# Life on the Coast is Easy? How native plants are built for life near the beach



Matt Collogan Area Natural Resources Agent Brunswick County Center



How can we increase nature-enhancing landscaping in coastal communities with easy, available, affordable, attractive solutions?



What do
you
notice
about
this yard?



## What about this yard?



### Coastal Landscaping Challenges

- Poor, sandy soil (also areas of hydric, organic soils)
- Heat
- Drought conditions
- Frequent storms
- Saltwater exposure and soil salinity
- Strong coastal winds
- Salt-aerosol damage
- Rapid development forest and ag land being converted to housing, roads, commercial



### What is a sustainable coastal landscape?

- Attractive
- Environmentally-friendly
- Well adapted to coastal region
- Storm-ready
- Functional & enjoyable
- Cost-efficient & manageable

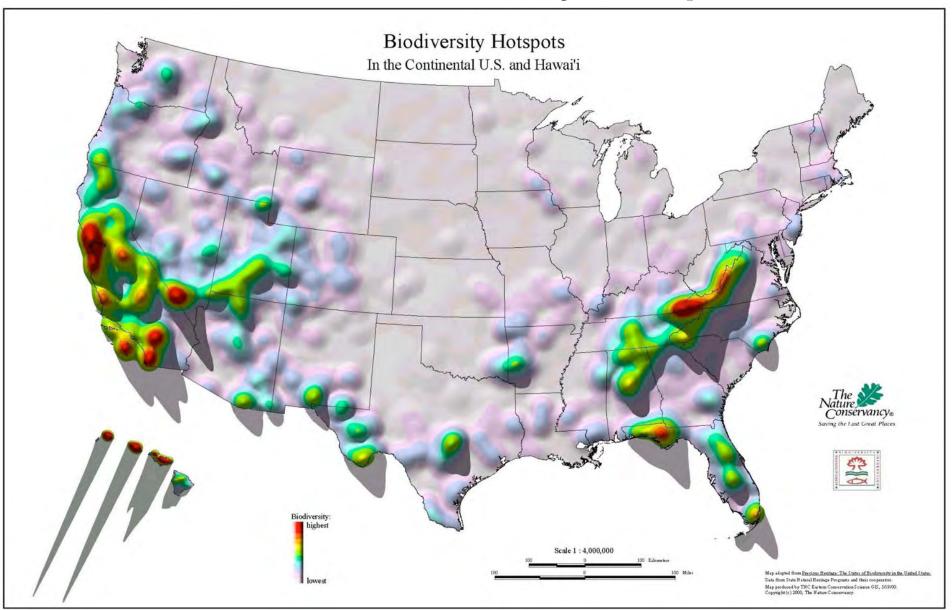


- Brand new construction
- New developments with small lots
- Rapid
   development,
   clear cutting
- Soil compaction
- Removal of topsoil
- Water drainage issues
- Polluted runoff

## Where are we starting?



## NC is a biodiversity hotspot!



# Choose native and non-invasive plants well suited to coastal conditions



Seashore mallow (Kosteletzkya virginica)



Carolina anole searches for prey on a seashore mallow

### Can you identify the native tree?



Loblolly bay (Gordonia lasianthus)



Mimosa (*Albizia julibrissin*)

#### Can you identify the native bush?



Thorny olive (*Elaeagnus pungens*)



Yaupon holly (Ilex vomitoria)

Shrubs are underutilized – native berries have a high fat content at a crucial time of year (migration), however, many invasive shrubs like privet have sugary berries that aren't healthy for bids

### Can you identify the native vine?



Japanese honeysuckle (Lonicera japonica) Coral honeysuckle (Lonicera sempervirens)

#### What is "Native"?

Species that evolve naturally in an environment without human intervention

Plants are adapted to local soil and climate conditions over thousands of years

Co-evolve with other species and form interdependent and highly specialized relationships that are necessary for the other's survival

Much of our coast represents the Floristic transition between the Virginian and Carolinian biogeographic regions



#### **NC STATE UNIVERSITY**

- -Uniquely adapted to local environmental conditions
- -Generally require less care and less water once established
- -Protect local water quality by reducing the need for fertilizer
- -Provide ecosystem services: clean air & water, heat mitigation, flood abatement, decreased crime, slower traffic, improved mental & physical health
- -essential habitat for our native insects and wildlife

## Why plant Natives?



## Adding Native Plants: base of food web



Ginkgo





River Birch = 413

#### Data from Doug Tallamy's Research on Lepidopteran Use of Native and Non-native Plants

#### Woody Plants

#### Common Name Plant Genus Butterfly/moth species supported

Oak	Quercus	534
Black cherry	Prunus	456
Willow	Salix	455
Birch	Betula	413
Poplar	Populus	368
Crabapple	Malus	311
Blueberry	Vaccinium	288
Maple	Acer	285
Elm	Ulmus	213
Pine	Pinus	203
Hickory	Carya	200
Hawthorn	Crataegus	159
Spruce	Picea	1.56
Alder	Alnus	156
Basswood	Tilia	1,50
Ash	Fraxinus	150
Rose	Rosa	139
Filbert	Corylus	131
Walnut	Juglans	130
Beech	Fagus	126
Chestnut	Castanea	125



#### Herbaceous Plants

Common Name	Plant Genus	Butterfly/moth species supported
Goldenrod	Solidago	115
Asters	Aster	112
Sunflower	Helianthus	73
Joe pye, Boneset	Eupatorium	42
Morning glory	Ipomoea	39
Sedges	Carex	36
Honeysuckle	Lonicera	36
Lupine	Lupinus	33
Violets	Viola	29
Geraniums	Geranium	23
Black-eyed susan	Rudbeckia	17
Iris	Iris	17
Evening primrose	Oenothera	16
Milkweed	Asclepias	12
Verbena	Verbena	11
Beardtongue	Penstemon	8
Phlox	Phlox	8
Bee balm	Monarda	7
Veronica	Veronica	6
Little bluestem	Schizachyrium	6
Cardinal flower	Lobelia	4

From briningnaturehome.net

# Carolina Chickadee

Length = 4.75" Weight = 10.5g (two nickels)





To raise one clutch (2-3 birds) to fledge (plus 21 days) = 10,000 caterpillars!!!

Bird seed and winter berries

# Moths & Butterflies as Food

- Worldwide 37% of animal species are herbivorous insects
- Beetles and Lepidoptera
- Convert plant tissues of all types to protein, fat
- 96% of bird species eat insects



Pound for pound insects have more protein than beef—high in valuable energy! Source of carotene, birds can't make on own.



# Nature at Home Principles

- 1 Add native plants: right plant, right place
- 2 Remove non-native invasives
- 3 Manage stormwater
- 4 Increase garden beds; reduce lawns
- 5 Reduce use of synthetic herbicides, pesticides, fertilizers
- 6 Leave the leaves; save the stems
- 7 Provide wildlife structures and water features
- 8 Reduce nighttime light pollution



### Right Plant, Right Place

- Native alone does not mean a plant is well suited to a site
- Know your soil, hydrology and habitat

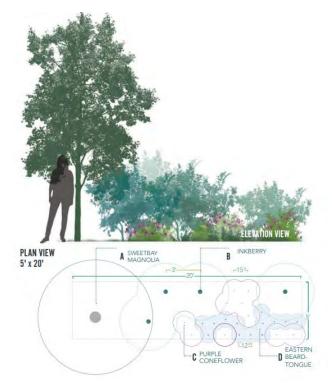


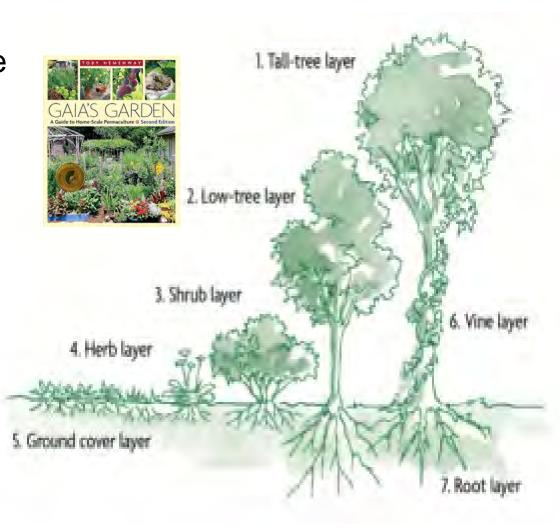




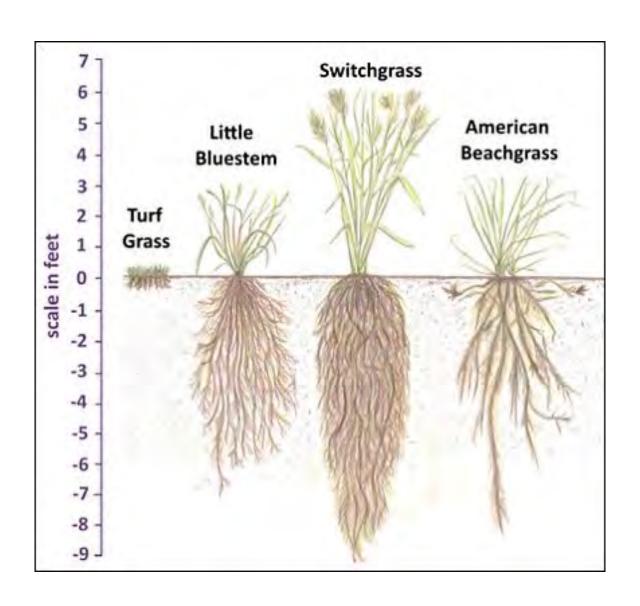
### **Diversity in Species and Structure**

- Five layers of plantings
- Canopy trees if possible
- Try for at least three layers

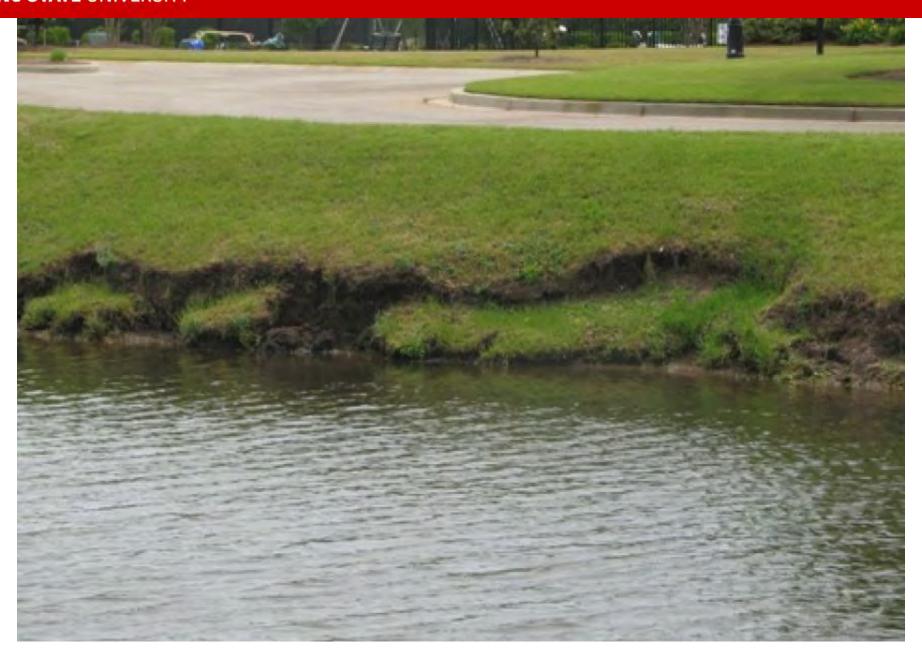




#### Turfgrass has very shallow roots



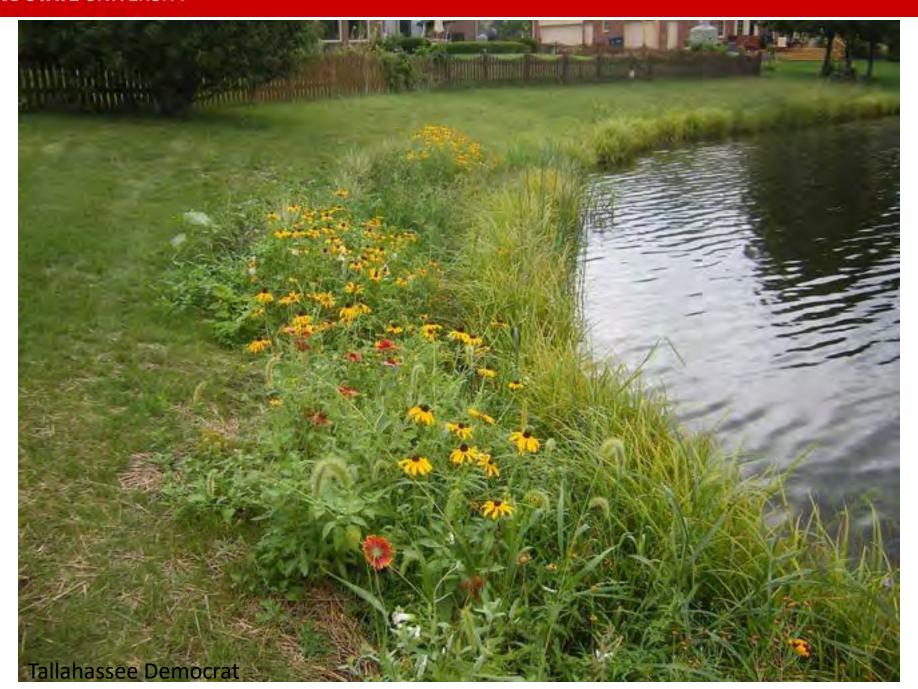
#### **NC STATE UNIVERSITY**



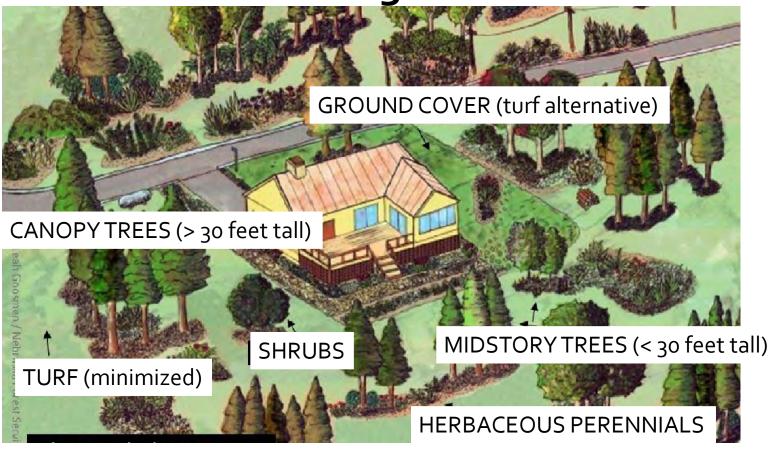
### **Native Plant Pond Buffer**



#### **NC STATE UNIVERSITY**



# Use a mix of plant types for health & ecological benefits



#### COASTAL NORTH CAROLINA







**Eco-friendly Alternatives to** Harmful Ornamental Plants







From the COASTAL LANDSCAPES INITIATIVE

SPECIMEN TREES

#### **AVOID THESE TREES**







#### **PLANT THIS INSTEAD**



#### SERVICEBERRY Amelanchier canadensis

This deciduous tree or small shrub features slightly fragrant white flowers that appear before the leaves in early spring. In late spring, tasty purple-red berries appear, which songbirds and various mammals eat. Its early blooms are important to pollinators, and the Amelanchier genus supports over 94 species of butterflies and moths. Its attractive fall foliage is yellow to bright orange-red.

TIP A dark foliage backdrop helps to highlight this tree's attractive flower, leaf, and bark.

LIGHT: Full sun to part shade SOIL: Moist HEIGHT: 10'-20' WIDTH: 15'-20'





#### REDBUD Cercis canadensis

In early spring before foliage emerges, this deciduous, multitrunked understory tree blooms profusely with stunning pea-like rose-purple edible flowers which cover the bare branches. Its heart shaped leaves turn pale yellow to greenish yellow in the fall. Beanlike seed pods often remain through the winter. This tree is a larval host plant for 12 species of Lepidoptera, the insect group that includes butterflies and moths. Birds feed on redbud seeds.

LIGHT: Full sun to part shade SOIL: Occasionally dry to moist HEIGHT: 20'-30' WIDTH: 25'-35'



#### FRINGETREE Chionanthus virginicus

A showy, deciduous, multi-trunked tree with an abundance of softly fragrant fringe-like white flowers that appear in spring. The leaves turn yellow in autumn. The tree is used for food and shelter by many animals including birds, bees, and other pollinators. It is a host plant to the Fawn Sphinx and Rustic

TIP Plant it in a mass (large group) or as a specimen.

LIGHT: Full sun to part shade SOIL: Occasionally dry to moist HEIGHT: 12'-30' WIDTH: 12'-20'

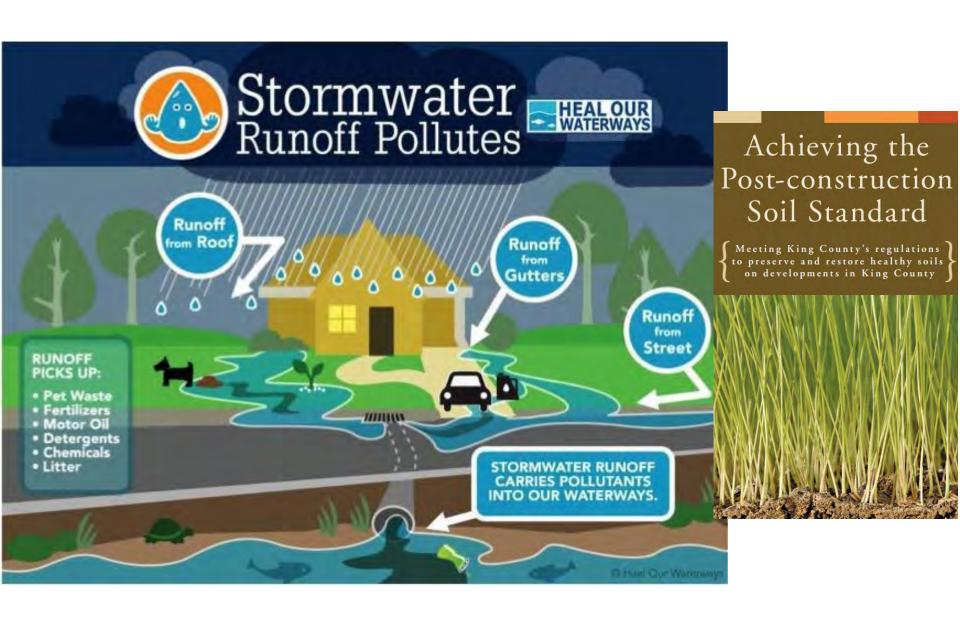
#### MORE SPECIMEN TREES

Flowering Dogwood Cornus florida Sweetbay Magnolia Magnolia virginiana Blackhaw Viburnum prunifolium

Red Mulberry Morus rubra Sparkleberry Vaccinium arboreum Red Buckeye Aesculus pavia

Carolina Cherry Laurel Prunus caroliniana Hawthorn Crataegus phaenopyrum Red Maple Acer rubrum

go.ncsu.edu/CoastalLandscapes



## Manage storm water to improve water quality



Harvest and use rain water



Direct downspouts to gardens

Maintain stormwater ponds for water quality and beauty

### **Low Impact Development - LID**



Practices that prevent storm water runoff from polluting waterways by mimicking a site's natural surface water & groundwater hydrology

- •Disconnected impervious surfaces
- •Preservation of open space/natural features
- •Rain Gardens or Bioretention Areas

- Porous pavement
- •Water harvesting (rain barrels, cisterns
- •Low-input native landscaping

# Reduce turf and adopt lawn alternatives to create habitat for wildlife



Wild ginger (Asarum canadense)



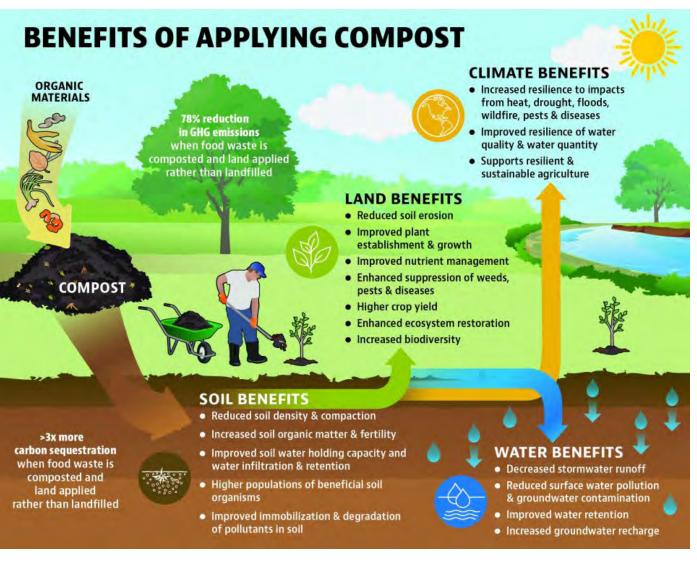
Cinnamon fern (Osmunda cinnamomea)



Pink muhly grass (*Muhlenbergia capillaris*)

Water & fertilize strategically to maintain water quantity & quality







carolinacompost.com/

Chapter of the US Composting Council Graphic source: EPA

## Leave the Leaves, Save the Stems

- Leaving leaf litter in designated areas provides critical habitat for animals like lightning bugs that pupate in leaf litter
- Leaf litter helps to infiltrate water.
- Save stems for overwintering pollinators
- Safe to cut stems only in first winter trim back after first frost or before last frost – once trimmed, don't cut again
- Trim perennial stems back in fall or winter to leave stubble of 18"-24"
- Stems won't be occupied first winter, they will be available for pollinators and beneficial insects to use as nesting sites the following spring & summer
- Waiting until late winter to trim stems gives birds and wildlife time to feed on seed heads, increasing number of species supported
- Once trimmed, no further maintenance eventually stems biodegrade
- Cutting stems off at ground level removes them from the ecosystem altogether and prevents them from ever becoming a nesting resource





Elsa Youngsteadt & Hannah Levenson NCSU

## **Provide Wildlife Structures & Water Features**



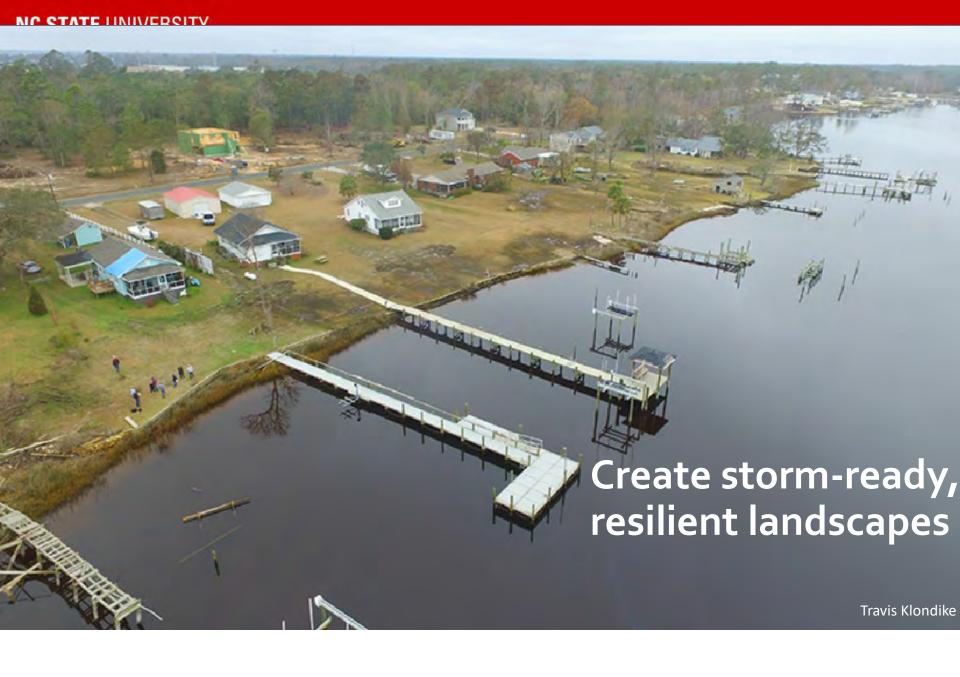
cats...

## **Reduce Nighttime Light Pollution**

- Outdoor light major cause of insect decline (moths = majority of caterpillar diversity)
- Save on power bill



 Change bulbs to yellow/amber bug light (insects attracted to white & blue wavelengths, converting to yellow reduces interference); motion sensor, direct lighting downward



## Consider nature-enhancing alternatives when replacing deteriorating bulkheads



Install living shorelines to protect your property & wildlife



## Select storm-ready trees to protect your home

Common Name	Storm Observations
Coastal American hornbeam ( <i>Carpinus</i> <i>caroliniana</i> )	Hard, dense wood; limbs resist breakage; medium-high wind resistance
Flowering dogwood (Cornus florida)	Hard, dense wood; high wind resistance; limbs resist breakage; wind defoliates tree
Common persimmon ( <i>Diospyros virginiana</i> )	Hard, dense wood; medium-high wind resistance
American holly ( <i>Ilex</i> opaca)	High wind resistance
Yaupon ( <i>Ilex vomitoria</i> )	High wind resistance; high flood tolerance

Source: Paul E. Hosier, Seacoast Plants of the Carolinas

## Select storm-ready trees to protect your home

Common Name	Storm Observations
Southern magnolia ( <i>Magnolia grandiflora</i> )	High wind resistance; wind defoliates tree; flood tolerant
Black gum ( <i>Nyssa</i> sylvatica)	High flood tolerance; good wind resistance
Live oak (Quercus virginiana)	High wind resistance; wind defoliates tree; deep roots when in well-drained soil; somewhat low profile
Cabbage palmetto ( <i>Sabal palmetto</i> )	High flood tolerance; high wind resistance
Bald Cypress ( <i>Taxodium</i> distichum)	High wind resistance; widespread roots; few branches and leaves; flood-tolerant (fresh water only)

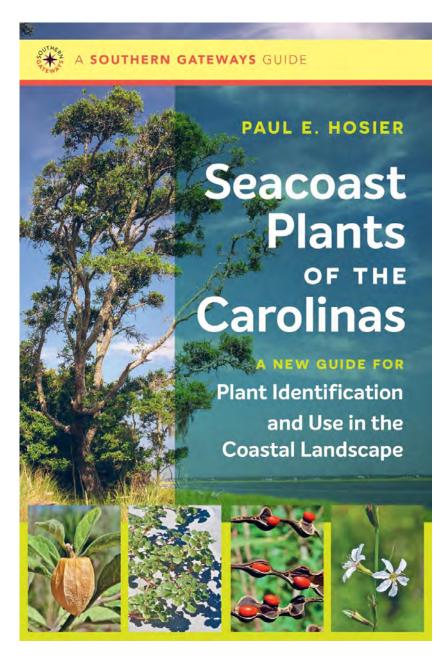
Source: Paul E. Hosier, Seacoast Plants of the Carolinas

## Select storm-ready trees

See Chapter 7 on Native Vegetation and Coastal Storms



Live oak (Quercus virginiana)





### **Live Oak**

Quercus virginiana

40-80' tall, 40-100' spread, not a "true" evergreen

Adaptable to both clay and sandy soils that are acidic and well-drained

Most wind resistant tree

'Cathedral' cultivar



Hosts: Pinus sp., Acer sp., Quercus sp. Liquidambar styraciflua, Sassafras albidum



### **Shumard Oak**

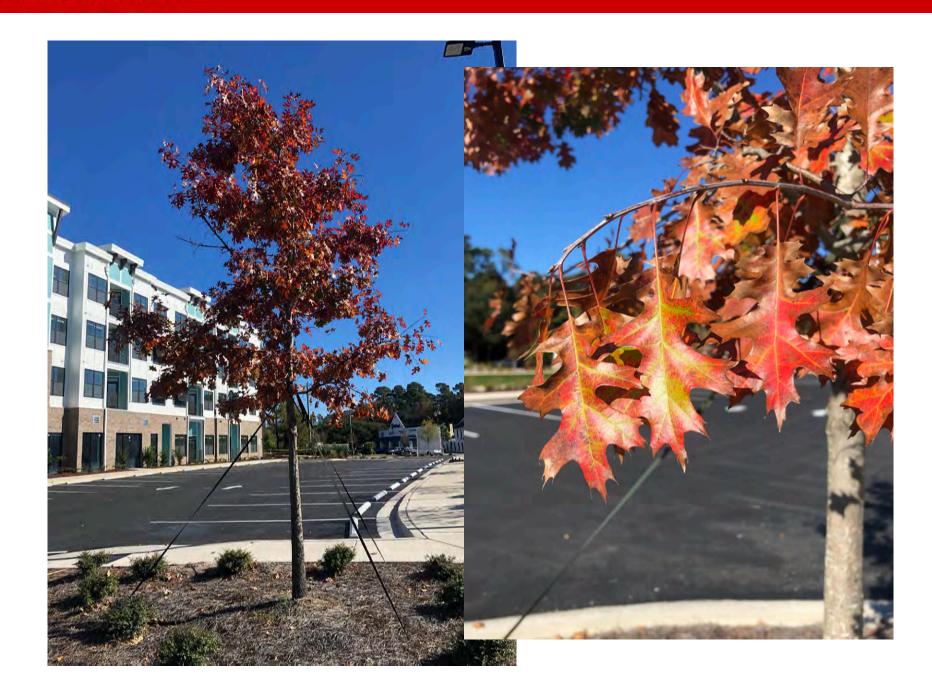
Quercus shumardii

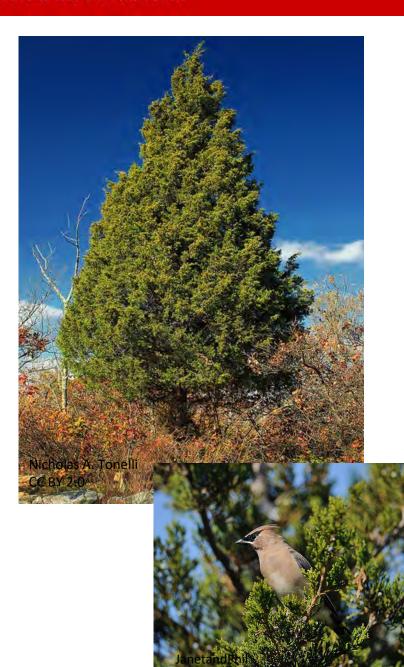
40-80' tall, 40-50' spread

Adaptable to wide variety of soils, very stress tolerant

Great tree for urban settings

Wildlife value





#### **Eastern Red Cedar**

Juniperus virginiana

Evergreen tree that can grow to 30+' tall, width 12-24'

Fast growing conifer

Extremely drought tolerant

Provides cover and food for wildlife



## **Sweetbay Magnolia**

Magnolia virginiana

20+' tall, semi-evergreen tree or multi-stemmed shrub, deer resistant, 10-20'width

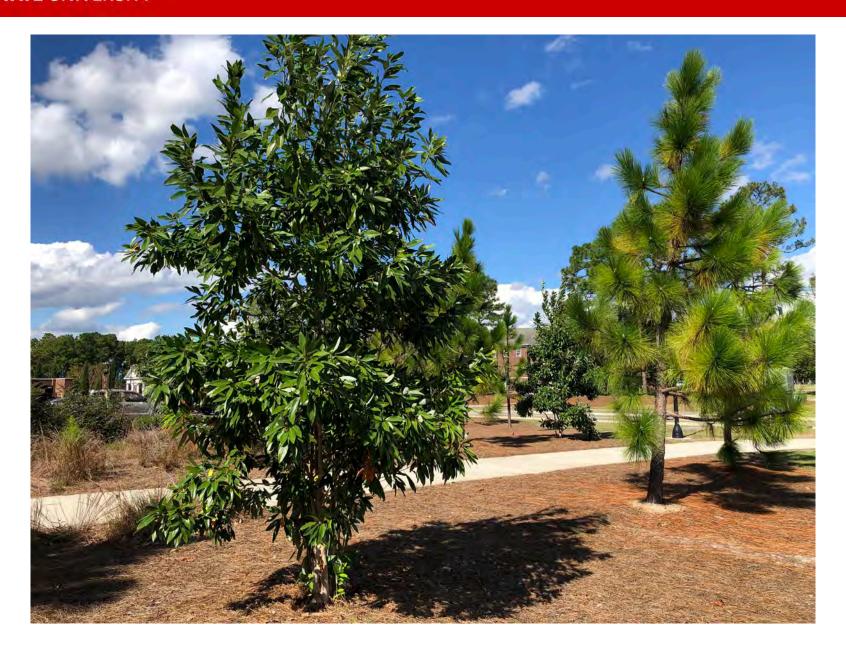
Fragrant flowers

Larval host for Spicebush Swallowtail and Eastern Tiger Swallowtail butterflies

Medium-high wind resistance



Eastern Tiger Swallowtail Butterfly





## **American Holly**

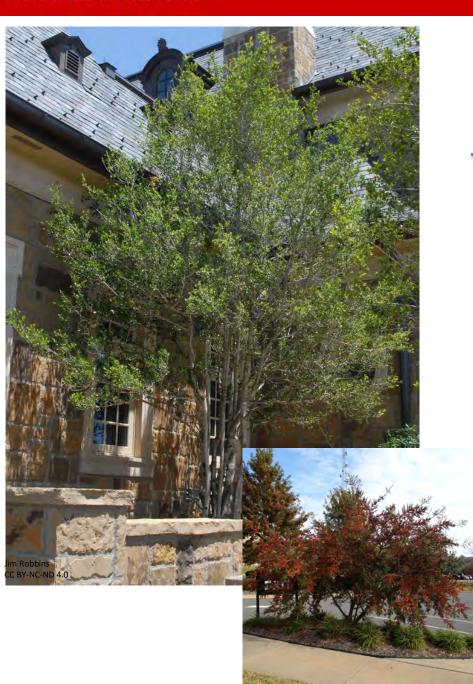
Ilex opaca

40-60' tall, full sun to part shade

Will take a broad range or soils and is pollution tolerant

Flowers are attractive to pollinators and fruits for wildlife

Highly wind resistant



## **Yaupon Holly**

Ilex vomitoria

Large shrub or small tree, can reach 10-20' tall, 8-12' width

Very drought tolerant

Female plants produce attractive red berries

Very attractive to pollinators



## **Dwarf Yaupon Holly**

Ilex vomitoria 'Nana'

Dense, compact, evergreen shrub 3-5' tall, 3-6' width

Drought and salt spray tolerant

Grows rapidly

Has a more formal appearance





Dwarf cultivar: 'Shamrock' 3-4' tall

## **Inkberry** *Ilex glabra*

Evergreen shrub

Slow growing, 5-8' tall

Tolerates a variety of soils, moderately salt tolerant

Cover and food for birds and pollinators enjoy flowers



### **Dwarf Palmetto**

Sabal minor

2-5' tall, 4-6' width

Drought and moderately salt tolerant

Most cold hardy native palm

Fruits eaten by robins, raccoons, and other birds and mammals



## **Wax Myrtle**

Myrica cerifera

Evergreen tree/shrub, 15-20' at maturity

Native to NC marshes, swamps, fresh-brackish streams

Great for erosion, wind and salt spray tolerant

Wildlife value



## **Beautyberry**

Callicarpa americana

3-8' tall, Full sun

**Deciduous Shrub** 

Fruits appear August-Oct Valuable food source for songbirds and small mammals



#### Yucca

Yucca filamentosa

Evergreen sword-shaped leaves with curly filaments

Prefers coarse, sandy soils in full sun

Tall panicle of white flowers attracts pollinators





## **Muhly Grass**

Muhlenbergia capillaris

4' tall, 3' width

Long-lived, little to no insect or disease pests and highly resistant to deer grazing

Tolerates heat, humidity, drought, poor soil and is highly salt tolerant





### Little Bluestem

Schizachyrium scoparium

2' tall, Vigorous, long rooted grass

Good for erosion control: Stream banks, slopes, rain gardens

Larval host plant for skippers, seeds eaten by birds

Cut back in March



Cultivar 'Northwind'

## **Switchgrass**

Panicum virgatum

3-5' tall, full sun

Moist clay or sandy soils

Bluish cast in the summer, pink flowers in fall

Slightly salt tolerant

Plant in masses



## **Black-eyed Susan**

Rudbeckia hirta

Full Sun

Blooms summer through fall

Short lived perennial, easily reseeds



#### **Blanket Flower**

Gaillardia pulchella

Naturalized in NC

Barrier island, sandy soils, full sun

Drought and salt tolerant

Blooms summer to fall

Attracts butterflies



## **Spotted Horsemint**

Monarda punctata

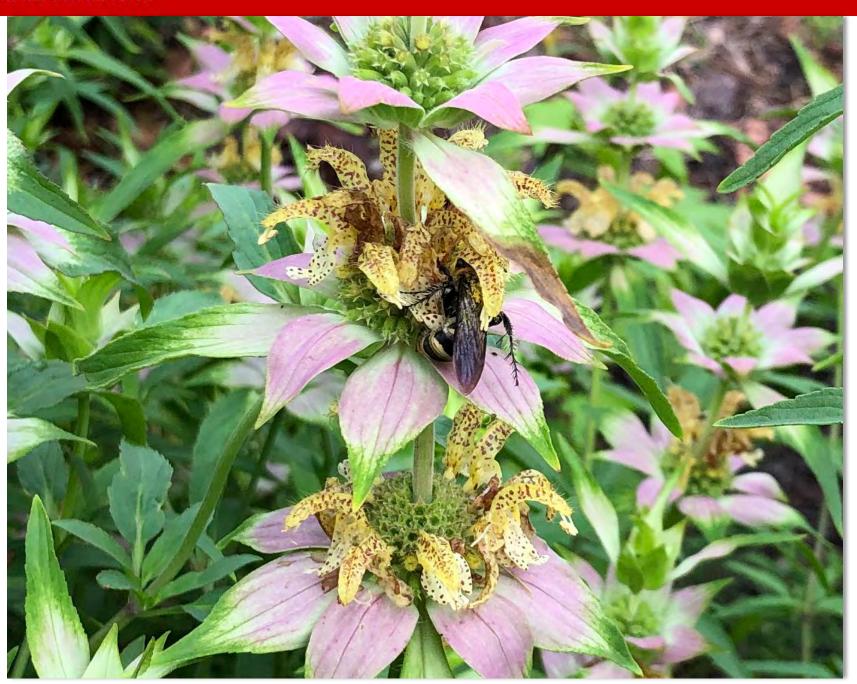
2-4' tall

Herbaceous perennial

Drought tolerant

Excellent cut flower

Deer and rabbit resistant





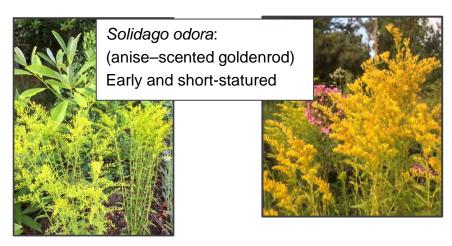
## Beautiful, Beneficial Goldenrods... solidago spp



...different from ragweed!













S. speciosa (showy) & S. rigidum (prairie):
Back of the border, late summer pollinator magnets





Solidago 'Fireworks': Heralds the fall, evergreen foliage



S. sempervirens:
(seaside goldenrod)
Late fall monarch favorite,
prefers low nutrient soils





## **Surf City Roundabout**



Eastern Red Cedar
Dwarf Palmetto
Dwarf Yaupon Holly
Yaupon Holly
Magnolia 'Little Gem'
Laurel Oak or
Darlington Oak







- Public & private sector partners collaborating to encourage sustainable practices in coastal communities by fostering coastal landscapes that are beautiful, functional, cost efficient and environmentally friendly
- https://ncseagrant.ncsu.edu/programareas/healthy-ecosystems/coastal-landscapes
- "Native Plant Picks" videos featuring beautiful, maintainable, cost-efficient, and environmentally beneficial selections adapted to thrive in the harsh conditions of coastal NC, strong sun and wind, the dry, sandy soil, and the salty air and water; check out Sea Grant's Youtube Channel
  - https://ncseagrant.ncsu.edu/news/2021/09/new-video-series-highlights-native-plants-for-coastal-landscapes/
- Design Templates
- Booklet (A Native Plant Guide Provided by the Coastal Landscapes Initiative – 34 plants) and Brochure
- Videos, webinars, presentations
- Container gardens with natives

### **CLI Design Templates**

#### **Screening Designs**

- Screening with Trees
- Pollinator-Friendly Border
- Screening High & Low
- Foundation
- Evergreen Screen

#### **Border Designs**

- Low Evergreen Border
- Bird-Friendly Screen
- Shoreline Border
- Screening with Vines
- Filter strip



#### **POLLINATOR-FRIENDLY BORDER**

FOR SUNNY AREAS WITH DRY TO MOIST SOIL













#### DESCRIPTION The combination of flowering perennials

make ones entail griss and shubs add year-cound interest with testive and color. This design also prevides reportant loaging granulus and highlat for briss, bees and butterfiles. Butterfly weed for milkweed is a host plant for monarchibutterfiles. It also readly seeds, so palies! paddeems on plant less, hotteril yet accessive over time. If exposure to salt sprays a concern, search for more salt-

#### ALTERNATIO

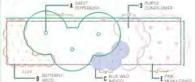
Shrub substitutes: For dry soils, Adem's needle (Yocce filamentosa) is a good choice. Otherwise, opt for inkberry (Nex glabre).

Perennal substitutes: eastern smooth breadforague (Pentatemen levegated), sand coreopsis (Coreopsis Lancelolata) or more butterfly resed. Also, add a talf (6-foot) semi-evergreen but its zanobia. (Zeroba pulventants) on the back of the border for year found structure.

#### MAINTENANCE

Prune clettra in winter or early spring, if needed. Out back grasses in late winter or early spring. Leave an 8-to-12-inch crown on multily grass.

#### PLAN VIEW 5'x 20'



#### PLANT SELECTION

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#### BIRD-FRIENDLY SCREEN

DRY TO MOIST AREAS WITH SUN TO PART-SHAD

SUN: ★ゲ SOIL MOISTURE: 4-44 SEASONAL COLOR: MAY-DEI









#### DESCRIPTI

All plants in this design attract birds to the yard. Was myttle, inkhany and breautyburry produce abundant barries in late summer and automn that are mesirable to birds and other backyied wildfile. Many barrs also eat the seeds of the orange conellower.

privacy or block unwented views. It also creates a stated-alone garden rans for choicing middle. Only female plants of the property of the property of act by to salect a formule plant the recently and small plants of the property of positions of the neighborhy and or a natural area, This approach is sho true for the alternative block.

Wax myrtle and beautyberry are lastgrowing while inkberry is slow-growing.

#### ALTERNATIVE

All of these plants should be reacily available. If you need less height, dwarf varieties cost for most of the should.

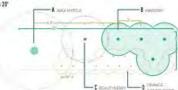
Shrub substitutes: For wax myrtle, try yaupon haily (like verniona). For beauty-barry, choses writershery holy (like vernicillat) or rod chokebarry (Acesia arbutifolia). For initiemy, try disert pairmette (Sebar microf or desciziona contiberry (Symphonicarpos orbiculatus).

#### MAINTENANC

If needed, shrube can be pruned in late autum or winter. Beautyberry can be pruned more than other shrube if a smalare is desired, but it also thrives if left to grow. We myste recovers quickly from minor storm damage, but broken brainhas or damaged bank should be removed.







#### PLANT SELECTION

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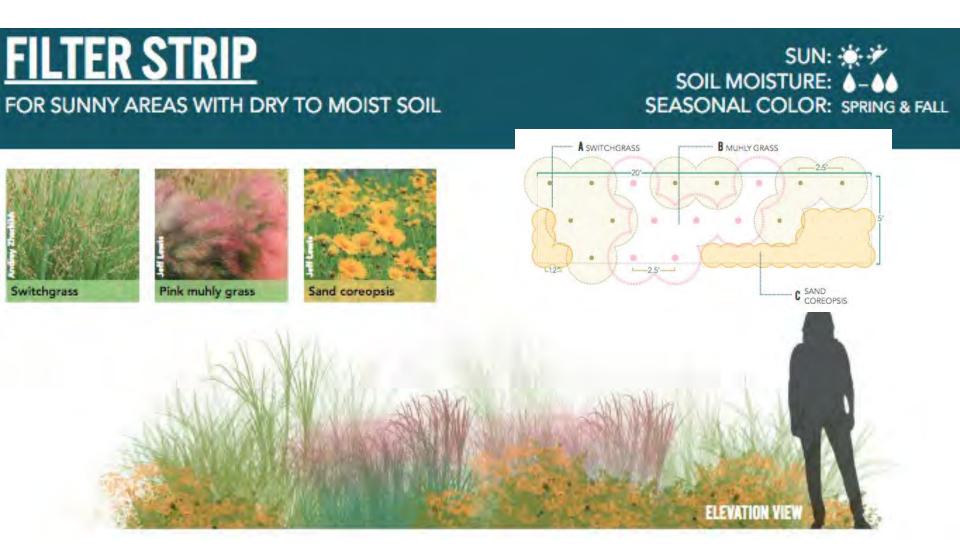
go.ncsu.edu/CoastalLandscapes

## Greening Your Space

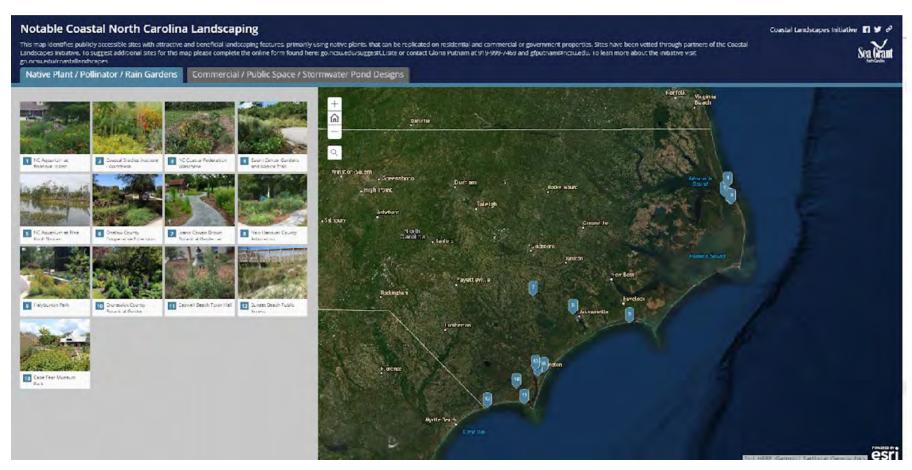
Creating Eco-Friendly Container Gardens for Coastal North Carolina

From the COASTAL LANDSCAPES INITIATIVE

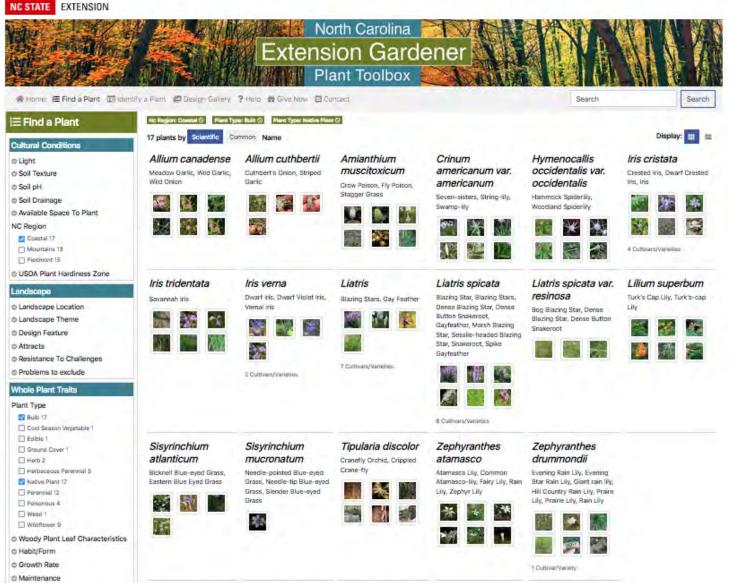
go.ncsu.edu/CoastalLandscapes



## go.ncsu.edu/ModelLandscapes



## NC Extension Gardener Plant Toolbox plants.ces.ncsu.edu



- Find a Plant
- Identify a Plant
- Gallery of Garden Designs
- Filter to generate lists of plants to fill niche
- Photographs
- Botanical features
- Life cycle
- Seasonal interest
- Native alternatives
- Better adapted options

## Nature At Home



newhanover.ces.ncsu.edu/nature-at-home/resources/

## Consumer Horticulture Horticulture Programs Nature at Home, School Gardens & Garbage to Gardens

#### Pesticide Classes

#### Native Plants

Cape Fear Native Plant Festival-Re-Imagined!

#### Extension Master Gardener<sup>s™</sup> Volunteer Program

Extension Master Gardener Plant Sale EMGVA Grants

#### New Hanover County 4-H

Enrollment: 4-H Online 2.0 4-H Programs
4-H Clubs in New Hanover County,
4-H Teen Leaders Council

4-H School Enrichment Embryology School Enrichment Program

4-H Events and Awards ...
4-H Presentations / Public
Speaking, 4-H Project Record
Books, Annual 4-H Food Drive
Caring HEARTS, Helping HANDS

Therapeutic Horticulture
Simple Activity Sheets Accessibility in
School Gardens Campus Nature Rx ...

Family & Consumer Sciences in New Hanover County

#### Nature at Home Program Resources

> en Español / em Português

#### **Nature at Home Resources**

- Homeowner Folder Contents
- Nature at Home Practices and Principles
- Nature at Home Brochure
- Recommended Native Plants for Southeastern NC
- Coastal Native Plant Sources (NC)
- Cape Fear Area Garden Centers

#### Helpful Links for Eco-Friendly Landscaping

- How to Create Wildlife-Friendly Landscapes
- $\bullet$  <u>Coastal Landscapes Initiative</u>  $^{\boxtimes}$  (NC State) Includes design templates, native plant guides, brochures, and more
- Landscaping for Wildlife with Native Plants (NC State Extension)
- Butterflies in Your Backyard (NC State Extension)
- Managing Backyard and other Urban Habitat for Birds (NC State Extension)
- How to Make Wildlife Friendly Landscapes (NC State Extension)

https://newhanover.ces.ncsu.edu/nature-at-home/



# The Dune Book





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