



# Ellerbe Creek Watershed Improvement Project

## Overview of Stormwater Best Management Practices and Stream Restoration Opportunities

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- What are “Stormwater BMPs”?
- What is “Stream Restoration”?
- Results of field studies
- Opportunities available in Ellerbe Creek
- Q & A





# What are Stormwater Best Management Practices (BMPs)?

- Tool kit or programs for reducing the impacts of urban stormwater runoff on water quality, flooding, and aquatic health of our streams
- Two Categories of BMPs:
  - Structural BMPs (e.g., ponds)
  - Non-structural BMPs (e.g., public education)

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# Constructed Wetlands



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# Wet/Dry Ponds

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# Sand Filters

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# Bioretention Areas



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# Low Impact Development Measures

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# Non-Structural Stormwater BMPs

- Public education
- Identification and removal of illicit discharges
- Elimination of illegal dumping
- Street Sweeping
- “Good Housekeeping” practices (e.g., Riparian Area management Plan)
- Land use management /control
- Open space preservation

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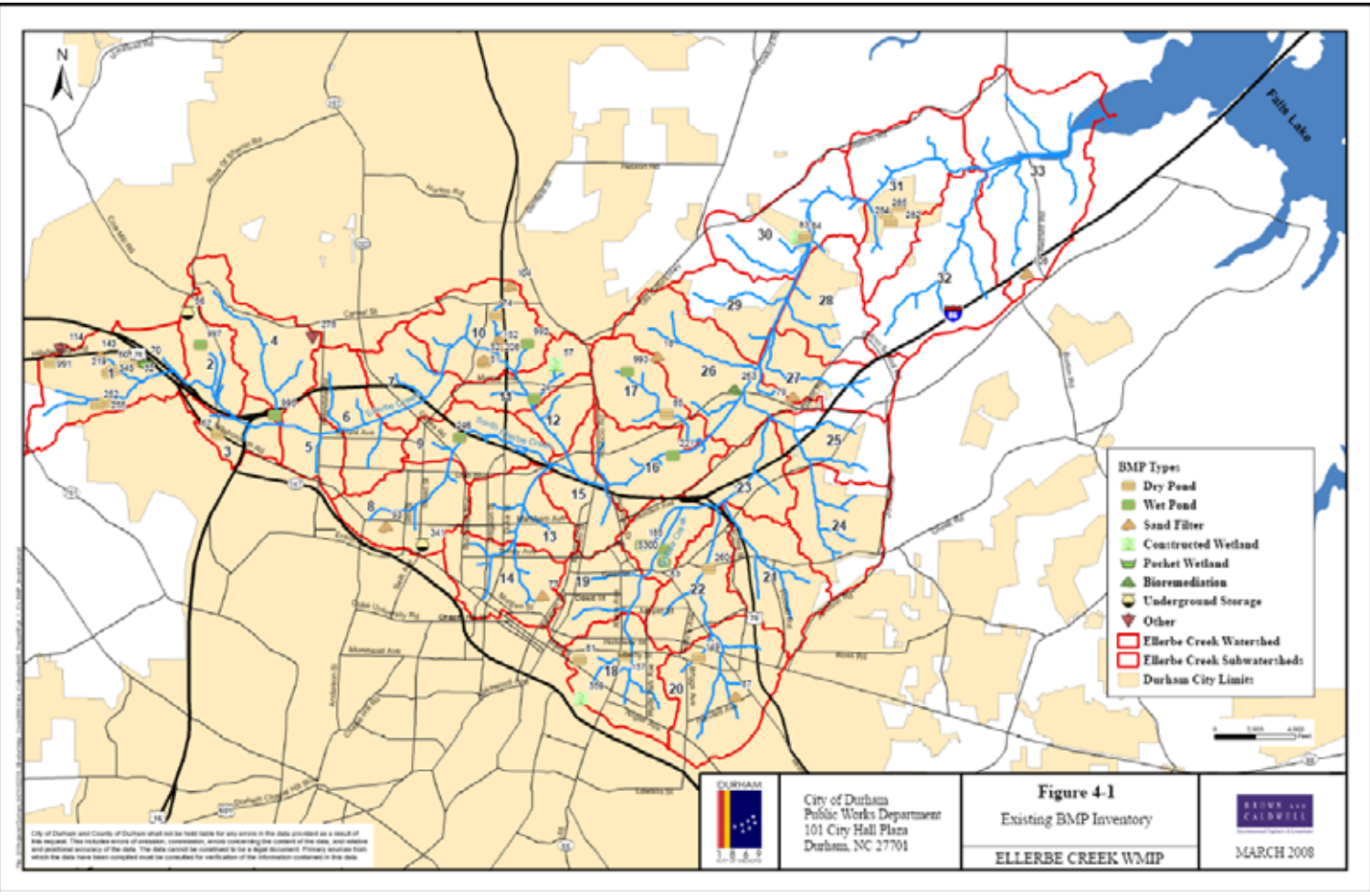


# Inventory of Existing Stormwater BMPs

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# Results for Existing Stormwater BMPs

- 27 of the 48 existing stormwater BMPs have water quality “retrofit” potential:
  - Convert dry pond to a wet pond or wetland
  - Change outlet structure to increase retention time
  - Increase pond storage volume
- Remaining BMPs were not suitable for retrofits due to:
  - No room for expansion to increase volume
  - Infeasible to route additional stormwater runoff to the BMP

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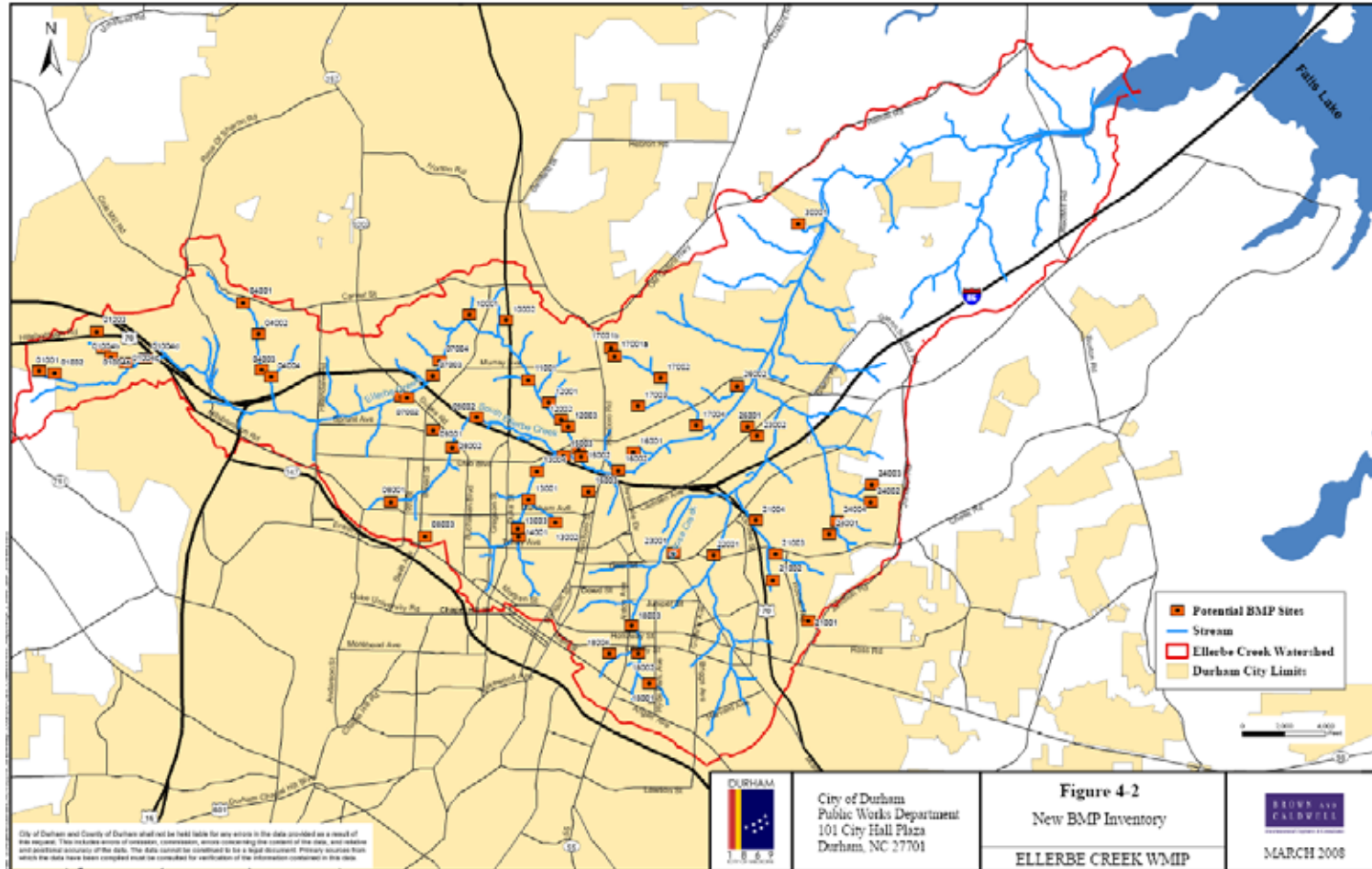


# Potential New Stormwater BMPs

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**Figure 4-2**  
 New BMP Inventory

ELLERBE CREEK WMIP



MARCH 2008



# Results for New Stormwater BMPs

- 46 of 59 sites appear suitable and were recommended for further evaluation:
  - 11 wet ponds
  - 23 constructed wetlands
  - 7 bioretention areas
  - 5 other BMP types
- Remaining sites were not suitable due to:
  - Preservation of existing upland forest
  - Utility conflicts
  - Inadequate space available

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# What do you think?

- Are particular stormwater BMP types more acceptable?
- Should City favor dry/wet ponds and wetlands over more distributed and integrated measures (e.g., bioretention and Low Impact Development measures)?
- What incentives would encourage homeowner associations and private landowners to take responsibility for long-term maintenance of potential new stormwater BMPs?

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# What is Stream Restoration?

- Measures aimed at restoring or improving the water quality, habitat, and aquatic health of Ellerbe Creek and its tributaries
- Restoration measures typically fall into 5 categories:
  - Restoration
  - Enhancement
  - Stabilization
  - Buffer Restoration
  - Preservation

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# Stream Restoration

- Converts an unstable, degraded stream and riparian buffer into a fully-functioning natural system
- Addresses all 3 aspects of the stream:
  - Physical stability
  - Water quality
  - Stream ecology

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# Opportunity for Stream Restoration



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# Stream Enhancement

- Measures aimed at “improving” the conditions of the stream but will not result in full restoration

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# Opportunity for Stream Enhancement

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# Stream Stabilization

- Measures that focus on improving the physical stability of a degraded stream
- Most applicable for re-aligned streams with little or no buffer from development

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# Opportunity for Stream Stabilization

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# Stream Buffer Restoration

- Measures aimed at re-establishing a forested riparian buffer along a physically stable stream
- Typically aim for a minimum 50-foot wide buffer on each side of the stream

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# Stream Preservation

- Aimed at preventing future impacts to high-quality stream reaches
- City could negotiate a conservation easement to protect these stream corridors

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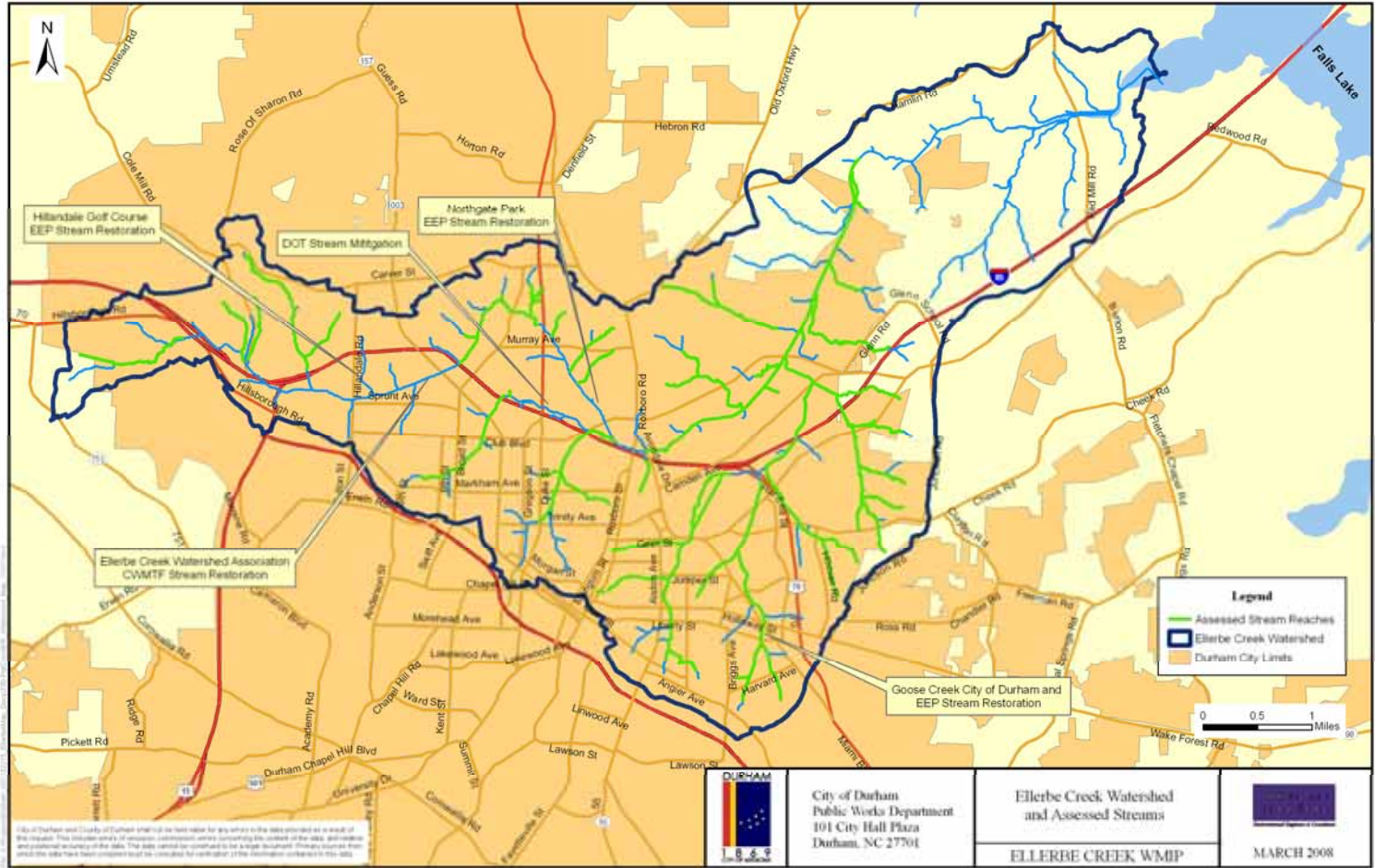


# Stream Assessment

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# Results of Stream Assessment

- Assessed condition of 37 miles of Ellerbe Creek and its tributaries; conditions were typically “Fair” and “Poor”
- Dumping of garbage and debris were widespread
- Maintenance of main stem of Ellerbe Creek for flood control (under agreement with USACE) has negatively impacted stream ecology

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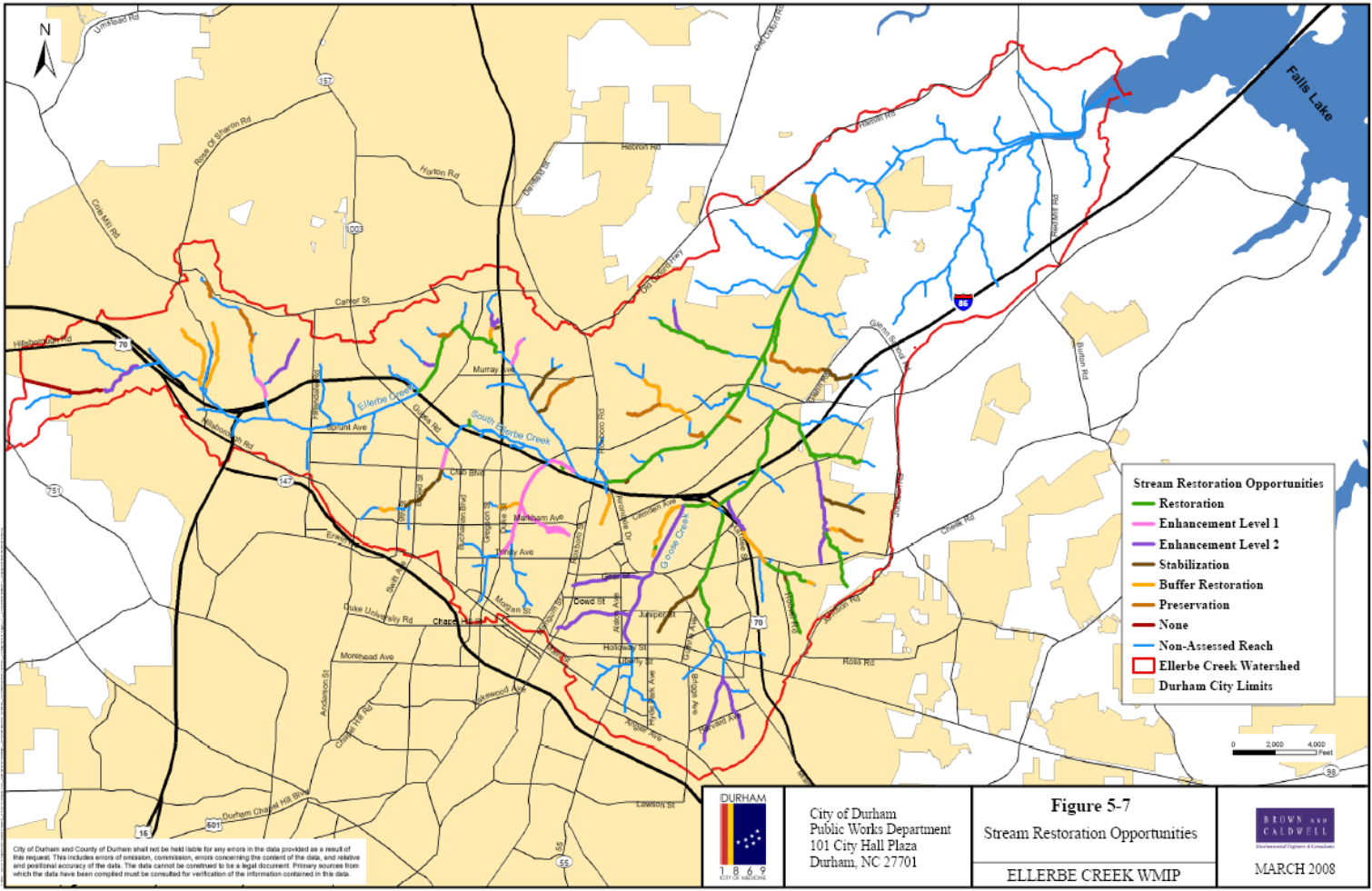


# Stream Restoration Opportunities

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**Figure 5-7**  
 Stream Restoration Opportunities  
 ELLERBE CREEK WMIP

**BROWN AND CALDWELL**  
 Environmental Engineers & Scientists  
 MARCH 2008



## What do you think?

- Should the City prioritize stream restoration over stormwater BMP retrofits or new stormwater BMPs?
- What incentives would encourage stream-side property owners to work with the City to complete stream restoration projects or re-establish a riparian buffer?

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