



Delaware Valley  
Regional Planning  
Commission

2007

## CONSERVATION ELEMENT of the MASTER PLAN

for the TOWNSHIP of

Ewing

MERCER COUNTY, NEW JERSEY







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Created in 1965, the Delaware Valley Regional Planning Commission (DVRPC) is an interstate, intercounty and intercity agency that provides continuing, comprehensive and coordinated planning to shape a vision for the future growth of the Delaware Valley region. The region includes Bucks, Chester, Delaware, and Montgomery counties, as well as the City of Philadelphia, in Pennsylvania; and Burlington, Camden, Gloucester and Mercer counties in New Jersey. DVRPC provides technical assistance and services; conducts high priority studies that respond to the requests and demands of member state and local governments; fosters cooperation among various constituents to forge a consensus on diverse regional issues; determines and meets the needs of the private sector; and practices public outreach efforts to promote two-way communication and public awareness of regional issues and the Commission.



Our logo is adapted from the official DVRPC seal, and is designed as a stylized image of the Delaware Valley. The outer ring symbolizes the region as a whole, while the diagonal bar signifies the Delaware River. The two adjoining crescents represent the Commonwealth of Pennsylvania and the State of New Jersey.

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# Acknowledgments

This Conservation Element, adopted by the Ewing Planning Board July 6, 2006, is an integral part of the Ewing Master Plan adopted in February 2006 and readopted with revisions July 6, 2006. The two documents should be read together for a comprehensive picture of Ewing's future.

Many thanks are due to the organizations that provided funding for this Conservation Element of the Master Plan. They are:

- The New Jersey Department of Community Affairs, Office of Smart Growth
- The Township of Ewing
- The Delaware Valley Regional Planning Commission, Open Space and Greenways Program

## **Township Council, Township of Ewing**

Mayor Wendell Pribila  
President Kathleen Wollert  
Vice President Don Apai  
Councilman Les Summiel  
Councilman Joe Murphy  
Councilman Bert Steinmann

The impetus for the creation of the document, and its guidance and review, came from the Ewing Planning Board and the Ewing Environmental Commission

## **The Ewing Township Planning Board**

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## **The Ewing Township Environmental Commission**

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# Introduction

*We do not inherit the earth from our ancestors,  
We borrow it from our children.*

*- Native American Proverb -*

## Purpose

The purpose of this Conservation Element of the Master Plan of Ewing Township is to identify the natural resources of the community; to explain why they are important to protect; to bring the most recent knowledge on the connections between a healthy environment and economic vitality and on sustainable development practices to the attention of the community; and to articulate steps that the Ewing community can take to preserve, conserve, and utilize its resources to maintain and raise the township's high quality of life.

### **Statutory Authorization for a Conservation Element of the Master Plan**

The New Jersey Municipal Land Use Law (MLUL) states in Article 3 – Master Plan, Section C. 40:55D-28, that the planning board may prepare and, after public hearing, adopt or amend a master plan, or component parts thereof, to guide the use of lands within the municipality in a manner that protects public health and safety and promotes the general welfare. The required components of a master plan are the statement of objectives, principles, assumptions, policies and standards upon which the constituent proposals for the physical, economic, and social development of the municipality are based, and the land use plan.

In Section C. 40:55D-28 (8), the MLUL states that the conservation element should provide for the preservation, conservation, and utilization of natural resources, including — to the extent appropriate — energy, open space, water supply, forests, soil, marshes, wetlands, harbors, rivers and other waters, fisheries, endangered or threatened species of wildlife, and other resources; and that the element should systematically analyze the impact of each other component and element of the master plan on the present and future preservation, conservation and utilization of those resources.

Ewing Township updated and adopted a new Master Plan in 2006. This conservation element was coordinated with the Ewing Master Plan, which is available as a separate document that should be read in combination with this Conservation Element.

## Background

Up until World War II, Ewing's resources made it an agricultural community. By the second half of the 20<sup>th</sup> century, though, Ewing lost most of its agricultural heritage — replaced by industry, institutions, and residential subdivisions. Today, the township is almost completely built out, covered predominantly by residential, commercial, and institutional uses at suburban densities, the Trenton Mercer Airport, and two large farms operated by the New Jersey Department of Corrections. Interspaced among the developments are wooded stream corridors, parks, and golf courses.

This Conservation Element was developed by working with the township to identify its conservation goals, and then coming up with methods to achieve them. The Conservation Element builds on a companion document, the *Environmental Resource Inventory (ERI) for the Township of Ewing*, March 2005, which contains baseline documentation of the community's environmental resources. The Conservation Element reviews the documentation of the township's natural resources from the ERI, assesses their current levels of protection based on extant regulations, and makes recommendations for changes to better meet Ewing's conservation goals.

Ewing Township's first Master Plan was conducted in 1967, and provided an in-depth look at existing conditions and future needs. Since then, the township has completed numerous reexamination reports, approximately every six years. In 2004, the township initiated a major new Master Plan process, incorporating all new Master Plan Elements. This Conservation Element, and the accompanying ERI, are integral to the Master Plan and are incorporated into the Master Plan process and policies.

## Overview

The *Environmental Resource Inventory for the Township of Ewing*, March 2005, identifies, describes and explains the significance of the natural resources of Ewing Township. To make the most use of the Conservation Element, the ERI should be seen as a companion document, to be looked at simultaneously. Copies of the ERI are available from the township and are accessible at the township website:

[www.ewingtwp.net](http://www.ewingtwp.net).

As a brief summary, the ERI provided the following data on Ewing's resources:

1. *Ewing Size*: 9,960 acres or 15.6 square miles
2. *Land Use*: As of 2002, Urbanized land = 72 percent, Forest = 14 percent, Agricultural = 7 percent, Wetlands = 4 percent, Water = 2 percent, and Barren Land = 1 percent (Source: NJDEP)
3. *Physiography*: Ewing is located in the Piedmont Plateau, subsisting primarily of sandstone, shale and argillite; fertile soils; and gently rolling topography
4. *Elevations*: Highest is 220 feet, at Mountain View Golf Club; lowest is 40 feet, by the Delaware River
5. *Soils*: Mostly silty, shaly or stony, include 27 series and 60 varieties within series, rich in agricultural value; some soils present building limitations mostly due to high water table.

6. *Surface Water Resources*: There are 25 miles of streams in Ewing, 24 miles are first and second order streams; 2 major lakes; a few unnamed ponds; 443 acres of wetlands; and one known (uncertified) vernal pond
7. *Floodplains*: 10 percent, or 1,032 acres, of Ewing are in flood hazard areas
8. *Surface Water Quality*: All streams classified as FW2-NT; 5 sites in or near Ewing tested for aquatic life — 3 sites were fully attaining standards, 1 site had insufficient data, and 1 site is impaired so will therefore need a TMDL (total maximum daily load) study of amount of pollutants the stream can assimilate without violating its water quality standards
9. *Groundwater* – Ewing is located in the Newark Basin; predominant aquifers are the Passaic, Stockton and Lockatong formations
10. *Vegetation* – 1,924 acres are covered by forest, shrub land, wetlands and water
11. *Rare plant species* – 4 recorded in the NJDEP’s Natural Heritage Database
12. *Landscape Project* – The project documents the value of various types of habitats, and ranks them based on known occurrences of state threatened and endangered species. In Ewing, most of the area designated as critical habitat has been subsequently developed. Habitat identified as Suitable still remains.
13. *Animals*: 6 rare and endangered species are listed for Ewing; many other vertebrates and invertebrates also make their home in Ewing.
14. *Contaminated Sites*: 66 Known Contaminated Sites on NJDEP’s inventory in Ewing Township.

*Map One – Critical Environmental Areas* shows the locations of wetlands, flood hazard areas, steep slopes, Landscape Project Priority Habitats, and high groundwater recharge areas in the township. Individual maps of each of these resources, as well as the other features mentioned in the list above, are in the Ewing ERI companion document.

*Never doubt that a small group of thoughtful,  
committed citizens can change the world:  
indeed, it’s the only thing that ever has.*

- Margaret Mead -

## **Public Participation Process**

The Conservation Element was developed with input from the Ewing Township Planning Board and Environmental Commission; from interviews with the township Manager, Mayor, Planning Board and Environmental Commission members, Mercer County Planning Board staff, and other professionals working in Ewing; from feedback gathered from surveys filled out by township residents; and from citizen feedback at public presentations to the Planning Board.

## Goals and Objectives

*Goal:* Inform the Ewing community about sustainability issues so that municipal, personal and business practices will incorporate a strong environmental protection ethic

*Objectives:*

- Convey information about sustainability issues to township decision makers so that they may incorporate sustainability into township policies and practices
- Promote green buildings and LEED (Leadership in Energy and Environmental Design) certification for both public and private projects
- Provide township officials with information about the importance of trees, riparian buffers, undisturbed steep slopes, groundwater recharge, and important habitat areas for public policy purposes
- Distribute information to residents, businesses, and institutions (especially those with campus-like settings) about proper care for their properties, including the merits of keeping areas in natural states as opposed to lawns, overuse of pesticides and fertilizers, maintaining vegetated stream buffers, creating backyard habitats, and not dumping chemicals down drain pipes
- Develop good stewardship practices on publicly owned lands in conjunction with public works officials
- Involve Ewing high school students or college students at the College of New Jersey by having them conduct water quality monitoring and vernal pool assessments
- Create a new Nature Center and self-guided tours

*Goal:* Protect and Manage Critical Environmental Resources in the township

*Objectives:*

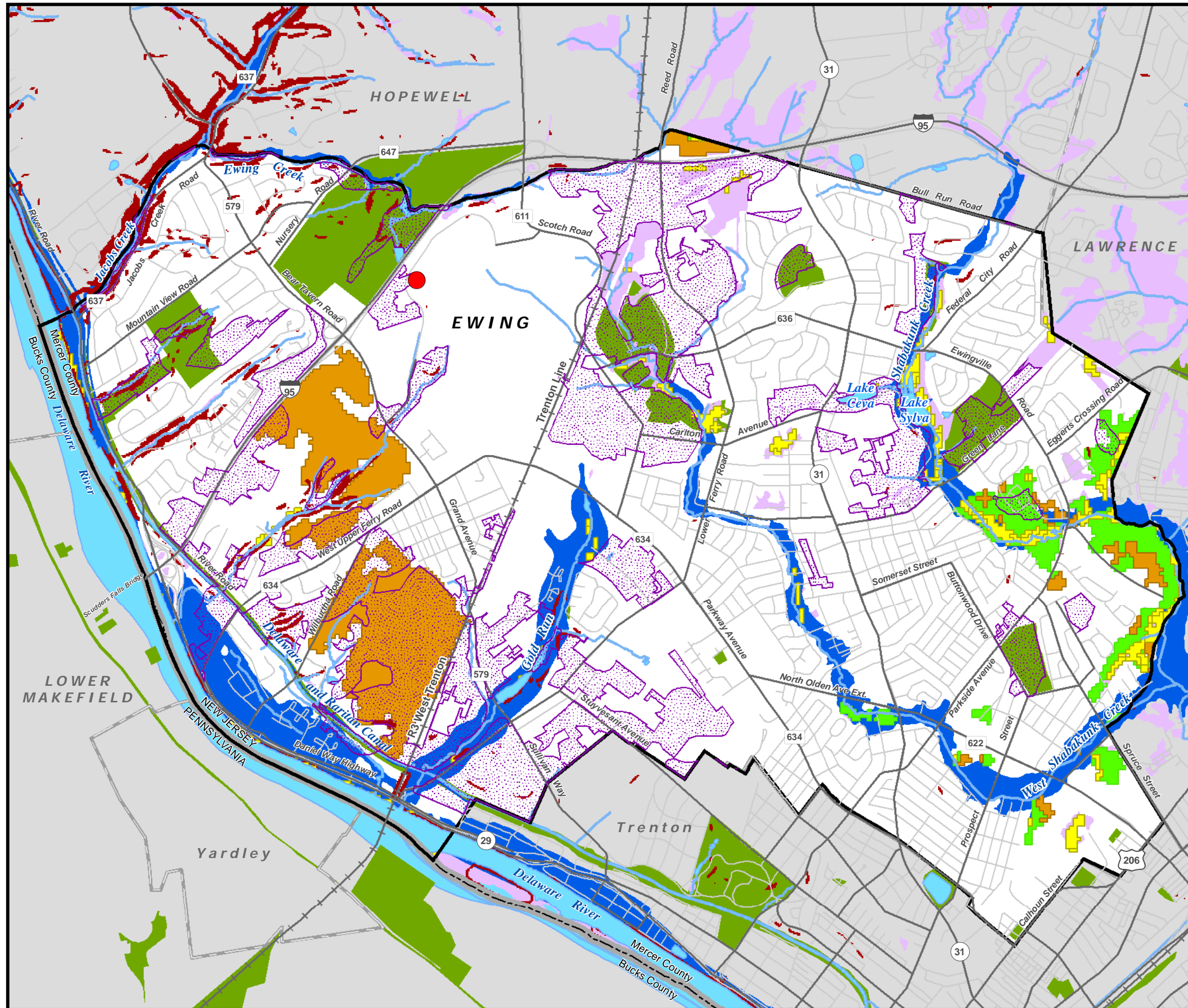
- Protect remaining wetlands
- Preserve stream corridors
- Conserve steep slopes
- Promote more tree plantings and protect existing trees from deforestation
- Preserve Landscape Project-identified critical and suitable habitats
- Limit development on high groundwater recharge areas

*Goal:* Create an Open Space and Greenway System along rivers, streams, and canals that protects and links important natural, recreational and cultural features

*Objectives:*

- Identify greenway linkages throughout the township
- Propose areas worthy of consideration as protected lands
  - Show potential trail connections linking neighborhoods to parks and community destinations

# Map 1: Critical Environmental Areas Ewing Township



- River or Stream
- Lake
- Vernal Pond
- Ewing Township Boundary
- Other Township Boundary
- County Boundary

### LANDSCAPE PROJECT PRIORITY HABITATS

- Grassland
- Upland Forest
- Wetlands

- ### WETLANDS
- Wetlands

- ### SLOPES
- Slope >15%

- ### FLOOD HAZARD AREAS
- 100-Year Floodplain

- ### GROUNDWATER RECHARGE
- 11-14 inches / year

- ### PROTECTED LANDS
- Protected Land (2003)

Source : NJDEP, NJDOT, DVRPC.  
This map was developed using New Jersey Department of Environmental Protection Geographic Information System digital data, but this secondary product has not been verified by NJDEP and is not state-authorized.

0 0.5 1 Miles

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# **Summary of Recommendations**

## **Recommendations for the Township Council**

1. Support and promote sustainable development and building principles and practices in the site design, construction and operation of all public facilities and publicly funded projects in the township. Use the LEED system for green buildings.
2. Adopt code changes on wetlands, stream corridors, steep slopes, trees, the Conservation Zone and sketch plan submissions as recommended by the Planning Board and Environmental Commission.
3. Establish a Street Tree Commission, apply to become Tree City USA, and charge the Street Tree Commission to prepare a community forestry management plan.
4. Establish an Open Space, Greenway and Trails Committee to facilitate the creation of additional open space, greenways and trails in the township.

## **Recommendations for the Planning Board**

1. Support and promote sustainable building principles and practices into the design, construction and operation of all public facilities and publicly funded projects, as well as into private construction projects that come before the board. Use the LEED system as a design and measurement tool to determine what constitutes sustainable building principles and practices, and urge applicants to comply with these principles and practices.
2. Require wetlands and required buffers to be shown on major subdivision and site plan submissions, along with Letters of Interpretation from NJDEP, by recommending code changes to the township council.
3. Require certified vernal ponds and required 75-foot buffers to be shown on subdivision and site plan submissions, and conservation easements around such areas, by recommending code changes to the township council.
4. Work with the Environmental Commission to craft a Stream Corridor Protection Ordinance, and recommend its adoption by the township council.
5. Work with the Environmental Commission to craft a Steep Slope Protection Ordinance, and recommend its adoption by the township council.
6. Work with the Environmental Commission to craft a Tree Protection Ordinance, and recommend its adoption by the township council.
7. Change the Conservation Zone language to include a purpose statement and lower the impervious coverage ratio to 10 percent, and recommend the change to the township council.
8. Work with the Open Space, Greenways and Trails Committee, when established, on a more in-depth open space plan and its implementation.
9. Consider methods to preserve the Jones Farm.
10. Add language strongly encouraging sketch plan submissions to the township code, forward recommendations to the township council.

## **Recommendations for the Environmental Commission**

1. Take the lead on developing a sustainability plan for the township, ensuring that the plan has widespread input and support to promote its implementation.
2. In concert with a newly appointed Street Tree Commission, when established, submit a grant application to the NJDEP Community Forestry Program to create a community forestry management plan. If funding is not awarded, encourage the township to conduct the plan without the benefit of the \$1,500 maximum grant.
3. Work with the Planning Board to craft Stream Corridor Protection, Steep Slope Protection, and Tree Protection ordinances, and to modify the Conservation Zone to a maximum impervious coverage of 10 percent, and to expand the Conservation Zone, as appropriate.
4. Inform township residents and property owners about the importance of vegetated streamside buffers by distributing stewardship materials, placing them on the township website, and holding educational forums.
5. Promote conservation landscaping in the township through education and partnerships with nonprofits already engaged in these projects, such as the Stonybrook-Millstone Watershed Association.
6. Recruit qualified College of New Jersey biology students to investigate vernal ponds in the township, and forward the data to NJDEP for certification, as appropriate.
7. Seek out a place for a nature center, adjacent to an environmental feature, that could protect the feature, serve as an environmental resource center, and even become a “town jewel” — a special place that township residents are proud of and identify with.
8. Work with the Open Space, Greenways and Trails Committee, when established, on a more in-depth open space plan and its implementation.



# Community Benefits of Environmental Protection and Open Space Preservation

*Land — they ain't making it any more.*

- Will Rogers -

Will Rogers, president of the national nonprofit *Trust for Public Land* (Note: this is not the same Will Rogers-cowboy-philosopher quoted above), says that open space conservation is not an expense, but an investment that produces important economic benefits. The Trust for Public Land (TPL) report “The Economic Benefits of Parks and Open Space” cites the following benefits:

1. **Attract Investment.** Parks and open space create a high quality of life that attracts tax-paying businesses and residents to communities. Corporate CEOs and small business owners alike rank quality of life, including parks and open space, among the top three priorities for choosing a business location. This is especially important in today’s atmosphere where most businesses are not tied to any location, due to technology that allows them to locate anywhere. Providing a high quality of life through parks and open space can attract and retain businesses.
2. **Revitalize Urban Areas.** Urban parks, gardens, trees and recreational open space stimulate commercial growth and promote revitalization of urban areas. In another recently released study, Wharton Professor of Real Estate Susan Wachter showed that planting trees within 50 feet of houses in New Kensington — a densely populated row-house neighborhood of Philadelphia — increased home prices by about 9 percent, or about \$3,400. The positive impact extended 50 feet in a neighborhood where most houses are only 15 feet wide; and the trees were young, and therefore not very big. Not every parcel, therefore, needs to be considered for a tax ratable development — some properties in urban areas should be “greened” to enhance the neighborhood, which will then result in private sector investment and higher property values in the neighborhood.
3. **Boost Tourism.** Open space boosts local economies by attracting tourists and supporting outdoor recreation. In fact, at present rates of growth, the tourism/leisure industry will soon become the leading U.S. industry of any kind. In Ewing, the Delaware and Raritan Canal Park has the potential to attract many users, which could support certain spin-off businesses that would cater to trail users, such as ice cream parlors, cafes, and canoe and bike rentals.

4. **Prevent Flood Damage.** Floodplain protection offers a cost-effective alternative to expensive flood-control measures, by preventing floods from occurring in the first place. Avoiding all development in the floodplain is sound environmental as well economic practice. One study showed that a 1 percent increase in protected wetlands along a stream corridor reduced peak stream flows by 3.7 percent.
5. **Protect Farms.** Protecting agricultural lands sustains farming economies and safeguards local food supplies. In Ewing, the two remaining farms, Knight Farm and Jones Farm, are owned and operated by the NJ Department of Corrections. These farms provide numerous benefits, including scenic views, groundwater recharge, low impact on community services, and food supply for the state's penal institutions.
6. **Promote Sustainable Development.** Open space conservation is often the cheapest way to safeguard drinking water, clean the air, and achieve other environmental goals. If each community contributes to conservation, then both the local community and the community at large benefit, by not paying the engineering costs to clean water for drinking at the water treatment plant, or not paying the health care costs — doctors' bills, medicines, and lost days of work from poor air quality.
7. **Create a Livable Community through Conservation.** In the long term, economic advantage will go to communities that are able to guide growth through land conservation and other smart growth measures. Some real estate analysts predict that over the next 25 years, as fossil fuels are depleted and energy costs rise, real estate values will rise fastest in the smart communities that incorporate the traditional characteristics of successful communities: a concentration of amenities; an integration of residential and commercial uses; and pedestrian, bicycle and transit-friendly infrastructure. Many low-density, segregated use suburban communities will suffer lower land values because of poor planning, increasing traffic, deteriorating housing stock, and loss of exclusivity. The TPL report concludes that there is no greater risk to land values than unrestrained development.

(Source: Trust for Public Land, *Community Benefits of Open Space*)

# Sustainability

*Let us permit nature to have her way.  
She understands her business better than we do.*

- Michel de Montaigne -

## The Meaning of Sustainability

Sustainability is a widely used, but not well-understood term. In 1987, the United Nations World Commission on Environment and Development developed a definition of sustainability that was included in its findings, which became known as the Brundtland Report. It stated that:

*Sustainable development meets the needs of the present without compromising the ability of future generations to meet their own needs.*

According to Stella Tarnay, in her article on Green Neighborhoods in *Urban Land*, 2005: More than 20 years ago, the concepts of sustainable development, with their emphasis on the interplay between environmental, social and economic dynamics in communities, began to offer a different way of thinking about planning and development. Progressive policy makers promoted sustainable development, but the mainstream questioned what it looked like on the ground and whether it could be part of a successful business practice. More recently, the well-defined fields of smart growth, new urbanism, low impact development, conservation, transit-oriented development and green buildings have all contributed tools and practices that are available to private developers and public policy makers alike. Together, the integration of these fields is providing more comprehensive opportunities for truly realizing sustainable development. (Stella Tarnay, "Green Neighborhoods," *Urban Land*, May 2005)

### **Sustainable development incorporates the following features:**

- Energy efficiency
- Alternative energy sources
- Water conservation
- Waste minimization
- Storm water management
- Pollution prevention
- Using resource-efficient materials
- Improving indoor air quality
- Woodland conservation/replanting with native species wherever possible, and
- Taking advantage of existing infrastructure before building new

Recognizing the growing interest in sustainable development, the New Jersey Department of Environmental Protection launched an initiative designed to support and help educate New Jersey communities that would like to become more environmentally sustainable. DEP's vision is a sustainable New Jersey built on a network of environmentally sustainable communities. To promote this vision, the DEP issued "How to Become an Environmentally Sustainable Community – A Primer" in August 2005.

The primer states that, from an environmental perspective, a sustainable community is one that manages its natural resources and environmental assets such that their value is preserved, restored and enhanced for present and future generations; and such stewardship complements the community's efforts to foster economic and social health. A sustainable community is one in which quality of life and standards of living can improve without impairing the natural systems on which the community depends.

## **Benefits of Becoming a Sustainable Community**

There are numerous benefits to becoming a sustainable community, and, as individual communities become successfully sustainable, the global community also progresses toward sustainability.

### **Sustainable Community Benefits to Residents**

- Establish and maintain a quality of life based on shared values adopted by the community
- Establish links between issues that often are viewed as separate (i.e., economic development, housing, public safety and transportation)
- Equitable distribution of critical resources and opportunities for the current generation as well as for future generations
- Enhanced quality of life/improved livability
- Economic development that better supports community infrastructure with quality tax bases (reflecting true costs of community resource use and applying "user pays" principle) and creates potential for increased community prosperity by providing diverse, high-quality local jobs for a greater portion of the population.
  - Helps keep economic benefits and resources within the community — what is earned is put back into the local economy
  - Supports existing local businesses that tend to be more responsive to local needs and more likely to support the community
  - Encourages the establishment of new, locally owned enterprises
  - Seeks small-scale solutions — which are usually faster, more flexible, less expensive, and more manageable than large ones — to economic production problems
  - Builds social capital — the capacity of its people to work together for the common good

Source: How to Become an Environmentally Sustainable Community – A Primer, NJDEP, August 2005

The DEP primer includes a section on getting communities started toward becoming sustainable that involves a number of steps to be taken, including reaching out to a diverse and representative set of stakeholders. The Environmental Commission of Ewing Township should take the lead on developing a sustainability plan for the township, but the plan must have widespread input and support to truly succeed.

## **Municipal Efforts towards Sustainability in New Jersey**

To date, a number of New Jersey municipalities have actively chosen to become sustainable communities, but they have approached the process in different ways to address their specific circumstances. Below is a brief summary of municipal initiatives that Ewing can draw from and seek additional information as needed:

Township of Monclair, Essex County (Year 2000 population: 38,658; 6.16 square miles): The township has an institutionalized approach through creation of a sustainable township planning guide and adoption of a local government resolution with a policy of sustainability for township decision-making, purchasing and operations. The township has established programs and projects in the following areas: energy (purchase of compressed natural gas cars, installation of LED traffic lights, solar roof panels for municipal and school buildings, changeover to bio-diesel-fueled municipal truck fleet); expanded and improved solid waste recycling program; environmentally preferable purchasing of products; storm water management education (stream clean-up, storm-drain stenciling); bicycle and pedestrian planning; farmers' market (fresh produce for consumers, family-farm protection, reduced energy use in food transport); code enforcement of environmental ordinances (recycling, noise controls for gasoline-powered leaf blowers); and reorganization of local government operations to include a new division of administration, code enforcement, and environmental affairs in the township. The Sustainability Montclair's Planning Guide is an excellent document to draw from and can be found at [www.mtcenv.com/pdf/sustain-guide.pdf](http://www.mtcenv.com/pdf/sustain-guide.pdf)

Source: How to Become an Environmentally Sustainable Community – A Primer, NJDEP, August 2005

Highland Park, Middlesex County (Year 2000 population: 13,999; 1.8 square miles): put forth a long-term vision that focused on its environment, economy and diverse and changing population. Environmentally sustainable policies and practices embodied in its plan included retrofits to make public buildings more energy and water efficient; requiring green building standards for new major construction; streetscape projects featuring recycled content benches and trash receptacles, LED traffic signals and high efficiency lighting on street lamps; additional green plantings in downtown areas and reclamation of open spaces for recreation and social gatherings, replacement of blacktop with pervious pavement, heat-mitigating vegetation in parking lots, and the construction of a solar-powered environmental center for public education. More information on Highland Park's efforts can be found at [www.greenhp.org](http://www.greenhp.org).

Source: How to Become an Environmentally Sustainable Community – A Primer, NJDEP, August 2005

West Windsor Township, Mercer County (Year 2000 population: 21,907; 26.3 square miles): received an Association of New Jersey Environmental Commissions Smart Growth Planning Grant in 2005 to help fund the creation of an environmentally sustainable community plan termed *Sustainable West Windsor 2006 Plan*. The plan's primary emphases are on greening municipal practices, policies and decisions, and on developing an active outreach and education program to raise awareness among the community's various stakeholders about sustainability and their respective roles and opportunities for action. The plan's focus will be on environmentally related strategies, but, consistent with overall concepts of sustainability. How such strategies can complement and enhance township priorities relating to economic development and social networking building will be equally important.

Source: <http://www.state.nj.us/dep/dsr/bscit/westwindsor.pdf>

Lawrence Township, Mercer County (Year 2000 population: 29,159; 22.16 square miles): is planning to be an "Eco-Municipality." Several well-attended forums have been held by the township in pursuit of sustainability. In the summer of 2005, the nonprofit "Sustainable Lawrence" was formed, with board representatives from government, academic institutions and corporate arenas. One critical element that arose from Sustainable Lawrence was the need for the municipal government to be a model for the community. Future plans include a conference in 2006, with the outcome of the conference to be a long-range plan for Sustainable Lawrence.

Source: <http://www.state.nj.us/dep/dsr/bscit/Lawrence%20Township%20.pdf>

Ewing has opportunities to embrace concepts of sustainable development in a variety of ways. The redevelopment of two brownfield sites — the Naval Air Warfare Center and General Motors sites — into Transit-Oriented Developments, is a major opportunity the township has to embrace and execute sustainable development. Smart growth redevelopment on these properties — which embraces pedestrian, bicycle and transit connections; mixed-uses at a human scale; low-impact development; green buildings; and quality open space for environmental protection, recreation, and the purpose of providing a place for people to congregate and socialize — would serve as excellent examples of sustainable development in the township.

Integrating sustainable development practices into township policy would demonstrate that Ewing is a progressive community and would likely serve to attract the "cultural creatives" demographic, identified by Paul H. Ray and Sherry Ruth Anderson in their 2001 book *The Cultural Creatives: How 50 Million People Are Changing the World*. These homebuyers, residents and workers value authenticity, community, creativity, and environmental stewardship. Most feel alienated from the conventional market, and prefer to purchase older homes in older neighborhoods. According to the real estate and market research polling firm American LIVES, about 22 percent of Americans identify with cultural creative values. (Stella Tarnay, "Green Neighborhoods," *Urban Land*, May 2005) Places that adopt sustainable development practices into their local policies will attract this class.

## Green Buildings

Sustainable, or green, building designs use resources efficiently while creating healthier building habitats. Sustainable buildings are designed, constructed and operated in ways that reduce or limit any negative impact on the environment and occupants. These buildings integrate materials and methods that promote environmental quality, economic vitality, and social benefits through the design, construction and operation of the built environment.

### **Features of sustainable, or green, buildings are:**

- The integration of natural daylight for lighting
- High indoor environmental air quality
- Reduced utility bills
- The use of finishes and materials low in volatile organic compounds, which will improve indoor air quality
- Increased productivity of building occupants due to healthier work places
- Reduced impact from building construction on the environment through careful construction planning, including the protection of trees
- Use of locally produced materials, which will support the local economy, and
- Enhanced social interaction through community involvement in building planning and operation

The U.S. Green Building Council (USGBC) has developed the rating system LEED – Leadership in Energy and Environmental Design. LEED is a voluntary, consensus-based, market-driven green building rating system by which projects are registered, evaluated and certified. It is based on proven technology and evaluated environmental performance from a “whole building” perspective. LEED is a self-certifying system designed for rating new and existing public, commercial, institutional, and multifamily residential buildings. It contains prerequisites and credits in five categories: Sustainable Site Planning, Improving Energy Efficiency, Conserving Materials and Resources, Embracing Indoor Environmental Quality, and Safeguarding Water. There are four rating levels: Certified, Silver, Gold and Platinum.

Promoting green buildings through policy and regulation is an important approach toward achieving sustainability because of the size and impact of the built environment. For example, buildings consume nearly 40 percent of the country’s energy, 70 percent of the country’s electricity, 12 percent of all potable water, 40 percent of raw materials globally,

and, in the U. S., buildings generate about 136 million tons of building-related construction and demolition debris annually. (USGBC Fact Sheet: March 2006)

Green buildings greatly reduce these impacts, and produce cost savings for the builder and owner as well. For example, a 2003 study based on LEED buildings in California showed that an upfront investment of 2 percent in green building design, on average, resulted in life cycle savings of 20 percent of total construction costs. According to EPA research, tenants can save about 50 cents per square foot each year through strategies that cut energy use by 30 percent. This can represent a savings of \$50,000 or more in a five-year lease on 20,000 square feet. Another study found that sales in stores with skylights were up to 40 percent higher compared to similar stores without skylights. (USGBC Fact Sheet: March 2006) The landscape architect of the greenest building in New Jersey, the Willow School (which received a Gold Rating from the USGBC) stated that “it’s not harder to build this way, it’s just a change in the way we think about building.” (Anthony Sblendorio, landscape architect for the Willow School, as quoted in “It Pays To Be Green” by Colleen Diskin, *The Hackensack Record*, January 2, 2006).

Because people in the US spend 90 percent of their time indoors, creating healthier indoor environments is crucial to promoting better health as well as productivity. EPA studies indicate indoor levels of pollutants may be two to five times higher — and occasionally more than 100 times higher — than outdoor levels. Green buildings use nontoxic materials, improved ventilation and natural light, resulting in healthier indoor environments.

**Ewing Township should support and promote sustainable building principles and practices into the design, construction and operation of all public facilities and publicly funded projects, as well as into private construction. The LEED system should be used as a design and measurement tool to determine what constitutes sustainable building principles and practices, and applicants should be urged to comply with these principles and practices.** Some communities, such as the County of San Mateo, California, have chosen to adopt sustainable building policies that require all new construction or additions of at least 5,000 square feet to be evaluated for compliance with the LEED rating system. Closer to Ewing, the township of Cranford, New Jersey, passed the state’s first Green Building Ordinance in 2005. The ordinance supports the township’s resolution on implementing sustainability programs and projects, and adopts green building standards promulgated by the LEED rating system.

Source: <http://www.state.nj.us/dep/dsr/bscit/cranford%20twp.pdf> and [http://www.recycleworks.org/greenbuilding/sus\\_building\\_policy.html](http://www.recycleworks.org/greenbuilding/sus_building_policy.html)



# Protecting Critical Resources

*Each water course is a natural garden, self-sustaining and refreshing.  
Landowners and municipalities would do well to protect their water courses as prized  
community assets.*

- John Ormsbee Simonds, *Earthscape* -

## Wetlands

Wetlands are defined as areas that are inundated or saturated by surface or ground waters at a frequency to support vegetation suited for life in saturated soils.<sup>1</sup> New Jersey's wetlands are located around the numerous interior stream systems, and along coastal rivers and bays. NJDEP classifies wetlands with naturally occurring vegetation into two major categories: (1) *coastal wetlands*, wetlands associated with tidal portions of the Delaware River system and waterways draining into the Atlantic Ocean; and (2) *interior wetlands*, wetlands found in nontidal lowlands associated with waterways, and isolated wetlands surrounded by uplands. NJDEP also identifies *modified wetlands*, which are areas that have been altered by human activities and do not support typical natural wetland vegetation, but which do show signs of soil saturation on aerial infrared surveys.

Wetlands are a critical ecological resource, supporting both terrestrial and aquatic animals and boasting biological productivities far greater than those found on dry land. Wetlands play a vital role in maintaining water quality by cleaning surface and ground waters. The ecological importance of wetlands, however, has not always been appreciated. For more than three centuries, people drained, dredged, filled and leveled wetlands to make room for development and agriculture. Although the pace of wetland destruction has slowed markedly in the past three decades, human activities have destroyed approximately 115 million of the original 221 million acres of wetlands in the United States since the beginning of European settlement.

The location and type of vegetation are key features for classifying wetlands. Virtually all wetlands in Ewing Township are found in association with the major streams and their tributaries. Freshwater, deciduous wooded wetlands, particularly along the main channel of the Shabakunk Creek, are the dominant category of wetlands in the township. These wetlands are "palustrine" wetlands (stream-associated, versus "lacustrine" or lake-associated) and are usually covered with deciduous trees or shrubs, although some evergreen trees or shrubs may be present. Shrubs are also the dominant plants where

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<sup>1</sup> NJDEP. "Anderson Land Use Classification System." Originally derived from "A Land Use and Land Cover Classification System for Use with Remote Sensor Data" U. S. Geological Survey Professional Paper 964, 1976.

wetlands are recovering from past impacts. For locations of wetlands, see the Ewing ERI Map 8: Surface Water, Wetlands, and Vernal Ponds.

New Jersey protects freshwater wetlands under the New Jersey Freshwater Wetlands Protection Act Rules: N.J.A.C.7:7A. The law also protects transition areas or “buffers” around freshwater wetlands. The New Jersey freshwater wetlands maps provide guidance on where wetlands are found in New Jersey, but they are not the final word. Only an official determination from DEP, called a “letter of interpretation” (LOI), can determine for sure if there are freshwater wetlands on a property. An LOI verifies the presence, absence, or boundaries of freshwater wetlands and transition areas on a site. Activities permitted to occur within wetlands are very limited and permits are required for most of them. Additional information on wetlands rules and permits is available through NJDEP and on its website under “landuse.”

Ewing Township has freshwater wetlands along each of its stream corridors, with the majority of its wetlands found around the Shabakunk Creek. Wetlands of all types total 443 acres within the township. Of this total, 346 acres are wooded wetlands, 38 acres are scrub/shrub wetlands, 14 acres are herbaceous wetlands, and 45 acres are modified wetlands.

**Although development on wetlands is regulated by NJDEP, townships can be more vigilant about encroachments into wetlands by requiring that they be shown as a feature on major subdivision and site plan submissions. This allows the township to determine where wetlands may be threatened by inappropriate development, and request site plan changes as appropriate. The current language in Chapter XV Ewing Land Development Ordinance Section 15-83.2 Submission of Preliminary Major Subdivision Plats and Preliminary Major Site Plans/Details Required, requires locations of natural features such as wooded areas, any extensive rock formations, trees having a caliper of six inches or more measured at three feet above the ground, and existing and proposed watercourse, to be indicated on the plan. Wetlands should be added to this requirement. Wetlands are required on the checklist details for minor subdivisions and site plans in Article XIII, but not on the checklist for major subdivisions and site plans. This requirement should also be added to the major subdivision and site plan checklist. In addition, if wetlands appear present from NJDEP maps or if hydric soils are present, the township should also require the submission of a Letter of Interpretation (LOI) with the submission of the preliminary plan. The plan should show the state-certified wetlands as proofed from the LOI or wetlands permit, and any required wetland buffer areas.**

## **Vernal Ponds**

Vernal ponds are bodies of water that appear following snow melt and during spring rains, but which disappear or are dry during the rest of the year. They are highly important sites for certain rare species of amphibians. Particular types of frogs and salamanders will only breed in vernal ponds (obligate breeders), which provide their offspring with a measure of

protection because the ponds' impermanence prevents residence by predators who would consume the eggs and young.

Vernal ponds are so intermittent that their existence as wetlands has frequently not been recognized. Consequently, many of them have disappeared from the landscape, or have been substantially damaged. This, in turn, is a principal cause of the decline of their obligate amphibian species. For example, members of the Ewing Environmental Commission and Planning Board were aware of a vernal pond, near Route 31 on the campus of the College of New Jersey, that is now paved over.

The New Jersey Division of Fish and Wildlife has been conducting a Vernal Pool Survey project since 2001, to identify, map, and certify vernal ponds throughout the state. Once a vernal pond is certified, regulations require that a 75-foot buffer be maintained around the pond. NJDEP's Division of Land Use Regulation oversees this designation and restricts development around vernal ponds by denying construction permits.

The state has identified one vernal pond in Ewing Township, located near the Trenton Mercer Airport between the airport and Interstate 95. See Map 8 of the Ewing ERI. A survey of the pond is needed to determine what species are present and, indeed, if the pond is still in existence as a natural habitat. This site was not surveyed by mid-2004. **The township should investigate whether this is a true vernal pond by first sending out biology students from the College of New Jersey who are skilled in this field to judge the pond. If they deem it is a certifiable vernal pond, the Ewing Environmental Commission (EEC) should petition the NJDEP to visit it and certify it. Ewing should require certified vernal ponds and the 75-foot buffer to be shown on subdivision and site plan applications, and should request conservation easements on land surrounding certified vernal ponds to help ensure their protection.**

*We never know the worth of water till the well is dry.*

- Thomas Fuller, *Gnomologia*, 1732 -

## **The Ecology of Stream Corridors**

Virtually all of the streamside properties along the various creeks that travel through Ewing reside in a floodplain. A floodplain is considered the area that would be flooded by a 100-year flood, or a flood that has the statistical probability of occurring every 100 years, according to the Federal Emergency Management Agency (FEMA). A flood of this magnitude can occur at any given time, however. Therefore, it is imperative to understand the importance of floodplains.

Left untouched, floodplains serve many vital functions and perform many environmental services:

*Water Quality:* Located between waterways and adjacent lands with extensive human use, floodplains serve to filter out excess nutrients in groundwater through vegetative uptake and rhizofiltration (microbes that live on root systems break down nutrients) before they reach streams and rivers. High nutrient loads on streams will negatively affect water quality. Narrow greenways, coupled with heavily developed edge communities with high levels of pollution, may render filtering of runoff and sediment loads inefficient and futile.

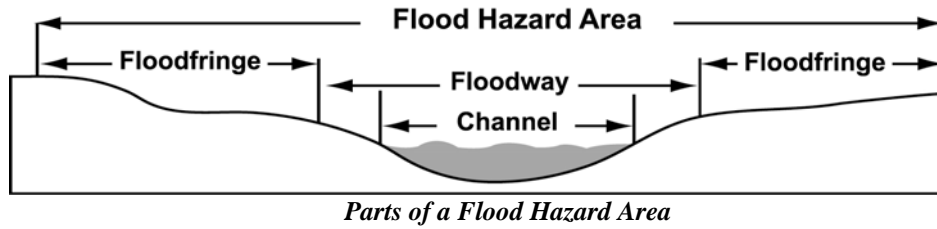
*Prevention of Erosion:* Microtopography, vegetation, and natural ground coverings (e.g., leaves and logs) form a physical screen for materials moving down slope. This allows pollution to be filtered out of surface water before it has a chance to cover streambeds or fill in reservoirs. Erosion shrinks the size of the floodplain and causes sedimentation downstream.

*Stream Morphology and Hydrology:* Floodplains help maintain natural surface water levels within a stream while also maintaining natural rates of flow. This is done by stabilizing stream banks and providing for a diversity of natural stream structures (e.g., pools and riffles).

Bank erosion and sedimentation change the natural geomorphology of streams. Bank erosion is normally caused by clearing trees and other vegetation from the stream bank for purposes of agriculture or development. This results in a loss of very important habitat (e.g., many fish species spawn near the roots of stream bank trees) and increased sedimentation downstream. Sedimentation and siltation downstream prevent sunlight from reaching aquatic plants, thus limiting photosynthesis (plants use solar energy to produce energy and biomass). This does great damage to the base of the water's food web. These are only a few of the many negative effects of land clearing, erosion, and sedimentation.

*Flood Mitigation:* A wide floodplain provides areas for water storage during flooding events. Wide natural corridors allow flood waters to spread out and move more slowly. Narrow areas cause an increase in flow velocity and erosion rates through an increase in peak flow runoff. Development in floodplain areas and stream banks causes an increase in costly flood damage (and, possibly, a loss of life) and an increase in costly flood mitigation projects (e.g., channelization and dredging).

*Flood Hazard Areas:* Flood hazard areas are defined as the combination of the 100-year floodplains and the adjacent flood fringe areas that help to hold and carry excess water during overflow of the normal stream channel. A 100-year floodplain is defined as the land area that will be inundated by the overflow of water resulting from a 100-year flood (a flood that has a 1 percent chance of occurring in any given year).



In New Jersey and throughout the country, building in areas subject to flooding is regulated to protect lives, property, and the environment. New Jersey regulates construction in the flood plain under the Flood Hazard Area Control Act, N.J.S.A. 58:16A-50 et seq., and its implementing rules at N.J.A.C. 7:13. Activities that are proposed to occur in a flood hazard area will require issuance of a stream encroachment permit or a letter of non-applicability from the NJDEP.

Ten percent (10%) of Ewing Township’s land is characterized as flood hazard areas, principally surrounding Gold Run and Shabakunk Creek, and along the Delaware River. See Map 9: Flood Hazard Areas, of the Ewing ERI.

**Flood Hazard Area Acreage**

Category	Acres
Area inundated by 100-year flooding	1,032

Source: Federal Emergency Management Agency (FEMA)

*Stream Ecology and Food Chain:* Streams and greenways are important ecological resources for many plants, animals, and microbes. Wetland areas provide the key habitat in riparian and upland zone ecosystems. These areas provide a home and a source of food not only to the flora and fauna living on the land, but also to the species living in the stream itself. Terrestrial plant species provide valuable food sources, in the form of detritus (dead organic matter such as leaves and twigs), to the microbes that reside in the stream. These microbes then serve as a food source to macroinvertebrates (insects and small crustaceans), which make up the base of the stream and riparian zone food chain. Development along stream banks clears out all this vegetation, thus eliminating the source of detritus for microbes. This, effectively, destroys the basis of the food chain and hurts all flora and fauna that rely on this food chain.

Greenways that are part of a floodplain and riparian zone also serve to direct species migration along the stream corridor, effectively serving as an important conduit for migratory species. Riparian zones also serve as a natural air conditioner for the local environmental. Trees along stream banks cool the air passively by providing shade and actively through evapotranspiration. This not only makes for a more comfortable recreational environment, but it also is important to species dependent upon the aquatic environment. For example, cooler streams are much better breeding grounds for many

fish species, such as trout. Riparian buffers are also natural air scrubbers, filtering out harmful particulate matter and cleaning up the air for breathing at the same time.

Sources: *Ecology of Greenways*, Daniel Smith and Paul Cawood Hellmund, editors, 1993, and *Greenways: A Guide to Planning, Design, and Development*, Loring LaB. Schwarz, editor, and Charles Flink and Robert Searns, authors, 1993.

Although the state regulates development in flood hazard areas — through waterfront development permits for stream encroachments, provided that the proposed development meets specific criteria, such as not obstructing stream flow and adequately complying with storm water runoff and water quality regulations — it is best to not permit development in the floodplain for the environmental and safety reasons explained above.

**The township can fortify this approach by enacting a stream corridor protection ordinance.**

**A Stream Corridor Protection Ordinance ensures that vegetated riparian buffers are maintained by requiring development to be set back from stream banks, floodplains and wetland areas and by limiting the use and intensity of activities within the corridor. Buffer widths typically range from 25 to 300 feet, depending on the community's goals. Its emphasis is different from floodplain management ordinances, which focus on preventing flooding from the standpoint of protecting life and property. Floodplain ordinances typically still allow development in the floodplain, provided the development is flood-proofed. The stream corridor protection ordinance protects the ecological values of the stream corridor. A sample stream corridor protection ordinance is in the Appendix. This can be adapted to more closely fit Ewing's needs and development patterns.**

**The Stream Corridor Protection Ordinance should be adopted in combination with an outreach program that educates the community at large, and especially streamside landowners, about the importance of vegetated stream buffers. Public education can consist of mailing information on the importance of vegetated stream buffers to streamside property owners, as well as placing this information on the township's website. The environmental commission should consider holding a public information session to answer questions on stream corridor protection and the ordinance. By integrating the educational component, property owners are more likely to comply with the ordinance, and the township may be better able to avoid the need for enforcement and penalties. Sample streamside stewardship educational materials are in the Appendix.**

## **Report on Delaware River Flood Mitigation**

After two successive floods in September of 2004 and April 2005 caused widespread damage in New Jersey's Delaware River towns, Acting Governor Richard J. Codey established the Delaware River Flood Mitigation Task Force to address the floods' causes, to review various government agencies' responses, to recommend measures to reduce the impacts and likelihood of future flooding, and to improve communication and assistance to residents. The Task Force issued its draft report in February 2006,

consisting of 36 findings, recommendations and implementation parties. The Task Force found that damage during these events was disproportionately due to patterns of development that are insensitive to flooding, and to the lack of adequate hazard-mitigation planning. The report said that — in view of continued development pressures, expected increases in hurricane intensity over the next several decades, and the potential for warmer ocean temperatures associated with global climate changes that are likely to increase the frequency and severity of extreme weather events in the future — significant changes in policy, management, planning, and development will be needed to limit New Jersey’s risk of loss from future flood events in the Delaware Basin.

The Task Force’s report has special relevancy to Ewing Township because the township is located on the Delaware River and portions of the township experienced severe flooding that caused the evacuation of residents for several days. Ewing Township and its current and future residents can benefit from heeding the findings and recommendations of the flood mitigation report. Following is a summary of the major findings and recommendations from the report that relate to the scope of Ewing’s Conservation Element:

Major Finding – The Floodplains Should Be Expected to Flood

- No set of measures, alone or in combination, will stop or eliminate flooding in the Delaware River floodplain.
- The potential for hurricanes and other extreme weather events to be more intense and more frequent means that the risks and foreseeable consequences of flooding are increasing in magnitude.
- Better planning, stricter protection of flood plains, increased efforts to restore disturbed and developed floodplain areas, and more rational rebuilding standards can significantly reduce economic loss to New Jersey from flooding when it occurs.
- The current patchwork of floodplain delineations, many of them long out of date, must be updated if risk-reduction strategies are to be effective in reducing losses (other findings in the report state that New Jersey’s flood hazard area mapping greatly *underestimates* the limit of the floodway along the Delaware River and the state’s other streams and rivers).

Major Recommendation – Regulatory Protection of Flood Plains and Homes Must Be Strengthened

- Regulatory stream buffers of 300 feet should be established in flood-prone areas between tributaries and any new development.
- The Delaware and Raritan Canal, currently a C1 candidate, should be reclassified on an expedited basis.

- Delaware River Basin Commission (DRBC) should extend the “Outstanding Basin Waters” classification to remaining segments of the nontidal Delaware and its tributaries as a bulwark against additional development. Outstanding Basin Waters are interstate and contiguous intrastate waters that are contained within the established boundaries of national parks; national wild, scenic and recreational river systems; and/or national wildlife refuges that are classified by the DRBC as having exceptionally high scenic, recreational and ecological values that require special protection.

The report on Delaware River Flood Mitigation contains many more findings and recommendations covering mitigation and control measures, plus additional planning, regulations and resources needed to reduce flood risk as well as to assist homeowners before and after flooding. Ewing Township’s environmental quality and residents’ personal and property safety will gain from the implementation of these recommendations, many of which are the responsibility of the NJDEP or require changes in legislation. **However, there are areas that the township can act upon. To further advance reducing impacts from flooding along both the Delaware River and Ewing’s streams, the township should strongly discourage development in the floodplain through zoning controls, and should seek to restore areas that consistently flood back to their natural state through floodplain acquisition.** The township can apply for Green Acres funding to acquire flood-prone properties. For a significant statewide buyout program to succeed, additional funding will be needed from the Blue Acres Bond Act of 1995.

The report also described the National Flood Insurance Program (NFIP) Community Rating System (CRS), a voluntary incentive program that recognizes and encourages community floodplain management activities that exceed the minimum NFIP requirements. Communities that participate receive discounted flood insurance premium rates, ranging from 5 to 45 percent, depending on the level of the community’s flood reduction activities. Neither Ewing Township, nor any other community along the Delaware River, is currently participating in this program.

## **Steep Slopes**

Only a small percentage of Ewing Township has slopes greater than 10 percent (the percent of vertical rise to horizontal distance). However, the steepest slopes are very steep indeed — ranging from 40 percent to 60 percent along Jacobs Creek. Steep slopes are found mainly around Jacobs Creek and to a lesser extent around the smaller Delaware River tributaries. Most of these slopes are well vegetated. In some locations, development has occurred on the edge of very steep slopes. In these instances, it is important that natural buffers and other storm water best-management practices are used



to separate the slope from the development and prevent runoff from eroding the slope. See Map 5: Steep Slopes, of the Ewing ERI.

In general, development of steep slope areas is inadvisable because it can result in soil instability, erosion, sedimentation of the stream below, increased storm water runoff and flooding. This causes habitat destruction and potential damage to property. Erosion on steep slopes is especially prevalent where excessive tree removal has taken place.

**To prevent development on Ewing’s steep slopes, the township should adopt a steep slope ordinance. The steep slope ordinance would limit development on slopes greater than 10 percent, and severely restrict development on slopes greater than 20 percent. A sample steep slope ordinance is included in the Appendix.**

## **Tree Protection**

*For in the true nature of things, if we rightly consider, every green tree is far more glorious than if it were made of gold and silver.*

-Martin Luther -

People like trees because they make life more pleasant. People respond not only to the beauty of trees, but to the sense of well-being, tranquility, and connection to nature that the presence of trees provides. In fact, there are notable social, environmental and economic benefits to trees. If asked, most communities will say that they want more trees, but it takes certain policies and actions to protect existing trees and to promote urban forestry practices in a developed community such as Ewing Township.

### *Benefits of Trees*

*Environmental Benefits:* Trees alter the environment by moderating climate, improving air quality, absorbing storm water, and harboring wildlife. Climate control is obtained by moderating the effects of sun, wind and rain. In urbanized areas, trees can reduce the “heat island” effect caused by pavement and buildings, resulting in energy savings for air conditioning. Compact foliage can lessen the impact of strong winds on people, pets and property. The leaves of trees capture rain, lessening the amount that reaches the ground requiring storm water management practices. Air quality is also improved by trees through carbon storage and sequestration, and trees filter the air and remove dust and particulates.

*Economic Benefits:* The economic value of trees is both direct and indirect. Direct economic benefits are usually associated with energy savings from trees that reduce air conditioning costs or trees that provide windbreaks, reducing home heating costs. Direct benefits also accrue from higher property values associated with properties with mature landscaping versus little to no trees and landscaping. A 2005 study, released by Wharton Real Estate Professor Susan Wachter, documented property values increased nearly 10 percent in a densely populated neighborhood of Philadelphia after trees were planted.

Another study by a professor at Kansas State University showed that retail customers preferred shopping in areas beautified by trees as opposed to shopping in areas without trees:

- 86 percent felt that trees enhanced the shopping area
- 62 percent said they would shop more often
- 57 percent would stay longer
- 42 percent would buy more
- 58 percent would spend more

Source: Economic Benefits of Trees within Business Areas – A Viewpoint of Consumers in Smaller Great Plains Communities, R.E. Hildebrant, Department of State and Extension Forestry, Kansas State University, Manhattan, KS

The indirect economic benefits may be even greater. For example, lower electricity bills are paid by customers when utility companies are able to use less water in their cooling towers, build fewer measures to control air pollution, and employ less engineered control of storm water runoff. To the individual, savings may be small, but to the community, reductions in these expenses can be huge. The CITYgreen software program, developed by American Forests — a nonprofit conservation organization dedicated to improving the environment by planting and caring for trees — analyzes land cover data and calculates the dollar benefits resulting from the work trees and other natural features of the landscape provide.

The Mercer County Soil Conservation District used the CITYgreen program to demonstrate a variety of impacts of newly planted trees until they reached maturity.

In the first year of planting:

- Storm water runoff was reduced by 0.4 percent
- Retention basin volume was reduced by 179 cubic feet
- Energy costs per home were reduced by \$18.06
- The trees collected 1.30 tons of carbon

At maturity (same trees)

- Storm water runoff was reduced by 6.9 percent
- Retention basin volume was reduced by 3,228 cubic feet
- Energy costs per home were reduced by \$36.12
- The trees collected 31.82 tons of carbon

Source: Mercer County Soil Conservation District

*Social Benefits:* As mentioned above, trees make life more pleasant, and they provide a sense of serenity and restfulness. Hospital patients have been shown to recover from surgery faster when their hospital room offered a view of trees. People often become attached to trees that they have planted, as well as large “landmark” specimens that represent history and continuity. Community residents usually resist street widening projects involving the removal of trees.

### *Fun Facts about Trees*

- In one year, an acre of trees can absorb as much carbon as is produced by a car driven up to 87,000 miles.
- The death of one 70-year old tree would return more than 3 tons of carbon to the atmosphere.
- The amount of oxygen produced by an acre of trees per year equals the amount consumed by 18 people annually. One tree produces nearly 260 pounds of oxygen each year.
- One acre of trees removes up to 2.6 tons of carbon dioxide each year.
- Shade trees can make buildings up to 20 degrees cooler in the summer.

Source for Benefits of Trees and Fun Facts – <http://www.treesaregood.com/> from the International Society of Arboriculture

### *Cumulative Impacts of Tree Loss*

In 2003, American Forests, Inc. did a study of tree coverage in the nine-county Philadelphia metropolitan area, which includes Mercer County and the township of Ewing. The study, called “Urban Ecosystem Analysis – Delaware Valley Region,” documented landscape changes that occurred over time and identified the impact these changes have made on the environmental services provided by the region’s forests. The analysis showed that even though the changes in heavy tree cover were modest over the 15 years between 1985 and 2000 (880,715 acres to 849,444 acres — a 1.5 percent reduction), which is typical for an older northeastern metropolitan region like Philadelphia, the ecological impact of tree loss when calculated over the 2.4 million acre area is huge. With the decline in heavy tree canopy, the Delaware Valley’s urban forest lost the ability to detain almost 53 million cubic feet of storm water, a service valued at \$105 million. This represents the cost to build storm water retention ponds and other engineered systems to intercept this runoff. With respect to air quality, the loss in heavy tree canopy resulted in the inability to remove about 1.7 million pounds of air pollutants annually, at a value of \$3.9 million per year. In addition, had heavy tree coverage not declined, the trees would have stored an additional 633,000 tons of carbon and sequestered an additional 1,373 tons annually.

Source: Urban Ecosystem Analysis – Delaware Valley Region, American Forests, March 2003

The cumulative loss of heavy tree coverage stems from everywhere, including Ewing Township. To counter this trend, each community can do its part by setting tree coverage goals and methods to achieve them. American Forests recommends the following generalized goals for different land uses, recognizing that every community is different and needs to set their own goals.

- 40 percent tree canopy overall
- 50 percent tree canopy in suburban residential
- 25 percent tree canopy in urban residential
- 15 percent tree canopy in central business district

In addition, American Forest recommends that communities develop specific management strategies to achieve tree cover goals. Strategies should include:

- Plant trees in suitable spaces such as vacant lots, parks, and riparian areas
- Plant trees to meet storm water management goals
- Use trees to decrease peak storm flow
- Require trees as part of redevelopment and new development projects
- Maintain trees to prolong their life and environmental benefits

#### *Shade Tree or Street Tree Commissions*

To implement these strategies, Ewing Township would benefit from a two-pronged approach that protects existing trees and promotes additional tree plantings and maintenance. **To promote additional tree plantings and maintenance, Ewing should form a Shade Tree, or Street Tree Commission.** Such street tree commissions are governmental advisory boards of appointed citizens charged with oversight responsibility for the planting and maintenance of trees on all municipal streets and highways, parks, open spaces and other public rights-of-way. Current municipalities in Mercer County with street tree commissions are Princeton and Hamilton townships, and Hopewell Borough.

#### *Tree City USA Designation*

**Another action that Ewing Township should take, after forming a Street Tree Commission, is to apply to become a Tree City USA.** Requirements for designation are:

- Tree Board/Department/Arborist – Community must have a person or commission assigned responsibility for municipal tree resources, such as an active Shade Tree Commission or arborist.
- Tree Resource Management Plan – Plan must address species diversity, planting needs, hazardous trees, insect and disease problems, and patterns of regular care, such as pruning and watering, with a budget of at least \$2 per capita (in Ewing, that would be about \$71,414 based on the 2000 census population).
- Tree Care/Protection Ordinance – Ordinance must legally designate the person or entity responsible for creating and implementing the tree resource plan. It also gives clear guidance for planting, maintaining and removing trees from streets, parks and other public places.
- Arbor Day Observance and Proclamation – Event can be created from scratch or linked with existing tree-related events or festivals.

Benefits of Tree City USA designation include:

- A Framework for Action for Communities to Maintain and Protect their Tree Resources – The very act of applying for Tree City USA designation provides the initial direction for a community forestry program.
- Education – Technical assistance and contact with state forestry staff.
- Positive Public Image for Community – Tree City USA signs placed at community gateways tell residents, businesses and visitors that this is a community that cares about its environment and is an indication to prospective businesses that quality of life may be better here.

- Enhancement of Civic Pride in Community – Tree City USA presents the kind of image most citizens want for the place where they live or conduct business.
- Financial Assistance – Tree Cities often receive priority in grants related to tree planting and maintenance, because federal and state agencies will give preference to those municipalities with the foresight and commitment to become Tree Cities.
- Positive Publicity Opportunities for the Community – The presentation of the Tree City USA award and celebration of the Arbor Day events offer excellent, free, positive publicity opportunities, plus they will serve to educate more people about the importance of trees.

More than half of the 13 municipalities in Mercer County have Tree City USA designation. They are: West Windsor, Pennington, East Windsor, Hopewell Borough, Lawrence, Princeton Borough and Township, and Trenton.

Source: <http://www.arborday.org/programs/treecityusa.cfm>

This website also has numerous bulletins offering technical assistance with trees.

#### *New Jersey Community Forestry Public Outreach and Programs*

The Department of Environmental Protection, Division of Parks and Forestry has a Community Forest Program that provides staff to help advise and assist counties, municipalities and local organizations to develop and implement community forestry activities. Activities can include:

- Proper tree selection, planting and maintenance
- Community involvement
- Ordinance development
- Public awareness and education
- Insect and disease management
- Long-term strategies for natural resource planning

In addition to technical assistance, and in response to the passing of the New Jersey Shade Tree and Community Forestry Assistance Act of 1996, the Community Forestry Program also offers grants to help fund forestry management plans. The act allows New Jersey communities to obtain liability protection under the NJ Tort Claims Act for their shade tree programs. To qualify for the protection, though, community representatives must develop a community forestry management plan for their community, as well as attend the state's training skills and accreditation program.

Funding has been available to help communities create their own community forestry programs through the Green Communities Challenge Grant Program. The grants are for offsetting the cost of hiring a forestry consultant to work with the community in the development of a forestry management plan. Fifty percent of the grant request must be matched with either cash or in-kind services.

The management plan is an essential guide to successfully achieving a healthy and safe community forest. The most recent deadline for the Green Communities Challenge Grants was December 1, 2005. **Ewing Township should check for the next round of grants and should consider submitting a grant application to conduct the**

**community forestry management plan, or consider conducting the plan without the benefit of the \$1,500 maximum grant.** The website is <http://www.state.nj.us/dep/parksandforests/forest/community/grants.html>

#### *State's Policy of No Net Loss of Trees on State-Owned Property*

New Jersey has passed an act concerning reforestation of areas larger than one-half acre in size that are owned by a state entity and are scheduled for deforestation. Section 2 of P.L. 1993, c. 106 (C.13:1L-14.2) requires a reforestation plan resulting in no net loss of existing forested area for areas subject to deforestation. Township staff, the Planning Board, the Environmental Commission and the Street Tree Commission (if established) should be aware of this state provision to ensure compliance, especially considering the high number of large state-owned properties in the township (the College of New Jersey, the Jones and Knight farms, the Katzenbach School for the Deaf, the NJ Department of Human Services, the NJ Psychiatric Hospital, the NJ State Police, and NJ Department of Transportation).

#### *Tree Protection Ordinances*

**In addition to protecting and planting more street trees on public property, Ewing could take additional steps to limit deforestation and clear cutting from subdivision and development activity by enacting a Tree Protection Ordinance.** Hunterdon County, New Jersey, has a comprehensive Woodlands Retention Ordinance and materials on obtaining conservation easements, hiring woodlands advisors, and questions to ask during the site plan review process regarding trees. This information should be closely examined by the Environmental Commission and incorporated into Ewing's practices. It can be found at <http://www.co.hunterdon.nj.us/planning/addressingsprawl.html>.

The Township of Byram, Sussex County, also has a tree ordinance that could be adapted for Ewing. It is shown in the Appendix.

#### *Tree Disease and Health Issues*

In addition to enacting ordinances, insect and disease awareness and treatment are important features in a community's forestry management plan. Currently, there are two tree health issues affecting trees in New Jersey of which to be especially aware: Bacterial Leaf Scorch (BLS) and Asian Longhorned Beetle (ALB). Bacterial Leaf Scorch is a serious disease attacking oak trees in New Jersey and elsewhere. A statewide survey of BLS in oak trees was conducted in the summer and fall of 2001 by the NJ Forest Service Community Forestry Program, with oversight by the New Jersey Community Forestry Council. The results indicated that BLS is a serious threat to the state's trees. More than 61 percent of samples taken in several counties, including Mercer, gave positive results for the disease. The economic impact of the disease could be devastating to municipal budgets, since trees will need to be pruned or even removed to address potential hazards caused by the disease. The aesthetic impact will also be huge, as large tree removals will change the character of neighborhoods and replacement trees will take decades to grow to the size of the trees that were removed. Unfortunately, there is no known cure for BLS. Injecting diseased trees with antibiotics has been tried, but is expensive and only suppresses symptoms without eliminating the pathogen. The NJ Forest Service recommends watering affected trees and pruning off affected branches well below the

symptomatic leaves. Beyond this, the NJ Forest Service encourages residents to be aware of the disease, to monitor trees for it, and to seek further advice from a NJ-certified tree expert or approved forester.

Source: <http://www.state.nj.us/dep/parksandforest/community/bls.html>.

The Asian Longhorned Beetle attacks maples, willows, poplars, ash, horse chestnuts, elm and buckeye trees, and has been detected in Jersey City and Hoboken. The beetle has already caused widespread destruction in Chicago and New York City. The United States Forest Service cautions every town to be aware of the potential for infestation, and stresses that early detection is the only way to combat the pest. The beetles are about  $\frac{3}{4}$  to  $1\frac{1}{4}$  inches long, with a glossy jet black body with white spots on their backs, and long antennae (horns) up to  $2\frac{1}{2}$  inches, with distinctive black and white bands. For more information on what to do if Asian Longhorned Beetles are seen, see <http://www.nj.gov/dep/parksandforests/forest/community/alb.html>

## **Landscape Project Priority Habitats**

*Never does nature say one thing and wisdom another.*

- Juvenal, *Satires* –

The Landscape Project, developed by the Endangered and Nongame Species Program of the NJDEP Division of Fish & Wildlife, documents the value of various types of habitats within New Jersey. It then ranks these habitats as to their importance. The highest ranking goes to habitat areas where there has been a documented occurrence of one or more species that are on either the federal or the state Threatened and Endangered Species lists and where there is a sufficient amount of habitat type to sustain these species (“critical habitat”). A second category includes habitats that have documented occurrences of species of special concern in New Jersey. Another rank consists of lands with habitat deemed suitable for species that are included in the higher categories but for which there are no documented occurrences or sightings (“suitable habitat”).

Landscape Project data for Ewing Township identifies locations with the most important habitats for wildlife and categorizes them as either “critical habitat” (the highest) or as “suitable habitat.” It is important to preserve both levels of habitat, in order to maintain the diversity of species that still exists in the township.

The Landscape Project data is based on mid-1990s information. It should be noted that since this time, Ewing Township has developed a significant portion of its critical habitat. For example, the new commercial development along the Shabakunk Creek, between Spruce Street and Eggerts Crossing Road, is situated on land listed in the table below as critical habitat. The acreage listed in *Landscape Project Habitat Rankings – Acreage in Ewing Township* has *not* been adjusted to reflect these new developments on landscape priority habitats. See Map 15: Landscape Project Habitat Priorities of the Ewing ERI.

**Landscape Project Habitat Rankings – Acreage in Ewing Township**

Type	Rank	Acres	Subtotals by Category	% of Total Landscape Project Acreage	% of Total Township Acreage
Grasslands	Suitable Habitat	494.97	533	58%	5%
	Critical Habitat	38.17			
Upland Forest	Suitable Habitat	0.94	217	24%	2%
	Critical Habitat	216.55			
Forested Wetlands	Suitable Habitat	62.65	99	11%	1%
	Critical Habitat	36.47			
Emergent Wetlands	Suitable Habitat	52.16	69	8%	1%
	Critical Habitat	16.87			
<b>Total Landscape Project Acres</b>		<b>918.78</b>		100%	9%
<b>Total Township Acres</b>		<b>9,959.31</b>			

Source: NJDEP

*Landscape Project Data on Wetland Habitat:* The Landscape Project divides wetland habitats into two types — forested and emergent wetlands. They can also be home to various rare amphibians (frogs and salamanders). Usually, emergent wetlands are marshy areas characterized by low-growing shrubs and herbaceous plants in standing water. They can be tidal or nontidal. Animal species that can be found there include endangered turtles, rare fish, mollusks, crustaceans, and insects.

About 32 percent of the wetland acreage in Ewing that is ranked as critical (the highest value) is emergent wetland (17 acres). Forested wetlands make up the other 68 percent of wetlands ranked at the highest level (36 acres). Emergent wetlands ranked at the suitable habitat level occupy 52 acres and forested wetlands ranked at the suitable habitat level occupy 63 acres. Nearly all critical and suitable wetlands are located along the Shabakunk Creek.

*Landscape Project Data on Upland Forest Habitat:* The Landscape Project has ranked upland forests in the same manner as wetlands. What remains of Ewing’s highest ranked “critical habitat” upland forests are also found along the Shabakunk Creek. Critical upland habitat constituted 217 acres when the Landscape Project was originally conducted — however, much of this land has since been developed for commercial uses. One acre was ranked at the suitable level.

*Landscape Project Data on Grassland Species Habitat:* Nearly all of the land ranked as critical habitat for grassland-dependent species is located along the Shabakunk Creek (38 acres). Land rated at the lower level, as “suitable habitat” (495 acres), is located in the western part of the township, mainly on the Knight and Jones farms. Examples of



grassland-dependent species that use this kind of habitat for nesting or feeding include various grassland birds.

### *Protecting Priority Habitats*

Actively protecting Landscape Priority Habitats will involve a number of approaches. The wetland habitats should be primarily protected through current wetland regulations, but the grassland and forest habitats are less protected and more vulnerable. Woodland and tree protection ordinances are discussed in the previous section under Tree Protection. The grassland habitats in Ewing primarily occur on the Jones and Knight farms as suitable habitat, with a small area occurring above I-95 at Reed Road. These areas can be protected through certain zoning changes and changes to the site plan review process.

The Knight Farm is zoned Conservation, and has been deed restricted from further development by an executive order of Governor Whitman. The Jones Farm is zoned Conservation and Office Park 1. Keeping these minimum-security prison farms in Ewing provides a number of benefits to the community. The two farms provide the only remaining substantial Landscape Project Habitat Priority areas remaining in the township. They provide pastoral scenery and scenic relief in an otherwise built-up area. They are also areas of high groundwater recharge (see Map 13: Groundwater Recharge, of the Ewing ERI). Moreover, the farms are important because they are productive dairy farms — the Jones Farm processing plant produces 1.6 million pints of milk each month, enough milk for 14 state prisons and 18 institutions run by the Juvenile Justice Commission and Department of Human Services. Together, the two farms save the state about \$1 million a year in food production costs.

Source: *Philadelphia Inquirer*, Joel Bewley, “Farm offers inmates honest, essential work” March 18, 2005

The two state prison farms appear to be an asset to both the state and the township, but, should the state decide to discontinue them or a portion of them, the land could potentially be sold off and developed according to its zoning. The Conservation Zone (Section 15-28 of Land Development Chapter XV of the Township of Ewing Code) permits public and institutional, agricultural and recreational uses and structures owned and operated by the federal government, the state of New Jersey, the county of Mercer, or the township of Ewing. Should the state sell off any property in the Conservation Zone to a private entity, it would presumably require a zoning change, since only publicly owned entities can build structures in the Conservation Zone.

In the meantime, even with the land in public ownership, the Conservation Zone may not live up to its title because it allows up to 80 percent lot coverage, the highest lot coverage percentage permitted in any of the township’s other zoning districts, except the Industrial Park districts, which also allow 80 percent lot coverage. Any lot with 80 percent impervious coverage would be almost entirely paved over, and would not conserve the environmental and scenic values of the property. As written, the Conservation Zone appears to be more akin to an Institutional Zone than a true conservation zone.

To use zoning to better achieve the township’s conservation goals, the township should consider lowering the lot coverage limit in the Conservation Zone. Ewing Township’s

neighbor, Lawrence Township, has an “Open Space District” with the following purpose, permitted uses and area requirements:

Lawrence Township Code – Section 424 - Open Space (OS) District

- A. Purpose. The Open Space zone is established to delineate land dedicated or otherwise restricted to active recreation, passive recreation, conservation, and agricultural uses owned by a public entity, land trust, conservation foundation or other organization for open space purposes.
- B. Permitted Uses. In the Open Space zone, no lot shall be used and no structure shall be erected, altered or occupied for any purpose except the following:
  - a. Public parks and recreation
  - b. Conservation
  - c. Agriculture
  - d. Municipal Use
- C. Accessory Uses Permitted. The following accessory uses shall be permitted in conjunction with a principal use:
  - a. Public recreation facilities
  - b. Environmental center
  - c. Historic interpretation center
  - d. Farmstead
  - e. Accessory uses on the same lot and customarily incidental to the principal use
- D. Area, Yard, Height and Building Coverage. Except as otherwise modified, the following bulk standards shall apply to all lots:
  - a. Farmsteads. Minimum lot area 4 acres. Maximum impervious surface ratio 10 percent
  - b. Agricultural Uses. Minimum lot size 5 acres. Maximum impervious surface ratio 5 percent

**Ewing Township should amend its Conservation Zone to include a purpose statement and a lower impervious ratio limit, similar to Lawrence Township. The impervious coverage limit may need to be as high as 10 percent to meet the state prison farm needs for barracks and production facilities. This would allow the continuation of the currently permitted agricultural, park, recreation and conservation uses found in Ewing’s Conservation Zones, but would prohibit these districts from becoming overdeveloped and paved over.**

Since the Jones Farm provides the same scenic and environmental benefits as the Knight Farm, the township should consider rezoning it to a Conservation Zone. For economic development opportunities, it would make more sense to provide for infill and redevelopment in other areas of the township that have sewer and water service connections in place, where the landscape has already been altered, and where public opposition to change will be lower.

*Conservation Design Zoning:* An effective approach to conserving open space, greenways and natural resources while still protecting landowner equity is called

Conservation Subdivision Design. This is an approach developed by nationally known planner and landscape architect Randall Arendt, who is on staff at the Natural Lands Trust in Media, Pennsylvania.

### **Conservation Design**

Three interrelated tools are part of this approach:

1. A map is developed of all natural, historic, and cultural features in the municipality that should be protected, as well as areas that are appropriate for development. The map should be part of the Master Plan, referenced in the zoning ordinance, and treated as a rebuttable presumption that developers must address seriously.
2. Mandated conservation design is put in place for all major subdivisions, requiring a minimum 50 percent permanently preserved, undivided open space/agricultural land, preferably linked to existing and proposed open space areas.
3. A four-step design process is utilized in which a site visit and creative thinking is employed by the developer in conjunction with the Planning Board:
  - a. Identifying the land to be permanently protected. This involves detailed site analysis with identification of primary areas (critical environmental areas) and secondary conservation areas (high-value recharge land, threatened and endangered species habitat, scenic views, hedgerows, large old trees, historic sites and structures).
  - b. Locating the sites of individual houses (or nonresidential construction) within the Potential Development Area (the area that is not to be permanently protected). The number of houses is based on a yield plan — whatever the zoning would allow in a conventional subdivision on the parcel.
  - c. Connecting the “dots” with streets and trails
  - d. Drawing the lot lines.

Source: Growing Greener - Putting Conservation into Local Plans and Ordinances, Randall Arendt, 1999

Conservation Design involves making changes to both the zoning and the subdivision codes, and has typically been used in rural communities undergoing major residential subdivisions. Although this is not the situation in Ewing, aspects of the ordinance could be used to help preserve the Landscape Priority Habitat areas, the high groundwater recharge areas, and other “secondary” conservation areas that are not otherwise protected through state and local regulations. For example, the subdivision and site plan requirements checklist could add a requirement to show areas designated as Landscape Project Priority Habitats, areas of high groundwater recharge, and historic structures, as identified in the Ewing ERI and Master Plan. Even if these features are required in an Environmental Impact Statement, it is helpful to have them shown on the site plan in case the EIS requirement is waived. Conservation Subdivision Ordinance language also

strongly recommends a site visit with the applicant, members of the planning board, and the town planner and/or engineer before even a sketch plan is submitted, so that the town leaders can express their ideas and wishes for the site before the applicant invests time and money on site plans. And Conservation Subdivision Design strongly recommends the submission of a sketch plan (subsequent to the field visit) so that the planning board may give input again before substantial time and money is invested in development of a preliminary plan. The township currently has provisions for sketch plan review by its planning board, but the language says it is at the request of the developer, rather than the other way around. **Strongly encouraging a sketch plan submission is an excellent way for the planning board and applicant to come to agreement on the layout of the plan from the beginning, avoiding disappointments and disagreements later on. The planning board should consider this approach, and the wording in the code should be changed accordingly to strongly encourage the Sketch Plan submission.**

# Proposed Greenways, Open Space and Pathways

*Everybody needs beauty as well as bread, places to play in and pray in,  
where nature may heal and give strength to body and soul.*

- John Muir -

## Background

Ewing Township is nearly 75 percent built-out (Ewing ERI, Table 1: Land Use), but it still has remaining farmland, open spaces and greenways that are important to protect for attracting investment, revitalizing urban areas, boosting tourism, preventing flood damage, protecting farms, promoting sustainable development, and creating a livable community through conservation. (See Community Benefits of Environmental Protection and Open Space Preservation on page 8.)

Since greenways and open space provide multiple environmental, recreational, scenic, economic and quality of life functions, they are increasingly being considered as “Green Infrastructure,” thereby elevating their status as an *integral*, not extra, part of a community. The word “infrastructure” is defined by *Webster’s Dictionary* as “the underlying foundation or basic framework (as of a system or organization).” The concept of Green Infrastructure began 130 years ago with Frederick Law Olmsted, the designer of New York’s Central Park and Boston’s Emerald Necklace. “No single park would provide all the beneficial influences of nature,” Olmsted maintained. “Instead, parks should be linked to one another and to surrounding residential neighborhoods.”

Source: Edward T. McMahon, “Green Infrastructure,” *Urban Land*, May 2005

In addition to the important environmental functions that greenways provide, greenways with paths can be a conduit for physical activity, which is becoming more and more important as American society becomes more sedentary. According to the Active Living Network, a nonprofit group citing information based on research by the Centers for Disease Control and Prevention, 74 percent of Americans do not regularly engage in physical activity, and 28 percent do not get any physical activity at all. They also cite that the average American only walks about 400 yards per day, less than five city blocks; that the number of children who are overweight has doubled since 1980; and that the number of adolescents who are overweight has almost tripled. Not coincidentally, the number of children who walk to school has declined over the same period, by 60 percent.

Source: Doug Schultz, “Active Living,” *Urban Land*, May 2005.

Local trails not only provide a means to exercise and connect people to places, but they can also connect people to each other, forming a type of social infrastructure that people are seeking out more and more. For example, in the recent past, interest in the hearth and home led to the growth of the home improvement and home entertainment industries and produced the term “cocooning,” referring to people’s retreat and insulation from others. In contrast, people today seem to want to reconnect as well as return to their homes, and

this cultural phenomenon has been described as “hiving.” (Mary Lee Kiracofe, “The Art of Living,” *Urban Land*, May 2005) Trails that people can easily access from their homes provide places for people to socialize, either as a planned activity or through impromptu meetings.

The first step in preserving remaining open lands and greenways is identifying them, the second step is assessing the applicability of the preservation tools available, and the third step is choosing the best tool for each area and implementing it. See Map 2: Proposed Greenways, Pathways, and Open Space. The map incorporates much, but not all, of the remaining open space lands in the township. These lands are identified for potential open space preservation for environmental, scenic, recreational, social, economic, and quality of life purposes.

## Proposed Greenways

*One touch of nature makes the whole world kin.*

- William Shakespeare -

A greenway is a corridor of open space linking natural, recreational and cultural features. Due to the linear nature of greenways, they pass through a variety of neighborhoods, connecting people to open space, destinations, and to each other. Greenways are not the same as trails, and they do not have to be in public ownership to perform many important environmental functions. In Ewing, some greenways should simply be vegetated buffers along stream corridors, to preserve the ecology of the watercourse. Other greenways in a mature, developed community such as Ewing, however, should have trails, because they can provide a great way to elicit existing, but hidden, open space for residents to enjoy; and they can provide off-road transportation alternatives for people to walk and bike to places. Map 2 shows two types of proposed greenways for Ewing — *greenways* proposed for environmental protection purposes, and *greenway paths* proposed for public access/trail purposes. Some of the proposed paths go through greenways, and some go through abandoned highway rights-of-way and rail corridors that can be converted to trails.

*Greenway Buffers for Environmental Protection:* All streams in Ewing should be buffered by a vegetated corridor, for the ecological purposes explained in the Stream Corridor protection section. These greenways will typically stay in private ownership, with a stream corridor protection program involving landowner stewardship education and regulatory ordinance language requiring disturbance setbacks as the main means of achieving the greenway. Map 2 shows the location of these proposed greenways.

*Greenway Creation:* **This Conservation Element recommends that a vegetated, green buffer be maintained as shown on Map 2 for purposes of water quality protection, flood control, wildlife habitat and recreational opportunities, where appropriate. The goal is to preserve the greenway in perpetuity by formalizing**

**riparian corridor protection at the township level through landowner stewardship education, stronger land use regulations and by using conservation easements and acquisition, where appropriate. Educational materials targeted toward streamside landowners will help residents understand the importance of vegetated greenway buffers. Adoption of stream corridor protection and steep slope ordinances will provide the local regulations needed to maintain the stream buffers. In addition, there are numerous ways land can be acquired or eased. In some cases the land development or subdivision approval process triggers negotiations, in other cases, the municipality, county or a land trust may approach the landowner and negotiate an agreement to conserve the property.** The box on the following page lists and describes conservation options involving easements and acquisitions.

### **Proposed Open Space and Farmland Conservation Areas**

Map 2 also shows areas proposed for farmland conservation and open space preservation. The Knight and Jones farms, the two remaining farms in the township, are proposed for farmland preservation. For open space, three relatively small areas are proposed in this Conservation Element: the area between the township municipal building and county library, the historic Trenton Bath House, and an area adjacent to the Delaware River on Route 29, near Wilburtha Road.

*Farms:* The two farms are proposed to remain agricultural for a variety of reasons. First is to maintain their environmental functions as the last large remaining suitable habitat for threatened and endangered species, and as areas of high groundwater recharge. If these areas were to convert to developed uses, species dependent on grassland habitat would no longer be found in Ewing, further depleting the community's biodiversity. Aquifer recharge would also suffer, and increased storm water runoff resulting from development would aggravate flooding on the Delaware River tributaries and the river itself. The farms also provide quite scenic views of a bucolic landscape in an otherwise built-up environment. And, the farms produce a significant amount of dairy products for the state's penal institutions, lowering state costs for institutional food supply, and providing rehabilitative labor for inmates.

There are several approaches that could be taken to preserve the farms. First, however, the township should coordinate with both the NJ Department of Corrections (property owner and operator) and the State Agricultural Development Council (SADC) to discuss intentions and ways to preserve the farms. One method to consider is rezoning the entire Jones Farm to Conservation, and reducing the zone's impervious coverage limit to 10 percent. Other methods would be another Executive Order of the Governor for preserving the Jones Farm (similar to the Knight Farm), or a conservation easement on the Jones Farm.

Some people believe that developing farms into higher intensity uses will provide needed tax ratables for the community. However, many studies show that farmland costs much less in services than it pays in taxes, thereby producing a net increase for the

# Map 2: Proposed Greenways, Pathways, and Open Space Ewing Township

COMMUNITY FACILITIES	
1	Ewing Municipal Building
2	Ewing Branch of Mercer Co. Library System
3	The College of NJ
4	Ewing Community Center
5	Antheil Elementary School
6	Fisher Middle School
7	Ewing High School

- River or Stream
- Lake
- Ewing Township Boundary
- Other Township Boundary
- County Boundary
- Community Facility
- Historic Site

### PROPOSED OPEN SPACE

- Greenway Path
- Greenway
- Right-of-Way/Rail-to-Trail
- Open Space
- Farmland Conservation Area

### 2003 PROTECTED LANDS

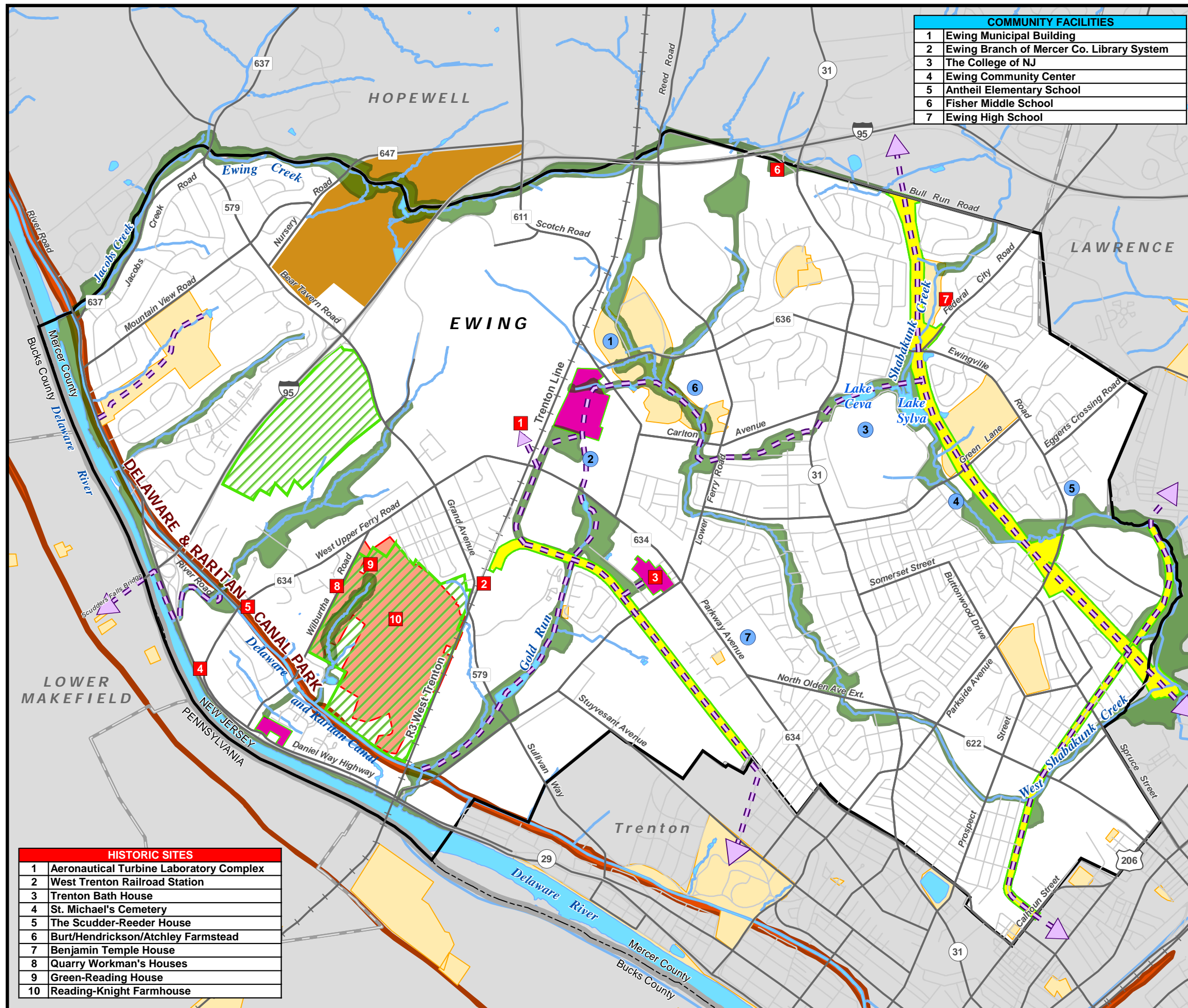
- State
- County
- Municipal
- Knight Farm:  
Preserved by Governor's Executive Order in 1999

Source : NJDEP, NJDOT, Schoor DePalma, DVRPC.  
This map was developed using New Jersey Department of Environmental Protection Geographic Information System digital data, but this secondary product has not been verified by NJDEP and is not state-authorized.

0 0.5 1 Miles

Delaware Valley  
Regional Planning Commission  
July 2006

HISTORIC SITES	
1	Aeronautical Turbine Laboratory Complex
2	West Trenton Railroad Station
3	Trenton Bath House
4	St. Michael's Cemetery
5	The Scudder-Reeder House
6	Burt/Hendrickson/Atchley Farmstead
7	Benjamin Temple House
8	Quarry Workman's Houses
9	Green-Reading House
10	Reading-Knight Farmhouse










# Map 3: Proposed Greenways, Pathways & Open Space (with 2002 Aerial Photos) Ewing Township





### PROPOSED OPEN SPACE

-  Greenway Path
-  Greenway
-  Right-of-Way/Rail-to-Trail
-  Open Space
-  Farmland Conservation Area

Source : NJDEP, NJDOT, DVRPC, NJOIT.  
This map was developed using New Jersey Department of Environmental Protection Geographic Information System digital data, but this secondary product has not been verified by NJDEP and is not state-authorized.

0 0.5 1 Miles

Delaware Valley  
Regional Planning Commission  
July 2006

\*Aerial photographs do not extend further into Pennsylvania

municipality. Even commercial development, often seen as a panacea for tax woes, can cost a township significantly in terms of needed road improvements and maintenance, and police and fire protection, as opposed to farmland's service needs. There are numerous models available for calculating the fiscal impacts of different land uses, and this issue should be further explored and understood regarding the remaining farmland in Ewing. In addition, the community should examine its existing commercial inventory and judge whether there is sufficient support for new development that will not result in existing commercial areas becoming vacated. Places that over-provide for commercial development end up with empty eyesores. When new development is needed in a community, redevelopment of outdated structures should also be considered.

*Proposed Open Space:* This Conservation Element proposes three areas for open space preservation. One is located between two major community facilities — the municipal building and library — and could serve to link them if it were to become public open space land with a pathway. This open field sits within the Airport Safety Zone of the Trenton-Mercer Airport. As such, its use is limited by the provisions of Chapter 62 Air Safety and Zoning under N.J.S.A. 27:1A-5 27:1A-6 and the Air Safety and Zoning Act of 1983, P.L. 1983, c260, as amended.

The language of this Act states that the municipality shall implement ordinances that implement the following standards for land use around airports:

#### Section 16:62-5.1 Minimum land use standards

1. Permitted uses:
  - a. Residential single-family dwelling units on lots of at least 3 acres in size and not located in a clear zone. Residential zoning is permitted in the Clear Zone as long as all dwellings are physically located outside of the Clear Zone
  - b. Airpark
  - c. Open Space
  - d. Agricultural
  - e. Transportation
  - f. Airport
  - g. Commercial (not located in a Clear Zone)
  - h. Industrial (not located in a Clear Zone)
2. Specifically prohibited land uses:
  - a. Residential units not situated on a lot of at least 3 acres
  - b. Planned unit developments and multifamily dwellings
  - c. Hospitals
  - d. Schools
  - e. Aboveground bulk tank storage of compressed flammable or compressed toxic gases and liquids
  - f. Within runway end subzones only, the aboveground bulk tank storage of flammable or toxic gases and liquids
  - g. Uses that may attract massing birds, including landfills
  - h. Above-grade major utility transmission lines and/or mains.

The site's location across the tracks from the proposed mixed-use, transit-oriented development (TOD) site also supports its use as open space. The redevelopment of the TOD sites can create a town center for the community, and the addition of this parcel could provide an opportunity to ensure that open space and trail connections are part of the mix.

### CONSERVATION OPTIONS



1. Conservation Easement – a legal instrument by which a landowner limits, without relinquishing ownership, the development potential of property that has significant natural resources, open space or habitat value, and grants the right to conserve those values. A conservation easement goes with the land — all subsequent owners are bound by the restrictions, which are recorded with the deed and filed at the County Recorder's office. The land remains in private property, but the organization to which the land is eased, whether a private land trust or government agency, is responsible for monitoring compliance with the deed restrictions with current and future property owners. A conservation easement *with public access* allows people to enter the area for recreation. According to the NJ Landowners Liability Clause, landowners are released from liability so long as no fee is charged and the landowner does not willingly cause or ignore a hazardous situation. A conservation easement can substantially reduce the value of the property for real estate tax purposes and inheritance tax purposes, often enabling the land to remain in the family rather than be sold to pay inheritance taxes.
2. Fee Simple Acquisition – a government entity and/or land trust buys the land and becomes the owner. If sold at less than fair market value, the sale can provide tax benefits to the landowner.
3. Bargain Sale – a sale to a land trust or other qualified entity at less than fair market value. The difference between the sale price and the appraised fair market value qualifies as a tax-deductible, charitable contribution.
4. Installment Sale – a mechanism by which the income from the sale of a property is spread over several years in order to help reduce capital gains taxes.
5. Donation – an outright gift, with or without charitable intent, for no financial remuneration. However, the value of the land given can serve as a tax deduction.
6. Reserved Life Estate or Remainder Interest – land is transferred to a land trust immediately, but the owner reserves the use of the property for his or her lifetime. This permits the landowner to continue to live on the property and receive an income tax benefit during his or her lifetime. It can also benefit future generations by removing the value of the property from the estate, reducing inheritance taxes.
7. Bequest – the landowner conveys the deed of the property to a land trust at the time of his or her death. This removes the property from the estate for inheritance tax purposes. Including a conservation easement ensures that the property will be permanently protected.

*Source: Adapted from Greenways, winter 1999 newsletter of the D and R Greenway Inc. from an article written by Linda Mead, and from "Its No Longer Greek to Me – Land Conservation Terms Made Easy," a flyer put out by D and R Greenway, Inc.*

The parcel adjacent to the Delaware River is proposed for open space because it is entirely within the floodplain; therefore, it should not be developed in order to protect against future flooding and to provide a vegetated buffer area near the river. In addition, because it is adjacent to residential and commercial properties that are developed within the floodplain, keeping this area open can serve to help absorb floodwaters when the river next floods its banks. According to Ewing Planning Board and Environmental

# Map 4: Trenton-Mercer Airport Safety Zone *Ewing Township*




-  Airport Safety Zone
-  Municipal Boundary

Sources : Frederick R. Harris, Inc., NJDEP, NJOIT, DVRPC.  
This map was developed using New Jersey Department of Environmental Protection Geographic Information System digital data, but this secondary product has not been verified by NJDEP and is not state-authorized.

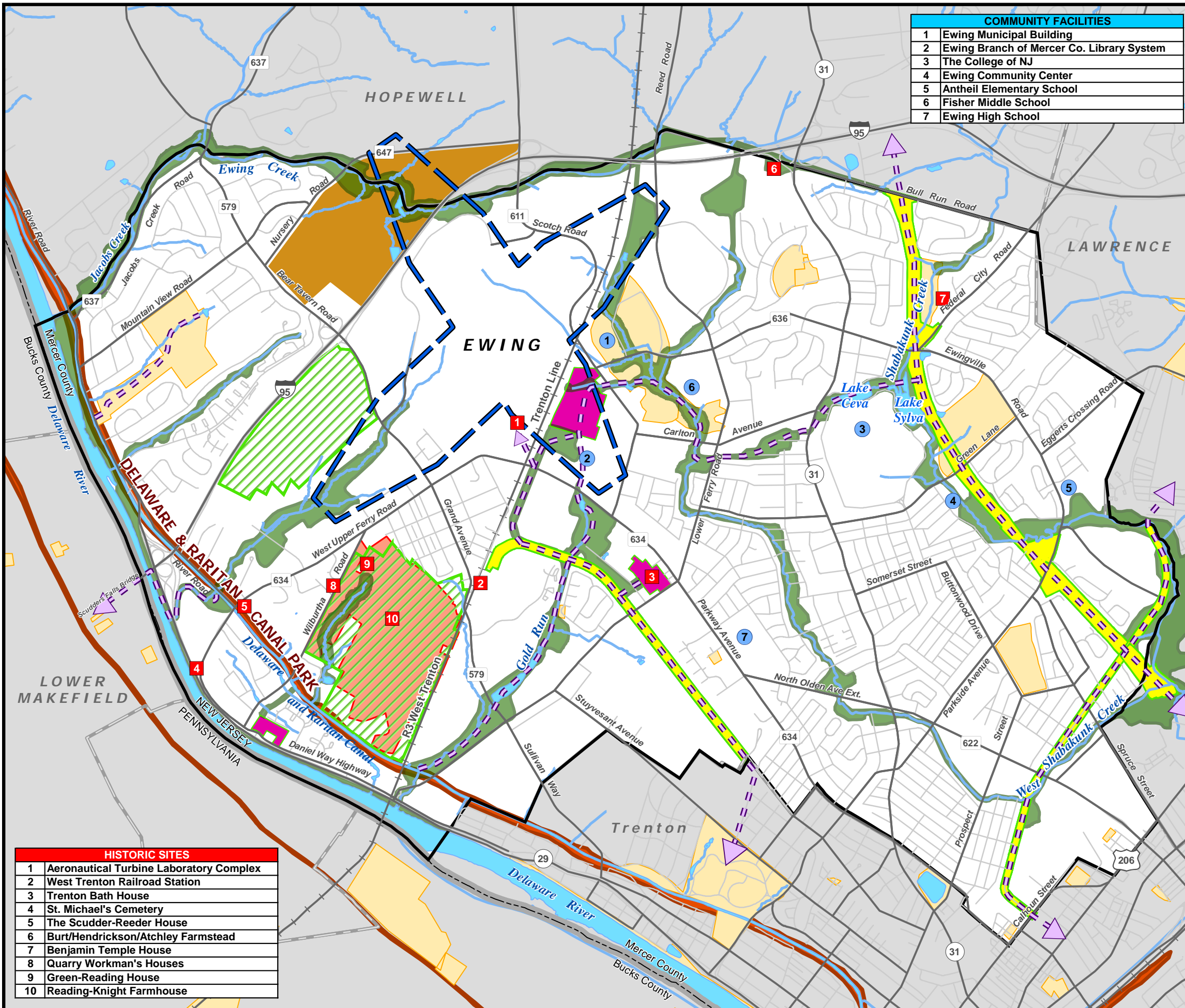


0 500 1,000 2,000 Feet

 Delaware Valley Regional Planning Commission  
July 2006

# Map 5: Proposed Greenways, Pathways, and Open Space (in Relation to Airport Safety Zone) Ewing Township

COMMUNITY FACILITIES	
1	Ewing Municipal Building
2	Ewing Branch of Mercer Co. Library System
3	The College of NJ
4	Ewing Community Center
5	Antheil Elementary School
6	Fisher Middle School
7	Ewing High School



- Rivers and Streams
- Lakes
- Ewing Township Boundary
- Other Township Boundary
- County Boundary
- Community Facility
- Historic Site
- Trenton-Mercer Airport Safety Zone

**PROPOSED OPEN SPACE**

- Greenway Path
- Greenway
- Right-of-Way/Rail-to-Trail
- Open Space
- Farmland Conservation Area

**2003 PROTECTED LANDS**

- State
- County
- Municipal
- Knight Farm: Preserved by Governor's Executive Order in 1999

HISTORIC SITES	
1	Aeronautical Turbine Laboratory Complex
2	West Trenton Railroad Station
3	Trenton Bath House
4	St. Michael's Cemetery
5	The Scudder-Reeder House
6	Burt/Hendrickson/Atchley Farmstead
7	Benjamin Temple House
8	Quarry Workman's Houses
9	Green-Reading House
10	Reading-Knight Farmhouse

Sources : Frederick R. Harris, Inc., NJDEP, NJDOT, Schoor DePalma, DVRPC.  
 This map was developed using New Jersey Department of Environmental Protection Geographic Information System digital data, but this secondary product has not been verified by NJDEP and is not state-authorized.

0 0.5 1 Miles

Delaware Valley  
Regional Planning Commission  
July 2006

Commission members, residents from this area were evacuated during floods that occurred in 2005.

Any development that could take place on the site would need to conform to NJDEP's Flood Hazard Area Control Act and the Federal Emergency Management Agency (FEMA) National Flood Insurance Program's building regulations. However, development on this parcel could require more people to be evacuated in the future and more damage to the property, as well as to downstream properties, from the reduction in flood storage area. The development of this site may therefore exacerbate flooding in an area already severely impacted from 2005 floods. The township should investigate methods to keep the parcel open. Methods can include combining regulations with acquisition and conservation easements.

The other parcel proposed for open space is a 44-acre partially wooded tract that is home to the historic Louis Kahn bathhouses that sit on the property. Mercer County is looking into purchasing this property, with 13 acres owned by the Jewish Community Center, which is moving to West Windsor Township, and 31 acres owned by a land trust. Source: Lisa Coryell, "Focus is shifting to small tracts," *The Times of Trenton*, January 30, 2006.

## **Greenway Paths**

Proposed paths are shown on Map 2 where the opportunities for trails appear most viable and where connections to destinations can be made. This map identifies pathway opportunities, but does not imply that any trails or pathways are to be constructed at a future point. The construction of any trails should involve township residents with additional, more detailed planning and design issues.

Significant outreach on greenway and trail projects will be critical to their success, because many myths surround the impacts of greenways and trails on local residents. Some people fear that crime will increase and property values will decline. However, studies show that property values along greenways actually increase. In Salem, Oregon, land next to a greenway drew \$1,200 more than land only 1,000 feet away. The Minnesota Department of Natural Resources compared attitudes of landowners on proposed trails and existing trails. Seventy-five percent of those on the proposed trail expressed fear of crime and vandalism while those on existing trails nearly unanimously believed there were no crime problems.

Source: *Green Infrastructure Guide – Planning for a Healthy Urban and Community Forest*, Regional Planning Partnership, 2001

The proposed path on the old Route 31 ROW corridor would link the College of New Jersey with several of the township's historic resources and community facilities, running north to southeast through the eastern side of Ewing. Near the ROW's southern terminus, the trail could link with the former Trenton Princeton Traction Company Line, and could extend into Lawrence Township and connect to Rider College. The portion of the Trenton Princeton Traction Company Line between Princeton and Lawrenceville was

abandoned in 1921, and the portion between Lawrenceville and Trenton was abandoned in the 1980s. The ROW is about 40 feet wide and could serve to connect two major destinations: Rider College and the College of New Jersey. These trail sections are part of the proposed Ewing-Lawrence Greenway concept.

The former Trenton Industrial Track/West Trenton Branch spur from the R3 line was abandoned in 1982, is 3.5 miles long, and is one track wide. This proposed path could link the West Trenton Train station with the Delaware and Raritan Canal Park via the Gold Run Trail. (A quarter-mile spur from the R3 line may be used to service Homosote — this needs further study. Re-use as a trail connection is dependent on freight use.)  
Source: DVRPC Abandoned Rail Road Inventory and Policy Plan, 1997

An east-west pathway link could be created between the ROW trail at the College of New Jersey, traveling west through an open space corridor that connects to John S. Watson Park and the municipal building. The proposed path can then be extended south to the Ewing Branch of the Mercer County Library system, the two proposed Transit-Oriented Development sites, and onto the Gold Run Trail and the D&R Canal Park. A loop links the two proposed TOD sites north to the library and municipal complex, and south to the D&R Canal.

Altogether, Ewing Township has some fabulous opportunities for trail connections that could link together schools, historic resources, parks, and neighborhoods within the township and beyond. Linking to the D&R Canal Park provides a way for trail users to go to Washington Crossing State Park, Lambertville, New Hope, and points farther north, as well as south on the towpath to Trenton, and east to New Brunswick. This section of the D&R Canal Park (Trenton to New Brunswick) is also part of the East Coast Greenway, a proposed off-road trail from Maine to Florida. At Trenton, trail users can also continue on the Delaware River Heritage Trail, a planned loop trail from Trenton south to Palmyra, and Tacony north to Morrisville, using existing Delaware bridges for crossings. To the south, many additional connections can be made to the proposed Assunpink Creek Trail, Crosswicks Creek Greenway, Kincora Trail, and Rancocas Creek Trail. In addition, the reconstruction of the Scudders Falls Bridge includes a proposed lane for bicycles and pedestrians, providing a pathway connection west to Pennsylvania and the Delaware Canal Towpath, which provides numerous other trail connection opportunities on the Pennsylvania side of the river.

Implementing the proposed open space, greenways and trails will require a group of concerned residents to champion the greenways and trails and to organize support and funding to make them happen. **Ewing Township should form a Greenway and Trail Committee to start promoting the benefits of trails, developing an implementation plan, and raising funds to create the open space, greenways and trails. The Greenway and Trail Committee should work with neighboring communities on joint greenway projects such as the Ewing-Lawrence Greenway, and should seek technical advice from the Mercer County Planning Division, NJDEP Office of Natural Lands Management, NJDOT Bicycle and Pedestrian Coordinator, DVRPC Bike and Pedestrian Coordinator, and nonprofit groups such as the Rails-to-Trails Conservancy and East Coast Greenway, Inc.**





# Stewardship

*A lawn is nature under totalitarian rule.*

- Michael Pollan, *Second Nature*, 1992 -

Stewardship embodies the concept of land as a resource, and recognizes our responsibility to wisely manage that resource for the benefit of current and future generations.

## Conservation Landscaping

The impacts of daily landscaping decisions reach far beyond individual property lines. By better managing the land that each landowner is responsible for, whether it is a backyard, school, park or corporate campus, property owners can make positive contributions to the surrounding habitats, the wildlife they support, and the water quality in the region.

The conservation landscaping approach to lawn and garden management works with nature to reduce pollution and enhance wildlife habitat. It requires some thought to yard care, including the amount of fertilizer and pesticides used, the size of manicured lawn area, amount of irrigation required, and the use of native plants.

Conservation landscaping is especially important in a community such as Ewing, because of its mostly developed status. While pristine habitats are irreplaceable, there are many actions that can be taken to provide a healthier environment for wildlife and people. By practicing conservation landscaping, property owners in Ewing can:

- Create new habitat for wildlife displaced by development
- Use fewer chemicals on properties, thereby reducing the level of toxic runoff into streams and rivers (the Delaware River is a drinking water source for Ewing residents)
- Plant more native vegetation, which will help to conserve water and create wildlife habitat

### *Stewardship Education for Businesses*

There are numerous institutions and corporate campuses in Ewing that have large lawn areas. While lawns are preferable to pavement, manicured lawns also require a lot of mowing, irrigation, pesticides and fertilizers, at great costs to both the property owner and the environment. Mowing alone can cost some companies tens of thousands of

dollars annually, in addition to the expense of chemical applications and reseeding. A 1,000-square-foot area of lawn requires 10,000 gallons of freshwater every summer to stay green. Plus, the pesticides and fertilizers applied to lawns kill beneficial creatures, impair water bodies, and leach into human drinking water supplies.

Instead of keeping vast areas as green lawns, corporate campuses, municipal parks, institutions, and other large lots, landowners can turn their acres into tall grass and meadows, saving themselves money and at the same time contributing to biodiversity and increasing employee morale. The biological significance of any one habitat enhancement project may seem small, but the cumulative impact of many enhancement projects is great. Plus, once one property owner turns their lawns to meadows and reaps the benefits, their experience will often spill over to neighboring properties, increasing biodiversity awareness across the area.

One large property owner in the Philadelphia region that accomplished this is McNeil CSP in Fort Washington, Pennsylvania. The company has a corporate campus of 113 acres, 80 of which were initially maintained as fine lawn and landscaped area. Since 1990, McNeil has returned 24 of these acres to tall grass and meadow. The company focused not only on the feasibility of biodiversity conservation, but also on the economic and educational opportunities that such activity presented.

They discovered that from 1989 to 2000, the company spent approximately \$59,000 in converting 24 acres of fine lawn into tall grass and seeded wildflower meadow. The costs were mostly for staff time, supplies, and plantings. That may sound expensive, but, over the 11-year period, the company saved more than twice that — \$133,570 — from reduced fertilizer use, less aeration and weed control needs, fewer equipment costs, and less need for mowing labor. McNeil also reported that the project increased employee morale, because the employees knew that the company cared about the environment enough to make a difference.

Source for Stewardship Education for Businesses: Partnership for the Delaware Estuary, *Estuary News*, Summer 2005

Close to Ewing, the Stony Brook-Millstone Watershed Association provides businesses the opportunity to become better environmental stewards, decrease fiscal expenditures, and assume a leadership role in protecting the community's environmental quality. The association serves as a resource and provides one-on-one consultations to assist businesses in achieving their goals through its River-Friendly Business Certification Program. More information can be found at [www.thewatershed.org/river\\_fr\\_prog\\_lv12.php?id=C0\\_84\\_48](http://www.thewatershed.org/river_fr_prog_lv12.php?id=C0_84_48)

#### *Lawn Alternatives for All Property Owners*

There are many alternatives to lawns for both corporate campuses and individual homeowners. Anytime property owners can reduce the size of their lawn by turning to a lower maintenance natural alternative, they will probably see cost and environmental savings from reduced needs for mowing, fertilizers, pesticides and irrigation. Here are a few lawn alternatives that property owners can consider:

- Groundcovers – spread across the ground but do not grow tall, so no cutting is required. Can be chosen for texture, density and how well they spread and choke out weeds.
- Ornamental Grasses – are low maintenance and grow well in most soils, seldom require fertilizer, and have few disease and pest problems.
- Flower and Shrub Beds – can be strategically located to add color and interest while expanding the “low maintenance” areas of the yard.
- Mulched Trees and Shrub Islands – will provide additional storm water, air quality, temperature control and scenic benefits.

Source: [http://www.emmitsbur.net/gardens/articles/Frederick/2003/alternative\\_to\\_traditional\\_lawns.html](http://www.emmitsbur.net/gardens/articles/Frederick/2003/alternative_to_traditional_lawns.html)

Employing a variety of the above techniques is most effective, and a variety avoids the use of monocultures, which are susceptible to drought and disease.

#### *Encouraging Creation of Backyard Habitat*

Although Ewing is a largely built-out community, residents’ treatment of their individual yards can have profound impacts on water quality and biodiversity. In fact, by educating people about changes that they can make, residents can learn and directly participate in efforts to conserve the natural world. Only through such experiences are people likely to internalize environmental values and change their behavior. Even though the impact of individual actions seems small, the cumulative effect of many people making these choices and acting on them will be great, and is an important step toward creating a more sustainable way of life.

Source: National Stewardship Initiatives: Conservation Strategies for U.S. Land Owners – <http://www.defenders.org/pubs/nsi08.html>

*Naturescaping:* People interested in attracting wildlife to backyards and commercial properties can follow these guidelines:

- Provide some food. Native plants will attract a variety of animals and require less water and care than most introduced plants.
- Provide water. Water attracts more wildlife than specialized food. Building a pond, conserving a wet area, or placing a birdbath in the yard is a good starting point.
- Provide shelter. Allow leaf litter to accumulate under shrubs — when it decomposes it enriches the soil. Build bat houses for the garden — on average, a single bat eats 3,000 to 7,000 insects per night.
- Provide protection. Wildlife needs cover from predators. Shrubs, food plants, rock and brush piles, snags, downed logs, and other woody material make good

cover. Space is also important — animals need safety zones with food, cover, and water, especially during nesting season.

- Minimize or eliminate use of pesticides, herbicides and chemical fertilizers. Birds, fish, and mammals are all sensitive, directly and indirectly, to chemical exposure through their food supply. Keep plants healthy, because insects prefer weak plants. Use insect-resistant plants, and, when necessary, biological controls.

*Source: Hirose et al, 1992, from National Stewardship Initiatives: Conservation Strategies for U.S. Land Owners – <http://www.defenders.org/pubs/nsi08.html>*

For more information, the U.S. Department of Agriculture, Natural Resources Conservation Service, National Association of Conservation Districts and Wildlife Habitat Council put out an excellent brochure titled “Backyard Conservation – Bringing Conservation from the Countryside to Your Backyard.

<http://www.nrcs.usda.gov>

#### *Dog Waste Control*

The U.S. Geological Survey estimates that pet waste contributes between 20 to 30 percent of the water pollution in America. Excessive nutrients from animal waste contributes harmful bacteria, promotes excessive plant growth and causes algae blooms, all of which rob the water of vital oxygen when plant materials decay. This happens when pet waste is left on the ground, and rainwater washes it into storm drains or directly into streams and rivers.

Encouraging pet owners to clean up after their furry companions is easier when tools are provided on site. The Partnership for the Delaware Estuary promotes the use of “DogiPots” units, which are bag dispensers that feature educational signage. The Partnership can provide Ewing with more information on obtaining these units.

See

<http://www.delawareestuary.org/educationandoutreach/communityinitiatives/dogwastercontrol.asp>

## **Stewardship Education**

#### *For Public Officials*

The process of developing the Conservation Element with the Ewing Planning Board is serving to keep the planning board members informed about environmental issues. The process also involved meetings with the township mayor and manager, also serving to bring environmental issues to the forefront. The planning board should encourage the Ewing Township Council to read the Conservation Element to advance the recommended policies and practices.

#### *For Public Works Officials*

Flyers and talks to public works officials can inform them about good stewardship practices in which they are involved on a regular basis. It’s especially important to

inform public works department staff about the importance of riparian buffers so that: (1) they do not mow public area lawns down to the stream's edge, and (2) if volunteers undertake riparian buffer replanting projects, public works officials will not undo their work by mowing it (this has happened in a number of communities and demoralizes volunteers!).

### *Involving Students*

Many schools are incorporating environmental education into their curriculum. High school and College of New Jersey students could deepen their educational pursuits by conducting water quality monitoring on the township's streams, and reporting their findings to both the township and the NJDEP. The water quality monitoring and reporting to public bodies would provide a lesson in science and ecology, as well as a lesson in civics.

### *Create a Nature Center*

Ewing Township does not currently have a Nature Center or signage explaining environmental features within its borders. Nature centers typically protect a particular environmentally sensitive area, provide trails for people to experience and enjoy the land, and provide programming for residents to learn about the flora and fauna of the region. A nature center in Ewing could focus its programming and activities on protecting the environment within suburbia, covering such topics as composting, creating backyard habitats, tree identification and care, stream ecology, and bird watching. Educational signage at the nature center, or along any of the proposed greenways and trails, could provide information on the local environment for self-guided tours. **Ewing Township should seek out a place for a Nature Center, adjacent to an environmental feature, that could protect the feature, serve as an environmental resource center, and even become a “town jewel” — a special place that township residents are proud of and identify with.** One possibility to consider is the Public Works facility on the Shabakunk Creek. If this facility were relocated, the township would have an opportunity to re-create this area for a new use, which could be accessed by the proposed rail-to-trail.



# Wildlife Management

## Deer Management

In Ewing Township, deer are becoming more and more frequent visitors to municipal parks and neighborhoods. People initially enjoy seeing deer because they represent a return of wildlife to areas. After time, though, too many deer can become a nuisance and even a danger. In the future, if deer become problematic in Ewing to the point where the township wishes to take action, then the information below will prove useful.

According to the NJDEP Division of Fish and Wildlife, white-tailed deer have reached problematic numbers in many suburban communities in New Jersey, as evidenced by deer-vehicle collisions, damage to ornamental landscaping, damage to agricultural crops, and destruction of the natural forest ecosystem associated with high deer populations. Historically, the deer herds have been managed by sport hunters. However, as the state becomes increasingly more urbanized, land open to deer hunting has been reduced.

Recognizing these conditions and obstacles, the Division of Fish and Wildlife has taken steps to manage deer population by lengthening the hunting seasons, increasing the bag limits, increasing the number of hunting permits issued, and offering incentives for hunters to harvest more antlerless deer (does and fawns). However, hunters can no longer control deer populations in many suburban settings due to safety zone regulations, township firearm discharge ordinances, and posted private properties.

In an effort to limit deer population in those areas of the state where sport hunting is not considered a viable management tool, the division has permitted alternative methods of controlling deer populations under the Community-Based Deer Management Permit (CBDMP) Program. The program was created in 1995 to explore alternative methods of deer population control.

Alternative methods include any technique, other than traditional hunting, employed to reduce a deer population. This may include, but is not limited to, controlled hunting, shooting by an authorized agent, capture and euthanization, capture and removal, and fertility control. The program allows townships, airports and county Boards of Agriculture to apply for a permit issued by the division that would allow these alternative control methods. A township resolution endorsing the CBDMP application must accompany the application.

Steps in applying start first with designating a Special Deer Management Area where control is necessary. The area can include the entire township or a portion thereof. The applicant for the CBDMP then must demonstrate that an overabundant deer population has caused significant damage to property (crops, ornamental landscaping, etc.), has caused a significant number of vehicle collisions, and/or is a significant hazard to airplanes on runways in the Special Deer Management Area.

When the review of a submitted application is complete, the division approves, denies or supports modification of the proposed plan and Special Deer Management Area to the Fish and Game Council. Once the division approves the Special Deer Management Area and plan, it submits the plan to the Fish and Game Council for its review. If the application is approved by the Fish and Game Council, the permit is issued by the director of the Division of Fish and Wildlife.

The process of developing a plan acceptable to the community, the division and the council can be lengthy. Applicants are encouraged to work closely with the division throughout the process. In Mercer County, Princeton Township has instituted a CBDMP. Part of its plan involved a birth control vaccine known as SpayVac, which was applied to deer in Princeton in 2004 by White Buffalo Inc., in conjunction with the Division of Fish and Wildlife, but failed. A different drug, called Gonadotropin-releasing hormone, simply known as GnRH — which can provide three to five years of sterility, and possibly even longer-lasting effect if a deer is injected a second time — was then applied to 39 of the deer in Princeton in the summer of 2005. It is still too early to know if GNRH will work. In any case, the drug will need FDA approval before it can be widely used.

Source: <http://www.state.nj.us/dep/fgw/cbdmp/htm>)

## **Canada Geese Management**

The State of New Jersey is estimated to contain a resident Canada goose population of approximately 100,000 birds that no longer migrate to more southern locales, and may double in the next 5 to 10 years. While many people enjoy seeing geese, the birds can also cause property and environmental damage. Goose droppings washed into lakes during storm water events can elevate coliform bacteria to unhealthy levels, closing lakes to swimming. Goose droppings limit human use of grassy areas in parks; and because geese can be quite aggressive during the nesting season, they can also injure humans.

The United States Fish and Wildlife Service issued a Draft Environmental Impact Statement (DEIS) of Resident Canada Goose Management in March of 2002. The DEIS proposed the creation of a new regulation to allow state wildlife management agencies to actively manage populations of resident Canada geese that cause personal and public property damage. Under the proposal, states would be granted the authority to undertake approved population control strategies, such as nest and egg destruction, trapping and culling programs, and expanded hunting. The draft EIS looked at a wide range of alternatives and found that a variety of techniques will be needed to control the population. Activities that do not require permits, and can be carried out by localities and individuals, include planting shrubby vegetation around lakes and streams to block waterfowl access and discouraging humans from feeding geese.



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# **Appendix A – Sample Stream Corridor Protection Ordinance**

## **Plumsted Township, Ocean County Proposed Stream Corridor Protection Ordinance**

### **Section 1.00 Statement of Intent**

In expansion of the purposes stated in Section 15-1 of Chapter 15 – Zoning, of the Plumsted Code, it is the intent of this ordinance to provide reasonable controls governing the conservation, management, disturbance, and restoration of riparian corridors in conformance with the goals of the Conservation Element of the Plumsted Township Master Plan. The specific intent of this ordinance is to:

1. Improve surface water quality by reducing the amount of nutrients, sediment, organic matter, pesticides, and other harmful substances that reach watercourses, wetlands, subsurface, and surface water bodies by using scientifically-proven processes including filtration, deposition, absorption, adsorption, plant uptake, and denitrification, and by improving infiltration, encouraging sheet flow, and stabilizing concentrated flows.
2. Improve and maintain the safety, reliability, and adequacy of the water supply for domestic, agricultural, commercial, industrial, and recreational uses along with sustaining diverse populations of aquatic flora and fauna.
3. Preserve and protect areas that intercept surface water runoff, wastewater, subsurface flow, and/or deep groundwater flows from upland sources and function to remove or buffer the effects of associated nutrients, sediment, organic matter, pesticides, or other pollutants prior to entry into surface waters, as well as provide wildlife habitat, moderate water temperature in surface waters, attenuate flood flow, and provide opportunities for passive recreation.
4. Regulate the land use siting, and engineering of all development to be consistent with the intent and objectives of this ordinance and the best-accepted conservation practices, and to work within the carrying capacity of existing natural resources.
5. Support pertinent state regulations concerning flood hazard areas, freshwater wetlands protection, and erosion and sediment control practices.
6. Assist in the implementation of the New Jersey State Development and Redevelopment Plan, which contains statewide policies in support of stream corridor protection.
7. Conserve natural features important to land or water resources such as headwater areas, groundwater recharge zones, floodway, floodplain, springs, streams, wetlands, woodlands, significant wildlife habitats, and other features that provide recreational value or contain natural amenities whether on developed or undeveloped land.
8. Work with floodplain, steep slope, and other requirements that regulate environmentally sensitive areas to minimize hazards to life, property, and riparian features.
9. Recognize that natural features contribute to the welfare and quality of life of Plumsted's residents.

10. Conserve natural, scenic, and recreation areas within and adjacent to riparian areas for the community's benefit.

### **Section 2.00 Definitions**

As used in this ordinance, the following words and terms shall have the following meanings:

*Activity* – any land disturbance, including any development for which an application for development is necessary.

*One Hundred Year Flood Line* – the line, which is formed by following the outside boundaries of the area inundated by a 100-year flood. A 100-year flood is estimated to have one percent chance in 100 of being equaled or exceeded in any one year. The 100-year flood line shall be determined by reference to N.J.A.C. 7:13-2.3 and 2.4.

*Stream* – all naturally occurring watercourses that normally contain flowing water during all times of the year, including streams that may dry up during periods of extended drought. These include all perennial streams identified in the most recent Soil Survey of Ocean County; all perennial streams identified on United States Geological Survey Maps (U.S.G.S); all intermittent watercourses otherwise identified in the most recent Soil Survey of Ocean County; and/or streams identified on plans submitted by applicants that have an upstream drainage area of 50 acres or more.

*Stream Corridor* – shall mean the bed and banks of a stream that confine and conduct continuously or intermittently flowing water (also referred to as the stream channel), all of the land within the 100-year flood line, all of the land within a 100 foot wide buffer around the 100-year flood line, *and* all contiguous wetlands. If there is no 100-year flood line delineated, the 100-foot buffer shall be measured outward from the top of the bank of the stream channel. In cases where wetlands abut the outer boundary of the stream corridor, the area of such wetlands shall also be included within the stream corridor.

### **Section 3.0 Stream Corridor Protection**

#### 3.10 Applicability

All tracts falling in whole or in part within a stream corridor shall be subject to the standards set forth in Section 3.20.

#### 3.20 Standards

*3.21 Activities Permitted in Stream Corridors:* Stream corridors shall remain in their natural state, with no clearing or cutting of trees and brush (except for removal of dead vegetation and pruning for reasons of public safety), altering of watercourses, re-grading or construction except for the following activities:

- (1) Wildlife sanctuaries, woodland preserves and arboretums, but excluding enclosed structures.

- (2) Game farms, fish hatcheries and fishing reserves, operated for the protection and propagation of wildlife, but excluding enclosed structures.
- (3) Unpaved hiking, bicycle and bridle trails
- (4) Fishing areas
- (5) Reconstruction of a structure which pre-dates the adoption of this ordinance in the event of damage or destruction by fire, storms, or other acts of nature, provided that the reconstruction does not have a greater footprint or total area than that of the damaged structure and that no change in land use occurs; and further provided that the reconstruction shall be permitted only if no more than 50% of the structure is destroyed.

### *3.22 Location of Activities on Tracts Partially within Stream Corridors*

- (1) All new lots in major and minor subdivisions and site plans shall be designed to provide sufficient areas outside of stream corridors to accommodate primary structures as well as streets, and any normal accessory uses appurtenant thereto.
- (2) The Land Use Board may allow an average stream corridor width of 100 feet from the one hundred year flood line, thus allowing reasonable flexibility to accommodate site planning when necessitated by the size and shape of the tract and physical conditions thereon. The stream corridor width may be reduced to a minimum of 50 feet from the one hundred year flood line provided there is an equivalent increase in the width elsewhere on site and all relevant permits (e.g. Stream Encroachment, Freshwater Wetlands) are obtained (and provided that the compensatory land is equal in its ability to buffer the stream as the land that is intruded upon).

### *3.23 Activities Permitted in Stream Corridors when there is no reasonable prudent alternative*

The following are permitted in a stream corridor when subdivisions or site plans cannot be designed in the manner set forth in *Section 3.22*, or, in the case of a pre-existing lot for a one-family or two-family dwelling, when there is insufficient room outside the stream corridor for permitted accessory uses. In either case, there must be no other reasonable or prudent alternative to placement in the stream corridor, as determined by the Land Use Board:

- (1) Yard improvements such as lawns and accessory structures such as swimming pools.
- (2) Recreational use, whether open to the public or restricted to private membership, such as parks, camps, picnic areas, golf courses, sports or boating clubs, not to include enclosed structures, but permitting piers, docks, floats or shelters usually found in developed outdoor recreational areas.
- (3) Outlet installation for sewage treatment plants and sewage pumping stations and the expansion of existing sewage treatment facilities.

- (4) Private or public water supply wells that have a sanitary seal, flood proofed water treatments facilities or pumping facilities.
- (5) Dredging or grading when incidental to permitted structures or uses, including stream cleaning and stream rehabilitation work undertaken to improve hydraulics or to protect public health.
- (6) Dams, culverts, bridges and roads provided that they cross the corridor directly as practical.
- (7) Sanitary or storm sewers
- (8) Utility transmission lines installed during periods of low stream flow in accordance with soil erosion and sediment control practices and approved by the County Soil Conservation District in a manner which will not impede flows or cause ponding of water.
- (9) Structures compromising part of a regional flood detention project.
- (10) Detention or retention basins and related outfall facilities

*3.24 Activities Permitted in Stream Corridors when Prohibiting such Activities would cause extreme Economic Hardship, and the Required Mitigation*

- (1) New structures (other than those permitted as exceptions to *Sections 3.21 and 3.23*) including retaining walls, parking facilities and roads (but not those which are parallel to the stream) are permitted in a stream corridor only if:
  - (a) Upon a clear and convincing demonstration by the applicant that prohibiting such activity would result in extreme economic hardship or would conflict with a compelling public need.
    - {a} The Land Use Board shall use the following standards in determining whether extreme economic hardship exists:
      - (i) Prohibiting the activity would result in an extreme economic hardship, as distinguished from mere inconvenience, because of the particular physical surroundings, shape or topographical conditions of the property involved. The necessity of acquiring additional land to locate development outside the stream corridor shall not be considered an economic hardship unless the applicant can demonstrate that there is not adjacent land which is reasonably available, and
      - (ii) An applicant shall be deemed to have established the existence of an extreme economic hardship only if the applicant demonstrates, based on the specific facts, that the subject property is not capable of yielding a reasonable economic return if its present use is continued and that this inability to yield a reasonable economic return from unique circumstances peculiar to the subject property which:
        - i. Do not apply to affect other property in the immediate vicinity;
        - ii. Relate to or arise out of the characteristics of the subject property rather than the personal situations of the applicant; and
        - iii. Are not the result of any action or inaction by the applicant or the owner or his predecessors in title



- (b) An applicant shall be deemed to have established a compelling public need if the applicant demonstrates, based on specific facts, that:
  - (i) the proposed project will serve an essential public health or safety need;
  - (ii) public health and safety require the proposed activity;
  - (iii) the proposed use is required to serve an existing public health or safety need;
  - (iv) there is no alternative available to meet the established public health or safety need;
  - (v) the activity will not be materially detrimental or injurious to other property improvements in the area in which the subject property is located and will not endanger public safety; and
  - (vi) the exception granted is the minimum relief necessary to relieve the compelling public need

(c) The stream corridor includes more than 75% of the tract, pre-existing at the date of adoption of this ordinance.

- (3) If an exception set forth in subsections 3.24-(1)-(a) or (b) is granted, the Land Use Board or the zoning officer, as the case may be, may reduce the width of the stream corridor to no less than 50 feet from the one hundred year flood line.
- (4) If such an exception is granted, the applicant shall rehabilitate an environmentally degraded corridor within or adjacent to the same tract at least equivalent in size to the stream corridor reduction permitted and, if not possible, rehabilitate or expand a stream corridor of such size within a nearby tract and if available, within the same watershed. Rehabilitation shall include reforestation, stream bank stabilization and removal of debris. The area to be rehabilitated and the rehabilitation plan shall be acceptable to the Land Use Board or the Zoning Officer.

### *3.25 Prohibited Activities*

All activities not permitted pursuant to subsection 3.21. 3.23 and 3.24 shall be prohibited. In no circumstance shall the following be permitted as exceptions to such subsections:

- (a) Any solid or hazardous waste facilities, including but not limited to sanitary landfills, transfer stations, wastewater lagoons and subsurface sewage disposal areas.
- (b) Junkyards, commercial and industrial storage facilities, and open storage of vehicles and materials
- (c) Use of fertilizers, pesticides, herbicides, and/or other chemicals in excess of prescribed industry standards or the recommendations of the Ocean County Soil Conservation District

(d) Sod farming

*3.26 Provisions Governing Activities in Stream Corridors*

- (1) The applicant for any activity permitted in a stream corridor shall rehabilitate any degraded areas within the stream corridor, in a manner acceptable to the Land Use Board or the Zoning Officer, unless the applicant demonstrates that it is economically infeasible to do so.
- (2) The applicant shall also:
  - (a) rehabilitate or cure the effects of the disturbance caused during construction;
  - (b) maintain the integrity of the surrounding habitat; and
  - (c) maintain the existing ability of the stream corridor to buffer the stream
- (3) The applicant shall provide whatever additional measures are necessary to ensure that areas designated as stream corridors will be preserved and to prevent additional encroachments in the stream corridor likely to occur as a result of the approval granted.
- (4) The Land Use Board may require conservation easements or deed restrictions ensuring that there will be no further intrusion on the stream corridor than that permitted by the activity approved.

*3.27 Submission Requirements*

An applicant for an activity in a stream corridor shall submit to the municipality a map of the project site delineating the following (at a scale of 1 inch to 200 feet) using the best available information:

- (a) one hundred year flood line
- (b) state wetland boundary lines
- (c) stream corridor boundary;
- (d) the location of all improvements and land disturbance proposed to be located within any of the above boundaries.

*3.28 Severability*

If any section, subsection, clause or phrase of this ordinance is held to be unconstitutional or invalid for any reason, such decision shall not take the remaining portions of this ordinance.

*3.29 Repeal*

All ordinances or parts of ordinances inconsistent with this ordinance are hereby repealed to the extent of such inconsistency.

*3.30 Effective Date*

This Ordinance shall take effect 20 days after the final passage and publication according to law.

# Appendix B – Sample Tree Protection Ordinance

## ORDINANCE OF THE TOWNSHIP OF BYRAM ENTITLED “TREE PROTECTION ORDINANCE”

### SECTION 1. Purpose

- a. The Township Council, Planning Board and Environmental Commission have found that the indiscriminate, uncontrolled and excessive destruction, removal and cutting of trees upon land within the Township causes: increased drainage control costs; increased soil erosion and sedimentation; degradation of water resources; decreased groundwater recharge; and increased air pollution and dust, all tending to impact upon the character of the Township by decreasing property values, and adversely affecting the public health, safety and general welfare.

Through this Ordinance, the Township intends to: regulate and control indiscriminate and excessive removal and cutting of trees within the Township; have the maximum possible number of quality trees preserved in the course of development of a site or lot; protect larger specimen trees; and encourage innovative design and grading to promote the preservation of existing trees.

- b. The Township Council, Planning Board and Environmental Commission recognize a strong relationship between the integrity of Township and regional water resources and development on constrained land (such as steep slopes, wetlands, reduced depth to ground water ), tree removal, soil disturbance, storm water management, and the general use of land resources. Appropriate management of resources in the Township is an important health, safety and general welfare issue.

### SECTION 2. Definitions

Terms are defined as follows for the purposes of this Chapter:

- a. **Clear Cutting** - the removal of all standing trees on a lot or portion of a lot.
- b. **Diameter at Point of Measurement (DPM)** - the diameter of a tree measured four and one half (4.5) feet (forestry method) above ground level, on the downhill side of existing trees. Trees utilized for the replacement of existing trees, or proposed in a landscape plan, shall be measured twelve (12) inches above ground level for trees over four inches in caliper; the measurement shall be six (6) inches above nursery grade for trees up to four (4) inch caliper (nursery method).
- c. **Drip Line or Tree Canopy** - a limiting line established by a series of perpendicular drop points marking the maximum radius of the crown of an existing tree, but not to be less than six (6) feet from the trunk.
- d. **Replacement Tree** - a nursery-grown certified tree, properly balled and burlapped, marked with a durable label indicating genus, species and variety and satisfying the standards established for nursery stock and installation as set forth by American Association of Nurserymen.
- e. **Selective Cutting** - the removal of certain, but not all, trees in an area, on an individual basis – dead, diseased, damaged, mature or marketable, or to improve the quality of a tree stand.
- f. **Silviculture** - the management of wooded areas on any tract or lot of land to insure its continued survival and welfare, whether for commercial or non-commercial purposes, pursuant to a plan approved by the New Jersey Department of Environmental Protection (“NJDEP”), Division of Forestry.
- g. **Thinning** - the removal of undesirable, competitive, diseased or damaged trees so as to cultivate and improve the remaining trees on the site.
- h. **Tree** - any deciduous or coniferous species, which reaches a mature height of eighteen (18) feet or more and has a typical DPM of six (6) inch caliper or greater.
- i. **Tree Replacement Plan** - a specific plan for replacement of trees removed in accordance with the provisions of this Chapter.

### **SECTION 3. Cutting or Removal Restrictions**

- a. Existing trees tree with a DPM of six (6) inch caliper or greater shall not be destroyed, cut, or removed, or caused to be destroyed, cut, or removed except in compliance with this Chapter.
- b. Site plan or major subdivision applications that propose the destruction or removal of any tree shall not be approved until a Tree Removal Plan , and if necessary in accordance with this Chapter, a Tree Replacement Plan (See Section 8) is submitted to and approved by the Planning Board.
- c. Trees may not be removed on areas of a lot which are afforded protection by conservation easement, wetlands restriction or wetland buffer, or the Township's steep slopes ordinance unless those trees meet the requirements of Section 4d.

### **SECTION 4. Exemptions**

The following exemptions apply:

- a. Any individual residential lot where tree removal would be limited to an area less than 5,000 square feet for the purposes of constructing additions to the dwelling, accessory structures and/or expanded yard area, so long as a minimum of 30% of the lot area is maintained with a tree canopy per Section 5b. Separate tree removal events on a single residential lot over a 3-year period that exceed 5,000 square feet area in total are not exempted from the requirements of this Chapter.
- b. Trees to be removed in an area greater than five (5) acres that will be actively and primarily devoted to agricultural use. A Tree Removal Plan must be submitted to the Site Plan Committee of the Planning Board for prior review and approval. In the event the expanded farmland (versus woodland) is not actively farmed for a period of two (2) consecutive years, the tree replacement provisions of this Chapter will apply.
- c. Parcels of land with an approved forest management plan that qualify for valuation, assessment and taxation under the "Farmland Assessment Act of 1964", as amended (N.J.S.A. 54:4-23.1 et seq.).
- d. Dead, dying, diseased, or damaged trees, or trees whose angle or growth makes them an immediate hazard to structures or human life. (See Section 7 for disposal of dead or diseased trees.)
- e. Commercial nurseries or fruit orchards.
- f. Christmas tree farms.
- g. Any tree that is a part of a cemetery.
- h. Trees directed for removal by Township, County, State or Federal authority pursuant to law.
- i. Removal or thinning of trees within sight easements or within the right of way by utility companies for maintenance of utility wires or pipelines.
- j. Parcels of land with preliminary site plan or major subdivision approval. Removal of trees prior to Planning Board preliminary approval is prohibited. The Site Plan Committee of the Planning Board must grant approval prior to removal of trees for the purpose of site investigation, such as percolation testing for septic system suitability or groundwater well test drilling.

## **SECTION 5. Review and Design Standards for Construction Projects**

- a. Trees shall be permitted to be removed as necessary to allow the construction of buildings, structures, decks, pools, driveways, septic fields, lawn areas for recreational use for the residents of the dwelling and any other authorized improvements. Existing vegetation shall be preserved to the greatest extent feasible.
- b. Existing lots with tree cover shall maintain a minimum of 30% of the lot area with a tree canopy. This standard may be waived by the Planning Board or Zoning Officer upon good cause shown.
- c. Tree protection measures shall be in place, including a field delineated area of disturbance, and/or a silt fence or construction fence in place at the drip line of trees to be protected prior to tree removal or other site work.
- d. Healthy trees outside of the building setback requirements shall be retained to maintain resource protection and buffering to neighboring properties, unless the trees pose a hazard to persons or property, or where the approved construction grading or disturbance would cause damage to a tree, creating an unsafe condition.

## **SECTION 6. Requirements for Protection of Trees**

- a. Wherever practical, no material or temporary soil deposits shall be placed within the drip line of a tree to be preserved. A minimum of six (6) feet must be maintained.
- b. Except while engaged in tree removal, no heavy construction equipment shall be operated within six (6) feet of any tree to be preserved.
- c. Temporary tree protection as detailed in Section 5c is required prior to commencement of tree removal or other site work.

## **SECTION 7. Disposal of Removed Trees**

- a. Disposal of leaves, branches and trunks of healthy or dead trees shall be at the discretion of the property owner.
- b. Disposal of leaves, branches and trunks of trees afflicted with diseases or infestations declared to be a threat to any remaining trees by the NJDEP Division of Forestry shall follow the prescribed procedures as set out by the Division.

## **SECTION 8. Tree Replacement Requirements**

- a. Where clearing and/or construction on a or part of a lot pursuant to an approved tree removal plan, or where clearing and/or construction has resulted in accidental removal or severe damage which will result in the death of any tree intended to be preserved, the owner/developer shall replace the tree(s) on a basis per individual tree removed or damaged in accordance with the following table:

Caliper of Existing Tree Removed	/# of Replacement Trees
Between 6 and 17 inches	one (1) tree
Between 18 and 23 inches	three (3) trees
Between 24 and 29 inches	five (5) trees
Between 30 and 35 inches	seven (7) trees
36 inches or greater	ten (10) trees

- b. Replacement tree(s) must be 2.5" caliper or greater and shall be located on-site.
- c. The type of replacement tree(s) shall be the same as the species removed, or as otherwise approved by the Planning Board in consultation with the Environmental Commission.
- d. Execution of a Tree Replacement Plan must be completed within two years of tree removal for any site plan or minor or major subdivision, and within ninety (90) days of tree removal on any residential lot. An extension may be granted upon request until the next appropriate planting season if necessary.

## **SECTION 9. Site Plans and Major Subdivisions.**

- a. Where tree removal is a part of an application for site plan or major subdivision approval, the Municipal Land Use Law governs.
- b. Approval will be given to remove only those trees necessary to construct the project.
- c. Refer to the Site Plan Checklist for the required information.
- d. No approval shall be granted, if the Board finds that the proposed tree removal is contrary to the best interests of the public health, safety or general welfare and/or that the tree replacement proposal is appropriate
- e. The duration of the tree removal/tree replacement approval for a site plan, subdivision or variance application is based on the Municipal Land Use Law.
- f. The permittee must notify the Planning Board Secretary in writing five (5) days prior to start of work.

## **SECTION 10. Existing Individual Lots**

- a. A tree removal application and, where needed, tree replacement plan must be submitted with any application for a Building Permit. Where application is made in connection with a single-family lot (not part of a subdivision) the Zoning Officer shall have ten (10) days to review and act.
- b. If the Zoning Officer fails to act within the 10 day period, or denies issuance of a permit, application may be made to the Site Plan Committee of the Planning Board, which shall have thirty (30) days to act. The time period may be extended with consent of the applicant. If the Subcommittee denies the permit, the applicant may request a hearing before the full Planning Board based on the information presented.
- c. Removal of trees from an area greater than 5,000 square feet requires prior application to the Site Plan Subcommittee of the Planning Board to request a waiver from the requirement for a tree removal and/or tree replacement site plan. If the Subcommittee denies the requested waiver, the applicant may request a hearing before the full Planning Board based on the information presented.
- d. Existing tree cover shall be maintained so that a minimum of 30% of the lot area has a tree canopy. The Site Plan Subcommittee and/or Planning Board may waive this standard for good cause shown.
- e. A permit for a single-family lot with no variances shall expire one (1) year from the date of issuance.

## **SECTION 11. Application Form and Fees**

- a. The application form shall be available from the Planning Board Secretary and shall include the following information.
  1. Name, address and telephone number of owner of the premises.
  2. Block and Lot, and address of property where the tree removal is located.
  3. Name, address and telephone number of person who will perform the work.
  4. A list of trees to be removed with a DPM equal or greater than six (6) inches, identified by size and species, including total number of each species to be removed.
  5. Purpose of tree removal (construction, driveway, recreation area, patio, parking area or other similar activity).
  6. A property survey or other drawing indicating the area of the tree removal activity and existing tree line to remain.
  7. A plan for tree replacement where necessary.
- b. Fees to be paid when the application is filed:
  1. Existing Residential Lot (per Section 9) - application fee \$(TBD) and escrow fee \$(TBD).
  2. Major Subdivision and Site Plan – application fee \$(TBD) and escrow fee \$(TBD).

## **SECTION 12. Violations and Penalties**

- a. Upon conviction, any person who violates this Chapter, shall be subject to a fine of up to \$1,250.00 per day for any such violation, or shall be imprisoned for a period not to exceed ninety (90) days, or both.
- b. Each and every day shall be considered a separate and distinct violation
- c. In addition, the Township shall be entitled to apply to the Superior Court for an injunction to prohibit the commencement and/or continuation of such activities undertaken in violation of this Section.





# **Appendix C – Sample Steep Slope Protection Ordinance**

## **Plumsted Township, Ocean County Proposed Steep Slope Protection Ordinance**

### **Section 1.00 Statement of Intent**

In expansion of the purposes stated in Section 15-1 of Chapter 15 – Zoning, of the Plumsted Code, it is the intent of this ordinance to provide reasonable controls governing the conservation of steep slopes in conformance with the goals and recommendations of the Conservation Element of the Plumsted Master Plan. The specific intent of this ordinance is to minimize danger to public safety and health by minimizing disturbance to slopes, which can result in increased stormwater runoff, erosion, sedimentation and siltation of nearby streams, downstream flooding, and decreased stability of the slope itself, which can lead to slope collapse.

### **Section 2.00 Designation of Areas**

Steep slope areas shall include all areas in the Township in which the slope is 15% or greater, as indicated on the current topographic maps of the US Geological Survey, and also shown on the Steep Slope Map of the Conservation Element of the Master Plan, 2003.

### **Section 3.00 Slope Disturbance Standards**

*Section 3.1* Slopes of 20% or greater shall not be altered, re-graded, cleared, built upon or otherwise disturbed unless such disturbance is necessary:

*Section 3.11* To accommodate an access road when no other feasible route for such an access road exists and if the slope is disturbed to the minimum extent necessary to accommodate such a road; or

*Section 3.12* To accommodate a trail or trails that are part of an existing or planned trail network and are located and constructed based on accepted best management practices for minimizing erosion.

In no case shall more than 15% of land with slopes of 20% or greater be disturbed.

*Section 3.2* No more than 30% of slopes 15% or greater but less than 20% shall be altered, re-graded, cleared, built upon, or otherwise disturbed.

*Section 3.3* All buildings and foundations shall be set back a minimum of 50 feet from the top of any slope of 20% or greater that has a grade differential from top to bottom of at least ten feet.

*Section 3.4* Any parcels covered completely by steep slopes at the time of the adoption of this ordinance may be disturbed in an amount necessary to provide for reasonable use of the property.

## Appendix D – Sample Stewardship Materials

# HOW TO CARE FOR YOUR STREAM

**DO:** ...plant trees and shrubs along your stream.

**WHY:** The roots of woody plants stabilize the banks and reduce erosion. Trees and shrubs also shade and cool the stream, which is better for fish.

**DON'T:** ...remove native vegetation from stream banks

**WHY:** Leaf litter from native plants is part of the local food chain.

**DO:** ...maintain or create buffer zones (the wider the better) along streams and wetlands.

**WHY:** Buffer zones absorb water and filter out lawn chemicals, fertilizers and sediment.

**DON'T:** ...mow your lawn right up to the stream bank.

**WHY:** Turf does not make a good buffer. It sheds water, especially on slopes, and its shallow roots do not hold the soil as well as native grasses, trees, or shrubs.

**DO:** ...limit your use of yard fertilizers and chemicals. Maintain septic tanks in good condition.

**WHY:** Lawn chemicals and septic tank pollutants easily find their way into streams, and can kill insects, fish, frogs, birds, and plants.

**DO:** ...leave naturally occurring debris, such as fallen logs, leaves and rocks in place in your stream.

**WHY:** In-stream debris provides shelter and food for aquatic life.

**DON'T:** ...dump swimming pool water or soapy water directly into streams or storm sewers.

**WHY:** Storm sewers run directly into streams, where chlorine and detergent harm fish & plants.

**DON'T:** ...throw grass clippings or yard waste into the stream—compost them.

**WHY:** Grass clippings and debris reduce oxygen in the stream, killing water animals.

CHESTER-RIDLEY-CRUM  
WATERSHED ASSOCIATION

NEVER DUMP OIL, ANTIFREEZE OR TOXIC CHEMICALS  
DISPOSE OF THESE AT APPROVED DISPOSAL CENTERS.

## EVERY LITTLE STREAM COUNTS . . .

The stream on your property may be a spring-fed rivulet, or a real creek. All are part of a single system, feeding into the Delaware River. Even the smallest stream supports aquatic plant and animal life, and is an important part of the water cycle. Every stream deserves to be cared for, and kept free of pollutants, to keep the whole system healthy.

## SOME HELPFUL DEFINITIONS:

A **STREAM BUFFER** or **RIPARIAN BUFFER** is a strip of land along a stream where trees, shrubs, and small plants are encouraged to grow. Recently scientists have learned the importance of buffers in keeping streams healthy.

The U.S. Forest Service now recommends a 50 foot buffer, free of all development, on each bank of a stream. Buffers of 300 feet or more are often used to protect the natural character of streams. On smaller properties, aim for a minimum of ten feet between your lawn and the stream bank. Even a single row of trees or bushes will help protect your stream.

**NATIVE VEGETATION** refers to plants that have always grown in this area. The animals in our streams use specific tree leaves for food and building material and thrive best when those species are present.

Non-native plants can contribute to a buffer zone by reducing erosion, but they may be invasive, and are less well suited to the existing food chain.



## BEAUTIFUL AND HEALTHY:

We may be used to seeing streams edged by neatly mown grass. But running water offers an opportunity for imaginative landscaping. A buffer zone of trees, shrubs and ferns will add interest to your landscape and protect your stream. Here are some of the native species you might try:

**Flowers:** Purple stemmed aster; rose mallow; blue flag; yellow iris; cardinal flower; turtlehead; swamp milkweed; Joe-Pye weed.

**Ferns:** Sensitive fern; cinnamon fern; royal fern.

**Grasses & Sedges:** Soft-stem bulrush; fringed, lurid or tussock sedge; big bluestem; cattails.

**Woody Plants:** Buttonbush; red-twig or silky dogwood; spicebush; Virginia sweetspire; shadbush; cranberry bush viburnum; red or black chokeberry; sweet pepperbush; inkberry and winterberry holly; common alder.

**Trees:** Many kinds of willow; river birch; ash; box elder; red maple; sweet bay magnolia.

Ask your local arboretum or nursery for information about these or other stream side plants.



## WHO IS RESPONSIBLE FOR OUR STREAMS?

We all are! Most of us live upstream from someone else, and what we do affects others' water as well as our own. We need to work together to keep our streams clean and healthy. We are all stewards of the land.

Your township or borough is responsible for making regulations to protect the streams that run through it. These may cover development on steep slopes or flood plains, storm water management, sewers and septic tank regulations. Most streams run through more than one jurisdiction, and ordinances vary. Encourage local officials in towns along your stream to cooperate to protect it.

*Local watershed groups work across municipal boundaries to monitor and enhance the various creeks in our area. You might want to start your own stream protection group, or contact:*

Darby Creek Valley Association  
P.O. Box 583  
Lansdowne, PA 19050

Chester/Ridley/Crum Watersheds Association  
P.O. Box 972  
Edgmont, PA 19028

Brandywine Valley Association  
1760 Unionville-Wawaset Road  
West Chester, PA 19382-6751

*This pamphlet was developed by the Media Area League of Women Voters, in cooperation with the Darby Creek Valley Association and the Chester/Ridley/Crum Watersheds Association. Layout courtesy of Taylor Memorial Arboretum.*



## REDUCE TURF AREA

"Americans love their lawns with a passion rarely seen in other countries; fifty-eight million Americans enthusiastically plant, weed, water, spray and mow an estimated twenty million acres of lawn." The passion for lawns has many impacts on our urban/suburban environments. Some of these impacts are:

- ▲ Loss of Forest Cover and Wildlife Habitat
- ▲ Air Pollution from Gasoline Powered Engines
- ▲ Pollution from Lawn Maintenance Chemicals
- ▲ Stress on the Municipal Water Supply

As land development carves up the landscape, fragments of the former landscape remain. Frequently, these fragments which consist of trees, shrubs and plants, are transformed into a grove of trees meeting a manicured lawn.

It is the goal of this Urban Forestry Information Bulletin to discuss how to best preserve these forest fragments in developed areas and present some environmentally sound and low cost/maintenance alternatives to grass or turf.

### Impacts of Turf

Turf and other ground covers require maintenance which is generally incompatible with the needs of a forest ecosystem. Turf offers little or no wildlife habitat compared to the diversity of plants found in an existing forest.

Growing grass or turf management contributes to nonpoint source pollution by the residues of lawn fertilizer insecticides and herbicides applied to the lawn. Maintaining

turf also requires burning fossil fuels to power lawnmowers, and increases the volume of waste (clippings) sent to landfills.

Clearing or grading for the installation of turf and landscape plants destroys the existing plants and damages the remaining trees. Removing leaves and other fallen debris that comprise the forest "duff layer" interrupts the natural cycling of nutrients and water. Digging or tilling under trees (for the removal of understorey and installation of turf or other plants) can damage tree roots and causes a decline in tree health. Soil stockpiled under trees or added to help drainage whether (temporarily or permanently), can interrupt the balance of oxygen, moisture, and nutrient absorption to the tree's root system, and may result in tree decline and/or death. Select areas away from trees being preserved to stockpile soil and use natural or existing drainage contours to direct runoff.

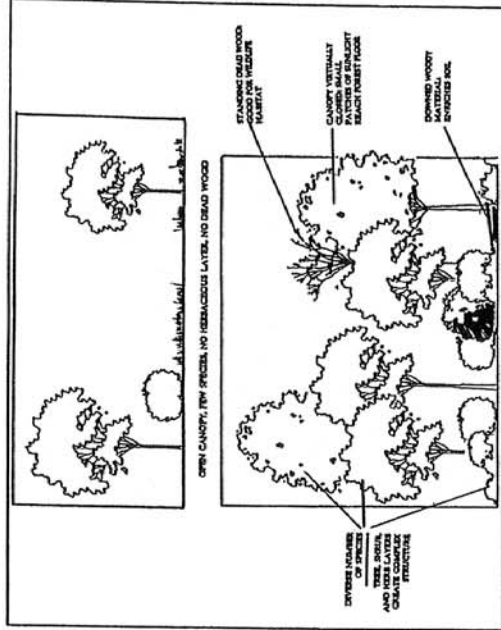
### Ground Covers

The ecology of forests is comprised of many integral components, including flora and wildlife habitat. It is important to consider the entire ecosystem for forest management planning. *The best ground cover* around trees and in forests is the type which most closely resembles the naturally occurring conditions. In general, our forests are characterized by a layered canopy structure consisting of large (overstorey trees), smaller (understorey trees), shrubs, and natural ground covers. The most prominent natural ground cover is leaf mulch. In deciduous forests, it is composed of deciduous leaves, in evergreen forests, it is primarily needles. Rainfall seldom creates runoff beneath a natural forest canopy due in

part to high soil absorption rates, favorable soil conditions, and large amounts of water which are "sponged" or soaked up by the leaf mulch layers.

The best plants to grow under mature trees are species found in the natural leaf-mulch or "duff layer" of the forest floor. The horticultural industry is becoming increasingly successful at commercially producing more of the naturally occurring or native plants for enhancing natural landscapes. Ferns, woodland species wildflowers, understorey shrubs, sedges, and mosses are now available through many nursery suppliers.

Unlike grass, very few native ground covers form dense blankets on the forest floor. Under normal circumstances, native ground covers tend to be randomly distributed, loosely arranged, overlapping patches of plant communities. Under moderate cultivation, some of these native plants will flourish and form a dense, uniform patch of vegetation.



Our forests have an understorey comprised of mountain laurel, american holly, and other broad-leaved evergreens highly valued for spring blossoms, berries, screening, wildlife food and cover. There are also plants valued for their low to moderate growth habit and spring blossoms, such as wild azaleas, sweet-bay magnolia, flowering dogwood, redbud, and wildflowers. There are species of grasses, sedges, and ferns which also flourish in these undisturbed areas.

It is not necessary to limit ground cover selection to native plants. There are many introduced species which can add color, texture, and form. *However, these introduced species need to be carefully scrutinized* to avoid those with a tendency to take over or become "invasive." Some introduced species may offer the

opportunity to create a blanket effect without requiring excessive maintenance or containing invasive characteristics. Wildlife benefits of non-native species are typically less than native species.

### Benefits of Natural Ground Cover

Maintaining diversity in plant communities is important because it provides balance and reduces the potential for any individual species to dominate the landscape.

Careful selection of alternative ground cover plantings will lead to reduced maintenance. Matching plant requirements to site characteristics to determine the ground cover selection will create a self-sustaining forest ecosystem. Occasional weeding, light fertilization, and supplemental watering may be required until the area has become established. Intensive turf maintenance activities such as mowing, pest treatment, dethatching, overseeding, aerating, and irrigation will also be eliminated.

Retaining the existing natural forest plants maintains the existing environmental character, enhances neighboring areas, and offers considerable environmental and financial advantages over turf and other ground covers. Maintenance requirements will reduce substantially over time for a properly planned and managed forest. More frequent use of turf alternatives will increase as communities discover the maintenance benefits and their importance to the environment.

Communities should focus on preserving as many components of the natural ecosystem as possible and consider the establishment of ground cover in terms of environmental enhancement through stewardship.



Community Forestry Network, CFN, 1994  
For more information on CFN, call (202) 962-3393.

This bulletin was co-authored by Don Zimar of The Care of Trees in Manassas, Virginia and Brian M. LeCouteur of the Metropolitan Washington Council of Governments and the Community Forestry Network.

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# How to Care for Your Stream

by Jennifer Robinson

*This valuable list of does and don'ts was taken from Wildlands, May/June 1994,  
the newsletter of the Wildlands Conservancy of Emmaus, Pennsylvania:*

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## **Don't remove native vegetation growing adjacent to the streams.**

**W**hy: Trees and shrubs shade the stream (trout require cool waters for survival) and provide leaf litter which forms the base of the aquatic food web.

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## **Do plant native trees and shrubs along unvegetated areas of the stream bank.**

**W**hy: the root systems of woody vegetation stabilize stream banks and prevent erosion.

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## **Don't mow your lawn right up to the stream; allow at least a 5 to 10 foot buffer along the stream. (most experts recommend a minimum of 50 feet.)**

**W**hy: an unmowed, naturally vegetated streambank buffer helps prevent erosion and filters out lawn chemicals which are damaging to stream life.

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## **Do limit your use of lawn chemicals such as fertilizers, pesticides and herbicides.**

**W**hy: these chemicals easily find their way into the stream and can kill stream life including vegetation, insects, fish and birds.

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## **Don't throw your grass clippings (or any other refuse) into the stream.**

**W**hy: Grass clippings in the stream will cause water-quality problems and will suffocate fish and other aquatic organisms.

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## **Do restrict livestock from streamside area.**

**W**hy: Trampled banks release sediment into the streams and fecal bacteria animal wastes can cause serious water-quality and health problems.

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## **Don't dump used oil, antifreeze, etc. into storm drains.**

**W**hy: These dangerous chemicals enter our streams through storm drains.

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## **Don't remove stable, naturally occurring, instream debris, such as fallen logs.**

**W**hy: Instream debris holds rock fragments and organic particles for processing by aquatic animal life and provides cover and cooling shade for fish and other stream dwellers.

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## **Do urge your local municipality to manage streamside parks in a more natural way.**

**W**hy: Many governing bodies believe that well-manicured parks are the only kind that are acceptable to residents. They need to hear a different opinion. In addition, mowing and manicuring requires large amounts of time, effort and taxpayer money.



# LAWN CARE

**WITHOUT TOXIC CHEMICALS**



**ENVIRONMENTAL FEDERATION**

Our thanks to Nancy Coleman & Susan Wolf of NJ Coalition for Alternatives to Pesticides and Jane Nogaht and Tom Moritz of the NJ Environmental Federation.

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Princeton, NJ 08540 • (609) 924-7429

## MONITOR THE LAWN

Identify problems:  
Sufficient sunlight and air? Diseases? (eg. dollar spot, leaf spot) Pests? (Chinch bugs, etc.) Treat only the problems that exist and use alternative controls specific to the problem.

## MOWING

Set mower 3"- 4." Taller grass chokes out weeds (like crabgrass).  
To prevent compaction, rotate mowing pattern. Mow lawn as needed, never cutting more than 1/3 of leaf blade at a time, and leave grass clippings on lawn for nutrient recycling.

## TEST SOIL FOR FERTILITY AND PH

Have soil tested each year.  
Adjust pH to the needs of your lawn. Pulverized or pelletized lime should be added according to need determined by pH test results. Fertilize twice a year, once in the fall and once in the spring or fertilize four times a year at half/rate.

Use natural organic fertilizers; they feed the soil, and release slowly throughout the season. They enhance and encourage beneficial organisms which aerate soil and naturally break down thatch. Never fertilize in hot weather. Established lawns may need less frequent fertilization, especially with "cut and leave it" practices.

## PLANT PROPER VARIETIES OF GRASS

Choose appropriate grasses for your soil and light conditions. Re-seed bare spots, preferably in the fall. Overseed (rake in) if grass plants are aging. You can contact the Rutgers Cooperative Extension Program for more information.

## AERATE SOIL

Aeration helps prevent weeds and reduces compaction. Core aeration is ideal. Aerators can be bought or rented. A good supply of earthworms will aerate the soil adequately as long as there is no compaction problem.

## REMOVE THATCH

Thatch is the accumulated dead material at the base of the grass. Rake frequently by hand or rent a thatching machine. Dethatch only if thatch is one inch or more. Organic fertilizers help break down thatch naturally. Worms do too!

## REDUCE WEEDS

Use correct mower height. Re-seed bare spots preferably in the fall. In the spring, use seed soaked in water for 24 hours to speed up germination and mix with soil and sand in bare spots.  
Identify weeds and establish tolerance levels. Hand dig weeds until competition by grass plants eliminates most weeds.

## WATERING

If less than 1" of rain falls per week, water deeply and infrequently. This encourages deep root growth. Sandy soils and sloped lawns need more frequent watering. Water only in cool of morning. Lawns in full sun need more frequent watering.

## ELIMINATE PESTS

Attract birds, "nature's insect control," by planting proper shrubs and by offering housing, water and food. Identify pests, then use biological pesticides specific to that pest. E.G. B.t. for leaf eating caterpillars; milky spore powder for the longterm control of Japanese beetle grubs. Use beneficial nematodes to control high populations of Japanese beetle grubs. Natural pesticides such as pyrethrum, rotenone and sabadilla are broad spectrum and toxic, but are short lived in the environment. They should be used with caution and only as a last resort, in accordance with label directions.

## LAWN SERVICE

Avoid chemicals entirely. Get a written contract, specifying what chemicals the service will use. Reserve the right to cancel use of any chemical product. Don't let them treat problems that are not there!

**LAWN CARE WITHOUT TOXIC CHEMICALS**





**Title of Report:** Conservation Element of the Master Plan, Ewing Township, Mercer County, New Jersey

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**Publication No.:** 07007

**Date Published:** March 2007

**Geographic Area Covered:** Ewing Township, Mercer County, New Jersey

**Key Words:** Conservation, benefits of environmental protection and open space preservation, sustainability, proposed greenways, open space and pathways, floodplain protection, stewardship, wildlife management, Ewing Township

**ABSTRACT:** The purpose of this Conservation Element of the Master Plan of Ewing Township is to identify the natural resources of the community; to explain why they are important to protect; to bring the most recent knowledge on the connections between a healthy environment and economic vitality and on sustainable development practices to the attention of the community; and to articulate steps that the Ewing community can take to preserve, conserve, and utilize its resources to maintain and raise the township's high quality of life. Maps of proposed greenways, pathways and open space are included.

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