Landscaping for Water Quality in Currituck County

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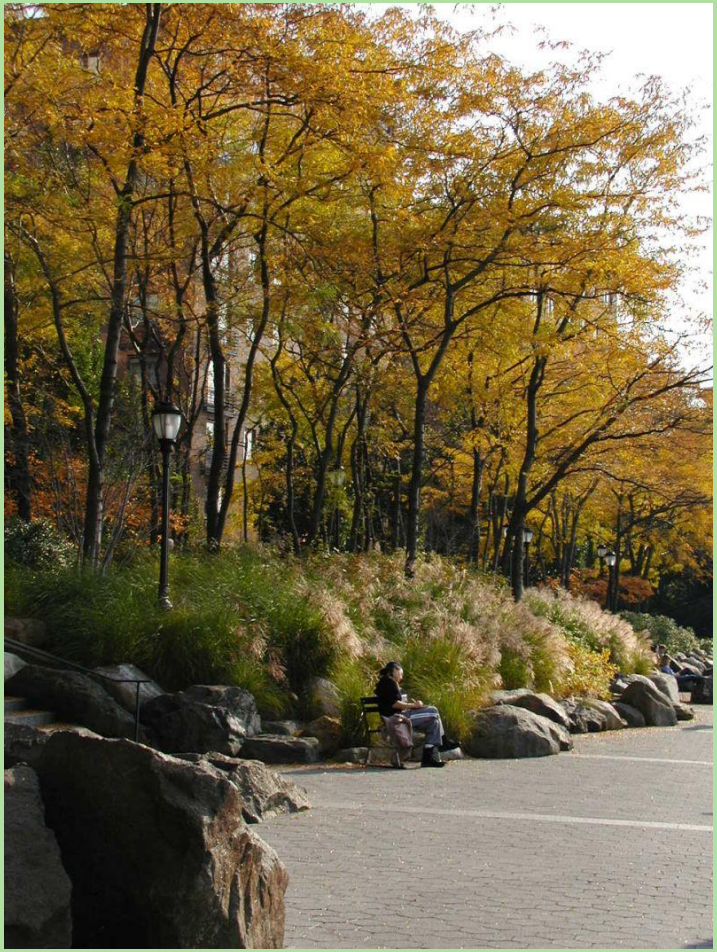
Sustainable Landscapes

Goal: Improve coastal natural resource quality through establishing sustainable residential and commercial landscapes in eastern North Carolina.

What is a sustainable landscape?

- Attractive
- In balance with the local climate and environment
- Requires minimal resource inputs
- Functional
- Cost-efficient
- Environmentally friendly
- Maintainable



Includes:

- Reducing and treating stormwater runoff
- Reducing water use
- Reducing fertilizer and pesticide use
- Enhancing wildlife habitat
- Improving soil fertility and infiltration
- Using native plants
- Establishing and managing vegetated riparian buffers and shorelines
- Reducing energy use (i.e. through reduced mowing, maintenance, etc. or use of renewable energy)
- Reducing carbon and air pollution
- Reducing energy requirements for buildings

Outreach Objectives

- Provide education and technical assistance to coastal municipalities, universities, home owner associations and businesses
- Establish demonstration projects for sustainable landscapes on private and public properties.
- Conduct training and tours for designers, planners, home owner association managers on all aspects of sustainable landscape design, implementation & management.
- Conduct research to document benefits of sustainable landscapes.

What benefits do these stormwater BMPs provide?

What benefits do these stormwater BMPs provide?

How could this stormwater BMP be more sustainable?

Which landscape is more sustainable?

Not just stormwater BMP's

Helping Currituck Co. Go Green

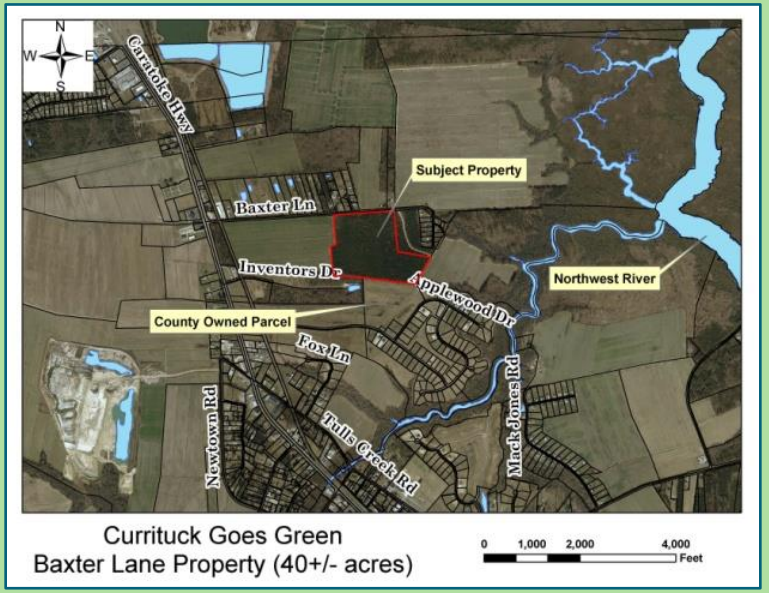
Partners:

- NC State University
- Cooperative Extension
- County Staff
- NC Coastal Studies Institute
- NC Coastal Federation
- East Carolina University

Sea Grant
North Carolina

What has been done so far . . .

- Develop a sustainability mission statement
- Create a sustainability resolution
- Launch a website for businesses and citizens
- Conduct design charettes for county properties
- Implement a stormwater pond retrofit demonstration project



Currituck Goes Green Team Mission:

To provide leadership, education, and opportunities that help government, staff, citizens, and businesses operate in a manner to conserve, sustain and enhance our environment and natural resources

Currituck County Sustainability Resolution

WHEREAS, Sustainability means focusing on the environmental, economic, and social characteristics of our community in order to meet the needs of the present without compromising the needs of future generations;

WHEREAS, the County is committed to lead by example, through its operations and policies, demonstrating the benefit of sustainable practices through financial savings from increased operational efficiencies and reduced energy costs;

WHEREAS, the County continues to support and be involved in the Currituck Goes Green initiative that will work to save tax dollars, assure clean land, air and water, improve working and living environments, and allow the county to thrive in the future;

WHEREAS, the County is committed to the design of more environmentally conscientious facilities, promoting LEED or other similar certified facilities; and,

WHEREAS, the County staff should be a leader in Currituck in setting policies, guidelines, goals, and strategic actions that will result in:

- a more sustainable community,
- energy, water and cost savings through the location, construction, operation and maintenance of high performance buildings and landscapes,
- increased recycling and materials reuse,
- a healthier and more productive staff and work environments,
- reduced environmental risk and liability, and
- better educated staff, elected officials, and community.

NOW, THEREFORE, BE IT RESOLVED That the Board of Commissioners of Currituck County, North Carolina, authorizes County staff to develop policies, guidelines, and strategic actions for becoming a more sustainable County;

That the Board of Commissioners directs County staff to provide continual training and education opportunities for staff and the community to further sustainable stewardship;

That in order for the County to fully achieve the above initiatives, the Board requests that staff explore the feasibility of developing a Sustainability Plan; and

BE IT FURTHER RESOLVED that the County through all the initiatives described above hereby acknowledges its commitment to the residents of Currituck County to provide a more stable, sustainable future for its residents that will ensure lasting social, economic, and environmental prosperity.

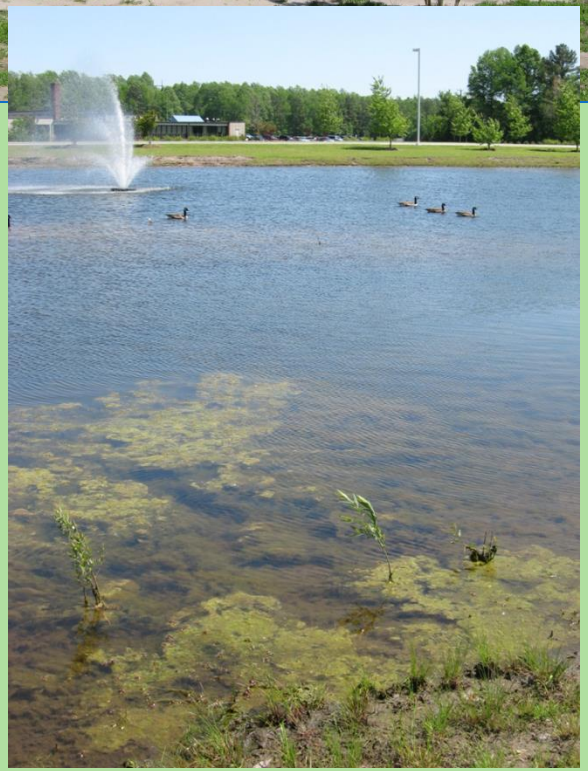
Adopted this 21 day of September 2009.

J. Owen Etheridge
Board of Commissioners' Chairman

Attest: Gwen H. Keene, CMC

Cooperative Extension Campus
Planning Charette for Expansion and Water Quality Improvements

Leading By Example . . . at the Cooperative Extension Facility

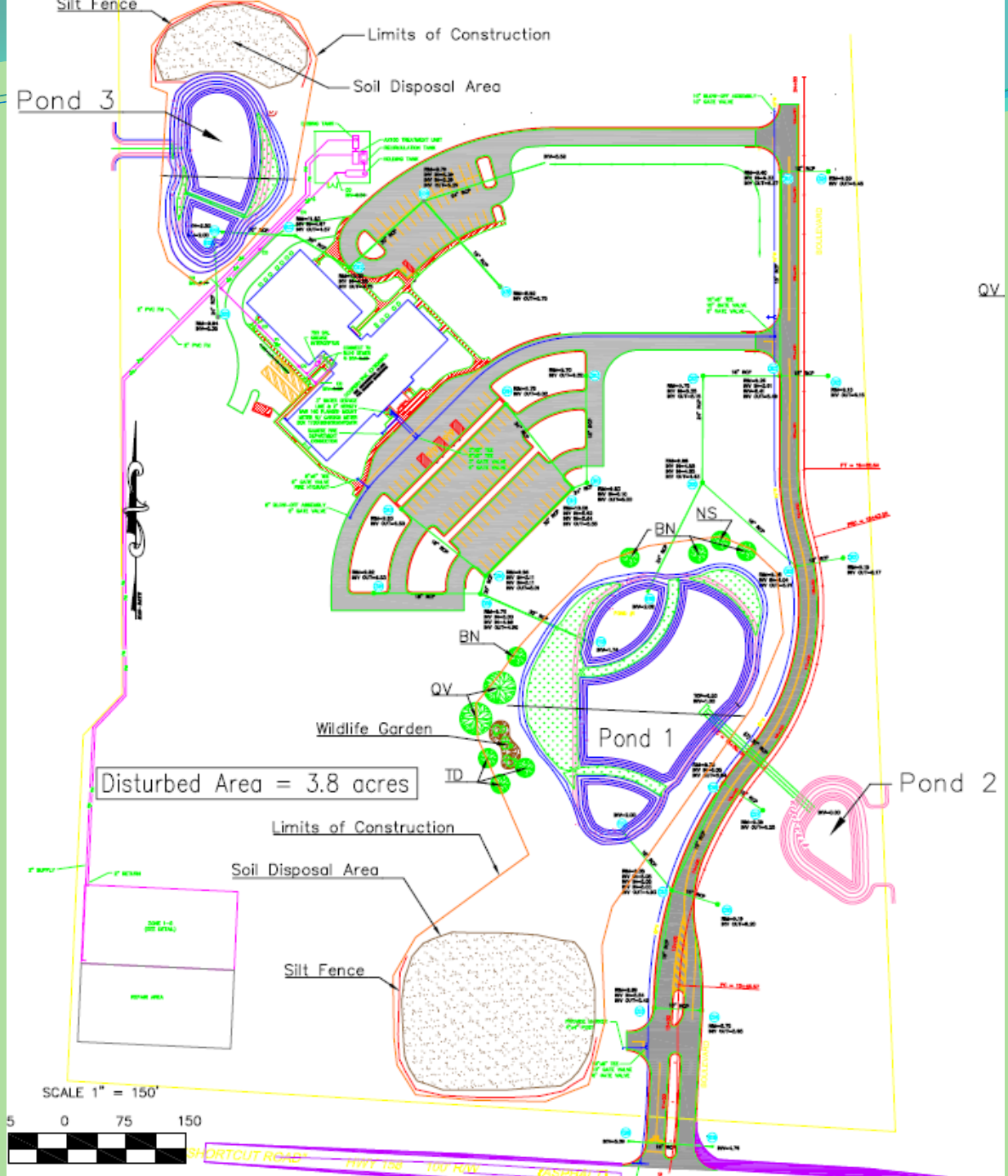


Currituck County Wet Ponds

- Retrofit existing wet ponds by adding aquatic shelves and planting wetland vegetation
- Enhance Shoreline Vegetation around the perimeter of the ponds
- Add a floating treatment wetland

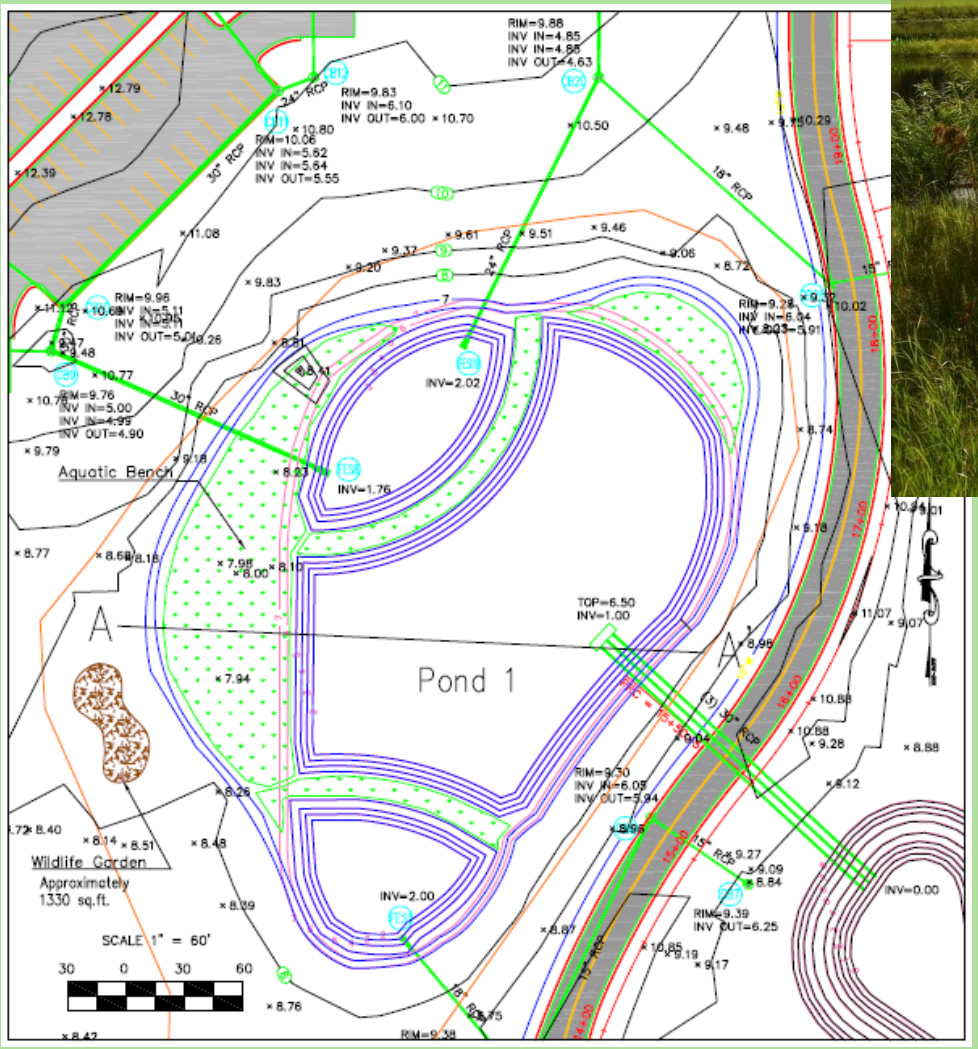
Why? Improve water quality leaving the site by increasing the contact between stormwater runoff and soil and vegetation

How? APNEP Grant acquired for the retrofit work ($20K) and $24K match from the County


Silt Fence
Limits of Construction
Soil Disposal Area
Pond 3
QV
BN
NS
BN
QV
Wildlife Garden
TD
Pond 1
Pond 2
Disturbed Area = 3.8 acres
Limits of Construction
Soil Disposal Area
Silt Fence
SCALE 1" = 150'
5 0 75 150

Currituck County Wet Pond

Cooperative Extension Campus –Pond Retrofit



Aquatic Shelves

- Required around all ponds in NC
- Typically 10 ft wide, on 10:1 slope
- Benefits:
  - Lessen the potential for drowning
  - Potential nutrient removal benefits (plant uptake)

Infertile Subsoil

Organic Amendment

Excavating the Aquatic Wetland Shelf

Adding Topsoil to Aquatic Shelves and Forebay Berms

Plants were installed in July so watering had to continue through the summer

Temporary Goose Exclusion Fencing

July 2011 – 1 year later

2012– 2 years later

2012– 2 years later

2013– 3 years later

Floating Treatment Wetland

Educational Signage

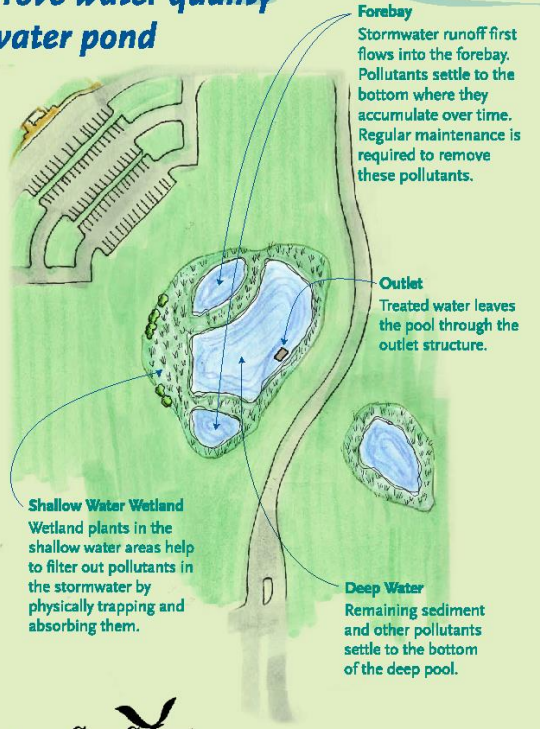
Educational Sign Installed at Pond

Landscaping for Water Quality in Currituck County

Shallow water wetlands improve water quality treatment of existing stormwater pond

This stormwater pond was physically reconstructed to improve the quality of stormwater leaving this developed property. Soil was removed around the perimeter of the pond and plants were installed to create a shallow water wetland. Native plants also were incorporated along the shoreline. This vegetation increases the pollutant-removal capacity of the stormwater pond.

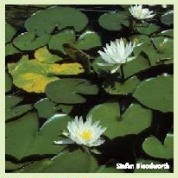
When it rains, water runs off the surrounding rooftops, roads and parking lots. This excess water is called stormwater runoff. Stormwater runoff picks up pollutants such as sediment, oil, antifreeze, brake dust, fertilizer and pesticides and can flush them into local waterways. Water from this property flows into the headwaters of the North River, which in turn drains into the Albemarle Sound. Best management practices (BMPs) like this pond are designed to capture and treat the runoff water before it leaves the property.



Before wetland enhancement, the pond provided minimal water quality treatment and aesthetic value.

The addition of plants and wetlands transform the treatment pond into a more natural landscape feature. Native wetland plants not only provide water quality benefits, but can add beauty and color to the landscape. They also attract beneficial insects and amphibians such as dragonflies, damselflies and frogs that eat mosquitoes.

Lizard Tail
Saururus cernuus



Fragrant Waterlily
Nymphaea odorata

Pickerel Weed
Pontederia cordata

Arrow Arum
Peltandra virginica

Pinewoods Treefrog
Hyla femoralis

Damselfly
Odonata

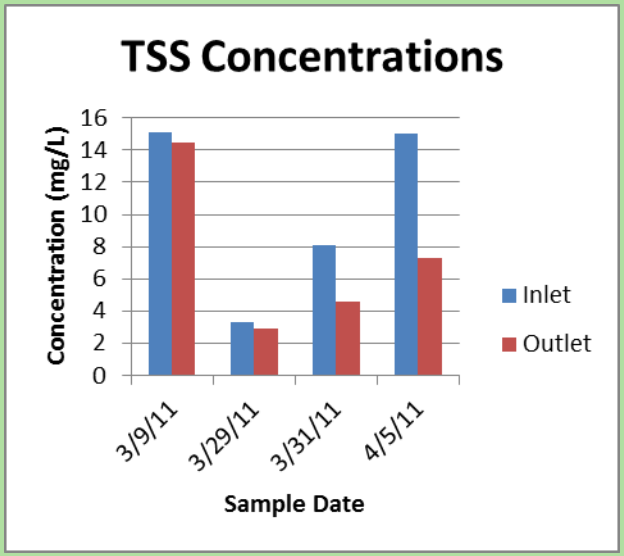
Duck Potato
Sagittaria latifolia

Sea Grant North Carolina
UNC-SG-10-05

Sign design format courtesy of the City of Raleigh

“Wildlife Garden”

Document Benefits water quality sampling



NC Sea Grant Sustainability Fact Sheet Series

Go to: www.ncseagrant.org and search for "sustainability."

presents opportunities, examples and resources for local officials seeking sustainable solutions in their coastal communities