

**A Watershed Management Model for New Jersey**  
***Stemming the Tide of Sprawl***  
**The Stony Brook-Millstone Watershed Association**

**Summary**

Issue: Sprawl threatens natural resources. All over the country, rapid growth transforms farmlands and forests into roadways and strip malls. In the overwhelming majority of states, land use decisions are made at the local level. Communities compete with each other to “chase ratables,” spreading businesses, roads and homes out onto the landscape.

Central New Jersey is a main front in the battle to stop sprawl. Situated within the metropolitan corridor between New York and Philadelphia, development threatens every piece of open space. New Jersey is also a classic example of “home rule,” where each municipality acts independently of the others. The consequence is clear: development is threatening natural resources, most particularly putting the region's water quality and quantity at risk. Nitrates, phosphates and fecal coliform bacteria are elevated in our waterways. The N.J. Department of Environmental Protection designated our watershed as impaired, citing the pace of development and nonpoint source pollution as the major problems.

Goal/Strategy: A three-part strategy is needed in a “home rule” state. First, a statewide campaign is necessary to eliminate major incentives that help create sprawl, and to create incentives for new growth patterns. Second, a marketing effort is needed to link the statewide issues with local concerns. Third, awareness and decision making at the municipal level must be improved, in part to create the ground-up link with the statewide campaign.

In New Jersey, important land use decisions are being made at the local level. Since we do not know when the statewide campaign will be ready, the third component is time critical. We must improve decision making at the municipal level now. All too often, however, our relationship with municipalities is ad hoc – usually revolving around a disputed proposal. Our goal is to create a pro-active relationship that helps put in place comprehensive policies that can help limit sprawl from the onset. Our program consists of a watershed management plan, supported by key planning and GIS resource assistance, and four elements: watershed field program, citizen action network, municipal partnership and a technical advisory committee. Our goal is to create a comprehensive effort that links citizen action with municipal improvements, supported by sound scientific analysis and an active field program. Our plan is short on theory and long on action. None of its components can work alone; each serves the other.

Conclusion: In a home rule state, municipal governance must be improved to combat sprawl. We seek to create a model program to be sure that every municipality improves its Master Plan, zoning and ordinances to put in place a sustainable vision for the future, and then every major development project is reviewed in this light. Only then can we create a sustainable alternative to sprawl that protects the quality of life and water in our vulnerable region.

# **STEMMING THE TIDE OF SPRAWL**

## **The Stony Brook-Millstone Watershed Association**

### **INTRODUCTION**

All across America, suburban sprawl is devouring open space at an astounding rate, changing forever the character of the places we call home. Countless acres of open lands have become strip malls and roads. Former cornfields now grow poorly planned residential and commercial developments. This devouring of open space by haphazard growth is not merely aesthetically disturbing, but environmentally disastrous.

Nowhere, except perhaps in southern California, is sprawl spreading at a faster rate than in the Northeast metropolitan corridor. And in New Jersey, nowhere is it so rampant as in the Stony Brook-Millstone Watershed (see map, Appendix A: Stemming the Tide of Development). Our watershed is, in fact, one of three remaining areas of open space in the megalopolis between Boston and Washington, D.C.

The 265-square mile area encompassed by our watershed (see Appendix B: Map of Stony Brook-Millstone Watershed) is under extraordinary development pressure. According to the New Jersey Office of State Planning, nearly 15,000 acres of land were developed in the watershed between 1986 and 1995 (see Appendix C: New Development in the Stony Brook-Millstone Watershed). Nearly 20 percent of that loss occurred in Mercer County. Although no official statistics are available post-1995, a visual assessment indicates that development now is progressing at even a more rapid pace in this region.

One of the main fronts in the national battle to stop sprawl is here, and is being fought every day. Although we are winning some skirmishes, we are afraid of losing the war. Last year, the New Jersey Department of Environmental Protection (DEP) designated our watershed as impaired. Officials cited two major problems threatening the quality of water in our region: the extraordinary pace of development and nonpoint source pollution. The designation is based on measurable indicators -- nitrates, phosphates and fecal coliform bacteria are elevated in many of the waterways in our region. Some of those waterways provide drinking water to nearly three million people in central and northern New Jersey.

The loss of open space is leading to that designation. Development has replaced forests and wetlands with impervious surfaces, resulting in record stormflows that scour streambanks, denude waterways of vegetation and initiate significant erosion. Stream sediment and pollutant loads are elevated due to the lack of buffer zone, soil cover and bank stability. Soils along the waterways are actively sloughing into the water, burying fish and macroinvertebrate egg sites, carrying soil-borne contaminants into the water, and silting in lakes and streams.

The intense pace of growth in central New Jersey threatens to swallow what little open and agricultural land remains here. The quality of our water and the quality of our life are at stake.

### **PROJECT DESCRIPTION**

#### **A. Our Vision: A Model Watershed Program to Manage Growth**

Along with standing on the front-line of the battle against sprawl, New Jersey is also a classic example of a "home rule" state where land use decisions are made almost exclusively by local governments. Our primary objective therefore is to summarize our overall strategic model to combat sprawl at the local level in a home rule state.

First, we understand that this strategy must have statewide components. In New Jersey, for example, a coordinated statewide campaign should be developed to address the property tax system, public transportation and the State Development and ReDevelopment Plan. Every home rule state will have unique statewide issues. We do not describe the statewide component of the strategy here, primarily because we do not believe our organization should take the lead on such an endeavor. However, our model is designed to mobilize regional and local support for such a plan, when it is ready to be launched. We certainly plan to develop and implement this plan with a firm idea on how we fit into the big picture.

Second, we believe that the development of the local component of the sprawl model is time critical – for important land use decisions are being made at the local level, and will be for the foreseeable future. If we were to wait for the statewide campaign, which may take years, we risk losing critical resources before any solution is put in place. Municipal decisions regarding land use must be improved now.

Third, we can manage sprawl at the local level by managing watersheds. The principal goal of watershed management is to preserve water quality and quantity by influencing land use decisions. The principal threat to water quality and quantity is sprawl, which replaces open lands with impervious cover. Thus one is irrevocably linked to the other. This relationship, combined with the imperative to create Total Maximum Daily Loads under the Clean Water Act based on watershed loading models – creates an unprecedented opportunity to harness watershed management to combat sprawl.

Given our 50-year commitment to watershed management, we are poised to become a model for other watershed associations, grassroots preservation groups and municipal officials to follow. Although we cannot manage a statewide campaign against sprawl, we can become a public policy demonstration of the manner in which local municipalities, counties and regions can implement a key component of a statewide policy. We will make the connection between what happens at the end of a local street and the national effort to achieve sustainable growth.

Because municipalities are on the front line, the thrust of our plan will focus on assisting them in making sound land use decisions. All too often, our relationships with municipal officials are ad hoc, usually revolving around a disputed land use proposal. Our goal is to create a more pro-active relationship that helps put in place a comprehensive range of policies that can help limit sprawl from the onset. Based on this relationship, we can help officials analyze whether, how and where their communities can grow.

## **B. Our Watershed Management Program: Plan and Elements**

We are building a comprehensive watershed management program that can be applied to any watershed in New Jersey and across the nation. Our program consists of a plan and four elements (which correspond to the diagram in Appendix D: Vision of Watershed Management). Our plan is short on theory and long on action. None of its components can work alone; each serves the other.

### **1. Watershed Management Plan**

The watershed management program will be governed by a plan. Associated with the implementation of this plan will be resources that will support each element of the program. Highlights of the plan itself:

- ✓ The plan will be a short document (10-15 pages) that will describe how the Association will convene and organize the four elements of the program. It will briefly describe each element and the procedures and protocols that will be used to manage that element.
- ✓ The plan will be housed in a loose-leaf notebook, and will be constantly changed as conditions warrant. The plan itself will not include extensive mapping or analysis – it is designed to describe how we will come to action, not what the actions should be.

- ✓ The plan will be followed in the notebook(s) by detailed implementation strategies for elements of the program. These strategies will be divided between strategies that are subject-based (how we implement pesticide reduction programs in any community) and location-based (how we assess the conditions in a particular municipality).
- ✓ The plan will drive the creation of two committees to manage the program: a) a technical committee that will advise the Association on technical aspects, such as proper monitoring criteria or suitable assessment techniques; and b) a partnership committee that will oversee the development and implementation of projects within the subwatershed or municipal framework.
- ✓ The plan will drive the development of a "How To" Manual on watershed management. We will offer our plan as a realistic and working model for others interested in forming a watershed organization. Each year, we would focus on several aspects of watershed management, collect sample documents and methods, consult with experts, and draft a "best" model document or procedure. We would use standardized "boiler plate" language in the documents and place them in the binder so that they are ready for use by any group. We would also create a computerized version of the model document binder, so that interested citizens could access it and download any document they choose -- all from the Internet on their own time.

Three resource areas will support implementation of all the elements of the program.

- 1) *Sound Science*. We have created a Research Department that will investigate scientific aspects of sprawl to support our program. Professor Robert Tucker, past Director of Science and Research at NJDEP and past Director of the EcoPolicy Institute, has joined the Association to become the Director of Research.
- 2) *Land Use Planning*. A licensed professional planner will provide master plan, zoning and ordinance assistance to our program. The planner's primary role will be to help with the municipal government component of the plan (see Element 4 below), although assistance will also be offered to members of the Natural Lands Network for review of select individual development applications (see Element 3 below).
- 3) *Interactive GIS Analysis*. We plan to create a GIS Resource Center, staffed by a qualified expert, to provide interactive mapping expertise and analysis to the program – including web-based support. This Resource Center will provide GIS assistance to municipalities and groups in central and south Jersey, and will concentrate on creating interactive visual displays of municipal build-out scenarios.

In sum, the Plan is the "constitution" that establishes the principles to govern the watershed management program. Resources associated with the Plan will provide direct support to all elements of the program.

## 2. Element: Watershed Field Program and Subwatershed Restorations

The cornerstone of the watershed management program is an expansion of the Association's existing field program. This field program comprises two major pieces: monitoring and restoration projects, supplemented by assessments and restorations of subwatersheds.

- 1) *Water Quality Monitoring* – Cited as one of the Country's Four Best Programs. Our five-year citizen-based water-monitoring program is run by more than 150 volunteers who conduct visual, biological and chemical assessments on more than 60 miles of streams. Volunteers are segmented into three programs: River Action Teams (RATS) visually monitor by teams covering two to four mile "beats" on waterways six times annually; Chemical Action Teams (CATS) monitor 25 stream sites for levels of nitrates, phosphates, dissolved oxygen, pH, temperature and turbidity bimonthly; and Biological Action Teams (BATS) conduct benthic macroinvertebrate assessment at nine sites seasonally. The three programs

expanded in 1998 to include two local school groups monitoring on the Stony and Beden Brooks, both chemically and biologically.

2) *Restoration Projects* – Taking Immediate Action to Restore Degraded Areas.

We restore streams and reforest streamside lands in order to prevent further degradation from occurring at many sites throughout the watershed. This action-oriented approach is the very essence of our program. Every spring since 1996 we have conducted a series of action projects across the watershed region. Our staff, along with volunteers from communities and schools, conducted a dozen restorations totaling thousands of feet of streambank and acres of reforestation. These projects were completed using bioengineering, including the use of coconut fiber logs and matting. We target our restoration projects based on results from visual, biological and chemical monitoring. We also use our results to identify sources of pollution and work with communities, individuals and businesses to remedy problems.

These two basic pieces will be expanded in our watershed management program. First, we will maintain a base level of monitoring and restoration projects in areas throughout the watershed, consistent with our practice over the last several years. Second, we will be expanding our field program to include detailed and extensive subwatershed assessments and action plans.

3) *Assess Subwatersheds* – Targeting Critical Areas

The most effective management efforts are confined to subwatersheds on the order of 10 - 20 square miles. A limited area allows personal contact with the community, and fosters building relationships and trust. Most successful programs changing personal behavior have cited one-to-one relationships as the key to success. This project will address problems cited by NJDEP: sprawl and nonpoint source pollution, as well as issues specific to each subwatershed. The subwatersheds covered under the DEP proposal are the Upper Millstone, located primarily in Middlesex County, and Bedens Brook, located in Mercer and Somerset County. We plan a three-step process:

Step 1: Characterization and Assessment

We seek to perform a characterization and assessment to delineate which areas are most impaired; to determine what tools will be effective; and to evaluate where specific tools should be applied. We will review background information, including:

GIS mapping	groundwater aquifers
existing zoning, ordinances (township-specific)	soil types
designated water use	monitoring data (DEP's and ours)
economic forces	road alignment
boundaries	land use/land cover
terrain	rare or endangered plant/animal species
water bodies	recreational uses
surface water intakes	fish and game surveys
impervious cover analysis	tax lots and maps
point source pollution	development and employment trends

Characterization will include a visual survey. Staff and volunteers will hike or canoe the waterways and document the conditions. Assessments will include a detailed evaluation of the factual record. We will identify sources of pollutants, and where changes to land use

would pose the most threat to future water quality and quantity. If not already established, an ongoing dialogue will be initiated with municipal officials, business leaders, residents, and others to identify their concerns and begin an open and collaborative effort. This process will take advantage of our Streamwatch program, and we will expand monitoring in areas that need further classification. Step 1 will be conducted during the first six months; recognizing that the characterization and assessment will be continuously updated and improved.

### Step 2: Identifying Watershed Restoration Tools

Once the subwatersheds are identified and evaluated, the most effective watershed management tools will be selected to a) remediate or restore sources of pollutants; and b) to protect against possible future threats of pollution. For example, if non-point source pollution from agriculture and residential lawns were identified as a concern, we would focus on introducing our River Friendly Programs for agriculture and residents, rather than corporations. One area may need extensive streambank restoration, while another may need stormwater flow protection. This Association, with 50 years of experience in water quality protection, has a large arsenal of tools that have been utilized successfully in the past.

- \* Streambank restoration, riparian buffer creation, and reforestation.
- \* Assistance for farmers to implement agricultural Best Management Practices (BMPs).
- \* River Friendly Programs: one-on-one education of residents, businesses, golf courses, schools and municipalities on BMPs for their property.
- \* StreamWatch, our successful, long-term water quality monitoring program.
- \* Site plan review of new development.
- \* Open space acquisition planning

### Step 3: Evaluating and Improving the Model

We will implement an evaluation process. We will seek to tie each identified pollutant source with a measure, and evaluate how well our tools reduce the measure. In this manner, we can make reasoned decisions to modify or enhance our assessments, identify and improve tools, and ultimately, make sure this subwatershed process evolves to highlight actual results.

The benefits of the expanded Watershed Field Program are many:

- ✓ Volunteer monitoring and restoration programs build awareness and support in local communities to advocate for water quality and environmentally-friendly projects.
- ✓ Volunteer restoration projects build good will with municipalities
- ✓ Subwatershed restoration projects hold the prospect of improving water quality and/or preserving existing water quality
- ✓ Subwatershed assessments will provide the support for land use changes within the relevant municipalities.

### 3. Element: Grassroots Organizing – The Natural Lands Network

We founded the Natural Lands Network in 1998 as a grassroots umbrella group of 42 local and statewide preservation groups that serves as a watchdog for land use issues throughout the 26 municipalities in the watershed. We conduct two-way information sharing: they bring information up to us about local issues that deserve regional or national attention, and we disseminate information down to them on statewide issues that need local support. We also hold bi-monthly meetings with featured speakers and presentations on growth and preservation issues.

The network coalesced around the effort to support the statewide open space ballot question in New Jersey and the ten local open space ordinances in our area. The network created a registered lobbying organization (The Open Space Alliance) and coordinated an open space campaign. The statewide effort won handily, and all ten local ordinances passed as well. A one-page description of the Network and an updated list of member organizations are enclosed as Appendix E. Our watchfulness has resulted in scores of requests for assistance from us. The New Jersey Conservation Foundation is considering it as a model for organizing citizen groups around the state.

The Association now works with Network members to take positions on issues that may impact water quality, flow and natural resources through public participation in township committee, environmental commission and zoning and planning board meetings. For example:

We wrote and introduced a model stream corridor ordinance that has been adopted in four municipalities so far. We are continuing to work with Network members to encourage adoption by the remaining municipalities in our watershed. It calls for a minimum 100-foot buffer from the 100-year flood plain. Hardship provisions are allowed and farmers are exempt.

We succeeded in helping to downsize two threatening developments. One in Hopewell, where a poorly planned extension of sewer service would have opened the door to sprawl in one of the watershed's few remaining rural areas. The other was also in Hopewell Township, where we helped downsize a proposed corporate development by 450,000 square feet.

We are currently advocating for a better alternative to the proposed Millstone Bypass around Route 1 in Princeton. The current proposal places the bypass too close to the Millstone River and the Delaware and Raritan Canal.

This element of the overall program accomplishes several major tasks:

- ✓ The Network acts as the eyes and ears for the Association in local matters
- ✓ The Network complements our Streamwatch program in building local support for improvements to municipal master plans, zoning and ordinances
- ✓ The Network will help inform the development of a statewide campaign by highlighting grassroots concerns
- ✓ The Network will be prepared to help build local support for a statewide campaign

#### 4. Element: Municipal Assessments and Assistance

The single most important “audience” for our regional program is municipal officials and the laws and procedures they administer. In some respects, all the other elements of the program coalesce to focus on the actions of municipal officials. We plan to work with officials to assess the condition of their municipalities and develop action plans to improve the laws and procedures that dictate land use.

The Streamwatch and Natural Lands Network elements of the program will help engineer the public will to make these changes happen. Two key projects will help drive our work with municipalities:

- 1) Municipal Education – A Nuts and Bolts Approach. We plan to hold a two-day training seminar to provide municipal official with a nuts and bolts approach to watershed management. We will invite mayors, municipal and county planners, township engineers, administrators, environmental committee members, zoning board members and township committee members.

We will provide participants with concrete, how-to information. We will provide intensive hands-on training using case studies of land use strategies; open space planning, acquisition and management; water monitoring programs and zoning changes. We will show how water quality and quantity concerns can be incorporated into their master plans, zoning ordinances and site plan reviews. We will supply participants with an extensive compendium of model ordinances, descriptive articles and how-to guides.

- 2) Convene Watershed Partnerships -- Ecology over Politics. We plan to create the Stony Brook-Millstone Watershed Partnership, a formal organizational structure comprising municipal officials, technical experts and citizen groups to strategically manage the watershed along ecological rather than political boundaries. The goal is to make watershed management the cornerstone of local environmental policy by incorporating all the components of our watershed management program.

Beginning in Mercer County, and expanding to municipalities with subwatersheds subject to restoration plans, we will seek to obtain an intermunicipal agreement among the mayors of the municipalities to carry out environmental protection by using a watershed-based approach. We will strongly recommend that the plan balance immediate action with long range planning. Through this process, mayors and other local officials will work to institutionalize watershed management into municipal government. The municipal partnership committees will work cooperatively to accomplish the following objectives:

- \* Develop and implement their action plans.
- \* Meet a minimum of twice a year to share information and progress regarding the implementation of the plan and the health of the watershed.
- \* Identify intermunicipal issues requiring cooperative actions.
- \* Take immediate action and plan for long term needs.
- \* Review progress annually and redirect or leverage resources as necessary.
- \* Work towards environmental quality and economic stability
- \* Recognize the interaction between surface and ground water and the link with land use.
- \* Work toward educating residents to reduce individual impacts on the watershed.
- \* Offer the plan as model for statewide and national use.

Resources associated with the Watershed Plan will drive this effort. The licensed planner will work to systematically review, town by town, environmental aspects of the laws and procedures that govern development. The planner, supported by the GIS Resource Center, will conduct buildout analyses of master plans to understand what is permitted, and how potential development will affect the future quality of life in the town in terms of impacts on impervious cover, water quality and quantity, open space, traffic, school building needs, roads and taxes.

This analysis would include reviewing existing zoning and ordinance structures to determine what level of growth is currently allowed and where it could be located. The planner will compare each town to a model set of plans, ordinances and procedures to develop a set of recommendations. The planner will then work with officials to implement these recommendations. Having developed relationships with officials through this process, the planner will also work with them to provide initial environmental reviews of key development plans and analyze how they fit into master plans. A review could include a site visit, initial habitat and resource inventory, site plan review and recommendations for improvement.

The GIS Resource Center will develop tools needed by the planner and the visual and web-based depictions of the information to be accessible and understandable to the public.