

A RESOLUTION RECEIVING STAFF REPORT  
ON BOLIN CREEK WATERSHED RESTORATION ACTIVITIES  
Resolution No. 34/2010-11

WHEREAS, the Town has been pursuing watershed restoration opportunities for many years and actively collaborating with other members of the Bolin Creek Watershed Restoration Team, including most recently participation in 319 grant projects;

NOW, THEREFORE BE IT RESOLVED by the Carrboro Board of Aldermen that the Board receive the staff report on recent watershed restoration activities.

This is the 9th day of November in the year 2010.

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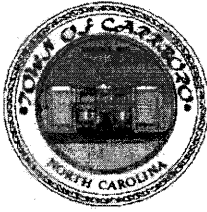
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## TOWN OF CARRBORO

NORTH CAROLINA

### TRANSMITTAL

### PLANNING DEPARTMENT

DELIVERED VIA: ☒ HAND ☐ MAIL ☐ FAX ☐ EMAIL

**To:** Steve Stewart, Town Manager  
Patricia McGuire, Planning Administrator  
George Seiz, Public Works Director  
Anita Jones-McNair, Recreation and Parks Director  
Mayor and Board of Aldermen  
Environmental Advisory Board  
Greenways Commission

**From:** Randy Dodd, Environmental Planner

**Date:** October 26th, 2010

**Subject:** Bolin Creek Watershed Restoration Team Update

#### Background and Summary

Local, State and EPA staff have joined efforts to form the Bolin Creek Watershed Restoration Team (BCWRT). The BCWRT is working to improve conditions in Bolin Creek, and ultimately to remove the creek from the federal 303(d) list of Impaired Waters. The objective of this multi-year effort is to restore biological health and a more natural hydrology to the Bolin Creek watershed as a whole. This report provides an update on efforts being pursued by the Town through two grants funded through the EPA 319 grant program. (More detailed information from previous staff reports related to these grants on February 10, 2009 and January 15, 2008 is not repeated in this report.) This grant program provides assistance to address nonpoint sources, and has a strong emphasis on measurable results. Participation in the 319 grant program is a highly desirable demonstration of watershed restoration. Both grant projects are moving forward, with completion of milestones for two tasks (construction for Baldwin Park restoration efforts and installation of a rain garden and cistern at McDougle Middle School) recently completed or anticipated within the next few months.

**Information**

After extensive study and site reconnaissance, the Bolin Creek Watershed Restoration Team has decided to pursue three on-the-ground restoration projects in Carrboro as part of initial restoration efforts. These include stormwater management and stream restoration along two streams flowing through Baldwin Park, a demonstration rain garden and cistern at McDougle Middle School, and streambank stabilization for a short section of Dry Gulch. These projects along with developing a Watershed Restoration Plan, and watershed and development site monitoring comprise the scope for which the Team has received 319 grant assistance in Carrboro. Additional projects are being pursued in Chapel Hill, as described in previous staff reports. A general summary of the status of Carrboro projects is provided in Table 1. Additional details are provided in the ensuing text.

**Table 1: Summary of 319 Grant Status for Carrboro Activities**

<b>319 Grant</b>	<b>Activity</b>	<b>Status</b>	<b>Upcoming</b>
2008	Baldwin Park Restoration	Permits and landowner agreements obtained; final engineering review in process.	Construction/invasive plant management begins late November/early December. Riparian planting: winter. Workshops/outreach/plant maintenance: winter-fall.
	Monitoring	Preconstruction project site monitoring complete; benthic monitoring being pursued	Post construction project site monitoring. Long term watershed monitoring plan being developed
	Watershed Restoration Plan	Draft outline and early drafts of some materials	Drafts for review by BCWRT, public, and elected officials in 2011-2012
2009	McDougle Rain Garden and Cistern	Installation complete	Outreach, including public workshop(s)
	Dry Gulch Restoration	Preliminary concept plan complete. Monitoring initiated.	Permits and landowner agreements; design and engineering; continue monitoring
	Pacifica Monitoring	Post construction project site monitoring.	Complete post construction project site monitoring in 2011.

### Baldwin Park Project

Two small streams traverse Baldwin Park, draining portions of downtown Carrboro and adjacent neighborhoods. The restoration plan for this site involves stream restoration, including changes in channel cross-section, reducing bank slopes, creating a bankfull bench, improving riffle and pool habitats, and bank stabilization/revegetation. A stormwater BMP (bioretention area) will treat runoff from Lloyd Street. Invasive vegetation removal will also be pursued. Carrboro and Chapel Hill staff have worked with several adjacent landowners to extend the project onto adjacent parcels, and have also informed a larger group of neighbors about the project plans. Environmental permits have been received from the North Carolina Division of Water Quality and US Army Corps of Engineers. Monitoring completed to date includes base flow and storm flow water quality samples and a benthic survey. This project straddles the Carrboro – Chapel Hill border. Restoration construction is anticipated to begin in late November/early December 2010, with follow up work to include native plant establishment and maintenance and invasive plant management. Staff will release a press release and inform all interested parties as soon as a date for initiation of construction has been established.

### McDougle Cistern and Rain Garden

A demonstration rain garden and cistern are being installed in a courtyard at McDougle Middle School to treat roof and patio runoff. As a site draining less than an acre of rooftop and courtyard, the project will serve less for its demonstrable improvements and more as a highly effective demonstration and education site. It will: (1) allow for measurement of rain garden reductions in nitrogen; (2) serve as a valuable educational tool and curriculum enhancement for students at the school; (3) be used to promote homeowner and neighborhood scale efforts to treat stormwater at the source by incorporating backyard rain gardens and wetlands, rainwater catchment and plantings into the landscape; and (4) serve as a pilot project for considering future site retrofits and projects for other schools in the Bolin Creek watershed. The students and community at large, through school and Town staff, and Friends of Bolin Creek are being invited to participate in design, finish installation (plants/mulch), outreach (public workshops), and routine ongoing maintenance. Educational signage will be included in the project. The cistern will be used for rain garden and adjacent landscape irrigation needs. The grading installation was completed in August, 2010, and remaining installation completed 10/29/2010 through an all day work day involving students at McDougle, NCSU and Town staff, and Friends of Bolin Creek and community volunteers.

### Dry Gulch Stream Restoration

Dry Gulch is an intermittent stream flowing through residential neighborhoods slightly north of downtown into Bolin Creek. A damaged stream bank between Bolin Forest and Hanna Street has been estimated to contribute 61 tons of sediment per year. The project site is characterized by an adjacent sewer easement along one side of the riparian corridor

and forested land cover along the other side, and a badly eroding stream bank along a meandering section. The conceptual plan for this project includes channel realignment, changes in channel cross-section, stabilizing eroding bank slopes, creating a bankfull bench, and improving riffle and pool habitats along about 150 feet of the stream. An offline wetland BMP would also be installed. Due to the built-out condition of the subwatershed, and Carrboro ordinances requiring no increase in off-site runoff in new and redevelopment, we do not anticipate problematic changes in hydrology that might negate our restoration efforts. Staff intends to work with NCSU, OWASA, and adjacent landowners in the winter of 2010-11 to pursue detailed design and engineering, environmental permitting, and landowner right-of-entry. The current plan is to pursue restoration construction in the summer/fall of 2011.

#### Watershed, Restoration, and Site Monitoring

In order to demonstrate the measurable results that are required by EPA, some amount of watershed monitoring or assessment must be conducted. Concurrent with the development of the Watershed Restoration Plan will be development of a comprehensive monitoring plan (itself one of the 9 elements) to measure improvements in the Bolin watershed. Sediment mobilization, water quality and field parameters, soil erosion, stability/quality of stream banks and instream features and habitat, and survivorship of desired riparian vegetation will be used as indicators of success of these projects. Carrboro and NC DWQ will continue their existing monitoring efforts which can also be used to demonstrate measurable improvement in the Bolin Creek watershed as a whole. Carrboro has worked with Chapel Hill to collect base flow water quality samples along the mainstem of Bolin Creek since 1994. Parameters include suspended sediment, turbidity, nitrogen series, phosphorus, fecal coliform, metals, and field parameters. This program has been discontinued because of its limited utility; Chapel Hill and Carrboro staff are currently working on a more useful long term water quality monitoring design. Carrboro has conducted annual macroinvertebrate collection at four points along the mainstem of Bolin Creek for seven years, and has recently expanded efforts working with a leading benthic macroinvertebrate scientist (Dave Lenat). DWQ conducts fish sampling at 3 stations and benthic macroinvertebrate sampling at 5 stations once every five years. DWQ has no ambient water quality (chemical and physical) monitoring stations in the watershed. The entire monitoring program for the watershed is currently being reviewed by the BCWRT. Complimentary to and independent of the Bolin Creek watershed restoration efforts, the Town is pursuing activities as part of their NPDES Phase 2 permits to monitor and address illicit discharges and connections. The area that Bolin Creek flows through includes both relatively recent and older neighborhoods, including some of the central business district in Carrboro, a priority area for the IDDE program. It is expected that IDDE activities will address the issue of toxins as contributing stressors.

NCSU staff are continuing to pursue runoff monitoring from Pacifica to assess low impact development (LID) and BMP effectiveness in minimizing the effects of development on the hydrology of Bolin Creek, and nutrient runoff. One year of pre-development and 2 years of during development (6 months of this might be considered

post development) runoff monitoring have already occurred; additional post-development data is needed to complete the assessment. Storm by storm and annual pollutant export data will be compiled and compared to pre-development data and to runoff data from conventional developments to assess the effectiveness of this stormwater management for this development.

#### Develop a Watershed Restoration Plan

A Watershed Restoration Plan is required by the EPA in order to get continued 319 funding. The Bolin Creek Watershed Restoration Plan will be focused on the stressors identified in previous watershed studies. Existing watershed studies already contain a considerable amount of information that can be compiled to meet EPA's 9 required elements of a plan. Stakeholder involvement is strongly encouraged by EPA, and with some issues it will be necessary in order to solve problems. In particular, UNC, Orange County, the Chapel Hill-Carrboro School System, OWASA (and other utilities) will be involved in order to meet their concerns and include their planned activities that may affect the Bolin Creek watershed. Because of the amount of privately owned land, the plan will also need to identify recommended approaches for reducing runoff impacts from privately owned land.

Members of the Bolin Creek Watershed Restoration Team are in the early stages developing a Watershed Restoration Plan. The plan will include: identifying causes and sources of impairment, identifying and locating management measures to achieve impairment source reductions, estimating reductions in loads/sources, estimating technical and financial assistance needed, creating an implementation schedule and milestones, defining criteria to measure effectiveness, and monitoring to evaluate effectiveness. Public information, education, and outreach activities will be included in the plan. It is anticipated that the plan will take about 18 months to complete.