

# SMART YARDS



North Carolina  
Coastal Federation  
*Working Together for a Healthy Coast*

**SIMPLE  
DO-IT-YOURSELF  
SOLUTIONS  
TO REDUCE  
STORMWATER  
POLLUTION**





# Why Have A Smart Yard Guide?

*Because you care about keeping our creeks, rivers and sounds healthy for fishing and swimming. This guide includes simple do-it-yourself **Smart Yard** projects to reduce stormwater and improve the health of our coastal waters.*

## What's the Problem?

Stormwater – it isn't soaking into the ground the way it did before the land was developed. Now, rooftops, driveways and other compact surfaces drain stormwater runoff into streets, pipes and ditches that flow to coastal waters. The polluted stormwater is full of bacteria and other pollutants. That is why we often see signs alerting us not to swim or catch shellfish.

## What's the Solution?

This guide includes simple projects to reduce stormwater from your yard. The goal of **Smart Yards** is to use the soil, plants and containers (rain barrels) to capture the rain before it has a chance to become polluted runoff. Some techniques such as rain gardens absorb the runoff. Others, such as rain barrels, catch the runoff for later use.

## Together We Can Fix It

You can install a \$9 roof downspout diverter quickly and easily for big results. This simple solution can reduce the amount of runoff from your yard by up to 50 percent. However, if you need help with a project, just contact us at the N.C. Coastal Federation – 910.509.2838 or email Lauren Kolodij at [laurenk@nc coast.org](mailto:laurenk@nc coast.org) – and we will connect you with additional resources.

## We'll Give You A Hand

We want to applaud your **Smart Yard** and show photos of your projects on our web page. Be sure to share your work with us by emailing Lauren Kolodij at [laurenk@nc coast.org](mailto:laurenk@nc coast.org).



**Even Simple Things Can Make A BIG DIFFERENCE**

A downspout disconnection program in Portland, Oregon reduced 1.2 billion gallons of runoff each year by redirecting 56,000 downspouts in the city.



# Simple DIY Solutions: Rain Gardens

SMART YARDS: SIMPLE DO-IT-YOURSELF SOLUTIONS TO REDUCE STORMWATER POLLUTION



Winding River Rain Garden Planting



Winding River Rain Garden during 1.5" rain



Winding River Rain Garden 24 hours later

## What is a Rain Garden?

Rain gardens are small, shallow, vegetated areas that capture rain during storms. They are lower than the surrounding lawn and function as a bowl as they collect rainwater off your roof or driveway. The plants and soil in a rain garden then soak up the water before it has a chance to become polluted runoff.

## Did You Know?

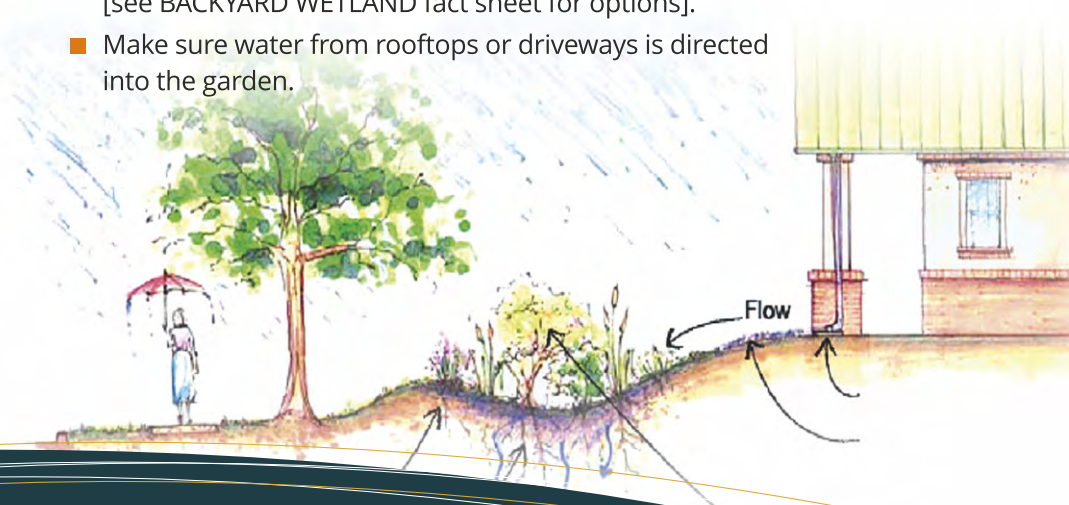
- Rain gardens can reduce stormwater runoff by 90% or more.

## Benefits

- Reduced stormwater runoff
- Reduced pollutants
- Reduced flooding
- Natural stormwater treatment
- Enhanced curb appeal of your yard

## Helpful Hints

- Observe water flow patterns during rains to determine potential areas for rain gardens.
- Use native plants for lower maintenance.
- Rain gardens may not be suitable in areas with standing water [see BACKYARD WETLAND fact sheet for options].
- Make sure water from rooftops or driveways is directed into the garden.





# Where to Start

## Locate

- Select an area that will capture and absorb runoff based on how water flows across your land.
- Site the garden at least 10' from your house and 25' from wells or septic fields.
- Make sure the soil will drain.

## Design

- Rain gardens are typically 4-8 inches lower than the surrounding lawn.
- Go to N.C. State University [Rain Garden Guide](#) for sample designs [see references below].

## Build & Plant

- Dig a shallow depression for the outline and base of the rain garden.
- Plant flowers, shrubs, grasses or even turf (choose native vegetation when possible).
- Use heavy double or triple shredded hardwood mulch that won't float away.

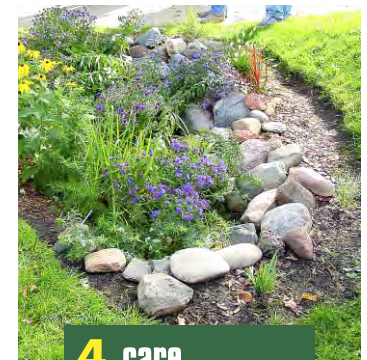
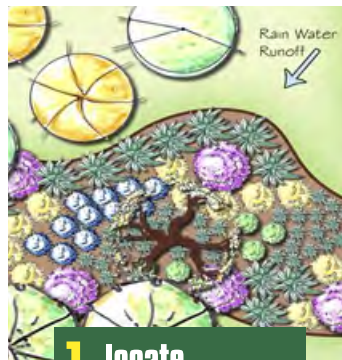
## Care

- Periodically water your garden until established.
- Mulch and weed annually.

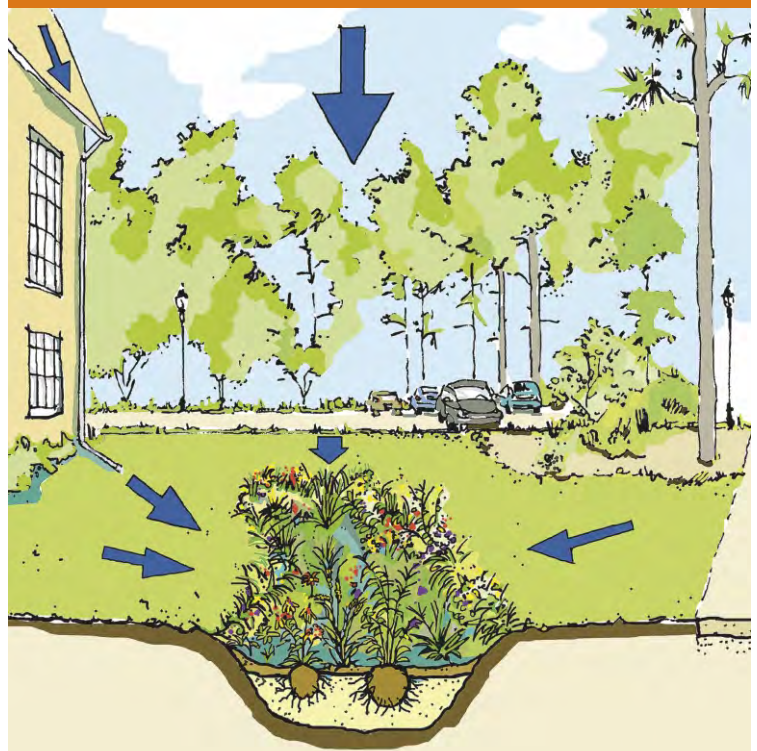
## References and Resources

- **N.C. State University Rain Garden Guide**  
[www.bae.ncsu.edu/topic/raingarden/Building.htm](http://www.bae.ncsu.edu/topic/raingarden/Building.htm) [Building A Backyard Rain Garden]
- **Brunswick County Cooperative Extension**  
[brunswick.ces.ncsu.edu](http://brunswick.ces.ncsu.edu) [The Low Impact Homeowner]
- **N.C. Coastal Federation**  
[www.nccoast.org](http://www.nccoast.org) [Click Restore/Preserve]
- **Growing Wild Nursery**  
[www.growingwildnursery.com](http://www.growingwildnursery.com)

## HOW TO BUILD A RAIN GARDEN



## HOW A RAIN GARDEN WORKS



North Carolina  
Coastal Federation  
*Working Together for a Healthy Coast*



# Simple DIY Solutions: Reroute Downspouts

SMART YARDS: SIMPLE DO-IT-YOURSELF SOLUTIONS TO REDUCE STORMWATER POLLUTION



Demonstration of materials for rerouting downspouts



Typical placement of a downspout



Rerouted downspout

## Why Reroute Downspouts?

Downspouts directed to driveways, sidewalks or parking lots increase the amount of polluted runoff by an average of 50 percent or more. Instead of contributing to stormwater pollution, you can put rain water to good use.

## Did You Know?

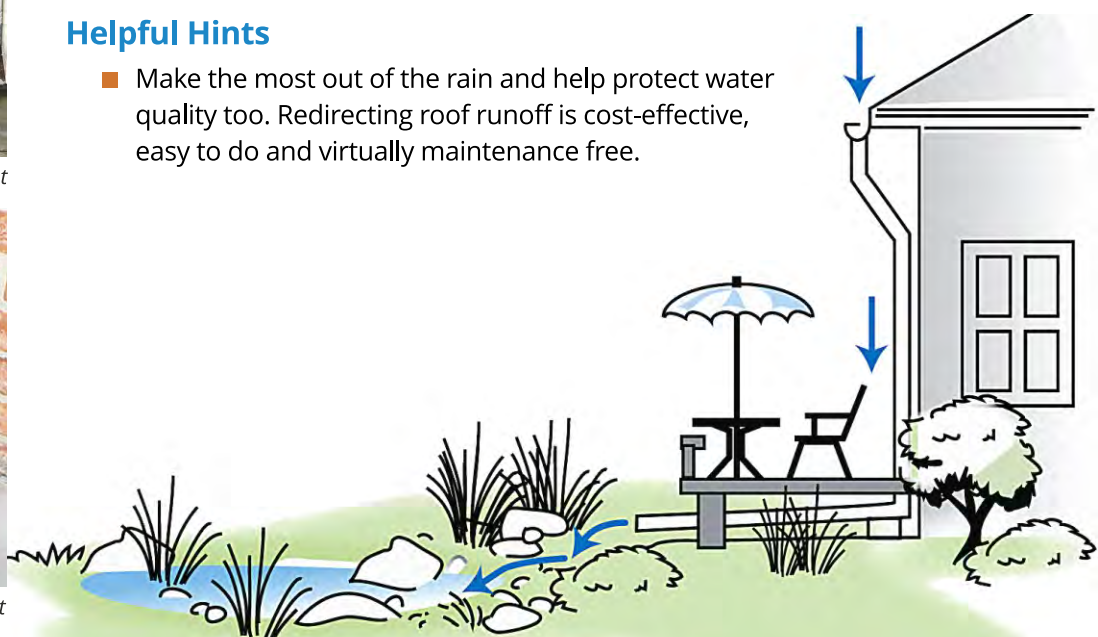
- During the summer months it is estimated that nearly 40 percent of household water is used for lawn and garden maintenance.
- Approximately 12 gallons of water per minute flows from a single house downspout during a one-inch rainfall.

## Benefits

- Reduced runoff volume
- Reduced pollutants
- Reduced flooding

## Helpful Hints

- Make the most out of the rain and help protect water quality too. Redirecting roof runoff is cost-effective, easy to do and virtually maintenance free.





# Where to Start

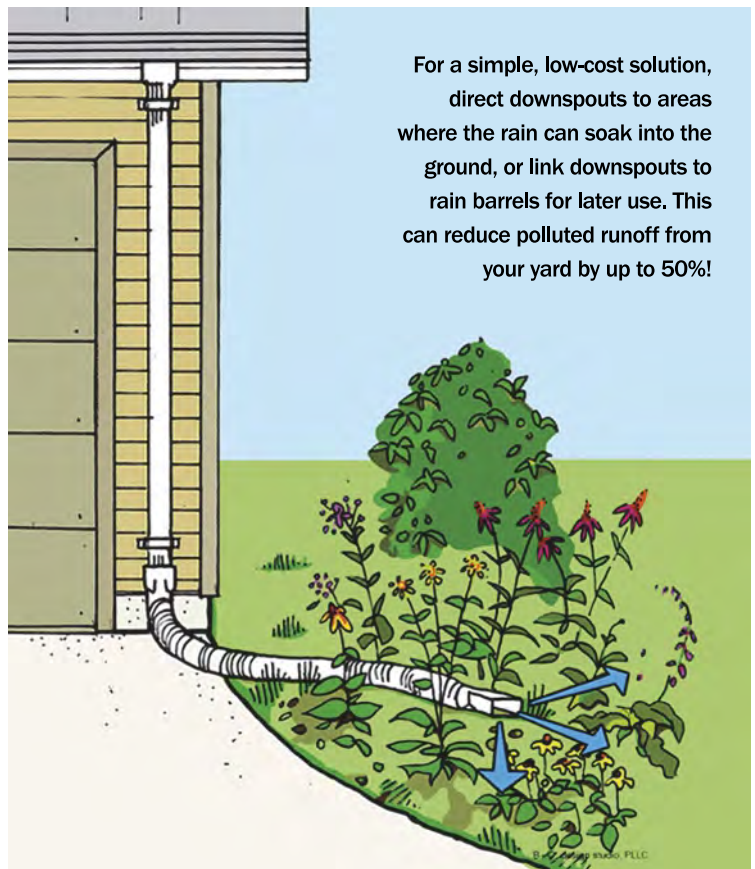
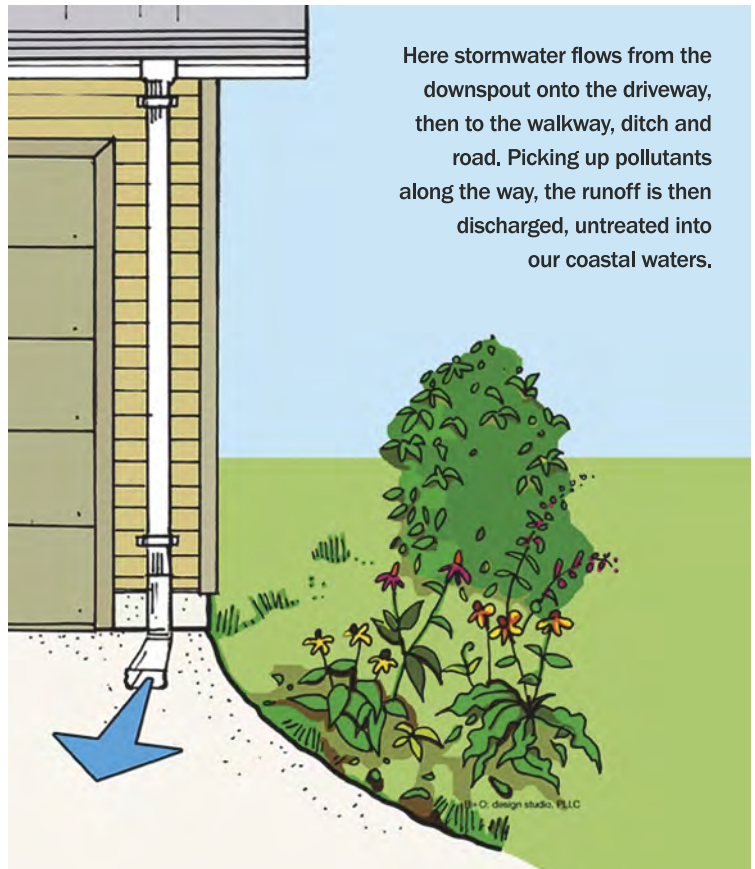
## Reroute Your Downspout

**Reroute your downspout with these few simple techniques:**

- Direct downspouts to areas that can infiltrate into the ground.
- Turn downspouts away from sidewalks and driveways into yards and other vegetated areas by using extension gutters to “disconnect” the impervious surfaces.
- Route downspouts to landscaped areas such as rain gardens.
- Link downspouts to rain barrels.
- Use extension gutters or splash blocks to help direct the flow of water.
- Reroute all stormwater at least five feet from your foundation.
- Avoid routing downspouts to neighboring property or directly over a septic system or drain field.

## References and Resources

- **Mid-America Regional Council**  
[www.marc.org/environment/water](http://www.marc.org/environment/water)
- **North Carolina Coastal Federation**  
[www.nccoast.org](http://www.nccoast.org) [Restore/Preserve]
- **City of Portland Stormwater Solutions Handbook**  
[www.portlandonline.com](http://www.portlandonline.com)
- **DC River Smart Homes**  
[www.ddoe.dc.gov](http://www.ddoe.dc.gov)  
[search downspout disconnection]

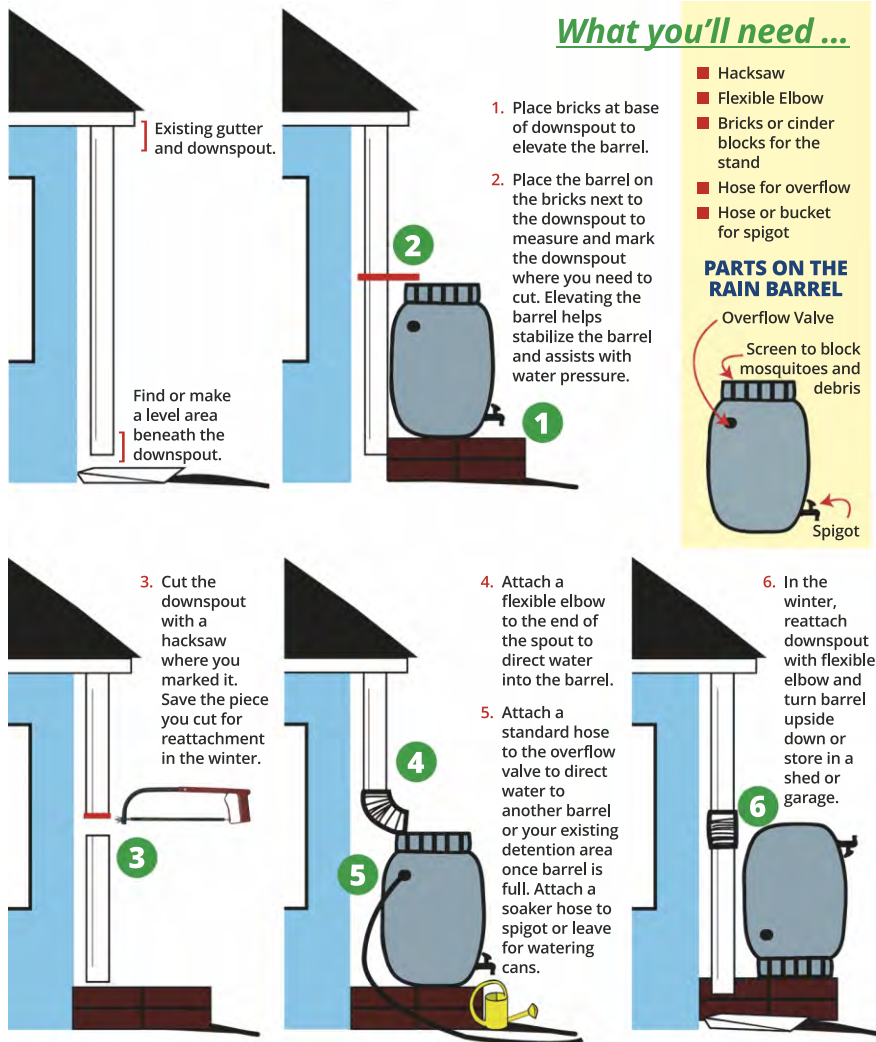


North Carolina  
Coastal Federation  
*Working Together for a Healthy Coast*

# Simple DIY Solutions: Rain Barrels

SMART YARDS: SIMPLE DO-IT-YOURSELF SOLUTIONS TO REDUCE STORMWATER POLLUTION

## How To Install Your Rain Barrel



Source: DuPage County Stormwater Management 1/2010

### What is a Rain Barrel?

A rain barrel is a container that collects and stores rainwater from your roof. Rain barrels come in all shapes and sizes. They are placed under roof gutter downspouts and typically hold 50-55 gallons of water.

### Did You Know?

- One quarter-inch of rain produces enough runoff to fill a rain barrel.

### Benefits

- Reduced stormwater runoff
- Free source of water for watering plants and gardens

### Helpful Hints

- Keep screens on your rain barrel lid to prevent mosquitoes.
- Rain barrels only work if you use the water collected.

### References and Resources

- **N.C. State University**  
[www.bae.ncsu.edu/topic](http://www.bae.ncsu.edu/topic)  
[water harvesting]
- **N.C. Coastal Federation**  
[www.nccoast.org](http://www.nccoast.org) [Restoration/Preservation]
- To purchase rain barrels locally contact the **Brunswick Soil and Water Conservation District** at 910.253.2830 or email [soil-water@brunscosco.net](mailto:soil-water@brunscosco.net)



# Simple DIY Solutions: Native Landscaping and Tree Planting

SMART YARDS: SIMPLE DO-IT-YOURSELF SOLUTIONS TO REDUCE STORMWATER POLLUTION



*Sweet Bay Magnolia*



*Carolina Laurel*



*Joe Pye Weed and Black Eyed Susans*

## What is Native Landscaping and Tree Planting?

Native landscaping includes the use of native plants that are hardy and well suited to the soils and climate of the southeast coastal region. Tree planting can help reduce stormwater by intercepting it and allowing it to evaporate. Trees also provide shade, which helps keep surface temperatures lower, and they facilitate stormwater infiltration and groundwater recharge.

## Did You Know?

- Native trees and plants require little care once established as compared to non-natives.
- Plants absorb and slow the flow of stormwater runoff, prevent erosion and increase soil permeability.

## Benefits

- Native plants save time and money by eliminating or reducing the need for fertilizers, pesticides and irrigation.
- It is estimated that one hundred large mature trees intercept 1.2 million gallons of rainfall per year.
- Properties with trees are estimated to be valued 5 to 15 percent higher than comparable properties without trees.

## Helpful Hints

- Direct runoff to a native landscaped feature, such as a rain garden, to capture stormwater and create beautiful habitats.

## References and Resources

- **N.C. State University** for native landscaping design ideas and plant lists applicable to your community  
[www.ncsu.edu](http://www.ncsu.edu) [How To Go Native]
- **Brunswick County Cooperative Extension**  
[www.brunswick.ces.ncsu.edu](http://www.brunswick.ces.ncsu.edu) [The Low Impact Homeowner]
- **N.C. Native Plant Society**  
[www.ncwildflower.org](http://www.ncwildflower.org) [Search SE Coast]



# Simple DIY Solutions: Backyard Wetlands

SMART YARDS: SIMPLE DO-IT-YOURSELF SOLUTIONS TO REDUCE STORMWATER POLLUTION



*Example of a backyard wetland garden*



*Eagle Point Golf Club stormwater wetland*



*Bradley Creek Elementary School stormwater wetland*

## What Is A Backyard Wetland?

Backyard wetlands are depressed wet areas that are enhanced with native wetland plants. They are well suited for areas of your yard that are usually wet for several days following a rain event. Backyard wetlands are designed to capture and treat stormwater similar to a rain garden but in locations with high-water tables and soggy soils.

## Did You Know?

- Man-made backyard wetland gardens can provide many of the same benefits as natural wetlands.

## Benefits

- Capture, reduce and filter runoff
- Enhance landscaping
- Bird and butterfly habitat

## Helpful Hints

- For the best water treatment and mosquito control, create a diverse native plant and animal habitat to encourage a wide range of plant and animal species (especially frogs and dragonflies).
- You can also avoid mosquito problems by keeping out cattails and using trees sparingly, adding non-toxic mosquito dunks, or adding Gambusia (mosquito fish).



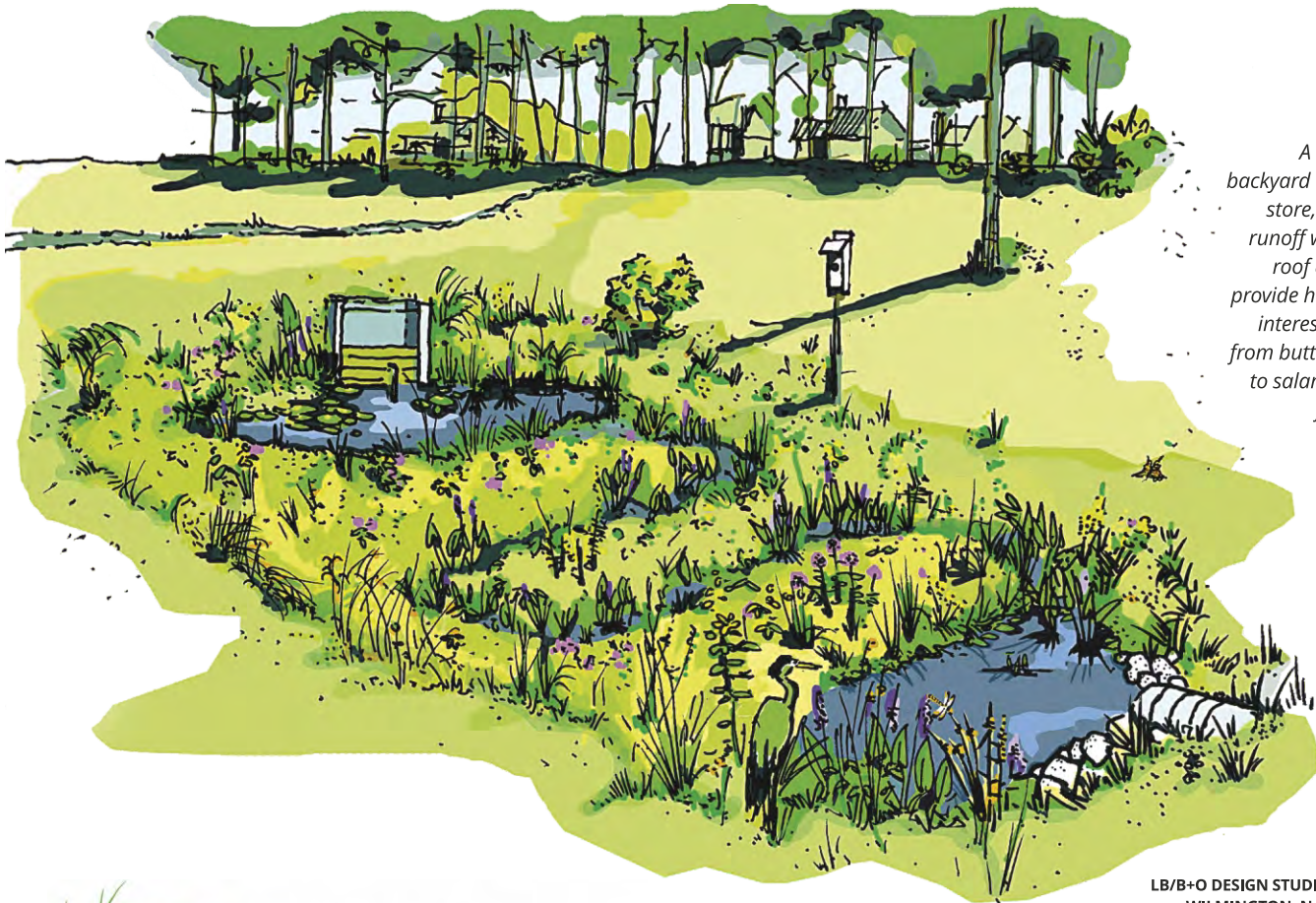
# Where to Start

## Build and Construct

- Choose areas of your lawn that include naturally occurring wet spots for your wetland.
- Locate wetland at least 10 feet from any foundation.
- Build wetland at least 25 feet from septic fields and well heads.
- Ponding depth of wetland should be no more than 9 inches.
- Refer to *Common Wetland Plants* to determine the type of native plants to use in your backyard wetland.

## References and Resources

- **Natural Resources Conservation Service**  
[www.nrcs.usda.gov](http://www.nrcs.usda.gov) [Backyard Conservation - Water Conservation]
- **NCSU Stormwater Publications**  
[www.bae.ncsu.edu/pubs.htm](http://www.bae.ncsu.edu/pubs.htm) [Stormwater Wetlands Design Update (2007)]
- **N.C. Department of Environment and Natural Resources, Division of Water Quality**  
[www.ncdenr.gov](http://www.ncdenr.gov) [Common Wetland Plants]
- **N.C. Department of Agriculture and Consumer Services**  
[www.ncagr.gov](http://www.ncagr.gov) [Community Conservation Assistance Program]
- **Brunswick County Cooperative Extension**  
[www.brunswick.ces.ncsu.edu](http://www.brunswick.ces.ncsu.edu) [The Low Impact Homeowner]



*A wetland in your backyard will temporarily store, filter and clean runoff water from your roof and lawn. It will provide habitat for many interesting creatures – from butterflies and bees to salamanders, toads, frogs and birds.*

LB/B+O DESIGN STUDIO  
WILMINGTON, N.C.



North Carolina  
Coastal Federation  
*Working Together for a Healthy Coast*





# North Carolina Coastal Federation

*Working Together for a Healthy Coast*

[www.nccoast.org](http://www.nccoast.org)

## Acknowledgments

**The North Carolina Coastal Federation would like to thank the following for their contributions to the development of this guide:**

Brunswick County Cooperative Extension Service  
N.C. State University

N.C. Attorney General's Environmental  
Enhancement Grant Program

N.C. Division of Water Quality

U.S. Environmental Protection Agency's  
Section 319 Grant Program

Withers & Ravenel

And the multiple resources listed throughout  
this publication



**WITHERS & RAVENEL**  
ENGINEERS | PLANNERS | SURVEYORS





## About the North Carolina Coastal Federation

The federation is the state's only non-profit organization focused exclusively on protecting and restoring the coast of North Carolina through education, advocacy and habitat restoration and preservation. For more information call 252.393.8185 or check out the federation's website at [www.nccoast.org](http://www.nccoast.org).



N.C. Coastal Federation  
Southeast Region Office  
The Landing • 530 Causeway Dr • Suite F1  
Wrightsville Beach, NC 28480  
Bus 910.509.2838  
Fax 910.509.2840



North Carolina  
Coastal Federation  
*Working Together for a Healthy Coast*



For more information  
[www.nccoast.org](http://www.nccoast.org)