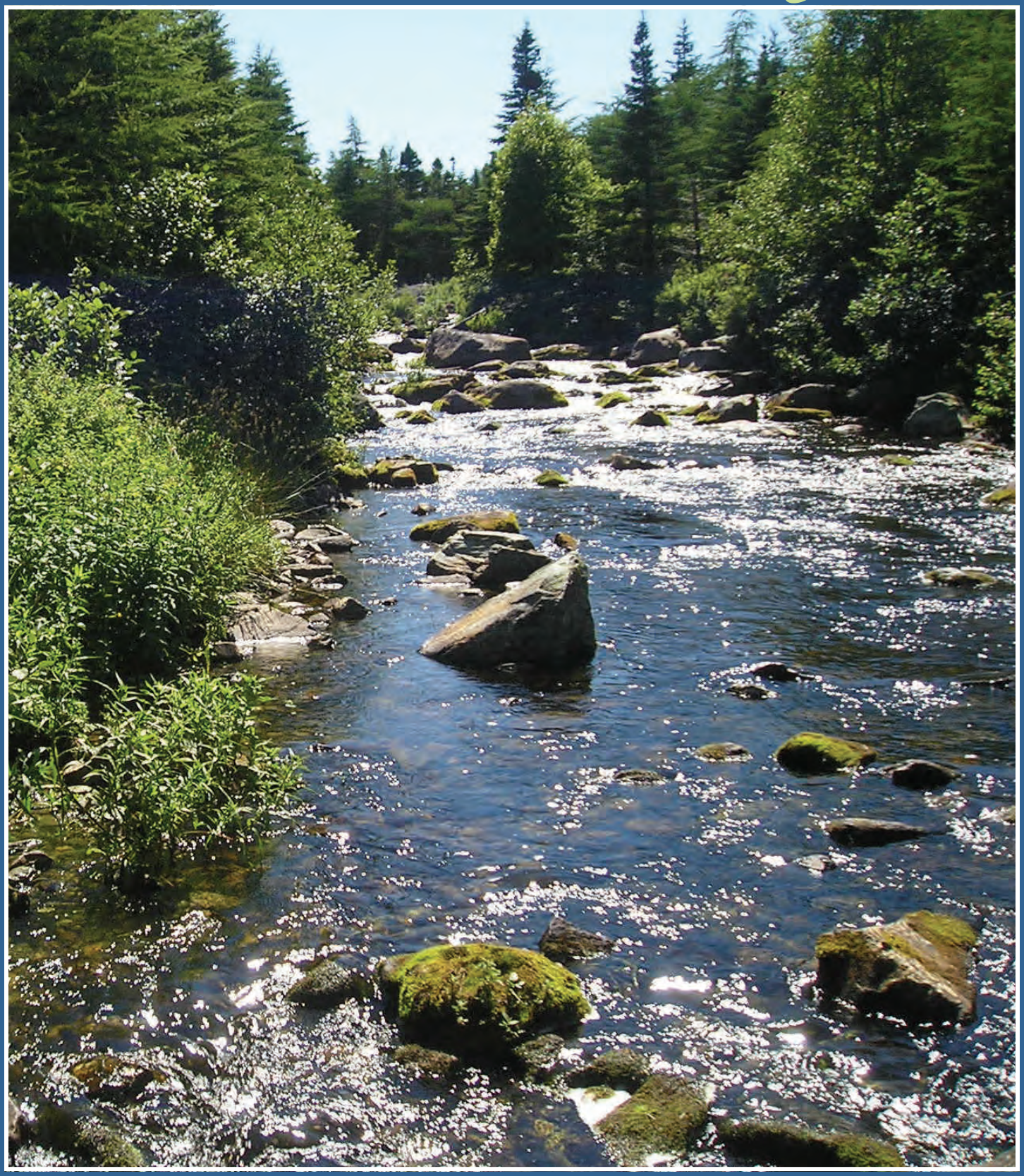
# *Freshwater Joys*



**Your handbook for enjoying and protecting your freshwater shoreline**

## *For all life along our beautiful Newfoundland and Labrador shorelines*

This handbook was compiled by Northeast Avalon ACAP.

Project Writer and Editor: Emilia Bartellas

Front cover photography: Aaron Dale

Back cover photography: Aaron Dale, NAACAP Green Team of 2009

Printed March 2010 in Canada by Wade Atlantic.

This not-for-profit publication was produced with the support of:



Northeast Avalon ACAP, Inc.

(Atlantic Coastal Action Program)

**Disclaimer**

This book offers simplified information of a general nature. Each shoreline property is unique and requires individual assessment and advice; readers are advised to obtain competent expert help for any work relating to topics discussed in this handbook including shoreline erosion, bank stability, retaining walls, docks, construction plans and approvals, septic permits, tree condition and removal, or any other actions described.

It is the responsibility of the shoreline resident, or his/her authorized agent or contractor, to obtain all necessary permits, licenses, letters of authority and approvals for any work which falls under the jurisdiction of Federal or Provincial acts or regulations, and any Municipal land use bylaws, development, or building regulations.

It is recommended that any alterations or corrective measures be carried out with due care and attention to human safety and to the structural integrity of buildings and landscape. All areas of this book are designed as an introduction to the topic. Readers are advised to undertake further research prior to making major expenditures, and to discuss with manufacturers, contractors or

# *Freshwater Joys*

## Your handbook for enjoying and protecting your freshwater shoreline

Keep for your reference or pass on to your neighbours

Northeast Avalon ACAP

# Preface

As Newfoundlanders and Labradorians, we are all familiar with the joys as well as hardships that are associated with living near water. While we are lucky to be surrounded by an abundance of freshwater, we have to understand that it is indeed a finite and precious resource.

Not only are shorelines areas of rich animal and plant diversity, it is precisely from rivers and lakes where much of our drinking water is supplied. Everything we put on our lawns, wash down storm sewers and discharge in the sink eventually ends up back in our rivers and lakes. Damages to watersheds are hard to reverse so, as homeowners, there are some important things you can do to help protect water quality!

This handbook, *Freshwater Joys*, has been compiled from many different sources as a homeowner's "how-to" guide to maintaining a healthy waterfront. It is designed to help you find answers to commonly asked questions, allowing you to live in harmony with your waterfront.

**Enjoy!**

Emilia Bartellas
Northeast Avalon ACAP
Summer 2009
www.naacap.ca

# Contents



# NAACAP: Who Are We?

The Northeast Avalon Atlantic Coastal Action Program is a citizen's organization dedicated to promoting the wise use of our water resources and revitalizing the environmental quality of the watersheds and coastline within the Northeast Avalon region. NAACAP works with all sectors of the community, including all three levels of government to monitor, protect, and restore our aquatic resources.
Join us to protect your environment!

Some of the ways NAACAP works for Healthy Watersheds:

Pollution Prevention Initiatives

Water Conservation Projects and Field Trips

Public Awareness through Presentations and Workshops

Monitoring, Research and Analysis

Resource Library

River Rangers

And more…

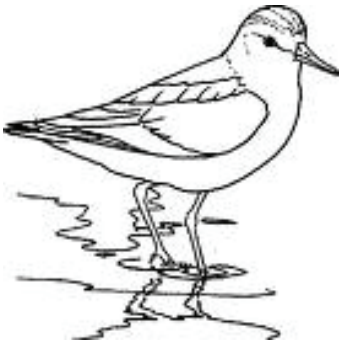
Website
www.naacap.ca

Phone
(709) 726-9673

We welcome your participation in our organization.
**Come join us!**

# Natural Beauty; It's a Shore Thing

**Importance of Healthy Shorelines**



Healthy shorelines help filter pollutants, protect against erosion and provide habitat for fish and wildlife. Keeping shorelines natural is the easiest way to protect water quality and the value of waterfront properties.

Shorelines are the "vital edges" where the water from lakes, ponds, rivers, streams and marine water meet the land. The shallow waters and the first 10-15 metres of shore around lakes and rivers form an area that provides food and habitat essential to the survival of many species of plants, microorganisms, insects, amphibians, birds, mammals, and fish. These areas are very sensitive and it is important that the delicate ecological balance is maintained.

**Shoreline Ecosystems**

It is important to understand that the shoreline ecosystem is made up of three distinct, but overlapping, zones. Activities undertaken in *any* part of the shoreline will have an impact on other parts of the ecosystem.

### Upland Zone

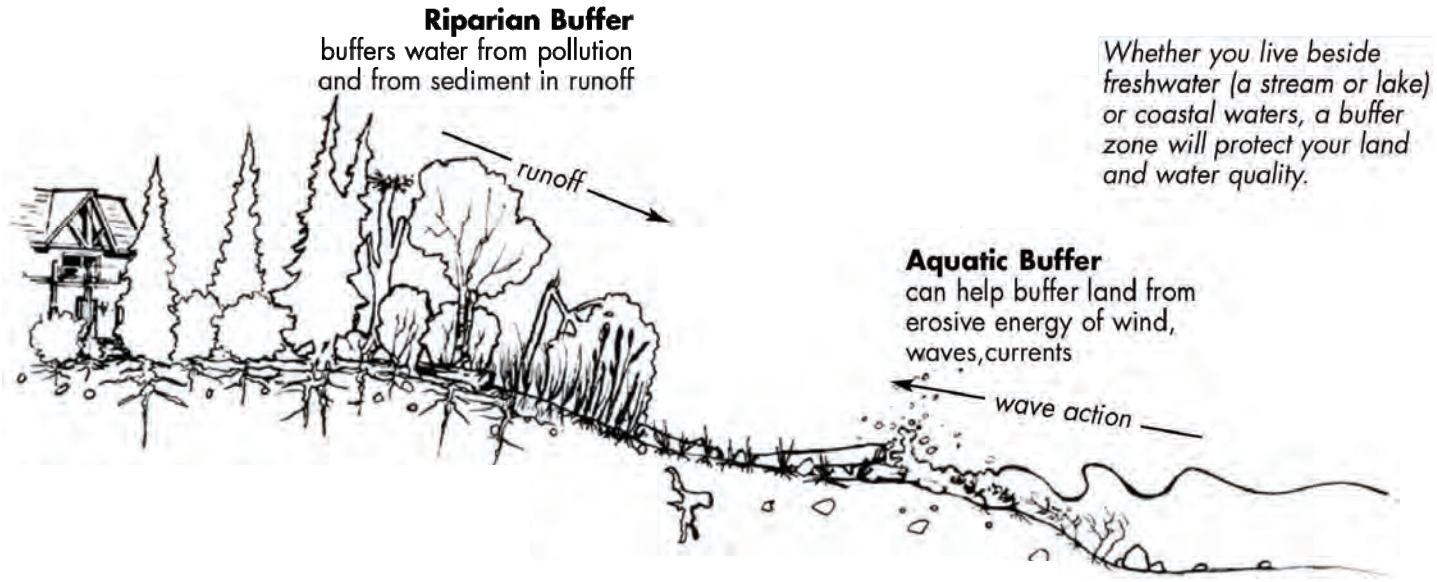
This zone is generally the higher and drier ground. This is likely the area in which the residence is located. Here you'll find trees and shrubs that require well-drained soils.

### Riparian Zone

This zone is the section of land closest to the shore. Its name comes from the Latin word '*ripa*', meaning bank. A wide variety of plants are found here which provide excellent food and shelter for many wildlife species. This vegetation helps reduce runoff and soil erosion, and provides shade which cools shallow waters.

### Littoral Zone

This zone extends from the water's edge to the area of the lake in which the sun no longer penetrates to the lake bottom. Here you'll find algae, fish, waterfowl etc. This area is up to 500% more diverse in plants and animals than other areas found upland.




*Whether you live beside freshwater (a stream or lake) or coastal waters, a buffer zone will protect your land and water quality.*

◄ Upland Zone ► ◄ Riparian Zone ► ◄ Littoral Zone ►

## Signs of a Healthy Shoreline

- Lots of native vegetation
- Different levels of vegetation (bushes and trees)
- Native trees in a range of ages (young and old)
- Things "look wild"
- Birds, fish and other wildlife are present

## Signs of an Unhealthy Shoreline

- An area has been cleared of all or most of the vegetation
- Lawns that extend right to the water's edge
- Natural Shoreline has been replaced with breakwater or gabion baskets
- Problems like shoreline erosion and poor water quality can be seen
- Algae blooms are excessive and weed growth is prominent

**Tip!**

**See page 40 and 41 to see the difference between a healthy and an unhealthy shoreline.**

**Did you know…**
90% of all lake life is born, raised, sheltered and fed along the shoreline.

# Functions of Healthy Shorelines

**Help Maintain Clean Water.** Without vegetation, pollutants such as fertilizers, pesticides, pet feces, manure, effluent from malfunctioning septic systems, motor fluids and road salt on the land can be carried into the water by storm runoff. Nutrients in wastewater act as fertilizers and promote algae growth. Sediments impact fish habitats and pathogens can impact the recreational enjoyment of our water.

**Prevent Soil Erosion**. Erosion can lead to loss of property, unsafe areas and loss of habitat for fish. Shoreline vegetation is the best adefense against erosion as plants keep the soil in place with their underground root system.

**Protect your Property from Flooding**. Well-vegetated shorelines provide barriers against floodwater by slowing it down, reducing its force, height and volume and by absorbing some of the water.

**Provide Wildlife With Food and Habitat**. Shoreline vegetation protects wildlife from weather and predators. It provides important feeding areas and habitats for many creatures. Also, it helps stabilize temperatures and protect water quality by shading shallow water and cooling headwaters. This cool water is critical for many fish species.


**Increase Recreational Property Value**. Property value is tied to water quality. A property with good fishing, good swimming, clean water and stable land will hold greater value than a property that offers an expensive green lawn, erosion and algae along its waterfront. Natural shorelines thrive without much work from owners and they also help to provide privacy and screen noise.

# Shoreline Erosion and Buffers

Shorelines are environments that are constantly evolving. Erosion is a continuously occurring, natural process where the land is eroded by wind, ice, water movement and gravity.


**What do people do that increases erosion?**

**Removal of shoreline vegetation**. Shoreline plants are essentially the glue that keeps the banks intact. Their roots grip the soil, while the plants themselves protect the soil from the erosive forces of the wind, rain and waves. If you take the glue away, the shoreline is eventually going to fall apart.

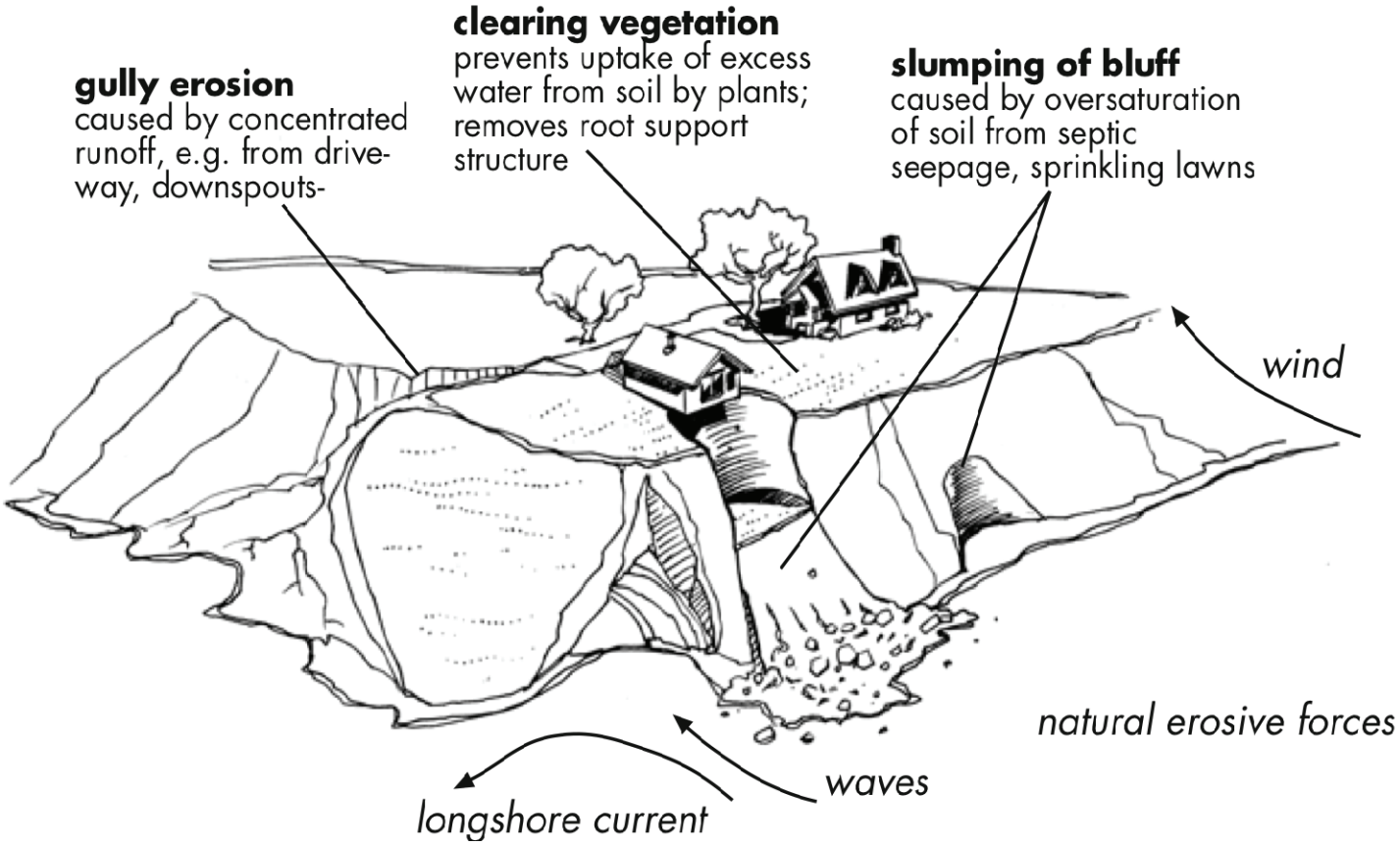
**Runoff** is the result of rain and melting snow. In natural areas, runoff is normally filtered and absorbed by vegetation and soil. When the vegetation is replaced with hard surfaces like pavement, patio stones, and rooftops, water flows along these surfaces as opposed to soaking into the ground. Gravity will cause the water to runoff the paved surfaces and onto the soil in the same direction every time.

**Boat wake**. The wake generated by motorized watercraft such as boats and jet skis can be a huge contributor to shoreline erosion, especially in areas where these watercraft are driven parallel or close to shore. Motorized watercraft create waves which wash onto the shoreline and eat away at the soil bit by bit. Generally speaking, the faster or bigger the waves that are generated the greater the potential for erosion.

**Construction** along or near the shoreline can be a large contributor to erosion if the proper precautions aren't taken. Cleared lots and freshly exposed soils are very susceptible to erosion.

**Foot traffic**. When people travel the same routes to access an area, they end up trampling vegetation and creating areas where bare soil is exposed. If the soil isn't covered up by gravel, mulch or wood chips, it becomes very susceptible to wind, rain and other natural causes of erosion. If the footpaths happen to be along a steep slope, the traffic can physically loosen the soil causing it to erode away.

**Shoreline alteration** can cause significant erosion problems. When vegetation along the shoreline is replaced by hard structures such as breakwaters, wave energy is no longer absorbed. Rather, it is deflected onto neighbouring shorelines where it can cause erosion. Any alterations to waterbodies are subject to the approval of Department of Environment and Conservation under Section 48 of the *Water Resources Act.* This includes activities such as land development within 15m of the high water mark, pipe crossings, construction of docks etc.




**Impacts of Erosion**

It can be frustrating for a landowner to watch their property falling off or gradually eroding into the water. This **loss of property** translates into a significant decrease in property value.

Erosion can create **unsafe areas** near the shoreline with steep, unstable slopes.

The loss of shoreline vegetation translates into a **loss of habitat** for shoreline creatures.

As soils erode into a water body, the bottom becomes covered with a layer of soft sediment. This **increase in sediment** gives a mucky bottom for swimmers and waders, makes the area too shallow for boating, is detrimental to aquatic creatures and can smother eggs of fish and insects.

When soil washes into the water it becomes cloudy, **reducing water clarity**. Because less light can penetrate the water, the whole food web can be disrupted as plants do not have ideal growing conditions. Poor visibility makes it difficult for fish to find food and particles can clog their gills.

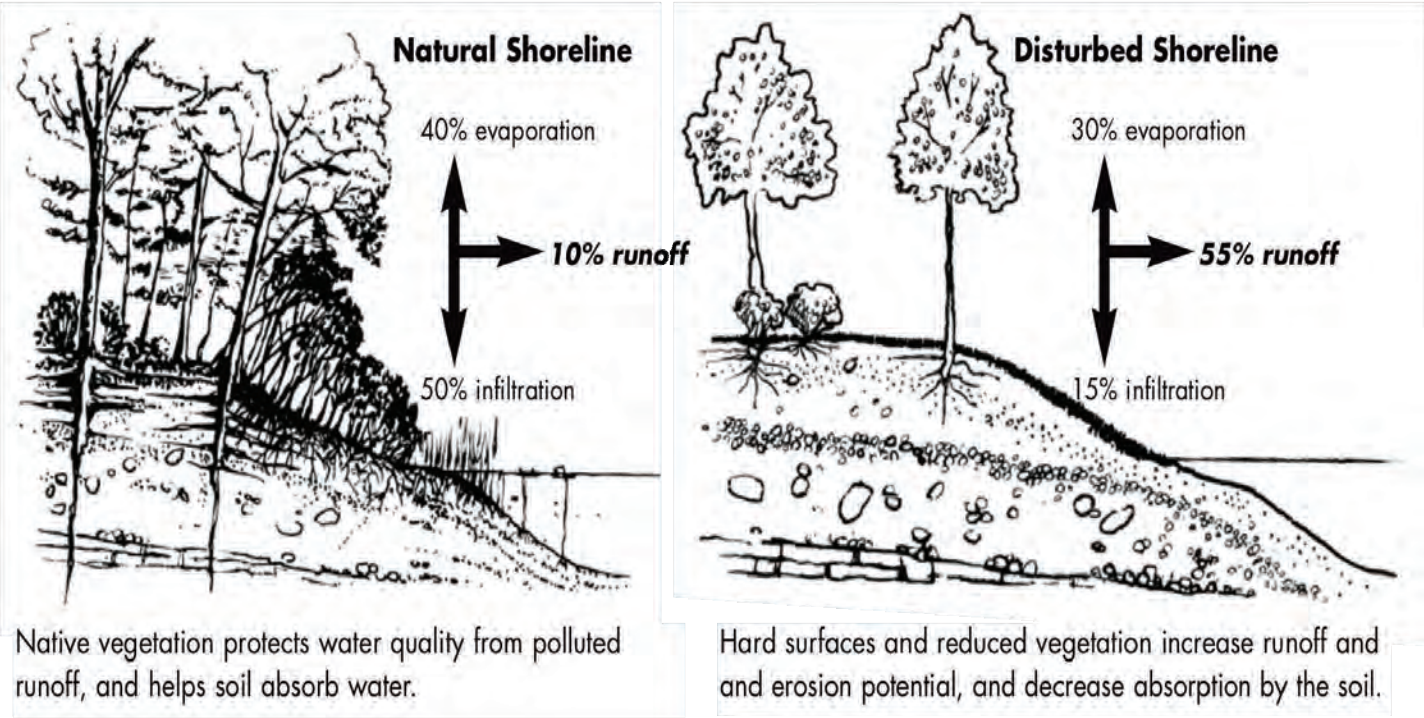
Water from runoff picks up a significant amount of heat so when it goes into the water it **increases the water temperature**. This thermal pollution has an adverse effect on many organisms, such as the trout, that need cooler water temperatures to survive.

When soil enters the water it can release **harmful chemicals** or heavy metals that were once bound to it. This is troubling for landowners as well as aquatic life forms.

Soil particles also have chemically bound nutrients attached to them, such as phosphorus and nitrogen. Once in the water, they are released and become available for algae. This **increased nutrient input** causes excessive algae growth, also known as algae blooms. This leads to oxygen depletion, deposits in the water and changes in organism composition.

## What are the signs of Erosion?

- Exposed soil
- Slumping, undercut banks
- Cloudy water
- Stream or river becoming wide and shallow
- Receding shorelines
- Leaning trees, downed trees, and exposed roots




Native vegetation protects water quality from polluted runoff, and helps soil absorb water.

Hard surfaces and reduced vegetation increase runoff and and erosion potential, and decrease absorption by the soil.

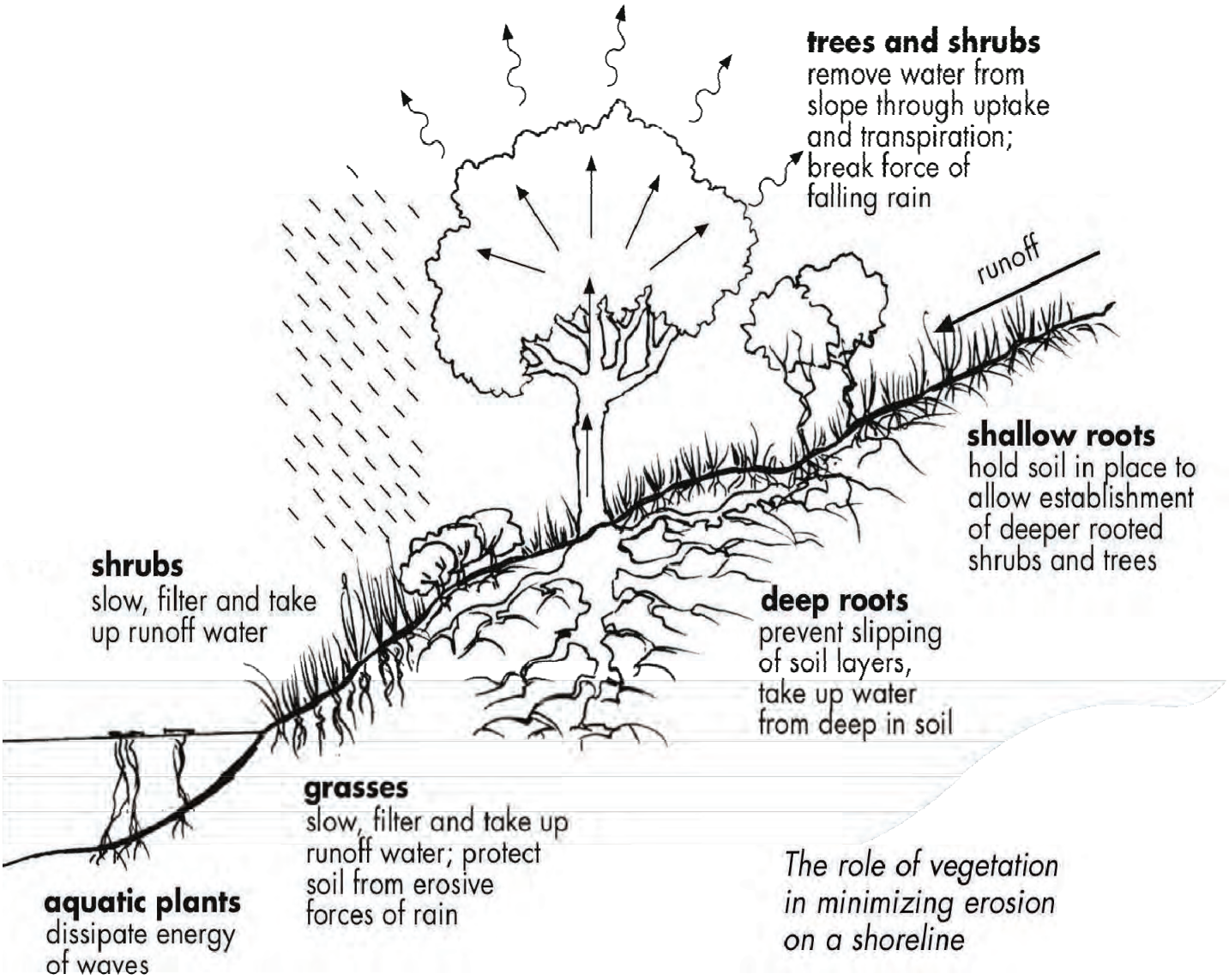
Shoreline vegetation increases water infiltration into the soil, giving less runoff.

## What can I do to Prevent Erosion?

**Tip!**

**Buffers**: the wider the better! A buffer extending back to a minimum of 15m from the lake is sufficient for most lakes. Try to work your buffer back in stages, adding a bit more buffer zone each year.

**Protect the natural shoreline. Natural Buffers are the best defense!** The best insurance policy against erosion is to keep the natural characteristics of the shoreline intact. This means keeping lots of vegetation, keeping a good buffer strip (no mowing up to the water's edge!), and leaving in place all of the stones, boulders, snags and dead branches that are found along the shoreline. These materials combine to absorb the energy from erosive forces and keep the shoreline glued together. Plus, there is little maintenance required. To establish a buffer zone, don't cut the grass and allow the natural vegetation to grow near the shore. To accelerate the growth, you may wish to plant some native plants as well. Your shoreline should be covered with native vegetation along more than 3/4 of the riparian buffer. See Contacts and Resources for more information.




*The role of vegetation in minimizing erosion on a shoreline*

**Reduce runoff.** A good way to prevent erosion is by encouraging rainwater to filter *through* the soil rather than traveling *over* soil. When rainwater travels over the ground, it can wash the soil away. To encourage rainwater to infiltrate the soil, the landowner can minimize the amount of paved or hard surfaces on their property (i.e., driveways, decks, patios). Runoff from the driveway can be directed into a settling area, and runoff from the roof should go into a rain barrel or soaking area. This will help maintain the natural, gradual water renewal process rather than allowing large volumes of water to enter the river or lake at one time. The landowner should think about controlling runoff on their property. It should be kept on site allowing it to infiltrate into the ground instead of flowing into surface waters.

**Tip!**

The 4D's of Runoff Control

**D**ecrease the amount of runoff you cause
**D**etain water to slow it down
**D**ivert the runoff to less erodible areas
**D**issipate the runoff – spread it out

**Minimize the wake from boats (and other motorized watercraft).** Boat wakes not only erode the shoreline, they can disturb aquatic ecosystems, swamp the nests of loons and other waterfowl, damage docks and boats, upset canoes and small boats, and create danger to swimmers. The best way to reduce the effects of boat wash and wake on shorelines is simply to slow down. In **Newfoundland and Labrador**, boats must slow down to 10km/hr within 30m of shore according to the Canada Coast Guard Safe Boating Guide, *The Boating Restriction Regulations*. If the boat doesn't have a speedometer, remember that at 10km/hr there will be little or no wake.

Did you know…
Over time, even small ripples from passing boats can gradually erode banks, bluffs or beaches that have had their shoreline vegetation removed.

**Take precautions during construction.** If you are building on your waterfront property, you need a plan to control erosion and to keep the disturbed area as small as possible. Make sure your contractor has a copy of the protection plans and permits. Use of erosion control equipment such as filter cloths, hay bales, and silt fences should be employed as required. Re-vegetate exposed soils as quickly as possible after construction. Fill piles should be covered with tarps to prevent soil from being carried away by runoff. If possible, construction should be avoided during wet seasons; as the softer soil will be more prone to damage by heavy equipment.

**Tip!**

Before you consider making any changes to the shoreline, obtain professional advice and check with DFO and other regulatory agencies for permits. See Permits and Legalities on page 27.

**Did you know…**

The sediment and silt then enters surface water from runoff and erosion can:

- Destroy plant habitat by blocking sunlight
- Increase costs of water treatment
- Make swimming less enjoyable
- Cover fish spawning beds

**Limit impacts of foot traffic.** Foot traffic can trample vegetation and, especially on steep slopes, cause soils to loosen and fall away from the shore. Depending on the degree of the problem, you may want to omit access entirely to that portion of the shoreline or simply control the access. Barricades like fences, hedges, or brush can prevent access to certain areas, while the use of terraces, boardwalks, or stairs can help control access and reduce the impact.

**Contour & cover pathways.** Pathways that extend from a building to the water's edge generally tend to take the shortest route to the water, which is often a direct downward route. This encourages erosion, since the gravity can pull soils and runoff straight down the path toward the water. A better option is to position (or if necessary, re-route) pathways to follow the contours of the slope from the building to the water. Any exposed soil on pathways and heavy traffic areas should be covered up. Mulched wood chips, straw, and pine needles make good material for covering up bare patches. This prevents the soil from blowing away or being washed away by rain.

**Avoid/reduce alterations to water courses.** The natural meandering pattern and vegetation-lined banks are what makes a river or stream work. The water's energy is dissipated through the turns and absorbed by the vegetation. A natural, meandering river has deep, calm areas called pools (where sediment is deposited) and shallow, bubbling areas called riffles, (where sediment is picked up and carried downstream); whereas channelized water courses are often one big erosive water chute. If changes are necessary, you should use 'soft' erosion control and wave breaking techniques rather than the traditional 'hard' techniques (e.g. concrete structures). Vegetation and natural materials are flexible and able to work with nature, while hard structures work against it with damaging effects. Any alterations to waterbodies are subject to the approval of Department of Environment and Conservation under Section 48 of the *Water Resources Act.* This includes activities such as land development within 15m of the high water mark, pipe crossings, culverts, ATV crossings, construction of docks/wharfs etc.

**Did you know…**

Taking water from a water source or moving rocks around to create a swimming area is altering a water course. These activities are discouraged because they may restrict fish pathways, disturb riparian areas and can change the dynamic of a lake, river or pond.

# Home Sweet Home

Imagine that you have chosen to live in a boat for a year on a tiny lake. You use the lake's water for drinking (so you don't want to pollute it with your wastes) and as a disposal site (you have nowhere else). Everything you do- washing the dishes, using the toilet, traveling- could affect the safety and cleanliness of the water and your ability to survive. This is analogous to living by the water! There is an increased risk that any products you use in your home may end up in our waters- through surface runoff or through ground water. Because **we are all in the same boat**, our choices affect our neighbours and their choices affect us. Water quality starts at home and each individual and household can make a difference!

◆Use common sense ◆Find alternatives ◆
◆Be an informed consumer ◆

**Conserve water**. The single most effective way to do this is to replace your old 20L per flush toilet with a new, efficient 6L per flush toilet. This can reduce your household water usage by 30%! Use low-flow toilets and showerheads and use aerators in your bathroom and kitchen sinks. Be sure to fix all leaky faucets in the house. Take a shorter shower! Turn off the tap when you're brushing your teeth. Do only full loads in the dishwasher or the laundry machine. Use rain barrels to collect rainwater for use in the garden. Use **greywater** to water your garden or to wash your car.

**Use alternative cleaning products**. Consider using baking soda, vinegar, pure liquid soap, vegetable oil, washing soda, scrubbing pads and steel wool. Note that borax, ammonia and hydrogen peroxide are toxic and are harmful to your health. Wear rubber gloves and work in a well-ventilated area to protect yourself.

## Tip!

**Greywater** is any washwater that has been used in the home except for toilet water. Dish, shower, sink, and laundry water comprise 50-80% of residential "waste" water. This may be reused for other purposes such as watering your garden or washing your car.

Check out this great website!

www.greywater.net

## Website

Learn about alternative cleaners, bleaches, deodorizers, disinfectants and more at aboutcleaningproducts.com

# ALTERNATIVE CLEANER RECIPES

(Do NOT eat)

Five basic ingredients serve as the building blocks for many safe home cleaning needs:

◆**Baking Soda** - Cleans and deodorizes. Softens water to increase sudsing and cleaning power of soap. Good scouring powder.

◆**Borax** - Cleans and deodorizes. Excellent disinfectant. Softens water. Available in laundry section of grocery store.

◆**Soap** - Biodegrades safely and completely and is non-toxic. Available in grocery stores and health food stores. Sold as liquid, flakes, powder or in bars. Bars can be grated to dissolve more easily in hot water. Insist on soap without synthetic scents, colors or other additives.

◆**Washing Soda** - Cuts grease and removes stains. Disinfects. Softens water. Available in laundry section of grocery store or in pure form from chemical supply houses as "sodium carbonate."

◆**White Vinegar or Lemon Juice** - Cuts grease and freshens.

| **General cleaner** | **Laundry soap:** | **Window cleaner** | **Wood Furniture Polish** |
|---|---|---|---|
| ¼ cup baking soda<br>½ cup borax<br>½ cup vinegar<br>1 gal. water<br><br>Mix together. | 1/3 cup washing soda<br>Soap flakes<br>½ cup borax<br><br>Add washing soda to water before placing clothes in machine and substitute soap flakes or powder for detergent. Add ½ cup borax for additional cleaning power. | 2 tsp. vinegar<br>1 quart warm water<br><br>Mix together. Rub dry with newspaper to avoid streaking. | 2 parts olive oil<br>1 part lemon juice<br><br>Mix together. Rub mixture in, let stand several hours. Polish with soft, dry cloth. To remove watermarks, rub toothpaste on wood furniture. |

For many more home cleaner recipes, visit **www.ecocycle.org/hazwaste/recipes.cfm**.

# Compost, Recyclables and Toxic Chemicals: What to do with them?

**Compost organic debris.** Rather than throwing it in the garbage, compost food wastes to make your soil healthier by replenishing its nutrient content. Set a covered compost collection bin in a handy location in your kitchen and empty it regularly to prevent odour and flies.

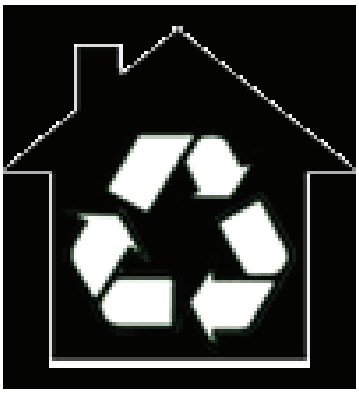
Did you know…

**HHW** items are: batteries, antifreeze, aerosol, compact fluorescent light bulbs, oil, medications, pesticides and more.

www.mmsb.nf.ca for more information.

Did you know…

In Newfoundland and Labrador, organic waste makes up 30% of our total generated waste!



**Reduce, reuse, recycle**. Reduce the amount of garbage you produce. Purchase less packaged goods. Make recycling easy by setting up labeled recycling boxes in your home so you can "sort as you go". Flex those creativity muscles by reusing materials for other purposes.

**Go toxic free!** The best way to manage household hazardous waste (**HHW**) is to not purchase them in the first place! Evaluate your need before purchasing toxic products. There are many alternatives for most products. Make sure the product will do what you want it to, and buy only the amount you will use. NEVER pour toxic products down the drain, on the ground or down the storm sewer. Don't store paint or pesticides where they can freeze. Once they thaw out, they are unusable and pose a problem for disposal. Visit www.mmsb.nl.ca/hhw.asp to find out when and where you can dispose of your HHW in your area! Note that the city of St. John's holds it's own HHW collection events.

**Tip!**

These don't belong in the garbage:

- Toxic products.
- Glass, paper, cans, metal, cardboard, recycle what you can.
- Kitchen scraps and yard waste – compost (for your garden).
- Beverage containers – return for refund.

# Lessen Your Lawn's Impact

We just love our lawns but did you ever ask a pond how it felt? A lawn is the last thing a pond wants beside it. Lawns replace the hardworking native plants that protect the lake with an "aesthetically pleasing" grass that is too short. On a natural shoreline, 90% of rain is absorbed however, on a lawn with short grass, 55% of precipitation runs off into the lake. This of course causes erosion into the waterway. In North America, watering our lawns makes up 60% of our daily domestic water use.

Pesticides are chemical ingredients that are specifically designed to kill "undesirable" organisms such as weeds, insects and fungi. At the same time, they can also kill insects that help your garden, like ground beetles, ladybugs, wasps and spiders. While there are over 6,000 pesticide products registered in Canada, their overall impact on humans and wildlife is generally unknown. In some cases though, their use has been linked to some forms of cancer. A typical, chemically manicured lawn has between 5-10 times the concentration of pesticides per acre than on most farm fields. And with all of our watering and lawn mowing, they are easily transported to nearby waters. So, follow these tips to improve your relationship with your lawn.

**Tip!**

To encourage deeper root growth and less vulnerability during dry periods, start your lawn with a minimum 6 inches of quality topsoil.

**Less lawn, more native vegetation**. This promotes water conservation and protects groundwater resources. Native vegetation requires far less water than European turf grasses, they hold more precipitation than a lawn and they lose less moisture to evaporation and runoff. Also, they have co-evolved with pests in the area and so do not require pesticides to survive. Manicured lawns are usually depleted in nutrient content therefore, over time, native plants can replenish soil health. Also, such vegetation is crucial for native birds and butterflies- they make for a more aesthetically pleasing property. Watch out for invasive plant species – they are species that are characteristically adaptable, aggressive, and have a high reproductive capacity. As they are foreign to the area, they don't have natural enemies and this can lead to outbreak populations. Visit www.mun.ca/botgarden/home.php for a listing of native vegetation and invasive plant species in Newfoundland and Labrador. Provincial regulations require your lawn to be a minimum of 15m away from your shoreline. However, additional distance between the shoreline and your lawn is healthier.

**Mow high and let the lawn-clippings lie**. Let the grass grow to at least 8 centimeters between trimmings to conserve soil moisture. Leaving the grass clippings returns nutrients, such as nitrogen, and naturally fertilizes the soil. Caution: Only do this is if the lawn is far enough away from the water that the clippings won't get washed into the lake.

**Curb your herbicide, pesticide and fertilizer use**. When put on your lawn, these substances are easily washed into the water and are harmful to aquatic creatures! While pesticides are intended to harm insects, they have been shown to be harmful to animals and people. Children are especially at risk because of their under-developed immune system and size. Also, pests can develop resistance to applied chemicals. Before using a pesticide, herbicide or fertilizer, first consider natural alternatives. To control garden pests try garlic oil, pressure sprayers, pheromone traps or physical barriers. If you must use a pesticide, use an applicator, which allows you to direct a small spray towards a specific plant- do not apply pesticides to your whole lawn. Mix your crops with companion plants such as marigolds, onions, garlic and herbs – they help keep bugs away. Also, avoid planting areas with just one type of crop because they are more vulnerable to insect damage. Keep your lawn well aerated to improve its health. Chemical fertilizers contain a high concentration of nitrogen and phosphorus and when washed into the water cause overgrowth of algae. Most soils don't even need fertilizer – take a sample of your soil to a nursery to determine if and what nutrients are lacking. They can recommend fertilizer application rates.

**Mulching prevents weeds**. Mulch is a material made out of decaying leaves, bark and compost. Mulching is the best way to prevent weeds. While your seeds are sprouting, employ early manual extraction methods. When your seedlings are stronger and taller, weed again and apply a thick layer of mulch. Weeding is easier when the soil is damp. Mulch keeps insects out of your garden, it holds water in the soil, insulates plant roots and increases yields and fertility of the soil.

**Did you know…**

Letting your lawn clippings lie can increase your soil's fertility by up to 50%!

**Did you know…**

One kilogram of phosphorus fertilizer washed off the lawn and into the lake fuels the growth of 500kg of aquatic plants – depriving the water of light and oxygen and tangling up boat propellers.

**Website**

The Northwest Coalition for Alternatives to Pesticides protects the health of people and the environment by advancing alternatives to pesticides and herbicides.

www.pesticide.org/factsheets.html#alternatives

Did you know…

**Stormwater runoff** is water that originates from precipitation events.
**Eutrophication**: excessive richness of nutrients in a lake or other body of water, frequently due to runoff from the land, which causes a dense growth of plant life and death of animal life from lack of oxygen.

Did you know…

It's good to have native trees in a range of ages on your property. Do not remove dead trees—they become shelter for wildlife.

Website

**Do It Yourself Rain Barrel**

www.thisyounghouse.com/2009/03/how-to-make-a-rain-barrel/

**Adjust your tolerance level to insects or weeds**. Some weeds help build your soil and keep your lawn green during dry times. Would you be able to live with a healthier soil?

**Never apply nutrients just before a rain**. As nutrients are easily dissolved and carried off by rainwater, make sure you check the forecast before you apply anything to your lawn!

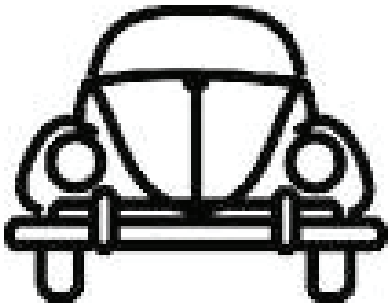
**Dispose of pet waste in the garbage or down the toilet.** Pet waste from **stormwater runoff** has a significant impact on water quality, contributing particularly to bacterial contamination. In a study conducted in the U.S., it was found that 95% of fecal coliform found in urban stormwater was of non-human origin. These bacteria are hazardous to human and animal health. Furthermore, excess nutrients from pet wastes, when washed into a pond, river or lake, can cause **eutrophication**. Water contaminated by pet waste can also infiltrate into wells.

**Be water wise**. Water your lawn infrequently but thoroughly to encourage deep root growth. Overwatering can be just as harmful as under-watering.

**Use a rain barrel** to reduce runoff and conserve water. Use this water on your garden or to wash your car. Avoid having your eavestrough discharge directly into the road or driveway. This runoff goes onto all hard, paved surfaces like your driveway, and will carry grease, oil, heavy metals, brake dust and other contaminants into the storm sewer – eventually ending up in sensitive aquatic habitats. Make your own rain barrel or purchase one at your local home improvement center.

**Turn off hose when not in use.** Easy!

# Vehicle Maintenance



We've all heard that driving a car is a huge responsibility. Did you ever think of the environmental responsibility associated with owning and driving a car? Cars negatively impact air quality and water quality and contribute to greenhouse gases, ozone depletion and noise pollution. As oil and particles are easily washed into lakes, ponds and gutters, proper vehicle maintenance and cautious vehicle usage can help protect water quality. Here are some tips to minimize your car's impact on our waterways.

**Store all fuels safely**, far away from surface water, gutters or wells.

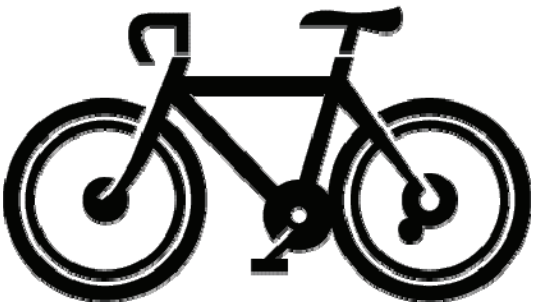
**Keep your vehicle well maintained** to reduce fluid leaks that contribute chemicals to storm water. When changing oil, use a drop cloth to capture solvents. Use as little water as possible to clean spills. Instead, use dry rags or kitty litter. Check that there is proper air pressure in your tires, as this will reduce fuel consumption.

> Did you know…
> One quart of oil can pollute 250,000 gallons of a drinking source!

**Recycle used motor oil**. Many gas stations and car care centers will accept used motor oil. Motor oil can also be taken to a household hazardous waste collection site. For dates and locations see www.mmsb.nl.ca/hhw.asp.

**Drive less**. Enjoy the outdoors! See this as an opportunity to walk, bike or take public transit. Going my way? Carpool with friends to reduce emissions and to save money on gas!

**Wash your vehicle at a car wash that recycles water** or on a permeable surface like a lawn or gravel with soap and water. This way, the ground will naturally filter the chemicals rather than them going straight into the gutter and our waterways. In Toronto and Calgary, it is actually illegal to have runoff from driveway car washing go directly into the storm sewers as this runoff carries grease, oil, heavy metals and other contaminants into nearby lakes and rivers, untreated.



← **Use me!**

**Replace small engines** found in lawnmowers, leafblowers, chainsaws and weedeaters with the latest non-polluting 2 or 4-stroke engines according to USA Environmental Protection Agency 2006 standards.

**Be careful when adding antifreeze**, especially ethylene glycol- based antifreeze because it is highly toxic. Try propylene glycol antifreeze as it is much less toxic.

**Build an open-surface driveway**, using crushed rock or paving stone. Permeable surfaces help runoff to be absorbed by the ground, replenishing groundwater and reducing flooding.

**Don't slip!** For icy surfaces, use sand, sawdust or kitty litter to provide traction. You only need a thin layer. Avoid salt (chloride) based de-icers and use ones that contain calcium magnesium acetate or potassium acetate.


Shorelines look and feel their best when they are "au naturel". When restricted by concrete, paved areas, breakwater, gabion (wire and rocks), steel and stone, not only does it look gray and lifeless, but the shoreline can literally become lifeless! As plant habitat is destroyed, other wildlife such as birds, fish and amphibians will move on to "greener pastures".

**Website**
The Living By Water Project website has lots of great resources and information.

www.livingbywater.ca

What's worse is that these hardened shorelines provide only a temporary fix for erosion problems. When wave action hits a vertical breakwater, two things happen. Firstly, the energy is deflected to the top and bottom of the wall. This causes the ground beneath the wall to wash away, causing the wall to break up and eventually topple over. Secondly, that wave energy is deflected across the water body – essentially you are causing more wave action to hit your neighbour's shoreline – causing them to have erosion problems.

Make sure you have the proper permits and authorizations when making alterations to the shoreline. See Permits and Legalities section.

**Plant a buffer zone**. This will reduce the energy of the waves and will diminish erosion in the area. Include lots of deep-rooted native shrubs to hold the soil together.

**Little, littoral zone improvements**. To extend the life of your **breakwater**, anchor a log or two at the base of a retaining wall to improve wildlife habitat and help break the force of water. This will help reduce the scouring action of waves breaking against the wall. Piling stones (riprap) at a 45-degree angle in front of the breakwater will absorb wave energy and increase the lifespan of your wall. Also, it will provide additional places for fish to hide and feed. Gradually sediment may start to deposit amongst the rocks, and aquatic plants may grow.
Shore "ladders" of riprap from the base of the wall to the top may be feasible for some walls, again with appropriate approvals from DFO and/or Water Resources Division, Department of Environment and Conservation. These will help provide wildlife (such as amphibians) access from the water to the land

**When the breakwater falls**…If your breakwater is falling apart, this is your chance to naturalize and create a shore-friendly waterfront. Dig out the bank behind the wall to a slope of 25-degrees or less. Either remove the wall or break it into smaller pieces. To keep the soil in place, cover the slope with **geotextile filter cloth**. Cover the cloth with riprap (additional stones which are 15-20cm in diameter) and plant shrubs behind the riprap. Eventually, the shrubbery will grow in between the stones and you will have a beautiful shoreline where erosion is under control.

**Erosion-prone areas**. These areas require a more active approach to control erosion, called soil bioengineering. This approach uses plant and natural materials to create erosion control structures which complement nature. As the living plant material takes root, it further stabilizes the structure as it becomes part of the land. In addition, these structures become more effective over time. Look into the possibility of using live **staking, fascines, brush layers and brush mattresses** for your erosion problems.

### Did you know…

**Breakwater**: A barrier that protects a harbor or shore from the full impact of waves, normally made out of concrete. It is also known as a breakwall.

**Geotextile filter cloth:** A thick, strong, felt-like cloth used to hold soil in place beneath rock or plantings, that allow water to pass through.

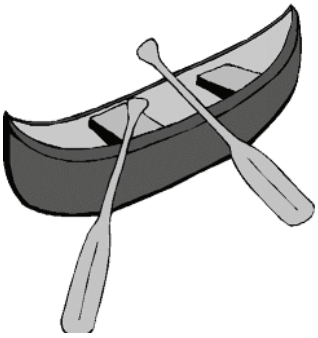
**Staking:** Putting pointed cuttings of native woody plants (30 – 60cm in length) into the ground to root and grow to prevent erosion. Native poplar and dogberry trees are good to use.

**Fascines:** Bundles of branch cuttings (1.5 – 3m in length) tied into a roll are placed in trenches along the shoreline to control erosion. They will take root, acting like a live fence.

**Brush layers:** They are similar to fascines but the branch cuttings (1m in length) are not tied together when placed in the trenches.

**Brush mattresses:** Used to cover large areas of open soil. Branch cuttings of 1.8m in length are laid on top of the soil. Again, these will take root to give a live structure.

**For more information, visit:**
www.trcr.bc.ca/docs/2002-polster.pdf



# What's Up Dock?

Docks allow us to enjoy the water we live beside. However, it is important to make sure that your dock causes minimal harm to the environment. Ill-designed shoreline structures fragment the habitat that is crucial for many lakeside creatures and can cause erosion and water-quality problems. When it comes time to replace that rickety old dock that came with your property, you must first obtain a permit from the Department of Fisheries and Oceans. A permit is also required from the Department of Environment and Conservation , under Section 48 of the *Water Resources Act* (See Contacts and Resources). Landowners are much more likely to get permission to build environmentally friendly docks –these will allow fish, wildlife and water to move beneath it, while having minimal contact with the bed of the body of water. The best way to ensure that your investment will last as long as possible and withstand the forces of nature (wind, waves, ice, currents and wildlife) is to design your dock in harmony with its surroundings. We prescribe the following tips and information for your shoreline to be in tip-top shape.

Did you know…

The **high water mark** of any body of water is where the water has been for years and has formed a distinct character in the soil from that of the bank.

**Tip!**

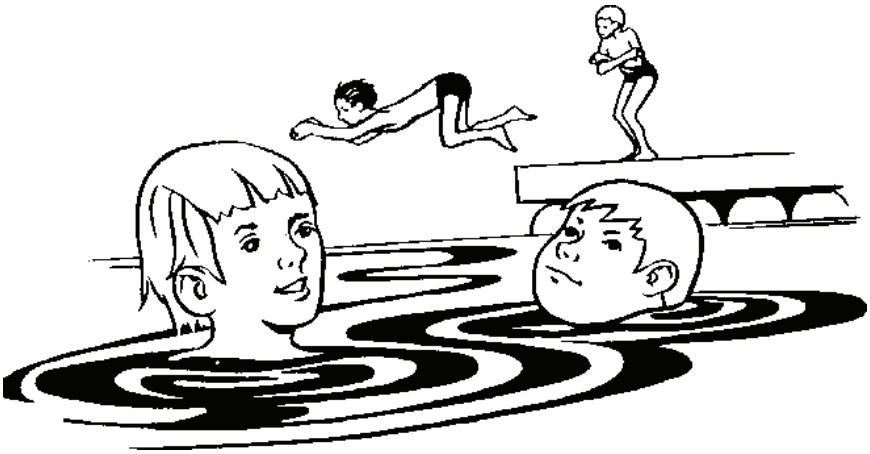
Consider sharing a dock with a neighbor. Agree in writing how responsibilities for maintenance and insurance will be shared, and what will happen if either of your properties are sold.

**Materials**. Choose non-toxic building materials whenever possible. Aspen is an excellent material for decking. Treated wood is a second choice but, be wary as it is toxic. While the preservatives kill the organisms that cause wood to rot, they can harm other creatures as well as you! If you must use pressure treated wood, buy it from a factory rather than doing it yourself as they have strict quality controls and environmental standards. There are many acceptable alternative building materials, such as UV resistant plastic lumber, that are available for dock construction. Avoid using tires as boat bumpers on your dock unless you have cleaned them thoroughly with soap and water away from the water. Use clean rocks taken from upland areas for your dock-removing rocks from below the high water mark will expose your shore to erosion and disturb shoreline habitat. Do not use styrofoam for your floating dock. It breaks into small pieces that float away and litter the shore.

**Location, location, location**. Reduce the impact of your dock by choosing a site with little or no vegetation and only develop 25% or less of your total shorefront. Also, allow your dock to lie north to south, if possible, to allow better light penetration to the submerged land underneath.

**Dock Maintenance**. In the fall, you may want to remove your dock from the water to prevent ice-damage. Wood decking sections should be stored in a well-ventilated area.

**Avoid painting or staining your dock**. It will last longer and weather beautifully without a finish. Sealing off wood with paint or plastic will cause it to rot from the inside out!



**Be a green boater**. Slow down when you come close to shore. Wave action can cause soil erosion and disturb animal habitats that are built close to the water's edge. Opt for the latest four-stroke or two-stroke injection motor that meets or betters the USA Environmental Protection Agency (EPA) emission standards for 2006. Keep up with regular maintenance and inspect fuel lines monthly. Fuel up away from the water. Use non-toxic cleaners! Never discharge black water. Use bilge pillows to soak up oil, fuel or antifreeze. Remove any plants or animals that may be clinging to the boat or motor *before* moving to a different water body so as not to introduce invasive species to a new water body.

### Website

An older 70hp two-stroke, operated for two hours, produces more airborne pollutants than driving 8,000 km in a car!

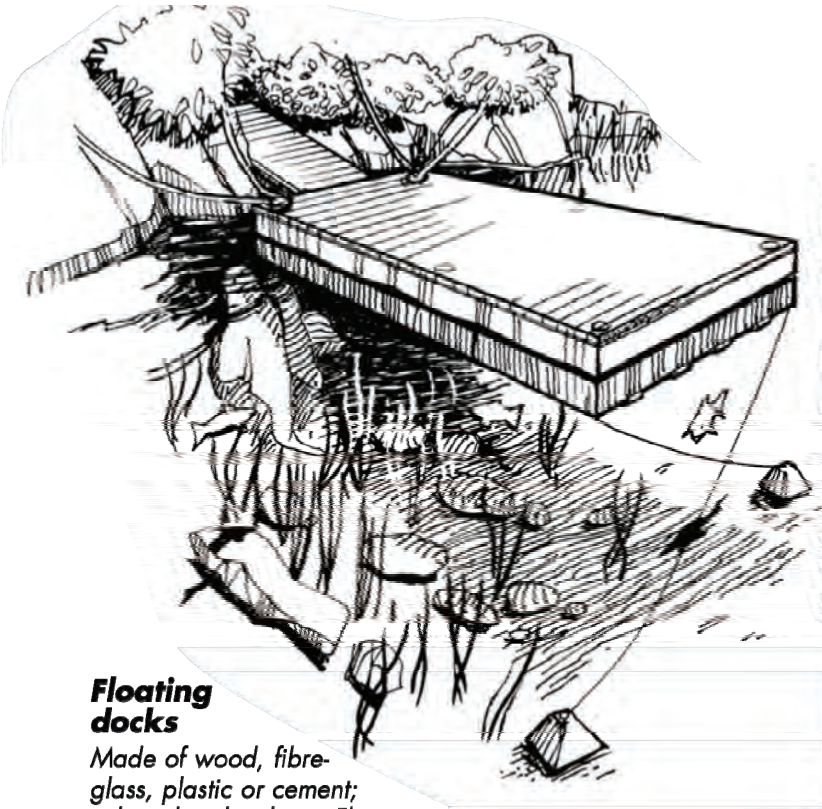
Visit www.epa.gov for more information.

### Did you know…

**HADD**:

**H**armful
**A**lteration
**D**isruption
**D**estruction
of fish habitat.

This must be avoided when doing shoreline projects. A permit from DFO (Department of Fisheries and Oceans) is required to authorize HADD of fish habitat, and is *only* granted under carefully prescribed conditions.



## Floating Docks

### advantages:

- Relatively easy to build; relatively economical.
- Adaptable to many types of shorelines.
- Distance between the top of the dock's deck and the surface of the water remains constant.
- Can be used in deep waters.
- Minimal direct disruption to submerged lands.
- Can be pulled ashore in fall to protect from ice damage.
- Approval may not be required if dock can be pulled ashore.

### disadvantages:

- Can lack stability; best if made long, wide, low and heavy (minimum size of 2 m x 6 m (6 ft x 20 ft) recommended).
- Blocks sunlight for aquatic plants and harms fish habitat.
- Heavy; pulling ashore may not be practical, or can damage the banks of your shoreline in doing so.
- May not last as long as other docks as most of its surface is in constant contact with water.

**Floating docks**

*Made of wood, fibreglass, plastic or cement; tethered to the shore. Flotation is provided either by the wood used for the dock or by building buoyant material into it. Most floating docks are accessed from shore by a ramp which moves up and down with changing water levels. Consider adding a second rectangular section to make an 'L' or 'T' shape to provide more versatility and stability.*

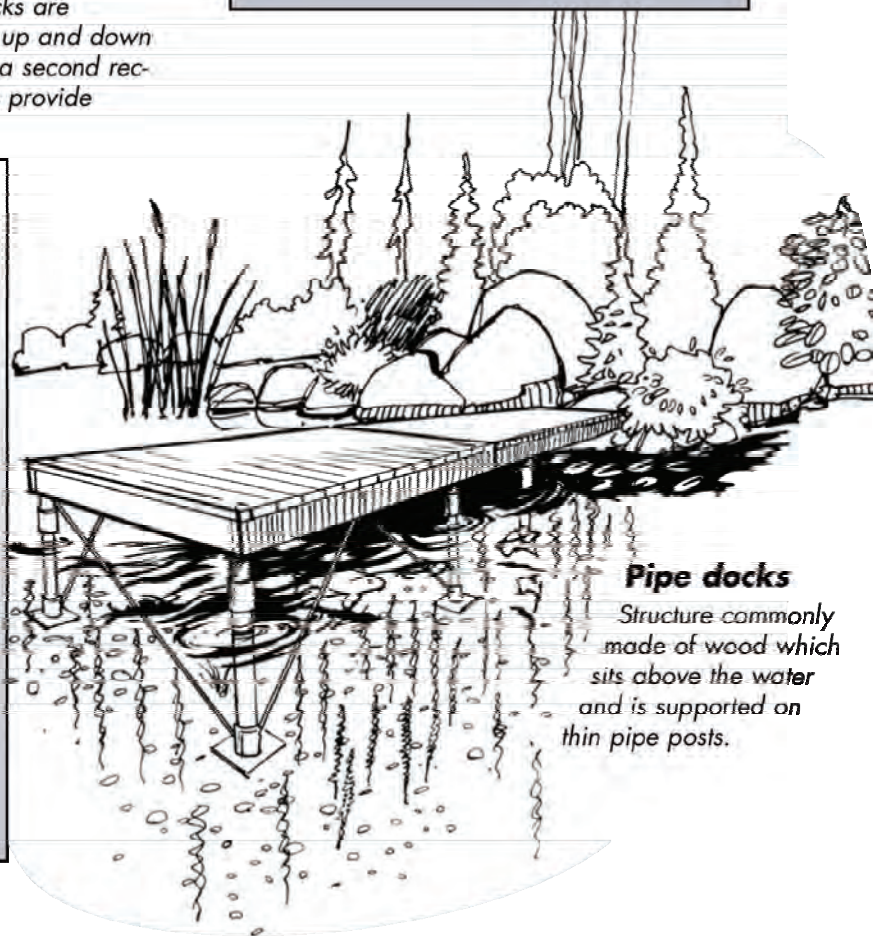
## Pipe Docks

### advantages:

- Generally the least costly dock option and easy to construct.
- Least environmental impact – minimal damage to submerged lands; sunlight can penetrate water below.
- Can be made narrow and small and still remain stable - good choice in shallow water.
- Will last longer than floating docks because less surface is in direct contact with water.

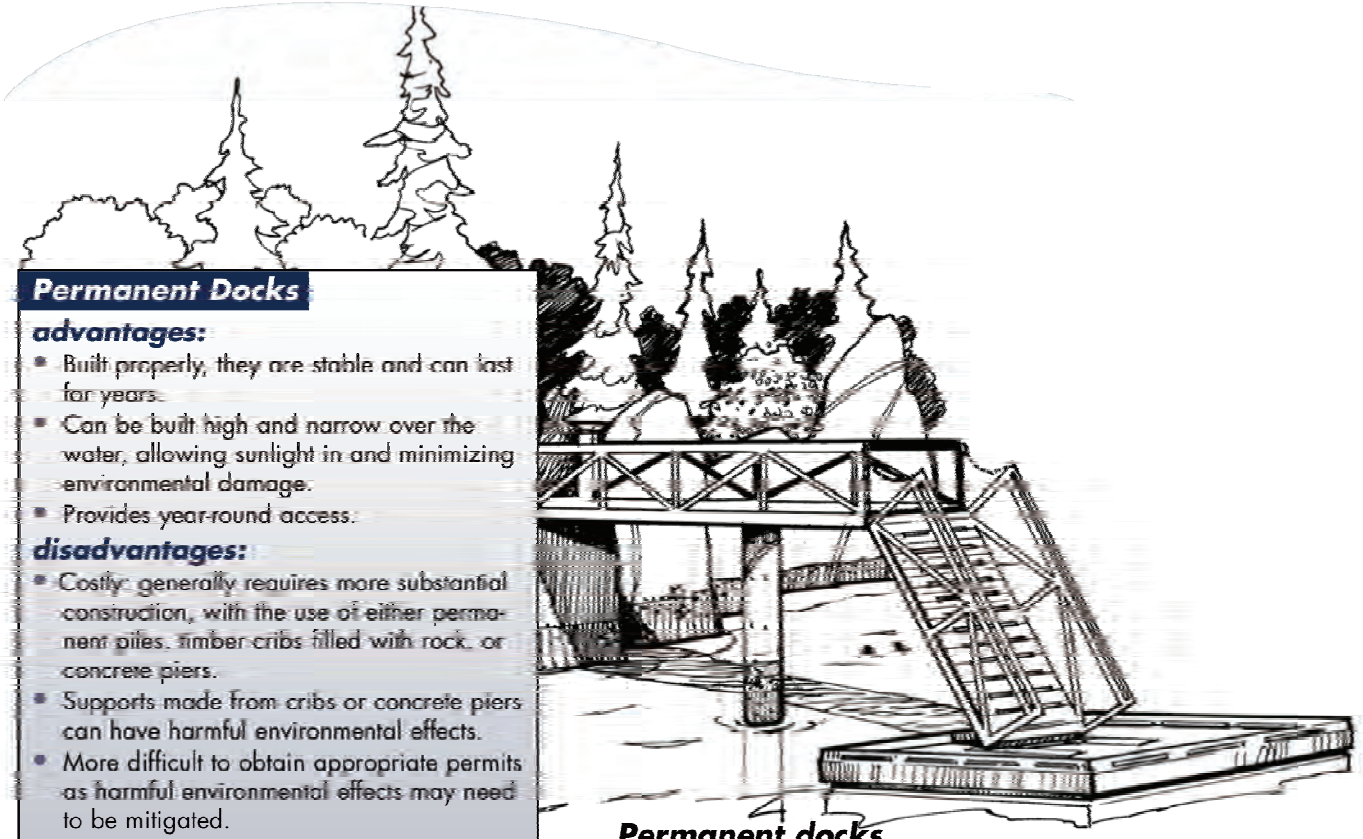
### disadvantages:

- Distance between dock surface and water surface will vary due to fluctuations in water levels; adjustable legs may be possible.
- Very sensitive to ice pressures; should be moved out of the water in the fall where water freezes.
- Doesn't create a sheltered area for moorage.
- Maximum water depth 2 m (6 ft).



**Pipe docks**

*Structure commonly made of wood which sits above the water and is supported on thin pipe posts.*



## Permanent Docks

### advantages:

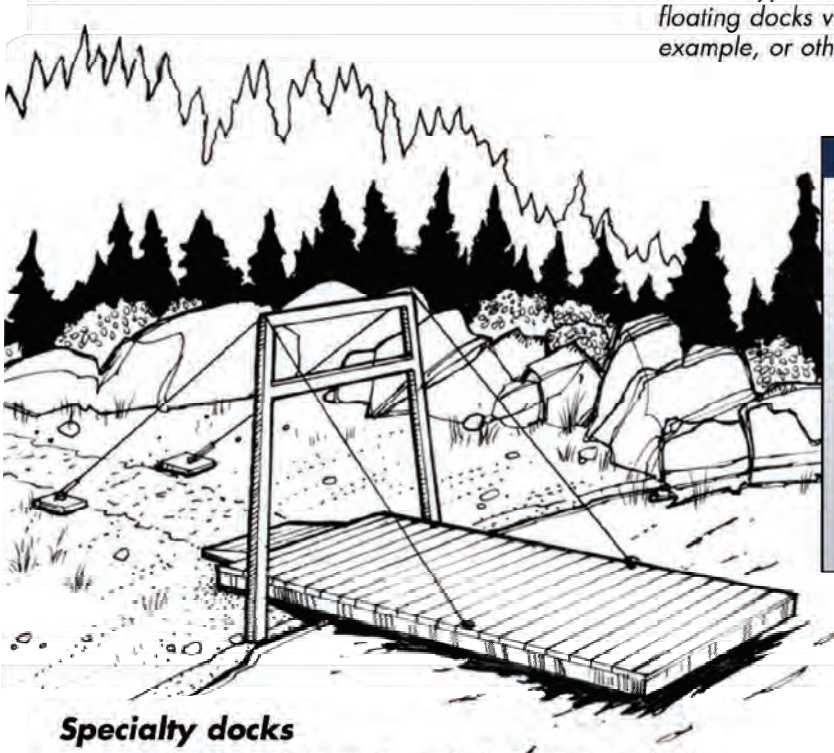
- Built properly, they are stable and can last for years.
- Can be built high and narrow over the water, allowing sunlight in and minimizing environmental damage.
- Provides year-round access.

### disadvantages:

- Costly: generally requires more substantial construction, with the use of either permanent piles, timber cribs filled with rock, or concrete piers.
- Supports made from cribs or concrete piers can have harmful environmental effects.
- More difficult to obtain appropriate permits as harmful environmental effects may need to be mitigated.
- May suffer damage in areas that experience harsh winters.

**Permanent docks**

*Used for structures which remain in place through the winter. This type of dock is frequently used in conjunction with floating docks via a ramp (to accommodate tide levels, for example, or other changes in water levels).*



## Specialty Docks

### advantages:

- No disruption to water or water body floor.
- More protected from winter ice; helps increase life span.
- Can be used in shallow water.

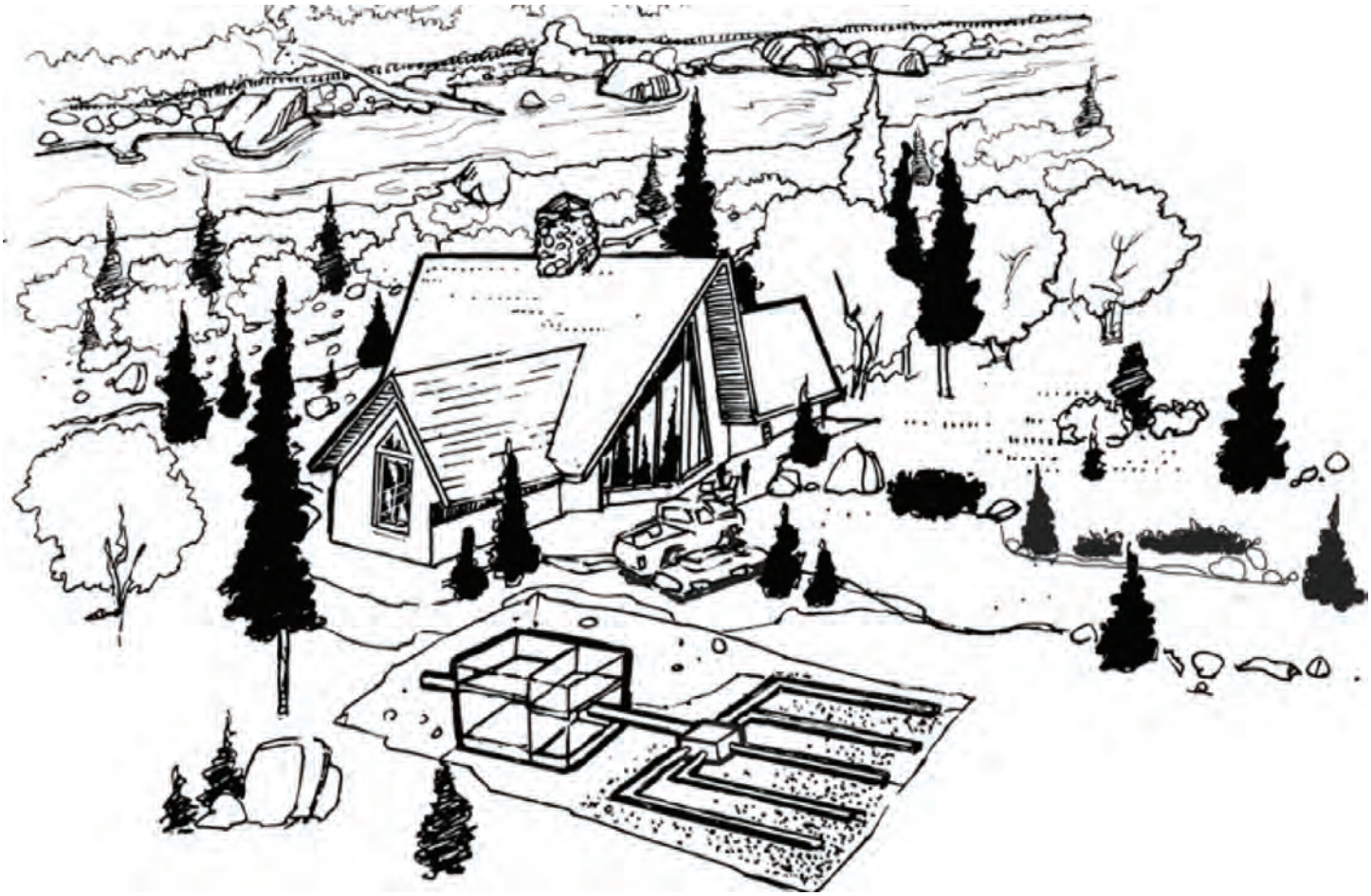
### disadvantages:

- Can be made out of wood but may need steel reinforcement if on a large body of water with heavy wave action.
- May be expensive to buy or build.
- May not be suitable for places with large changes in water levels.

**Specialty docks**

*Other dock styles include cantilever docks, suspension docks and lift docks. A cantilever dock extends out over the water, supported by the header which is usually built entirely above the high water mark. Lift docks are particularly suitable on lakes which freeze in winter because they can be moved up and back from the water surface.*

# Maintain Your Septic System



Septic systems are a great way to treat wastes. However, they need to be properly maintained. Improperly treated effluent can be hazardous to your family and the environment. One failed septic system can affect an entire community.

Septic systems treat wastewater that comes from toilets, sinks, showers and other appliances. Wastewater can contain bacteria, viruses and contaminants and so must be treated before going back into the environment. If left untreated, these contaminants can find their way into ground water sources (where wells get their water) and ecosystems. If ingested, these contaminants can cause serious health problems like dysentery and hepatitis and can be devastating to aquatic ecosystems. Using natural processes, these contaminants are processed by the septic system.

It is especially important to maintain your septic system if you live by the water as conditions in these areas may make the system less efficient in treating wastewater. Once a septic system is severely damaged, it is very difficult to fix and often must be replaced. So, to protect your health, your environment and your wallet, maintain your septic system.

**Be in the know**. Find out what type of wastewater treatment system you have, know where it is located (especially septic tank and drainage field) and know how they work. Ensure drainage field is never compacted by structures or vehicle parking.

**Watch what goes down the drain or else your system will**. Never throw solid items down the drain. Synthetic cleaning products and toxic chemicals should never be discarded down the drain- save them and discard them at a hazardous waste collection day (See Contacts and Resources). Use alternative cleaners. These systems are very delicate; if harmful substances are put down the drain, they will kill the bacteria in your septic system and it will stop working.

**Pump your septic system**. It is recommended that septic tanks should be pumped every three years.

**Inspect area regularly**. Extra green vegetation may indicate that the leaching bed is full or there is too much wastewater being pushed through the septic system. If the ground over the leaching bed is moist and soft, this may also indicate that the leaching bed is full. Odours and foul smells may indicate a saturated leaching bed, incomplete sealing of the tank, wastewater backup or broken house-to-tank pipes.

**Conserve water**. Use a low-flow toilet, install a tank volume reducer, use aerators in your bathroom and kitchen sinks, or follow the old saying "If its yellow let it mellow, if its brown flush it down".

**Subtract additives**. Septic system additives are unnecessary and costly. The best approach is to watch what goes down the drain, and have the tank inspected and pumped regularly.

**Tip!**

Provincial regulations outline minimum distance requirements for well placement. Here are several of them:

**15m** from septic tank systems

**30m** from septic fields

**75m** from manure spreadings on agriculture fields

Did you know…

Many septic system failures are caused by overloading the system with too much water. A standard toilet sends 13-20L (3-4.5 gal) per flush into your tank.

**Tip!** "If it's yellow let it mellow, if it's brown flush it down".

# Be Well Aware

Your well taps into one of nature's treasures, an underground water source which is cool and clean. Groundwater originates from surface water and precipitation, including rain and melting snow, that has infiltrated the earth, filling the cracks and open spaces in the rocks and soil. Saturated layers below the water table that store and transmit significant quantities of groundwater are called aquifers. You and your family depend upon this precious resource every day for cooking, washing, and a continuous supply of safe drinking water.

For more information, see "Well Aware; a guide to caring for your well and protecting your family's health", written by the Conservation Corps of Newfoundland and Labrador in partnership with Green Communities Canada (See Contacts and Resources).

**Keep it *well* maintained**. All wells must be properly maintained to prevent contamination. Contaminant sources affecting your well are often found in your own backyard. Keep pet waste, pesticides/fertilizers, gasoline and other hazardous materials away from your well. Keep your septic system in good running order (See Maintain your Septic System).

**Well placement**. There should be a raised, grassy area around the top of the well casing, allowing runoff to flow away from the well. This prevents contamination and absorbs excess runoff. See side table for well placement provincial *requirements*.

**Visually inspect your well once a year**. See checklist provided in Well Aware (See Contacts and Resources). If you have any concerns, have it inspected by a Department of Environment and Conservation (DOEC) licensed well driller.

**Test your water** at least twice a year for the presence of bacteria. Send your sample to the Department of Health and Community Services, they test for the presence of E.Coli and fecal coliforms. Test your water every two years for metals and minerals. Contact your local Government Service Centre or an accredited laboratory, and they can test your well water for chemicals.

**Unused wells are your responsibility too**. An unused well on your property must be properly sealed and plugged. An open and unmaintained well is a hazard and is a direct source of contamination for your groundwater and that of your community. Do not do this yourself, hire or consult a drilling contractor as they are familiar with the provincial legislation and appropriate materials for the task.

# Permits and Legalities

A permit is required before you begin any project on or near a shoreline as this area is known to be very sensitive and crucial for the majority of life in this ecosystem. There are quite a few laws that govern these areas so, depending on the activity, a permit may be required from a municipal, provincial or federal department. Failing to obtain a permit for a project can result not only in heavy fines but you would be required to undo the project itself. Understand that the laws are in place to protect you and the environment you live in so please abide by them!

For a thorough list of contacts in the Northeast Avalon Region of Newfoundland, see the Contacts and Resources section at the end of this handbook.

**Alterations to a body of water**. The Water Resources Division of the Department of Environment and Conservation of the Government of Newfoundland and Labrador (GNL), requires prior approval/permit/ authorization of alterations to a body of water before any work can begin on such a project. Such projects can include altering a body of water (surface and groundwater), water use allocation, portable water dispensing units, water and sewage works and more – this means constructing a well or installing septic systems.

Visit www.env.gov.nl.ca/env/Env/waterres/Forms/WRMD-Forms.asp for required forms.

**Get a work permit**. A work permit is required from the provincial government to build docks or boathouses, as beds of all water bodies in Newfoundland are legally public land.

**Tip!**

When you start planning to do a shoreline project, you should contact:

- DFO area office
- Crown Lands
- Local Municipality
- Water Resources Division, Government of Newfoundland and Labrador

**Don't create HADD of fish habitat.** Any project that upsets the physical, chemical and biological balance of fish habitat may damage it and must be avoided – for instance building a dock or any shoreline alterations. These include shoreline development, dock construction or removal, breakwater construction and more. Upon successful project submission, DFO will send you a "Letter of Advice" confirming that your project will not cause harmful alteration, disruption or destruction (HADD) of fish habitat. You will need authorization from the Department of Fisheries and Oceans Canada (DFO), in accordance with the *Fisheries Act*, for any cases where the HADD of fish habitat is unavoidable.

**Removal of aquatic plants – not without a permit**. Excessive aquatic plant growth may be an indicator that your water is unhealthy and is perhaps receiving too many nutrients- escaping from your lawn or garden into the water. However, simply removing the plants may be doing harm to the aquatic environment and fish habitat also. Some aquatic plants species help to remove nitrogen from the water and release it back into the atmosphere. So, removing these species may actually worsen the water quality. See a factsheet produced by the Department of Fisheries and Oceans Canada for further information: www.dfo-mpo.gc.ca/regions/central/pub/factsheets-feuilletsinfos-on/i2-eng.htm.

# Get Informed and Get Involved!

Now is the time to put these tips into action! Go out and really get acquainted with your shoreline and property. As we have perhaps the most direct influence on our shoreline, we have the power to change it for the better; allowing it to be prosperous and healthy and in return, letting it buffer and protect our water quality. If you'd like to learn more and help protect and restore shorelines, here are some ideas.
Don't forget that each small change we make can add up to make a big difference to the health of our shorelines and to our health, wealth, time and happiness.

**Join Forces!** Set up a support network- this could include your family, friends, neighbours and others who are interested in protecting shorelines in your area. You could organize nature walks in your area to appreciate the beauty that surrounds you! You may be interested in doing shoreline clean-ups in the spring, helping to bring environmentally friendly products to your area or initiating water quality sampling. Get involved in raising awareness about the importance of a healthy shoreline to the people you care about.

**Questions?** There are so many valuable resources available to you! Please see the list of Contacts and Resources on page 32 for finding help on specific topics in the Northeast Avalon region. There is also a wealth of information available online through the websites of many government and non-governmental agencies. Use the Blue Pages in your phonebook or go online to get in touch with federal, provincial and municipal representatives. They are there to help you with information and resources. Always ask for clarification if you do not understand what you are being told. When dealing with permits and regulations you want to be sure you know what is going on so you can avoid any unnecessary penalties and fines. You'll find the Yellow Pages useful for finding local businesses such as contractors, nurseries, and more.

Website
www.naacap.ca
www.nlen.ca

**You are not alone**! Join one of the many non-governmental organizations in the region helping to protect and restore shorelines. Check out the Newfoundland and Labrador Environment Network's list of Member groups at www.nlen.ca to find a group that you're interested in!

**Evaluate your shoreline**. Use the "How Healthy is My Shoreline" quiz on page 30 by taking a good look at your shoreline, home and garden. This will help you to identify areas you might need to change or improve upon to have a healthier shore.

**Take Action!** Take out this checklist of helpful hints on page 31 and put it on the fridge to remind yourself and your family of your shoreline commitments.

# How Healthy is My Shoreline?

| Statements | Page reference | Agree / Disagree / Not applicable |
|---|---|---|
| **This simple quiz can help give you an idea of whether your shoreline needs some help, or is at risk of having future problems. For a detailed scientific assessment, consult a local naturalist or biologist.** | | |
| **Shoreline** | | |
| •My shoreline is covered with native vegetation along more than ¾ of the riparian buffer (remember – turf grass is not native). ★ | 8 | ❑❑❑ |
| •There are native trees in a range of ages – young and mature trees. | 16 | ❑❑❑ |
| •There are standing dead trees used by wildlife on or near my shoreline. | 16 | ❑❑❑ |
| •There are few, if any, invasive plants on or near my shoreline. | 18 | ❑❑❑ |
| •There is very little evidence of erosion (slumping, cloudy water, loss of land). | 5 | ❑❑❑ |
| •There are few paved areas that permit direct runoff into the water. | 18 | ❑❑❑ |
| •I have a pipe, cantilever or floating dock. | 22 | ❑❑❑ |
| •My shoreline is free of any hard structures such as breakwater, standard gabions (wire and rocks) or paved ramp. ★ | 18 | ❑❑❑ |
| •My shoreline attracts a wide variety of wildlife such as fish, insects, and birds. | 14 | ❑❑❑ |
| **Garden** | | |
| •My sewage disposal system meets current standards. ★ | 24 | ❑❑❑ |
| •I pump my septic system every 3 years. | 24 | ❑❑❑ |
| •The edge of my lawn is more than 15m from my shoreline. | 14 | ❑❑❑ |
| **House** | | |
| •I avoid using chemical fertilizers and pesticides on my lawn, yard and garden. | 15 | ❑❑❑ |
| •I use phosphate-free soaps and detergents when cleaning, doing dishes or laundry. | 12 | ❑❑❑ |
| • I compost organic matter from my kitchen. | 12 | ❑❑❑ |

★*Factors which are essential for a healthy shoreline*

**Total (15)**
**Subtract number of "not applicable" boxes checked: 15 - ____ = _____ (1)**
**Number of "Agree" boxes checked: _____ (2)**

**Total %: (2) _____ ÷ (1) _____ = _____ x 100 = _____ %**

**ANY starred statements (★) marked as "Disagree":** *Your shoreline may need help.*

◆**Over 75% AND "Agree" with all of the starred statements (★):** *Your shoreline in likely in good shape.*
◆**Under 75%:** *Your shoreline may need help.*

◆**For each item you've marked as "Disagree",** *turn to the page reference for tips to improve the situation. Also, see Contacts and Resources for further information..*

# Take Action!

These are the new actions I'll take and the things I'm already doing **to protect <u>my</u> shoreline**.

## ☑I will…

### Shoreline

- ❑ **Start a buffer strip by leaving some grass uncut near the water's edge**
- ❑ **Protect a strip of native plants along my shoreline**
- ❑ **Replant native trees and shrubs along my shoreline**
- ❑ **Let natural debris (e.g. rocks, fallen trees) accumulate as much as possible**
- ❑ **Build a low-impact dock**

### Garden

- ❑ **Reduce my use of fertilizers and pesticides**
- ❑ **Handle fuels, oils and chemicals with great care and be prepared for spills**
- ❑ **Use a rain barrel to conserve water**

### House

- ❑ **Use environmentally-friendly soaps and cleaners**
- ❑ **Conserve water by installing low-flow toilets and shower heads**
- ❑ **Compost organic waste**

### Boating

- ❑ **Use oil absorbing bilge cloths**
- ❑ **Practice safe refueling**
- ❑ **Drive at no-wake speeds**
- ❑ **Purchase or use a 2 or 4-stroke motor that meets or betters EPA 2006 guidelines**
- ❑ **Maintain my boat motor and have it inspected regularly**

# *Notes*

# ☎ Contacts and Resources

| What? | Who? | Where? |
|---|---|---|
| **Agricultural Questions** | •Forest and Agrifoods Agency, Department of Natural Resources, GNL*<br>•Agriculture and Agri-Food Canada | •www.nr.gov.nl.ca/agric/, (709) 729-6758<br>•www.agr.gc.ca/, (709) 772-4063 |
| **Algae blooms** | •Department of Environment and Conservation, GNL (bluegreen algae FAQ) | •www.env.gov.nl.ca/env/Env/waterres/WQMA/Blue_Green_Algae/BGA_FAQ.asp, (709) 729-2563 |
| **Aquatic Plants** | •Fisheries and Oceans Canada, Controlling Aquatic Plants<br>•Evergreen | •www.dfo-mpo.gc.ca/regions/central/pub/factsheets-feuilletsinfos-on/i2-eng.htm<br>•www.evergreen.ca/nativeplants/search/guided.php?province=NF |
| **Boating<br>-safety,<br>speed restrictions, regulations,<br>green boating** | •Boating Safety Info Line<br>•Fisheries and Oceans Canada<br>•Boating Safety Officer<br>•Canadian Coast Guard<br>•Canadian Power and Sail Squadrons | •1-800-267-6687<br>•www.dfo-mpo.gc.ca/ , (709)-772-4423<br>•1-877-525-5255<br>•www.ccg-gcc.gc.ca<br>•1-800-808-BOAT , www.cps-ecp.ca |
| **Building<br>Regulations, bylaws** | •Local Municipality | •Blue Pages or online |
| **Burning license** | •Local Municipality | •Blue Pages or online |
| **Cleaning Products** | •Information<br>•Ecocycle, alternative cleaners and recipes<br>•Go to natural food isle in your supermarket | •aboutcleaningproducts.com<br>•www.ecocycle.org/hazwaste/recipes.cfm |
| **Composting** | •Multi-Materials Stewardship Board (MMSB) | •www.mmsb.nl.ca/composting.asp, (709) 757 3686 |
| **Crown Lands** | •Lands and Mapping, Government Services, GNL | •www.gov.nl.ca/Services/lands.stm#Crown |
| **Ditches<br>-alterations of land and vegetation near adjacent water bodies; fish screens, stream crossings, ditches, culverts** | •Fisheries and Oceans Canada<br>•Water Resources Division, GNL | •www.dfo-mpo.gc.ca, 709-772-4423<br>•www.env.gov.nl.ca/env/Env/waterres/Forms/WRMD-Forms.asp,<br>(709) 729-2563 |

*GNL: Government of Newfoundland and Labrador

# ☎ Contacts and Resources

| What? | Who? | Where? |
|---|---|---|
| **DFO Area Office** | •DFO Eastern Area Office | •1144 Topsail Rd.<br>Mt. Pearl NL A1N 5E8<br>(709) 772-5597<br>(709) 772-2659 |
| **Docks – licenses and permits** | •Fisheries and Oceans Canada<br>•Water Resources Division, GNL | •www.dfo-mpo.gc.ca, (709) 772-4423<br>•www.env.gov.nl.ca/env/Env/waterres/Forms/WRMD-Forms.asp, (709) 729-2563 |
| **Emergency** | •911 | •9-1-1 |
| **Environmental emergencies -oiled birds, oil and chemical spills, fish kills** | •Environment Canada<br>•Canadian Coast Guard | • (709) 772-2083<br>•1-800-563-9089 |
| **Erosion problems** | •Fisheries and Oceans Canada<br>•Water Resources Division, GNL<br>•Agriculture and Agri-Foods Canada | •www.dfo-mpo.gc.ca , (709)-772-4423<br>•www.env.gov.nl.ca/env/Env/waterres/Forms/WRMD-Forms.asp, (709) 729-2563<br>•www.agr.gc.ca/, (709) 772-4063 |
| **Fish habitat** | •Fisheries and Oceans Canada, Fish Habitat Management | •www.dfo-mpo.gc.ca/habitat/habitat-eng.htm, (709)-772-4423 |
| **Fishing regulations and licenses** | •Department of Environment and Conservation, Wildlife<br>•Fisheries and Oceans Canada, Eastern Area Office | •www.env.gov.nl.ca/env/wildlife/hnttrapfish/index.htm,<br>(709) 772-4423<br>•www.dfo-mpo.gc.ca/, (709) 772-5597 |
| **Flood protection** | •Water Resources Management, GNL<br>•Environment Canada | •www.env.gov.nl.ca/env/Env/water_resources.asp,(709) 729-2563<br>•www.ec.gc.ca/ |
| **Forest regulations** | •Forestry Services Branch,<br>•Department of Natural Resources, GNL | •www.nr.gov.nl.ca/forestry/ourforest/<br>•www.nr.gov.nl.ca/forestry/permits/, (709) 256-1450 |
| **Gardening** | •MUN Botanical Garden<br>•Organic Landscape Alliance | •www.mun.ca/botgarden/home.php, (709) 737-8590<br>•www.organiclandscape.org/factsheet.htm |

# ☎ Contacts and Resources

| What? | Who? | Where? |
|---|---|---|
| **Greywater** | •Greywater Central | •www.greywater.net |
| **Hazardous material disposal -paint, flammable, gas, pesticides** | •Multi-Materials Stewardship Board (MMSB)<br>•City of St. John's | •www.mmsb.nl.ca/, (709) 757 0782<br>•www.stjohns.ca/cityservices/garbage/index.jsp, 3-1-1 |
| **Health Concerns** | •Department of Health and Community Services, GNL | •www.health.gov.nl.ca/health/, (709) 729-4984 |
| **Heritage Rivers** | •Canadian Heritage Rivers System<br>•Parks and Natural Areas Divison, Department of Environment and Conservation, GNL | •www.chrs.ca/Main-e.htm<br>•www.env.gov.nl.ca/parks/rivers/, (709) 635-4520 |
| **High water mark -locating** | •Water Resources Division, GNL | •www.env.gov.nl.ca/env/Env/water_resources.asp, (709) 729-2563 |
| **Invasive Species -identification, removal** | •Canadian Botanical Conservation Network<br>•MUN Botanical Garden<br>•Newfoundland Aquaculture Industry Association (NAIA)<br>•Evergreen | •www.rbg.ca/cbcn/en/projects/invasives/invade1.html<br>•www.mun.ca/botgarden/plant_bio/Invasive_Alien_Species/invasive.php, (709) 737-8590<br>•www.naia.ca/, (709) 754-2854<br>•www.evergreen.ca/nativeplants/search/guided.php?province=NF |
| **Lake information** | •Resources Division, GNL<br>•Fisheries and Oceans Canada | •www.env.gov.nl.ca/env/Env/water_resources.asp, (709) 729-2563<br>•www.dfo-mpo.gc.ca, (709)-772-4423 |
| **Lake Management** | •North American Lake Management | •www.nalms.org |
| **Lawn Care** | •Living By Water | •www.livingbywater.ca/yard.html |
| **Lighting** | •International Dark-Sky Association | •www.darksky.org/ida/index.html |

# ☎ Contacts and Resources

| What? | Who? | Where? |
|---|---|---|
| **Livestock management -fencing, watering, waste** | •Agriculture and Agri-Foods Canada<br>•Department of Natural Resources, GNL | •www.agr.gc.ca/, (709) 772-4063<br>•www.nr.gov.nl.ca/agric/ |
| **Native trees, shrubs, plants, etc.** | •MUN Botanical Garden<br>•Evergreen<br>•Tree Canada | •www.mun.ca/botgarden/home.php, (709) 737-8590<br>•www.evergreen.ca/nativeplants/search/guided.php?province=NF<br>•www.treecanada.ca |
| **Naturalization Programs** | •Evergreen Canada | •www.evergreen.ca |
| **Nest boxes** | •Ducks Unlimited Canada | •www.ducks.ca/resource/general/wetland/pdf/duckbox.pdf |
| **Permits -work above or below high water mark -shoreline alterations** | •Fisheries and Oceans Canada<br>•Local Municipality<br>•Water Resources Division, GNL | •www.dfo-mpo.gc.ca, (709)-772-4423<br>•Blue Pages or online<br>•www.env.gov.nl.ca/env/Env/waterres/Forms/WRMD-Forms.asp,<br>(709) 729-2563 |
| **Pesticides** | •Green Communities Canada | •www.gca.ca/indexcms/index.php?pfn |
| **Poaching** | •Crime Stoppers<br>•Forest Resources, Department of Natural Resources, GNL | •1-800-222-TIPS<br>1-800-222-8477<br>•www.nr.gov.nl.ca/forestry/contact/violation.htm |
| **Rain barrels** | •This Young House, Do It Yourself Rain Barrel | •www.thisyounghouse.com/2009/03/how-to-make-a-rain-barrel/<br>www.naacap.ca |
| **Recycling** | •Local Municipality<br>•Used oil<br>•Multi-Materials Stewardship Board (MMSB) | •Blue Pages or online<br>•www.usedoilrecycling.com<br>•www.mmsb.nf.ca/recycling.asp, (709) 757 3686 |
| **Reservoirs and Dams** | •Water Resources Division, GNL<br>•Fisheries and Oceans Canada | •www.env.gov.nl.ca/env/Env/water_resources.asp,<br>(709) 729-2563<br>•www.dfo-mpo.gc.ca, (709)-772-4423 |

# ☎ Contacts and Resources

| What? | Who? | Where? |
|---|---|---|
| **River data** | •Fisheries and Oceans Canada | •www.dfo-mpo.gc.ca, (709)-772-4423 |
| **Septic Systems** | •Public Health Inspector<br>•Septic Contractor<br>•Septic System Approval, Government Services, GNL | •Blue Pages for Regional Health District<br>•Yellow Pages<br>•www.gs.gov.nl.ca/gs/gsc/water-septic/system-4545L.stm<br><br>(709) 729-2008 |
| **Sewage** | •Department of Environment and Conservation, GNL | •www.env.gov.nl.ca |
| **Shoreline Monitoring and Enhancement** | •Fisheries and Oceans Canada<br>•Department of Environment and Conservation, GNL | •www.dfo-mpo.gc.ca, (709)-772-4423<br><br>•www.env.gov.nl.ca |
| **Shoreline Restoration** | •Shoreline Restoration home page | •www.uwex.edu/ces/shoreland |
| **Shoreline stewardship programs** | •Living By Water<br><br>•Great Canadian Shoreline Clean-up | •www.livingbywater.ca<br><br>•www.vanaqua.org/cleanup |
| **Soil Bioengineering** | •Department of Natural Resources, Agriculture Branch, Land Resources Division, GNL<br><br>•Soil Bioengineering Techniques for Riparian Restoration | •www.nr.gov.nl.ca/agric/soil_land_new/aboutus.stm (709) 729-6588<br><br>•www.trcr.bc.ca/docs/2002-polster.pdf |
| **Soil surveys** | •Department of Natural Resources, Agriculture Branch, Land Resources Division, GNL<br><br>•Agriculture and Agri-Foods Canada | •www.nr.gov.nl.ca/agric/soil_land_new/aboutus.stm (709) 729-6588<br><br>•www.agr.gc.ca/, (709) 772-4063 |
| **Spills- fuel, oil, paint** | •Environment Canada | •www.ec.gc.ca |
| **Stewardship** | •Department of Environment and Conservation, Wildlife, GNL | •www.env.gov.nl.ca/env/wildlife/outreachpp/contactwildlife.html<br><br>(709) 637-2354 |

# ☎ Contacts and Resources

| What? | Who? | Where? |
|---|---|---|
| **Swimming platforms -permits** | •Fisheries and Oceans Canada | •www.dfo-mpo.gc.ca, (709)-772-4423 |
| **Volunteer monitoring -testing surface water -shoreline monitoring -River Rangers** | •Water Resources Division, GNL<br>•Northeast Avalon ACAP<br>•Canadian Nature Federation | •www.env.gov.nl.ca/env/Env/water_resources.asp, (709) 729-2563<br>•www.naacap.ca (709) 726-9673<br>•www.cnf.ca/watch.html |
| **Water -general information -conservation -rights, licenses, diversions -quality (testing drinking water) -surface water license -working in and around** | •Safe Water<br>•Water Wiser<br>•Water Resources Division, GNL<br>•Fisheries and Oceans Canada<br>•Local Public Health Inspector<br>•Environmental Permits for Alterations to a Body of Water, Department of Environment and Conservation, GNL | •www.safewater.org<br>•www.waterwiser.org<br>•www.env.gov.nl.ca/env/Env/water_resources.asp,<br>(709) 729-2563<br>•www.dfo-mpo.gc.ca, (709)-772-4423<br>•Regional Health District (Blue Pages)<br>•www.env.gov.nl.ca/env/Env/waterres/Forms/WRMD-Forms.asp |
| **Waste disposal** | •Local Municipality<br>•Waste Management, GNL<br>•Multi-Materials Stewardship Board (MMSB) | •Blue Pages or Online<br>•www.env.gov.nl.ca/env/Env/PollPrev/waste_management.asp<br>•www.mmsb.m5i.com/, (709) 753 0948, 1-800 901 MMSB |
| **Well** | •Newfoundland and Labrador Water Well Association, DOEC licensed well drillers association | •1-877-312-7810 |
| **Well Aware** | •Conservation Corps of Newfoundland and Labrador | •www.conservationcorps.nf.ca/wellaware/ |
| **Wetlands information/education -riparian area questions** | •Ducks Unlimited Canada<br>•Wetkit: Tools for working with Wetlands<br>•Water Resources Division, GNL | •www.ducks.ca, (709) 738-5405<br>•www.wetkit.net<br>•www.env.gov.nl.ca/env/Env/water_resources.asp,<br>(709) 729-2563 |
| **Wildlife and fish habitat -protection** | •Fisheries and Oceans Canada, Fish Habitat Management | •www.dfo-mpo.gc.ca/habitat/habitat-eng.htm, (709)-772-4423 |
| **Wildlife, injured** | •Environment Canada | •www.ec.gc.ca |
| **Work below high watermark -docks, removing retaining walls** | •Fisheries and Oceans Canada<br>•Local Municipality | •www.dfo-mpo.gc.ca, (709)-772-4423<br>•Blue Pages |

# Acknowledgements

Thank you to Sarah Weaver for the permission and use of *On the Living Edge; Your handbook for Waterfront Living* information and images as well as Living By Water materials. Special thanks to Diana Baird of NAACAP for her time, support and contributions to this project. Thanks to the Northeast Avalon ACAP board for their valuable input and help in editing this document. Thanks to Conor for his insightful comments and help with the layout. Thanks to Maeve for reviewing this booklet.

# References

Department of Environment and Conservation, Government of Newfoundland and Labrador. www.env.gov.nl.ca/env/.

Fisheries and Oceans Canada. www.dfo-mpo.gc.ca.

*On the Living Edge; Your Handbook for Waterfront Living, Saskatchewan/Manitoba Edition*. Kipp, S. and C. Callaway. 2003. The Federation of British Columbia Naturalists, Nature Saskatchewan and the Living By Water Project.

Living By Water. www.livingbywater.ca.

*The Living By Water Project; Effective Tools to Help Communicate the Importance of Healthy Shorelines*. 2008. The Living By Water Project.

*The Shore Primer; A Cottager's Guide to a Healthy Waterfront*. Cottage Life and Fisheries and Oceans Canada. Toronto, Ontario.

*Well Aware; A Guide to Caring for your Well and Protecting your Family's Health*. 2005. Conservation Corps Newfoundland and Labrador and Green Communities Canada. St. John's, Newfoundland.

*Water Resources Act; An Act Respecting the Control and Management of Water Resources in the Province.* 2002. Government of Newfoundland and Labrador. http://assembly.nl.ca/Legislation/sr/statutes/w04-01.htm.


Give Your Shoreline a Make-over!
before
after

## Before

1. **Cleared, manicured lot** - lacks shade and privacy; loss of native plants leads to more erosion, runoff...and work for you!
2. **Runoff** - flows over solid surfaces accelerating erosion; pollutants and excess silt degrade habitat for aquatic life.
3. **Chemical fertilizers and pesticides** - degrade water quality, are hazardous to your health and deadly for fish and other wildlife.
4. **Lawn to the water's edge** - lacks deep roots required to stabilize bank.
5. **Hardened shoreline** - can deflect erosion downstream, eliminates "natural filtering" of pollutants and sediment, degrades habitat.
6. **Artificial beach** - requires ongoing sand replacement, reduces water quality, degrades aquatic habitat.
7. **Old 2-stroke engine** - dumps 25-40% of fuel, un-combusted into water and air.
8. **Solid crib dock** - destroys aquatic habitat, alters currents, can deflect erosion downstream.
9. **Malfunctioning septic system** - allows phosphorous and bacteria to leach into adjacent waterways.
10. **Harmful household chemicals and cleaners** - damage septic system and degrade water quality.

## After

1. **Prune trees rather than removing them**; plant low maintenance native trees and shrubs to reduce erosion and absorb runoff.
2. **Replace solid surfaces** with porous materials where possible; redirect runoff into settling areas, away from the water's edge.
3. **"Mow it high and let it lie"** - leave grass 8 cm high to retain moisture, mulch clippings for fertilizer.
4. **Buffer Zone** - leave some grass uncut along the water's edge; restore with deep rooting native plants.
5. **"Soften" your shoreline** - improve erosion protection with native trees, shrubs, grasses and aquatic plants.
6. **Create a "dry land" beach above the high water mark**; let imported sand erode away naturally and native plants grow back.
7. **Use a well maintained electric motor**, or a 4 or 2-stroke engine that meets or exceeds EPA 2006 guidelines.
8. **Remove solid dock** - try a pipe, cantilever or floating dock, avoid treated wood; use public access where possible.
9. **Replace and properly maintain your septic system** - consult an expert.
10. **Use environmentally-friendly products**, or al-

# *Notes*

*Do you live by a pond, lake or river in Newfoundland or Labrador?*

Learn how to protect your shoreline and have more time to enjoy your waterfront setting. This user-friendly handbook includes tips, advice as well as many local contacts and resources to help you with the joys and challenges of waterfront living. Have fun!

# *Freshwater Joys*

**Your handbook for enjoying and protecting your fresh-water shoreline**

Topics include:

- Importance of shorelines
- Shoreline erosion
- Caring for your lawn and garden
- Co-existing with wildlife
- Tips for home
- Vehicle Maintenance
- Septic systems, Wells and Docks
- Contacts and Resources