

6 Being a Friend to Your Woods: *Protecting Your Land from Damage*

The woods in your backyard are remarkably resilient, but they are not immune from damage.

Fortunately, you have some control over the ecological health of your little piece of the earth. What you decide to do with your property (or decide not to do) affects it, the land adjacent to it, the water that falls on it and flows over it, and the birds, butterflies, and other animals that rely on it. Even doing nothing has an effect.

With a little planning and a little work, you'll see the benefits of your efforts. For example, if you see muddy water in the ditch after a rainstorm this year and you plant bushes and wildflowers to slow the runoff, your reward will be clean flowing water next year. You'll keep your nutrient rich soil in your yard and the whole range of aquatic life in nearby streams will benefit. You'll see the results of your own efforts right out your back door.

Your Woods are Unique

Several factors besides the availability of sunlight affect tree and plant growth including; the slope of the land, climate, and soil. All contribute to which tree species will grow well in a certain location. Added up, these factors make up the site conditions of a woodland. There may be more than one site on your property.

Site conditions provide a sort of natural constraint on what will grow effectively on your property. If you have a dry south facing slope, for example, white pine and woodland wildflowers will probably do well. But white cedar would not thrive. Artificial changes in site conditions are possible, but

not very practical. They tend to be expensive and require a lot of maintenance. It's much easier to work with native tree and plant species that will thrive on an existing site.

Soil: The Foundation of Your Yard and Your Woods

Soil is similar to the foundation of your house. It's not very noticeable, but there wouldn't be any thing growing on top without it. In fact, soil is one of the most important factors in determining what kinds of tree and plant species grow well in a certain location.

The basic ingredients of soil fall into two categories: mineral soil (made up of clay, silt, and sand) and organic soil (made up of



Soil:
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O - Organic Pad - Dead and decayed organic matter mixed with soil
A - A Horizon
B - B Horizon
C - C Horizon - Parent Material



Cutaway view of soil test pit

decomposing leaves and other organic matter as well as small invertebrates and other organisms). Soil moisture and air spaces in the soil also factor in to the kinds of plant or tree life a certain location can support.

The amount of sand, silt, and clay varies from place to place. Soils with a heavy clay content tend to be sticky and not well drained, though they can be quite fertile. Soils with a lot of sand tend to be gritty, not hold water very well, and usually are not very fertile. Silt laden soils feel smooth and tend to have good drainage. Loam is a fairly even mix of all three.

Decomposing trees and leaves form the organic layer (also called the O horizon). As the organic layer breaks down, it mixes with mineral soil from below to form the nutrient-rich topsoil (the A horizon) beneath the O horizon.

If you have ever dug a hole on your property, you probably noticed different colors of soil layers as the hole got deeper. The dark organic soil layer on top is usually about an inch thick. The organic layer and the layer below it (the topsoil) contain most of the nutrients that nourish a growing woodland. These rich soil layers are not easily replaced; it takes between 100 to 600 years to form an inch of top soil.

Unfortunately, wind and water can erode away an inch of topsoil in a single year if there are no trees, shrubs, plants, downed logs or other material to hold it in place. Once the topsoil washes away, it is much harder for plants and trees to grow at all and a cycle of erosion leaves the land nutrient poor. Soil sediment also is likely to end up in waterways, where it affects fish and other aquatic life.

Soil maps available from the Natural Resource Conservation Service (NRCS) can provide a general idea of what to expect from your soil. They are accurate from three to five acres. Inexpensive soil analysis kits are also available from NRCS and your county Cooperative Extension office. You send a sample of soil to the lab with information on your land ownership goals, and they send back specific information that can factor in your planning process.

The trees growing in a certain location can give you some clues about the soil. The white pine mentioned previously grows well on well-drained soils while the cedar favors poorly drained sites.

Protecting Soil and Water

Forested areas tend to act like sponges when it rains. Trees and their roots hold water in the ground and release it slowly after taking up many of the nutrients that can become pollutants if they end up in streams or lakes. They also hold soil in place when it rains. Rain that hits bare ground runs off into water ways. It has no vegetative “sponge” to soak it up, so it picks up soil, pesticides, herbicides, and motor oil as it runs off. The soil particles, once suspended in a stream or pond, rob the water of dissolved oxygen needed by aquatic life. Some fish and other aquatic life in Maine tolerate low oxygen levels in muddy water. Many more do not. A muddied stream can ruin habitats for fish, frogs, and other water dwelling creatures. As anyone who fishes for trout knows, you can’t catch a clear water fish in a muddy stream. A muddy stream doesn’t look very nice, either.

If you plan to build a house or put in a woods trail, some planning is necessary to prevent erosion when removing vegetation near water or on slopes.

Any conservation measures you take will help keep the precious soil on the ground while also keeping water clean.

CONSERVATION MEASURES THAT PREVENT EROSION INCLUDE:

- ✿ Designing woods roads and trails to divert run-off into vegetation
- ✿ Planting trees and shrubs near waterways
- ✿ Alternating small lawn areas with landscaped shrubs, wildflowers, or ground covers
- ✿ Planting areas next to driveways and parking lots
- ✿ Seeding areas that were cleared during construction
- ✿ Covering bare soil to keep it from washing away

Coping with Insect and Disease Problems

While all trees have a limited life span, insects and disease can affect the health of your woods by paving the way for premature decay. The impact can be widespread if conditions are ripe for insect or disease outbreaks. Ten million acres of mature balsam fir and spruce forest provided the right conditions for the spruce budworm to take hold in the nineteen eighties, resulting in large tracts of dead and dying trees.

As with most things, it is easier to prevent insect and disease problems than to treat them. It is not necessarily too late once mushrooms begin growing out of tree trunks, or dead limbs and discolored foliage appear, but prevention is preferable and usually less costly.

The best defense against insects and disease is to encourage a variety of different tree species to grow, since most pests specifically attack only one kind of tree or bush.



Can you find and identify these woodland features?

- a. Edge b. Riparian Area c. Snags d. Mast trees e. Vernal pool*

White pine blister rust, for example, will not attack red pine, spruce, larch, or balsam fir. A property with trees of different ages is also more resistant than one with trees of all the same age.

Some pest outbreaks can be controlled, while others run their course naturally without widespread damage to the woods. A dead tree here or there is a good thing to have in the woods: snags contribute important wildlife habitat and recycle nutrients into soil. Not all mushrooms and insects cause tree health problems, either; many are beneficial to the overall health and beauty of the woods. But you probably don't want a lot of trees to die at the same time. Diversity is the key. The more variety of trees you have, the more likely it is that your woods will remain healthy overall.

Information bulletins on specific tree ailments and newsletters on current insect

and disease conditions in the state are available from the Maine Forest Service. Contact the Insect and Disease Division at 207-287-2431 or check out their Internet site at www.state.me.us/doc/mfs/idmhome.htm

SPECIAL CONSIDERATIONS

Wetlands

Do you have woodland areas that are wet in spring but dry up in summer? If so, you probably have a temporary forested wetland called a vernal pool on your property. Vernal pools, which vary in size from as small as a mud puddle to many acres in size, provide important spring breeding sites for frogs, toads, salamanders, insects, and small mammals. Some vernal pools are home to rare and protected species.

All wetland areas and stream sides are home to a variety of life. They are also very

susceptible to erosion, so special considerations are important when undertaking activities such as cutting trees, digging, planting, and trail building. Guidelines on activities in wetland areas are available from the Maine Forest Service and the Maine Department of Environmental Protection.

Sensitive Species

How can you tell if you have a threatened plant or other sensitive species on your property? What does it mean in terms of what you can or cannot do? Most sensitive species are found in riparian areas, or the edge area between wetlands, streams, pools and adjacent uplands. Certainly, it is a privilege as a land owner to be a steward to a sensitive species, but it also carries certain responsibilities. Sensitive species rarely pose problems to property owners who want to improve their woods. The Maine Natural Areas Program puts out a list of species of special concern and can give you guidance on what may live on your property.

Laws You Need to Know Before You Cut

No-one likes laws, but four statewide conservation laws are designed to protect water quality and forest health. Amendments of the laws occur periodically, so it is a good idea to call the Department of Environmental Protection, the Land Use Regulation Commission, and the Maine Forest Service to get updates on current amendments before you cut trees or move soil. Your town office is a good place to start to find out about local regulations in your area. If no local regulations exist, then the state laws still apply.

The four state laws are:

Protection and Improvement of Waters Law

Protects waterways from pollution by soil runoff that can occur during home con-

struction, road construction, logging, or any similar activity with the potential for causing erosion.

Natural Resources Protection Act

Regulates any work done in, over, or next to any body of water, including dunes, marshes, and other wetlands. Also applies to areas that have significant wildlife habitat and to mountain areas over 2,700 feet in elevation.

Shoreland Zoning

Regulates activities as wide ranging as construction and pruning trees within 75 feet of streams and within 250 feet of ponds, lakes, rivers, tidal areas, and freshwater wetlands. Towns may have even more stringent regulations than the state, so check with the town office on local zoning requirements. If you live in an unorganized town, check with the Land Use Regulation Commission. All areas of the state are subject to shoreland zoning, so if you have difficulty obtaining information from local sources, contact the Department of Environmental Protection for guidelines.

Forest Practices Act

Regulates the size, arrangement, management, and regrowth of clearcuts. Check with the Maine Forest Service for current information on this law.

A booklet titled *A Field Guide to Laws Pertaining to Timber Harvests in Organized Areas of Maine* outlines the four laws in more detail. A booklet titled *Best Management Practices: Field Handbook* is a how-to guide for on-site erosion control.

RESOURCES

Preventing Erosion

Best Management Practices: Field Handbook.

1992. Illustrates proper procedures for preventing erosion and pollution of wetlands, streams, and waterways. Maine Forest Service.

Department of Conservation. Free. Contact: 800-367-0223.

Best Management Practices Manual. Includes sections on groundwater, plant nutrient programs, pesticides, fertilizers, animal manures, and soils. University of Maine Cooperative Extension. 35 pp. in a 3-ring binder. Bulletin # 2014. Free. Contact: 800-287-0274 or the Internet at <http://www.umext.maine.edu>

Eight Simple Steps to Clean Water. Easy to read brochure that highlights things to do at home to protect clean water. Department of Environmental Protection, Bureau of Land and Water Quality. Contact: 207-287-3901 or the Internet at www.state.me.us/dep/mdephome.htm

A Field Guide to Laws Pertaining to Timber Harvests in Organized Areas of Maine. A quick review of the laws you need to know before you cut wood. Contact: Maine Department of Environmental Protection at 800-452-1942.

Land Use Regulation Commission. Department of Conservation. Contact for information on activities in unorganized towns. Contact: 207-287-2631.

Natural Resources Conservation Service (NRCS)/Soil and Water Conservation Districts. The best local contact for information and assistance on how to protect soil and water, and the plants, trees, and animals that rely on them. Call for the number of your local office. General Information: 207-866-7241 or the Internet at <http://nrcs.usda.gov>

Protecting Water Quality in Forested Areas.

Morten Moesswilde, Water Quality Coordinator, Maine Forest Service. Personal contact: 207-287-8430 or e-mail at morten_moesswilde@state.me.us

Insects and Diseases

Know Your Tree Diseases. 1988. Designed to help youth or adults determine what disease is attacking a tree. Shows what contributes to the health—or demise—of a tree. 24 pp. Cornell Cooperative Extension. Bulletin # 153J116. \$3.00. To order: 607-255-2080 or the Internet at <http://www.cce.cornell.edu/publications/natural-resources.html>

LaBonte, George and Richard Dearborn. 1980. *Field Book of Destructive Forest Insects.* Division of Entomology, Maine Forest Service, Department of Conservation. For current information, contact: Insect and Disease Management Division at Maine Forest Service, 50 Hospital St., Augusta, ME 04330 or 207-287-2431.

Marsh, Joel W., et al. 1974. *Insect Primer, with Special Reference to Forest Pests and with Notes on Forest Tree Diseases and Injuries.* Classification of insects, with particular information on insects that are helpful and harmful to people, animals and trees. Circular No. 9. Sixth Edition. Contact: Insect and Disease Management Division at Maine Forest Service, 50 Hospital St., Augusta, ME 04330 or 207-287-2431.

Pest Alert Series. Current bulletins on tree insect or disease problems in the state. Describes the problem (*including identification in the field*), then offers remedies if they exist. An informative newsletter is also sent out during the growing season. Call or write to be put on the mailing list. Contact: Insect and Disease Management Division at Maine Forest Service, 50 Hospital St., Augusta, ME 04330. 207-287-2431.

Sensitive Species

Maine Natural Areas Program. Brochure. More information available on specific species or habitats. Contact: Maine Natural Areas Program, Department of Conservation, 93 State House Station, Augusta, ME 04333 or 207-287-8044.

Soils

Complete Soil Test Kit. Don't want to send your sample out for testing? Here's the complete do-it-yourself kit for 15 fast soil tests. Garden guide manual and the Lamotte Soil Handbook included to help you interpret results. Refills Available. \$37.95. Available from Acorn Naturalists (#TEST-6390). To order: 800-422-8886 or the Internet at <http://www.acornnaturalists.com>

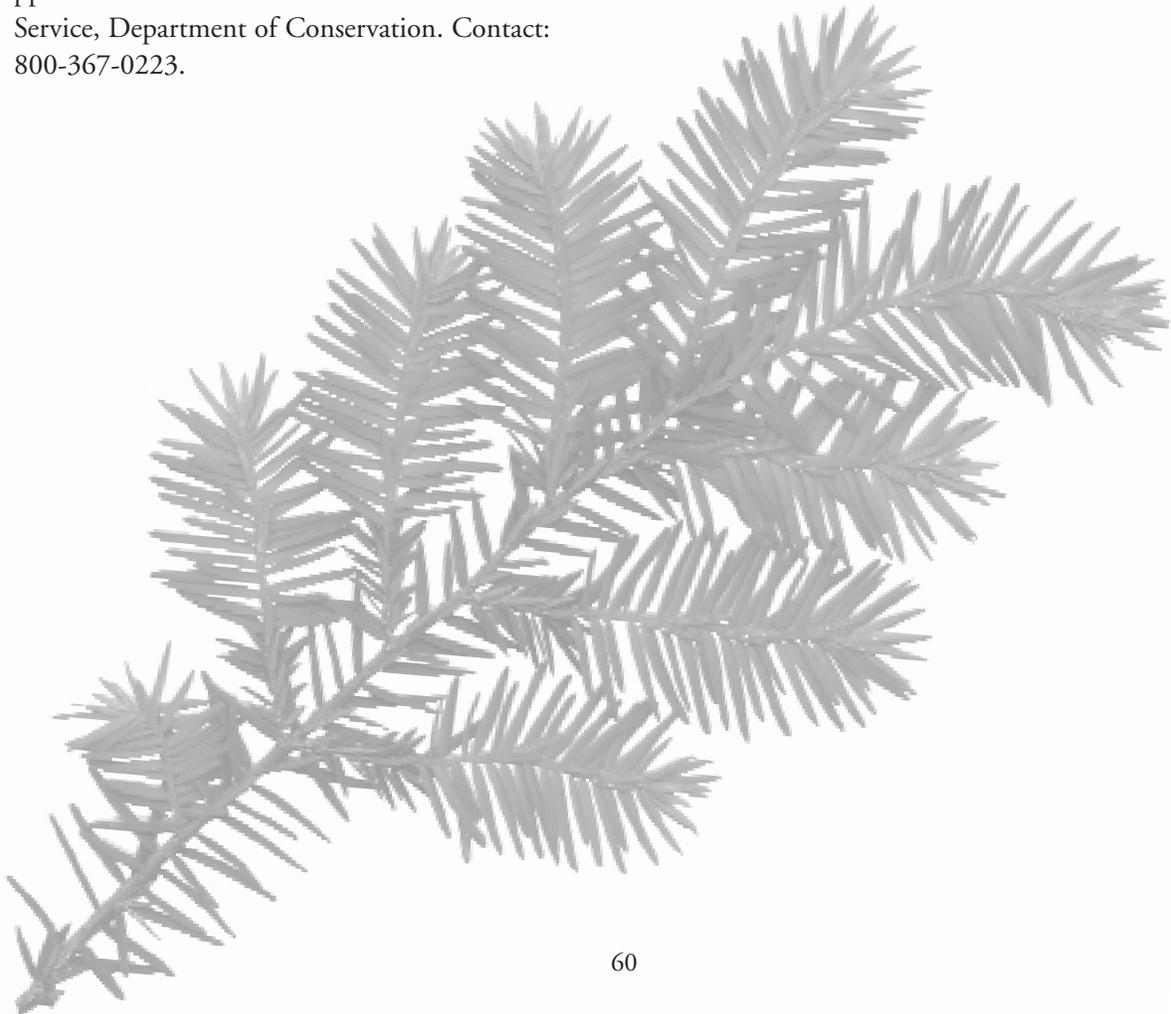
Landowners Guide to Forest Stewardship Practices: Forest Soils. Informative introductory bulletin on forest soils. Includes illustrations. 4 pp. Free. Available from the Maine Forest Service, Department of Conservation. Contact: 800-367-0223.

Natural Resources Conservation Service (NRCS)/Soil and Water Conservation Districts.

The best local contact for soil and water information and assistance. Also offers a wide range of training sessions. Call for the number of your local office. General Information: 207-866-7241 or the Internet at <http://nrcs.usda.gov>

Winkler and Rogers. *Soil.* From the award winning Our Endangered Planet series. Covers soil formation, types, weathering, relationship to groundwater, gardening and plant growth. Targets ages 9 - 16. \$16.95. Available from Acorn Naturalists (#B-4181). To order: 800-422-8886 or the Internet at <http://www.acornnaturalists.com>

What's Under It? Yankee Woodlot Series. A look at forest soils and how they function. Illustrated. University of Maine Cooperative Extension. Bulletin #7076. 6 pp. \$.50. To order: 800-287-0274 or the Internet at <http://www.umext.maine.edu>



Getting Down and Dirty: *Looking at the Soil Beneath Your Feet*

The soil beneath our backyards is full of hidden life. Tiny soil microorganisms (*and the bigger animals like earthworms and woodchucks*) are the original recyclers. They turn old leaves, dead trees, and other organic matter back into nutrient rich soil and create tiny spaces in the soil that allow oxygen and water to flow through.

Not all soils are created equal, though. The underlying rock influences the type and quality of the soil, as does the wetness of the area, and the slope. Erosion can also strip off the fertile top soil even on a good site if the land is treated poorly.

It can be a lot of fun to poke around beneath the mysterious surface to see what's below it. You can easily determine the quality of your soil in a more scientific manner at the same time by collecting a soil sample and sending it in for analysis. The University of Maine will analyze your soil for a small fee and give you some ideas about what you can grow on your property.

But first, you get to play in the dirt!



Leaf Litter - Forest Floor - Soil Critters

How many forest floor critters can you locate?

*Hint: Mouse, Salamander, Rotting Log, Millipede, Earthworm, Beetles,
Fungi - (Toadstools, Indian Pipe),
Small Woodland Flower - (Jack-in-the-pulpit)*

GETTING READY

1. If you didn't do *Backyard Family Project #1: Scouting Your Land*, now is a great time to go back and make a map of your property. It will be useful if you want to put the Family Projects together to make a plan.
2. Review the University of Maine Cooperative Extension Bulletin #7076. *What's Under It? Forest Soils* and/or *Landowners Guide to Forest Stewardship Practices: Forest Soils* available from the Maine Forest Service.

TOOLS

- ✿ Shovel or garden trowel
- ✿ Several small glass jars (baby food or jelly jars with lids work great)
- ✿ Magnifying glass
- ✿ Pen or pencil
- ✿ Soil Sleuth Checklist
- ✿ *What's Under It?* and/or *Landowners Guide to Forest Stewardship Practices: Forest Soils*
- ✿ Compass (optional)
- ✿ A photocopy of the Master Map (optional)

DOING THE ACTIVITY

Time Frame: 1 - 2 Hours

1. Follow compass bearings established in *Backyard Family Project #1: Scouting Your Land*, or simply walk through the woods until you notice a change in vegetation type. If you made a Master Map, stop and draw the vegetation boundary line on the map. (For example, if you are in a hardwood stand and come to an area with ferns and moss, that boundary may indicate a soil change. The same holds true if you come to an area with mostly spruce and fir).
2. Dig a small hole in both areas. (Soil pits are usually three feet deep, but a foot or less should be sufficient for this activity).
3. Without packing down the soil, take a sample of the topsoil from each location (about 3 or 4 inches down from the ground surface) and put them in separate jars. There is no need to fill the jars. A half cup of soil from each site should be enough.
4. Label the jars (*Site #1, Site #2, and so on*). Write the Site #'s down on the Master Map if you use one.
5. Using the hand lens or magnifying glass, look at the soil samples. What do you see? Small pieces of leaves and sticks? Small soil animals like earthworms and insects? Small pebbles or grains of sand? Sticky clay? Compare your soil samples using the Soil Sleuth Checklist. If you have a copy of the Master Map, write your soil notes right on it in the appropriate locations for each soil sample site.

6. Take your soil samples to the back porch or kitchen and add enough water to almost fill each jar, put the lids on and shake hard for several minutes until all the soil is suspended in water. No clumps should remain. Then let the soil samples sit overnight without moving.
7. The soil will settle in layers, with the largest sediments settling out first. Tiny pebbles will fall out first, followed by sand, silt, and clay on top. Organic materials may float. Compare your samples. Is the sand layer larger in one sample than another? Does one have a thicker clay layer? (Clay sometimes will stay suspended in the water for a long time, making it cloudy. This is a good indication that there is a fair amount of clay in the soil). Use *What's Under It?* and *Forest Soils* to help you figure out what you have.
8. Why do you think you found certain trees and vegetation in one site and not in the other? Does the soil give you any clues?
9. Send your soil samples to the University of Maine to be tested and you can check to see how well you did! (See *Resource list* for address information).

(Family Project adapted from *Project Learning Tree: Soil Stories*. American Forest Foundation. 1993).

FOLLOW - UP

Digging a Soil Pit

If you do decide to dig a deeper hole, you will be able to see the color changes between the different layers of the organic layer (*O horizon*), the top soil (*A horizon*), and the underlying mineral soil layers (*B and C horizons*). You will also get a better idea of the ratio of sand, silt, and clay.

A soil pit allows you to look at and feel the texture of the different colored soil layers. If you have a significant change in vegetation or slope, you may want to dig more than one hole. If you only dig one, choose a place that is representative in slope and vegetation to the rest of your property. You'll need a sharp edged shovel to dig a hole with clean, sharp sides that will allow you to clearly see the different soil horizons. Use the publications listed above to help interpret what you see. The soil will change color and texture from layer to layer. How thick is each layer? Sketch a vertical cross section of the soil profile and estimate the thickness of each layer and note it on your sketch. Knowing what your soil is made of will go a long way to giving you ideas about what you can and cannot do on your property.

S O I L S L E U T H C H E C K L I S T

- What grows on the site? Evergreens? (*White pine? Spruces?*) Hardwoods? (*Oak? Red maple?*) Ferns and mosses?
- Is the site on a hill or slope? Flat area? Depression?
- Describe the color of the soil. What kind of brown is it? Orange-brown? The color of coffee grounds? Khaki-colored? Does it look more like chocolate ice cream or whole wheat bread?
- What does it smell like? Fresh? Fishy? Clean? Rich? Like rotten eggs?
- Rub it between your fingers. How does it feel? Gritty like sand or sticky like clay? Smooth like silt? Is it dry, damp, or wet?
- Look closely with a magnifying glass. What do the different soil particles look like? Are they large, small, or both? How big are the air spaces between the particles? Can you see them?
- What little creatures do you see? Draw a sketch if you don't know what they are.
- What other organic components do you see? Pieces of leaves, twigs, or small roots? Seeds or nuts?