn to do this, and you will conserve water and save a bundle on your water bill if you are public water. Unless you are just starting a lawn from seed or sod, watering your lawn regularly is unnecessary. When establishing a lawn, water early in the morning instead of during the heat of the day. To apply 1 inch of water to 1,000 square feet of lawn, an average sprinkler system takes approximately 100

minutes. To measure this, place a container with a ruler in it under the sprinkler and when it is filled to the 1-inch mark, then you know you have watered that area enough.

4. Return the grass clippings to the lawn. Grass clippings are 80 percent water. Millions of tons of water are hauled away to landfills each year because people continue to bag their grass clippings and throw them away. By leaving the grass clippings on the lawn, you also fertilize your lawn for free by reducing the amount of nitrogen needed by 30 percent. Grass clippings do not cause thatch. Thatch is caused by a combination of compacted or poor soil (which grass roots cannot penetrate) and shallow, frequent watering and excessive fertilizing which causes the accumulation of grass roots and stems to remain at the top of the soil. The undecomposed roots and stems cause a tangled mass, and hence you have thatch.

Try these tips:

- Leave grass clippings where they fall, but be sure they are not matting on the lawn.
- Mow lawns when they reach 3-4 inches long and only cut one-third off the top of the grass blade.
- Buy a mulching mower.
- Use a rotary mower to mulch your leaves and then leave them on the lawn.

5. Use slow-release fertilizers. Fertilizing is discouraged within 100-200 feet of water bodies. Fertilizer from an upland house or yard has the ability to be absorbed by the soil or plants, but lakeshore properties have very small "buffer zones," which means fertilizers may flow into the water body. People living on a water body have a special responsibility to ensure that none of these extra nutrients makes their way into the water. This means using proper timing and application rates, as well as choosing the right fertilizer.

Here is advice about fertilizer use for low-maintenance lawns:

- If you fertilize once a year, fertilize only in early fall (around Labor Day), not in early May. Heavy spring applications can actually harm lawns by promoting more top (leaf) growth than root growth.
- Choose an "organic" slow-release fertilizer and avoid chemical fertilizer. Fertilizers such as sulfur-coated urea or natural organics will provide a more uniform release of nitrogen, which is important to water quality.
- If you fertilize twice a year, fertilize in the spring (around Memorial Day) and in early fall using a slow-release organic fertilizer. If you fertilize three times a year, add a late-fall fertilizer which can be applied to promote a deep, healthy root system and hardy spring lawn. Apply this slow-release, late-fall fertilizer when the average daily temperature drops below 50 degrees F.
- Use extra caution when applying fertilizer near surface waters. Do not spread within 100 feet of the water or wetland. Use a "drop" spreader and not a "cyclone" spreader to avoid getting fertilizer in the water.
- Fertilizer that has spilled should be swept up, not washed off.
- Follow directions on the bag carefully.

6. Avoid pesticides. According to the EPA, homeowners use up to 15 to 20 times more chemicals per acre than farmers. These pesticides include herbicides (weed killers), insecticides (insect killers), and fungicides (fungus destroyers). The insecticides do not discriminate between the good bugs and the bad ones. *"More than 99 percent of insect species are of benefit to*

humanity," according to E. O. Wilson, noted Harvard entomologist. If you have "bad bugs," be patient because the good ones are probably close behind ready to depress the bad ones.

Use integrated pest management (IPM), a program that integrates techniques to minimize favorable conditions for pests and maximize natural obstacles to pests, using chemicals only as one of the last alternatives. IPM aims to encourage natural enemies and change habitats favorable to pests. You may help by timing your planting and harvesting to avoid peaks of pest presence, choosing pest-resistant plant varieties, and encouraging natural parasites and predators.

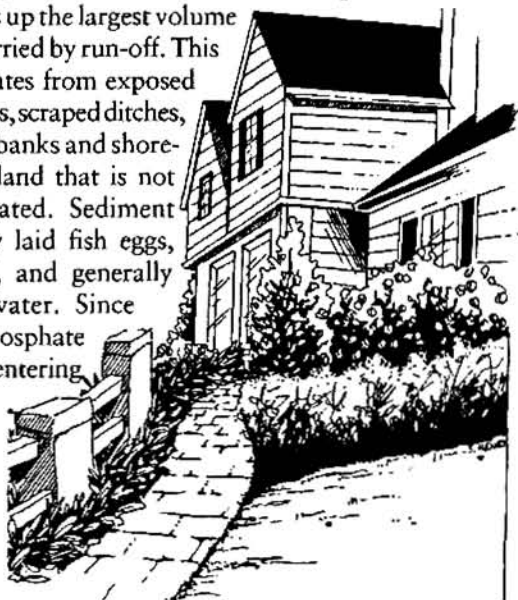
When choosing a lawn care company, make sure it customizes its services to your needs. If your lawn doesn't have grubs, then don't allow the company to spray for grubs. Lawn companies often perform blanket pesticide applications not because there is necessarily a pest problem, but because the customer has signed up for the spraying program and it is your lawn's time to be sprayed. Pay the company to do what you want done. And require them to do a site check to see if there is indeed a problem. Be sure the problem is serious enough to warrant spraying. For example, if a square foot in your lawn uncovers more than 10 grubs, then the lawn may need to be treated. If there are fewer than 10 grubs per square foot, the problem is not serious enough to treat. Even when treatment is necessary, look to the nonchemical choices (in this case, parasitic nematodes) and time your application carefully to coincide with the most vulnerable time in the insect's life cycle and the proper soil moisture conditions.

Follow these tips when dealing with weeds or insects:

- Choose the organic, or nonchemical, method first. If organic controls have been tried and have not solved the problem, then choose the least toxic control method for the job.
- Buy only as much chemical as needed.
- Only do spot treatments, not a blanket application of a chemical.
- Hire an organic lawn company to handle these problems and help develop your general lawn maintenance schedule.

LANDSCAPE

1. **Erosion control plantings and buffer zones.** Soil erosion is a major consequence of storm run-off from unprotected soil. Sediment makes up the largest volume of pollutants carried by run-off. This sediment emanates from exposed construction sites, scraped ditches, exposed streambanks and shorelines, and any land that is not properly vegetated. Sediment smothers newly laid fish eggs, clogs fish gills, and generally muddies the water. Since most of the phosphate and pesticides entering waters are attached to these soil particles, eroding soil has a significant impact on water quality.



Some signs of erosion are

- exposed tree roots, small stones, or rocks
- small rills or gullies that are beginning to form
- buildup of silt in certain low areas
- soil splashed on windows and outside walls
- the widening or deepening of stream channels

Preserve green buffers on the shores of the water body. These green buffers include low-growing herbaceous and woody plants such as shrubs. This vegetation slows the speed of run-off, allows sediment to settle out, and allows huge amounts of nutrients such as phosphorus and nitrogen to be absorbed by the roots before they enter the water. When buffers are removed from shorelines, surface run-off drains into the water body carrying with it destructive sediments and nutrients. Buffers also provide essential shade to keep water temperatures cool enough to sustain trout and other cold-water critters. If you want lawn right up to the water's edge, be sure the soil is not compacted and use core aeration and/or a soil surfactant so rain will soak into the soil more readily.

2. **Native vegetation.** Native plants are well adapted to your site and benefit local wildlife. Some examples of native plants of the Northeast include bayberry (*Myrica pensylvanica*), beach plum (*Prunus maritima*), shadbush (*Amelanchier canadensis*), red cedar (*Juniperus virginiana*), and American holly (*Ilex opaca*). Never pick native plants from a wild area and plant them in your yard; many are listed as endangered and cannot be picked. As a general rule, buy your native plants at a local nursery and be sure the nursery did not dig them from the wild.

3. **Plant location.** Plant trees in strategic locations throughout your yard to protect your home from cold winter winds and hot summer sun. By knowing what to plant and where, you can prevent landscape problems later. Some typical landscape problems include planting under eaves or in front of dryer vents. Others include planting grass on steep banks that tend to be dry and are dangerous to mow. Look for alternative plants for these steep sites, such as day lilies (*Hemerocallis* sp.), Virginia creeper (*Parthenocissus quinquefolia*) for shade, crown vetch (*Coronilla varia*) for sunny areas, or other low-maintenance ground covers.

4. **Mulching.** Mulch includes organic materials such as leaves, wood chips or bark, pine straw, and nut shells as well as small gravel which, when placed around plants, prevents weed growth, retains moisture, and aids water infiltration.

When mulching, follow these tips:

- Mulch to a depth of 2–4 inches and be careful not to pile the mulch too high. Mulch that is deeper than 4 inches can smother roots.
- Spread mulch to the outer limits of the drip line of the tree.
- Do not pile the mulch right up to the tree trunk—it invites rodent damage.
- If you use wood chips, try adding a light application of fertilizer to the soil beneath the mulch. (Wood chips decompose very slowly and tie up nitrogen in the process, making it unavailable for plants.)
- Use nonpacking leaves to mulch your garden beds. Do not rake them into the lake.

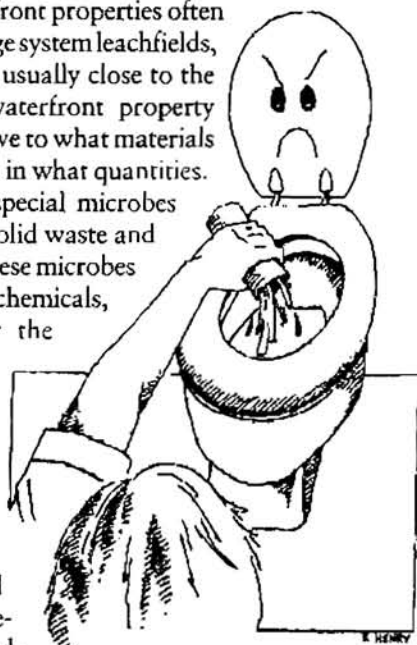
5. **Modular paving.** Most residential areas are characterized by roads, rooftops, and parking lots. In contrast to forests and fields, which allow rainwater to soak in, these impermeable

surfaces force rainwater to run off without soaking into the soil. This run-off carries oil and grease, debris, and soil into the nearest water body. By using paving materials that allow rainwater to soak into the ground, you can reduce this run-off.

6. Beachfronts. Most shoreline owners want a nice beach area where they can easily access the water. Many don't realize that these sand beaches and straight walkways to the water cause real problems for water quality. Artificial sand beaches built on water bodies where none existed before can cause serious problems with aquatic plants and animals as well as increased erosion. If you must have a sand beach, choose the largest grain size available, preferably pea-gravel to provide a more stable beach. But remember, you may be gaining a beach but you will be losing habitat, run-off control, and erosion control. Do not use soap or shampoo in the water and insist that swimmers do not use the water as a bathroom.

HOUSEHOLD

1. Septic system. A septic system provides a safe and effective method of wastewater treatment. If properly designed, installed, and maintained, a septic system can last for decades. Remember that waterfront properties often do not have large sewage system leachfields, and the water table is usually close to the surface. Therefore, waterfront property owners must be sensitive to what materials go down the drain and in what quantities. A septic system has special microbes that break down the solid waste and make it into sludge. These microbes are very sensitive to chemicals, and you can render the system useless if you kill too many of these beneficial bacteria. The liquids from the tank flow into a grid of perforated pipes and then soak into the soil where it is filtered and becomes innocuous before it reaches the groundwater.



The following are tips to improve septic system functioning:

- Remove sludge from septic systems every 3–5 years or when the sludge level exceeds one-third of tank volume.
- Make sure you know where your septic tank and drain tiles are located in the yard. Drainfields are one of the few places you don't want to plant trees, because roots can clog and interfere with the flow through the pipes.
- Do not compact the soil over the drainfield. This means *not* parking your cars on the lawn.
- Keep grease, hair, cigarette butts, facial tissues, paper towels, feminine hygiene supplies, bandages, and even colored toilet paper out of the septic system.
- Don't pour household hazardous waste into your sink or toilet.
- Do not use garbage disposals—they can cause a buildup of solids in the tank and can clog distribution pipes.

- Avoid using the chemical products that claim to clean septic tanks. These products convert the organic material in the septic tank into a liquid that will move quickly through the drainfield. This will end up sending much larger amounts of nutrients into the water system and could contaminate nearby surface and groundwater.
- Do not use toilets as trash cans!

2. Water usage. The more water that flows through the septic system, the faster and more intense will be the release of nutrients into the ground. As a rule, by conserving water you will reduce nitrogen releases, which in turn will affect your water body. Decreasing our use of water reduces the amount of nutrients entering the watershed.

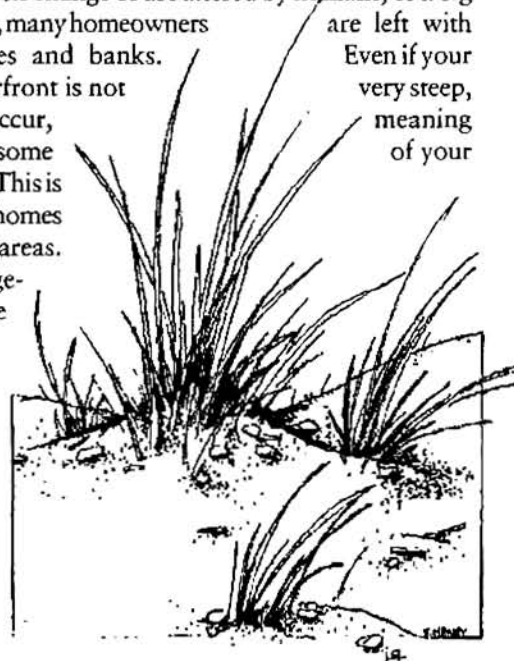
Follow this advice to be sure you are not a water-waster:

- Keep a container of drinking water in the refrigerator.
- Test for leaks by adding food coloring to the toilet tank. Without flushing, note whether any color appears in the bowl after 30 minutes.
- Place half-gallon plastic jugs, filled with water, in the toilet tank. Doing this will cut the number of gallons per flush.
- If you are on city water, turn off all your fixtures and check the meter. If the dial moves, you have a leak.
- Run the dishwasher only when you have a full load.
- Avoid running water continuously while washing the dishes.
- Take showers, not baths.
- Don't run the water while shaving, brushing teeth, washing hands or washing the car.
- Install a conservation showerhead, which can reduce water flow by 25 percent.
- Wash the car on the lawn, not in the driveway. This way, the grass absorbs the water, and the soap is actually beneficial to the lawn.

SHORELINE MAINTENANCE

1. Use vegetation to reduce shore erosion. One of the biggest problems with living along a shoreline is erosion. When seasonal water levels change or are altered by humans, or a big storm hits the area, many homeowners are left with eroding shorelines and banks. Even if your slope to the waterfront is not very steep, meaning of your erosion can still occur, you may be losing some land to the water. This is especially true for homes near fragile dune areas.

By planting vegetation along these fragile shoreline areas, you will greatly reduce the incidence of shoreline erosion. If you haven't cleared the plants from your shoreline, leave them alone. If your land is already barren, then plant vegetation, preferably native



plants, all along the shorelines. A few examples include crown vetch (*Coronilla varia*), autumn olive (*Elaeagnus umbellata*), bearberry (*Arctostaphylos uva-ursi*), button bush (*Cephalanthus occidentalis*), and cattails (*Typha latifolia*), to name a few.

If you live in a dune area, your dunes will need extra care and maintenance. Dunes are constantly shifting and moving, and no matter what is done, nature usually prevails. Erosion is also a natural process that occurs in sensitive dune areas or in high storm surge areas. Therefore, houses should never be built on or near a primary dune (the one closest to the water). All primary dunes should be vegetated, usually with American beachgrass (*Ammophila breviligulata*) in the Northeast. These plants act as dune stabilizers by slowing wind and helping to hold the sand in place. There are many grasses, vines, shrubs, and trees that can be used for dune and shoreline stabilizing projects. Your local Soil and Water Conservation District can help you choose the right material to plant.

Repairing an eroded area is costly. Protection structures range from \$3 to \$3,000 per linear foot. So before you clear a shoreline of vegetation or build a home too close to the water's edge, think about the maintenance and repair costs that may be incurred in the future.

To prevent erosion, follow these guidelines:

- Don't build any structure in the primary (first) dunes.
- Leave all vegetation including trees and shrubs along the shoreline to act as a buffer.
- Keep dunes vegetated.
- Build boardwalks over dunes to reach the beach.
- Use snow fencing to encourage dune growth.

2. Don't feed ducks or geese. Their wastes can foul a body of water. All those nutrients settling to the bottom of the water body invite aquatic weed growth. They also contribute to high bacteria levels in your lake or pond. And ducks carry parasites that cause the infamous "duck itch."

Acknowledgments:

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Now that you've read about all the ways you can be a better shoreline property owner, it is time to make a commitment to these changes. If you are interested in becoming a waterfront winner, then sign up for the Shoreline Winners program. Please send your name, address (including county), water body you live on, and phone number if you would like to receive a checklist. By checking off at least 10 environmentally sound practices that you did for your home, lawn, and garden, you will receive a certificate stating you are a water-quality steward.

Mail to
New York Sea Grant
21 South Grove Street
East Aurora, NY 14052

Questions? Call (716) 652-7874

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