



Department of
Environmental
Conservation

Lake Wise

Lake-Friendly Practices for Shoreline Landowners in the
New York Portion of the Lake Champlain Basin

NYCAC
June 24th, 2024



GREENLEAF DESIGN, LLC
ECOLOGICAL LANDSCAPE DESIGN
ILLUSTRATION & GRAPHIC DESIGN

Lake Wise

- In 2022 NYSDEC worked with Greenleaf Designs to create 24 lake friendly living factsheets for the Lake Champlain Basin
- Funded by the Lake Champlain Basin Program/NEIWPC
- Project adapted the Vermont Department of Environmental Conservation's Lake Wise Program Info Sheets
- Info sheets provide lakeshore landowners and managers with guidance for implementing shoreland best management practices

New York Lake Wise Goals

- Inspire landowners to adopt lake-friendly practices
- Create materials that are engaging, accessible, user-friendly, and visually appealing
- Maintain clear expectations and standards



Development of New York Lake Wise Info Sheets

- Utilizes QR codes on each fact sheet
- Organized under three categories:
 - Upland Stormwater Management
 - Lake Access
 - Living Shorelands



Upland Stormwater Management Info Sheets

- Rain Gardens
- Dry Wells
- Infiltration Trenches
- Downspout Disconnection/Rain Barrels
- Filter Berms
- Check Dams
- Vegetated Swales

Lake Wise Info Sheet



Shoreland Best Management Practices for Lake-Friendly Living.

Benefits

-  Water Quality
-  Wildlife Habitat
-  Prevents Erosion
-  Slow, Spread, Sink Stormwater
-  Visual Appeal
-  Low Cost
-  Low Maintenance
-  Protection & Resiliency

Related Info Sheets:

- Filter Berms
- Vegetated Swales
- Downspout Disconnection & Rain Barrels

 See NYS DEC for more information

RAIN GARDENS

Upland stormwater management



Section drawing of a rain garden.

Description.
Rain gardens are both aesthetic and functional concave gardens with native plants that filter stormwater runoff, reduce erosion, and replenish groundwater.

Applicability.
Rain gardens are designed to capture and filter stormwater from developed areas. They collect water in bowl-shaped vegetated areas and allow it to slowly soak into the ground while native plants and soils filter out pollutants such as sediments and nutrients. Avoid areas with high groundwater tables, the bottom of the rain garden should be 3 feet or more above the seasonal high groundwater table and at least 1 foot above*. Not recommended for steep slopes**.

How to.

1. Locate an open area where stormwater flows from roofs, driveways, pathways, lawns, or other developed areas via surface flow or from a pipe or swale. Avoid steep slopes.

Soils should be well drained; do not select areas where water regularly ponds. A rain garden should optimally infiltrate water at a rate of 1/2-inch per hour or soak in within 24-48 hours. If there isn't a well-drained area, e.g., areas with heavy clay soils, you can dig a larger or deeper depression and add a sandy soil filter bed mix to increase water retention capacity.

*Underdrains can adapt rain gardens to function with high groundwater levels (within 3 feet of bottom) and low infiltration rates.

Select an area at least 10 feet away from existing structures (in most cases) or septic systems.

****If slopes are greater than 8%, you may need internal check dams or berms to create a stepped or terraced design.**

PERCOLATION TEST
Dig a hole 2'3" deep, fill with water and let it drain fully, twice. On the third time, monitor the infiltration rate for 1/2" per hour. If a 2' hole drains within 48 hours, you are good to go!

RAIN GARDENS

Upland stormwater management

Rain Garden Area.
Inch Filter Bed Depth (area feet)

12	18	24
49	42	36
1	99	83
1	198	167
5	297	250
9	396	333
2	495	417
18	742	625
83	990	833
720		



A lakeside rain garden infiltrates water runoff.

are most
ch or more of
event. The size
infiltration
re the drainage
perious (e.g.,
Calculate the rain
the VCLT Green
Sizing Tool
precise size
gardens can be
rain gardens
efits.
en using string
ensure there
Remove sod and
roving or
(plastic.
lowest point
ground surface

(up to 12 inches for areas with limited space). The edges should be gently sloped towards the bottom. If soils are not well drained, dig down further and replace with a 12-inch to 36-inch deep sandy filter bed mix, comprised of a roughly 70/30 mix of sand and native soils. Option to add a 3-inch layer of washed crushed stone underneath the filter bed mix for added water retention capacity. If on a slope, berms can be built around the basin to maintain a level bottom and ponding depth.

5. Stabilize the inlet area with crushed stone or river rock to prevent scouring and erosion. A pre-treatment forlaby, a small depression lined with stone, can be built for areas with a lot of sediments (e.g., driveways, roads) to allow suspended solids to settle before runoff enters the basin.
6. Design an outlet at the level of the desired ponding depth to direct overflow to a stabilized area, e.g. stone lined outlet directing flow to a meadow filter strip or naturally vegetated area that is not at risk of eroding.



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Lake Access Info Sheets

- Planning Pathways
- Water Bars and Open-Top Culverts
- Turnouts and Rock Aprons
- Infiltration Steps
- Driveways and Lake Roads

Lake Wise Info Sheet

NEW YORK STATE
LAKE CHAMPAIN

Shoreland Best Management Practices for Lake-friendly Living.

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- Turnouts & Rock Aprons
- Infiltration Steps

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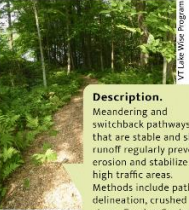
Lake Champlain Basin Program

NEW YORK PCC

VERMONT DEPARTMENT OF ENVIRONMENTAL CONSERVATION WATERSHED MANAGEMENT DIVISION

PLANNING PATHWAYS

Low impact lake access

Meandering peastone and wood chip access pathways.

Description.
Meandering and switchback pathways that are stable and shed runoff regularly prevent erosion and stabilize high traffic areas. Methods include path delineation, crushed stone, Erosion Control mix, and water bars.

Applicability.
Properly designed pathways for foot traffic minimize compaction to surrounding areas, absorb water, reduce the rate of stormwater runoff flow, protect soil from erosion, and prevent pollutants such as sediments from entering the lake.

How to.

1. Review your property and determine where the high foot traffic areas are. It can be helpful to print or draw a map and draw in your pathways. Notice where there are steep slopes, signs of erosion, soil compaction, and where water runoff flows along pathways during rain events. Design pathways to meander gradually for gentle slopes, to have switchbacks running across contour and waterbars for steeper slopes, and install infiltration steps for pathways that must traverse a steep slope directly. Avoid steep slopes if possible.
2. Design pathways that are only as wide as necessary, typically 3 to 4 feet wide for residential landscapes and a maximum of 6 feet wide is recommended to minimize water runoff and impacts to water quality. Mark the paths using stakes, spray paint, fencing, or rocks.

By avoiding straight and steep pathways, you reduce the volume and velocity of water runoff entering the lake; the turns, switchbacks, waterbars, and infiltration steps divert water off the pathway and into nearby vegetated areas to soak into the ground.

1 to 4 inches of silt needles, a permeable 1/8" from sider mowing from into a

7 paths can be solar lights, or efflu and reduce nts and soils.

a pathway that e pathway into d/or densely This prevents tering the lake.

s that can be ie to use only and effectively s, rocks, or e surface of y at about a 30 yway.

Materials.

- Stakes, rocks, spray paint to mark area
- Measuring tape, level, string
- Shovel, rake, wheelbarrow, tarps, etc. to transport and lay path materials
- Wood chips, peastone, crushed stone, or Erosion Control Mix: wood fibers, soil, and gravel blended together
- Optional: stepping stones can be set in gravel to create a smooth surface

Water Bar Spacing Guide.

Slope (%)	Spacing (feet)	Adapted From
<5	125	The VT Standards & Specifications for Erosion Prevention & Sediment Control
5-10	100	
10-20	75	
20-35	50	
>35	25	

Maintenance.
Inspect the pathways after large rain events and in the spring. If any damage occurs, repair as soon as possible. If applicable, remove any accumulated sediment from water bars.

For more information...

- A Guide to Healthy Lakes Using Lakeshore Landscaping: Design templates and easy-to-use planting plans (2015)
- Do-It-Yourself Water Quality (Lake George Association)
- Contact your regional NYS DEC office for possible permit requirements

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Lake Champlain Basin Program

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Living Shorelands Info Sheets

- Beaches and Recreation Areas
- Conserve and Protect Lakeshores
- Low Impact Lakeshore Development
- Lake-Friendly Yard Maintenance
- Live Stakes and Fascines
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- Ticks and Shorelands
- Bioengineering
- Lakeshore Buffers
- Managing Invasive Plants
- Restore Natural Plant Communities
- Form a Lake Association

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- Planning Pathways
- Restore Natural Plant Communities

See NYS DEC for more information

TICKS & SHORELANDS

Minimize risk & protect water quality

Description. Manage for native vegetation and pathways along shorelands to minimize risk of human contact with ticks and prevent tickborne diseases, including Lyme Disease and Anaplasmosis.

Applicability. It is important to understand the tick life cycle and conditions that cause tick populations to increase in order manage your property to reduce risk of contact.

Native plant communities help to minimize tick populations. Strategies to minimize contact with ticks on lakeshores.

1. Plant and promote native species.

Native plants diversify habitat for birds and other wildlife. Birds, such as owls, eat ticks in addition to other bugs and mice, lowering the tick population.

Native plant communities create an environment that is less protective of ticks and mice due to varied plant heights and growth forms. Woodland environments maintain a humidity level that does not necessarily promote tick growth.

How ticks spread. Deer and mice are common hosts to ticks and help them to spread. Mice act as hosts for ticks in their larval stage and deer are hosts to nymph and adult ticks.

Lyme disease. Lyme disease is the most commonly reported tickborne disease in Vermont. It is caused by the bacteria *Borrelia burgdorferi* and is spread by the bite of a blacklegged tick. Ticks become "infected" during their larval stage when they first feed on blood of animals.

^ tick life cycle.



Not all ticks spread disease. The three most common ticks in New York are the Deer (Blacklegged) Tick, the American Dog Tick, and the Lone Star Tick (shown below). Only Deer Ticks can carry the bacterium that causes Lyme Disease. See NYS Department of Health.

Plants

- Columbine
- Echinacea
- Lobelia
- Liatris
- Lupine
- Rudbeckia
- Wintergreen
- Yarrow

Ticks that commonly bite humans. Prevent tick bites with repellents registered by the EPA, like DEET (note: DEET should not be used on infants), Picaridin, and Oil of Lemon Eucalyptus. Permethrin can be used on clothing, but not skin. And always check yourself, children, and pets for ticks after spending time outdoors.

For more information...

Health.ny.gov/environmental/pests/tick



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MANAGING INVASIVE PLANTS

Methods to minimize shoreland invasive species



VtInvasives.org

Garlic mustard is toxic to other plants and each plant can produce about 600, up to 7,900 seeds! Prevent flowers going to seed - pull root or cut for large areas.

5 Steps for Successful Invasive Plant Management.

See more in-depth guidance at NYIS.info

1. Prevention

Avoid disturbance and degradation to natural areas. Do not use fill from a location where invasive species are found. Do not take ornamental plants from friends or neighbors that are invasive (e.g., Bishop's Weed is an invasive garden perennial that is also called Snow-on-the-mountain) or have invasive plant material in the soil (e.g., areas that have a lot of Garlic Mustard nearby tend to have seeds in the soil). Clean tools, machinery, boots, and clothes after working in areas with invasive species. These are primary ways invasives are spread.



National Park Service

Invasive shoes can spread by soles - clean shoes in place.

Description.

Invasive species are non-native plants, animals, algae, fungi, or pathogens that threaten and often outcompete native species and undermine the function and integrity of an ecosystem. They are typically a result of human degraded environments and introduction. Limiting the growth or eradicating invasive species is critical to protecting the survival and diversity of native plant species, which are the foundation for ecosystem health, wildlife habitat, water quality protection, and aesthetic and recreational value.

Applicability.

Invasive plants along lakeshores pose a significant threat to lakeshore habitats. They tend to spread along waterways and it is very important for lakeshore landowners to be able to identify, prevent, contain, and eradicate invasive species. There are a variety of management methods that are dependent on the species, location, and extent of the infestation. Landowners that manage invasive species timely and properly help to protect their land, lake, and community.

Lake Wise Info Sheet



MANAGING INVASIVE PLANTS

Methods to minimize shoreland invasive species

Common invasive plant species along New York lakeshores.

Photos: VtInvasives.org & Wikimedia Commons



Common Buckthorn,

Rhamnus cathartica
- woody shrub/small tree
- harmful to birds, wildlife;
- seeds contain a laxative
- creates dense thickets



Japanese Knotweed,

Reynoutria japonica
- herbaceous perennial
- dense thickets take over
- harmful to fish, wildlife
- causes bank erosion



Garlic Mustard,

Alliaria petiolata
- herbaceous perennial
- toxin inhibits other plants
- forms dense stands
- edible shoot and leaves



Honeysuckle shrubs,

Lonicera morrowi,
maackii, *tatarica*, *x bella*
- berries harmful to birds
- hollow pith differentiates
- from native honeysuckles



Goutweed/Bishop's Weed,

Aegopodium podagraria
- creeping herb, perennial
- blocks native plants, trees
- root fragments resprout
- do not plant in gardens!



Yellow Iris,

Iris pseudacorus
- blooms yellow early spring
- colonies invade wet areas

2. Early detection

Learn to identify common invasive species and promptly eradicate new invasions before they can spread. Your chances of eradicating or controlling an invasive plant are far greater the sooner you detect it and make a systematic effort to remove it.

There are a variety of invasive plants found along lakeshores; you can view invasive species common to your area at your local **PRISM (Partnerships for Regional Invasive Species Management)**. You can also use a plant identification app on your phone like **Seek from iNaturalist** where you can add your observation to 'NY iMapInvasives'. Check out NY iMapInvasives.

3. Assess the situation

Identify the invasive species, the locations and extent, and how established they are. Identify nearby areas that could be vulnerable to invasion, such as a new planting, area of erosion, compaction, or other area with disturbed soil. It can be helpful to print or hand draw a map of your property to mark areas of invasive species and describe the population. Ask yourself: What types of species are present? Is the area small or large? Are they scattered, growing in clumps, or a dense monoculture? Mark nearby areas of importance such as native plant communities, water bodies, wildlife paths, and drinking water sources. Keep the map for reference and to record progress.



Common Reed,

Phragmites australis
- herbaceous perennial grass
- colonizes wet areas via rhizomes
- exudes toxins, kills other plants
- causes higher fish mortality rates



Wild *Poison* Parsnip,

Pastinaca sativa
- herbaceous biennial/perennial
- phototoxic sap causes burns, blisters, rash!!!



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WATERSHED MANAGEMENT DIVISION



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Benefits

- Water Quality
- Wildlife Habitat
- Visual Appeal
- Low Cost
- Protection & Resiliency

Related Info Sheets:

- Lakeshore Buffers
- Restore Natural Plant Communities
- Bioengineering
- Lake-friendly Yard Maintenance
- Ticks & Shorelands

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MANAGING INVASIVE PLANTS

Methods to minimize shoreland invasive species



Garlic mustard is toxic to other plants and can produce up to 7,900 seeds! Prevent flowers to seed - pull root or cut for large plants.

5 Steps for Successful Invasive Plant Management.

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Invasive seeds can spread by shoes - clean shoes in place.

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There are a variety of management methods that are dependent on the species, location, and extent of the infestation. Landowners that manage invasive species timely and properly help to protect their land, lake, and community.

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Garlic Mustard,

Alliaria petiolata

- herbaceous perennial
- toxin inhibits other plants
- forms dense stands
- edible shoot and leaves



5 Star Invasive See more

1. Prevention

Avoid not using found nearby invasive plants in the soil (e.g. garden boots) to prevent spreading species.

Honeysuckle shrubs,

Lonicera morrowi, maackii, tatarica, x bella

- berries harmful to birds
- hollow pith differentiates from native honeysuckles



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 Visual Appeal

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Next Steps

- Finalizing Info Sheets
- Posting on NYSDEC Lake Champlain Watershed Webpage



Thank You

- Erin Vennie-Vollrath
- Lake Champlain Coordinator, NYS DEC and NEIWPC
- Erin.Vennie-Vollrath@dec.ny.gov

Lake Wise Info Sheet



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Benefits

-  Water Quality
-  Wildlife Habitat
-  Protection & Resiliency

New York State Federation of Lake Associations (NYSFOLA)
visit nysfola.org

Adirondack Lakes Alliance (ALA)
visit adirondacklakesalliance.org

 See NYS DEC for more information

FORM A LAKE ASSOCIATION

How to build capacity & protect your lake





Why have an association?
Associations form for many reasons. In New York State, lake associations coordinate and provide a voice for the lake community on a diversity of issues ranging from private road maintenance to water quality and wildlife issues to organizing fun events such as a boat parade or ice out. Shoreland owners and lake recreationists benefit greatly by working together to protect the lake.

Forming a lake association.
Many lakes in New York already have associations - find out if your lake or pond already has one and get involved or start one yourself! The non-profit organizations, **New York State Federation of Lake Associations (NYSFOLA)** and **Adirondack Lakes Alliance (ALA)**, represent lake associations and share information and resources with members for the purpose of protecting and restoring lakes.

It can help to start a lake association with a commonly shared concern or question. For example, neighbors with a common interest in the lake's water quality might want to form a lake association to learn more about **lake monitoring** or to start a **boat monitoring program** to prevent the spread of aquatic invasive species. Lakeshore owners that want to improve water quality might want to form a lake association to promote the adoption of 'lake-friendly' practices. Lake association work has social benefits too. Associations develop a communication network for sharing lake news, develop partnerships among neighbors, and provide opportunities to meet neighbors, volunteer, and participate in fun events!



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"Founded in 1983, NYSFOLA is a not-for-profit coalition ... dedicated to the protection and restoration of New York lakes."



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