Taking the Next Step:

Monroe Township Municipal Assessment

June 2008

Stony Brook Millstone Watershed Association

The Stony Brook-Millstone Watershed Association

Since 1949, our member-supported organization has worked on behalf of local residents to protect, preserve and enhance our local environment. We are dedicated to caring for the integrity of the natural ecosystems of the 265-square miles of central New Jersey drained by the Stony Brook and the Millstone River. We focus on environmental education, watershed stewardship and water resource advocacy – helping present and future generations understand the wonders and workings of the natural world we are helping to preserve on their behalf.

We are headquartered on an 860-acre nature reserve in Hopewell Township (Mercer County) that includes a community supported organic farm, nature center, and a 14-mile trail system that leads visitors through our woodlands, wetlands, and fields.

Many activities within our watershed affect the quality of streams, air, wetlands, groundwater, meadows and forests. By changing how we carry out these activities, we can improve our environment and our quality of life. So whether at home, work or play, we can all make a difference.

If you have questions about this report or want to learn more about membership support, volunteer opportunities, or educational programs please contact us at:

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Pennington, NJ 08534

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Executive Summary

The best of both worlds: A harmonious community of young and old; a mix of rural and residential neighborhoods; traffic-free roads lined with greenery, bordered by safe sidewalks and bike paths that lead to good schools and pleasant parks; commerce and industry along with preserved greenways of woodlands, wetlands and streams; sites where residents can learn about their local history and environment.

This is the future of Monroe Township in the eyes of the community.

It is a place not that different from the one that exists today. The Monroe of the future is an organic extension of the Monroe of the present, while the Monroe of the past seems, from the vantage point of the present, radically different. Was the Monroe of today consonant with the vision of its residents ten, twenty or thirty years ago? Communities do not get where they *want* to go without conscious effort – without envisioning a future, planning how to get there from here, and then implementing that plan.

So, how can Monroe implement its community vision?

The Project for Municipal Excellence, supported by the Geraldine R. Dodge Foundation and the U.S. Environmental Protection Agency, supports the creation of partnership efforts between municipalities and the Stony Brook Millstone Watershed Association. It is designed to identify the issues in a municipality that either hinder or enhance the preservation of natural resources and quality of life in and around the community. Through this Project, the Watershed Association supports municipal leaders as they evaluate goals, policies and strategies and determine how to connect these with the community's ultimate vision for itself. The process is not easy or short. Strong community leadership is a necessity to accomplish real actions. Monroe is to be congratulated for embarking on this process and the Watershed Association is excited to be working with such an enthusiastic, forward-thinking and dedicated community.

After Monroe formally partnered with the Watershed Association through a resolution, we began the municipal assessment process with a collection of survey responses from municipal officials, staff, and residents to assess the community's vision for the future. We then reviewed the Master Plan, Environmental Resources Inventory, land use ordinances, policies, and best management practices. We toured the Township to see how the community's vision is reflected "on the ground". These steps guided us in identifying ordinances and practices that need to be strengthened so that Monroe can realize its vision. These are the focus of the assessment report and a "step" toward making the connection between the vision and the reality.

Each chapter - or "step" - in the assessment report lists the Township's *Goal* according to the Master Plan and survey responses and the *Current Practices* the Township has in place including codes, ordinances, educational initiatives and planning strategies. The heart of each step focuses on the *Options* for new opportunities. Here we suggest a menu of choices for planning and conservation projects to implement now and in the future. The *Did You Know* section contains supporting information such as initiatives in other communities that may provide models for action. Finally, *Additional Resources* provide additional guidance on the subject.

As a catalyst to achieve responsible planning and environmental quality, we intend that this report serve as a guide and inspiration for work. Future boards and committees should refer to this document for ideas and guidance and to make connections with other communities and local organizations. As an interim step in the implementation of these practices, the report offers a variety of recommendations, which the Watershed Association is partially funded to help implement.

This report is a general guide to current and future projects for this community that will connect goals with implementation and implementation with vision. The results of this analysis for Monroe are documented in this report, entitled "Taking the Next Step". Outlined below, and in no particular order, are ten strategies for achieving Monroe's goals. (Please refer to the report for more detail).

Open space protection and management
Township Goal: Retain 50% of the Township in acquired open space, protected environmentally sensitive areas or preserved farmland.
Current Practices: Acquisition and preservation programs; cluster developments
Recommendation: Adopt plans and policies to further protect open space, including conservation easements and stewardship plans.

Biodiversity planning
Township Goal: Preserve open space; protect wildlife and biodiversity
Current Practices: Natural Resource Inventory mapped critical habitat
Recommendation: Adopt practices to preserve ecological integrity of habitat (eg Inventory habitat; do GAP analysis, biodiversity planning and education; strengthen ordinances)

Greenways/trails
Township Goal: Provide continuous network of open spaces and greenways
Current Practices: Trail system being developed; contiguous open space in cluster developments favored
Recommendation: Create network of greenways with regional connectivity

Sourcewater/Wellhead protection [Water quality]
Township Goal: preserve the quality of both groundwater sources and surface water bodies
Current Practices: potable water is provided primarily by municipal wells
Recommendation: protect water quality of groundwater sources, e.g. by wellhead protection ordinance

Aquifer/groundwater recharge [Water quality and quantity]
Township Goal: Protect aquifer recharge areas
Current Practices: Open space preservation; tree protection; stormwater management ordinance; irrigation by nonpotable water
Recommendation: Protect quality/quantity of aquifers by various means

Surface water/stream corridor protection
Township Goal: protect stream corridors and surface waters
Current Practices: flood hazard area ordinance
Recommendation: Adopt better management practices for stream corridors to preserve and enhance water quality.

Conservation design
Township Goal: conserve natural landscape; preserve environmentally sensitive areas
Current Practices: land use ordinance seeks to preserve natural features when feasible
Recommendation: adopt conservation subdivision design ordinance

Critical areas protection
Township Goal: preserve open space, environmentally sensitive areas and important areas for conservation measures
Current Practices: trees, floodplains protected by ordinance; low impact development encouraged
Recommendation: Adopt ordinances to improve protection of woodlands, waterways, wildlife habitats

Sustainable community
Township Goal: encourage energy and water conservation
Current Practices: "green" building components and standards for some buildings
Recommendation: encourage sustainable practices throughout the community, by. E.g. green building standards, supporting local food sources

Effective public participation
Township Goal: community members in democratic municipal processes, educate community members about Township issues seek input from residents
Current Practices: residents invited to meetings, to join boards and commissions; website provides some electronic information and services
Recommendation: Encourage residents to participate in public meetings and community decisions.

Ultimately, Monroe Township must develop strategies to plan for current and future generations of residents. By committing to follow through on this report, the Association and the township are working to preserve and enhance our watershed and the communities within it. This report is the next step in realizing that vision.

Acknowledgements

We commend Monroe Township's leaders and professionals for participating in this program and for supporting the Watershed Association in evaluating current practices. It is difficult for anyone, whether an individual or a municipal body, to have the courage to evaluate current work, determine where and how to improve a current system, and if necessary develop a new strategy. We want the readers of this report to look at not only what can be done, but what has already been accomplished in Monroe Township.

Our hope is that Monroe will learn from and expand on its own experiences, challenges, and successes, as well as those of surrounding municipalities, keeping in mind that zoning and policy should look regionally to provide comprehensive and sensible growth. We also look forward to partnering with the Township in embracing new opportunities that protect and enhance the character and natural environment that makes Monroe a special place to live.

We thank the Geraldine R. Dodge Foundation and the U.S. EPA for their generosity in funding this project, and the members of the Monroe Township Council, Planning Board, Environmental Commission and staff for their responses to our survey. We would also like to acknowledge the individual input of John Riggs, Leslie Koppel-Egierd, Michael Costello, Roger Dreyling, Todd Ochsner, all those who responded to the survey, and to Ed Byrne who provided memories and resources on Monroe's history. Your time and dedication to this project is greatly appreciated.

Stony Brook Millstone Watershed Association

Although the information in this document has been funded wholly or in part by the United States Environmental Protection Agency under assistance agreement WS982909-03-0 to the Stony Brook-Millstone Watershed Association, it has not gone through the Agency's publications review process and, therefore, may not necessarily reflect the views of the Agency and no official endorsement should be inferred.

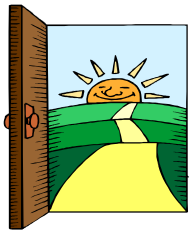
How To Use This Report

Each "step" in the assessment report lists Monroe's Goal for a specific subject according to the Master Plan and survey responses and the Current Practices in the Township's codes, ordinances, and policies. To guide our evaluation of these areas, we developed a checklist that covers areas important to land planning techniques, land conservation, how the municipality addresses environmental issues and what watershed stewardship projects are underway. We also interviewed key personnel.

Each chapter - or "step" - in the assessment report lists the Township's *Goal* according to the Master Plan and survey responses and the *Current Practices* the Township has implemented in codes, ordinances and actions. The heart of each step focuses on the *Options* for new opportunities. Here we suggest a menu of choices for planning and conservation projects to implement now and in the future. The *Did You Know* section contains supporting information such as initiatives in other communities that may provide models for action. Finally, *Additional Resources* provide additional guidance on the subject.

We intend that this report serve as a guide and inspiration for work: a catalyst to achieve responsible planning and environmental quality. In addition, it provides an opportunity for municipalities to support other community and local not-for-profit groups and foster a regional approach to any of these issues. Future boards and committees should refer to this document for ideas and guidance and to make connections with other communities and local organizations. As an interim step in the implementation of these practices, the report offers a variety of recommendations, which the Association is partially funded to help implement.

Next Steps



Once the Assessment report is presented and a short list of priorities is determined, the Watershed Association will work with Township officials to implement the recommendations using models and guides. This partnership will enable the Watershed Association to support Monroe's efforts in providing citizens with a sense of community, a healthy environment and a strong economy. By committing ourselves to follow through on this report and its results, the Watershed Association is achieving its mission of protecting and preserving the health of the watershed.

Highlights of Your Town

When beginning this assessment, members of the Monroe Township Council, Planning Board, Environmental Commission, and various staff articulated their goals and vision for the Township by responding to our survey (see Appendix A). It is important to note some proactive measures that have been implemented within the community and that have created the unique place that is Monroe.

Monroe's Vision

Monroe's character is defined largely by the Township's two dominant land uses: senior citizen (planned retirement community) developments, and natural areas. Agricultural, commercial, recreational, and single-family and multifamily residential uses also exist but they are not as dominant in the landscape. Seeking to *preserve* this balance and *enhance* the natural component is at the core of the community's vision:

- Survey respondents emphasized the importance of controlling growth and the goal of preserving a 50/50 balance between developed areas and open space.

- The 2003 Master Plan Land Use Goals and Objectives section notes that "future residential and nonresidential growth should be planned to preserve environmentally sensitive areas, create open space and preserve the rural suburban amenities of the community." The Plan states an objective to "retain 50% of the Township" by "open space acquisition, environmentally sensitive area preservation, and farmland preservation."

- The Master Plan Conservation Plan Goals and Objectives section states the objective to "preserve and protect environmentally sensitive lands and natural resources" by such methods as utilizing "the Natural Resource Inventory and GIS Base Map to identify floodplains, wetlands, aquifer recharge areas and woodland[s] and ensure their protection through State and local land use controls"; "develop additional land use policies to preserve and protect natural resources"; restrict development in critical environmental areas; "provide a continuous network of open spaces along streams, open spaces and critical environmental areas through cluster subdivisions techniques"; "restore and preserve existing bodies of water. " and "protect unique agricultural resources."

Highlights of Your Town (cont'd)

- The Master Plan Parks, Recreation and Open Space Goals and Objectives section states the objective to "provide for adequate parks, open space and recreational facilities for present and future population, and protect wildlife and biodiversity through a comprehensive recreation and open [space] plan that includes…[methods to] continue the acquisition of open space….encourage a network of pedestrian greenways along stream corridors and bicycle paths… provide for an additional 2000 acres of natural open space which would protect natural resources and environmentally sensitive areas while providing compatible limited recreational facilities…recommend the strategic acquisition of property for preservation, park development and environmental factors…continue to promote Farmland Preservation….". It also notes that "educating the public on the importance of treating the environment with respect and care is critical."

Good Things…

Examples of Monroe's ongoing work to implement the community's vision:

Historic Preservation of Dey Farm complex

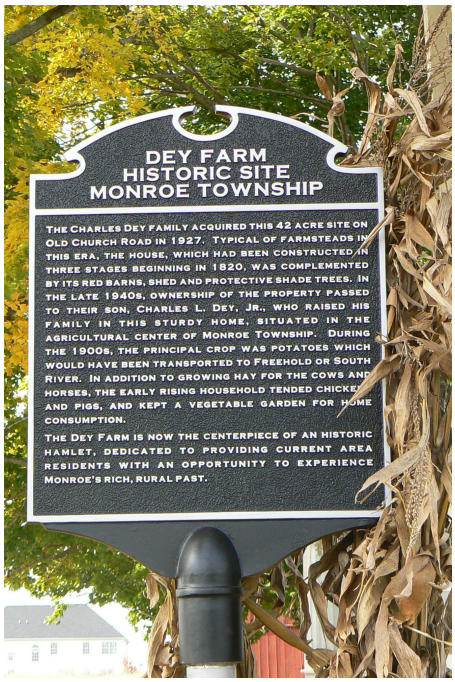
Monroe was extensively farmed for its first 150 years. Agriculture and supporting infrastructure influenced the clearing of woods and the development of roads and villages of the Township. It was not until the late 20th century that small family farms, the primary land use in the Township until that time, began to be replaced with housing developments. Recognizing the value in not only preserving but celebrating this rich history the Township acquired the 40-acre Dey Farm and is creating a historical farm and museum at the site. The plan is to restore the farm in the next few years, to give residents and visitors a sense of a typical 18th-century farm. This project advances the community vision by raising community awareness of the value of working open space in the landscape.

Environmental Protection Manager

While most New Jersey towns have advisory environmental commissions, Monroe is unique in employing a full-time Environmental Protection Manager heading an Environmental Protection Division. As stated on the Township Website, "through the Division of Environmental Protection, Monroe is better able to maintain and protect its air, land, water and energy." The Division "reviews and inspects all development applications to ensure compliance with local, state and federal environmental concerns; follows up on all Board-approved developments to verify adherence to the approved plans with respect to environmental concerns; consults with the Division Director, Township Planner and Township Engineer as necessary to ensure compliance with all matters of environmental nature." Such a commitment to environmental protection helps realize the community vision of planning land use to protect natural resources.

Tree Protection

Monroe's symbol is an elegant, ancient white oak tree that stands in a prominent place in town. Mayor Richard Pucci has written, "The Monroe Oak not only symbolizes the strength and close knit nature of our township, but also our continued support for the local ecosystem and desire to protect Monroe's forestry." The Township has preserved the Monroe Oak as a historic tree "making it the common property of the citizens of the township to be protected and maintained by the township". Monroe has made a number of efforts to protect trees generally. The Township has been a Tree City for 9 years. Under the Shade Tree Master Plan, thousands of trees are being planted throughout the township. A Tree Removal Ordinance that protects trees from removal, and requires replacement of trees greater than a minimum size, has been in place since 1998 and has withstood court challenge. The Shade Tree Commission oversees the tree protection program. Tree protection is one practice by which Monroe advances the community goals of incorporating greenery into the landscape, educating residents about the value of treating the environment with respect and care, and helping protect wooded sites.



Next Steps

Introduction

In 1938, Monroe Township celebrated its 100th anniversary by sponsoring a book written by the Federal Writers' Project. At that time it was still possible to say, "Throughout its history, Monroe has remained agricultural." Over 18,000 of its nearly 27,000 acres were in cultivation at that time. The Township's population stood at about 2900. "Monroe," the book stated, "has not changed essentially since its early days." The landscape consisted of "a rolling sweep of rich farmland and dark woodland," dotted with large farmhouses and outbuildings amongst "friendly hamlets," all connected by "a network of good roads, some dirt, some 'black top.'"

A few decades later, Monroe's character began to change radically. The economics of postwar agriculture favored Western farmers at the expense of small family farms in the East, while demographics, the rise of the automobile and subsidized federal highway system and a higher standard of living all combined to create an insatiable demand for suburban detached housing. Monroe's flat, cleared landscape and proximity to highways proved attractive to developers. In 1965 the first planned retirement community in the Township (now Rossmoor) was created. The steady replacement of farmland with residential developments, in particular senior housing subdivisions, continued into the early years of the 21st century.

Today, Monroe's population is ten times what it was in 1930. Over 60% of the housing stock was constructed after 1980. Yet as noted in the Master Plan, only 36.4% of the Township is developed; while 51% is "farmland or vacant." (Monroe, the largest municipality in Middlesex County, has the second-lowest population density.) Of the undeveloped land, much of it is natural areas. The 2006 Environmental Resources Inventory classifies 31% of the Township (apart from developed land) as wetlands, 17% as forests and 1% as water; another 17% (4048 acres) is agricultural. As noted in the Master Plan, there were about 959 acres of preserved farmland. The Township's vision to preserve a 50/50 balance between developed and open space by controlling growth will therefore probably focus on the remaining unpreserved farmland and any buildable portions of the natural areas.

The senior citizen populace in Monroe is an important factor in planning. The median age of the Township is 58.9 compared with Middlesex County's 35.7. More than half of the Township's population is over 55 years old (the eligibility age for a Planned Retirement Community under Township law). Indeed, more than 36% of residents are over 65, which is three times the statewide percentage. The presence of a large active adult community (many of whom are retired educators) has led to strong support for educational and library facilities, for walking and biking paths, and for open space integrated within the community. The higher-than-median age is reflected in less demand for schools and recreational fields, or for creating local jobs, than in suburban communities with comparable land uses and total population.

While Monroe is unique, the challenge for the Township is one that is not unfamiliar to other municipalities in the watershed: to balance natural resource protection with economic prosperity, encourage business, provide residential services, and determine how to protect and enhance the special character of the Township. Municipal leaders strive to ensure that the needs of current residents are met and that there will be high quality of life for residents in the future. To carry out this important task, officials rely on their Master Plan to provide a vision for the future and use zoning, policies and ordinances as tools to help carry out that mission.

The Watershed Association recognizes the magnitude of this task. We developed the Program for Municipal Excellence with the understanding that the protection and health of a watershed depend on the land use laws and policies that govern development and natural resource protection. In partnering with municipalities we provide an outside evaluation of current practices, and we support planning that protects the natural environment and ensures that the vision in the Master Plan is achieved.

By adopting a Master Plan that guides both growth and conservation, clearly states goals and objectives, and highlights a vision for the future, Monroe is planning for quality of life for both current and future residents. Township leaders are actively working to ensure that their community retains its historic character, environmental health, and viable economy.

The Watershed Association was excited to partner with Monroe on this project. The vision to preserve half of a town's land area as open space demonstrates a fervently held paramount value that a community is healthier, wealthier and wiser when it has space to breathe. Monroe's success in achieving its vision will require creative planning as well. Residents and leaders are committed to pursuing the vision.

STEP 1 Open Space Protection and Management

GOALS: The Master Plan states a goal to "continue the trend in open space acquisition, environmentally sensitive area preservation, and farmland preservation through various planning techniques and State or County funding resources….The objective is to retain 50% of the Township in a combination of the above land categories." The Conservation Plan Element states, "It is vital to recognize the impact and value that natural areas and environmental features have on the overall quality of life in the community. The primary objective is to preserve Monroe's open space and land areas that exhibit environmentally sensitive features." The Land Use Plan Element states the objective to "acquire… additional land that will be retained in open space, recreational land or left as a natural conservation area." The Master Plan goals include "continue the use of practical and flexible zoning controls … to gain open space; conserve the natural landscape… protect sensitive ecological areas."; "encourage noncontiguous cluster development in order to gain open space" and "continue to review the cluster development policy … in order to gain open space." The Parks, Recreation and Open Space element goal is to "provide for adequate parks, open space and recreational facilities, and protect wildlife and biodiversity through a comprehensive recreation and open [sic] plan."

CURRENT PRACTICES: Monroe has an open space tax of 2.5 cents, and has acquired 226 acres of parkland. Local, state and county owned land totals 4757 acres (includes basins, other property). An additional 783 acres is preserved under control of Home Owner Associations; while 1164 acres of farmland has been preserved. Land area totals 26,752 acres. Preservation of land identified as priority 1, 2, and 3 in the Open Space Plan is expected in 2008. The Land Development ordinance permits cluster developments including noncontiguous clusters. Open space in cluster developments may (but need not) be required to be dedicated to the public; the developer may be required to establish an open space organization under NJSA 40:55D-43. Under 108.12-16 open space in developments may be dedicated to the public or remain in private hands and must be subject to restrictions prohibiting subdivision, creating perpetual use, and ensuring "maintenance."

OPTION: ADOPT PLANS AND POLICIES TO FURTHER PROTECT OPEN SPACE.

Specifically, the Township should consider:

- Ensuring the permanent protection of municipally owned open space by third-party conservation easements, then developing and funding a conservation easement monitoring, stewardship and enforcement program
- Creating a natural land open space stewardship plan by establishing management objectives, outlining procedures, and defining responsibilities for restoring and maintaining natural areas
- Within subdivisions, requiring either dedication of open space or stewardship of privately held open space so as to ensure conformity with conservation plan
- Encouraging stewardship practices on privately owned open space (see also Step 7, Conservation Design).

Did You Know?

Ownership of natural areas carries with it a responsibility to manage the open space to achieve conservation objectives. While wilderness areas may to a large extent "take care of themselves," that is not true in central New Jersey where human disturbance of the natural ecosystems – including hydrology and soil changes, invasive species introduction, and nonpoint source pollution – are significant. Here, we must take an active restoration and maintenance role in order to prevent degradation of the natural area. Land conservation in the Northeast has reached a stage of maturity such that natural land stewardship best practices are now being identified.

The basic steps in land stewardship planning are first, to assess the land with an emphasis on its soil, hydrology, past activities, and vegetation; evaluate the relationship to the surrounding landscape; formulate conservation objectives; implement management strategies; monitor results and make changes to objectives or strategies where appropriate. Land stewardship is an application of *adaptive management*: using the framework of "evaluate – plan – act – monitor," new information is fed back into the process, enabling the plan to be updated. Even though the future is uncertain, optimal results are attained by iterative decision-making.

Additional Resources

Community Spaces, Natural Places: A guide to restoration, management and maintenance of community open space, Delaware Department of Natural Resources and Environmental Control (2005). Concepts and guidance on natural habitat management and community involvement, includes case studies. www.dnrec.state.de.us/dnrec2000/Divisions/Soil/dcmp/Open%20Space%20Nov%2005.pdf

A Guide to Stewardship Planning for Natural Areas (2d ed 2006), Ontario Ministry of Natural Resources: written for private landowners but applicable to all natural areas this is a simple guide to creating and implementing a land stewardship plan. www.mnr.gov.on.ca/mnr/forests/public/guide/stewardship_planning/06/stewardship_guide.pdf

Adaptive management of natural resources: theory, concepts, and management institutions (2005: Stankey, George H.; Clark, Roger N.; Bormann, Bernard T., Gen. Tech. Rep. PNW-GTR-654. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station), a comprehensive guide to the underlying principles and practices. www.fs.fed.us/pnw/pubs/pnw_gtr654.pdf

STEP 2 Biodiversity Planning

GOAL The Master Plan states an objective to "provide for adequate parks, open space and recreational facilities for present and future population, and protect wildlife and biodiversity through a comprehensive recreation and open [space] plan…".

CURRENT PRACTICES: The 2006 Natural Resources Inventory maps critical habitats in the Township

based on NJDEP Landscape Project data. This mapping shows areas that can support endangered or threatened species in the Township. Landscape Project follows the statewide Wildlife Conservation Plan in targeting threatened and endangered species. However, it does not assess the value of habitat for supporting plant or wildlife communities, nor does it assess biodiversity.

OPTION: ADOPT PRACTICES TO PRESERVE ECOLOGICAL INTEGRITY OF HABITAT.

Specifically, the Township should consider:

- inventorying plant and wildlife species, communities, and habitat types (including to the extent possible, on private land) to establish baseline measures of biodiversity, -using the above inventory, creating a map to indicate patterns of habitat in need of protection and opportunities for connection through acquisition as well as restoration; work with conservation biologists to interpret the data and conservation planners to implement planning
- do GAP analysis to identify areas where species are not adequately protected
- develop biodiversity plans at municipal or intermunicipal level that seek to protect diversity
- conduct educational sessions on biodiversity for staff, officials/boards and public ; also sponsor NatureMapping training workshops for the community to conduct long-term monitoring
- strengthen Critical Area, Low Impact Development, and Tree Conservation ordinances to enhance ecological integrity (see Step 8)
- Promoting backyard habitat and stewardship

Did You Know?

Biological diversity is "the variety of life and its processes, which includes the abundances of living organisms, their genetic diversity, and the communities and ecosystems in which they occur. Diversity at all levels from genes to ecosystems need to be maintained to preserve species diversity and essential ecosystem services like climate regulation, nutrient cycling, water production, and flood/storm protection." (Environmental Law Institute, 2003). Biodiversity is a relatively new framework for conservation planning. The prevailing approach over the last few decades, protecting threatened or endangered species, has failed to prevent a biodiversity freefall. As stated by the Millennium Ecosystem Assessment 2005, "current rates of loss exceed those of the historical past by several orders of magnitude and show no indication of slowing….Biodiversity is declining rapidly due to land use change, climate change, invasive species, overexploitation, and pollution."

Biodiversity planning does not focus on a single, vulnerable species. The goal is to "keep common species common."

Preventing species from becoming endangered in the first place will depend on protecting, restoring and enhancing ecologically intact communities.

Policy is evolving to address biodiversity. The New Jersey Wildlife Action Plan (Jan. 2008 draft) states, "Managing lands for biodiversity is [a] key thrust of the Plan. … Applying *best management practices* focused on endangered, threatened, and rare species and maintenance or improvement of the ecological integrity of New Jersey's natural communities will be the standard operating procedure on all public lands." (*italic* emph. in original, underlined added).

Municipal biodiversity planning goals include: support diversity *of* habitats at a landscape-level; support diversity *within* habitats by creating/protecting/restoring contiguous habitat, and minimizing invasive species; manage resources sustainable; plan for change.

Additional Resources

- ***GreenFacts on Biodiversity,*** summarizes scientific consensus documents. www.greenfacts.org/en/global-biodiversity-outlook/ and www.greenfacts.org/en/biodiversity/
- ***Integrating Land Use Planning and Biodiversity,*** The Biodiversity Partnership. Online resource center. www.biodiversitypartners.org/pubs/landuse/01.shtml
- ***Biodiversity Conservation Handbook: State, local and private protection of biological diversity*** (2006) and ***Conservation Thresholds for Land Use Planners*** (2003) , Environmental Law Institute, www.eli.org.
- ***New Jersey Wildlife Action Plan***, www.state.nj.us/dep/fgw/ensp/wap/pdf/wapintro.pdf, and ***Natural Heritage Program***, biodiversity clearinghouse , www.nj.gov/dep/parksandforests/natural/heritage/
- ***Chicago Wilderness Consortium Biodiversity Recovery Plan,*** an exemplary regional biodiversity plan. www.chicagowilderness.org/biodiversity/coalition/index.cfm.
- ***GAP Analysis and resources on biodiversity planning, USGS:*** using GIS to prioritize land for biodiversity conservation**,** gapanalysis.nbii.gov/.
- ***Biodiversity Conservation through Local Land Use Planning*** (Metropolitan Conservation Council, 2005). Addresses New Jersey's "perplexing array of plans, stipulations, tools, and directives for municipal land use decision-makers" that hinder effective local biodiversity planning. Uses a "biotic corridor" approach emphasizing habitat integrity. www.wcs.org/media/file/Tech-Paper-9-NJ_Assessment.pdf.

STEP 3 Creation of Greenways /Trails

GOALS:

The Master Plan states objectives to "Provide a continuous network of open spaces along streams, scenic areas and critical environmental area through cluster subdivision techniques" and to "encourage a network of pedestrian greenways along stream corridors…", and to "Provide for an additional 2000 acres of natural open space which would protect natural resources and environmentally sensitive areas." and to "develop linear parks along stream corridors and flood plains…". Further, as set forth in the 2006 Environmental Resource Inventory, priorities in the Open Space Acquisition Program amount to 1800 acres, and are 1, land adjacent to parkland, 2, Millstone River Watershed Conservation Area (environmentally sensitive land adjacent to Thompson Park,) and 3, extension of this area and infill along Thompson Park. Survey respondents strongly emphasized preserving open space and creating contiguous areas or greenways to protect air and water quality, and to protect wildlife habitat and for the aesthetic and recreational and psychological benefits to residents. As noted above, the Parks, Recreation and Open Space element goal is to "provide for adequate parks, open space and recreational facilities, and protect wildlife and biodiversity through a comprehensive recreation and open [sic] plan."

CURRENT PRACTICES:

The Environmental Commission is working on a Trails and Bikeway Development Plan to develop and implement a township plan for trailways for bicycles, pedestrians and equestrian riders, including trails along the Millstone River on land to be acquired by the Township. The Environmental Commission has established a goal of 20 miles of trails in 6 years with 5 miles expected to be completed in 2008; engineering studies are underway.

Open space within cluster developments is to be arranged so as to make connections with current or future open space (sec. 108-6.8(I)(1)(d)).

OPTION: CREATE NETWORK OF GREENWAYS WITH REGIONAL CONNECTIVITY.

Specifically, the Township should consider:

- Continuing to create intramunicipal trail system
- Creating a conservation plan for the Township to identify areas where open space can be connected to establish contiguous areas of open space
- Working with municipalities and organizations to create a comprehensive regional greenway plan that connects township open space into regional greenways
- Link local conservation planning with landscape scale biodiversity plans (step 2)
- Requiring developments with mandated open space to site open space contiguous to existing open space or in accordance with intermediate connections
- Restoring stream and riverbank corridors to provide higher conservation values

Did You Know?

To protect biodiversity, the *pattern* of natural areas on the landscape relative to development is almost as important as the total acreage conserved. Connecting habitat patches together helps provide a more diverse, more resilient network of plant and wildlife communities, integrated into the human community. Property values often increase in the vicinity of greenways and where greenways have recreational uses they generate revenue. Open space improves stormwater management and improves water quality.

The ecological, recreational, economic and psychological benefits of open space do not end at political boundaries. Connecting open space into greenways, and connecting greenways within a region, multiplies the benefits and enables municipalities to combine their resources. Intermunicipal (regional) greenway plans enable municipalities to identify connected open space and strategies to preserve, protect and enhance these greenways.

Greenways may (but need not) contain trails They may follow existing geographic contours such as waterways, hedgerows, or rail lines, or they may be created by connecting landscape types.

Habitat fragmentation is one of the most significant causes of the decline of wildlife. Larger tracts of connected open space generally support biodiversity as well as resilience of natural communities. Creating connected greenways is a step toward "defragging" the landscape.

It is important to note that while connecting open space has conservation benefits for many species, there are instances where connection may be less beneficial (e.g. where it permits introduction of invasive species into an undisturbed landscape.) Greenways – as with all natural areas – need to be managed with land stewardship practices (see Step 1).

Additional Resources

Creating Conservation Networks, The Biodiversity Partnership. How to design and implement conservation networks. www.biodiversitypartners.org/habconser/cnd/

How Greenways Work: A handbook on ecology, by Jonathan Labaree (1997). Primer on designing greenways to provide recreational and ecological benefits Originally published by the National Park Service. www.americantrails.org/resources/greenways/NPSintroGrnwy.html

Inter-Municipal Greenway Planning (2001) , and ***Closing the Missing Link on the Assunpink Greenway,*** (2000)., Delaware Valley Regional Planning Commission. Benefits of greenways, funding sources, and guidance on the planning process including case studies.

American Trails: Greenways & community trails. Resources on greenway projects including case studies on planning and implementation. Emphasis is on trails and recreational opportunities but is relevant to any greenway planning effort. www.americantrails.org/resources/greenways/

Garden State Greenways. Provides interactive mapping tools for planning greenways. www.gardenstategreenways.org

STEP 4 Source Water /Wellhead Protection (Water Quality)

GOALS: The Master Plan states goals to "preserve the quality of both groundwater sources and surface water bodies through flexible design techniques." ; "utilize the Township's Natural Resource Inventory and the new GIS Base Map to identify… aquifer recharge areas and …ensure their protection through State and local land use controls"; "develop additional land use policies to preserve and protect natural resources especially aquifer recharge areas… and "minimize the impacts of development on environmentally sensitive areas including … aquifer recharge areas" and "encourage lot averaging, planned development, cluster development and other techniques in order to preserve … aquifer recharge areas.."

CURRENT PRACTICES:
Potable water is supplied to most of the Township through a combination of groundwater and surface water provided by the Monroe Township Municipal Utilities Authority. The groundwater wells are located outside Critical Area #1. "Due to the quality of the groundwater in these wells, only minimal treatment of the water is required on most of the wells." However, "the area in which new wells may be developed is … constricted by the presence of both man-made and naturally occurring contaminants." (Utility Service Plan)
There is no wellhead protection ordinance. Wellhead protection areas are included as part of the definition of "Environmentally Critical Areas" in the Stormwater Management ordinance but there is no specific protection for such defined Area.
The New Jersey DEP-mapped wellhead protection areas extend beyond the Township boundaries.

OPTION: PROTECT WATER QUALITY OF GROUNDWATER SOURCES.

Specifically the Township should consider:

- Adopting a Wellhead Protection Ordinance.
- Mapping and protecting groundwater recharge areas (see also Step 5), coordinating with MUA and Township water consultant.
- Educating residents on nonpoint source pollution.

Did You Know?

Municipalities can regulate activities in wellhead protection areas under (among other authorities) the New Jersey Municipal Land Use Law, which authorizes each municipality to plan and regulate land use to secure a safe and adequate drinking water supply for its residents, and the New Jersey Local Boards of Health Law, which authorizes Boards of Health to protect public health, safety and welfare.

The area around each public water supply wellhead in the state was mapped by New Jersey Geological Survey to show three tiers of potential contamination, each defined by the time it theoretically takes groundwater to travel to a well: tier 1 is two years, tier 2, five years, and tier 3, 12 years. Since the time it takes a pollutant to migrate to a well is typically correlated with the groundwater travel time, activities may be regulated differently between tiers. The maps can be used to delineate source water protection areas and regulate the activities permitted within those areas – for example, hazardous waste storage, landfills, junkyards, vehicle storage areas, quarrying, or service stations.

The ordinance may apply to changes in land use (in which case it should be adopted as part of the zoning/land use law and the authority with jurisdiction would be the Planning Board or Zoning Board of Adjustment) or existing land uses (in which case the jurisdictional authority would be the municipality's Board of Health). Any such ordinance that regulates underground storage tanks more stringently than NJDEP rules, should be submitted to the NJDEP for review pursuant to NJSA 58:10A.35.

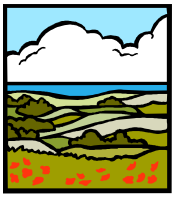
In addition to ordinance prohibitions, effective source water protection programs include educational initiatives to increase public awareness of the importance of best practices in protecting drinking water.

Additional Resources

Model Wellhead Protection Ordinance (part of the Hunterdon County Environmental Toolbox), Hunterdon County Planning Commission. Available at www.co.hunterdon.nj.us/planning/ordinances/toolbox/Environmental_Toolbox-Well_Head.pdf

Ordinance Implementation: Wellhead Protection, Stony Brook-Millstone Watershed Association. Background document on need for wellhead protection, options, and example ordinances. Available online at www.thewatershed.org/images/uploads/Wellhead_Ordinance_Implementation_Package.pdf.

Borough of Rocky Hill (adopted), and ***Montgomery Township (draft) Wellhead Protection Ordinances.*** Available from Stony Brook Millstone Watershed Association.



STEP 5 Groundwater/Aquifer Recharge (Water Quality and Quantity)

GOALS: The Master Plan states a goal to "utilize the Township's Natural resource Inventory and the new GIS Base Map to identify…aquifer recharge areas and …ensure their protection through State and local land use controls." It also states goals to "develop additional land use policies to preserve and protect natural resources especially aquifer recharge areas… and minimize the impacts of development on environmentally sensitive areas including … aquifer recharge areas" and "encourage lot averaging, planned development, cluster development and other techniques in order to preserve … aquifer recharge areas...". Also "Approved or proposed residential growth may in the future be subject to limitation of Township water supply and well draw down limits." The Master Plan also states a general goal to "provide for an additional 2000 acres of natural open space which would protect natural resources…."

The Utility Service Plan Element states a goal to "coordinate the improvement and expansion of the Township's utilities infrastructure to ensure adequate service for present and future development in accordance with the Master Plan Land Use policy and the Water Management Plan."

CURRENT PRACTICES: An Environmental Impact Statement submitted for subdivision or site plan review requires mapping of aquifer recharge areas., and assessment of impact to recharge (Sec. 38-3.4 [a]). Tree Protection Ordinance limits removal of trees; this helps protect some recharge areas. The only direct restriction on impervious cover is for Shopping Centers (60%), (Sec 107-7.2 (14)); Stormwater Management Ordinance seeks to encourage reduction of impervious surfaces. Municipal Utilities Authority Rule W:3-7 requires use of nonpotable water for irrigation, several nonpotable wells are in use.

OPTION: PROTECT AQUIFER QUALITY/QUANTITY.

Specifically, the Township should consider:

- Using NJGS aquifer (groundwater) recharge maps, Township open space mapping and the assessment of high to low recharge rates in the NRI, protect recharge areas by (a) identifying areas for preservation/acquisition, both inside and outside the Township and (b) amending land development ordinance to restrict development density in areas of high to moderate recharge
- Restricting activities with potential for contamination of high/moderate recharge areas
- Defining recharge areas as environmentally sensitive and reducing density of development.
- Adopting ordinances that limit use of pesticides and fertilizers
- Adopting an impervious cover ordinance

Did You Know?

On average, Middlesex County receives 49 inches of rainfall annually. Most of this precipitation runs off the surface into streams. Depending on a site's land use/land cover, topography, bedrock and surface geology, and soil permeability, rainfall can infiltrate into the ground and percolate into aquifers (interconnected underground voids through which water flows). This *recharge* is essential for providing groundwater that supplies wells, and it also is critical for maintaining the baseflow (flow outside of precipitation events) of many streams and rivers.

In Monroe Township, the areas of highest recharge (as noted in the Natural Resources Inventory) are 15 to 18 inches a year, but by far the predominant type of recharge area infiltrates to a lesser degree: 11 to 14 inches a year. Wetlands, which constitute a large portion of land in Monroe, have a poor recharge capability (by definition, wetlands are areas where water saturates the upper layers of soil, and typically these areas infiltrate at slow rates.)

Development can have a significant effect on recharge rates: impervious cover (buildings, roads, parking lots and other paved areas) reduces recharge to zero, while changing land cover types from deciduous woodlands or meadows to lawns reduces recharge and increases runoff. In a watershed, impervious cover greater than 10% is enough to begin impairment of water quality. The Watershed Association has calculated that in the Cranbury Brook Watershed impervious cover (using latest available land cover data, as of 2002) was 15.86% (up from 12% in 1995) and that Monroe Township's impervious cover averaged 10% as of 2002 which was a 34% increase over 1995 (see map Appendix B.) Indiscriminate use of pesticides and fertilizers in agricultural and residential areas of high recharge can decrease water quality as these chemicals are absorbed into the soil and end up in groundwater.

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The New Jersey Environmental Infrastructure Trust makes available low-interest loans (effective quarter-market rate) to help acquire or preserve land to benefit water quality, including aquifer recharge areas. In addition to the low interest, borrowing costs are reduced due to the economies of scale of a pooled bond issue. This funding source implements the federal Clean Water State Revolving Fund. Acquired land may be used for passive recreation (no bike trails); applications of fertilizers and pesticides are restricted. [www.state.nj.us/dep/watersupply/loanprog.htm]

Additional Resources

Ground-Water Recharge and Aquifer-Recharge Potential for Middlesex County, New Jersey, NJGS Open File Map OFM-21, available from New Jersey Geological Survey.

Borough of Mountain Lakes, NJ – Prime Aquifer Overlay Zone (Article VI of Chapter 102 of Code) example of restricting development of a critical recharge area.

Protecting Groundwater Supplies (2005), Stony Brook-Millstone Watershed Association. Citizen's Guide to why and how to protect water quality. www.thewatershed.org/images/uploads/SBMWA_groundwater_guide.pdf

Characterization and Assessment of Cranbury Brook Watershed (2005), SBMWA, includes many findings and recommendations on protecting water quality. www.thewatershed.org/ws_assess_lvl2.php?id=C0_180_50

Pesticide and Fertilizer Guidance (draft), SBMWA (in process): background on effect of these chemicals on water quality, suggested ordinance provisions.

STEP 6 Surface Water/Stream Corridor Protection

GOALS:

The Master Plan includes goals to "minimize the impacts if development on …. stream corridors," "preserve the quality of both groundwater sources and surface water bodies through flexible design techniques," "provide a continuous network of open spaces along streams…" and "restore and preserve existing bodies of water." The Land Use Element includes a goal to "continue the use of practical and flexible zoning controls…in order to protect sensitive ecological areas."

CURRENT PRACTICES:

The Township does not have a stream corridor ordinance. Ordinance provisions protect the flood hazard area (ch. 44 and sec. 108-5.20), prohibit (through the subdivision and site review process) structures and fill within 50 feet of a floodplain and restrict impervious surface within 80 feet of the floodplain (108-5.20 (I)(2)) restrict encroachment within resource protection areas (108-5.20(I)(3)) and allow for a 25-100 foot easement for drainage or stormwater (108-2.9(B)). The Township's tree protection ordinance (108-17ff) helps to protect wooded stream corridors.

OPTION: ADOPT BETTER MANAGEMENT PRACTICES FOR STREAM CORRIDORS TO PRESERVE AND ENHANCE WATER QUALITY.

Specifically, the Township should consider:

- Adopting a stream corridor ordinance using the 2007 Stony Brook-Millstone Watershed Association Model.
- Encouraging residential, business and institutional riparian buffer practices (such as not mowing to the stream bank and replacing turfgrass with native riparian trees, shrubs and herbaceous plants) by, for example, promoting participation in the Watershed Association's River-Friendly programs; model behavior by certifying municipal properties
- Protecting stream corridors through acquisition of, or implementation of conservation easements on, riparian open space (see steps 1 and 3)
- Adopting a stormwater mitigation plan and identifying potential retrofit projects such as restoration of eroded streambanks

Did You Know?

A stream corridor, or stream valley, is a complex and valuable ecosystem that includes the land, plants, animals and network of streams within it. Recognition of the value of stream corridors has come with the understanding of what has been lost through uninformed or misguided actions on many streams and the watershed that nourish them.
If stream corridors are maintained in their natural condition, with minimum disturbance, then they are instrumental in performing the following functions:
-Removing sediment, nutrients, and pollutants by providing opportunities for filtration, absorption, and decomposition;
-Reducing stream bank erosion by slowing stormwater velocity, which aids in allowing stormwater to be absorbed in the soil and taken up by vegetation;
-Preventing flood related damage to surrounding communities;
-Displacing potential sources of nonpoint-source pollution from the water's edge;
-Providing shade that maintains cooler water temperatures needed by certain aquatic species during the hot summer months;
-Maintaining genetic diversity;
-Helping maintain adequate flows of filtered water to underground aquifers; and
-Providing greenway corridors for wildlife.
The Association's River-Friendly Resident program would enhance water quality protection in the Borough. Individuals, businesses and institutions can find out more about becoming "river friendly" by contacting the Association. (see below)

Additional Resources

Model Stream Corridor Ordinance and Implementation Package. Stony Brook-Millstone Watershed Association. The Watershed Association also has on file stream corridor ordinances from other New Jersey communities. www.thewatershed.org/managing_resources.php?id=C0_45_32

The Watershed Association has ***River Friendly Programs*** for Residents, Businesses and Golf Courses. These programs help participants set goals for water conservation and land management practices on their property. After reaching their goals, participants become certified and are able to share successes with others in the town and throughout the watershed. For more information contact the Watershed's Environmental Stewardship Specialists at: 609.737.3735 or see www.thewatershed.org/river_friendly_program.php.

Stream Corridor Restoration: Principles, Processes and Practices, by the Federal Interagency Stream Restoration Working Group (10/1998, rev. 8/2001).
This benchmarking document is used by agencies and others to restore the function and values of the nation's stream corridors. www.nrcs.usda.gov/technical/stream_restoration/.

STEP 7 Conservation Design

GOALS:

Master Plan Land Use goals include "continue the use of practical and flexible zoning controls in order to …conserve the natural landscape" and "continue to review the cluster development policy with the objective to … preserv[e] environmentally sensitive areas." Master Plan Conservation goals include "develop additional land use policies to preserve and protect natural resources," and "encourage lot averaging, planned development, cluster development and other techniques in order to preserve natural amenities."

CURRENT PRACTICES:

§ 108-5.11 of the Land Development Ordinance (Preservation of natural features) requires that, "Wherever feasible, all of the following shall be preserved in their natural state": designated floodway areas, areas containing a significant number of specimen trees, watercourses, ponds, marshes and swamps; wetlands and hydric soils; slopes in excess of 10%; endangered flora and fauna and Township-designated unique trees.

Cluster development provisions (§108-6.8.I and §108-6.4) have the objective to reduce lot size and preserve open space as well as natural features within a site by permitting the same "gross density" on site with smaller lot size. Clusters are options in certain zones. Cluster provisions do not require open space per se, only by implication (i.e. the unimproved portion of the tract). Open space "should be so arranged that connections can be made to existing or future adjacent open spaces" and "shall include, wherever feasible, natural features." (§108-6.8.I (1)(d)(6),(7)).

OPTION: ADOPT A CONSERVATION DESIGN ORDINANCE

Specifically, the Township should consider:

- Using the Natural Resources Inventory and Open Space plan to identify existing and potential corridors and connections between natural areas (see step 3)
- Using the NRI description of scenic roadways to cerate buffer areas that will preserve viewsheds
- Adopting a conservation subdivision design ordinance that requires new subdivisions to be planned so as to preserve natural features, environmentally sensitive areas and open space connections, and excludes such constrained areas from density calculations. Such areas can be protected further by conservation easement and stewardship plans.

Did You Know?

Conservation design, or conservation subdivision design, differs from cluster development in several significant ways. Most importantly the conservation subdivision does not start with a density calculation. It begins with the site's natural features. Using the Natural Resources Inventory and (where appropriate) supplemental data and field studies, a sketch plan identifies natural features such as wetlands, buffers, woodlands, steep slopes, stream corridors, viewsheds and critical habitat as well as opportunities to connect with existing networks of open space. These features are excluded from the buildable portion of the site (and ideally are protected by conservation easement). House lots, roads and community open space are then sited to take maximum advantage of the site's unique characteristics. The developer works with the township to design an appropriate site prior to preparing an engineered site design for approval. The ordinance may give a developer a density bonus for exceeding certain requirements.

Conservation design subdivision ordinances enable a municipality to accommodate both development and conservation. Such planning techniques assume that additional growth and development is appropriate within the municipality (which will depend on the community's goals as expressed in the master plan) and they do not address the larger planning issue of regional sprawl (which the State Plan attempts to address).

Additional Resources

Conservation by Design, developed by Randall Arendt, is a comprehensive planning approach to the conservation design subdivision. Arendt's website has a wealth of resources on the subject, including the free booklet *Growing Greener: Putting Conservation Design Into Local Codes* (derived from a longer book) and a factsheet comparing conservation design ordinances with cluster subdivision ordinances. www.greenerprospects.com.

Montgomery Township, NJ Conservation Subdivision Ordinance (Code Section 16-6.5(g)). Example of conservation design (optional) within a residential zoning district, which protects natural features without requiring clustering of lots.
See www.montgomery.nj.us/.

Franklin Township (Somerset County), NJ Conservation Design Master Plan Amendment (2006), cogently explains the difference between cluster options for preservation, and conservation design ordinances. Furthermore, although Monroe's Master Plan goals include "other techniques" to preserve natural features, if desired the Master Plan could be amended to include similar language.
www.franklintwpnj.org/Franklin_MP_2006/Franklin%20MP%202006.pdf

The Conservation Subdivision Design Project: Booklet for Developing a Local By-law A Metropolitan Area Planning Council (Mass.) publication provides background and commentary on conservation subdivision design. www.mapc.org/regional_planning/Booklet%20for%20Developing%20a%20Local%20Bylaw%20-%20Aug%202000.pdf

STEP 8 Critical Areas Protection

GOALS: Master Plan Land Use goals include "continue and augment land use policies that reduce residential densities in appropriate areas and preserve open space farmland and critical environmental features." Conservation Plan Element goal is "to preserve Monroe's open space and land areas that exhibit environmentally sensitive features." Inventory within Conservation Plan identifies "important areas for conservation measures" including "watershed areas, aquifer recharge and wellhead areas, surface and ground waters, flood damage protection areas, and wetlands and woodlands."

CURRENT PRACTICES: Tree Preservation Ordinance (Code Ch. 97) and Tree Protection Ordinance (§ 108-17ff) restrict removal or destruction of trees; requires tree planting in "sparse" subdivisions. Stormwater Management Ordinance (§ 108-5.27) encourages Low Impact Development techniques. Sec. 108-5.11 of Land Development Ordinance requires that certain natural features be "preserved in their natural state" whenever feasible (see Step 7 above). Within floodplains, §108-5.20(I)(3) restricts encroachment on "marshlands" and "areas where conservation is required." Section 108-12.14(A)(3) provides that in site plan review "The reviewing agency may require larger lots where such lots are plotted on a tract or tracts containing tidal or freshwater wetlands, steep slopes in excess of eight percent (8%), lakes and ponds, stream corridors, floodways and floodplains. Where such conditions exist, the board may require that each lot contain an area unencumbered by the aforementioned conditions equal to the minimum area requirements of the respective zone district." Conservation easements (25-100 feet) may be required to protect streams (108-2.9(B)).

OPTION: ADOPT ORDINANCES TO IMPROVE PROTECTION OF WOODLANDS, WATERWAYS, WILDLIFE HABITATS.

Specifically, the Township should consider:

- Adopting a Woodlands Ordinance that protects forested areas and requires afforestation in new developments to increase contiguous woodlands;
- Providing for conservation easements to be deeded to the Township to further protect environmentally sensitive areas within developments
- Adopting a net-density technique for calculating permitted lot sizes, exclusive of environmental features
- Improving Tree Protection Ordinance to protect trees during construction.
- Adopting a Stream Corridor Ordinance (see Step 6), and Conservation Design Ordinance (see Step 7).
- Requiring Low Impact Development techniques.
- Requiring native plant species in landscape design

Did You Know?

Woodlands provide quantifiable social, health, economic and environmental benefits to the community. Forested watersheds enjoy significantly higher water quality than those without wooded areas. Forest cover in New Jersey provides ecosystem services valued at $2.2 billion per year, primarily by creating habitat for wildlife. The larger the contiguous woods, the higher the diversity and more resilient the population. Woodland ecosystem services also include support of water supply, pollination and aesthetic and recreation. Woods provide privacy, buffer road noise and provide cooling and shading, reducing energy costs. Property values are higher for homes next to woods.

Additional Resources

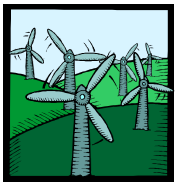
Robbinsville Township, NJ Natural and cultural resource conservation ordinance (Code § 142-40). Requires , inter alia, that all sites "shall provide a minimum of 20% of the tract area in forest, if less than 60% of the predevelopment site is woodlands and provide a minimum of 40% of site in forest, if greater than 50% of the predevelopment site is in woodlands either through conservation or through afforestation." Other conservation provisions include required resource conservation plan, tree protection during construction and topography conservation. www.robbinsville-twp.org/

Building Greener Communities: Planning for Woodland Conservation, Prepared for the North Jersey Resource Conservation and Development Council and the Hunterdon County Planning Board. Prepared by Marybeth H. Carter, ASLA, AICP. June, 2003. www.njrcd.org

NJ Department of Environmental Protection. Green Communities Challenge Grants are available through the NJ DEP and will be awarded to communities for the development of comprehensive community forestry management plans. www.nj.gov/dep/parksandforests/forest/community/grants.html

Valuing New Jersey's Natural Capital, NJ Department of Environmental Protection, (April 2007). Report on the economic value of woodlands, wetlands, riparian buffers and other "natural capital." www.nj.gov/dep/dsr/naturalcap/

Preserving Trees Affected by Development, from A Technical Guide to Urban and Community Forestry, US Forest Service. Provides guidance on how to preserve trees during construction; how to protect tree roots and soil; post-construction site assessment. www.na.fs.fed.us/Spfo/pubs/uf/techguide/preserving.htm



STEP 9 Sustainable Community

GOALS: :

The Master Plan includes a goal to "encourage energy conservation through subdivision and site plan techniques." The Utility Service plan includes a goal that "water conservation and retention policies should be established for all future developments." Survey respondents indicated support for goals relating to a sustainable community such as energy conservation/emissions reduction.

CURRENT PRACTICES:

The Township has established a committee to study adopting a "green building" ordinance. The Township has proposed to conduct an Energy Audit. The new elementary school will be LEED certified. The new firehouse for Fire District 2 will incorporate Solar panels and other green elements supported by a grant from the Middlesex County Sustainable Economic Growth Improvement Fund. The Township has a long history of promoting tree planting and preserving trees and woodlands, which reduces energy use and may help absorb greenhouse gases. There is an active Farmland Preservation program including a 5200 acre Agricultural Development Area. Buffer ordinances increase "green" elements in the landscape. The Township conducts a recycling program including electronics.

OPTION: ENCOURAGE SUSTAINABLE PRACTICES THROUGHOUT THE COMMUNITY.

Specifically, the Township should consider:

- Adopting standards and incentives for green buildings and communities into ordinances including encouraging wind energy, solar panels, green roofs
- Incorporating green building standards into building codes
- Adopting energy conservation measures for public buildings and reduced fossil fuel energy usage for public fleet vehicles
- Supporting "local economies" particularly local food sources, to reduce energy used in transportation and shipping, such as by preserving farmland, sponsoring farmers markets, and supporting community produce gardens and orchards in open space.
- Promoting water conservation
- Exploring programs to expand and improve open communications in the public decision-making process.
- Adopting energy renewal goals for the community that further the Global Warming Response Act and State Energy Master Plan

Did You Know?

"Sustainability" is a concept that derives from the 1987 Brundtland Commission's formulation of "sustainable development" that "meets the needs of the present without compromising the ability of future generations to meet their own needs." Two aspects of sustainability that relate to energy use goals are (1) reducing emissions of greenhouse gases in order to mitigate and prevent catastrophic climate change, and (2) decreasing use of nonrenewable (fossil) fuels (oil, gas, natural gas, coal) in order not to deplete resources for the future. These goals can be met by reducing energy use overall as well as by increasing the proportionate use of renewable energy.

According to the U.S. Department of Energy (DOE), residential and commercial buildings account for 40% of all energy consumption in the US, and 40% of all carbon emissions. Since 1990, 48 percent of the increase in U.S. carbon emissions can be attributed to increasing emissions from the building sector (about 1/6 of that in their construction, and 5/6 in their operations).

Reducing the energy consumption and greenhouse gas emissions from buildings is the primary objective of a "green building code". One standard that addresses these objectives is the LEED (Leadership in Energy and Environmental Design) standard of the US Green Building Council. Another effort is the Green Building Toolkit, a joint initiative of the American Institute of Architects and the US Council of Mayors.

Also according to the DOE, about 28 % of the energy we use goes to transporting people and goods from one place to another. Of the fuels used for transportation 62% is gasoline, 24% diesel fuel. Very little energy used for transportation is "renewable" such as biodiesel, electric, or hydrogen.

New Jersey's Global Warming Response Act (2007) established Renewable Portfolio Standards that require 20 percent of the State's electricity demand to be produced from specified renewable sources by 2020 including solar, wind, geothermal, and sustainable biomass.

Additional Resources

New Jersey Global Warming, www.state.nj.us/globalwarming/, ***NJ Clean Energy***, www.njcleanenergy.com ,and ***New Jersey Energy Master Plan***, nj.gov/emp/ have resources for reducing energy use and increasing the proportion of renewable energy used.

Green Building Code Toolkit for Mayors. American Institute of Architects. Toolkit to achieve a goal of reaching a 50 percent fossil fuel reduction by 2010 and carbon neutral buildings by 2030. Includes an overview of green building issues, sample ordinance language that has already been used effectively, and real-world examples of what communities are already doing to pursue green building programs. http://www.aia.org/aiarchitect/thisweek06/1110/1110n_mayors.cfm

LEED Resources. US Green Building Council. The LEED reference systems, guides and case studies for new and retrofitted construction; also standards for designing communities. www.usgbc.org/DisplayPage.aspx?CMSPageID=75&

STEP 10 **Effective** Public Participation

GOALS: To include community members in democratic municipal processes, and to educate community members about issues in the Township and seek input from residents. The Master Plan Parks, Recreation and Open Space element includes the goal "Educating the public on the importance of treating the environment with respect and care is critical." Survey respondents generally praised the Township's civic-minded good government and suggested improving public participation in decisions and knowledge of the Township's resources.

CURRENT PRACTICES:
Township residents are invited to attend Committee meetings and participate in the public comment portion of the meeting. Numerous boards and commissions exist. The Township's website includes Committee calendars and agendas (no minutes), newsletter, Mayor's message, and the Code of Ordinances. It is structured as a conventional website wherein the resident is a consumer of government services rather than a participant in process.

OPTION: ENCOURAGE RESIDENTS TO PARTICIPATE IN PUBLIC MEETINGS AND COMMUNITY DECISIONS..

Specifically, the Township should consider:

- Improving the Township's Website to provide more information about civic processes by posting meeting minutes and Master Plan; provide more information about the environmental resources of the Township by posting maps and text of the NRI as well as agendas and minutes of the Environmental Commission, Planning Board, Shade Tree Commission, and Open Space and Farmland Commission; trail maps.
- Providing video access to Township meetings via TV and Internet.
- Encouraging creation of educational programs and walks to learn more so the public can learn more about their community's natural and historic resources.
- Exploring programs to expand and improve open communications in the public decision-making process
- Provide email update service
- Use the Township's Website as a medium for resident participation in the civic process by such means as blogging or other two-way forums.

Did You Know?

Empowering community members to make informed decisions based upon the best available information will result in a commitment to a future that reflects the will of the people and provides a unified focus for all municipal activities.

Education programs sponsored by museums, nature centers, and community organizations encourage lifelong learning about issues so that individuals can make well-informed decisions.

Raising public awareness of and support for community goals and conveying information on indicators for these goals will encourage residents to apply practices towards these goals into their daily lives.

Partnerships extending throughout communities and levels of government will encourage support for community decisions, processes, and assessments.

Additional Resources

The Municipal Research and Services Center of Washington provides concrete suggestions on improving the open communication process by ensuring that public participation is meaningful. www.mrsc.org/. Also here are resources on eGovernment: www.mrsc.org/Subjects/infoserv/egov.aspx and infoserv.aspx.

North Hampton, New Hampshire conducted a pilot project called Sustainable Development in the Little River Watershed. This document gives a glimpse of the citizen participation involved in the visioning process. Please contact the Watershed Association for more information.

Public Linkage, Dialogue, and Education: Task Force Report. This document, distributed by the President's Council on Sustainable Development, provides sufficient case studies and results from projects throughout the country. Focuses mostly on sustainable development, but citizen participation efforts are well laid out and assessed. This document is available at the Watershed Association..

Appendix A
Summary of Municipal Officials Survey

To: Monroe Township Point Committee

From: Stony Brook Millstone Watershed Association

Date: October 5, 2007

Re: Municipal Assessment Survey Response Summary

This memo summarizes the eleven responses we received to our Municipal Assessment Survey, which was distributed to various Monroe Township officials and volunteers, and places those responses in context with the goals stated in Monroe's Master Plan (2003).

The first question asked the recipients to tell us their **vision for the future of Monroe Township**. Almost all respondents' vision includes some form of controlling growth. Many mentioned keeping Monroe's rural/ suburban character. Six specifically mentioned preserving open space (one suggested keeping 50% open). Other open space suggestions included keeping a buffer along the Millstone River; expand Thompson Park with buffering; create recreation walking/bike trails.

The vision of the community to control growth and preserve half of the Township as open space is reflected in the Master Plan as well. Master Plan goals express the vision of a Township balanced between open space and developed land. The top goal for Residential Land Use is to "preserve and protect existing viable residential neighborhoods by promoting development within the framework of existing zoning densities" – and another goal is to "continue the trend in open space acquisition, environmentally sensitive area preservation and farmland preservation…The objective is to retain 50% of the Township in a combination of the above categories." The Parks recreation and Open Space Element of the Master Plan states that "The goal is to preserve 50 percent of the Township's land in open space, wetlands, farmlands and State and County lands."

Although there is a clear preference for segregating residential, commercial and industrial areas there is not a clear direction suggested in the survey responses for the role of industry in the future of the Township; one suggested keeping industry to a minimum and one suggested increasing corporate occupancy of industrial park; others mentioned keeping commercial development out of residential areas and locating along route 33. The responses should be compared with the Master Plan goals to "encourage appropriate commercial development in areas of population concentration and in areas so zoned and in the Route 33 corridor" and to "promote industrial development in [specified areas]" and the Economic Plan element to encourage "continued light industrial and commercial development in appropriate areas."

Several respondents mentioned preventing traffic congestion. Low or stable taxes, and good schools were also mentioned several times. Another suggestion was for a Performing Arts Center. One respondent specifically mentioned adhering to the Master Plan to prevent overbuilding, traffic congestion, and overburdening the school system and to keep open space for recreation and air quality.

We next asked the recipients to list their **goals for the *environment***. Again, a majority stressed preserving open space, both for esthetic reasons ("greenery" was mentioned several times) and for air and water quality objectives. Several suggested protecting natural areas. One respondent suggested protecting wildlife habitats by acquiring contiguous parcels of open space, creating opportunities for environmental education. The Master Plan Conservation Plan element goal is to "preserve and protect environmentally sensitive lands and natural resources" through multiple methods including among others, the use of the Natural Resources Inventory to identify floodplains, wetlands, aquifer recharge areas and woodlands and ensure their protection; restricting development in critical environmental areas; providing a continuous network of open spaces along streams, scenic areas and critical environmental areas through cluster subdivision techniques; and encouraging development techniques to preserve natural amenities, woodlands, scenic views and open space and aquifer recharge areas and farmland. Also the Parks, Recreation and Open Space element goal is to "provide for adequate parks, open space and recreational facilities, and protect wildlife and biodiversity through a comprehensive recreation and open [sic] plan…"

In addition to open space, respondents indicated goals for a sustainable community. Several suggested efforts for energy conservation/emissions reduction such as green buildings and low-emission school buses. The Master Plan Conservation Element includes a goal to "encourage energy conservation through subdivision and site plan techniques." The Utility Service plan includes a goal that "water conservation and retention policies should be established for all future developments."

Other specific goals mentioned by respondents included the following. To use any additional analysis based on varying the zoning, densities, or land use to evaluate potential impacts. Encourage more creativity in our buffering to provide roadside environments not repetitious green walls. Coordinate with County Health Dept. Press for more timely remediation of known contaminated sites. Reducing traffic congestion by designing roads to minimize travel distances and encouraging mass transportation; creating trails/pedestrian/ bike paths. Use cluster zoning to secure land that complements overall open space plan instead of many small isolated parcels. Banning ATVs in preserved natural areas.

We asked respondents to list their **goals for the *social character*** of the Township.

More than half the respondents mentioned the 50/50 mix of generations (family and seniors), a characteristic of the community (almost half of residents live in age restricted communities), as a goal. Several of these suggested a strategy to integrate generations. Three suggested open space and recreational areas should be encouraged. The Master Plan goals reflect this vision; a top Land Use element goal is to "maintain a sound balance between

planned retirement communities and non-age restricted residential development." One Parks, Recreation and Open Space Plan goal is to "continue to enforce a sense of pride in the park and recreational facilities within the community through youth sports groups, clubs and organizations and adopt a parks program."

Other specific goals mentioned were: --courtesy and respect for others, -- -low crime rate --Encourage cluster development to insure greater amount of open space; preserve environmentally sensitive areas, e.g., stream corridors, wetlands and woodlands.-- Work towards increased recreational areas, such as bike paths and pedestrian greenways.-- Population should max out at 40-45,000. – Explore forming joint ventures with Jamesburg, the hole in the donut, to save both municipalities money.

We asked respondents to list their **goals for the *economic viability*** of the Township. Some responses focused on encouraging business development in the route 33 corridor, and supporting retail for local needs; others had more general goals of a mix of small/ large businesses; light industry to help with taxes; growth of income and employment; while one respondent noted that rapid growth will inevitably cool as the amount of undeveloped land diminishes and thought needs to be directed toward alternate ways of maintaining a low tax rate and high quality of life.

The Master Plan Economic Plan is consistent with these statements, as the goal is, as noted above, to encourage and direct the continuation of light industrial and commercial development in the route 33 corridor.

We asked respondents to list their **goals for the *historic* aspects** of the Township.

All those who responded supported preservation of historic buildings and sites. One also suggested creating a historic district. One also suggested acquisition by the Township of historic houses/farms. One suggested creating a kid-friendly visitors center to depict the history (including geologic history); similarly one suggested creating a public register/ display for historic artifacts and documents and encourage public to donate. Only one specific site was mentioned: the Dey Farm/Farm and Home Museum. Another suggestion was to publish a Township history.
The Master Plan Historic Preservation Element goal is to "Preserve and protect the historical sites and villages within the Township." The Master Plan includes a historic resources inventory.
The respondents were asked to discuss **how Monroe is protecting**:
open space:
Most respondents mentioned the aggressive program of purchase of open space and development rights, one noting that Monroe is the leader in the county. Many said zoning (including, several noted, cluster development). One said "working with Stony Brook Millstone Watershed Assn." Other points noted --encouraging farmers to join farmland preservation trust –requiring developers to delineate wetlands buffer boundaries -- expanding Thompson park -- accepting dedication of "useless" site areas --creating position of Environmental Protection Manager – buffering streams and wetlands – TDRS

– saving wetlands. The Master Plan Land Use element includes the goal to "continue the trend in open space acquisition, environmentally sensitive area preservation and farmland preservation through various planning techniques and State or County funding resources." The Master Plan Conservation Plan element notes goals to "develop additional land use policies to preserve and protect natural resources especially aquifer recharge areas and mature woodland in the Township," to "provide a continuous network of open spaces along streams, scenic areas and critical environmental areas through cluster subdivision techniques," and to "recommend the strategic acquisition of property for preservation, park development and environmental factors."

The Master Plan includes a comprehensive open space plan whose goals include , among others, "to provide for the retention of environmentally critical areas and open space and recreational land through flexible development techniques" and to "provide for 2000 acres of natural open space…through clustering, lot averaging and transfer of development rights" and to "develop linear parks along stream corridors and flood plains, on abandoned rail lines and along utility easements for the creation of hiking paths and bikeways."

***water quality* and *groundwater*,**

Respondents noted stormwater regulations, wellhead protection, recognizing areas of the Township that are geologically sensitive, protecting wetlands, making developers sample for pesticides/herbicides; regulation separating potable and irrigation pipes; saving open space in recharge areas. Occasionally extending public sewer to areas with failed septic systems. One noted there is wellhead protection by limiting development near Township wells and separated potable needs from potable water supply.

The Master Plan Conservation element includes goals to "preserve the quality of both groundwater and surface water bodies through flexible design techniques" and to "restore and preserve existing bodies of water for scenic and water conservation purposes." The Utility Service plan includes a goal to "continue to ensure an adequate and safe water supply by adopting a zero loss recharge standard within aquifer recharge outcrop areas."

***viewsheds*,**

Respondents pointed to requirements that new developments have tree buffers. Three mentioned open space preservation as a protective measure.

The Master Plan Conservation Plan element notes a goal to "encourage lot averaging, planned development cluster development and other techniques in order to preserve …scenic views…"

and *other natural resources*.

The Natural Resources Inventory (updated 2006) was mentioned.

The Master Plan Conservation Plan element notes a goal to "utilize the Township's Natural Resources Inventory and the new GIS Base Map to identify flood plains, wetlands, aquifer recharge areas and woodland and ensure their protection through State and local land use controls."

The respondents were asked to identify what they thought were **the Township's strengths and weaknesses**. Strengths most often cited were the civic-minded, good government providing good services and good schools. Also noted were the protection of open space including zoning to protect open space and require large lots; strong community with talented people; low taxes and low crime rate; real estate decisions made by Board of Education.
Monroe's chief weaknesses according to the respondents are growth-related; several noted roads and schools are not adequate for growing population. Other points noted: Environmental Commission is advisory only and can be ignored. -Lack of unity of different age groups. -No community center. -Lack of affordable housing.
Next, the respondents were asked to identify **strengths and weaknesses in the Township's efforts to protect the environment**. These similarly stressed the Township's civic-minded government and the challenge of dealing with growth on the other hand. The strength cited most often is Township's commitment to protecting the environment (including open space preservation, selection of knowledgeable Environmental Commission members, and having an Environmental Protection Manager; water and sewer regulations, buffering and bulk trash pickups). One weakness cited is too-rapid growth; another is the need for tougher ordinances; one suggested updating the Conservation Element and Open Space/ Parkland Element of the Master Plan and creating an open space management plan. One said lack of public interest and participation is a weakness.
Finally, the respondents were asked **how the Township encourages public participation**. Several noted that Township board/commission meetings are open to public input is welcomed, and meetings are advertised. One noted in addition to meetings, that public participates via sports leagues, PTA, volunteering. Several said that more can be done to encourage public participation – participation is low for the meetings open to the public. One suggestion was to generate interest by creating a local land trust or friends of the park, and hiring a local or county naturalist to conduct walks and educational programs.

The Master Plan Parks, Recreation and Open Space element includes the goal "Educating the public on the importance of treating the environment with respect and care is critical."

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As the Watershed Association prepares the next phase of the assessment, we look to the Master Plan, Land Use and supporting ordinances, and these survey responses to provide the areas where we can help Monroe's land use and environmental practices better fit the community's vision. Based on the responses of this survey and on the Master Plan, the Association will focus its assessment of ordinances and Best Management Practices on the following areas:

- Open space protection and management
- Greenways/trails
- Sourcewater/Wellhead protection
- Surface water/stream corridor protection
- Biodiversity planning
- Conservation design
- Aquifer/groundwater recharge
- Sustainable community
- Critical areas protection
- Historic preservation
- Public participation

These topics are a work-in-progress and the draft report may reflect some modifications.
If you have any questions, comments, or additional information that you would like to offer for the municipal assessment, please contact Susan Charkes, Environmental Planning Specialist, at scharkes@thewatershed.org, or (609) 737-3735.
We will be in touch soon to schedule a tour of the Township so that we can witness the Master Plan and Land Use Plan on-the-ground. We look forward to continuing to work with Monroe Township to ensure a high quality of life and natural resources in the Stony Brook-Millstone Watershed for all those who live, work, and play here.

Appendix B
Monroe Impervious Surfaces