A River Network Publication Volume 18| Number 2 - 2008

River Voices

Integrated Watershed Protection:

Making Tough Decisions Together

by Wendy Wilson & Gayle Killam, River Network

Across the country, community members are working together to build watershed awareness and create more integrated decision-making processes. Natural resource agencies are often tasked with creating watershed plans and watershed protection programs to address a specific concern such as water quality, sedimentation or toxic contamination. However, the effectiveness of these efforts is influenced by decisions beyond the natural resource agencies' control. Political, economic and social forces influencing local land-use patterns, transportation planning, development of water supplies and management of storm and waste water often have a greater impact on the health of the watershed than even the most thorough watershed plans.

To become more effective, today's watershed protection and restoration practitioners go beyond their traditional roles in order to integrate the work of many different entities. There is an important new need for helping communities understand how the physical and ecological conditions of the watershed interact with—and are irreversibly changed by—decisions to develop, pave over and build new plumbing across our common landscape.

No one agency or organization—working in isolation—can practice Integrated Watershed Protection. In most places, different agencies take responsibility for restoration activities, water quality monitoring, enforcement of water quality laws and funding public water infrastructure. And, if you add in the different agencies involved with land use planning, transportation, development and other activities that impact our waters, the list of watershed players who need to be "integrated" can be enormous. However, there are ways for them to collaborate to create a watershed-based community plan of action.

The process of reaching agreement and building community support for such a plan can be led by a collaborative stakeholder group, an inter-governmental group or a non-governmental group. The National Estuary Program (NEP) includes excellent examples of planning, communication and coordinated action. The Maryland Coastal Bays Program was recently recognized for its support of comprehensive local planning and zoning achievements.[1] The Coastal Bays Program includes the towns of Ocean City and Berlin, the National Park Service, Worcester County, U.S. Environmental Protection Agency, and the State of Maryland. These entities joined with citizens and representatives from the development, farming, golf, tourism and fishing industries to produce a highly effective conservation and management plan.[2]

Other successful efforts to integrate watershed protection have been partially funded by the U.S. Environmental Protection Agency through Watershed Assistance Grants administered by River Network from 1999-2004, and the Targeted Watershed Grants program since 2004.

Why Integrate?

There is no perfect Integrated Watershed Protection program. But there are many examples of how watershed protection efforts have suffered from a lack of integration. The watershed council that makes a big investment in a stream restoration project is rightly frustrated when its project blows out because of improper construction practices upstream. The

[1] www.epa.gov/nep/openhouse.html [2] www.mdcoastalbays.org

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River Network

Connecting People, Saving Rivers

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River Network is a national, nonprofit organization whose mission is to help people understand, protect and restore rivers and their watersheds.

From The President

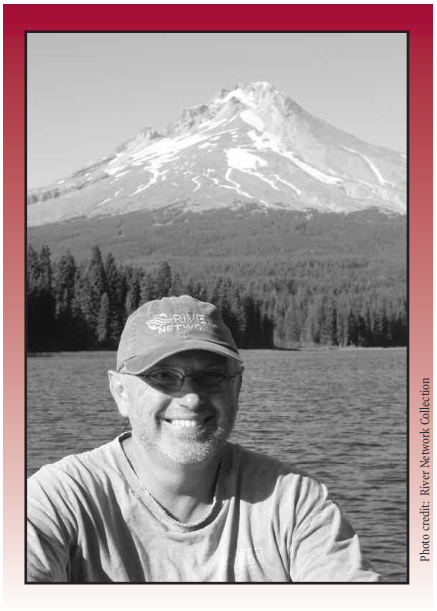

Photo credit: River Network Collection

Watershed planning has come a long way. It wasn't so long ago that the very idea was brand new in most places. Today, there are literally thousands of watershed planning processes underway across the country. They are involving people with many types of interests and expertise, and they are addressing a good and growing range of water quality, quantity and habitat issues.

But let's face it: far too many of our watershed planning processes still lead simply to a set of recommendations that are easily and regularly trumped by local and state transportation, land use and economic growth plans—as well as by land development pressures, market forces, and people's deeply ingrained habits about land and water use.

We must gain much greater influence. The great challenge for the watershed community in the decade ahead is integrating our planning efforts with other important community planning activities, and doing so in a way that leads to different kinds of major decisions throughout the watershed.

No decisions are more important to the future of a watershed than those about major infrastructure. Yet far too few of our watershed plans today seriously address even *water* infrastructure, much less the transportation and other types of infrastructure that have everything to do with where and how an area grows and develops. Ignore these in most watersheds and most of the rest of our work is for naught.

The good news is that the watershed provides an ideal spatial context for coordinating many types of ongoing planning efforts in most regions. While advancing our own organizations' missions, we can also lead the way to better planning in general for our communities. We at River Network hope that this issue of *River Voices* will help you get started on the path toward coordinated watershed planning and action.

Don Elder

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agency that approves a watershed planning document never to see it implemented due to a lack of political will becomes sluggish about writing any more plans. And all those engaged stakeholders drift away when implementation dollars for a TMDL do not materialize.

Integrated Watershed Protection is any process used to coordinate land use planning, environmental programs and resource protection on a watershed scale. **An Integrated Watershed Protection** process does not need to have one guiding document, but relies on the skills, resources and statutory authorities of all interested and affected parties to work together towards common goals.

Perhaps the worst possible results of "un-integrated" watershed protection lead us to community health issues and the uncertain future of our drinking water. All over the country there are examples of communities where development ordinances aren't designed to protect vulnerable drinking water sources. In the worst cases, a community may continue to suffer from public health problems because their concerns cannot be verified due to an inadequate inspections program for toxic discharges.

The good news is that interest is growing for coordinating watershed protection efforts, better planning and integration. Communities around the country are experimenting with new ways to tackle and untangle the problems facing our watersheds.

The Indicators of Success

In 2007, River Network convened a working group on Integrated Watershed Protection. The time with the working group gave us a chance to listen to leading grassroots watershed practitioners, representatives of organizations that support watershed protection and local and state agency staff involved in coordinating programs at the watershed scale. We asked them to advise us on the nature and extent of watershed "integration" or coordination. The working group participated in a day-long discussion and follow-up communications throughout the year. The group discussed goals and tools most useful in promoting such approaches. As River Network listened to the working group, we identified a set of "indicators of success" for Integrated Watershed Protection.

The working group emphasized the value of certain intangibles such as trust between stakeholders and community readiness for change. They also emphasized the importance of scientific tools such as regular water quality monitoring and watershed assessment.

In the end, River Network felt that the indicators of success fell into five broad categories:

1. Watershed Information Sources
2. Stakeholder Involvement
3. Planning Context
4. Regulatory Context
5. Community Readiness for Change

River Network then tested these indicators with leading watershed efforts across the country and modified them accordingly.

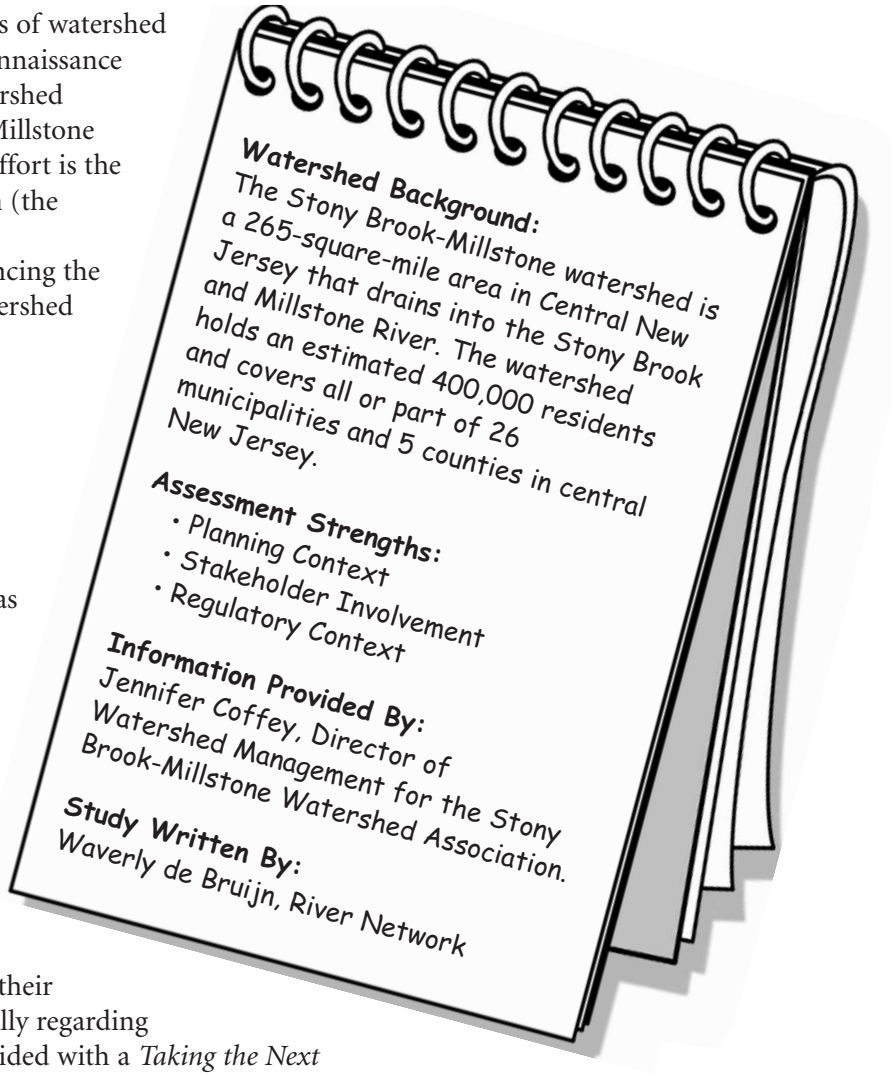
In this issue of *River Voices*, the case studies and Voices from the Field are intended to start strategic conversations and help you better carry out your mission. They illustrate different ways to start to inspire communities and to integrate the work of agencies, watershed organizations and other programs. The Integrated Watershed Protection Assessment found on pages 24-30 summarizes the indicators of success. The assessment is a tool to give you new ideas and further your existing watershed protection goals—whatever they may be.

CASE STUDY

Engaging Government and Business in Planning for Change

Stony Brook-Millstone Watershed, New Jersey

What began as a systematic process of watershed information-gathering and reconnaissance has evolved into integrated watershed protection in the Stony Brook-Millstone watershed. One catalyst in this effort is the Stony Brook-Millstone Watershed Association (the Association), a member-supported, nonprofit organization that has been dedicated to enhancing the quality of the natural environment in the watershed since 1949.



Engaging Local Governments

About nine years ago, the Association began assessing the environmental health of 12 sub-watersheds in order to determine which areas needed particular attention. Once this data was acquired, the next step was to determine how this information, and the Association, could be of assistance to municipalities—especially to the often-volunteer municipal officials who have little time, energy and expertise to identify new and innovative approaches to watershed protection. In 2001, the Association began the "Program for Municipal Excellence," which invites municipalities to partner with them for an examination of the discrepancies between their master plans and land use ordinances, especially regarding watershed values. The municipalities are provided with a *Taking the Next Steps* report, specially tailored to each municipality, which includes recommendations for strengthening their ordinances.

Another stakeholder in the watershed, Montgomery Township, has utilized the Program for Municipal Excellence and now works with its neighboring municipalities toward integrated, holistic water management and protection. Montgomery Township joined Stony Brook-Millstone Watershed Association's Program in 2002. Armed with their *Taking the Next Steps* report and other information, Montgomery Township began a process of "healthy watershed planning," which included rezoning the entire town and instituting conservation zoning in the Township's portion of the Sourland Mountain Region. The "Sourlands" contain 25,000 acres of contiguous forest and serves as an important habitat to threatened and endangered species and a stopover for

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Stony Brook-Millstone Watershed, cont.

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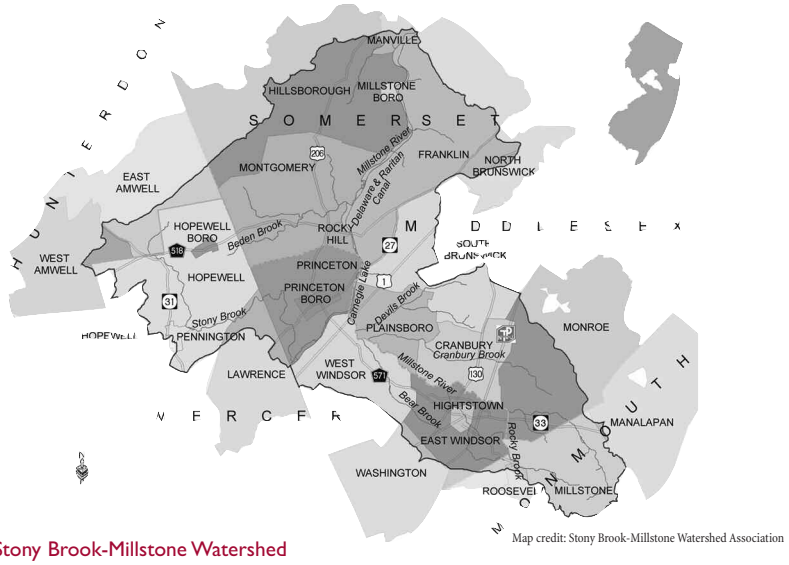
migrating birds.[1] Because the headwaters of the Stony Brook River originate in the Sourlands, this conservation zoning benefits the watershed as a whole.



Stony Brook-Millstone Watershed

Map credit: Stony Brook-Millstone Watershed Association

Montgomery Township also took a watershed approach to evaluate the effects of a proposed 12-bay gas station to be built in its community, taking into account potential impact to the greater area—including the Township and neighboring Rocky Hill Borough. Because Rocky Hill residents obtain their drinking water from wells in the vicinity, it was determined that in order to protect water quality, a well-head implementation plan was necessary. Restrictions on the placement of service stations on wellhead protection areas were then established. Both the Township and the Borough adopted ordinances to this effect, as well as an inter-municipal agreement for each to respect the other's ordinance.[2] This proved to be an example of how energetic leaders of municipalities can work together to protect drinking water sources that flow through both jurisdictions.

Another victory in watershed-wide planning occurred when stream corridor protection ordinances were passed in nine of the 26 municipalities in the Stony Brook-Millstone watershed, restricting land use 100 feet from the 100 year floodplain. This effectively protects the floodplain from future development.

Bristol-Myers Squibb in Hopewell, NJ completed the River-Friendly program, and received certification on August 12, 2006. Their accomplishments include the following:

- ✔ Reduced fertilizer use
- ✔ Conducted water quality monitoring
- ✔ Established over 300 linear feet of native riparian buffer plantings
- ✔ Hosted educational programs for employees
- ✔ Provided tours to local teachers
- ✔ Constructed and installed bird boxes

"River-Friendly" Businesses and Landowners

Many businesses and landowners are beginning to respect and appreciate the needs of the watershed by participating in the Stony Brook-Millstone Watershed Association's "River-Friendly" program. Once accepted into the program, the Association conducts a site visit and develops specific goals for the property. The River-Friendly program generally takes 12-18 months to complete, whereupon the business or landowner receives a certificate of completion. This program has encouraged sustainable, conscious maintenance of businesses, golf courses and private property along the watershed's rivers and streams, and has engaged local developers in Low-Impact Development practices. Other communities are becoming active through the establishment of township and community sustainability plans, of which watershed protection is a growing component. Organizations like the Association and others have helped highlight the importance of understanding the needs of the watershed in order to maintain water quality, quantity and the natural environment.

[1] www.njconservation.org/html/gfa-sour.htm

[2] www.npnweb.com/daily/news_print.asp?a=565448

Secrets to Success

When asked about what advice should be given to organizations looking to establish effective relationships with municipal planners, Jennifer Coffey, Director of Watershed Management at the Stony Brook-Millstone Watershed Association, remarked that one should start small and work to develop meaningful relationships with individuals. "It's all about relationships," she said. Jennifer suggests organizing a canoe trip for municipal officials, or holding a stream clean-up to develop trust and begin a relationship on a positive note. In many cases, environmental organizations have adversarial relationships with municipal and other governmental officials. Though there will be disagreements, it is important to maintain communication, trust and professionalism when possible. "It's kind of like a marriage."

Photo credit: Stony Brook-Millstone Watershed Association

RELATED PROGRAMS & PUBLICATIONS

The Program for Municipal Excellence

The Association's Program for Municipal Excellence focuses on building partnerships with municipal leaders and supporting proactive planning. Their assessment provides a unique regional perspective as well as recommendations to help municipalities in their watershed achieve their goals and enhance the quality of the natural environment.

www.thewatershed.org/wm_supporting_muni.php

The River-Friendly Program

The Association's River-Friendly Certification Program promotes environmental stewardship. The program provides education and information on nonpoint source (NPS) pollution reduction and best management practices focused on the landscape. The program works cooperatively with residents, businesses and golf courses to protect the local environment and reduce the amount of chemicals entering water bodies.

www.thewatershed.org/river_friendly_program.php

The Watershed Management Program

The Association has developed a Watershed Management Program that aims to protect and enhance water quality and natural resources, promote proactive planning and reduce sprawl, and improve the health of the environment. This program provides opportunities for partnerships with various stakeholders because it is felt that a watershed approach is the most environmentally and economically sound means of addressing regional issues. The Association has recently created *Watershed Protection: A How-To Series* for use by other organizations: the first three in this series of six publications are now available. Copies of Streambank Restoration: Mud, Sweat, and Volunteers; Watershed Reconnaissance: Getting the Lay of the Land; and Municipal Assessment: Partnering With Local Governments, $20 + S&H, can be ordered by emailing publications@thewatershed.org or by calling 609/737-3735.

www.thewatershed.org/managing_watershed.php

CASE STUDY

Collaboration Triggers Confluence of Watershed Strategies

Tualatin River Basin, Oregon

Watershed Background:
The Tualatin River watershed in northwest Oregon drains 712 square miles and ranges from the densely populated areas of southwest Portland, Hillsboro, Tigard and Beaverton to agricultural areas near Scholls, Gaston, Banks, Mountaindale and North Plains to the forests of Oregon's Coast Range, Tualatin Mountains and Chehalem Mountains. Most of the fast-growing urban population—approximately 500,000 residents—resides on 15% of the watershed's area. Agricultural uses take up 35% and 50% of the watershed is forest.[1]

Assessment Strengths:
- Stakeholder Involvement
- Planning Context

Study Written By:
Kendra Smith, Clean Water Services &
Gayle Killam, River Network

1 www.trwc.org/tualatin_info.html

Perhaps the average resident in the Tualatin River Basin does not think about the river on a daily basis. Yet, our collective actions have a daily impact on the watershed in which we live. Many individuals, organizations and local governments have been working for decades to improve the health of the Tualatin River and the communities through which it flows. One entity, in particular, has gone a long way to help make this happen.

Clean Water Services (CWS) is a county special service district that manages the stormwater, surface water and wastewater conveyance and treatment in the Basin. With a mission that is focused on water resources management, CWS has helped local and regional stakeholders focus on the broad benefits of improving water quality, managing water quantity and enhancing habitat using an integrated approach. The watershed community has responded eagerly to strategies that provide both socio-economic and environmental benefits.

Why Work Together?

It was swim together or sink. While a rising tide lifts all boats, regulatory floodwaters can sink them. Starting in 1999, the region saw the convergence of new water quality requirements for temperature under the Clean Water Act, the listing of steelhead and coho under the Endangered Species Act and new requirements under state land use planning for habitat protection. While no individual entity wanted to do significantly more than it was mandated, these regulatory obligations for water quality and habitat forced groups to reach beyond their comfort zone and support strategies they may not have considered otherwise. CWS focused the community on the goal of improving the ecological integrity of the green infrastructure (streams, wetland, floodplains and buffers) to support multiple watershed benefits.

What Was the Plan?

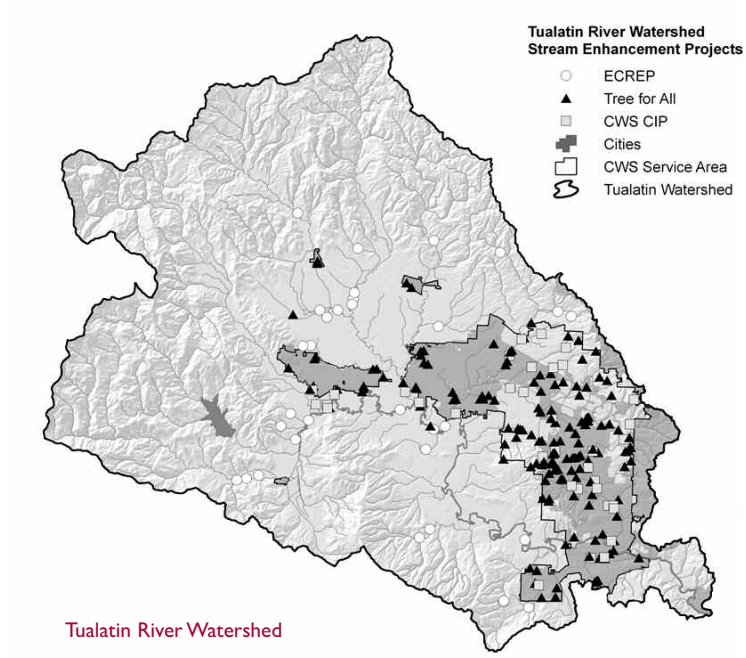
Draw from the wisdom of the crowd. While CWS served as the lead entity to develop the plan of action, it requested that everyone participate in the process in order to create ownership and commitment across the community. Comprehensive watershed data were gathered by scientists, hydrologic models were developed by engineers and community

values were shared. An Advisory Committee comprised of diverse stakeholders of the watershed made decisions about the priority and proportion of management actions.

Offer something for everyone. The resulting *Healthy Streams Plan* became the guide boat for improving the ecological integrity of the Basin's water resources. No one could—or wanted to—refute its findings or approach. The Plan calls for projects and programs on multiple scales and timeframes involving a diversity of partners. The Plan has something for everyone—from community tree planting for parks and nonprofits, to culvert and storm water outfall replacements for city engineers, to stream/wetland restoration for ecologists, to land use changes for planners, to rural buffer revegetation strategies for farmers. Everyone has something to do, and in many cases they have performance targets and schedules to meet. The performance targets help each community stretch beyond its standard obligations and give the regulators what they need to demonstrate steady improvements in the health of the system over time.

Why Do Things Get Done?

Show what you know. Meeting regulatory obligations is important, but the cornerstone of successful implementation of the Healthy Streams Plan can be found in the methods of gathering data and the ways those data have been utilized since the Plan was completed. The use of GIS to document resource conditions and track what is done across the watershed helps make the information transparent and accessible to all. Monitoring for project effectiveness and long term health trends depend on an integrated system that can spatially track actions and scientific data. The efforts that CWS has made to share information and learn from each implementation experience have built credibility with the community.



Map credit: Rich Hunter, Clean Water Services

Leadership in the implementation effort. CWS is now leading the implementation, project tracking and effectiveness monitoring of the *Healthy Streams Plan.* Each year CWS implements several large capital stream enhancement projects, and helps educate and support each community (through nonprofit assistance grants) in their "Tree for All: Community Stream Planting Challenge."[2] CWS also provides assistance for culvert and outfall replacement projects, and funds a significant portion of the rural buffer revegetation program called "Enhanced Conservation Reserve Enhancement Program" (ECREP) in partnership with the Soil and Water Conservation District. By offering stakeholders opportunities to partner with CWS to meet the performance targets, trust and commitment to the goals of the plan is building in the local areas.

Utilize the power of political peer pressure. The political peer pressure of carrying your own weight as a community

[2] "Tree for All" is a partnership of the cities within the Tualatin River watershed, Clean Water Services, SOLV, Friends of Trees and helpful volunteers. www.cleanwaterservices.org/PlansAndProjects/Plans/HealthyStreamsPlan.aspx.

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has compelled every city in the watershed to exceed their "Tree for All" community tree planting targets every year since the program began in 1995. Trees are good; they provide multiple benefits and create a legacy. What politician wouldn't support planting trees in their community?

What's Next?

The data and strategies developed through the planning process supported the regulatory negotiations that created the first watershed-based temperature trading permit in the country. It brought the community together to support a diversity of activities that are making measurable improvements in the watershed. The next question is: "how can the community leverage its ecological improvement efforts to bring more financial resources to the region?" Additional funds will be needed to sustain this programming long term. Ecosystem credits trading may offer one such opportunity. Stay tuned.

RELATED PROGRAMS & PUBLICATIONS

The Healthy Streams Action Plan

The Healthy Streams Action Plan identifies short-term and long-term policy and program refinement options and capital improvement projects that could be implemented to improve watershed and stream health. It focuses on improving the basic surface water management activities that Clean Water Services and its local partners already implement.

www.cleanwaterservices.org/content/documents/Healthy%20Streams%20Plan/Healthy%20Streams%20Plan.pdf

Revised Temperature Management Plan

The Revised Temperature Management Plan (TMP) describes the process through which the water quality temperature trading permit was designed.

www.deq.state.or.us/wq/wqpermit/docs/individual/npdes/cws/tmp/plan.pdf.

Photo credit: Monica Kearsley, Tree for All, 2007

Members of the Tigard High School Key Club joined with several neighbors to plant 200 trees.

Clean Water Services partners with Friends of Trees and SOLV in planting trees and shrubs along riparian areas of the Tualatin River Basin as part of the "Tree for All" program.

"Each year SOLV partners with the municipalities in the Tualatin Basin and holds roughly a dozen tree plantings throughout the spring and fall. SOLV brings together stakeholders from all parts of the community who volunteer at these events. Often, we have stream biologists working alongside corporate volunteer teams, Boy Scouts, church youth groups and high school students. While most of the volunteers are already aware of the benefits trees provide with regard to clean air, most learn for the first time how trees planted in the riparian zone filter polluted stormwater runoff and lower water temperature to improve fish habitat.

—Brett Lyon, Outreach Specialist, SOLV

CASE STUDY

Bringing the Community Together to Restore Watershed & Human Health

Pearl River Basin, Mississippi

Reichhold Chemical, a wood product company in Columbia, Mississippi, had a horrendous environmental record. In its years of operation, the company illegally buried thousands of drums of chemical waste and discharged wastewater containing numerous toxic chemicals into a nearby creek—a tributary to the Pearl River—without a permit. There were fish kills; over 200 cattle became sick and died, downstream on the creek. Then, the unthinkable happened. In 1977, the plant, located in the heart of Columbia, literally exploded. The more than 4,500 drums on site began to leak into the soil. Subsequent floods spread the toxins into surrounding farmlands, rivers and residential neighborhoods. EPA testing of sediments revealed the presence of numerous toxic contaminants, including xylene, PCB, arsenic, barium, beryllium, cadmium, chromium, cyanide and mercury. The local fire department reported incidents of the ground literally catching fire. Area residents began to get sick. Residents have reported high numbers of cancers, respiratory problems, immune deficiency disorders, miscarriages and skin disorders of various kinds. Columbia is a low-income community with a sizeable African American population and surrounding population of more than 26,000. Those who could afford to have already moved away, but most remain.

Watershed Background:
The Pearl River Basin covers an area of about 7,800 square miles. The headwaters of the Pearl River consist of several tributaries in east-central Mississippi. From there the Pearl River flows southwesterly, forming the boundary between Louisiana and Mississippi in the southern part of the Basin, and discharging into the Gulf of Mexico. About 65 percent of the Basin is forested, and about 30 percent is agricultural land. Use of surface water in the Pearl River Basin is relatively high. Roughly 1.2 million gallons per day are used for irrigation, 6.2 million gallons for livestock, 30.7 million gallons for industry, 220 thousand gallons for sand and gravel mining and 33 million gallons for municipal drinking water supply. The timber industry and the manufacture of wood products dominate the economy of the lower basin.

Assessment Strengths:
- Stakeholder Involvement
- Planning Context

Study Written By:
Steve Dickens, River Network

Residents complain that clean-up efforts have been woefully inadequate, and in some cases may have resulted in simply distributing the problem to other parts of the city. In an attempt to organize and respond to the problem, residents formed Jesus People Against Pollution (JPAP). Through a massive community effort, the group has spent years fighting for a remedy to the incredible environmental health problems that have resulted, advocating for a more comprehensive and complete clean-up and the relocation of citizens out of harm's way.

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Pearl River Basin, cont.

Photo credit: Steve Dickens, River Network

A River Network-trained volunteer administers a health survey to residents near the Superfund site.

Human Health Assessment

River Network assisted JPAP in planning and conducting a health survey of area residents. The health survey examined various exposure routes and adverse health outcomes. Trained volunteers surveyed residences surrounding the declared Superfund Site and the residents of a comparison community (selected by the Mississippi State University Social Science Research Center based on similar demographic features). River Network and JPAP hosted a number of gatherings of area residents who identified their health concerns. College students were paired with local residents and together they conducted over 200 30-minute interviews. Findings from these health surveys are not yet available.

Using Federal Laws and Local Outreach

The Superfund site was purportedly cleaned up and has been delisted from the National Priorities List (NPL). The residents likely have legitimate claims, however, that the area has not been properly cleaned. The NPL site was defined as the legal property boundaries of the chemical plant, not including the more broadly impacted area as required by the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA). River Network reviewed public documents pertaining to the de-listing of the site. Detection limits of many of the monitoring tests (the lowest level of a substance that the test could detect) were higher than some of the specified clean-up goals, leaving uncertainty as to whether these goals were met.

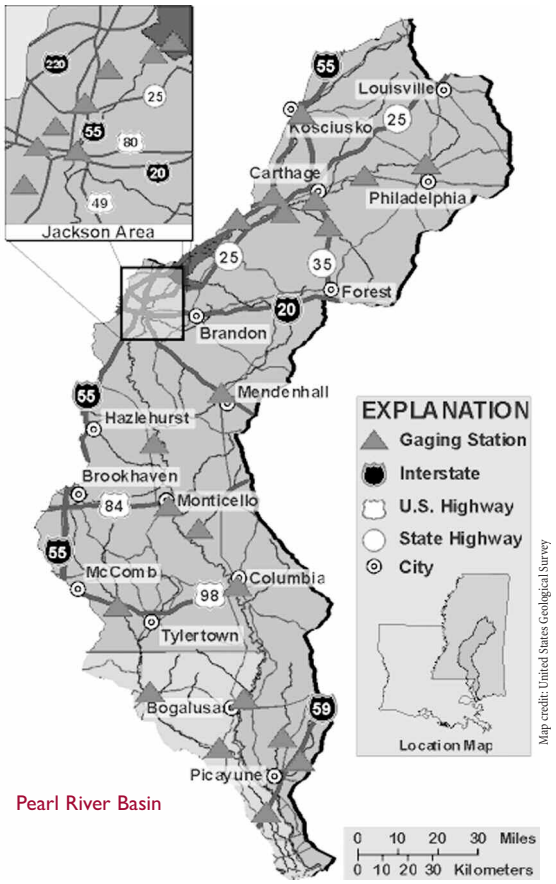
JPAP obtained an EPA Environmental Justice grant to embark on a collaborative problem-solving effort. The grant enabled JPAP to make significant progress to reach out to key stakeholders in the area and to create a blueprint for change. This was a huge step. At the time the site was declared a Superfund site, the community was divided over the issue and many stakeholders did not see eye-to-eye. There was considerable animosity on the part of the White business community towards some in the African American neighborhoods surrounding the plant. Many felt that declaring the site a Superfund site and threatening law suits was just a case of "poor people trying to take money that did not belong to them." Old attitudes die hard.

River Network worked with JPAP and engaged city leaders to establish a list of all the key stakeholders who had a role to play in fixing the problem. Together we went

door-to-door to speak with business owners, bankers, construction firms, city officials, religious leaders, hospital executives and others. Through numerous one-to-one meetings and intervening group gatherings of stakeholders—some quite contentious—the community began to pull together. Regardless of past disagreements, it was clear that ultimately everyone wanted the same thing: a safe and clean community and a revitalized site.

The result of this effort was a signed Vision-to-Action plan that was agreed to by the City, the regional economic development authority, business leaders and residents. The plan reflected an integrated and cross-cutting approach that addressed issues involving: community pride; recreation; continuing education for area youth on the streets; healthcare (including better access for and education of area residents); housing (including neighborhood relocation); safety; environmental clean-up (including area clean-up, sewage issues and monitoring); business redevelopment; employment and transportation. The Vision-to-Action plan detailed a long list of tasks that each party agreed to take on so that the plan could move forward.

At this time, community leaders are working hard to realize a key first step of the plan that will enable the relocation of neighborhood residents surrounding the former plant and the redevelopment the plant site itself. These efforts, while still in their infancy, would never have been possible without bringing the community together. Where the community was previously divided on the severity of and solutions for these issues, business leaders, city government and neighborhood residents are now united. United, their chance of success is much greater.



RELATED PROGRAMS & PUBLICATIONS

EPA Environmental Justice Collaborative Problem-Solving Cooperative Agreement Program

This Program provides financial assistance to eligible organizations working on or planning to work on projects to address local environmental and/or public health issues in their communities, using EPA's "Environmental Justice Collaborative Problem-Solving Model."

www.epa.gov/compliance/environmentaljustice/grants

CASE STUDY

Engaging Mayors in Watershed Protection

Jordan River Watershed, Utah

In 2005, Salt Lake County concluded that the *Area-Wide Water Quality Management Plan* drafted in 1978, while instrumental in early watershed-wide projects, was no longer adequate to meet today's challenges. The following year, they embarked on creating a new *Water Quality Stewardship Plan* (WaQSP) to update the 1978 plan. This update engaged city mayors and other stakeholders in an upswell of renewed watershed protection vigor. The climate now opens the door for new and stronger ordinances on stream setbacks, riparian overlay zones, impervious surface area and more.

Watershed Background:
The Jordan River watershed drains a total area of about 805 square miles in north central Utah. The watershed is bounded on the east by the Wasatch Mountains, on the west by the Oquirrh Mountains, and on the south by the Traverse Range. The Jordan flows north from Utah Lake to its terminus at the Great Salt Lake. Salt Lake Valley, the major population and employment center in the state, is currently home to over 800,000 residents. Reduced habitat from channel alterations, low Dissolved Oxygen (DO) levels, and lack of bank cover have impaired fish populations in the watershed. Stormwater shock loads contribute metals and other toxic chemicals to the riverine systems.[1]

Assessment Strengths:
- Community Readiness for Change
- Stakeholder Involvement

Information Provided By:
Natalie Rees, Water Resources Specialist, Salt Lake County Water Resources Planning and Restoration

Study Written By:
Waverly de Bruijn & Merritt Frey, River Network

Getting into the "Mayoral Fray"

Salt Lake County boasts seventeen mayors—one for each of sixteen cities and one County Mayor, Mr. Peter Corroon. During his tenure in office, Mayor Corroon has championed the development of the WaQSP as part of his environmental stewardship effort, and has said that he wants to spend upwards of 100 million dollars on the Jordan River over the next 10 years. He has even been spotted enjoying the recreational offerings of the Jordan himself.

The commitment of Mayor Corroon is being matched by many of the mayors of cities within the County. They are also enthusiastic about the creation of a WaQSP because they understand that having a collective watershed plan means that they will be able to more easily receive federal funding for restoration projects in their cities. Some of the smaller cities have boasted that they'd like to become the "gold star city" of WaQSP implementation.

[1] www.waterresources.slco.org/html/jwrc/jrWShed.html

How did these mayors become so involved in this planning process? A controversial new sewage plant proposal in the valley brought the need for an updated watershed plan to everyone's attention. The controversy continues, but it also helped create something positive—a resurrection of the County's role in watershed planning and coordination.

In 2007, Salt Lake County worked with cities and other agencies to compile water quality-related GIS data. They then created a map of each city that easily presented the data, giving copies to the respective mayors during the one-on-one meetings. In addition, Water Resources staff walked the streams in Salt Lake County and gathered data about stream function (e.g., bank stability, aquatic and terrestrial habitat, recreational facilities, etc.) for the benefit of each city. By providing this local information, mayors began to see how the quality of life for residents could improve when local creeks and rivers are protected and managed as valuable resources. Of the fourteen mayors visited (the County was unable to schedule meeting with two cities), every single one expressed enthusiasm for implementing the watershed plan and five submitted comments on the draft WaQSP.

What Else Contributes to a Positive Climate for Change?

In almost every scenario, role models help to bring others around to a certain way of thinking or acting. Murray City, led by Mayor Daniel Snarr since 1997, has been one such role model since the mid-1980s. Over the years, Murray City has invested in its section of the Jordan River, mitigating stability problems, restoring riparian habitat, building a nature center and maintaining a very popular recreational trail. Other mayors see how the effort made

Photo credit: Salt Lake County

The Jordan River

in Murray City created an asset to their community—residents from neighboring cities come to Murray City's stream corridor to enjoy its trails and its wildlife.

Vocal advocacy groups—from the Great Salt Lakekeeper who highlighted the controversy about the proposed sewage treatment plant to local community groups and citizens interested in a specific restoration project—have also been vital to the process. For example, the recently created Emigration Creek Property Owners Association, which focuses on the urban section of Emigration Creek, contributed to the over all "climate for change" by asking their city council members to become more engaged in protecting Emigration Creek. They were successful in taking council members out to look at and assess sections of the creek. When representatives hear the voices of citizens, the opportunity for progress grows even greater.

Over a three-month period, Salt Lake County staff met with city mayors and their key staff. These meetings were held with the expectation that the mayors will take the information to their City Councils. "By making initial contact with mayors," says Natalie Rees, Water Resources Specialist with Salt Lake County, "we are laying the groundwork for future interaction to assist cities with adopting stronger ordinances." In addition, mayors are often ideal partners

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through the contribution of labor and materials for restoration projects identified in the WaQSP.

The Future: New Plans, Overcoming Challenges

The mayors are off to a great start, and their enthusiasm is what promotes an atmosphere where change can occur. The key lies in channeling the visions mayors have for the Jordan River, which often includes recreational facilities and parks, into a plan that is socially beneficial but avoids any further degradation of the river and stream corridors in Salt Lake County. The next challenge? City mayors will need to broaden their view in order to work with mayors of other cities on a truly watershed scale.

While Salt Lake County has made strides in engaging mayors watershed-wide, challenges in engaging other stakeholders such as citizens, business leaders and developers remain. There are hopeful signs, however: at a recent County "open house" held to discuss the WaQSP, a group of citizens from the Rose Park neighborhood attended and were very interested in forming a local group focused on the Jordan River. "This is the type of engagement we are hoping for," said Natalie.

And, as the County moves from planning to implementation, the hope is that more of these interest groups will see what the watershed vision can mean for them and their neighborhoods. To promote the engagement of citizens, business leaders and others, the County will strive to make the process and the points of entry within the WaQSP applicable and relevant to these stakeholders. It should be clear what protection of the Jordan River watershed "means" for all concerned.

RELATED PROGRAMS & PUBLICATIONS

Water Quality Stewardship Plan

In 2006, Salt Lake County began a collaborative effort to develop a Water Quality Stewardship Plan (WaQSP). After two years of data collection and compilation, a WaQSP document is available.

www.waterresources.slco.org/html/waterQualityStewardship/WaQSP_draft_2008.html

River Network thanks the participants of the Integrated Watershed Protection Working Group for their valuable input:

Rob Buirgy, Big Thompson Watershed Forum (CO) • Danielle Donkersloot, Watershed Watch (NJ)
Margo Farnsworth, Cumberland River Compact (TN) • Ron Garst, Tualatin Riverkeepers (OR)
Barb Horn, Colorado Division of Wildlife (CO) • April Ingle, Georgia River Network (GA)
Chris Kilian, Conservation Law Foundation (VT) • Stuart Lehman, Environmental Protection Agency (DC)
Karen Miles, Oklahoma Department of Environmental Quality (OK) • Karl Morgenstern, Eugene Water and Electric Board (OR)
Tracie Nadeau, Environmental Protection Agency (OR) • Judith Peterson, Kentucky Waterways Alliance (KY)
Kol Peterson, Environmental Protection Agency (DC) • Cyn Sarthou, Gulf Restoration Network (LA/MS)
Bob Salinger, Audubon Society of Portland (OR) • Naki Stevens, People for Puget Sound (WA)
Paul Sturm, Center for Watershed Protection (MD) • Mary Wahl, City of Portland, Bureau of Environmental Services (OR)
Jim Waltman, Stony Brook-Millstone Watershed Association (NJ) • Brian Wegener, Tualatin Riverkeepers (OR)
Bob Zimmerman, Charles River Watershed Association (MA)

River Network offers our special thanks to our partners in the U.S. Environmental Protection Agency Office of Water - Office of Wetlands, Oceans and Watersheds, and the Assessment and Watershed Protection Grants program for helping to make this publication possible.

CASE STUDY

Creating a Model for Sustainable Watershed Protection

Beaver Creek Watershed, Tennessee

Successful watershed protection in the Beaver Creek watershed has been the result of coordinated commitment among stakeholders willing to implement new and innovative plans. In anticipation of Knox County's Phase II stormwater requirements (due to begin in 2003), the Water Quality Forum (WQF)[1] decided to direct its efforts towards addressing stormwater requirements on a watershed basis—focusing particularly on the urban/rural fringe and rapidly developing areas. Based upon the Forum's goals, Beaver Creek watershed was chosen as a pilot watershed that would become the model of integrated protection and restoration efforts. In 1998, the WQF brought agencies, institutions and utilities together to form the Beaver Creek Task Force (BCTF). The BCTF now generates information about the watershed through its studies, conducts educational activities and implements watershed plans and regulatory ordinances.

Watershed Background:
The Beaver Creek watershed is located in the 630 square mile Lower Clinch Basin in East Tennessee. Its 86 square miles lie within Knox County. Beaver Creek is a rapidly urbanizing watershed with 80,000 residents. The creek is on the State of Tennessee's 303(d) list of impaired streams. The primary impacts to Beaver Creek include sediment; nutrients and pathogens from agricultural and urban runoff and municipal point sources; and habitat alteration due primarily to land development. A TMDL requirement has been developed by the Tennessee Department of Environment and Conservation for sediment and pathogens in Beaver Creek.

Assessment Strengths:
- Regulatory Context
- Watershed Information Sources
- Community Readiness for Change

Information Provided By:
Roy Arthur, Knox County Watershed Coordinator

Study Written By:
Waverly de Bruijn, River Network

Communicating for Better Planning

The Beaver Creek Task Force is comprised of a healthy mix of partners, including the county, the city/county planning commissions, state departments of transportation, environment and conservation, university research centers, watershed associations, utility companies and more. In 2003, the Task Force took another step forward by providing seed funding for the Beaver Creek watershed Association (BCWA). BWCA is a nonprofit organization with a mission to "protect and enhance the natural and human environment of the Beaver Creek watershed through the mobilization of public support, building public awareness and the promotion of best management principles."[2] With the recruitment of over 250 volunteers, BCWA brings the critical element of citizen involvement to the table. In combination, the Taskforce and the Association represent a large number of stakeholders in the watershed. Their coordination of meetings and events allows

[1] The Water Quality Forum was formed by the City of Knoxville and the Knox County Stormwater Engineering Departments, the Tennessee Valley Authority, the Tennessee Water Resources Research Center at the University of Tennessee and others in 1990.

[2] www.beavercreekwatershed.org/bcwa.php

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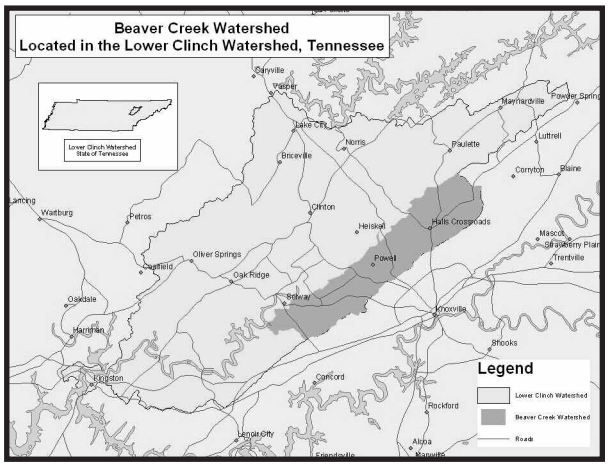
many to provide input and feel included in the watershed protection process, leading to greater engagement and better results.

Turning Information into Action

The BCTF began in 1998 by gathering scientific information about the watershed. By 2002, they created an inventory identifying future development patterns and construction projects, flood hazards, existing water storage and environmentally sensitive areas, as well as cultural and historic sites and potential greenway routes in the watershed. The *Beaver Creek Assessment* was distributed to key officials in both local and state government agencies and built awareness of watershed issues in the community.



Map credit: Tennessee Valley Authority

Lower Clinch and Beaver Creek Watersheds

To highlight and disseminate the lessons learned in Beaver Creek and the Cumberland River Basin throughout the state, the Institute for a Secure and Sustainable Environment at the University of Tennessee and the Cumberland River Compact formed the Center for Watershed Solutions. The Center is also conducting a state-wide needs assessment with nonprofits, Municipal Separate Stormwater Sewer Systems (MS4s) and local officials to better catalogue the needs of these groups. The Center has been named a "Center of Excellence in Watershed Management" by Environmental Protection Agency Region 4.

Also in 1998, Knox County updated the Federal Emergency Management Agency (FEMA) flood study for Beaver Creek and used the findings to write a Stormwater Master Plan. This Master Plan called for a regulatory mechanism to address the threat of flooding and considered build-out conditions so that the county could enact regulations to reduce future flood damage. In 2000, the flood study was used to enact a floodplain protection ordinance.

From 2004-2006, a Tennessee Department of Environment and Conservation (TDEC) TMDL Support Grant enabled the Department of Civil and Environmental Engineering at the University of Tennessee to collect samples at 13 sites in the watershed. The data helped researchers develop watershed models for sediments and nutrients. From this, the BCTF concluded that holistic and sustainable restoration strategies must include consideration of stream flows in addition to riparian and upland practices. The BCTF is now working with Knox County to develop a program to retrofit an estimated 700 stormwater structures to better control flow and filter sediment.

These studies helped form the basis from which agencies, councils and the public are able to engage in improvements to the watershed. Because all executors of these studies are participants in the BCTF, the Task Force was able to assist in the wide dissemination of the information collected.

Community Education Leads to Success

In 1999, the University of Tennessee conducted a telephone survey about the

knowledge and attitudes of watershed residents regarding water quality issues. Results indicated that an outreach/education campaign was needed in order for a watershed plan to be effective. The BCTF created an outreach committee to educate stakeholders about basic water quality problems, inform them about the watershed initiative and encourage them to get involved.

With so many stakeholders participating in different forums, taskforces and associations, it is not surprising that so many educational programs have been established in Beaver Creek, including:

- A 16-page Beaver Creek Supplement inserted in the local newspaper.
- An Adopt-A-Watershed program in middle and high schools (now in its eighth year).
- The Adopt-A-Stream program, conducted by the City of Knoxville, Knox County, and the Town of Farragut.
- The Outdoor Classroom adjacent to Halls High School (replacing impervious concrete and vacant lots).
- Demonstrations for residents on stormwater treatment and erosion control, and an educational campaign on wetland and riparian buffers.
- The "Tennessee Growth Readiness Initiative," to educate the public, local officials and other decisionmakers about nonpoint source pollution.

Photo credit: Beaver Creek Task Force

Knox County Stormwater staff

Photo credit: Beaver Creek Task Force

The County used underground detention and pervious concrete in the construction of the parking lot for Powell Branch Library.

These educational projects, while administered by different groups in the watershed, contribute greatly to the whole. They expose residents and municipal officials to important information regarding the watershed and solutions for protecting it.

Big Plans, Big Regulatory Changes

In 2002, Taskforce partners convened a Knox County Site-Planning Roundtable comprised of representatives of the county, city and state government agencies, environmentalists, lawyers, bankers, developers, builders and homeowners. Planning and zoning ordinances were reviewed and compared to "model" development ordinances. To date, 21 recommendations made by the Roundtable have been incorporated into Knox County Stormwater Ordinances and the related "Better Site Design Manual," and a number of LID demonstration sites have been—and are being—constructed.

The BCTF initiated a comprehensive planning effort in 2004 to create a Green Infrastructure Plan for the watershed. This

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Beaver Creek Watershed, cont.

cont. from page 19

Plan was used by the Metropolitan Planning Commission in 2007 to determine the placement of parks, greenways and trails, and is currently being used to revise the subdivision and zoning regulations for the watershed. With Knox County, the Commission aims to allow developers to easily build projects under the new LID-centered ordinance.

With help from another TDEC grant, the Beaver Creek Task Force developed a Watershed Restoration Plan. The 18-month public process included developers, farmers, residents and public officials.

Progress has also been made on stormwater concerns. A new Phase II Stormwater Ordinance passed in 2007, and BCTF and others are developing a pilot Ecological Trading Program that targets sediment. If proven effective in Beaver Creek, it will be expanded county-wide. Further, Knox County has begun to develop a stormwater utility to fund water quantity and quality projects in the county.

Photo credit: Beaver Creek Task Force

A cattle crossing on a farm in lower Beaver Creek.

Moving Forward: Restoration and Protection

The next phase of work in the Beaver Creek watershed will focus on restoration. In 2007, the Tennessee Department of Agriculture awarded the BCTF an almost one million dollar 319(h) restoration grant. By the end of 2008, they will have installed Best Management Practices on approximately 25 Beaver Creek properties. This will include projects such as pasture renovation, cattle exclusion fencing, bioengineered stormwater solutions, wetland and riparian restoration and streambank stabilization.

Continuing to nurture and promote partnerships across the Beaver Creek watershed will remain a priority. "What we have accomplished could not have been accomplished without the strong partnership that was developed and continues until today," said Roy Arthur, Knox County Watershed Coordinator. Roy emphasized that more participation by citizens and better informational resources will help restoration efforts. "Although there is a high degree of watershed awareness, with 80,000 residents it is difficult to involve more than a few." The BCTF plans to expand its community events and involve more residents in Adopt-A-Stream, the Outdoor Classroom and other programs.

RELATED PROGRAMS & ORGANIZATIONS

The Water Quality Forum
The Water Quality Forum is working to protect and improve water quality in Knox County.
www.waterqualityforum.org

The Beaver Creek Watershed Association
Beaver Creek Watershed Association is a community-based group of citizens living throughout the watershed.
www.beavercreekwatershed.org/index.php

Knox County Stormwater Management
This webpage highlights the Stormwater Ordinance and documents the various steps in its creation and passage.
www.knoxcounty.org/stormwater

CASE STUDY

Integrating Science, Community Outreach & Education

Pomperaug River Watershed, Connecticut

The Pomperaug River Watershed Coalition (the Coalition) is an example of a multi-stakeholder coalition. Its mission is to ensure that decisions regarding the health and protection of the watershed are based on sound science. The Coalition's board includes municipal representatives, water companies, environmental organizations such as land trusts and nature centers, engineers, water quality experts and citizen representatives. It formed in 1999 to determine how planned diversions of water from the aquifer (a request made by a power plant in a neighboring basin) and future land development would affect the flow in the river and the water table, and how river habitat would be affected by changes in the flow. These questions served as starting points for what would become Coalition's the first major study, conducted jointly with the United States Geological Survey (USGS). This project, funded by the State of Connecticut, successfully modeled the subsurface and surface hydrology of the watershed. In addition, the project supported the development of an instream habitat model to examine the impacts of changes in river flow on fish habitat. Each of the hydrological and habitat models were then applied to a series of future scenarios, and now provide information from which decisions about watershed protection can be made.

Watershed Background:
The 90-square-mile Pomperaug River watershed, home to roughly 45,000 people, is located in west-central Connecticut. One of the most important geological features of this watershed is the underlying stratified-drift-aquifer, the predominant source of potable water in the region. A total of eight towns—Bethlehem, Middlebury, Morris, Roxbury, Southbury, Washington, Watertown and Woodbury—are partially situated within the watershed, although Bethlehem, Southbury and Woodbury combined encompass 83% of the total watershed area.

Assessment Strengths:
- Watershed Information Sources
- Stakeholder Involvement

Information Provided By:
Ed Edelson, Director of the Pomperaug River Watershed Coalition

Study Written By:
Waverly de Bruijn, River Network

Making Science Community-Friendly

In 2007, the watershed experienced a severe drought. Tom Meyer, a Coalition volunteer, realized that the information from the instream habitat study could be used to communicate the impact of the drought on the river ecosystem. He developed a Habitat Meter for each of the main rivers where a USGS flow gauge is present.[1] Each night, the USGS data are downloaded and compared to various survival thresholds to determine if the existing flow and duration of that flow level is impairing fish habitat. The result of this data collection and analysis is shown on the home page of the Coalition's web site as a simple "traffic light" with green indicating adequate fish habitat conditions and red indicating catastrophic conditions.

The same year, the watershed also experienced severe flooding, which damaged many homes. Working with the Natural Resources Conservation Service (under the U.S. Department of Agriculture) and the local council of governments, the

cont. on page 22

[1] The meter is shown on www.pomperaug.org in summary form with more detailed graphics on linked pages.

Pomperaug River Watershed, cont.

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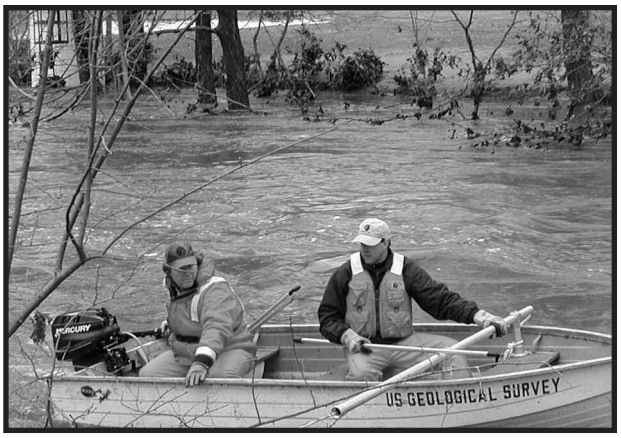
Coalition used this post-flood time as a "teaching moment." They organized several seminars to better educate local officials and all riparian owners about best practices for managing stream buffers to prevent erosion and flood damage.



United States Geological Survey hydrologists during the 2007 flood.

Photo credit: Pomperaug River Watershed Coalition

Alert to how future development in the region might impact runoff patterns, another joint effort was initiated between the Council of Governments of the Central Naugatuck Valley (COGCNV), the Pomperaug River Watershed Coalition and the Nonpoint Education for Municipal Officials (NEMO) program.[2] COGCNV, with assistance from the NEMO team, created maps of current and future impervious coverage for each Valley town (which includes all towns within the Pomperaug watershed). The Coalition joined the initiative and used the impervious coverage maps to determine which lands were critical to protecting the watershed. The Coalition and COGCNV have used these maps to help local land trusts understand the hydrological value of certain land parcels in order to make better decisions on protecting open space.

Talking "New Science"

Once enough data was collected to shed light on the issues facing the Pomperaug River watershed, the Coalition's biggest task was to interpret that data for public officials and property owners so they could make informed decisions about land use and development. In 2007, the Connecticut Community Foundation and the Southbury Community Trust Fund funded an outreach director position, allowing the Coalition to begin its communication efforts. The Coalition brought on Donna Lesch, who began the task of distilling the science gathered into key messages for the different audiences. Donna placed special emphasis on reaching elected leaders and the volunteer commissioners responsible for planning, zoning and inland wetlands. To do this, she developed a matrix of key audiences, key messages gleaned from the "new science" (combining the results of hydrological and instream habitat modeling) and the appropriate outreach tools to be used with each group. The Coalition made many presentations to garden clubs, historic societies, community organizations and Boy Scout and Girl Scout troops. A series of lectures were offered through a Life Long Learning Institute at the University of Connecticut and a program for local fifth graders on watershed science was initiated.

Perhaps the most valuable outreach tools developed by the Coalition for the Pomperaug River watershed are the Geographical Information System maps that show the land areas most critical to aquifer recharge. These maps have been given to towns within the watershed, and commissioners have been eager to get copies of these maps and their digitized geographic information.

This outreach effort has also had its challenges. The Coalition is limited by the

[2] NEMO is an educational program of the University of Connecticut Cooperative Extension System, Connecticut Sea Grant College Program and Natural Resources Management and Engineering Department. For more information, see nemo.uconn.edu.

time available to train and review study findings with commissioners, who are often the ones making important land use decisions in the watershed. Because of this constraint, the Coalition has adjusted its approach during the 20-30 minutes available to them by focusing on just one area of new science and how it can be utilized in the decisionmaking processes of commissioners.

Impacts and Next Steps

Changes in the viewpoints of land use officials in the watershed have been achieved. Since the Coalition's initial inquiry to determine the effects of the water diversion proposal, the power plant project was modified to be gas-fired, requiring greatly reduced quantities of water and thereby mitigating potential threats to the river.[3] Developers are being asked by municipal officials to maintain the existing hydrology of sites under development. Low Impact Development techniques are being recommended or requested. Citizens are more aware that flooding and drainage problems are a function of land use changes and not just random natural events.

Photo credit: Pomperaug River Watershed Coalition

Stakeholders meet to discuss modeling.

Now that Coalition members have a much better understanding about water quantity issues, their next goal is to focus on water quality. The Coalition plans to continue the work started by USGS as part of the National Water Quality Assessments project.

"For a ten year old watershed," said Ed Edelson, Director of the Pomperaug River Watershed Coalition, "the Coalition is proud of our work to take an integrated, science-based approach to understanding our watershed, informing and arming our public with this information, and encouraging people to see the watershed as a shared resource and a shared responsibility for its active stewardship."

RELATED PROGRAMS & PUBLICATIONS

Pomperaug Water Resources Management Project

The Coalition has developed a comprehensive, scientifically-based management plan in which it recommends strategies that can assist local and state government agencies, water utilities and landowners with managing allocation and preventing pollution of the finite water resources in the watershed.
www.pomperaug.org/wmp/index.htm

Assessment and Restoration of Instream Habitat for the Pomperaug, Nonnewaug and Weekeepeemee Rivers of Connecticut

This study by Piotr Parasiewicz, Jeffrey Legros, Joe Rogers and Miira Wirth was published by the University of Massachusetts' Northeast Instream Habitat Program in January, 2007. It evaluates the low-flow related stresses to physical habitat and fish community and determines ecologically viable objectives for a management plan for the Pomperaug River watershed.
www.neihp.org/projects/pomperaug/index.htm

[3]Due to financial reasons, the project was postponed as the company went bankrupt. The rights have now been purchased by another company that is working on finalizing its plans to move forward.

Evaluating your Progress:

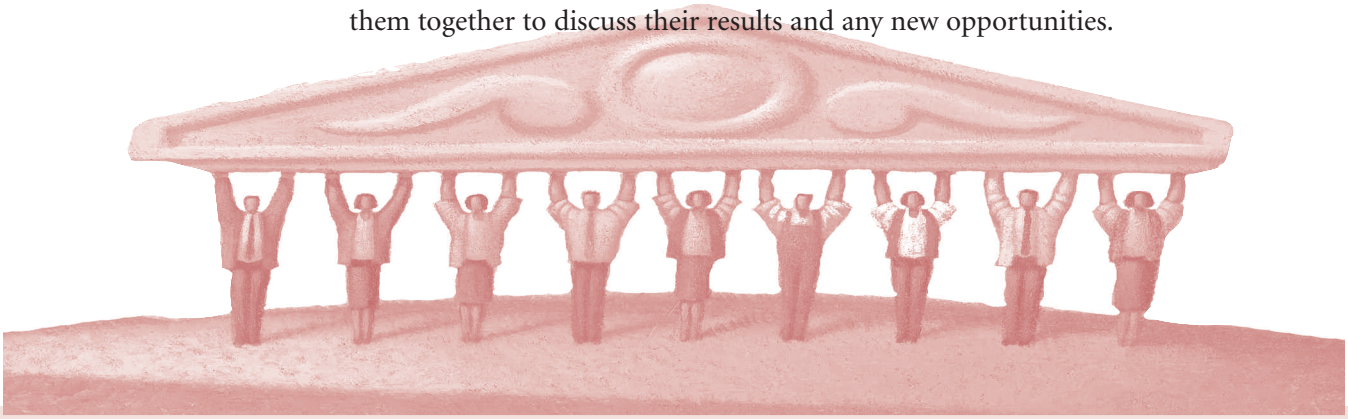
Integrated Watershed Protection Assessment

The Integrated Watershed Protection Assessment is a tool to help you measure important steps towards the success of your on-the-ground watershed protection efforts. The assessment begins to define some of the intangibles and subjective factors that contribute to long term success, and provides a benchmark for planning and measuring results.

Who Should Take the Assessment: Anyone involved in watershed protection efforts is encouraged to complete this assessment as a tool for individual learning. However, the results of the assessment will be more meaningful if more people in your watershed have a chance to offer their opinions and discuss the results with each other.

Here are a few suggestions for ways to use this assessment:

- **To Get Started.** Copy this assessment for your watershed organization or board members to read and complete before their next planning session as a way to enrich the conversation.
- **To Help Set Priorities.** Use the assessment in small group discussions to identify priorities for action.
- **To Evaluate and Redirect Ongoing Efforts.** Have several stakeholders take the assessment online at www.rivernetwork.org/rn/iwp_survey and bring them together to discuss their results and any new opportunities.



GENERAL INFORMATION

Today's date: _____

Watershed Name: _____

Drainage Area (*approximate sq. mi.*): _____

Estimated population in drainage: _____

Your name: _____

Organization: _____

INDICATORS OF SUCCESS

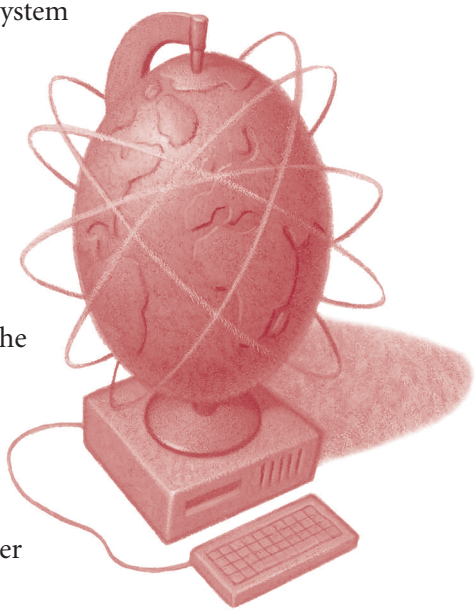
For each statement below, mark the number that corresponds with your level of agreement with the statement. A rating of 1 means "Strongly Disagree" and a rating of 5 means "Strongly Agree." Add details or notes about your responses (if desired) at the end of each section.

Strongly Disagree 1 2 3 4 5 Strongly Agree

I. WATERSHED INFORMATION SOURCES

This section reviews the types of data and information regularly collected and widely available to help you integrate watershed protection and decision making.

1. Mapping Resources. The hydrologic boundaries of our watershed, sources of pollutants, and surface and groundwater resources are well mapped and available in Geographic Information System (GIS) format.



2. Monitoring Information. There has been comprehensive water quality monitoring in our watershed within the last three years to identify trends in the watershed, sources of pollutants and/or evaluate remediation efforts.

3. Vulnerability Analysis. In our watershed we have a commonly recognized framework for classifying the vulnerability of specific areas of the watershed to water quality degradation.

4. Land Protection Priorities. Information about which lands in the watershed are most important for protecting drinking water sources, critical aquatic and wildlife habitats, floodways, groundwater recharge and cultural areas is readily available.

5. Use of Online Information. Interested citizens know how to access online information sources on watershed conditions, pollution and water quality monitoring and NPDES permit requirements in our watershed.

6. Community Right to Know. Citizens in our watershed can access information about toxic chemicals and other hazardous products stored, used and released into the environment by businesses and industries in the watershed.

7. Human Health Assessment. The communities in the watershed are informed about the location/presence of water-borne contaminants that may relate to human health problems.

8. Other Key Information Sources. There are other information sources that help people in our watershed stay aware of problems and issues. *If you agree, please explain below.*

NOTES:

TOTAL SCORE FOR SECTION I (out of 40)

II. STAKEHOLDER INVOLVEMENT

This section considers how well stakeholders in your watershed are communicating and working together.

1. Business Interests. The businesses that depend on clean water and/or a reliable supply of water in the watershed (such as agriculture, commerce and industry) communicate with each other about their goals and needs relating to water.

2. Municipal Interests. Local units of government in the watershed have open lines of communication with each other about mutual goals and challenges regarding water management.

3. Conservation Community. Conservation organizations, watershed organizations, land trusts, hunters and anglers communicate regularly and work towards common goals.

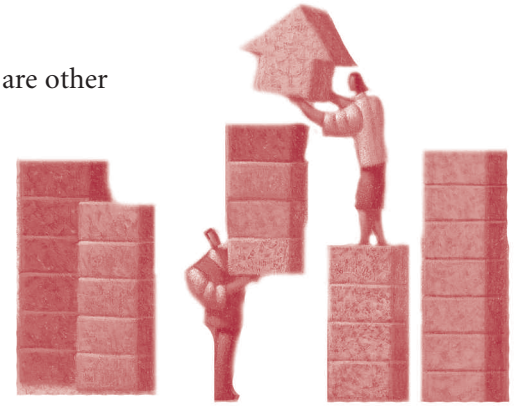
4. Stakeholder Engagement. Most key stakeholders feel they have been involved in a watershed forum or the creation of a watershed plan.

5. Shared Leadership. Our watershed forum sees leadership from people with widely varying points of view including local elected officials; local, state and/or federal agencies; leadership by individuals from the business community, faith community and public interest groups.

6. Strong Relationships. There is a fairly high and growing level of candor and trust among the key stakeholders in our watershed.

7. Quantity and Quality Considerations. Agencies focused on both water quantity and water quality management are equally engaged in watershed discussions.

8. Other Methods of Involvement. There are other important ways in which stakeholders are engaged in watershed-wide protection and restoration efforts. *If you agree, please explain below.*

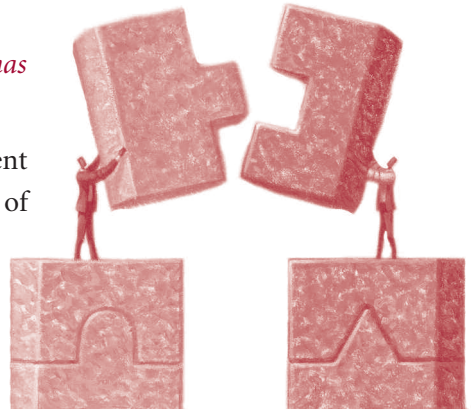


NOTES:

TOTAL SCORE FOR SECTION II (out of 40)

III. PLANNING CONTEXT

This section considers the context within which watershed planning has occurred and to what extent those efforts have been successful.



1. Watershed Plan. In our watershed, there is a current watershed plan that includes an overall assessment of the critical watershed problems and a prioritized list of actions to address those priority problems.

2. Implementation. Our watershed plan is being implemented in important ways (e.g., critical lands are being protected, discharge permits have been changed, ordinances or regulations are being strengthened or other steps have been taken to meet the goals of the plan).

3. Funding Coordination. There is a financial plan listing priority projects, funding needs, and diverse sources (such as business supporters, Clean Water and Drinking Water State Revolving Loan Funds, Clean Water Act section 319 grants, brownfields grants, land conservation funds, or targeted development grants).

4. Local Land Use. In our watershed, there are local land use plans or ordinances that address protection of water quality, stream flow and habitat (such as stream set-back requirements for new development, requirements for reducing impervious surfaces, protecting floodplains, green building practices or other Low Impact Development techniques).

5. Water Demand Management. Water infrastructure planning includes a sound strategy for reducing consumption.

6. Managing Transportation Impacts. Local transportation planning requirements include minimizing the impacts of projects such as roads, culverts and bridges.

7. Supplemental Water Supplies. Plans for stormwater, wastewater and/or drinking water management are coordinated and include consideration of maintenance of existing infrastructure, water re-use and retention strategies.

8. Other Key Planning Components. Our communities use other important planning processes to enhance watershed protection *If you agree, please explain below.*

NOTES:

TOTAL SCORE FOR SECTION III (out of 40)

IV. REGULATORY CONTEXT

This section reviews how important environmental programs and regulations are coordinated on a watershed scale.

1. Drinking Water Protection. Drinking water sources are afforded special protection when proposed activities are permitted in the watershed.

2. Wetland and Stream Channel Integrity. Wetlands and stream channels are recognized for their important watershed functions, protected, and impacts of permitting for dredge and fill (404) and/or stream alterations are mitigated.

3. Pollution Trading. Pollution trading opportunities are being pursued on a watershed scale with adequate attention to preventing negative impacts and reducing pollution overall.

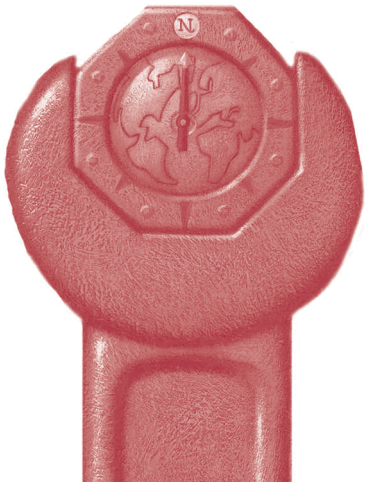
4. Habitat Conservation. Habitat Conservation Plans, required to identify, minimize and mitigate the impact of activities on threatened and endangered species, are developed and implemented on a watershed scale.

5. Clean Water Act Implementation. Total Maximum Daily Loads or NPDES permits, including stormwater permits, are being developed or implemented on a watershed scale.

6. Superfund Implementation. Our community has identified potential Superfund sites, petitioned for remediation where appropriate and actively participates in Superfund clean-up initiatives.

7. Cumulative Impacts. The cumulative impacts of water diversions, withdrawals and or impoundments are considered and minimized through the permitting processes.

8. Other Regulatory Methods. There are other ways that different local, state and federal agencies coordinate the implementation of their regulatory programs in our watershed. *If you agree, please explain below.*



NOTES:

TOTAL SCORE FOR SECTION IV (out of 40)

V. COMMUNITY READINESS FOR CHANGE

This section examines to what extent the communities in your watershed are prepared to consider proposed changes and act upon them.

1. Goals for Integration. Leaders in our watershed protection effort have assessed how the goals of watershed protection overlay with other local decision-making processes and have an open dialog with elected officials about common goals.

2. Commitment to Change. Elected officials in our watershed appear committed to taking action to protect and/or restore the watershed.

3. Business Engagement. Business leaders are putting their time and/or money towards environmental considerations and conditions in the watershed.

4. Media Concern. News and local media outlets have taken an interest in the problems, the plans for change and/or the activities occurring in the watershed.

5. Inter-agency Cooperation. Local, state and/or federal officials work together to respond to watershed concerns that cross political boundaries.

6. Nonprofit Sector Engagement. There are one or more nonprofit citizen organizations that participate in the community as a "voice for the river."

7. Agency Input Processes. Most relevant agencies in the watershed are committed to involving the public and are respectful and responsive to community input.

8. Other Community Factors. There are other key ways that our community encourages public participation affecting our watershed. *If you agree, please explain below.*

NOTES:

TOTAL SCORE FOR SECTION V (out of 40)

TOTAL CUMULATIVE SCORE (out of 200)

VI. RESULTS & PRIORITIES FOR ACTION

1. After reviewing your scores in the five categories above (I. Watershed Information Sources, II. Stakeholder Involvement, III. Planning Context, IV. Regulatory Context, V. Community Readiness for Change), which category do you feel is least developed in your watershed?

2. How could you encourage improvement in that category?

3. Which of the five categories is the most developed in your watershed?

4. Building on your successes in your most developed category, what next steps could you take to further watershed protection?

5. Given current opportunities in your watershed, what actions or activities could have a positive impact in your watershed within a short period of time?

6. What actions could you or your organization or agency take to implement these priorities?

What Does Your Score Mean?

The Integrated Watershed Protection Assessment asks you to consider 40 very qualitative questions. There are no right answers, but each question provides a different perspective for your consideration. If just one person takes the assessment, a high score may indicate a great attitude about his or her work or a lower score may indicate a bad day at the office. But, if many minds come together to discuss this assessment—regardless of their score—they may find unique opportunities for setting new goals, building coalitions or changing the way they work together.

After taking the Integrated Watershed Protection Assessment we suggest that your group spend time "diagnosing" your results, discussing specific issues and deciding which of the indicators (if any) you'd like to improve over time. The questions in Section VI will help lead you through this process. Be sure to take notes on the discussion, list issues that are seen as roadblocks to success or where members feel "stuck." What new ideas has the assessment surfaced? What issues generate the most energy within your group? What is your next priority for action?

What We've Learned:

Lessons of Integration

by Wendy Wilson & Merritt Frey

River Network

Approximately twenty groups piloted the Integrated Watershed Protection Assessment for River Network. Through their responses, it was easy to notice consistencies between successful Integrated Watershed Protection processes, such as:

- Many successful stakeholder groups found that working together to create and distribute a product—whether a source water area map or recommendations for city ordinances—attracted broader participation from municipalities and other target audiences.
- Many successful groups invested their time in outreach activities and carefully targeted opinion-leaders such as elected officials, faith communities or business leaders.
- Many good efforts began as a way to bring people together to resolve a specific contentious issue (a diversion project, a Total Maximum Daily Load, or new stormwater requirement) and then evolved over time to become broader, more integrated approaches to watershed protection.

The larger categories of indicators tend to reinforce each other. For example, a group with a history of strong stakeholder involvement will eventually create the buy-in necessary for community change. And having good sources of information always makes planning easier for everyone. Many groups have used their strengths in one area to build towards eventual improvements in others.

There are no silver bullets and not everything in a watershed can be fixed. However, setting reasonable goals and having everyone agree to them is more important than precisely what those goals might be.

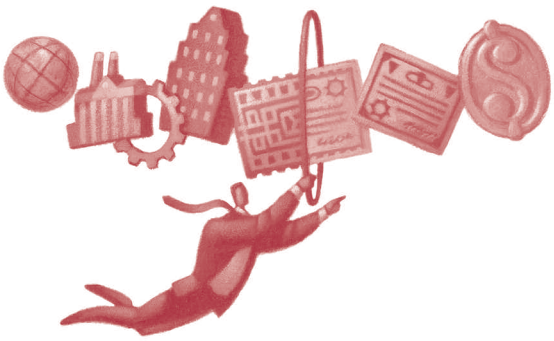
No one has it all figured out! All of our case study groups consider themselves to be "works in progress"—they all feel that some pieces just refuse to fall into place.

Don't get down on yourself about your score. None of our pilot assessment groups scored well in all categories. We did not discover a single "gold standard" for identifying a successful effort. The groups with the highest scores clustered between 130 and 160 points out of a possible 200. However, efforts that are known for having exceptional on-the-ground programmatic results (including the case study watersheds in this issue of *River Voices*) tended to cluster in the higher range of scores.

The road towards integrating watershed protection with the broader goals of our communities is not easy or well mapped. We must learn from each other, borrow from each other, and support each other as we find new and innovative ways to help citizens and communities resolve watershed conflicts at the local level. Remembering these lessons will help us stay on the path of protecting and restoring our watersheds.

The Neuse River Foundation (NRF) has implemented sourcewater protections for the Upper Neuse Basin using an integrated approach. The NRF and others spent the last few years opposing the largest water pollution trade ever proposed for U.S. waters. This trade proposal would have enabled an upstream municipality to purchase more than 600,000 pounds of additional nitrogen capacity per year to compensate for its wastewater discharge into Falls Lake, Raleigh's only drinking water supply. Fortunately, the city of Raleigh partnered with NRF and the Southern Environmental Law Center to defeat the plan. The NRF continued to strengthen the watershed's planning and regulatory measures through passage of Raleigh's Safe Drinking Water Protection Act of 2005, which included the development of a nutrient reduction strategy (TMDL) for Falls Lake. And when recommendations to create an Upper Neuse Basin sourcewater protection plan died in committee, the NRF and Neuse Riverkeeper proposed an alternate plan to Mayor Meeker. This plan called upon the city to partner with land trusts to conserve land along the streams and wetlands that feed water supply reservoirs. The formation of the Upper Neuse Clean Water Initiative is the embodiment of this plan, and brings stakeholders in the watershed together with land trusts and local and state government programs to protect sourcewater. Mayor Meeker continues to support the idea, and has made protecting the city's drinking water a main facet of his platform for re-election, garnering more than 70% of the popular vote. With coordination and innovation, the drinking water in the Upper Neuse Basin will continue to be protected.

Neuse River Foundation (NC)
www.neuseriver.org



In 2001 and 2002, the Cumberland River Compact held conferences to begin addressing nonpoint source pollution from non-farm sources. Our target audiences were the development community and local officials. As a result of the conferences, we began a sustainable building program for the development community. After this program was on its way, we turned our heads toward elected and hired local officials. We felt we could make the most immediate impact on this scale; after surveying local officials on their need for water quality/supply education, it seemed they agreed. The resulting Local Officials Curriculum took a wide array of existing programs from the agency, university and NGO spectrum and combined them into a holistic program that has been well-received by local officials. The program has resulted in multiple buffer zone and steep slope ordinances, full ordinance reviews and a much greater awareness of water issues by both officials and the public. Critical to its popularity has been our willingness to listen to the needs of officials and follow with a selection of water education points—instead of the other way around! This program, together with the sustainable building program and our watershed program (which helps create and strengthen new watershed organizations and subsequent restoration projects), has helped to form an integrated watershed protection effort in our Basin.

Cumberland River Compact (TN)
www.cumberlandrivercompact.org/programs_lowc.shtml

The Eugene Water & Electric Board (EWEB) Drinking Water Source Protection Program works with numerous agencies and organizations to protect the McKenzie River, which is the sole source of drinking water for nearly 200,000 residents in Eugene, Oregon. EWEB is a public utility that has little, if any, regulatory abilities to influence activities in the McKenzie watershed that may threaten Eugene's drinking water source. As a result, EWEB relies on building relationships with agencies, businesses, landowners, academia, nonprofits and other stakeholders to move source protection projects forward and find solutions that have multiple benefits.

The general approach EWEB has taken when establishing a program to address a specific threat to the watershed (chemical spills, urban runoff, commercial/industrial activities, forest management, agriculture, septic systems, development, etc.) includes the following:

- Reaching out to all entities that may have some involvement or role in the activity that poses a potential threat to Eugene's water supply and soliciting feedback, identifying opportunities and engaging in dialogue that leads to development of long-term relationships;
- Conducting a detailed assessment to better understand the activity, collecting data to address information gaps and outing an approach to reduce or mitigate for the threat;
- Focusing on areas where the activity poses the highest relative threat and monitoring for impacts; and
- Working with partners to implement solutions that achieve multiple benefits with a long-term perspective.

A few examples of this approach include the development of a watershed spill response program and an agriculture chemical collection effort. The McKenzie Watershed Emergency Response System (MWERS) involves 27 local, state and federal agencies as well as nonprofits and businesses to share information and resources through the use of a geographic information system (GIS) that allows first responders to gain access to critical information, equipment, and trained personnel and implement pre-planned response strategies for an effective response to hazardous material spills.

EWEB received grant funds to conduct an Agricultural Chemical Collection Event, which involved nine partner agencies and allowed farmers within the watershed to dispose of obsolete pesticides and other chemicals free of charge. Over 44 tons of old farm chemicals were removed from 126 different farms. This project was designed to protect regional drinking water sources and fish habitat and reduce exposure to family, pets and farm animals.

EWEB strongly believes in the importance of working together with a variety of watershed stakeholders to promote stewardship of the McKenzie watershed and maintain the excellent water quality for future generations. Key ingredients to successful collaboration include: providing leadership and broad vision, engaging all stakeholders and developing win-win projects that allow the players to build relationships and trust while achieving on-the-ground project objectives.

Eugene Water & Electric Board (OR)
www.eweb.org/Home/water_quality/watershedprotection.htm

Resources & References

Manuals & Toolkits

The California Watershed Assessment Manual (Volumes I and II) provides guidance for conducting a watershed assessment in California, and can be used as a template for similar manuals. It is intended to support the planning and technical needs primarily of watershed groups but also local and state agencies, academic scientists, consultants and individuals involved in developing and conducting a watershed assessment.

www.cwam.ucdavis.edu/Manual_chapters.htm

EPA's ***Handbook for Developing Watershed Plans to Restore and Protect Our Waters*** is intended to help communities, watershed organizations and state, local, tribal and federal environmental agencies develop and implement watershed plans to meet water quality standards and protect water resources.

www.epa.gov/nps/watershed_handbook

The ***Oregon Watershed Assessment Manual*** provides guidance on the systematic evaluation and assessment of watersheds 25,000 to 80,000 acres in size. Many sections of the manual are applicable to watersheds in states with similar characteristics.

www.oregon.gov/OWEB/docs/pubs/OR_wsassess_manuals.shtml

The American Planning Association has developed a ***Policy Guide on Water Resources Management***, in which it puts forth 12 recommendations that encourage sustainable policies in water resources planning, water use and well permits, regulations for source water protection, the integrated management of ground and surface water supplies and more. These policies can be promoted to appropriate state and local agencies, authorities, and governments in watersheds when applicable to local situations.

www.planning.org/policyguides/waterresources.htm

The Center for Watershed Protection's ***Smart Watershed Benchmarking Tool*** distills the lessons learned from around the country into a self-assessment tool to help local communities integrate and align their urban watershed programs to meet their water resource goals while maximizing the performance of staff and financial resources.

www.cwp.org/Store/guidance.htm

EPA's ***Water Quality Trading Assessment Handbook*** provides an analytical framework to assess the conditions and water quality problem(s) in any specific watershed and helps to determine whether Water Quality Trading (WQT) could be effectively used.

www.epa.gov/owow/watershed/trading/handbook/index.html

The Center for Watershed Protection's ***Watershed Vulnerability Analysis*** provides guidance on delineating subwatersheds, estimating current and future impervious cover and identifying factors that would alter the initial classification of individual subwatersheds. This technical release outlines a basic eight-step process for creating a watershed plan for either a large watershed or jurisdiction.

www.cwp.org/Resource_Library/Center_Docs/USRM/Vulnerability_Analysis.pdf

Programs & Databases

EPA worked with states to develop **Enforcement & Compliance History Online** (ECHO), providing Internet access to information on facility compliance and EPA/state enforcement of environmental regulations. Water data include Clean Water Act compliance by state.

www.epa-echo.gov/echo/index.html

For an example of a watershed-wide monitoring program, look to the **Green Mountain Conservation Group** (NH) and the **Saco River Corridor Commission** (ME), which have established a joint water quality monitoring program that encompasses one watershed, two states and twenty-six towns. The main goal of the program is to provide long term water quality data to study the health of the entire watershed, track changes overtime as development increases and educate the public.

www.gmcg.org/water-quality.php

The **Ten Towns Great Swamp Watershed Management Committee** in New Jersey is an example of inter-municipal cooperation. The Committee was formed in 1995 through an Intermunicipal Agreement among the ten municipalities that have lands within the Great Swamp watershed to implement a watershed management plan.

www.tentowns.org/10t/home.htm

The EPA's **Water Resource Management: A System-Wide Approach to Integrating Watersheds and Reservoir Systems** is a multi-day workshop that covers reservoir limnological processes and water quality management, sampling and data collection, watershed management post-project operations, assessment and more. The target audience includes engineers, hydrologists, soil conservation, water pollution and fish & wildlife agencies; power administrators; local lake associations and municipal water associations. Offered in various locations across the country. Contact Laurin Yates, U.S. Army Corps of Engineers, 601/634-3792; yatesl@wes.army.mil

www.epa.gov/owow/watershed/wacademy/training.html

The **United States Geological Survey** mission is to provide water information that benefits the Nation's citizens. On their Water Resources of the United States website, one can find publications, data, maps and applications software useful to watershed protection efforts.

water.usgs.gov

Publications & Papers

River Network's ***Cancer Downstream: A Citizen's Guide to Investigating Pollution/Health Connections*** helps community groups investigate and understand the potential impact of environmental contamination on community health. The approach is a set of tools to help organize, collect data, analyze data and take action to assess and address environmental health concerns in one's community.

www.rivernetwork.org/marketplace

River Network's ***The Clean Water Act Owner's Manual*** (2nd Edition) gives advice about how to use the Clean Water Act to solve real-world problems, and contains expanded information on antidegradation, stormwater permits, TMDLs and more. The *Owner's Manual* explains crucial sections of the Clean Water Act, points out how to get involved in regulatory decisions, and tells local stories of others who've done so.

www.rivernetwork.org/marketplace

The Journal of the American Water Resources Association published a paper by Barbara A. Smolko, Roy R. Huberd and Nancy Tam-Davis entitled ***Creating Meaningful Stakeholder Involvement in Watershed Planning in Pierce County, Washington*** (v38 (4), pp. 981–994). The paper describes how Pierce County engaged diverse groups of stakeholders in generating solutions to nonpoint sources of water pollution through their watershed planning process.

www.blackwell-synergy.com/doi/abs/10.1111/j.1752-1688.2002.tb05539.x

River Network's ***Watershed Innovators Workshop Proceedings and Swift River Principles***, proceedings by Pete Lavigne and principles by Kevin Coyle. This book covers the proceedings from a workshop on comprehensive, ecosystem-based watershed approaches to environmental protection. Forty watershed leaders discussed key players, role of science, promising strategies, measuring success and more.

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www.rivernetwork.org/call_for_proposal.php

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