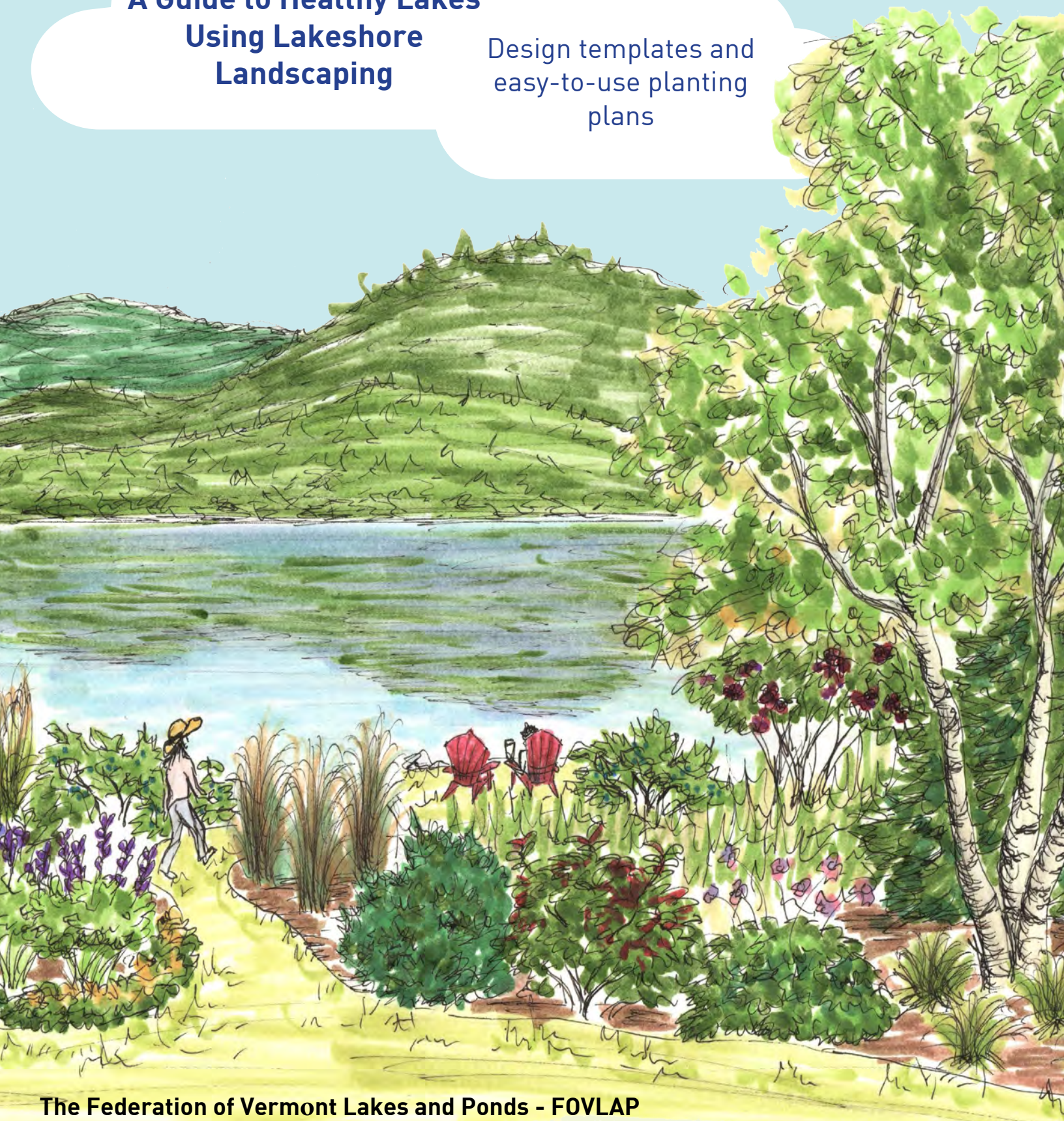
A Guide to Healthy Lakes Using Lakeshore Landscaping

Design templates and easy-to-use planting plans



The Federation of Vermont Lakes and Ponds - FOVLAP

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Keep Vermont Lakes Beautiful!

ORIGINS OF THIS GUIDEBOOK

How we got started

This booklet grew out of a series of Federation of Vermont Lakes and Ponds (FOVLAP) projects designed to encourage lakeshore property owners to add vegetation to their property. Vegetated buffers, like wetlands, are crucial to maintaining and improving water quality, flood resiliency, and aquatic and lakeshore ecosystems. When lakeshore owners act, everyone benefits. Clean water and healthy ecosystems enhance our recreational experiences, provide fish and wildlife habitat, reduce costs for drinking water systems, and protect lake property values.

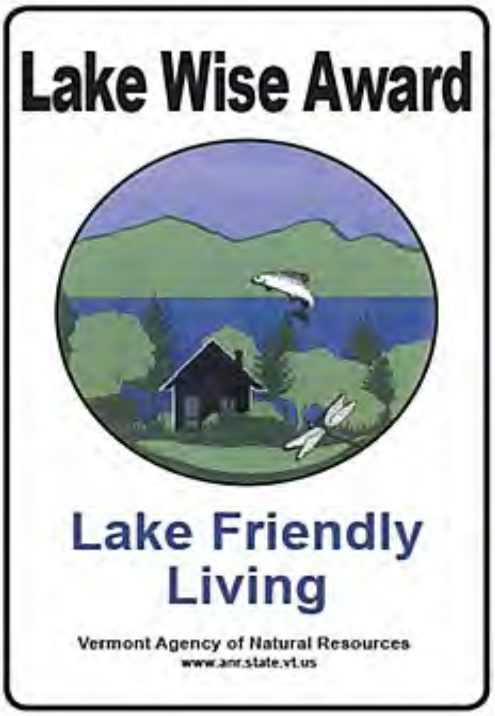
buffers for blue lakes
a program of The Federation of Vermont Lakes and Ponds

FOVLAP's Buffers for Blue Lakes projects have included: Creating a shoreland ecosystem educational kit and video, Working with Lake Association volunteers around Vermont to recruit property owners who plant blueberry bushes on their shores, Working with Lake Association volunteers to identify property owners who receive help to establish native-plant buffers and other lake-friendly best practices on their shores demonstrating a range of lake-friendly best practices featured by Vermont DEC's Lake Wise program, Developing sample landscape design templates and native plant planting plans specifically for lakeshores, and developing plans for urban lake and stream shoreland areas that emphasize native plant species and incorporate elements that invite users to explore and use the shoreland.

All of the designs and plans in this booklet use native species and can be left to re-naturalize, creating a robust vegetated buffer that will protect and enhance your lake.

What is Lake Wise?

The Lake Wise Program is an Agency of Natural Resources initiative that awards lake-friendly shoreland property, including that of state parks, town beaches, private homes and businesses. The goal of Lake Wise is to establish a new normal, a new culture of lakeshore landscaping that is proven to help protect the lake. A property that earns the Lake Wise Award will represent a "model" shoreland property. The Lake Wise Award certifies a property is well managed, using shoreland Best Management Practices, and is maintained to care for the lake. For more information about Vermont Shoreland Protection Act see page (36).



To learn more about the program, the science behind Lake Wise, and best practices for lakeshore living, visit the Lake Wise website: http://www.watershedmanagement.vt.gov/lakes/htm/lp_lakewise.htm

VEGETATED BUFFERS

What is a buffer?

Vegetative shoreland buffers, located along lakes, rivers, streams, wetlands, and ponds are the single most effective protection for water quality, lake ecosystems, and essential wildlife habitat. These strips of vegetation, which include ground covers, herbaceous plants, shrubs, and trees, as well as the organic matter that accumulates on the ground, serve as transitional areas where land and water meet to create unique and highly productive ecosystems. The canopy created by trees, shrubs and herbaceous vegetation moderates the impact of heavy rains, shades the shoreline to reduce water temperature, and produces organic matter and woody debris essential to maintaining healthy shallow-water ecosystems. Root systems also give structure to the soil, hold soil in place, direct rainfall down into the soil instead of over the soil, and can extract nutrients and filter contaminates from the soil. The abundance of water and the diversity of plant communities in vegetated buffers help support a variety of aquatic and terrestrial life. They also provide valuable social, economic and environmental benefits.

Why do we need them?

Some of the benefits of buffers include:

- Protecting water quality by absorbing excess nutrients (such as phosphorus and nitrogen) from natural and human sources).
- Recharging groundwater and limiting flooding by absorbing stormwater runoff.
- Filtering sediment and trapping pollutants, including fertilizer and pesticide residues, to purify drinking water.
- Stabilizing and protecting banks from stormwater and wave action erosion.
- Providing shade, woody debris, and nutrients to shallow-water ecosystems–the keystone of the web of aquatic life.
- Providing wildlife habitat and wildlife corridors that are essential for many species.
- Providing specialized habitat for rare, threatened, and endangered plants and other species.
- Providing economic values, including private and commercial uses.
- Providing aesthetic, recreational, educational, and research opportunities.
- Natural shoreland buffers have been lost in many places. Restoring them can improve water quality, bank stability, wildlife habitat and aesthetics around the state's lakes and ponds.

ABOUT THE PLANTING PLANS

What are these planting plans all about?

As part of FOVLAP's 2014-2015 lakeshore projects funded by a Vermont Watershed Management Division Environmental Restoration Program (ERP) grant, three general landscape design templates were developed for lakeshore properties. These templates illustrate best practices such as no-mow zones, meandering paths and steps, and native vegetation options for lakeshores. The three templates illustrate design options for level sites, gently sloping, and steeply sloping sites.

In addition to the general templates, six easy-to-use detailed planting plans were developed for specific lakeshore situations. The planting plans provide green infrastructure solutions for common lakeshore opportunities – steps and vegetation on shady slopes can absorb water and help control erosion; shade trees and edible plants can improve sunny shoreline areas; native plants and shrubs can transform grassy areas into a haven for pollinators; multi-layered, wooded planting can mimic the natural structure and functions of a lakeshore ecosystem; native water-loving plants can help manage excess water; and seating, shade, and stabilizing vegetation can enhance beach areas.

The planting plans use plants that are native to New England and include perspective drawings to illustrate the finished plantings in their mature state, sections drawings showing the root structure of the plans, and drawings detailing which plants, how many, and where to plant them. All of the plants suggested for these plans are collected in a table of plants, with useful information about sun and shade requirements, moisture requirements, zone, color, and plant size.

The shrubs and trees in the table of plants can be found at three native plant nurseries that were used for FOVLAP's ERP lakeshore demonstration projects in 2014. Many of the herbaceous plants, including perennials, ferns and grasses, are available at the two wetland plant specialists. The wetland plant suppliers identify which plants are suited for wet or shoreland areas and which are suited for more upland areas. Local nurseries will also carry many of these plants.

Check with your local nursery for native plant availability. Make sure you are getting the true natives and not cultivars of the natives, which may not have as may benefits for wildlife and may not be as hardy. Our primary sources for our 2014 ERP planting projects were: Vermont Wetland Plants, New England Wetland Plants, Intervale Conservation Nursery, and Lake Hills Nursery – Derby Center, Vermont.

INTRODUCTION

Why plant on lake shores?

Lakeshores are ecologically significant ecosystems with diverse flora and fauna that support the health of the lake and terrestrial and aquatic species. However, many of our lakeshores have been transformed into manicured lawns maintained with fertilizers, pesticides and herbicides, which have unintended consequences for the health of our lakes, wildlife, and ourselves. Since lawns have shallow root systems, water flows over the surface, carrying with it nutrients, harmful pollutants and sediments. This leads to nutrient loading and sedimentation of Vermont's water bodies, resulting in harmful effects such as algal blooms and degraded aquatic communities.

Vegetated lake buffers using native plant species are the natural way to keep nutrients, pollutants and sediments from reaching the lake, by slowing rainwater's flow and increasing water infiltration into the soil. Plants can absorb the nutrients and can filter or transform pollutants. Multi-layered vegetated buffers also stabilize banks, prevent erosion and alleviate flooding impacts, holding soil in place and absorbing and then slowly releasing excess water. Vegetated lakeshores cool waters at the lake's edge and provide food and habitat for aquatic species. Native plants also provide food and habitat for all types of shoreland wildlife. This doesn't mean you have to eliminate your lawn, but adding native shoreland plantings is critical for healthy lakes, and can also provide numerous other benefits such as berries and season-long blooms!

Lakeshore owners have the unique ability to prevent pollutants and sediment from entering lakes by letting native plants and trees grow in buffer strips along the shore. Vegetative buffers are crucial components of water quality, flood resiliency, and ecosystem protection. When lakeshore owners act, everyone benefits. Clean water and healthy ecosystems reduce costs for drinking water systems, enhance recreational opportunities, provide fish and wildlife habitat, and protect and even increase property values.

GETTING STARTED

Simple Best Management Practices for Lakeshores

- Minimum 15-25' vegetated buffer at the shore
- No-mow zones and native wildflower meadows
- Meandering paths and infiltration steps to reduce erosion
- Multi-layered lakescape gardening with native plants

Lake Wise Best Management Practices: http://www.vtwaterquality.org/lakes/htm/lp_lakewise_standards_bmps.htm

What to do first?

First, carefully preserve all existing vegetation on the lakeshore, unless it is invasive and threatens native species. The easiest way to add new vegetation is to create a minimum 15-foot no-mow zone where the lawn meets the lake. The grasses will grow to be 12-14 inches tall before going to seed. Soon, beautiful native wildflowers, grasses, shrubs and trees will establish and help to filter pollutants and improve soil integrity. Don't worry though, a no-mow zone with a well-defined edge or path meandering through it looks organized and beautifully naturalistic.

Establishing No-Mow Zones:
https://lakedunmorefernlakeassoc.files.wordpress.com/2013/08/establishing_no-mow_zones.pdf

Keep in Mind!

Carefully planned plants and shrubs won't block your desirable views and will even enhance them with framing! You can also block undesirable views with trees and shrubs. Plants make the water cleaner for swimming and wildlife. You can plant buffer zones and still have room for activities. Observe the best route to reach the lake and the best places for activities and relaxation, and design around those spaces to increase their enjoyment value!

WHAT YOU NEED TO GET STARTED

This booklet includes six lakescaping plans using native species that are easy to install and require no prior gardening experience. This section will help you understand what equipment you will need and ensure you are prepared to to plant and care for your native species garden.

Tools you will need

- Trowel
- Soil Knife
- Shovel
- Edging tool
- Watering Can or Hose





Choosing your plants correctly

You can choose to follow the planting plans we have provided, or choose your own. Here are a few design tips if you plan on the latter:

1. Make sure your plants are rated for your USDA hardiness zone.
2. Choose plants that will collectively have varying bloom times and year round seasonal interests, with diverse textures and colors.
3. Choose a diversity of plant types and sizes—try to include ground covers, grasses, flowering perennials, shrubs and trees in your designs!
4. Avoid planting in a straight line—group plants in a naturalistic way.
5. Plan for future growth and leave space for filling out.
6. Place the shorter plants in the front of your bed and taller plants in back.
7. Pay attention to the directions that come with the plant (sun/shade, soil moisture requirements).

Determine the amount of sunlight in the planting area

Different plants prefer different amounts of sunlight. Therefore it is important that you observe your prospective planting area and record the amount of sunlight/shade throughout a typical summer afternoon. Observe the direction your yard faces and where existing buildings and trees are to determine the type of sun you will be working with (hot south or west facing sun, cooler early morning sun from the east, dappled shade from a tree, etc.).

Full Sun
Part Sun
Full Shade
No preference

STEPS FOR PLANTING

Assess the moisture content of the planting area

There are many ways to evaluate moisture content of soil. A quick and simple way is to observe where there are especially wet spots in a heavy rain storm. A more scientific method is a soil percolation test. This requires some direction and labor, if you feel like getting a more accurate assessment please visit the website below.Plant according to the soil requirements of the plants. If a plant likes medium to wet soil conditions, plant these near the shore or in low spots. Higher spots that drain well will need plants that tolerate medium to dry soils. Areas that are bare, eroded, or on a slope need to be amended with mulch and compost and planted with plants that spread quickly.

Cornell Soil Testing You Can Do at Home: http://blogs.cornell.edu/horticulture/files/2012/04/HomeSoilTests-1nv3aiq.pdf

Planting methods

1. If you are planting a new bed you must first remove the lawn. Use a manual or motorized edger to create the outline of the bed. Then use a soil knife and shovel to remove the layer of sod. To avoid having to dig through sod, kill the grass first by laying black plastic on the area for several weeks.
2. Loosen the soil with a shovel at least 6" down and add at least 2" of compost to the entire bed, then mix the compost in with the layer of topsoil. This will help with drainage, regulating soil moisture, and plant growth. There is a ban on using Phosphorous fertilizers within 25' of the waters edge so stick to only using compost within that distance to the shoreline.
3. Lay out your plants according to the planting plans.
4. Dig holes for your plants. The hole should be twice as wide as the plant's root structure and deep enough so that the plant's soil is at level or a bit above the ground soil. If you plant it too low it won't grow, if you plant it high it won't die!
5. If the plant's roots are bound try to loosen them up before planting them.
6. You can also add a bit of extra compost in the plant hole before planting. Tamp (sticking your fingers into the soil around the roots to get rid of air pockets) around the plant's roots to secure it. You can even add a mini berm of soil around the base to help hold water to infiltrate down into the roots.
7. Add a 2-3" layer of fine mulch over the entire bed to suppress weeds, retain soil moisture, and provide organic matter over time to increase soil health. Mulch acts like the organic matter called duff that accumulates on the ground in naturally vegetated areas.
8. Water your plants generously immediately after planting and water them with one inch of water per week (unless it rains this much) until plants are established. This can take one to three years, depending on the adaptability and size of plants. Trees may need watering for a couple of years to fully establish.

Cornell Gardening Guide to Planting Perennials: http://www.gardening.cornell.edu/homegardening/scene39f0.html

GARDEN MAINTENANCE

Keeping up with your garden is fun and easy!

- Watering plants is essential in at least the first growing season.
- Try to do as little maintenance as possible to allow plants to provide as many ecosystem benefits as possible and evolve into a naturalistic cottage garden aesthetic. Don't be afraid of a little wildness!
- Do not cut grasses or flower stalks down in the fall. This will leave food and habitat for wildlife, and will also provide nice winter garden interest. Wait until spring to cut grasses down and lay grasses down as a natural mulch, perhaps in the back of the bed if you want them out of view.
- Pruning trees and shrubs can be done in the fall or winter. Check recommendations for specific species because you want to prune before they bud out. Also check the recommendations from Vermont DEC for maintaining vegetation on lakeshores.
- DO NOT rake out garden in spring and re-mulch. Just leave plant matter to decompose and enrich the soil, making your garden even more fertile and abundant! This will reduce the amount of additional mulch you need, and you can add mulch every two to three years instead of once a year. Mulch acts like the organic matter called duff that accumulates on the ground in naturally vegetated areas.
- Keep some wildness in your lakeshore planting. Naturalistic gardens and no-mow areas that have delineated edges are aesthetically pleasing.

A level slope site. Less than 3% slope.

A gradual slope site. Between 3-12% slope.

A steep slope site. Above 12% slope.

INTRODUCTION TO DESIGN TEMPLATES

The basic set up of planting plans

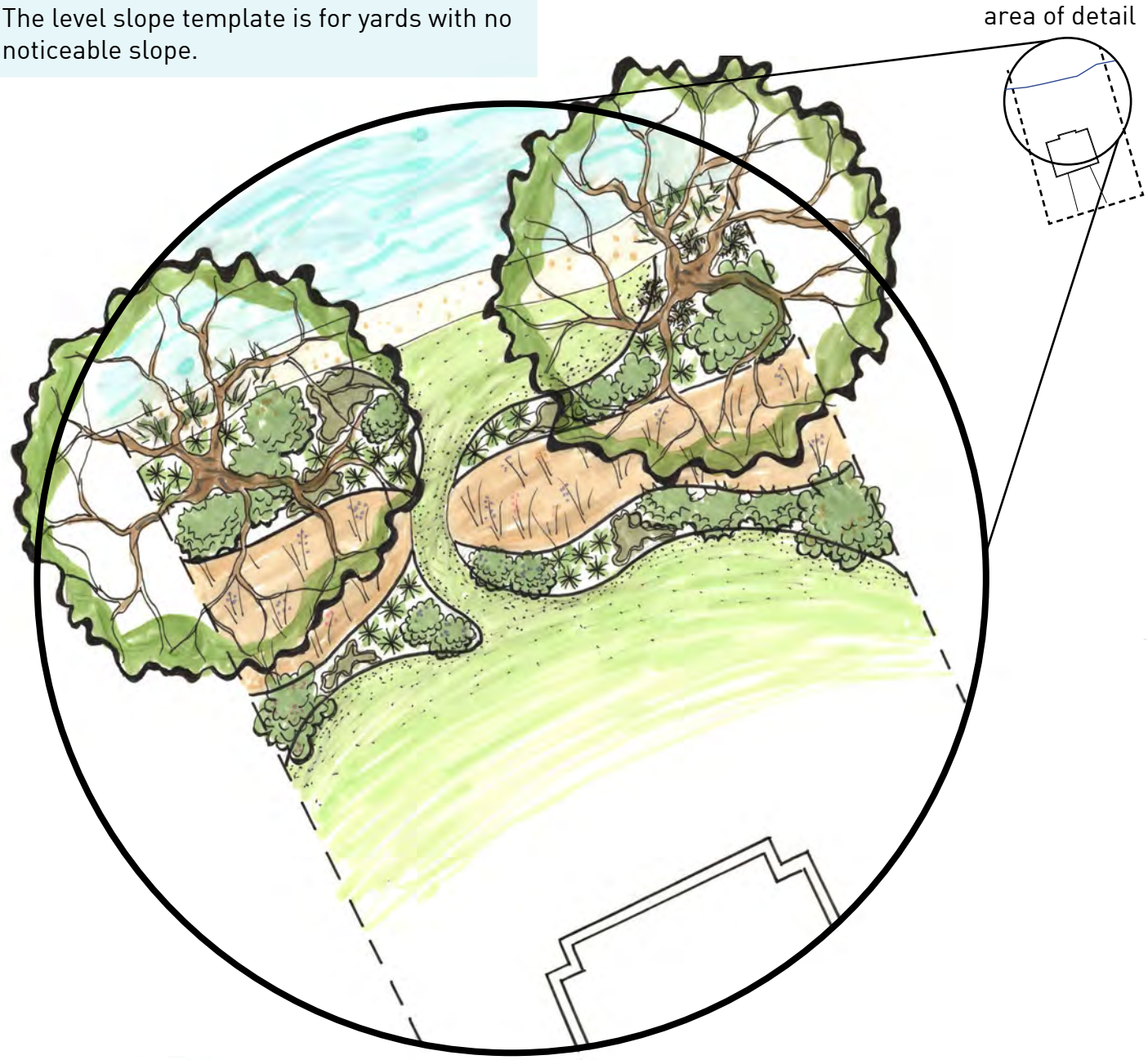
The general design of the three design templates includes four perennial garden beds with a no-mow zone in the middle. Two trees frame and enhance the view of the lake. Wetland obligate plants along the right and left edges of the beach filter water, stabilize soil, and provide habitat.

The gradual slope template is for yards with a walkable slope. The design includes four perennial garden beds sited along contour with a no-mow zone strip in the middle. Two trees and several shrubs frame and enhance the view of the lake. Wetland obligate plants along the right and left edges of the beach filter water and provide habitat.

The steep slope template includes horizontal perennial beds on contour that capture water runoff. Infiltration steps in the center allow slow percolation of water and prevent gullying and erosion. The swale at the top of the hill retains water for gradual infiltration. This template includes an existing retaining wall, which is often common on steep slopes along lakes

LEVEL SLOPE PLANTING TEMPLATE

The level slope template is for yards with no noticeable slope.



Key

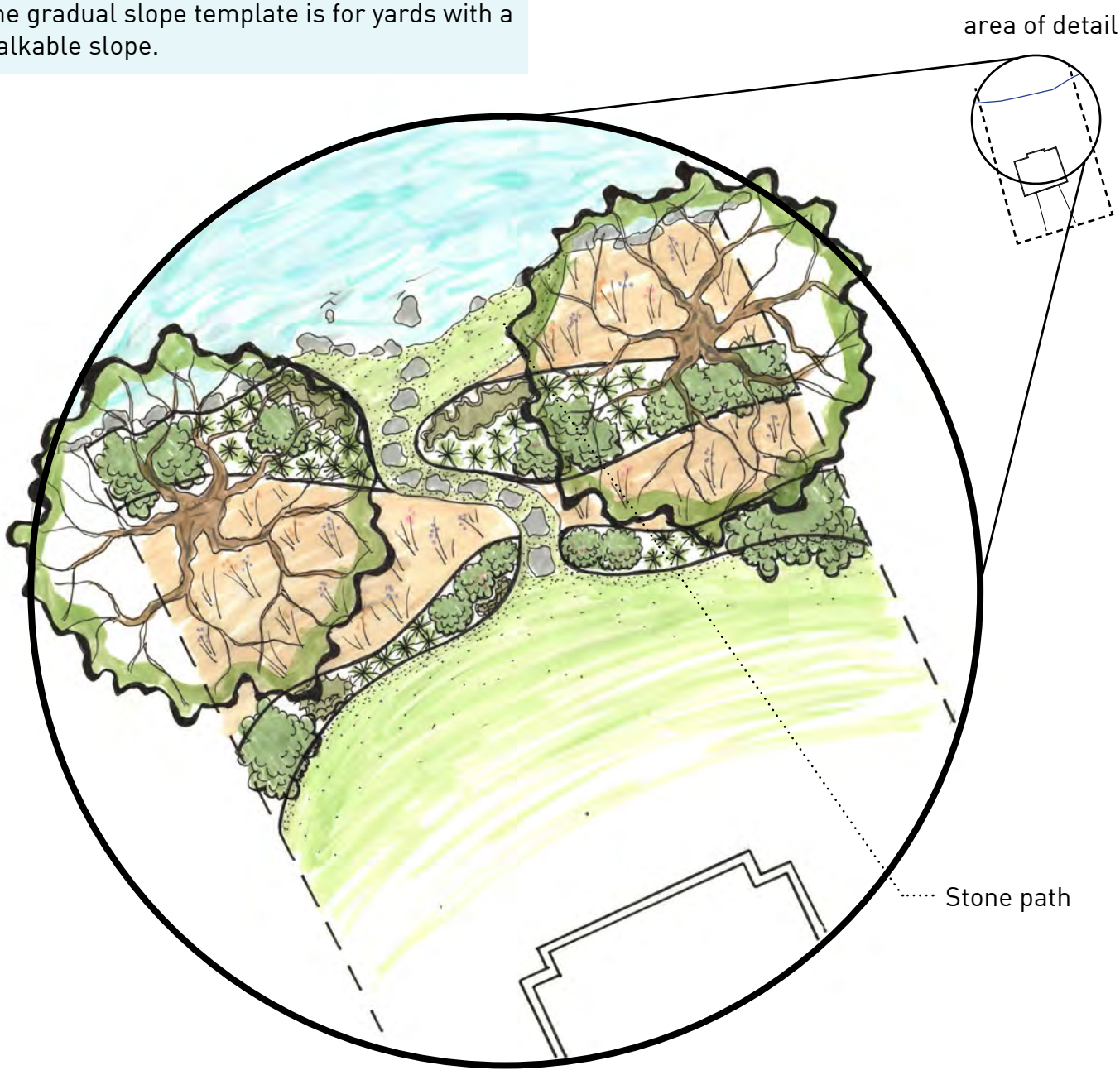
- Lawn
- No-Mow Zone
- Sand
- Lake
- ----- Property Boundary

The design includes four perennial garden beds with a no-mow zone strip in the middle. Two trees frame and enhance the view of the lake. Wetland obligate plants along the right and left edges of the beach filter water, stabilize soil, and provide habitat.

North 1" = 10'

GRADUAL SLOPE PLANTING TEMPLATE

The gradual slope template is for yards with a walkable slope.



Key

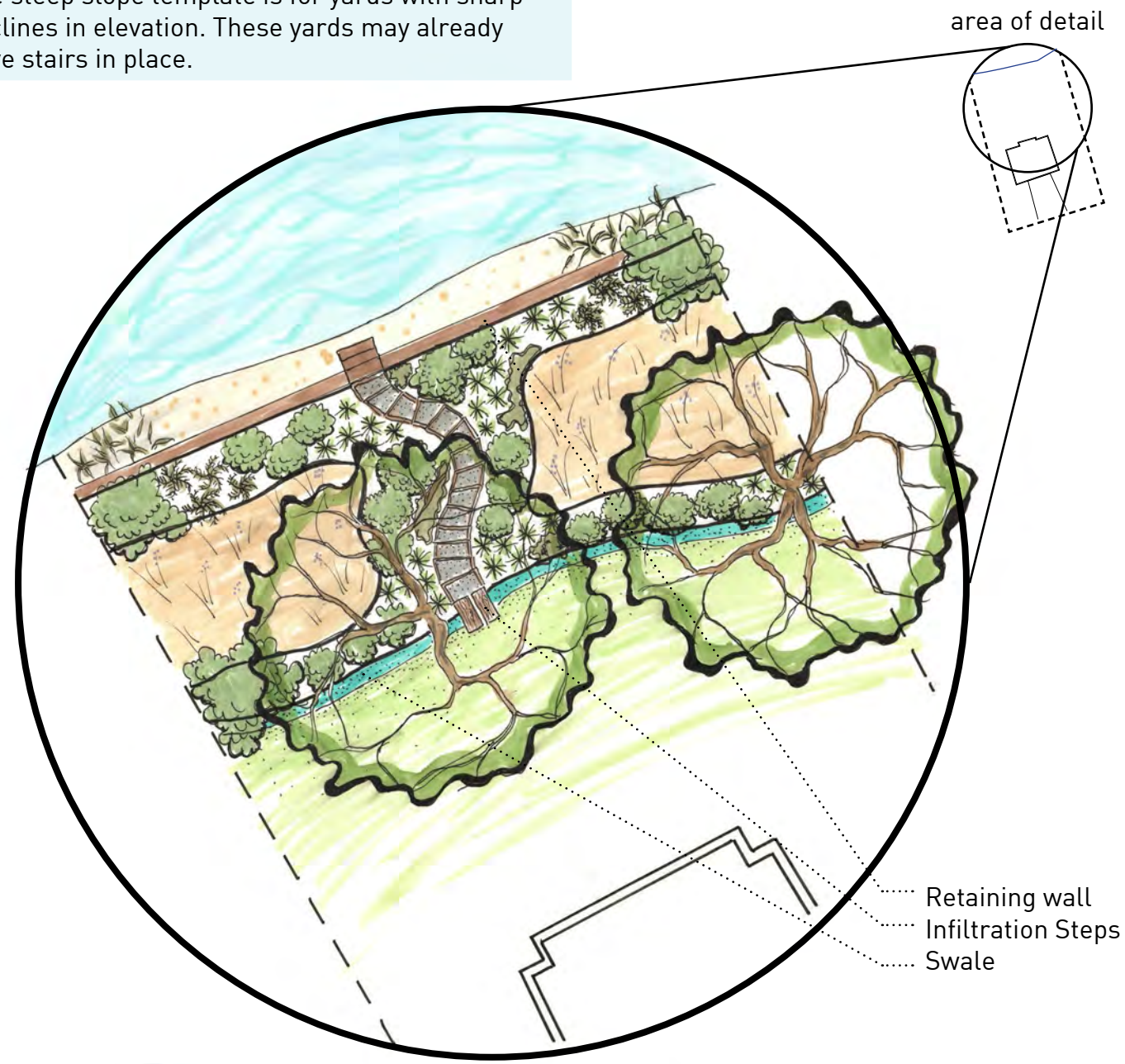
- Lawn
- No-Mow Zone
- Sand
- Lake
- ----- Property Boundary

The design includes four perennial garden beds sited along contour with a no-mow zone strip in the middle. Two trees and several shrubs frame and enhance the view of the lake. Wetland obligate plants along the right and left edges of the beach filter water and provide habitat.

North 1"= 10'

STEEP SLOPE PLANTING TEMPLATE

The steep slope template is for yards with sharp declines in elevation. These yards may already have stairs in place.



Key

- Lawn
- No-Mow Zone
- Sand
- Lake
- ----- Property Boundary

The design includes horizontal perennial beds on contour that capture water runoff. Infiltration steps in the center allow slow percolation of water and prevent gullying and erosion. The swale at the top of the hill retains water for gradual infiltration. This template includes an existing retaining wall, which is often common with steep slopes along lakes.

North 1" = 10'

LUSH AND LEAFY LANE

A shade garden for those sloped and narrow areas of your lawn!

This design is for an erosion control garden for shady areas with year-round visual interest. Consisting mostly of grasses and shrubs, the plants' extensive root systems secure the soil, reduce runoff and provide wildlife habitat. The design includes 'infiltration steps' to help with water to permeate the soil. The fern 'rain garden' captures water at the bottom of the steps in a shallow depression.

Section View

The deep rooted plantings significantly stabilize the hill and decrease possibility of erosion.

LUSH AND LEAFY LANE

Planting Plan

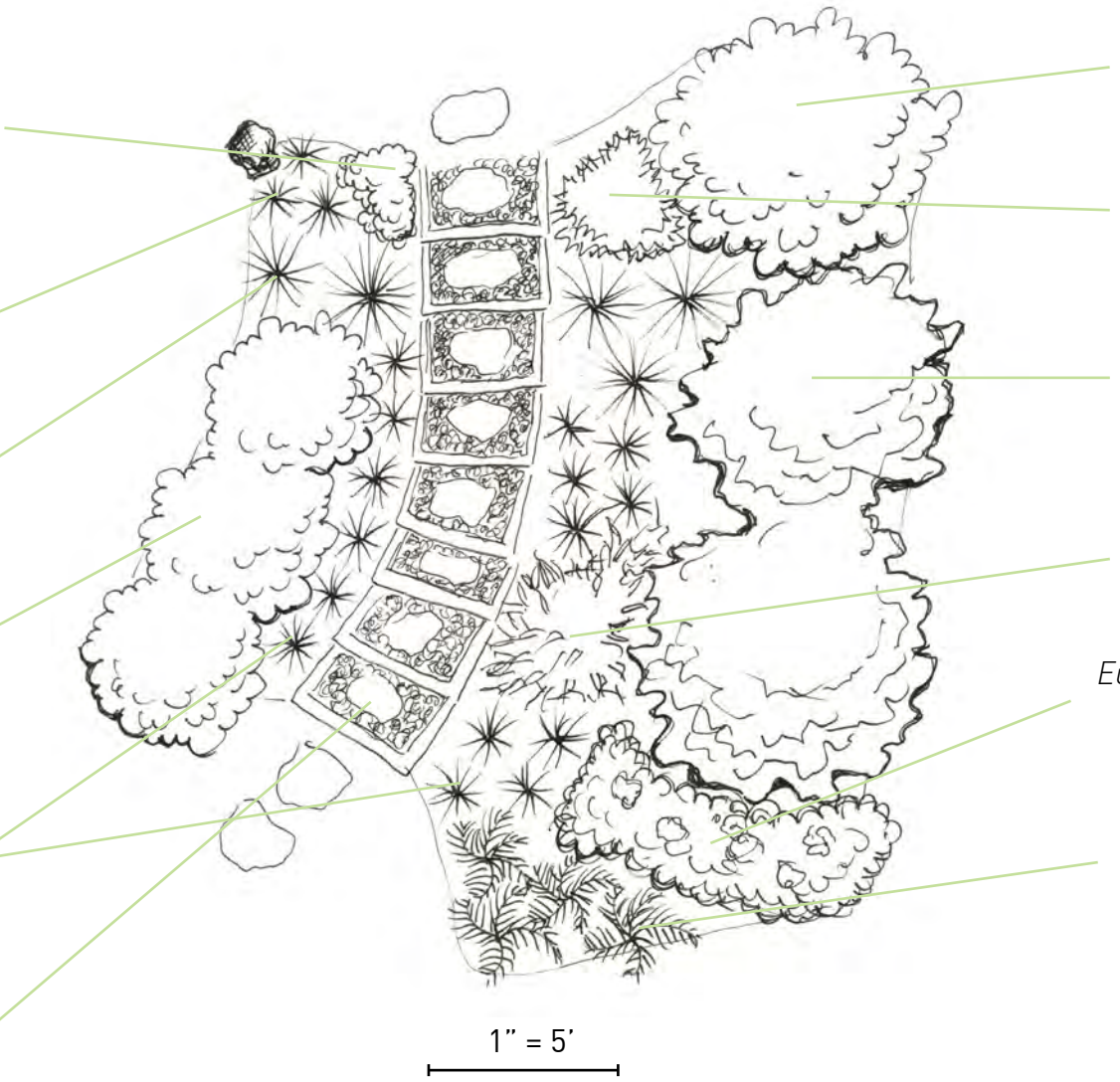
Geranium maculatum
Wild Geranium (3)

Carex vulpinoidea
Fox Sedge (3)

Panicum virgatum
Switchgrass (4)

Myrica gale
Sweetgale (3)

Carex grayi
Gray Sedge (14)



Cephalanthus occidentalis
Buttonbush (1)

Lobelia siphilitica
Great Blue Lobelia (6)

Ilex verticillata
Winterberry (2)

Tradescantia virginiana
Spider Wort (9)

Eupatoriadelphus maculatum
Joe Pye Weed (6)

Matteuccia struthlopteris
Ostrich Fern (4)

Infiltration Steps

Infiltration steps are crushed stone steps in timber frames that help with slowing water run off and allowing natural infiltration of the water into the ground.

Visit this site for detailed directions on how to build inflitration steps:
http://www.watershedmanagement.vt.gov/lakes/docs/LP_BMPInfiltrationSteps.pdf

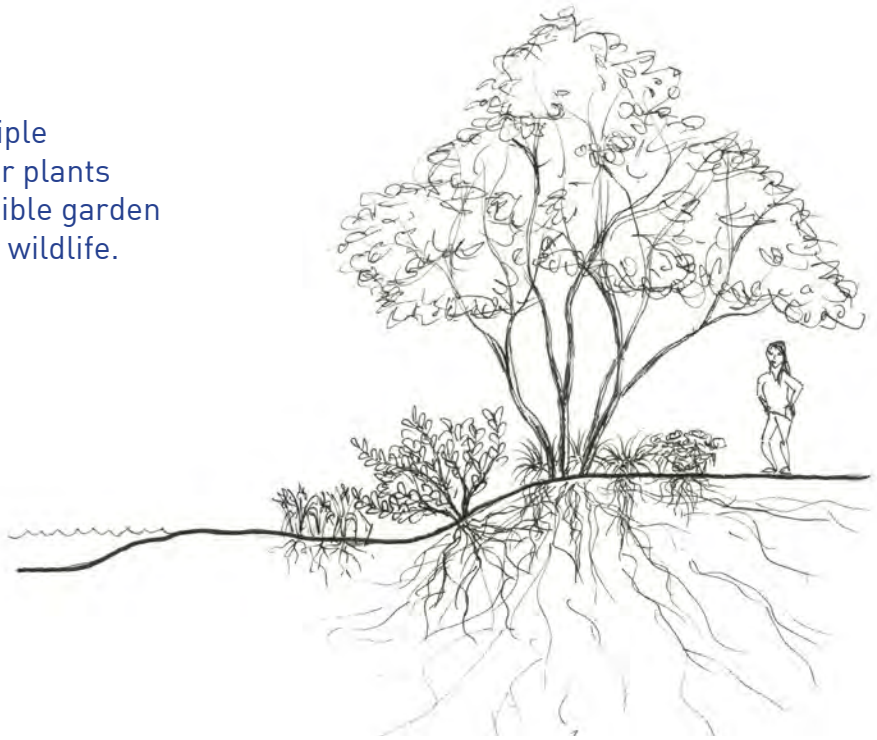
EDIBLE BEACH EDEN

A lakeside sanctuary for wildlife and people with gorgeous autumn colors!

This garden will make your shoreline more enjoyable and frame the view with edible berries and season-long blooms. Plants were selected for their tolerance to partly sunny and partly shady conditions with moist, but not saturated, soils. The diverse root systems will stabilize the lakeshore bank and help maintain a sandy beach.

Section View

The edible plant garden has multiple varieties of tasty berries and other plants with medicinal properties. The edible garden also provides food and habitat for wildlife.



EDIBLE BEACH EDEN

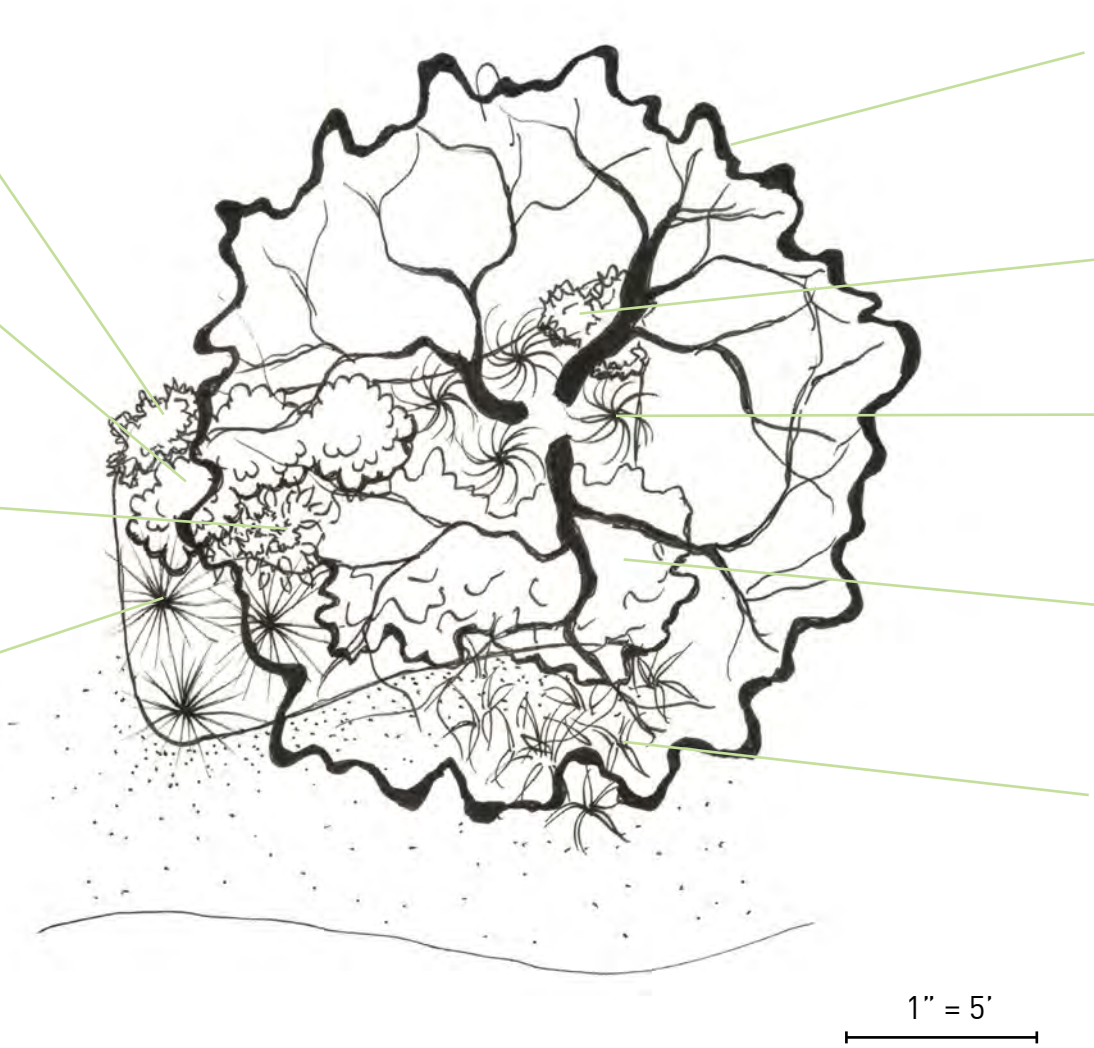
Planting Plan

Aquilegia Canadensis
Columbine (3)

Vaccinium angustifolium
Lowbush Blueberry (3)

Echnicea purpurea
Purple Coneflower (4)

Panicum virgatum
Switchgrass (3)



Amelanchier laevis
Downy Serviceberry

Asclepias tuberosa
Butterfly Milkweed (3)

Carex stricta
Tussock Sedge (4)

Aronia melanocarpa
Black Chokeberry (2)

Iris versicolor
Blue Flag Iris (5+)

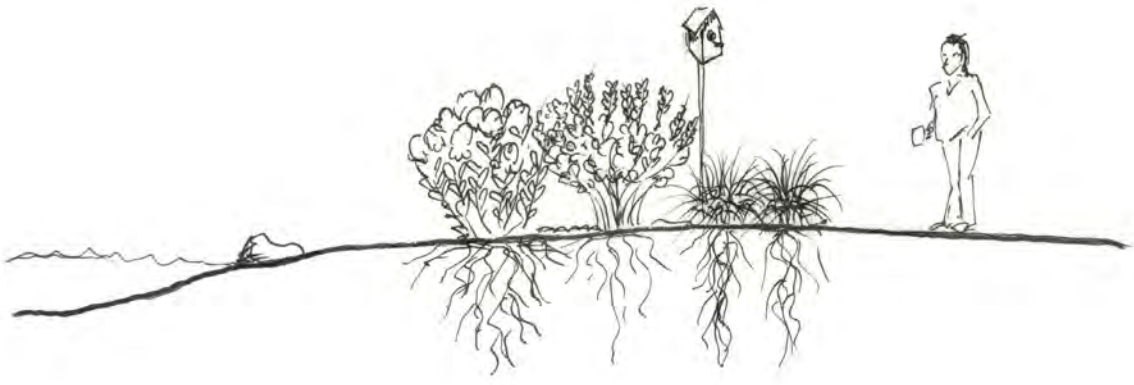
POLLINATOR MEADOW GARDEN

A vibrant cottage flower garden that will serve as a haven for birds, bees, butterflies, and you!

This garden will be buzzing with life come springtime! This cottage-style garden can require as much or little maintenance as you like, depending on your taste for the 'naturalistic' aesthetic. This design can be sited in a sunny to part-shade area in your lawn in fairly well-drained conditions with medium soil moisture. Season-long blooms will satisfy you and a variety of pollinator species.

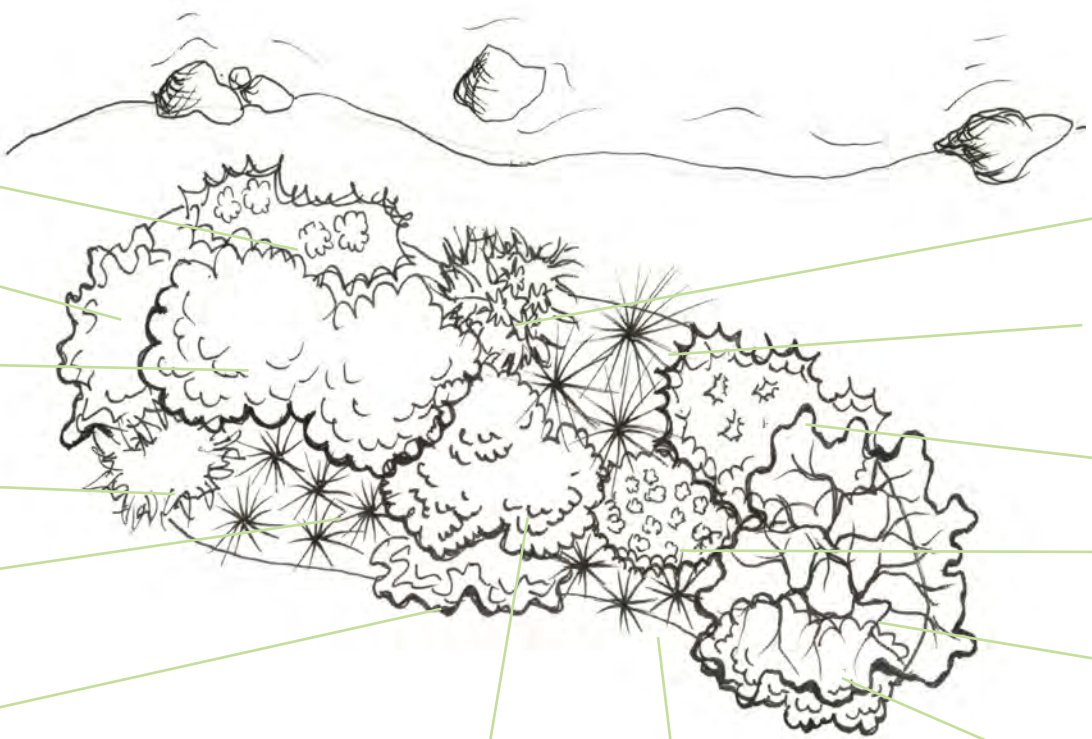
Section View

The pollinator meadow garden takes the form of a wild flower meadow with added cut flowers and extra color.



POLLINATOR MEADOW GARDEN

Planting Plan



Phlox paniculata
Phlox 'David' (6)

Geranium maculatum
Wild Geranium (4)

Baptisia australis
Blue Wild Indigo (2)

Penstemon hirsutus
Hairy Beardtongue (3)

Carex vulpinoidea
Fox Sedge (4)

Oenothera pilosella
Meadow Evening Primrose (3)

Spiraea alba
Meadowsweet (3)

Aristida purpurea
Purple Threeawn (3)

Echinacea purpurea
Purple Coneflower (4)

Sorghastrum nutans
Indian grass (4)

Spiraea tomentosa
Steeplebush (5)

Monarda punctata
Spotted Beebalm (5)

Sambucus canadensis
Elderberry (3)

Symphyotrichum novae-angliae
New England Aster (3)

1" = 5'

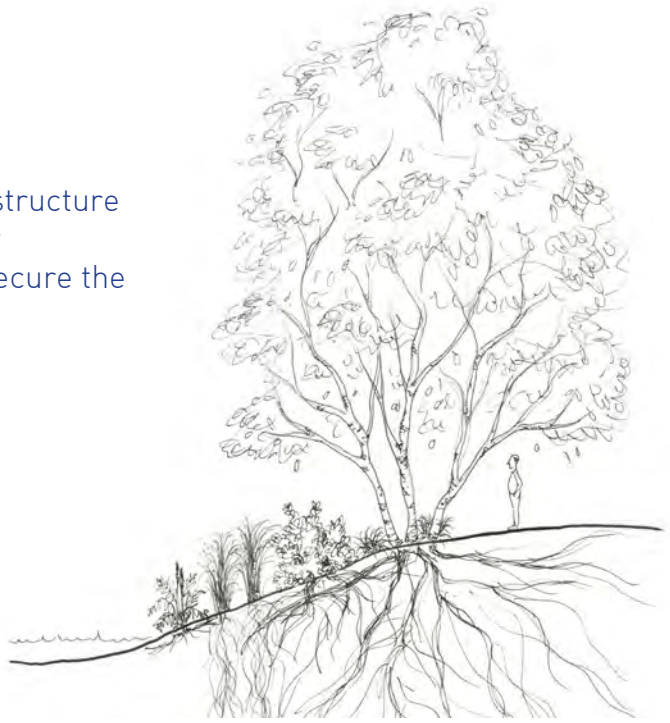
RIPARIAN WOODLAND

A semi-wooded peaceful garden for that tricky lakeside bank!

Comprised mostly of trees and shrubs, this garden is designed to frame and enhance your valuable view while stabilizing the bank, increasing water quality through water infiltration, and providing wildlife habitat for a diverse array of terrestrial and aquatic species. The design also provides food for people with delicious blueberries and elderberries!

Section View

This vegetative buffer mimics the natural structure and functions of a lakeshore ecosystem by establishing extensive root systems that secure the soil and prevent runoff and erosion.



RIPARIAN WOODLAND GARDEN

Planting Plan

Betula papyrifera
Paper Birch (1)

Schizachyrium scoparium
Little Bluestem (6)

Myrica gale
Sweetgale (3)

Schizachyrium scoparium
Little Bluestem (6)

Sambucus canadensis
Elderberry (3)

Osmunda regalis
Royal Fern (4)

Acer rubrum
Red Maple (1) OR Red Oak

Vaccinium corymbosum
High Bush Blueberry (3)

Clethra alnifolia
Summersweet (1)

Cornus sericea
Red Osier Dogwood (1)

Viburnum trilobum
American Cranberry Bush (1)

1" = 12'

COTTAGE RAIN GARDEN

Site this lush little garden in areas that will capture water runoff for these water-loving species to absorb!

A rain garden is an inverted garden set in the landscape to absorb rainfall. They are sited in areas that are not alreeady saturated with water, but key are locations to which water is intended to flow from upland areas or perhaps off a roof. This part sun/part shade garden will help alleviate erosion problems and surface water runoff through water absorption with plants that can also withstand dry spells. The cottage garden aesthetic provides plant diversity and seasonal visual interests.

Section View

Comprised of a mix of grasses, ferns, flowers, and shrubs, this diverse haven will improve water quality and your conscious!

COTTAGE RAIN GARDEN

Planting Plan

Carex lurida
Lurid Sedge (5)

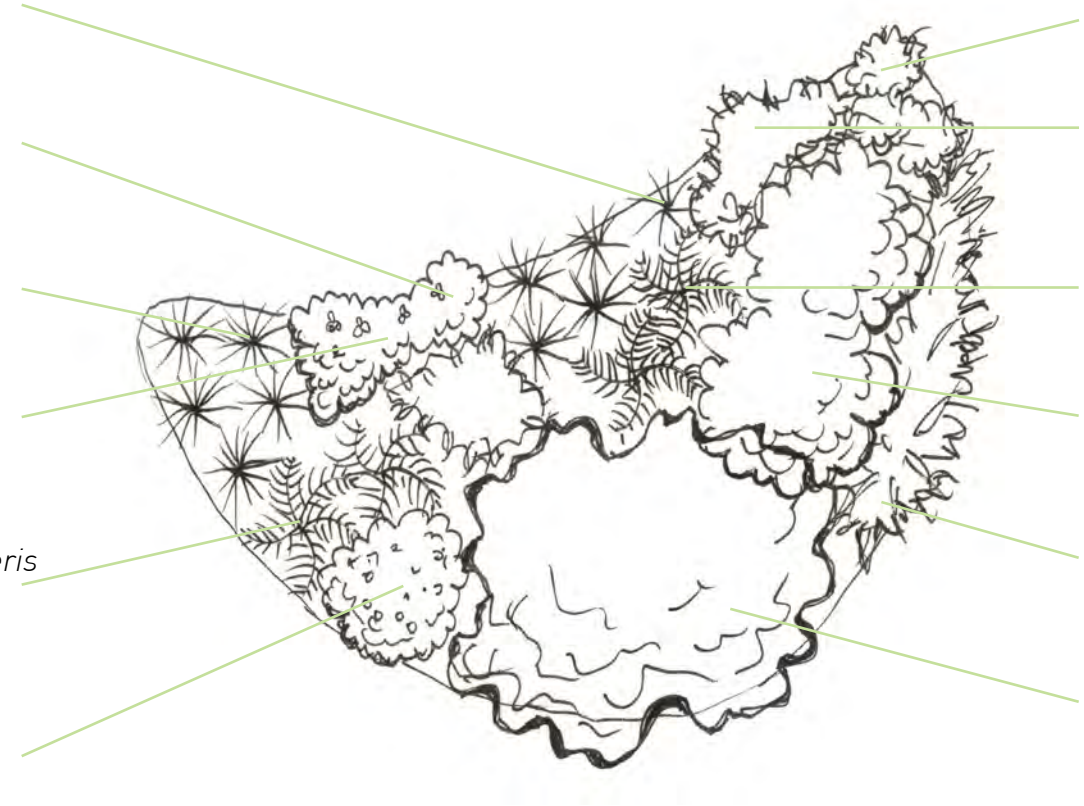
Anemone Canadensis
Wind Flower (4)

Carex stricta
Tussock Sedge (5)

Asclepias incarnata
Swamp Milkweed (5)

Matteuccia struthlopteris
Ostrich Fern (3)

Ratibida pinnata
Yello Coneflower (5)
OR Sneezeweed



Aquilegia Canadensis
Wild Columbine (3)

Lobelia cardinalis
Cardinal Flower (4)

Polystichum acrostichoides
Christmas Fern (3)

Ribes americanum *
Wild Black Curant (1)
OR use a different currant

Veronicastrum virginicum
Culbers Root (6)

Cornus sericea
Red Osier Dogwood (1)

1" = 5'

* Do no plant *Ribes americanum* near white pines

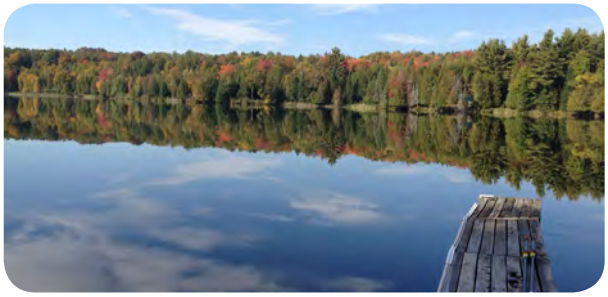
PUBLIC BEACH PARADISE

A vegetative haven for beach-goers that provides seating, shade, edibles, and fun!

The plants in this design were selected to help secure soil and lakeside banks, preventing erosion and maintaining a beach area. The trees and shrubs and their root systems filter pollutants out of water running off nearby roads to improve water quality within the swimming area. A small 'nature path' runs through the garden, creating space for kids to play. The design includes granite blocks that are used for for seating and to protect the plants from ice sheets in the winter.

Section View

A beach-goer can enjoy dappled shade while enjoying season long flowers, edible berries, and fragrant lavender!



PUBLIC BEACH PARADISE

Planting Plan

Baptisia australis
Wild Blue Indigo (3)

Veronicastrum virginicum
Culver's Root (5)

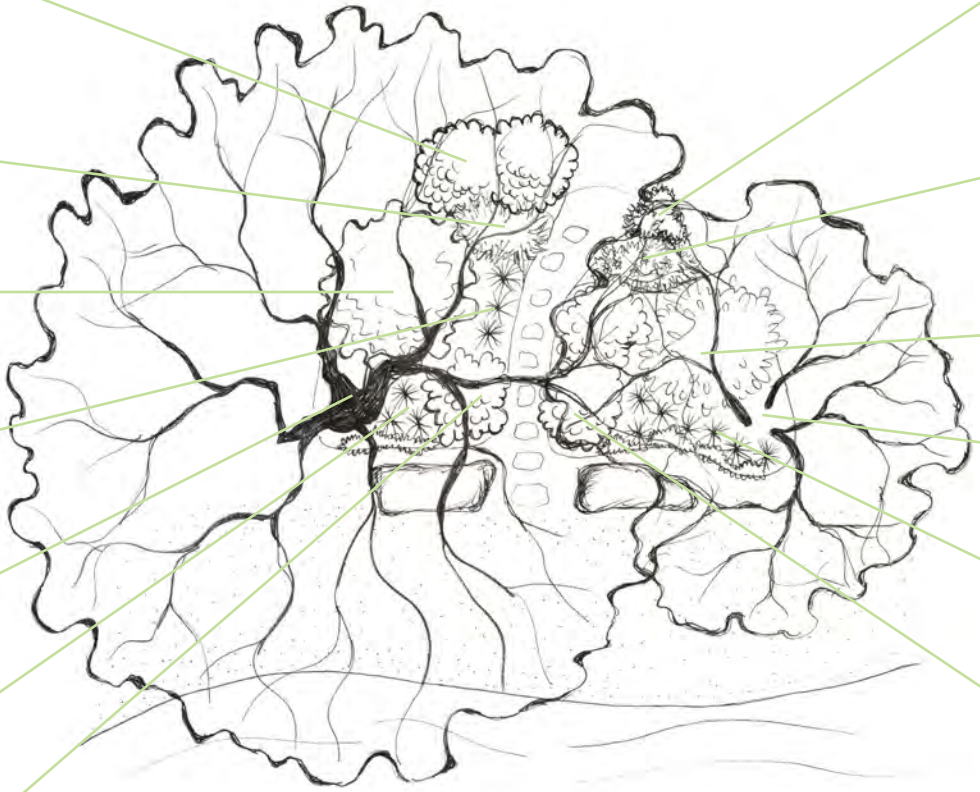
Cornus sericea
Red Osier Dogwood (1)

Andropogon gerardii
Big Bluestem (3)

Gleditsia triacanthos
Thornless Honeylocust (1)

Carex vulpinoidea
Fox Sedge (3)

Aronia arbutifolia
Red Chokeberry (1)



Asclepias tuberosa
Butterfly Milkweed (4)

Echinacea purpurea
Purple Coneflower (6)

Salix discolor
Pussy Willow (1)

Amelanchier laevis
Allegheny Serviceberry (3)

Carex stricta
Tussock Sedge (7(

Vaccinium corymbosum
High Bush Blueberry (2)

Lavandula
Lavender (12)

1" = 15'

TREES

soil: wet, moist, dry | full sun | part sun/shade | full shade | no pref.

z: zone
h: height
s: spread

Acer rubrum - Red Maple
March-April. Street and shade tree

z: 3
h: 40'-70'
s: 30'-50'

Amelanchier laevis - Allgheny Serviceberry. March-April. Fragrant.

z: 3
h: 15'-25'
s: 15'-25'

Betula papyrifera - Paper Birch
April. Acidic, sandy/silty loams.

z: 2
h: 50'-70'
s: 25'-35'

Gleditsia triacanthos var. inermis - Thornless Honey Locust. May-June. Wind and salt tolerant. Good for beach/ streets.

z: 3
h: 60'-80'
s: 60'-80'

Tsuga canadensis - Canadian Hemlock
April. Rock, cool soils. Sensitive to salt.

z: 3
h: 50'-75'
s: 25'-35'

Plant Symbol Legend

- Herbaceous Perennials
- Trees
- Shrubs
- Wetland Obligate
- Edible
- Cut Flowers
- Wildlife Attractor
- Require Extra Care
- Winter Interest
- Rain Garden
- Drought Tolerant
- Fall Foliage

Trees have the biggest impact on the quality of the watershed. The presence of trees near shore banks provides shade for animal habitats and absorbs rain water. Their deep and spreading roots increase soil stability and prevent erosion control.

Flowers

Symbol legend on page 25.

Anemone canadensis - Windflower
April-June. Sandy soil. Clumping.
z: 4
h: 1'-3'
s: 3'

Aquilegia canadensis - Columbine
April-May. Sandy.
z: 3
h: 2'-3'
s: 1'-1.5'

Asclepias incarnata - Swamp Milkweed
July-August. Adaptable.
z: 3
h: 4'-5'
s: 2'-3'

Ascelpias tuberosa - Butterfly Milkweed
June-August. Well drained.
z: 3
h: 1'-3'
s: 1'-1.5'

Baptisia australis - Blue Wild Indigo
May-June.
z: 4
h: 4.5'-5.5'
s: 3'-4'

Echinacea purpurea - Coneflower
June-August. Well-drained soil.
z: 3
h: 2'-5'
s: 1.5'-2'

Eupatoriadelphus maculatum -
Joe Pye Weed. July to October.
Adaptable. Leave flower heads in fall.
z: 4
h: 3'-5'
s: 1'-4'

Geranium maculatum - *Wild* Geranium
April-July. Acidic soil. Clumping.
z: 4
h: 3'-5'
s: 1'-4'

Iris versicolor - Blue Flag Iris
May-June. Clumping.
z: 3
h: 2'-2.5'
s: 2'-2.5'

Lavandula angustifolia - Lavender
June-August. Non-native.
z: 5
h: 1'-1.5'
s: 1'-1.5'

Lobelia cardinalis - Cardinal Flower
July-September.
z: 3
h: 2'-4'
s: 1'-2'

Lobelia siphilitica - Great Blue Lobelia
July-September.
z: 3
h: 2'-4'
s: 1'-2'

Monarda punctata - Spotted Beebalm
Juny-July. Sandy soil. Clumps/spreads.
z: 3
h: 1.5'-2'
s: 1'

Oenothera pilosella - Meadow Evening
Primrose. July-August. Adaptable.
z: 4
h: .5'-2'
s: Varies

Penstemon hirsutus - Hairy Beardtongue
Juny-July. Shallow, well-drained.
z: 3
h: 1.5'-2'
s: Varies

Phlox paniculata - Phlox
July-September. Tolerates clay.
z: 3
h: 2'-4'
s: 2'-3'

Ratibida pinnata - Yellow Coneflower
July-August. Tolerates clay.
z: 3
h: 2'-4'
s: 2'-3'

Symphyotrichum novae-angliae - New
England Aster. August-September.
Tolerates clay. Lots of wildlife.
z: 4
h: 2'-5'
s: 2'-3'

HERBACEOUS PERENNIALS

soil: wet, moist, dry
full sun, part sun/shade, full shade, no pref.
z: zone
h: height
s: spread

Grasses

Tradescantia virginiana - Spiderwort
August-September. Acidic.
z: 4
h: 1.5'-3'
s: 1'-3'

Veronicastrum virginicum - Culver's Root
June-July. Rain gardens.
z: 3
h: 4'-7'
s: 2'-4'

Andropogon gerardii - Big Bluestem
September-February. Erosion control. Cut to ground in spring. Winter interest.
z: 4
h: 4'-6'
s: 2'-3'

Aristidia purpurea - Purple Threeawn
May-September. Dry soils.
z: 3
h: 1'-3'
s: 1'-1.5'

Carex grayi - Gray Sedge
May-October. Salt tolerant.
z: 5
h: 2'-3'
s: 1.5'-2'

Carex lurida - Lurid Sedge.
May-September.
z: 3
h: 1.5'-3'
s: 1'-2'

Carex stricta - Tussock Sedge
May-June. Nesting habitat.
z: 3
h: 1'-3'
s: 1'-2'

Carex vulpinoidea - Fox Sedge. July-August. Clumping. Erosion control.
z: 3
h: 1'-3'
s: .5'-2'

Panicum virgatum - Switchgrass
July-February. Erosion control. Salt Tolerant. Clumping.
z: 4
h: 3'-6'
s: 2'-3'

Schizachyrium scoparium - Little Bluestem. August-November. Salt tolerant. Erosion control. Purpleish.
z: 3
h: 3'-5'
s: 1'-2'

Sorghastrum nutans - Indiangrass
September-February. Erosion control.
z: 4
h: 2'-4'
s: 1'-2'

Carex appalachica- Appalachian Sedge
May-September.
z: 3
h: 2'-4'
s: 1'-2'

Ferns

Athyrium filix-femina - Lady Fern
Clumping and spreading.
z: 4
h: 1'-3'
s: 1-2.5'

Matteuccia struthlopteris - Ostrich Fern
Tolerates clay soils. Fiddleheads.
z: 3
h: 3'- 6'
s: 5'-8'

Osmunda regalis - Royal Fern
Forms clusters. Full sun if kept moist.
z: 3
h: 2'-3'
s: 2'-3'

Polystichum acrostichoides - Christmas Fern. Evergreen. Erosion control. Full sun if moist
z: 3
h: 2'-3'
s: 2'-3'

Thelypteris noveboracensis - New York Fern. Groundcover. Grow in tufts.
z: 3
h: 1'-2'
s: 1'-3'

Adiantum pedatum - Maidenhair Fern
Groundcover.
z: 3
h: 1'-1.5'
s: 1'-1.5'

SHRUBS

soil: wet, moist, dry | full sun, part sun/shade, full shade, no pref. | z: zone, h: height, s: spread

Aronia arbutifolia - Red Chokeberry
April. Erosion control.Toleraes clay.
z: 4
h: 6'-8'
s: 3'-4'

Aronia melonocarpa - Black Chokeberry
May. Fruit is edible.
z: 3
h: 3'-6'
s: 3'-6'

Cephalanthus occidentalis - Buttonbush
June. Erosion control.
z: 4
h: 5'-12'
s: 4'-8'

Clethra alnifolia - Summersweet
July to August. Fragrant.
z: 4
h: 3'-8'
s: Varies

Cornus sericea - Red Osier Dogwood
May-June. Erosion control. Spreads.
z: 2
h: 6'-9'
s: 8'-12'

Ilex verticillata - Winterberry
June-July. Erosion control.
z: 3
h: 3'-12'
s: 3'-12'

Myrica gale -Sweetgale. July-September. Fragrant. Shorelines.
z: 2
h: 3'-6'
s: 3'-6'

Ribes americanum - Wild Black Currant
April-May. Delcious purple berries. *
z: 2
h: 3'-6'
s: 1'-4'

Salix discolor - Pussy Willow
April-May. Erosion control.
z: 2
h: 6'-15'
s: 4'-12'

Sambucus canadensis - Elderberry
June-July. Low maintenance.
z: 3
h: 6'-12'
s: 6'-12'

Spiraea alba - Meadowsweet
Long blooms midsummer.
z: 3
h: 3'-4'
s: 3'-6'

Spiraea tomentosa- Steeplebush
July-September. Mound form.
z: 4
h: 3'-6'
s: 3'-6'

Vaccinium angustifolium - Lowbush Blueberry. May-June. Acidic soil.
z: 3
h: .5'-2'
s: .5'-1'

Vaccinium corymbosum - Highbush Blueberry. May-June. Acidic.
z: 3
h: 6'-12'
s: 6'-12'

Viburnum trilobum - American Cranberry
April-June.
z: 2
h: 6'-12'
s: 6'-12'

* Do no plant *Ribes americanum* near white pines

ALTERNATIVE PLANT CHOICES

If the plants highlighted up above are not to your liking or are unavailable, here is a list of alternative plant options we would recommend. Use the plant database links from the resources page to learn a bit more about these plants.

Herbacious Perennials

Agastache foeniculum	Anise Hyssop
Diervilla lonicera	Bush-honeysuckle
Helenium autumnale	Sneezeweed
Penstemon digitalis	Smooth White Beardtongue/Foxglove
Rudbeckia triloba	Brown-Eyed Susan
Solidago rugosa	Goldenrod
Onoclea sensibilis	Sensitive Fern

Shrubs

Aronia prunifolia	Purple Chokeberry
Corylus americana	Hazelnut/American Filbert
Hamamelis virginiana	Common Witchhazel
Kalmia angustfolia	Sheep Laurel
Ribes hirtellum	Northern Gooseberry
Ribes triste	Swamp Red Currant
Sambucus racemosa	Red-berried Elderberry
Vaccinium macrocarpon	Cranberry
Vaccinium vitis-idaea	Lingonberry
Viburnum lentago	Nannyberry Viburnum
Viburnum prunifolium	Blackhaw Viburnum

Trees

Alnus rugosa	Speckled Alder
Amelanchier arborea	Downy Serviceberry/Juneberry/Shadbush
Betula alleghaniensis	Yellow Birch
Betula nigra	River Birch
Carya Ovata	Shagbark Hickory
Quercus macrocarpa	Bur Oak
Quercus rubra	Red Oak
Thuja occidentalis	Eastern White Cedar/Northern White Cedar/Swamp Cedar
Tilia americana	American Basswood

VERMONT SHORELINE PROTECTION ACT

How Native Gardening Designs Connect to Vermont's Shoreland Protection Act and Lake Wise Program

Replacing lawns with native gardens has many benefits including reducing stormwater runoff and increasing wildlife diversity. Converting an existing cleared area to a garden filled with native species can often lead to re-naturalizing a shoreland, which is the ultimate goal for lake protection. The information below explains how gardens are considered under the Vermont Shoreland Protection Act and the Lake Wise Program.

Under the Shoreland Protection Act, a permit may be required when land is cleared of existing vegetation or new impervious surface is created within 250 feet of the lake's mean water level for all lakes greater than 10 acres in size. Cutting or clearing any vegetation, with the exception of diseased, unsafe trees, or noxious and nuisance plants, triggers the Shoreland Protection Act's jurisdiction and a shoreland permit analyst should be contacted.
The following activities are examples of projects that do not need to be registered or permitted through Shoreland Permitting.

The information above is available on the Vermont Lakes and Ponds web site under Shoreland Permitting and Lake Wise: http://www.watershedmanagement.vt.gov/lakes.html

Exemptions

- Maintenance of existing buildings, gardens, and lawns, without enlarging them.
- Creation of a single six foot wide footpath to access the lake.
- Re-construction of existing impervious areas without increasing or changing the current footprint, such as rebuilding a house, deck, or driveway within the exact same footprint.
- Removal of 250 square feet of vegetation under three feet in height, 25 feet from the mean water level, is allowed as long as the Vegetation Protection Standards are met and the duff layer is not removed.
- Tree removal and pruning within 100 feet of the mean water level using the Vegetation Protection Standards.
- Removal of a diseased or unsafe tree, or noxious and nuisance plant.

Vermont Lake Wise Program

The Lake Wise Program is an Agency of Natural Resources initiative that awards lake-friendly shoreland property, including that of state parks, town beaches, private homes and businesses. The goal of Lake Wise is to establish a new normal, a new culture of lakeshore landscaping that is proven to help protect the lake. A property that earns the Lake Wise Award will represent a "model" shoreland property. The Lake Wise Award certifies a property is well managed, using shoreland Best Management Practices, and is maintained to care for the lake. To learn more about this voluntary shoreland management program, the science behind Lake Wise, and best practices for lakeshore living, visit the Lake Wise website.

VERMONT SHORELINE PROTECTION ACT

Question	Response	Permit Required?
Can an existing lawn area be converted to a garden?	Yes. Existing landscaped areas can continue to be maintained, but not enlarged, under the Shoreland Protection Act. No permit would be required to convert an existing lawn to a garden.	No Permit Needed
Can gardens be fertilized?	Only if set back at least 25 feet from the lake. Vermont has banned the use of phosphorus fertilizer on lawns and gardens and banned the use of all fertilizers from being applied to a lawn or garden within 25 feet of any surface water, such as a lake. To learn more about the phosphorus law, fertilizer choices and applications for gardens, visit Vermont's Lawn to Lake site.	No Permit Needed
Can I use herbicides on my lawn and garden?	Yes, when applied above the mean water level and not in a wetland. Generally, the label is the law on any herbicide product, though using herbicides along a lakeshore is not recommended. For using herbicides to control invasive species, follow the Nature Conservancy Landowner Guidance.	No Permit Needed
Can I plant non-natives in my garden?	Yes. But this is not encouraged or advised because of the negative impacts on wildlife and possible spread of invasive species.	No Permit Needed
If I build a rain garden in an existing lawn area, would this be considered a best management practice?	Yes. Constructing a rain garden to capture and treat stormwater runoff is considered a best management practice to address impervious surface. Using a rain garden as a BMP for a shoreland permit application to construct a new project must be approved as part of a permit application.	No Permit Needed
Can my new shoreland garden serve as a best management practice and be used to help me obtain a shoreland permit for another project I have planned?	Not automatically. Re-vegetating shorelands under the SPA and Lake Wise requires allowing the duff layer to build up and would prohibit clearing away the duff or pruning, unless done in accordance with the Vegetation Protection Standards. "Gardening" is not generally regarded as a BMP. The garden plans in this booklet could be used as template designs, but any best management practice utilized under the Shoreland Protection Act or under the Lake Wise Program should follow recommended BMP sizing for vegetated areas as well as be planted to naturally re-vegetate an area. Contact your regional shoreland permit analyst for more information.	Permit Needed
Can I clear existing vegetation to create a new garden?	No. All existing vegetation within 250 feet from the mean water level is protected under the Shoreland Protection Act with a few exceptions noted in the exemptions listed above. Any creation of new cleared area requires permit review.	Permit Needed
If I plant a garden, let it go wild for a period of time, and then want to change it back to lawn, could I?	No. Allowing a once landscaped area to re-naturalize would be considered "abandonment," in which case the vegetation management of this area would then fall under the Vegetation Protection Standards of the Shoreland Protection Act. However, if the garden area has only been neglected for a few years and there is little natural succession, then yes, you could take back the garden and continue to maintain it as a landscaped area. This question is best answered by contacting your regional shoreland permit analyst.	Permit Needed

Contacts

Are there Landscapers trained in Lake Wise Best Management Practices?

Landscaper and Contractor Trainings in shoreland Best Management Practices will be offered by the Vermont Lakes and Ponds Program, starting in 2016. These voluntary certification workshops will train landscape professionals and contractors in shoreland technologies and educate property owners about natural shoreland practices that benefit lake ecosystems. All Certified Natural Shoreland and Erosion Control Professionals will be listed on the Vermont Agency of Natural Resources Lakes and Ponds web site and can be used to contact a local "lake-friendly" landscaper or contractor.

Contacts at the Vermont Agency of Natural Resources, Watershed Management Division, Lakes and Ponds:

Shoreland Permitting

Misha Cetner: misha.cetner@state.vt.us 802-490-6199
Kevin Burke: kevin.burke@state.vt.us 802-490-6165
Dan Homeier: dan.homeier@state.vt.us 802-490-6200

Lake Wise Program

Amy Picotte amy.picotte@state.vt.us 802-490-6128

Resources

Visit the links below to access websites with aditional resources:

Federation of Vermont Lakes and Ponds: http://www.vermontlakes.org/
Go Botany - New England Plant Database: https://gobotany.newenglandwild.org/
Green Works: Vermont Nursery and Landscape Association: http://greenworksvermont.org/
Intervale Conservation Nursery: http://www.intervale.org/what-we-do/intervale-conservation-nursery/
Lady Bird Johnson Native Plant Database: http://www.wildflower.org/plants/
Lake Wise Resources: http://www.watershedmanagement.vt.gov/lakes/htm/lp_lakewise_resources.htm
Lake Wise Hompage: http://www.watershedmanagement.vt.gov/lakes/htm/lp_lakewise.htm
Maine Shoreline Landscaping for Lake Protection http://www.maine.gov/dep/land/watershed/bufa.html
Missouri Botanical Garden Plant Finder: http://www.missouribotanicalgarden.org/plantfinder/plantfindersearch.aspx
New England Wetland Plants: http://ww.newp.com/
SOAK Up the Rain New Hampshire: http://soaknh.org/
University of Connecticut Rain Garden Design Guide: http://www.nemo.uconn.edu/raingardens/
University of Vermont Rain Garden Manual: http://www.uvm.edu/seagrant/sites/uvm.edu.seagrant/files/vtraingardenmanual.pdf
USDA Forest Service, Urban and Community Forestry Program: http://www.fs.fed.us/ucf/
Vermont Lakeshore Management: http://www.watershedmanagement.vt.gov/lakes/docs/lp_standardsandbmppage.pdf
Vermont Urban and Community Forestry Program: http://www.vtcommunityforestry.org/
Vermont Wetland Plants: http://ww.vermontwetlandplants.com/
Vermont Landowner's Guide to Invasive Terrestrial Plant Management:
http://www.nature.org/ourinitiatives/regions/northamerica/unitedstates/vermont/volunteer/nature-conservancy-invasives-landowner-guide-april-2010.pdf

THANK YOU FOR HELPING PROTECT AND RESTORE VERMONT LAKES