

NC COASTAL FEDERATION LOW IMPACT DEVELOPMENT:

## HARKERS ISLAND



### Reducing Stormwater Runoff at the Core Sound Waterfowl Museum and Heritage Center and the Cape Lookout National Seashore Visitor Center

#### The Problem

When rain falls on a natural area, such as a forest or field, it is absorbed into the ground and filtered by plants and soils. However, when rain falls on a developed area, such as a parking lot, building or paved road, it *runs off*, carrying with it the contaminants that were on the ground. This polluted stormwater runoff quickly reaches our fragile coastal waters.

#### The Solution

Low Impact Development (LID) techniques such as rain gardens, cisterns and stormwater wetlands are simple, cost-effective methods for controlling stormwater runoff by managing it at its source rather than letting it run untreated into our creeks, rivers and sounds. A LID Pilot Study was conducted at the Core Sound Waterfowl Museum and Heritage Center and the Cape Lookout National Seashore Visitor Center, located in Harkers Island, N.C.

The goal of the project was to reduce bacteria concentrations entering Core Sound by identifying, designing and installing LID treatments at both sites. A comprehensive stormwater management plan identified 15 locations for stormwater practices, suggested the type of LID treatment for these locations and provided preliminary designs and cost-estimates for each LID treatment.

Several of these LID methods were designed and installed at the two sites to help capture, absorb and filter polluted stormwater runoff and thus reduce stormwater flow into the sound and protect coastal shellfish waters:

- **Cisterns and rain barrels** are large containers that collect and store stormwater runoff from rooftops. The water is then used to water plants and wash boats or vehicles, providing a significant cost-savings. Two 1,500-gallon cisterns were installed at the museum (below) and at the visitor center.





■ **Rain gardens** are depressions that contain native plants that absorb and filter polluted stormwater runoff. An 80 sq. ft. rain garden was installed near the Jean-Dale boat shed at the museum (top left). This rain garden collects stormwater runoff from the roof of the boat shed and the adjacent road. Master Gardener volunteers from N.C. State University's Cooperative Extension planted the rain garden and continue to maintain it. Two other rain gardens were installed at the visitor center to collect stormwater runoff from building roofs and parking lots. Students from Harkers Island Elementary School planted and mulched the 1,800 sq. ft. rain garden located at the front of the visitor center (top center). Before the planting, the students learned about rain gardens, native plants and ways to reduce stormwater runoff. District technicians from the N.C. Division of Soil and Water Conservation planted the 1,000 sq. ft. rain garden behind the visitor center (top right). Both rain gardens were excavated by park staff.

■ **Stormwater wetlands** are similar to rain gardens. A 1,500 sq. ft. stormwater wetland was installed at the museum to capture stormwater runoff from the front roofs (right). The wetland also provides habitat for fish, dragonflies and waterfowl.

To demonstrate the effectiveness of these LID practices, scientists at the Duke University Marine Laboratory monitored water quality and stormwater flow following rain events.

Additional treatments identified in the stormwater management plan will be installed at these sites as additional funding becomes available.

This community stormwater management project demonstrates how these simple techniques can be used on residential properties to reduce stormwater runoff and improve the water quality of local estuaries.

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- **Designed by:** N.C. State University's Department of Biological and Agricultural Engineering
- **Water quality monitoring:** Duke University Marine Laboratory
- **Other project partners:** Master Gardener volunteers of N.C. State University's Cooperative Extension, Harkers Island Elementary School



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**"Citizens Working Together for A Healthy Coast"**

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