



New Hanover County
Local Watershed Planning Group

MEETING SUMMARY

Tuesday, May 1, 2001 meeting held at the Cape Fear Riverwatch Educational Ctr.

Next Meeting scheduled for Wednesday, June 6, 2001

Meeting Focus: Wildlife Habitat in the Watershed

- ◆ Presentation on New Hanover County's Natural Resource Inventory
- ◆ Presentation on Natural Heritage sites in the watershed, Scott Pohlman, NC Natural Heritage Program

The meeting will be held at the Cape Fear Riverwatch Educational Center from 6:30 p.m.- 8:30 p.m. The public is welcome to observe.

Group Members/alternates present:

Jim Bordeaux, Castle Hayne Steering Committee
Joe Blair, NC Department of Transportation
Curt Hensyl, Local watershed resident/ International Paper
David Mayes, City of Wilmington
Marian McPhaul, UNCW
Stacy Smaltz/Bouty Baldrige, Cape Fear River Watch
Tommy Tew, Corbett Timber Co.
Michael Pope, Sierra Club, Wrightsboro Community
Don Cooke, CP&L
Jabe Hardee, Cameron Company
Karen Moorefield, Carolina Heights Neighborhood
Chris O'Keefe, New Hanover Co. Planning
Dick Loeffert, Northchase HOA

Support staff & guests present:

Larry Hobbs, NCWRP
Bonnie Duncan, NCWRP
Christy Perrin, WECO/NCSU
Sunny Snider, WECO/NCSU
Kevin Schneider, Cape Fear River Watch volunteer
Joe Pfeiffer, KCI
Dan Redgate, KCI
Bill Hunt, NCSU

Update on Subcatchments for Further Study

Presentation by Bonnie Duncan, Wetlands Restoration Program

The Wetlands Restoration Program (WRP) made a final decision on which subcatchments will undergo further study in Major Task 2. WRP discussed amendments to the Research for Proposal with David Mayes and Tommy Tew, and met with Mike Mallin, Joe Pfeiffer, and Larry Hobbs in order to make the final decision. The subcatchments chosen for further study are:

- * Burnt Mill Creek
- * Lower Smith Creek
- * Prince George Creek

Upper Smith Creek was not chosen for further study because it is very large, and the WRP wanted to study as many subcatchments as possible. If anyone has any comments on segments or sections within these subcatchments, please let Bonnie know.

Urban Stormwater Run-off & Best Management Practices (BMPs)

Presentation by Bill Hunt, NC Cooperative Extension Service

Bill Hunt, with the NC Cooperative Extension Service, gave an informative and entertaining presentation to the group on urban stormwater run-off and BMPs. Bill described urban stormwater run-off as the "stormwater superhighway." The "stormwater superhighway" describes the interconnectedness of impervious surfaces leading run-off to surface waters. For

Continued on Page 2

instance, pollutants are deposited on rooftops through atmospheric deposition. These pollutants are then washed off the roof by rain, travel down gutters and drains to a parking lot, cross the parking lot, flow into the road, and into storm drains. Finally, after a long trip along impervious surfaces of the “stormwater superhighway”, run-off reaches creeks and other bodies of water.

How do you stop, or at least slow down, the “stormwater superhighway”?

Best management practices (BMPs) are implemented to slow down or detain water moving along the superhighway. Examples of stormwater BMPs include:

- ♦ Wet detention ponds
- ♦ Stormwater wetlands
- ♦ Bio-retention areas (rain gardens)

Wet Detention Ponds

Adding a forebay, sideslopes, or an aquatic bench enhances wet detention ponds. A **forebay**, or shelf at the edge of a pond, and **side slopes** allow materials in stormwater to settle out and allow for periodic maintenance. An **aquatic bench**, or vegetation along pond banks, may improve water quality as well.

Stormwater Wetlands

Stormwater wetlands are considered the best BMP for treating stormwater. Stormwater wetlands slow down water moving along the “stormwater superhighway” and allow for the following processes that improve water quality.

- ♦ Sedimentation and Filtration: As water enters the stormwater wetland it loses energy. Pollutants can then be settled or filtered out of the water.
- ♦ Adsorption: Phosphorous and some metals will adhere to soil particles in the sediment.
- ♦ Plant Uptake: Plants uptake nutrients for growth, thus removing nutrients from the

water.

- ♦ Microbial Uptake: Microbes living in wetlands uptake nutrients for growth, thus removing nutrients from the water.
- ♦ Dry Times: Stormwater wetlands can be designed to periodically dry out. Exposure to sunlight and dry conditions will eliminate pathogens from the system.

Stormwater Wetland Features

Stormwater wetlands should have diverse zones including upland zones that don't get wet, deep areas that are always wet to maintain aquatic habitats during droughts, and forebay areas to slow water down as it enters the wetland system. Different zones are also important for maintaining diverse vegetation within the wetland.

Outlets should be designed to prevent clogging and ensure the proper water elevation for plant life. Wetlands should also contain mosquito-eating insects such as dragonflies, frogs, and mosquito-eating fish to limit the number of mosquitoes living in the wetland.

Where Can We Construct Stormwater Wetlands?

Before constructing a stormwater wetland, the following concerns should be addressed:

- Availability of water
- Depth of the water table (Areas with clayey soil may require more excavation to create a drainage envelope.)
- Flat topography
- Proximity to unattended children (snakes)
- Forested/cleared land
- Can the site be maintained? Vegetation that shades the water should be encouraged; otherwise sun-loving algae will grow, decreasing the wetland's effectiveness at improving water quality.

Continued on Page 3

Bio-retention Areas (Rain Gardens)

Stormwater that flows into bio-retention areas is drawn out of the area within a day. Thus, elevated water levels are present for only a short period of time, making them safer for unattended children. However, bio-retention areas are not as effective as stormwater wetlands at treating stormwater run-off. Since they are designed like a garden, they can be placed in areas required to be landscaped, like parking lots.

Impervious Surfaces

Methods for making impervious surfaces, such as parking lots, environmentally friendly are described below:

- **Trees** planted along parking lots can shade impervious surfaces, reducing the amount of heated run-off that enters surface waters. This idea is important for aquatic plants and animals, such as trout, that don't appreciate warm water.
- The use of **permeable block pavement**, correctly installed, can greatly reduce the amount of stormwater run-off from a site. A permeable block pavement test parking lot installed in Kinston, NC illustrated permeability for the site equivalent to that of wooded areas with clay soils.
- **Permeable asphalt** may be used, however, this technology currently has received mixed reviews. Some say it works great, others say it clogs easily and can't be maintained.

Bill Hunt holds a workshop and training course in Smithfield on Stormwater BMP Design. Information on these courses can be obtained at:

www.bae.ncsu.edu/programs/extension/

Questions for Bill

Q: How do you keep bio-retention areas from clogging?

A: You need access to pipes for maintenance. If there are no pipes you must remove the clogged material on the surface. Corrugated pipes need to be cleaned out periodically as plant roots may grow in slots and sediment may clog slots.

Q: What is the cost difference between pervious

pavement and impervious pavement?

A: Permeable block pavement cost 25-50% more than standard pavement. However, installing permeable block pavement could eventually decrease the cost and area needed for stormwater management. The danger of developers putting in more parking, since less area is needed for stormwater management, also exists.

Q: Has there been a liability study for high-heeled shoes and permeable block pavement?

A: Paved areas for walking and warning signs are installed along parking lots developed with permeable block pavement. It's not recommended for some areas, such as churches.

Q: Are there any studies comparing nutrient removal by ponds, stormwater wetlands, and bio-retention areas.

A: One study determined the following approximate removal rates: 1) dry detention pond-15% nitrogen removal; 2) well designed detention pond-25% nitrogen removal; 3) bio-retention area-25% nitrogen removal; and 4) stormwater wetlands-40% nitrogen removal.

Q: Are there any studies on the effectiveness of natural wetland areas for stormwater run-off treatment?

A: Natural wetlands would work well with some minor hydrological changes. For instance, wetlands do not have to be very wet to be considered wetlands. Adding water to some natural areas might make the area effective for treating stormwater.

Comment: Much of the existing wetlands are drying out as upstream development diverts stormwater away.

Q: The slides we saw showed BMPs covering small areas, are BMPs available to address large areas?

A: BMPs can be designed for large areas to create infiltration zones. Floodplains are an important place for wetlands.

Continued on Page 4

City of Wilmington Stormwater Program

Presentation by David Mayes, City of Wilmington

David Mayes, with the City of Wilmington, gave a great presentation on the City of Wilmington's Stormwater Program. A copy of his presentation is attached to this meeting summary.

Questions for David

Q: Have there been any studies on BMPs other than wet detention ponds?

A: There will be a study on two existing developments where developers were allowed to use natural wetlands as a retention area. The state allowed the developer to use the natural wetlands as the development was low density (less than 25% impervious surfaces). Currently, the City is trying to get a cost-effective example of BMPs other than wet detention ponds. Currently, Mike Mallin's studies are the only available studies.

A: Wet detention ponds are "cookbook" and easy to implement, therefore other BMPs are going unused. Examples of other methods need to be implemented.

A: Division of Water Quality regulations may contribute to the situation. Right now they approve other BMPs on a case by case basis.

New Hanover County Stormwater Management

Presentation by Chris O'Keefe, New Hanover County

Chris O'Keefe, with New Hanover County, gave a great presentation on the New Hanover County Stormwater Management Ordinance. A copy of his presentation is attached to this meeting summary.

Questions for Chris

Q: On Page 12 of the ordinance, under organic wastes, the ordinance states that riverbanks should be free from vegetation. This opposes what we've learned about stormwater management.

A: The intent was to move water from the property. This group could recommend such changes.

Q: Must property owners with large tracts of land, containing numerous ditches and creeks, keep all ditches and creeks cleaned out? Who issues permits?

A: Not sure who is responsible. The USACE will comment on this subject.

Q: Has the ordinance been challenged in court?

A: I don't know.

Q: Does the ordinance address forestry?

A: No

Q: On page 12, under fertilization (section f), is hydro-seeding considered fertilization?

A: That precedent may not have been set at this point.

Q: On page 10, under new development, what would prevent a developer from developing in small multiple tracts to avoid the ordinance?

A: This point could be a loop-hole, however, any new sub-division must comply with the ordinance.

Q: Is the Unified Development Ordinance going to supersede the stormwater ordinance?

A: That question cannot be answered now.

Q: Under Nuisances, open water wetlands may be a conflict. The county might say that open water wetlands couldn't be developed.

A: The health department ensures that wetlands are stocked with mosquito eating fish and other mosquito eating animals (no chemicals).

Action Item:

The group decided that July's meeting will be on **Tuesday July 11th** (instead of Tuesday July 4th) at the usual time and place!

*For more information about the New Hanover County Local Watershed Planning Group, contact Christy Perrin at (919) 515-4542
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