

The Department of Natural Resources (DNR) is seeking public input on a proposal to:

1. Finalize Wisconsin's 2014-2017 Healthy Lakes Implementation Plan (Plan), which describes relatively simple and inexpensive best practices that can be installed on lakefront properties. Corresponding factsheets further describe each practice, and they along with supporting guidance, provide enough technical information to understand and implement projects. The suggested best practices may require professional planning and implementation assistance.
2. Create a new Lake Classification and Lake Protection – Plan Implementation sub-category to fund installation of best practices described in Wisconsin's Healthy Lakes Implementation Plan. The first Healthy Lakes grant application deadline will be February 1, 2015.

The DNR is being proactive in notifying partners and potential 2015 applicants now about the Plan so changes can be integrated into updated grant guidelines, and partners can prepare for future projects.

A. Why Are We Doing This?

To establish and promote funding for implementing habitat restoration and erosion and runoff control practices that improve and protect lake health and to simplify the process for obtaining the grant funding. Staff and external partners have asked for both a new grant sub-category implementing best practices and a simplified process for several years. Furthermore, science shows that habitat stress is a major threat to lakes on a national scale, and lakes with degraded habitat are 3 times more likely to also have poor water quality.

Benefits for lakefront property owners, partner groups, and/or DNR staff include the following:

- Enough technical detail for do-it-yourselfers to implement best practices
- Potential funding and less bureaucracy for implementing best practices
- Consistent technical information, simplified grant forms/process, and a reasonable project commitment
- Tools to integrate into local planning efforts
- Improved program efficiency by standardizing and simplifying the requirements, forms, and process
- Improved customer satisfaction
- Potential for more best practices to be implemented and thus healthier lakes

B. Background.

Last fall a lean government team initiated a project to create a new grant sub-category to implement best practices for healthy lakes. Lean government applies objective methods to both identify and then implement the most efficient, value added way to provide government services. The team's overarching mission is to protect and improve the health of Wisconsin lakes by increasing lakefront property owner participation in habitat restoration and runoff and erosion control projects. The team has measures in place to confirm we've reached our objectives of reduced grant administration, improved customer satisfaction, a simplified process, and improved environmental outcome. Wisconsin's 2014-2017 Healthy Lakes Implementation Plan is the product of the team's efforts and will be evaluated again in 3 years.

The Plan and associated grant funding tie into a corresponding effort to streamline the grant process, reduce the amount of time that project sponsors spend completing applications, and improve applicant satisfaction with the overall award process. We expect to incorporate these changes into a comprehensive administrative code revision that will soon begin for chs. NR 190, NR 191, NR 195, and NR 198.

C. Summary of Proposed Changes.

- 1. Wisconsin's Healthy Lakes Implementation Plan can be adopted and implemented locally.** The Lake Classification and Lake Protection – Plan Implementation category has been the traditional funding source for implementing best practices for healthy lakes. The state share of grant funding is large (\$200,000 maximum award), and the projects are often complex requiring engineering design. Furthermore, the planning process preceding implementation can be long and expensive and requires DNR review and approval on a case-by-case basis. The statewide Plan describes relatively simple and inexpensive best practices that can be implemented on typical lakefront properties, and local grant sponsors can simply adopt and implement the Plan to be eligible for Lake Classification and Lake Protection – Plan Implementation – Healthy Lakes sub-category grants. This will save time and money.
- 2. Healthy Lakes grants provide seed money for lakefront property owners to take small steps to help their lakes.** DNR's traditional grant funding requires an all-in approach - often requiring lakefront landowners to substantially change their properties. Healthy Lakes grant sub-category has a maximum grant award of \$25,000 with up to 10% of the award being available for technical assistance, and each best practice will be capped at \$1000 state share. A grant sponsor can apply on behalf of multiple landowners. This will enable the DNR to fund more shovel-ready implementation projects amongst more properties while still providing technical assistance. The project commitment is reasonable with standardized operation & maintenance plans tied to 10-year contracts for the best practice(s). These grants are not intended for large, complex sites with challenging problems that may require engineering design.

D. Remaining Steps. Once the 21-day comment period is complete, all comments will be considered, revisions will be made to this draft guidance document as warranted, a *Response Summary* will be prepared, then both the *Response Summary* and *Final Guidance* will be made available using the existing DNR Program Guidance web page (<http://dnr.wi.gov/news/input/guidance.html>) and will be posted on the Lake Classification and Protection Grant webpage. *Please note the final guidance, including Wisconsin's Healthy Lakes Implementation Plan and corresponding factsheets will integrate professional editing and graphic design after the public review is complete and feedback gathered.*

Please forward your comments about this proposed policy no later than July 7, 2014, to:	Name: Pamela Toshner, Lake Biologist	Phone: (715) 635-4073
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Team Members: Dave Ferris, Pat Goggin, Jane Malischke, Tom Onofrey, Carroll Schaal, and Pamela Toshner

WISCONSIN'S HEALTHY LAKES IMPLEMENTATION PLAN

This statewide Healthy Lakes Implementation Plan describes relatively simple and inexpensive best practices that lakefront property owners can implement. The Plan also includes funding/accountability, promotion, and evaluation information so we can grow and adapt the Plan and our statewide strategy to implement it into the future. Working together, we can make Healthy Lakes for current and future generations.

WISCONSIN'S HEALTHY LAKES IMPLEMENTATION PLAN

I. Introduction

Wisconsin's lakes define our state, local communities, and our own identities. Fond memories of splashing in the water, seeing fireworks reflect off the lake, and catching a lunker last a lifetime. With over 15,000 lakes dotting the landscape, it's no surprise that fishing alone generates a \$2.3 billion economic impact each year¹, and the majority of property tax base rests along shorelines in some of our counties. Unfortunately, we've learned through science² that our love for lakes causes management challenges, including declines in habitat and water quality. In fact, habitat stress is the number one driver of lake health at a national scale. Lakes with poor habitat tend to have poor water quality. Working together to implement Wisconsin's Healthy Lakes Implementation Plan (Plan), we can improve and protect our lakes for future generations to enjoy, as well.

The Plan identifies relatively simple habitat and water quality best practices that may be implemented on the most typical lakefront properties in Wisconsin. We encourage do-it-yourselfers to use these practices but have also created a DNR Lake Classification and Protection Grant sub-category for funding assistance. Furthermore, local partners like lake groups and counties may choose to integrate the Plan into their lake management, comprehensive planning, and shoreland zoning ordinance efforts.

II. Goals & Objectives

Wisconsin's Healthy Lakes Implementation Plan goal is to protect and improve the health of our lakes by increasing lakefront property owner participation in habitat restoration and runoff and erosion control projects.

- Statewide objective: single-parcel participation in Healthy Lakes will increase 100% in 3 years (i.e. 2015 to 2017).
- Individual lake objective: lake groups or other partners may identify their own habitat, water quality, and/or participation goal(s) through a local planning and public participation process.

The target audience for this Plan and implementation of the associated practices is lakefront property owners, including: permanent and seasonal homeowners, municipalities, and businesses. Wisconsin's Healthy Lakes Implementation Plan is not intended for large, heavily developed parcels or sites with complex problems that may require engineering design. Technical assistance and funding are still available for these sites; contact your county land and water conservation department or local DNR lakes biologist for more information.

¹ Reference

² Weblink to supporting science here – to be developed on UW-Extension Lakes website.

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III. Plan Overview & Definitions

Wisconsin's Healthy Lakes Implementation Plan divides a typical lakefront parcel into the following 3 management zones: 1) in-lake, 2) transition, and 3) upland (Figure 1). One – 3 best practices are identified for each zone. A team selected these practices, based on customer feedback, because they are relatively simple and inexpensive to implement, appropriate for typical lakefront properties, and beneficial to lake habitat and/or water quality. The Plan also provides cost ranges and averages and technical, regulatory, and funding information for each practice. Factsheets for each best practice support the Plan and provide more technical detail, and additional guidance is referenced if it currently exists.

(To be inserted: Figure 1. Lakefront property zones and corresponding best practices with cross sectional graphic identifying and defining Ordinary High Water Mark)

Definitions

Best practice: a working method, described in detail, which has consistently shown results.

Divert: redirect runoff water.

Habitat: where a plant or animal lives.

Infiltrate: soak into the ground.

Installed: project cost that includes all materials, labor, and transportation.

Runoff: rain and snowmelt that doesn't soak into the ground and instead moves downhill across land and eventually into lakes, streams, and wetlands.

IV. Best Practices

Best practice descriptions follow. Each description defines the practice, identifies lake health benefits, provides cost ranges and averages based on recent projects, and identifies additional technical and regulatory information. The costs provided are installed costs, which includes all materials, labor, and transportation but does not include technical assistance, including design and project management/administration work. Cost ranges are a result of geographic location, property conditions like soils and slopes, and contractor supply and proximity to the project site.

(Final formatting to provide a more polished, reader-friendly table or other display of practices.)

Zone 1: In-Lake

- Practice 1 - Fish Sticks: large woody habitat structures that utilize whole trees grouped together resulting in the placement of more than 1 tree per 50 feet of shoreline. Fish Sticks structures are anchored to the shore and are partially or fully submerged.

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- Lake health benefits: improve natural fish and wildlife habitat and prevent shoreline erosion.
- Costs
 - Cost range: \$100-1000/cluster of 3-5 trees, installed
 - Average cost per unit of 3-5 trees: \$500, installed
- Technical information
 - Follow Fish Sticks Factsheet and WDNR Fish Sticks Best Practices Manual <http://dnr.wi.gov/topic/fishing/documents/outreach/FishSticksBestPractices.pdf>
- Regulatory information
 - General permit (\$303 fee unless WDNR grant-funded)
- Healthy Lakes grant funding available
 - Maximum of \$1000/unlimited clusters of 3-5 trees
 - Fish Sticks may be a stand-alone grant activity only if the parcel complies with local zoning. If not, the property owner must commit to leaving a 10 x 30 square foot area un-mowed at the base of the cluster(s) or implement native plantings (Practice 2).

Zone 2: Transition

- Practice 2 - 10 X 30 feet Native Plantings: template planting plans with corresponding lists of native plants suited to the given function of the plan. Native planting functions include the following: lakeshore, bird/butterfly, wet meadow, woodland, and critical areas.
 - Lake health benefits: improve wildlife habitat, slow runoff water, and promote natural beauty.
 - Costs
 - Cost range: \$480-2400 for 10 x 30 feet area, installed
 - Average cost per 10 x 30 feet area: \$1000, installed
 - Technical requirements
 - Draft guidance being developed
 - Follow Native Planting Factsheet and Draft Guidance
 - Regulatory requirements
 - Native plantings must follow local shoreland zoning ordinance. Consult with your county or municipal zoning staff.
 - Healthy Lakes grant funding available
 - Maximum \$1000/10 x 30 feet native planting installed and implemented according to the technical requirements
 - The planting dimension must be 300 square feet of contiguous area.

*Practice: Consider adding a Water Bar as a diversion practice in this and upland zones.

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Zone 3: Upland

- Practice 3 - Rain Garden: a landscaped shallow depression with loose soil designed to collect roof and driveway runoff.
 - Lake health benefits: improve wildlife habitat; divert, clean, and infiltrate runoff water; and promote natural beauty.
 - Costs
 - Cost range: \$500-9500/rain garden, installed
 - Average cost per rain garden: \$2500, installed
 - Technical requirements
 - Follow Rain Garden Factsheet and Rain Gardens: A How-to Manual for Homeowners http://intranet.dnr.state.wi.us/int/water/wm/nps/rg_cd/HowToCreateARG/RGManual-UWEX-DNR.pdf
 - Regulatory requirements
 - Rain gardens must follow local shoreland zoning ordinance. Consult with your county or municipal zoning staff.
 - Healthy Lakes grant funding available
 - Maximum \$1000/rain garden installed and implemented according to the technical requirements

- Practice 4 - French Drain with Catch Basin: also referred to as an infiltration trench, an underground drainage device consisting of a perforated pipe surrounded by gravel and lined with sturdy landscape fabric with a catch basin to capture, pre-treat, redirect, and infiltrate runoff water.
 - Lake health benefits: divert, clean, and infiltrate runoff water.
 - Costs
 - Cost range: being determined
 - Average cost per French drain: being determined
 - Technical requirements
 - Follow French drain factsheet and links.
 - Regulatory requirements
 - French drains must follow local shoreland zoning ordinance. Consult with your county or municipal zoning staff.
 - Healthy Lakes grant funding available
 - Maximum of \$1000/French drain with catch basin, installed and implemented according to technical requirements

- Practice 5: Rock Infiltration Pit: an excavated area that reduces runoff by storing it underground to infiltrate. Pit size and holding capacity are a function of the area draining to it and the permeability of the underlying soil.

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- Lake health benefits: divert, clean, and infiltrate runoff water.
- Costs
 - Cost range: \$510-\$9688/rock infiltration pit, installed
 - Average cost per rock infiltration pit: \$3800, installed
- Technical requirements
 - Follow rock infiltration pit factsheet and links.
- Regulatory requirements
 - Infiltration pits must follow local shoreland zoning ordinance. Consult with your county or municipal zoning staff.
- Healthy Lakes grant funding available
 - Maximum \$1000/rock infiltration pit installed and implemented according to the technical requirements

V. Funding and Accountability

Administrative details and the application process are described in detail in the DNR's Water Grant Application & Guidelines

(<http://dnr.wi.gov/Aid/LakeClassificationProtection.html>). Highlights include the following:

- 75% state share grant with a maximum award of \$25,000, including up to 10% of the state share available for technical assistance
- 25% match from sponsors, participating property owners or other partners
- Sponsor may apply on behalf of multiple properties
- Standard 2-year grant timeline to encourage shovel-ready projects
- Landowners may sign a participation pledge to document strong interest in following through with the project
- Standard deliverables, including a signed Conservation Commitment with operation and maintenance information and 10-year commitment to leave projects in place. Also:
 - Native plantings must remain in place according to local zoning specs if within the vegetation protection area (i.e. buffer)
 - Fish Sticks projects require a 10x30 native planting at shoreline base or commitment not to mow, if the property is not already natural
- Standardized application and reporting forms and process
- 10% of projects randomly chosen each year for self-reporting or professional site visits

VI. Promotion

Wisconsin's Healthy Lakes Implementation Plan will be supported and promoted as a statewide program. Lake groups, counties, and other partners may choose to adopt and implement the Plan as is or to integrate into their own planning processes. Statewide promotion, shared and supported by all partners, includes the following:

- A Healthy Lakes logo/brand

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- A website with plan, practice, and funding detail to be housed on UW-Extension Lakes website. It may also include the following:
 - Link to science and supporting plans
 - Shoreline restoration video
 - How-to YouTube clips
 - Maps with project locations without personally identifiable information

VII. Evaluation of Results

Wisconsin's Healthy Lakes Implementation Plan and results will be evaluated annually and updated in 2017, if warranted. Best practices may be modified, removed, or added depending on the results evaluation.

The following information will be collected to support an objective evaluation:

- County and lake geographic distribution and participation in Healthy Lakes projects
- Lakefront property owner participation in Healthy Lakes projects, including numbers of best practices implemented
- Standardized Healthy Lakes grant project deliverable report including:
 - Numbers of Fish Sticks trees and clusters
 - Dimensional areas restored
 - Structure/floral diversity (i.e. species richness)
 - Impervious area captured for infiltration

The results may be used to model nutrient loading reductions at parcel, lake, and broader scales and to customize future self-reporting options, like plant mortality and fish and wildlife observations, for lakefront property owners.

Acknowledgements

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- Cheryl Clemens, John Haack, and Scott Toshner
- Bone Lake Management District, Maine Lake Smart Program, and Vermont Lake Wise Program

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FACTSHEET Practice 1: Fish Sticks

Description:

Fish Sticks, an in-lake practice, (Figure 1) are large woody habitat structures that utilize whole trees grouped together, resulting in the placement of more than 1 tree per 50 feet of shoreline. Fish Sticks are anchored to the shore and are partially or fully submerged. Fish sticks are not tree drops since the trees utilized for the projects come from further than 35 feet from shore, thus they don't "rob from the bank" of trees that may otherwise grow and fall in naturally.

(insert Figure 1 photo)

Purpose:

This fish and wildlife habitat best practice creates food, shelter, and breeding areas for all sorts of creatures from small aquatic insects, to fish, to turtles, ducks, and songbirds. Fish Sticks can also help prevent bank erosion – protecting lakefront properties and your lake.

How to Build:

It may be necessary to work with your local DNR fisheries biologist, county land and water conservation department, or landscaper to design and/or construct this practice. Logging companies may assist with tree supply, cutting, and transportation. Check with your local zoning department to determine if any permits are necessary.

1. Find a location

Ideal Fish Sticks sites have low ice energy – places like protected bays and shorelines leading to and from bays. High ice energy areas on lakes greater than 250 acres require alternate methods that ensure they remain in place.

Typically a single Fish Sticks cluster occupies 50 linear feet of shoreline, so it should be placed on an area of your lakefront that is not used for pier(s) or swimming. If you have a lot of frontage, you may choose to add more than a single Fish Sticks cluster.

2. Create a design

Fish sticks structures are commonly made up of 3 to 5 whole trees. The butt ends of the trees, at the water's edge, are cabled to live trees on shore (Figure 2).

Sketch the design and dimensions to be sure you understand what area it will cover and how it may function or fit into your landscape. Consider the following:

- Is the water deep or shallow? Trees sink and settle with branches breaking off soon after installation, but more trees can be placed in a deepwater cluster.
- Is your lakefront mowed adjacent to the proposed Fish Sticks site? If so and if you would like DNR Healthy Lakes grant funding, will you have to commit to not mowing a 300 square foot area at the base of the cluster or installing a 10x30 Native Planting.

(insert Figure 2 design schematic)

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3. Apply for a permit

The DNR recently streamlined the water regulation permits to make it easier for you to install Fish Sticks. Eligibility standards and application materials are here: <http://dnr.wi.gov/Permits/Water/>.

4. Lay out the best practice

Flag the area(s) along your waterfront property where Fish Sticks will be installed. This is important because most projects take place in the winter making it more difficult to identify landscape features and location preferences.

5. Construct the practice

Installing Fish Sticks on ice is the most practical and inexpensive method. Identify an ice road and maintain with snow plowing until ice is adequate thickness for installation (18"). Cut live trees from outside the shoreline vegetation protection area, which is usually at least 35 feet from the water's edge. Transport and place the trees in criss-cross clusters or stacks and then cable and anchor them to a live tree on shore.

Maintain Fish Sticks.

- Check on the site soon after spring ice out to be certain all the trees remain in place.
- The cables should be removed approximately 3 years after installation so they don't damage the live trees or litter the shore.

Links:

UW-Extension Healthy Lakes website – to be developed

Fish Sticks Guidance <http://dnr.wi.gov/topic/fishing/outreach/fishsticks.html>

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FACTSHEET Practice 2: 10x30 Native Plantings

Description:

Native plantings (Figure 1) are template planting plans designed for a contiguous area of at least 300 square feet within the transition zone, also known as a shoreland vegetation protection area or buffer. Each template has a corresponding list of native plants suited to the given function of the plan, including lakeshore, bird/butterfly, wet meadow, woodland, and critical area options.

(insert Figure 1 photo)

Purpose:

Native plantings improve wildlife habitat, slow runoff water, and promote natural beauty. Each template described above serves all of these functions to some degree, but one may be better than another given your property's unique site characteristics and areas of concern. For example, the critical area template is most appropriate for places on your property with bare ground or visible signs of erosion.

How to Build a 10x30 Native Planting:

It may be necessary to work with your local land and water conservation department or a landscaper to design and/or install these plantings. Check with your local zoning department to determine if any permits are necessary.

1. Find a location

Native plantings should begin at the typical water's edge (i.e. Ordinary High Water Mark) and be at least 10 feet wide. Choose a piece of turf grass you wish to revert back to a more natural state or an already vegetated area you would like to augment. Try to choose a location in full or partial sun.

2. Determine soil type

It's important to understand what type of soil is in the planting location because that will determine which native plants can survive and thrive. The factsheet links provide tools and guidance to help determine your soil type.

3. Create a design

By planning your 10x30 native planting on paper first, you will be able to create the best appearance possible and you will understand how the practice will function and fit into your landscape (Figure 2).

(insert Figure 2 design schematic)

4. Choose your plants

Native plants should be used because they are best adapted for our climate and provide ideal habitat. You will want to choose plants that correspond to your soil type and moisture content (i.e. dry or moist). The 10x30 native planting templates include a mixture of grasses, sedges, wildflowers, ferns, shrubs, and trees, depending on the desired function and site conditions.

5. Lay out the planting

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Lay out the shape and boundary of the 10x30 native plantings based on your design. Before you start digging, contact <http://www.diggershotline.com/>.

6. Prepare the site

Removing lawn grass is critical to native planting success. The 2 most common ways to do so are with herbicide and black plastic. If you already have some native plants growing, you might consider removing weeds and planting among what is already growing. The designs provided in the factsheet links assume you are removing lawn grasses and starting from scratch.

Lay mulch down prior to planting. Mulch will conserve moisture and reduce weed growth within the planting area. Wood chips (2 inches deep), straw, or fallen leaves (each 3-4 inches deep) may be used as mulch.

7. Plant

Follow the design specifications by placing your plants in the approximate positions described in the template plan. Step back and look at the 10x30 native planting area. Plants should be placed about 1.5 feet apart from each other. When ready use a hand trowel, bulb planter, or bulb auger drill bit attached to an electric drill to plant them. *If grant funded, the 10x30 native planting must be in a contiguous area. In other words, the plants cannot be put into the ground in patches.*

8. Water and critter-proof the plants

Good water techniques and maintenance is the key to a quality native planting. Be ready to water them as soon as they are in the ground and to continue to water them daily for the first few weeks or until the plants are well established. Once plants are established, water only if prolonged dry periods occur.

A temporary fence or animal deterrent sprays may be necessary in areas prone to deer browse, rabbits, and other critters.

Maintain a 10x30 native planting.

- Watering is necessary, especially during dry periods, to establish plants during the first year.
- Become familiar with weeds and remove them frequently.
- The standing dead plants may be left in place through the winter for wildlife cover and food and then cut back when new spring growth emerges.

Links:

UW-Extension Healthy Lakes website – to be developed

10x30 Native Planting Guidance – being developed

Controlling Runoff and Erosion on Your Waterfront Property: A Guide for

Landowners <http://www.burnettcounty.com/DocumentCenter/Home/View/119>

Additional source:

Bone Lake 10x30 Native Planting

Program <http://bonelakewi.com/docs/10X30NativePlantings.pdf>

FACTSHEET Practice 3: Rain Garden

Description:

A rain garden (Figure 1) is a landscaped shallow depression with loose soil designed to collect roof, path, and driveway runoff. It is most commonly an upland practice but could also be placed in the transition zone, also known as a shoreland vegetation protection area or buffer.

(insert Figure 1 photo)

Purpose:

Rain gardens capture and infiltrate runoff allowing about 30% more water to soak into the ground than conventional lawn and can be used with any soil type. Rain gardens collectively protect lakes by preventing polluted runoff from entering them. They also simultaneously provide habitat for birds, butterflies, and beneficial insects and natural beauty. Rain gardens are designed to drain within 1-2 days, which means they won't pond water long enough to grow more mosquitos who need 7-12 days for a successful hatch.

How to Build a Rain Garden:

Rain gardens can vary in size from 5-50% of the drainage area, depending on soil type. Rain gardens for single-family homes will typically range from 150 to 600 square feet, but even a smaller one will help reduce water pollution problems. It may be necessary to work with your county land and water conservation department or a landscaper to design and/or construct this practice. Check with your local zoning department to determine if any permits are necessary.

1. Find a location

Place the garden at least 10 feet away from your home to prevent flooding. You should try to choose a naturally occurring low spot in your yard or position the garden where your downspouts or sump pump outlet can be used to direct rainwater into your garden. A grassy swale, French drain, or other device may be necessary to divert runoff water into the rain garden. Do not locate the garden over a septic field or where water already ponds. Try to choose a location in full or partial sun.

2. Measure drainage area

If you are building the rain garden in a low spot in your yard you do not need to measure the drainage area. Just ensure the area receives water regularly during a rainstorm.

If you are capturing water from a roof or other hard surface you will need to measure the specific drainage area of that surface and multiply by the number associated with the type of soil you have. For sandy soil multiply by 10%, for loam use 20% and for clay use 45%. These numbers are somewhat inflated but they will ensure the garden holds as much water as possible.

3. Create a design

Whether your garden is large or small the same basic principles apply. By planning your garden on paper first, you will be able to create the best appearance possible for your rain garden (Figure 2).

(insert Figure 2 design schematic)

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4. Choose your plants

Native plants should be used because they are best adapted for our climate. You will want to choose plants (flowers and grasses) that will grow well in both wet and dry areas because the rain garden will temporarily fill with rainwater from time to time.

5. Lay out the garden

Lay out the shape and boundary of the garden based on your design. Before you start digging, contact <http://www.diggershotline.com/>.

6. Dig the garden

Install silt fence downslope of where the garden will be constructed. Remove the turf grass and dig your garden approximately 6-18 inches deep for sandy soil; 6-12 inches deep for loamy soil; and 6-8 inches deep for clay soil. The bottom of the garden should be flat to evenly disperse water. Use the soil to build a berm around the garden edges if necessary.

7. Prepare the soil

Amend the soil with 2"-3" of compost. Mix in well.

8. Plant the flowers and grasses

Follow the design and place your plants in the approximate positions. Step back and look at the garden and the design. Plants should be placed about 1 foot apart from each other. Once you are satisfied you can start planting the flowers and grasses using a hand trowel.

9. Mulch the garden

Use coarse, fibrous, shredded woodchips, straw, or leaves. Apply the mulch about 2-3 inches deep. This will help to keep the moisture in and the weeds out.

10. Water and arrange downspouts

After you've planted the garden water every other day for 2 weeks if it doesn't rain until garden looks to be growing on its own. Good water techniques and maintenance is the key to a quality rain garden.

Maintain a Rain Garden.

- Watering may be necessary, especially during dry periods, to establish plants.
- Weeding is most important the first year and by the third year should no longer be necessary.
- The standing dead plants may be left in place through the winter for wildlife cover and food and then cut back when new spring growth emerges.

Links:

UW-Extension Healthy Lakes website – to be developed

Rain Garden Guidance <http://dnr.wi.gov/topic/stormwater/raingarden/>

Controlling Runoff and Erosion on Your Waterfront Property: A Guide for

Landowners <http://www.burnettcounty.com/DocumentCenter/Home/View/119>

Additional sources:

Vermont Lake Wise Program

FACTSHEET Practice 4: French Drain

Description:

This French drain design (Figure 1), also sometimes referred to as an infiltration trench, is an upland practice that includes a catch basin used to collect rooftop runoff water and provide settling before the water continues to drain tile for infiltration into the soil. It is constructed using simple materials; 1-2" clean washed stone, woven landscape fabric, and a perforated drainage pipe (usually the corrugated variety).

(insert Figure 1 photo)

Purpose:

This infiltration best practice captures, cleans, and infiltrates runoff that would otherwise move downhill into the lake. It is appropriate for sandy to loamy soils only and may require a catch basin or grassy berm to divert and pre-treat runoff water.

How to Build:

It may be necessary to work with your local land and water conservation department or a landscaper to design and/or construct this practice, particularly in regards to size and placement. Check with your local zoning department to determine if any permits are necessary.

1. Find a location

Place the practice at least 10 feet away from your home to prevent flooding. It can be placed closer to structures without basements or foundations. It should also be 50 feet from drinking water wells, especially if the well is old, and should not be placed uphill of or over a septic field. Dig a hole to be certain there is at least 3 feet of soil depth before groundwater is reached. You will also want to be sure the soil is sandy to loamy.

Identify the catch basin location at the base of a downspout. The gutter should lie on top of the catch basin and not be a sealed connection in the event of backup. You may need to use a gutter extension to be sure the catch basin is several feet from the foundation.

2. Measure drainage area and size the practice

The size of the practice will depend on the soil type and its infiltration rate as well as the size of the surface area it drains. The factsheet links provide some tools to measure drainage area and practice size. A typical French drain trench is 20 feet in length per downspout.

3. Create a design

Sketch the design (Figure 2) and dimensions to be sure you understand what area it will cover and how it may function or fit into your landscape. Consider the following:

- How will water flow from the practice if/when it overflows?
- Will you have adequate access to properly maintain it?

(insert Figure 2 design schematic)

4. Lay out the best practice

Lay out the shape and boundary of the project based on the design. Before you start digging, contact <http://www.diggershotline.com/>.

5. Construct the practice

Install silt fence downslope of where the practice will be constructed. After installing the catch basin at the base of the downspout, dig a trench in a location downslope and deep enough to allow for 6-12" inches of stone to be placed around the drain tile. A standard trench is about 1.5 feet deep and 10-12 inches wide, varying based on the size of the pipe chosen (usually 4-6 inches) and the desired depth. Line the trench with landscape fabric and place 6-12" of stone in the bottom of the trench. Install a 4" or 6" perforated drain tile and surround the pipe with stone and then backfill with soil. The landscape fabric should be wrapped all of the way around the stone to prevent mixing of the surrounding soil into the stone. This will keep the porous spaces in the stone open for the water to flow through. The trench should be sloped enough to move water through the drain tile to the desired destination and provide an outlet at the end for extreme storm events.

Maintain a French drain.

- Mark the location of the practice above the ground to avoid compaction, and do not drive across the area.
- Remove materials like leaves and pine needles that collect on top of the system and in/around the catch basin and overflow pipe.

Links:

UW-Extension Healthy Lakes website – to be developed
Controlling Runoff and Erosion on Your Waterfront Property: A Guide for Landowners <http://www.burnettcounty.com/DocumentCenter/Home/View/119>

Additional sources:

Solving Drainage and Erosion Problems: A Guide for Homeowners <http://www.fairfaxcounty.gov/nvswcd/drainageproblem/control-runoff.htm>
Vermont Lake Wise Program

FACTSHEET Practice 5: Rock infiltration pit

Description:

A rock infiltration pit (Figure 1) is an excavated area filled with rock that collects roof, path, and driveway runoff and allows it to soak into the ground. This upland practice is deeper than a French drain and can be designed to fit into smaller areas.

(insert Figure 1 photo)

Purpose:

This infiltration best practice captures, cleans, and infiltrates runoff that would otherwise move downhill into the lake. It is appropriate for sandy to loamy soils only and may require a catch basin or grassy berm to divert and pre-treat runoff water.

How to Build:

It may be necessary to work with your local land and water conservation department or a landscaper to design and/or construct this practice, particularly in regards to size and placement. Check with your local zoning department to determine if any permits are necessary.

1. Find a location

Place the practice at least 10 feet away from your home to prevent flooding. It can be placed closer to structures without basements or foundations. It should also be 50 feet from drinking water wells, especially if the well is old, and should not be placed uphill of or over a septic field. Dig a hole to be certain there is at least 3 feet of soil depth before groundwater is reached. You will also want to be sure the soil is sandy to loamy. The rock infiltration pit may function better if you locate it where incoming runoff first moves and cleans itself across a grassy area.

2. Measure drainage area and size the practice

If you are capturing water from a roof or other hard surface you will need to measure the specific drainage area of that surface. The size of the practice will depend on the soil type and its infiltration rate. Use the factsheet links to determine the specific drainage area and practice size.

3. Create a design

Sketch the design (Figure 2) and dimensions to be sure you understand what area the rock infiltration pit will cover and how it may function or fit into your landscape. Consider the following:

- How will water flow from the practice if/when it overflows?
- Can the practice be constructed so that the bottom is absolutely level in order to maximize the volume of water that can be captured and thus infiltrated?

(insert Figure 2 design schematic)

4. Lay out the best practice

Lay out the shape and boundary of the project based on the design. Before you start digging, contact <http://www.diggershotline.com/>.

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5. Construct the best practice

Install silt fence downslope of where the practice will be constructed. Dig the pit in a location downslope and deep enough to drain the area calculated in Step 2. It shouldn't be deeper than 5 feet because the soil below will compact and not drain effectively. Line the trench with landscape fabric and fill with $\frac{3}{4}$ "-2" rock to no more than within 6" of the top of the pit. Lay filter fabric over the top and cover the remaining space with 4"-6" or clean rock. The top layer of larger rock and filter fabric can be removed and replaced for maintenance and cleaning purposes.

Maintain a rock infiltration pit.

- Mark the location of the practice above the ground to avoid compaction, and do not drive across the area.
- Remove materials like leaves and pine needles that collect on top of or near the system.
- Check if sediment is accumulating between rocks and remove, sift, and/or wash and replace rock if it is.

Links:

UW-Extension Healthy Lakes website – to be developed

Controlling Runoff and Erosion on Your Waterfront Property: A Guide for

Landowners <http://www.burnettcounty.com/DocumentCenter/Home/View/119>