
CHAPTER 4: WATERSHED STEWARDSHIP

4.1 OVERVIEW

We seek to build the community's capacity for communication, networking, coordination, mutual leveraging of resources, and leadership that is required for successful long-term watershed restoration. Bolin Creek and its tributaries need a diverse group of stewards filling multiple restoration niches. As discussed in previous chapters, land use patterns and the distributed nature of watershed stressors indicate that progress towards the goals of this plan requires a comprehensive and collaborative approach that achieves a very high degree of private landowner awareness and adoption of improvements that reduce impacts of runoff on streams and aquatic life.

The general level of awareness of watershed challenges and opportunities must be raised; however, a high level of awareness will not, on its own, improve water quality and aquatic habitat. The watershed's residents and businesses need to not only understand, but be committed to modify both their properties and their behavior to support community wide goals to protect Bolin Creek and its tributaries. A goal of this plan is to help expand awareness and collaboration on behalf of the watershed as a home in need of repair. The aquatic life in the creeks is a strong indicator of the health of the larger community; it is both an ambitious aspiration and a potential source of civic pride and identity for a community to be an urban area that has figured out how to support healthy creeks.

4.2 OUTREACH, EDUCATION, AND PUBLIC PARTICIPATION STRATEGIES

PURPOSE OF AN OUTREACH PLAN

The purpose of an outreach and education plan is to identify and prioritize problems that need solving; to know which audiences are interested in, contributing to, or affected by each problem; to educate and enable community individuals and groups to follow practices to remove Bolin Creek from the 303(d) list; and finally to inspire community members to become watershed advocates to help teach and/or motivate others to live in ways that protect our waterways, and to work diligently and creatively to provide necessary resources for implementation and completion of important projects. In order to think and plan holistically and strategically, the rules of social marketing can lay a foundation and path as found in Philip Kotler and Nancy R. Lee's Third Edition *Social Marketing: Influencing Behaviors for Good* (2008 Sage Publications, Inc.) and Doug McKenzie Mohr's Third Edition *Fostering Sustainable Behavior: An Introduction to Community-Based Social Marketing* (2011 New Society Publishers).

OUTREACH STRATEGIES AND CAMPAIGNS

Using social marketing for separate campaigns and outreach will require a blend of different approaches and strategies. We know that person-to-person outreach results in the highest participation rates, yet person-to-person is very time intensive. One of the best models for community residential participation is the block leader program, often used by recycling programs and national parks' campgrounds host programs to provide a leader to those living or staying in a

neighborhood. Block leaders are educated peers, who can remind their neighbors about acceptable and unacceptable behaviors and practices, can provide newsletter articles to their HOAs or hand out written information when necessary, conduct meetings, and set out reminder signs for events. In the stormwater management outreach arena, the Adopt-A-Drain or Adopt-A-Stream programs would work well in involving leaders and their neighbors. A volunteer coordinator, most likely within each Town, would be necessary to set up and maintain a block leader program, due to the time requirements for doing a thorough job.

In considering campaign/outreach projects, Philip Kotler and Nancy Lee (Third Edition [Social Marketing: Influencing Behaviors for Good](#) (2008 Sage Publications, Inc.) page 98) suggest use of several criteria in choosing from an initial list of options:

Behavioral Change Potential: Is there a clear behavior that can be promoted to address the issue?

Market Supply: Is this issue already being addressed adequately in this way by other organizations and campaigns?

Organizational Match: Is this a good match for the sponsoring organization? Is it consistent with its mission and culture? Can its infrastructure support promoting and accommodating the behavior change? Does it have staff expertise to develop and manage the effort?

Funding Sources and Appeal: Which approach has the greatest funding potential?

Impact: Which approach has the greatest potential to contribute to the issue?

After reviewing each of the above questions, the Towns and/or other leaders of outreach campaigns may then assess organizations' internal strengths and weaknesses, and list factors and forces from inside and outside of the campaign leader's organization to determine what factors may need to be addressed in order to have a successful campaign. For better collaboration, we propose setting up a local work team called FLOW (Friends and Leaders of Watersheds) to meet on a bimonthly schedule. Through this team, collaborative efforts can be planned and initiated, tasks delegated to avoid duplication or confusion, committees created for special events or projects, resources shared, promotion of projects or programs coordinated, and clear and open communication optimized.

General education, awareness building and group development will continue to take place through current programs, symposia, festivals, Earth Action Day events, and public involvement opportunities.

COMMUNITY BASED SOCIAL MARKETING

Community based social marketing (CBSM) is an attractive and effective alternative to outreach based on information-intensive campaigns, attitude-behavior or economic self-interest perspectives. Its effectiveness is due to its pragmatic approach that involves carefully selecting the behavior to be promoted; identifying the barriers and benefits associated with the selected behavior; designing a strategy to address these barriers and benefits; piloting the strategy with a

small segment of a community; and evaluating the impact of the program once it has been implemented broadly. The following considerations are all part of a social marketing approach to issues and campaigns, and summarizes the approach as described in Doug McKenzie Mohr's Third Edition Fostering Sustainable Behavior: An Introduction to Community-Based Social Marketing (2011 New Society Publishers):

1. SELECTING BEHAVIORS: Watershed restoration presents a wide array of both landscape changes and human behaviors that may be promoted. For example, a goal of promoting rain gardens might be achieved by involving community members in the building of a demonstration rain garden. Similarly, there are numerous behaviors that could be encouraged related to fertilizer use, rainwater harvesting, erosion control, car washing, and tree planting. The first step of community-based social marketing is to determine which specific practices and behaviors should be chosen to be promoted, determine the impact this change would make, and the probability that this change would happen. Choose behavior to target - calculate impact - determine probability - consider visibility of action for ongoing evaluation - then prioritize for outreach impact and success.

2. IDENTIFYING BARRIERS AND BENEFITS: If any form of sustainable behavior is to be widely adopted, *barriers* that impede people from engaging in the activity must first be identified along with identifying *motivators* for them to take the desired action. But barriers that prevent an unwanted behavior also need to be identified. You want to keep those! Approaches to identifying these barriers and benefits can include literature reviews, observations, focus groups, surveys, meetings, and other means of information gathering. Barriers identified may be "internal" to individuals such as lack of knowledge regarding how to carry out an activity, or "external" as in structural changes that need to be made in order for the behavior to be more convenient. Social science has found that that the barriers that prevent individuals from engaging in one form of sustainable behavior (e.g., installing a rain garden) likely have little in common with the barriers that keep them from engaging in other desired behavior (e.g., adopting a stream reach). Further, this research demonstrates that even within a class of sustainable activities, very different barriers emerge as being important. Since the barriers that prevent individuals from engaging in sustainable behavior are activity-specific, the barrier-benefit approach develops a strategy only after a particular activity's barriers and benefits have been identified. Once the barriers and benefits have been identified, a strategy to remove the barriers and enhance the benefits is developed. One proven element of adoptability of a new behavior is convenience. Make a behavior easy and convenient and the probability of it happening skyrockets.

3. DEVELOPING STRATEGIES: Social scientists have identified a variety of effective "tools" that span the gamut from gaining commitments from an individual that they will try a new specific activity to developing community norms that encourage people to behave more sustainably. The techniques that are used can be carried out both at the community level and also involve direct personal contact. Personal contact is encouraged because social science research indicates that we are most likely to change our behavior in response to direct appeals from others.

4. COMMITMENT: Baby steps work to increase commitment. Have someone agree to a small project, gain trust with its results, then ask them to participate in a larger project. Ask people to sign pledges to do something or to change a behavior after sharing with them the reasons you need their participation. Offer follow up and/or coaching to make sure a project is on task. Send out a letter from a respected community member asking people to participate in a survey before sending out the survey. Send free "tools" to help implement the behavior, such as a storm drain protector or

free plants for a rain garden, upon commitments to use them. But remember, commitment must be voluntary or the commitment will not last.

5. BUILDING COMMUNITY SUPPORT: Norms, peer pressure, modeling behavior. One case study in downtown Chapel Hill comes from the Chapel Hill Downtown Partnership's grant with Keep America Beautiful to install cigarette urns on Franklin Street. In the past cigarette butts littered the street from east to west. At one count, scheduled with a weekly halt in maintenance to better calculate need for the grant, over 6,000 butts were found in landscaping, gutters, rights of way and on the sidewalks. After installation of cigarette urns in several strategic locations, the change was slow, but caught on as smokers observed other smokers using the urns to dispose of their butts. The urns now in place are filling up and the Chapel Hill Downtown Partnership hopes to expand the program. Getting people to pick up after their dogs is the same type of issue: with greenway signs requesting this behavior and modeling by dog walkers, those who may not have picked up earlier are more likely to adopt the behavior.

6. SOCIAL DIFFUSION: Social networking, influence with friends and family, block leader influence, public and personal recognition of models for the behavior, using the grapevine to distribute an invitation to join in a desired behavior, making the desired behavior very visible and able to be participated in by others – all are very effective means of speeding up and gaining both commitment and long lasting results. Chapel Hill Stormwater Management's rain barrel sale and H₂O! Fair during the drought of 2008 attracted more than 700 people, mostly by word of mouth. Can you spell flash mob?? Social media can play a very large role in this element of marketing.

7. CREATING PROMPTS: How many of you have reusable grocery bags but leave them in the car when you go in to shop? You get the picture. People forget, get sidetracked, don't think straight sometimes. Prompts, or reminders to behave in a certain way, are helpful. Wouldn't it be nice if we could place squawkers on all storm drains to go off when someone approaches with a polluting substance? We can't do that, but we can adhere storm drain labels or paint storm drain hoods a caution yellow. We can place the pollution hotline number on the labels so an observer can call to report dumping. We can place stickers on painters' or concrete workers' truck windows to remind them to protect our storm drains and creeks. Doug McKenzie-Mohr cites a case that by simply beautifying a litter receptacle increased its use by 100% in one study and by 61% in another study.

8. COMMUNICATION: How can we use communication to persuade others to adopt a desired behavior? Grab attention with information that is the opposite of boring, but personalized and clear, using comparisons that people can relate to, especially in the use of measurements or volumes. The use of humor, art, music can help a message or it can hurt, depending on the audience and how the message is framed and crafted.

9. INCENTIVES: The "what's in it for me?" question often arises, especially if a government is asking citizens to participate in a new program. Let them know, be consistent with incentives, and update participants with results of their participation. Create incentives like having clean water to drink and swim in, saving money, reducing the amount of work needed to maintain a yard, earning a beautiful yard ornament, or gaining recognition by being part of a project.

10. CONVENIENCE: Basically, is the desired behavior going to make the participants' lives harder or easier? Will the participation in a project require large amounts of time or money? Will the behavior be sustainable in the long term? Is what we are asking going to have more benefits than costs?

11. TESTING A STRATEGY: Before piloting a project or a campaign, the strategy should be tested with a focus group from the pilot test area. The focus group participants will be able to find the flaws or suggest tweaks that would be more effective for their community. They may also possibly become the leaders within the community, as they have formed some ownership and commitment to the outreach by participating in the focus group.

12. PILOTING: Prior to implementing a community-based strategy, it is a good idea to pilot the strategy in a small portion of a community. Conducting a pilot allows a program to be refined to improve effectiveness and cost-effectiveness in other areas. Finally, conducting a pilot can produce evaluative results and be a crucial step in demonstrating to supporters/funders the worthiness of implementing a program on a broader scale.

13. BROAD-SCALE IMPLEMENTATION AND EVALUATION: The final step of community-based social marketing involves broad implementation and ongoing evaluation. In conducting an evaluation, community-based social marketers emphasize the direct measurement of behavior change over less direct measures such as self-reports or increases in awareness. The information gleaned from evaluation can be used to refine the marketing strategy further as well as provide evidence that a project should receive further funding.

4.3 LEADERSHIP AND COLLABORATION

The Bolin Creek Watershed has three local government jurisdictions - The Towns of Carrboro and Chapel Hill, and Orange County; and a State landholder - the University of North Carolina at Chapel Hill. The public non-profit Orange Water and Sewer Authority (OWASA) is an important stakeholder in the Bolin Creek watershed as well. Each holds its own NPDES permit, with the exception of the County which does not have a separate stormdrain system. Collaborative efforts include erosion control issues, illicit discharge detection and elimination, watershed outreach and education, planning and/or funding for projects sharing the common mission of improving the health of Bolin Creek and protecting Jordan Lake under the Jordan Lake Rules. In addition, Friends of Bolin Creek, Orange County Soil & Water Conservation District, the Haw River Assembly, UNC's Institute for the Environment, teachers and students from the local school system, and other individuals and groups interested in stream restoration and protection lend huge amounts of energy to governmental programs as well as to implementing projects and workshops on their own. Having such active groups allows exponential outreach that just one entity could not attain on its own.

COLLABORATION STRATEGIES

Top Down P's (Typical government strategy):

Policies, practices, programs, projects, payments

Bottom Up E's (Typical grassroots strategy):

Education, encouragement, engagement, empowerment, enthusiasm

How do we simultaneously build from the bottom up ("the E's" mentioned above) and top down ("the P's")? The common thread and the secret ingredient that holds these approaches together is

community. A united community is primed to help restore Bolin Creek, while a struggling, divided, distracted, or disinterested community creates many barriers to progress. Often in plans like this one, recommendations are presented as policies, practices, programs, and projects led by local governments. This approach is typically task oriented, formally structured, and linear from the top down, and is often slow and methodical. Those using this approach plan carefully, but can also underestimate grassroots expertise, energy, and enthusiasm, and can find themselves being left behind as others charge ahead.

The BCWRT is dedicated to making public involvement and participation a community process. Therefore, plans for implementation will rely on consensus building and collaboration among the many stakeholders. The key is in:

- consensus building among stakeholders already actively involved with caring for and repairing Bolin Creek;
- inviting participation from those not yet committed to a team approach;
- building leaders' and volunteers' skills and knowledge;
- identifying and delegating tasks and projects clearly and appropriately to ensure that legal requirements and regulations are met and that skills and tools are matched to delegated tasks;
- and having clear communication and interchange between stakeholders throughout the process.

STAKEHOLDERS AND ROLES

Laying the foundation of partnership requires up-front work to understand watershed stakeholders and change agents' interests, facilitate information-sharing and visioning, build trust, and experience successes together. The Bolin Creek Watershed, possibly more so than any other in Chapel Hill and Carrboro, has a plethora of residents and visitors who deeply appreciate the creek and enjoy its recreational aspects for walking, biking, running and playing; its natural habitat for the study and teaching of flora and fauna; and its opportunities to become involved with its care. Citizen groups such as The Friends of Bolin Creek and Save Bolin Creek, along with the Towns' Parks and Recreation, Stormwater Management and Planning Departments, have over the years, brought attention to the beauty of the creek itself as well as to issues that affect its health. Differing opinions among the groups, especially about Carrboro's proposed greenways and bicycle paths, have led to discord, yet all parties agree that working collaboratively to ensure the best management for Bolin Creek is the most important goal.

This watershed teems with leaders. By bringing active citizens and agencies together to work towards important goals and objectives, confusion, errant messages and overlap can be avoided, while providing the needed talents, knowledge, people and energy to fulfill goals and objectives.

Actual and potential outreach partners are listed in Table 10, with asterisks for level of involvement. It identifies who is currently involved as well as potential others who have an interest in the watershed.

Those involved in local stormwater education and outreach are already working together to establish a collaborative Chapel Hill-Carrboro network called FLOW (Friends and Leaders of Our Watersheds) to enable integrated planning and discussions. Those involved with one subwatershed

are often involved with another creek association, and lessons learned in the Bolin Creek watershed can be applied in others. Friends of Bolin Creek, the Towns of Chapel Hill and Carrboro, UNC's Institute for the Environment, Chapel Hill High School, Morgan Creek Valley Alliance, and Orange County Soil & Water District have formed a base to which other stakeholders will be added. Group members bring expertise, knowledge, and contributions of time to fulfilling goals and objectives. In addition, potential for funding is also increased as a number of agencies working together can draw from different sources and combine funds for larger, more expensive restoration projects.

Delegating tasks and having specific duties and training for volunteers, with their different strengths, perspectives, associates and audiences, will increase outreach more quickly to improve our waterways. Therein also lies the challenge of maintaining consistent messages, communicating important issue and project updates, providing training, and organizing several community efforts at once.

Table 10: Actual and Potential Outreach Partners as of June 2012	
Activity	* ** *** (Less ---> More)
***	Friends of Bolin Creek
***	Morgan Creek Valley Alliance
***	OWASA
***	UNC-Institute for the Environment
***	Chapel Hill - Carrboro City Schools
***	Chapel Hill Downtown Partnership (representing downtown businesses)
***	NCSU- Stream Restoration Program and NC Cooperative Extension
**	Orange County Cooperative Extension Service
***	Orange County Soil & Water Conservation District
***	Orange County Animal Control/Shelter
***	Triangle J COG: Clean Water Education Partnership & Jordan Lake Groups
***	Orange County Environmental Health, Solid Waste Departments
*	Real Estate Agents
**	Town and County Elected Officials
***	UNC Stormwater Management & EHS
**	UNC Office of Sustainability
***	Town of Carrboro working jointly with Town of Chapel Hill (Stormwater)
*	Sierra Club Orange Chatham Group
*	New Hope Audubon Society
*	NC Forest Service
***	NC Botanical Garden
***	Haw River Assembly
***	NC Division of Water Quality
*	NC Office of Public Affairs & Environmental Education
***	NC Big Sweep
*	UNC Environmental Clubs and Groups
***	Boy Scout Troops
*	Girl Scout Troops
*	Churches
*	University Mall and Other Businesses

**	Town of Chapel Hill Grounds/Landscaping
**	Town of Chapel Hill Parks & Recreation - Greenways, Events, Activities
	UNC Carolina North Forest (UNC Division of Facilities Services)

UNIVERSITIES AND ACADEMIC INSTITUTIONS

The BCWRT partnerships are strong with UNC-Chapel Hill and NC State University. Both universities are a constant source for research and have provided exceptional technical assistance, funding and staffing to enhance and expand our local watershed programs, especially through NCSU’s Stream Restoration Program and Cooperative Extension (including Watershed Education for Communities and Officials), and through UNC’s Institute for the Environment and Office of Environment, Health and Safety. In addition to NCSU’s partnership on stream restoration, both universities have contributed to education and support of outreach programs, such as conducting a local rain garden workshop, providing science curriculum assistance and science teacher training, helping to organize watershed advocates, and partnering to develop and produce a water pollution prevention training program for food service establishments. UNC-Chapel Hill stormwater engineers and outreach staff often work with Town stormwater staff in projects and outreach programs, and UNC is represented on Chapel Hill’s Stormwater Management Utility Advisory Board. The NC Botanical Garden Foundation, umbrella organization for the Morgan Creek Valley Alliance, also supports work by Bolin Creek advocates, providing space and staff support and leadership for educational watershed programs, such as Friends of Bolin Creek’s cosponsored “Can We Heal Our Waterways?” Symposium in February 2011.

LOCAL SCHOOL SYSTEM

Schools present special opportunities since they not only are centers of education but also have schoolyards with real restoration opportunities that can serve as focal points for both youth and adult education and outreach, while producing significant environmental improvements. The main challenges with working with schools are time demands on teachers and limited funds. Parents, teachers, school clubs, administration, PTA, and the CHCCS Foundation are all invited to help identify ways that these barriers can be overcome and education and outreach efforts can be pursued at schools. The Chapel Hill-Carrboro Schools District is currently in the process of assessing architectural integrity of buildings and stormwater problems on the campuses of older schools. This architectural study will help to support the working relationships currently fostered between the school system and those agencies currently working with Chapel Hill High School on stormwater management projects and the Water Sustainability Initiative.

The Town of Carrboro and Friends of Bolin Creek worked with McDougle Middle School in Carrboro through a 319-grant to promote stormwater education and clean water by installing a bioretention cell and cistern on the school campus. Recent collaborative work at Chapel Hill High School under the “Water Sustainability Initiative” (~~Addendum X~~) has built teamwork among 12 various agencies and organizations to promote hands on learning by students, stormwater drainage improvements and demonstration projects, and water quality improvement projects. Funding has been requested by the Green Tigers Environmental Club, Friends of Bolin Creek, CHHS Science Teacher Rob Greenberg, and Orange County Soil & Water Conservation District. In-kind funding has been provided by Friends of Bolin Creek, the Redwoods (Insurance) Group, NC Cooperative

Extension, the NC Stream Restoration Program (NCSU), and the Town of Chapel Hill Stormwater Management Division.

In a recent PRISM (Promoting Innovation in Science and Mathematics) grant from Burroughs Wellcome to Chapel Hill High School (CHHS) teacher Rob Greenberg, funding was given for contracting with Shodor, a Durham based national resource for computational science education to develop a model of water flow through the CHHS campus. This company has specific experience in developing stormwater models for high school classrooms and specializes in working with teachers on developing individualized computational projects. Professional development for CHHS teachers will allow teachers to project how specific improvements would decrease stormwater volumes. In addition to technical assistance, CHHS would receive guidance in the integration of modeling and simulation tools into the high school curriculum, consistent with state and national standards.

A matching grant from Strowd Roses, Inc. was awarded to Friends of Bolin Creek to further water quality and hydrology studies by students attending CHHS and the Carolina Center for Educational Excellence.

PRIVATE PROPERTY OWNERS

Stormwater retrofit and stream restoration projects typically require substantial technical and often legal/regulatory input and permitting, not to mention financial outlays and land area. There are limited opportunities for engineered restoration and stormwater retrofit projects since much of the watershed is owned by private property owners and built upon to some degree. Most of the needs for restoration will require the involvement, or at least permission to enter, from private landowners. Working with landowners to gain their trust and instill the importance of repairing our watershed to motivate them to participate in restoration efforts is an art as well as a science. Finding the right approach is critical before planning gets too far along. Project design and property owner commitment is a chicken or the egg quandary: receive commitment from homeowners first or design and plan the project first to present to homeowners? How can a property owner commit to an unknown process and outcome? It is best to involve landowners at the outset, before a grant proposal is even undertaken. This will require many hours spent following up with and visiting one-on-one with those who do not accept invitations to initial meetings.

Optimally, many smaller landscape enhancements, along with the larger projects that are feasible, will be pursued. “Soft” restoration through watershed friendly norms and behavior will require attention to the rich mix of cultural practices, social interactions, economic status, and human feelings that influence individuals, groups, and organizations. The fundamental goals are for stewardship efforts to educate, encourage, and empower the community to pursue watershed restoration goals such as reducing the rate and volume of runoff, recharging groundwater by capturing and infiltrating stormwater, and preventing illicit discharges into creeks and storm drains. Campaigns such as Seattle’s 12,000 rain gardens or Kansas City’s 10,000 rain gardens are models for the country. Working together with stakeholders, Chapel Hill and Carrboro can also design effective campaigns for each of the above goals.

WATERSHED SITUATION ASSESSMENT AND RECOMMENDATIONS

Recent research highlights that "the design of transparent and open social learning processes is a key requirement of sustainable water management regimes. Effort has to be devoted to building trust and social capital for problem solving and collaborative governance. An increase in, and maintenance of, the flexibility and adaptive capacity of water management regimes should be a primary management goal. Entrenched perceptions and beliefs block innovation and change. Space has to be provided for creative and out-of-the-box thinking and experiments." (Pahl & Wost)

As part of the Bolin Creek Watershed Restoration 319 grant, NCSU Cooperative Extension's Watershed Education for Communities and Officials (WECO) was contracted in 2010 to conduct a non-biased situation assessment of stakeholders in the Bolin Creek watershed to help identify:

- the key stakeholder voices that must be engaged for any successful public participation;
- the main stakeholder concerns, issues, and interests;
- the specific opportunities where public input can help to shape decisions about the issues;
- any issues or constraints that may affect public participation;
- successes achieved so far that can be built upon.

WECO conducted interviews and a focus group with 41 stakeholders. The report's recommendations include:

1. Create a multi-organizational Bolin Creek initiative group that can receive training on building collaborative and consensus decision-making skills in order to agree upon common goals and objectives, and divide into productive workgroups.
2. Design an online network for sharing ideas and discussions, preferably managed by a neutral party.
3. Examine how to more holistically plan and manage water resources across departments and jurisdictions. (Local governments and OWASA)
4. Increase community outreach and engagement on UNC's Carolina North Forest Stewardship Plan.
5. Investigate how to raise revenue dedicated to water quality protection and restoration. Continue to work together to address the landfill and groundwater contamination issues in the Rogers-Eubanks community. (Note: Orange County will close the Eubanks Road landfill on July 1, 2013.)
6. Convene a facilitated search for common understanding about ways to connect pedestrian and cyclist routes while also protecting and improving Bolin Creek's riparian corridor.

IDENTIFYING AND PRIORITIZING PROBLEMS

After putting together a collaborative team, we must identify and prioritize problems that need solving; to know which audiences are interested in, contributing to, or affected by each problem; and to set forth a plan for collaboration of stakeholders to identify and work towards goals and objectives in an efficient and friendly manner, with clear communication and task division, ending with measurable results. The ultimate goal is to remove Bolin Creek from the 303(d) list.

Appendix 4 identifies stressors and their sources that impair our waters, and targets who can make the changes to eliminate the stressors and what practices are recommended to avoid or fix the problems. Appendix 5 (Outreach Methods) lists perceived barriers and benefits to fixing the

problem and suggests outreach methods and tools that can be used. The barriers and benefits are taken from experience with field calls and talking with citizens; however, others may exist that can be identified through focus groups or surveys once a topic is selected for a targeted outreach campaign.

RECOMMENDATIONS FOR COLLABORATION

Where do we go from here? Stakeholders have a significant number of issues in need of response.

Convene a multi-organizational initiative group whose members will make a long term commit to working on outreach and education in the Bolin Creek watershed. One suggestion is to hold a series of at least three or four intensive facilitated workshops at the beginning:

- 1) to build team skills, and come to an understanding of outreach strengths and weaknesses with each partner; to understand what various group members can or cannot bring into the group as a whole;
- 2) provide training on consensus decision-making in order to agree upon common goals and objectives;
- 3) discuss current work in the watershed and evaluate for efficiency and effectiveness; what needs are still lacking in order to meet current goals, and which programs should be dropped or modified, if any;
- 4) choose and prioritize projects and campaigns for the Bolin Creek watershed based on the model of social marketing; and
- 5) divide into productive workgroups, each with clear leadership, for tackling the top priorities.

4.4 OUTREACH STRATEGIES FOR DIFFERENT AUDIENCES

Educating both adults and children about proper watershed restoration practices and water quality protection is critical for creating a watershed restoration-friendly community. The most effective outreach program will address both the “how-to” of watershed restoration practices and the engagement of the community. Information can be distributed through brochures, newsletters, newspapers, bumper stickers, other print media, and electronic delivery such as social media, posting on the web, and distribution lists. However, while *information delivery* can present a message, it is not a sufficient and effective means of encouraging watershed stewardship. Local events and initiatives such as person-to-person contact, festivals, summer camps, neighborhood campaigns, workshops, public projects, and Stream Steward Programs are examples of ways to engage the community in restoration efforts that are much more holistic – and effective - than information delivery. Items such as bumper stickers and social media may transfer information, but also be used to give a sense of belonging to an active group with a mission, which may motivate people to go beyond what they read, and *act* to help Bolin Creek.

Education also needs to reach a variety of audiences, such as homeowners, schools, businesses, and municipal staff in engaging ways. Efforts need to be made to reach out in ways that recognize diversity in age, ethnicity, and other socioeconomic factors to encourage watershed restoration.

DIRECT COMMUNICATION WITH RESIDENTS

Outreach in the Middle Bolin Creek watershed must target transient populations such as students and property managers and must be repeated periodically and consistently in order to have much effect. In the late 1990's, during a recycling survey of the Northside community in Middle Bolin Creek sub-basin, Eagle Scouts conducted a house to house, in-person survey to address low recycling participation and what could be done to increase the number and quality of recycling bin set outs. It was found that residents were motivated by "wanting to help." After the survey, recycling set outs were tallied and participation increased by 35% over several months. The success of "neighbor to neighbor" or in-person outreach is supported by annual visits of UNC, Town and Recycling representatives who visit rental housing communities in August, soon after the fall semester move-in, to educate new residents about being good neighbors by showing courtesy to others and by following local rules and regulations about occupancy, parking, alcohol, noise, and trash. This outreach has improved compliance rates, showing that *direct communication* with residents motivates them to become involved in their community.

MIDDLE CLASS TO AFFLUENT NEIGHBORHOODS

For middle class to affluent neighborhoods, where many services are likely to be contracted out, outreach should include landscapers and service providers as well as residents. According to the 2006 Community Based Survey conducted by Jewell Engineering and the Town of Chapel Hill Stormwater Management Division, approximately 50% of homeowners had their lawns cared for by contractors. In addition, with busy schedules and older age, a good percentage of households most likely have a housekeeper or maid service, and may use mobile services such as carpet cleaners, dog grooming, car washing, and pressure washing. All of these services have been found to occasionally and illegally discharge wash water into the storm drain systems. Most instances have been attributed to the individual not knowing that storm drains lead directly to creeks with no treatment, or to ignorance about proper wash water disposal.

ENGLISH AS A SECOND LANGUAGE COMMUNITIES

The Hispanic or Latino population comprises 8.4% of the total Bolin Creek watershed. Anecdotally, Hispanic and Latino families use English as a second language to varying degrees. It is often the children who are most proficient in English. Therefore, it is important to reach school aged children in this population so that they can educate their families, or to provide programs in Spanish for adults.

During focus groups conducted for developing a pollution prevention training program for food service establishments, UNC-Institute for the Environment and the Town of Chapel Hill found that Hispanic and Latino workers want to do the right thing and to be part of their communities. The

largest motivating factor was to keep their families healthy and safe. Correlating clean streams with a clean and safe Jordan Lake, where many families fish and swim, is an important outreach strategy.

El Centro Hispano, Cliff's Meat Market, and various Mexican restaurants and Tiendas would be good locations to talk with customers and employees, and to distribute printed information about proper household hazardous wastes and storm drain protection. Visiting with families whose children are in the dual language program through Chapel Hill-Carrboro City Schools or meeting with day workers who assemble in Carrboro each day are other potential outreach opportunities. Finding a Spanish-speaking ambassador for clean water would be optimal.

Only 6.6% of the Bolin Creek Watershed population is Asian, with the larger distribution of the population in the Upper Bolin Creek subwatershed. Little has been done in Chapel Hill or Carrboro to design outreach materials or programs for this population that may include different dialects such as Mandarin and Karen. The Chinese School at Chapel Hill and UNC Chinese House students would be possible sources of assistance for translation and outreach.

RENTERS

According to the results of a 2006 Chapel Hill Community Based Survey to measure residents' perceptions, knowledge and interest in stormwater issues, the only factor that correlated with a lack of knowledge was having lived in Chapel Hill less than five years. Short-term residents who rent may also correlate with lower incomes. Rental property owners may have a lesser probability of having a "willingness to pay" for property improvements to benefit water quality. Expenses for maintenance of special landscaping or stormwater BMPs would not likely be a high priority. Yard care, if any, may not go beyond routine grass cutting as property owners want to maximize their income on rental property. They also may not have responsible tenants to care for the property. Outreach to landlords and property managers as well as residents is necessary. Incentives for watershed protection would be a motivating factor, such as free or heavily subsidized rain gardens, decreasing impervious surface to reduce stormwater fees, or subsidizing plants for landscaping.

MULTI-FAMILY UNITS (APARTMENTS AND CONDOMINIUMS)

Many residents in Chapel Hill and Carrboro are students, as apartments are located close to campus and on the bus routes. Much work can be done with residents of multi-family units, especially in educating about proper fats, oils, and grease (FOGs) disposal. At least 50% of sewer overflows contaminating Bolin Creek have come from grease clogs, and drains blocked with grease in apartment complexes are not unusual. OWASA has information about FOGs disposal, Orange County Solid Waste-Recycling accepts used cooking oil at the household hazardous waste collection, but other than information, little has been done to promote proper disposal. Triangle J Council of Governments' Clean Water Education Partnership is now planning to print grease can lids so that our communities can distribute these "tools" to get the message to residents about proper disposal and cleaner creeks.

Car wash areas, improper landscaping and waste disposal (i.e., dumping in the woods or drains behind complexes), and dog waste disposal are other potential sources of pollution into Bolin Creek from apartment complexes. Conducting walk arounds with apartment and condominium managers is recommended to discuss opportunities to prevent water pollution. Special storm drain labels could also be designed for placing on parking lot storm drains. Bus placards could be designed to reach students with stormwater messages.

FRATERNITIES AND SORORITIES

Most if not all of the UNC fraternity and sorority houses are in the Bolin Creek watershed. Parties and rush activities can contribute trash, sand and other debris that can block storm drains or be washed into Bolin Creek. Outreach staff will continue to educate students that storm drains lead directly to the creek and need to be protected. Entertaining stories, ads and PSAs can be run in the Daily Tar Heel, on WXYC Radio, and through the Office of Fraternity and Sorority Life.

LOCAL GOVERNMENT AND AGENCY INTERNAL EDUCATION

'Internal' education refers to the training of staff who are involved in the operation and maintenance of public lands (e.g., parks) and infrastructure (e.g., streets, sidewalks, utility lines) to become more aware of how their practices affect our waterways, and to help in implementing more watershed friendly protocol and practices. In addition to relevant Town and utility staff, elected and appointed government representatives should also be included in training sessions whenever possible. This training should cover all aspects of watershed restoration, including planning, design, development review, construction, and maintenance. This type of 'inreach' can be in the form of brown bag lunches, certification programs, workshops, and establishment of working groups. Even simple meetings to go over the Watershed Restoration Plan and communicate its strategies and objectives can be useful. Watershed restoration planning and design issues are complex, and state-of-the-art research and guidelines continue to evolve. Therefore, training sessions need to be updated and repeated on a regular basis.

PUBLIC HOUSING

Ten of the 13 public housing properties (www.townofchapelhill.org/index.aspx?page=211) are located within the Bolin Creek watershed with 250 of 336 units, or 74.4% of all public housing units. The Town of Chapel Hill's Housing Department operates and maintains each property. Some of the properties have resident representatives who lead programs and serve on the Public Housing Board. Stormwater outreach programs have been given for after school programs, resident meetings and participation in NC Big Sweep litter cleanups. Further work needs to be done by both the Housing Department and Stormwater Management in both educating about and enforcing proper waste disposal, especially as described under multi-family outreach.

SAFETY ISSUES

Crime statistics are significant. One reason some property owners do not want to maintain healthy riparian buffers, is the fear of (potential) criminals (and snakes unrelated to crime) being able to hide. Safety issues may also contribute to late night dumping by restaurant and bar employees in the downtown area who have to go into alleys to dispose of trash and grease after closing at night. The downtown business district continues to have significant issues with improper disposal of trash.

BUSINESSES

Outreach to employees, especially those in the landscaping, cleaning, construction, painting and restaurant businesses, is important, as we have answered many calls reporting improper disposal of waste in these professions. A guide to proper business waste disposal insert is included in each business license that is sent out to address part of the issue. Work with staff from the solid waste divisions and recycling is also ongoing and education-oriented.

Bilingual pollution prevention education is available to food service establishments through the Chapel Hill Stormwater Management Division or UNC's Institute for the Environment. We have seen improvement with several restaurants after they were cited for violations and took the training. In two cases, major plumbing work was done to avoid wash water running into storm drains. Some have stopped outdoor washing of compactors and mats. Others relocated and resized grease/oil collection containers which solved problems of sharing a site, and reduced spills on pavement and into the storm drains. Some restaurants are even training their neighboring businesses about proper wash water disposal. Workshops have been conducted and will continue to take place for local food service establishments. Inspections by Stormwater Management or the Orange County Environmental Health Department can find violations for which the training is given to the manager. Citizen reports of problems are also a cause for visiting a food service establishment.

Point of sales information/education could be implemented for painting contractors who too often dump painting wash water down storm drains or clean out their equipment directly in creeks. We have written newspaper articles, advised those who have been in violation, and worked with OWASA to come to an agreement about proper disposal. The Orange County Solid Waste Management Recycling Division also encourages proper disposal of paint and has a household hazardous waste collection that also includes a business disposal program.

We have explored outreach to concrete workers under a Wallace Genetics Foundation grant with UNC-Institute for the Environment, but abandoned that aspect of our proposal when UNC was unable to find workers for interviews, focus groups or surveys. Fear and mistrust prevented workers from wanting to talk about their practices of concrete wash outs. This is an area that should be revisited, as concrete trucks still occasionally use storm drains for wash out. However, working with the concrete company representatives and the plants where concrete is loaded is advised. Ideally, the employee taking the order for concrete would ensure that a proper wash out area was provided at the site. However, with batches being distributed to different locations, this may not be possible. "Prompts" or window stickers for concrete trucks with a clean water message and an emergency number to call if the delivery site has no wash out area would be ideal. The emergency number could go to a service that could bring a portable filter or pool.

For DIYers we could work with home and garden stores to include proper washout information along with bags of concrete and rentals of concrete mixers. A suggestion also was made by an engineering inspector that clean water messages and environmental protection be included in required OSHA tailgate talks with construction workers. Steps have been taken to investigate creation of storm drain protection waddles (filter socks) with a message to distribute to restaurants and other businesses that may need storm drain protection.

RECREATION

The Town of Chapel Hill's Community Center Park and 1970's unlined, but now covered, landfill are located between Bolin Creek and Battle Branch. This is the most used park in Chapel Hill and draws many families with young children, day campers in summer, and swimmers who use the pool. The Center has a beautiful rose garden and gazebo, a learning garden and a compost demonstration area. Chapel Hill Stormwater Management is currently discussing possible educational demonstrations with Parks and Recreation, Orange County Solid Waste and a local artist. The paved Bolin Creek greenway stretches from the Community Center west to Umstead Park. Several repetitively flooded single family homes on Dickerson Court, just north of the Center, were removed with a FEMA grant around 2001. A demonstration bioretention cell has been constructed in this area with a 319-grant.

The Chapel Hill Public Library straddles the Middle and Lower Bolin Creek boundaries. This large property is under construction with reopening expected in 2013. The library is a major gathering spot for families and individuals, and boasts the largest circulation of public library books in the state. With its property, trails, and significant visitation, it has high potential for hosting watershed education programs, films and exhibits and providing outdoor education.

It will be essential for Stormwater to work with Chapel Hill Parks and Recreation and the Greenways Commission regarding riparian buffer protection as the Bolin Creek greenway expands.