CHAPTER 7

PLAN FOR THE PROTECTION OF HISTORIC AND NATURAL RESOURCES

INTRODUCTION

The Pennsylvania Municipalities Planning Code (MPC) requires that municipal Comprehensive Plans address resource preservation, specifically identifying natural, cultural, and historic resources. The natural resources noted by the MPC are wetlands and other aquifer recharge zones, woodlands, steep slope areas, prime agricultural land, floodplains, and "unique natural areas." The MPC adds that municipalities are not limited by this list, but may provide for the protection of other resources of local importance.

Historic Resources

The Region's history is reflected in its architecture, people, and character. Historic resources connect us to the past, emphasize our sense of community, and often provide aesthetic value. In addition, historic resources can provide tourism benefits which often lead to economic development opportunities. Planning for the protection of historic resources is especially important because historical resources are not renewable.

Historic Districts

Local historic districts are areas in which historic buildings and their settings are protected by public review. Historic district ordinances are local laws adopted by communities using powers granted by the state. Historic districts consist of the Region's significant historic and architectural resources. Inclusion in a historic district signifies that a property contributes to a group of structures that is worth protecting because of its historic importance or architectural quality.

National Register of Historic Places

The National Register of Historic Places is the nation's official list of cultural resources worthy of preservation. Authorized under the National Historic Preservation Act of 1966, the National Register is part of a national program to coordinate and support public and private efforts to identify, evaluate, and protect our historic and archeological resources. Properties listed in the Register include districts, sites, buildings, structures, and objects that are significant in American history, architecture, archeology, engineering and culture.

Cultural Resources

Cultural resources are the special characteristics that make a community unique. A community that takes pride in and respects its traditions is typically a community with a well-defined character. Kutztown Borough contains a rich, diverse heritage with significant cultural resources that should be embraced and preserved.

Historic and Cultural Resource Strategies:

A. Update zoning ordinances as necessary to protect historic resources and community character. Options include:

1. Adopt Historic Resource Overlay Zoning.

   a. Create a historical commission and / or committee

   b. Identify historic resources

   c. Require developers to analyze:

   - Nature of historic resources on and near property
   - Impact of proposals on historic resources, and
   - Mitigation measures

   d. Encourage adaptive reuse of historic buildings

   e. Establish use, coverage, density, intensity, and yard bonuses for architectural treatments, building design, amenities, and open spaces/buffers compatible with existing resources, appropriate reuse of existing resources and donation of façade easements

   f. Encourage architecture, materials, and development patterns characteristic to the area

2. Adopt Demolition by Neglect Provisions:

   a. Require property owners to protect and maintain historic properties to avoid demolition by vandalism or the elements by requiring unoccupied structures to be sealed or secured by fencing

3. Regulate and minimize conversions of buildings, addressing:

   - Locations where permitted

- The procedural treatment of the use
- The type of building that can be converted
- Density of converted units
- Lot size for converted building
- Impervious surface/open space requirements
- Units allowed per structure
- Structure size requirements
- Minimum size of dwelling units
- Neighborhood compatibility standards
- Adequate parking requirements
- Screening of parking and common areas
- Limits on the structural revisions for buildings
- Minimum size of converted dwelling unit

B. Appoint a historical commission actively involved in historic preservation. The commission would be instrumental in administration of any historic resource overlay zoning that is adopted. The commission would:

1. Identify, evaluate, mark and foster awareness of historic resources

2. Investigate participation in Certified Local Government Program

3. Encourage retention, restoration, enhancement and appropriate adaptive re-use of historic resources and discourage removal of historic structures

4. Develop programs, events and interpretive signage and exhibits that emphasize the history of the Region

5. Evaluate the potential for historic districts and support their creation if warranted. If created, support the adoption of voluntary or mandatory Design Guidelines and Sign Controls for the Historic District.

C. Support the activities of individuals and groups like the Kutztown Area Historical Society that identify, document, evaluate, and protect historical resources and increase public awareness of the area's history and historic resources.

D. Work with Kutztown University to determine the most appropriate future of historical buildings on the University campus.

HISTORIC PRESERVATION AT THE STATE AND LOCAL LEVEL

Establishing a local Historic District requires an assessment of the present status of the community's historic resources, knowledge of past historic preservation efforts, and a list of goals and objectives. Taking such an assessment enables the designating community to take advantage of historic preservation incentives available at the national, state, and local governmental levels, such as grants, income tax credits for historic rehabilitation, low-interest loans, and local tax abatements. A requirement of establishing a local district, provided it was created pursuant to Act 67, the Historic District Act, is the establishment of a Historic Architectural Review Board (HARB). The HARB reviews all proposed erection, reconstruction, alteration, restoration, or demolition of buildings within the district before the issuance of any municipal permits pursuant to these actions. HARB reviews and recommendations must be consistent with the design guidelines established at the enactment of the Historic District. The governing body has the right to incorporate any of the HARB's recommendations into the permit requirements, but they may also override those recommendations. Municipalities whose districts are not created under Act 167 are not required to have a HARB, but instead may appoint a Historic District Commission or Committee.

Two Pennsylvania laws provide the legal foundation for municipalities to adopt historic ordinances and regulatory measures.

Act 247 – The Pennsylvania Municipalities Planning Code (MPC)

Acts 67 and 68 of 2001 amended the MPC, strengthening the ability of local governments to protect historic resources through their Comprehensive Plans, Zoning Ordinances and Subdivision and Land Development Ordinances. The following passages and paraphrases from the MPC are the most critical sections regarding this power.

- §603(C)(7) – Zoning ordinances may promote and preserve prime agricultural land, environmentally sensitive areas, and areas of historic significance.

- §603(G)(2) - Zoning ordinances are required to protect natural and historic resources.

- §702(1)(ii) – The governing body of each municipality may enact, amend and repeal provisions of a zoning ordinance in order to fix standards and conditions for traditional neighborhood development. In the case of either an outgrowth or extension of existing development or urban infill, a traditional neighborhood development designation may be either in the form of an overlay zone, or as an outright designation, whichever the

municipality decides. Outgrowths or extensions of existing development may include development of a contiguous municipality.

A Historic Overlay Zoning District, unlike the protection offered through the establishment of an Act 167 Historic District (discussed below), can include individual sites as well as clusters, as long as the resources are documented and identified on a historic resources map. A historic overlay district could require new buildings to be similar in type and scale to those already existing. Setbacks should be consistent with the common building setback. Requirements to replicate the existing building line, building height, and bulk could help to preserve the character of the neighborhood.

Act 167 - The Historic District Act (1961)

Municipalities may create historic districts within their borders to protect the historic character through regulation of the erection, reconstruction, alteration, restoration, demolition, or razing of buildings in the district. The Pennsylvania Historical and Museum Commission must certify districts, including a *determination of eligibility* for the National Register of Historic Places. In this way, historic districts established pursuant to Act 167 have the same protection from federal projects as do National Register properties. Act 167 also requires appointment of a HARB.

Historical and Museum Commission Act 1945

Act No. 446, approved June 6, 1945, created the Pennsylvania Historical and Museum Commission (PHMC) by consolidating the functions of the Pennsylvania Historical Commission, The State Museum, and the State Archives. The PHMC is an independent administrative board, consisting of 14 members: 9 citizens of the Commonwealth appointed by the Governor, the Secretary of Education (ex officio), 2 members of the Senate, and 2 members of the House of Representatives. The Executive Director is appointed by the Commission and is an ex officio member of three groups: the Environmental Quality Board, County Records Committee, and the Local Government Records Committee.

The PHMC is the official agency for the conservation of Pennsylvania's historic heritage. The powers and duties of the Commission fall into these principal fields: care of historical manuscripts, public records, and objects of historic interest; museums; archaeology; publications; historic sites and properties; historic preservation; geographic names; and the promotion of public interest in Pennsylvania history.

The PHMC is funded partially through an annual legislative appropriation, federal grants, and private donations. Officially recognized local historical organizations may benefit financially through the Commission’s eligibility to receive matching funds from various federal programs. The PHMC is active in many phases of historic preservation. The

PHMC also conducts a landmark identification program, presenting identification plaques to property owners for attachment on structures included in the Pennsylvania Inventory of Historical Places. The landmark identification program also includes the placement of roadside historical signs at various sites and locations having statewide and national historic significance. Today there are nearly 1,900 such markers across the state.

The Office of Historic Preservation is an arm of the PHMC responsible for assisting the public and private sectors in implementing the Commonwealth's policy to "protect and enhance our irreplaceable resources." To this end, the Office has implemented a five-point program:

- Registering historically and architecturally significant sites and structures on the National Register of Historic Places and on the Pennsylvania Inventory of Historic Places;
- Advising and guiding individuals and organizations regarding historic preservation and its funding;
- Reviewing applications for federal preservation grants;
- Working for legislation at the state level to provide effective tools for historic preservation; and
- Working with other governmental agencies to review the impact of projects, such as highways, on the Commonwealth's historic resources.

Pennsylvania Bureau for Historic Preservation

The Bureau is an agency of the PHMC. The Executive Director of the Bureau is designated as the State Historic Preservation Officer (SHPO).

The Bureau provides technical assistance for the preservation, rehabilitation, and restoration of historic buildings. The Bureau reviews architectural plans and specifications and provides comments on historic building projects for state and federal compliance. They also assist in code-related issues and accessibility programs in the form of letters of support for variances for historic buildings. To inform the public, public agencies, local governments, and other stewards of historic properties, the Bureau assists in the development and distribution of materials on applying the Secretary of the Interior's *Standards for Rehabilitation* when repairing historic buildings.

The Bureau also administers the Federal Rehabilitation Investment Tax Credit (RITC) program in partnership with the National Park Service. The tax credit program is one of the most successful programs for encouraging private investment in the rehabilitation of historic properties. Since the establishment of the PHMC in 1976, Pennsylvania has been a national leader in certified tax credit projects, completing over 1,800 projects and

generating over $2.5 billion in qualified rehabilitation expenditures. The Bureau provides technical assistance throughout the application process.

The Bureau also administers the State's Historic Preservation Program as authorized by the Pennsylvania History Code and National Historic Preservation Act of 1966. The program is guided by advisory boards as well as the Pennsylvania Historic Preservation Plan.

National Efforts and Legislation for Historic Preservation

Federal programs encouraging historic preservation include:

- the National Register of Historic Places,
- Historic Preservation Tax Credits on federal income tax for qualifying rehabilitation and adaptive reuse of historic buildings used for income-producing purposes,
- Section 106 Review of federally funded or assisted projects that impact historic resources, and
- the Certified Local Government Program, which facilitates historic preservation at the local level.

Federal Tax Incentives for Historic Buildings

According to the Tax Reform Act of 1986, a property owner is eligible for a 20% tax credit, along with a 27.5 to 31.5% straight-line depreciation for the substantial rehabilitation of historic buildings for commercial, industrial and rental residential purposes (not owner-occupied buildings). In addition, the Act allows a 10% tax credit for the substantial rehabilitation of nonresidential buildings built before 1936. The 10% tax credit is not available for rehabilitations of certified structures.

Two Federal Tax Incentive Programs currently apply to preservation activities in Pennsylvania: the rehabilitation investment tax credit and the charitable contribution deduction.

Rehabilitation investment tax credits are the most widely used incentive program. Certain expenses incurred in connection with the rehabilitation of an old building are eligible for a tax credit. Rehabilitation investment tax credits are available to owners and certain long-term leases of income-producing properties that are listed on the National Register of Historic Places. There are two rates: 20% for historic buildings and 10% for non-residential, non-historic buildings built before 1936.

The charitable contribution deduction is taken in the form of a conservation easement and enables the owner of a "certified historic structure" to receive a one-time tax deduction. A conservation easement usually involves the preservation of a building's facade by restricting the right to alter its appearance.

The Federal Tax Incentive Programs are coordinated through the State Historic Preservation Office, Bureau for Historic Preservation, Pennsylvania Historical and Museum Commission in conjunction with the National Park Service. Federal Historic Preservation Certification. Applications are available on-line.

The National Park Service "Certified Local Government" (CLG) Program

This program was created in 1980 under the National Historic Preservation Act and is administered by the Pennsylvania Historical and Museum Commission. The Certified Local Government Program provides additional benefits to municipalities interested in historic preservation. Once certified, the local government is then eligible for:

- Direct participation in the federal historic preservation program,
- Greater access to historic preservation funds,
- Greater level of information exchange with the State Historic Preservation Office (SHPO),
- Access to technical assistance and training from the SHPO, and
- A higher degree of participation in statewide preservation programs and planning.

This program was established to allow local governments to participate directly in the national historic preservation program and to provide funding to local governments to carry out their historic preservation responsibilities (survey, inventory, designation and protection of their historic resources). To achieve CLG status in Pennsylvania, a municipality applies to the Bureau for Historic Preservation. All states are required to set aside 10% of their federal historic preservation grant funds to CLGs. These grants are presently offered as a ratio of 60% funding from the Pennsylvania Historical and Museum Commission (PHMC) and 40% match from the CLG.

Critical requirements for CLG designation are:

- adopt and enforce appropriate legislation for designation and protection of historic properties,
- establish a qualified historic preservation commission,
- enact a system for surveying historic properties,

- enact a public participation component as part of the local program,
- adequately perform duties and responsibilities delegated through the certification process,
- provide continuing in-service historic preservation training for HARB and Historical Commission members (8 hours training annually per member),
- a good faith effort to appoint HARB members with appropriate professional qualifications for historic preservation backgrounds,
- submit an annual report of the municipality's historic preservation activities, and
- enforce the historic district ordinance.

NATURAL RESOURCES PLAN

Natural resources contribute to the economic activity, environmental health, and quality of life of a community. Parks, open space, woodlands, steep slopes, streams, wetlands, and farmlands are all resources that are aesthetically pleasing, and provide economic as well as environmental benefits. One example of this is the way that floodplains and wetlands act as natural storage basins in periods of high water and help to improve water quality by filtering out sediment and pollutants.

Natural Resources Strategies:

A. Update zoning ordinances as necessary, and consider adopting official map to protect the Borough's natural resources and to be consistent with the Future Land Use Map. Options include:

1. Uphold Natural Resource Protection Standards and/or Net-Out Provisions for the following resources:

   a. Floodplains
   b. Wetlands
   c. Wetland Margins (buffers)
   d. Watercourses
   e. Water bodies
   f. Greater than 25% slope
   g. 15-25% slope

2. Adopt Steep Slope Protection Provisions:

a. Control and limit development on steep slopes

- Require larger lot sizes and impose stricter impervious restrictions for steep slopes of 15 to 25% should we say "restrict?"

- Prohibit or severely restrict development on slopes greater than 25%

3. Adopt Groundwater Protection Provisions:

a. Protect aquifers through design standards, construction guidelines, use restrictions, impervious limits, and permit submission requirements.

4. Adopt Tree and Woodland Protection, Management and Planting Provisions:

a. Limit clearance for development in both subdivisions and land developments.

b. Require tree protection, especially mature and high-quality/high-value trees and require equivalent tree replacement during development.

c. Encourage the use of native species in landscaping. Discourage invasive species.

d. Establish limited clearance buffer zones around the perimeter of new developments

5. Adopt provisions for Wetland, Wetland Buffer, and Hydric Soil Protection:

a. Restrict development in wetlands.

b. Establish consistent wetland, wet area, and water body buffer (margin) requirements, such as 50 feet or 100 feet.

c. Require wetland delineation in hydric soil areas.

6. Adopt Floodplain Protection Provisions:

a. Severely restrict development in floodplains to compatible open space uses in accordance with governmental regulations including regulations of the Federal Emergency Management Agency and the Pennsylvania Environmental Protection Agency.

7. Establish Stream Corridor Overlay Zoning and require Riparian Buffers:

a. Restrict development and impervious surfaces.

b. Require riparian (vegetative) buffers to prevent artificial changes in water temperature, protect wildlife habitats, control sedimentation, and reduce pollution.

c. Require greenways.

d. Utilize the Best Management Practices where practical, and implement the Act 167 Stormwater Management Plans.

e. Protect the Region's streams.

8. Adopt Outdoor Lighting Standards to control light pollution and protect the night sky:

a. Establish illumination levels that are adequate but not excessive.

b. Require impacts on surrounding streets and properties to be mitigated by directing light down, not up or out to sides of fixtures.

c. Control glare.

B. Update subdivision and land development ordinances as necessary. Options include the following:

1. Expand plan data requirements to include a specific listing of environmental, scenic, historic, and cultural resources.

2. Require developers to identify the resources within their tracts, analyze the impacts of the development, and mitigate those impacts.

3. Require environmental assessment studies; hydrogeologic studies; scenic, historic and cultural resources impact studies; plans for preservation of environmental, historic, and cultural resources; and analysis of the site's ability to support the proposed use and intensity.

4. Require developers to identify natural, historic, scenic, architectural and cultural resources in their tracts and incorporate them into the open space system. Require management plans for open space as well as mechanisms to ensure the continuation as open space.

In review of Subdivision and Land Development Plans, requirements for setting aside open space can be used to preserve conservation corridors and provide for greenways.

Requirements for setting aside open space can also be used to protect targeted undeveloped areas and identified natural areas pursuant to municipal plans.

5. Establish development guidelines for development in groundwater recharge areas, including limits on impervious cover.

6. Require protection of vegetation during site work.

C. Support Environmental Advisory Commission to work with the Borough Council to preserve key tracts of open space, protect environmental resources in the Borough, and implement open space and recreation plans.

D. Encourage formation of groups within the community to assist the Maiden Creek Watershed Association by adopting the trail and providing monitoring and oversight along the stream corridor.

E. Pursue watershed planning opportunities under the Growing Greener initiative and other programs in order to protect community water resources.

Green Infrastructure

Green Infrastructure is a strategically planned and managed network of wilderness, parks, greenways, conservation easements, and working lands with conservation value that supports native species, maintains natural ecological processes, sustains air and water resources, and contributes to the health and quality of life of the community.

The Green Infrastructure network encompasses a wide range of landscape elements, including natural areas such as wetlands, woodlands, waterways, and wildlife habitat; public and private conservation lands such as nature preserves, wildlife corridors,

greenways, and parks; and public and private working lands of conservation value such as forests and farms. It also incorporates outdoor recreation and trail networks.

Riparian Buffers

A riparian buffer is an area of vegetation that is maintained along the shore of a water body to protect stream water quality and stabilize stream channels and banks. The buffers provide the following benefits:

- Filter runoff – Rain that runs off the land can be slowed and filtered in the buffer, settling out sediment, nutrients and pesticides (nonpoint source pollution) before they reach streams.

- Take up nutrients – Fertilizers and other pollutants that originate on the upslope land are taken up by tree roots. Nutrients are stored in leaves, limbs and roots instead of reaching the stream. Through a process called "denitrification," bacteria in the forest floor convert nitrate to nitrogen gas, which is released into the air.

- Provide shade – The leaf canopy's shade keeps the water cool, allowing it to retain more dissolved oxygen, and encouraging growth of plants and aquatic insects that provide food for fish.

- Contribute leaf food – Leaves that fall into the stream are trapped on fallen trees and rocks where they provide food and habitat for organisms critical to the aquatic food chain.

- Provide habitat – Streams that travel through woodlands provide more habitat for fish and wildlife. Woody debris provides cover for fish while stabilizing stream bottoms.

- Provides migration corridors for wildlife.

- Safeguard water supplies by protecting groundwater recharge areas.

- Provide flood control.

- Provide stormwater management potential – Natural vegetation provides a basis for innovative stormwater management systems. Stormwater flows from retention basins can be directed to, and allowed to flow through, buffers to reduce nutrient and sediment loads.

- Improve water and air quality.

- Stimulate economic opportunities such as providing valuable open space which may increase land values and, therefore, the tax base.

- Provide some federal tax incentives to landowners (depending on a landowner's financial situation) willing and able to place some of their lands under conservation easement.

- Reduce grounds maintenance.

- Provide recreational opportunities, and associated economic benefits for recreation-related businesses.

- Provide educational and research opportunities for local schools and colleges.

- Provide windbreak, shade, and visual buffer.

Greenways and Creek Conservation Corridors

What is a Greenway?

The Pennsylvania Greenway Partnership Commission defines a greenway as follows:

> A greenway is a corridor of open space. Greenways vary greatly in scale, from narrow ribbons of green that run through urban, suburban, and rural areas to wide corridors that incorporate diverse natural, cultural, and scenic features. Greenways can be land- or water-based, running along stream corridors, shorelines, lakes, waterfalls, or wetlands. Some follow old railways, canals, ridgelines, or other features. They can incorporate both public and private property. Some greenways are primarily recreational corridors, while others function almost exclusively for environmental protection and are not designed for human passage. Greenways differ in their location and function, but overall, a greenway network will protect natural, cultural, and scenic resources, provide recreational benefits, enhance the natural beauty and the quality of life in neighborhoods and communities, and stimulate economic development opportunities.

Benefits of Greenways

Greenways can have a number of benefits:

- Protect natural, cultural, and scenic resources.

- Provide for recreational opportunities such as walking, biking, and picnicking.
- Enhance the quality of life and promote revitalization in communities.
- Provide educational and interpretive opportunities.
- Enhance tourism and economic development opportunities.
- Maintain habitat linkages (wildlife corridors) and ecosystems.
- Allow access to natural, scenic and cultural resources.
- Preserve and build upon existing trail networks.
- Provide alternatives to vehicular travel.
- Provide riparian buffers to protect water quality.
- Provide linkages to trails of regional significance.

The borough should work toward the establishment of a greenway system.

SIGNIFICANCE OF NATURAL FEATURES

Natural features such as floodplains, wetlands, geologic formations, watersheds and watercourses are important to the protection of soil resources, groundwater recharge, and retention of the quality of surface and groundwater resources. The importance of protecting these natural features is summarized below:

Floodplains	Areas adjacent to a watercourse (stream/river) temporarily covered by water when the waterway exceeds its bankfull stage. The 100-year floodplain has been determined by the U.S. Army Corps of Engineers as to where water would be during the 100-year flood event. This flood event has a 1% chance of occurring every year, and is not a flood that 'occurs every 100 years' as commonly believed.
Protection Importance: Prohibiting and limiting development within the floodplain provides for protection of people and property from flood damage and minimizes downstream flood heights.	**Development Implications:** Residential development within the floodplain endangers both people and property in the event of a flood. Building, structures and filling within the floodplain increase downstream flood elevations. Compaction of soils and increasing impervious surfaces

Retention of natural stream/river floodplain corridors increases groundwater recharge and decreases stormwater runoff. Vegetated riparian corridors serve as buffers to sustain and improve water quality via nutrient removal and erosion and sedimentation control. Floodplain wildlife and plant habitats often support wetlands. Floodplain habitats can provide important open space and recreation areas.	along a floodway reduces infiltration and increases the rate of runoff, resulting in increased flooding downstream and higher flow velocities that cause increased flood damage. Removal of the natural vegetated riparian buffer along streams and rivers increases potential for water contamination from surface runoff and erosion. Erosion and storm runoff from development can deteriorate stream banks and cause sedimentation of waterways. Sedimentation of streambeds decreases habitat for aquatic life and navigable waterway. Development hinders aesthetic and recreational value of the waterway.
Protection Strategies: Strengthen municipal floodplain ordinance provisions to prohibit buildings, structures and large amounts of impervious surfaces within the 100-year floodplain to prevent damage to life and property. Limit impervious surfaces in developments adjacent to floodways through conservation zoning. Monitor current developments for poor management practices and offer planning assistance. Purchase conservation easements along streams to protect the floodplains and water quality. Cooperate with watershed associations and conservancies to promote education and outreach and conduct watershed studies.	

Forests	A forest by definition is an area densely populated by trees and other woody plants.
Protection Importance: Forest canopy along stream and	**Development Implications:** Development of forested lands can fragment habitat for

river corridors provides shade to minimize the warming of stream temperatures and reduce impacts to fish and other aquatic species. Forested riparian corridors help sustain stream and lake water quality by acting as nutrient filters and by stabilizing soil against erosion. Forested lands are part of the rural character and scenic relief. Undeveloped, forested landscapes allow for relatively high rates of infiltration or groundwater recharge and decrease stormwater runoff.	plant and animal species. Removal of forested riparian corridors has implications on water quality and clarity. Loss of these resources could have implications on quality of life. Improper development and management of forest resources can allow invasive species to proliferate.
Protection Strategies: Ordinance provisions and standards which require construction standards, protection of trees during development, landscaping standards which require native species establishment, limit of clearing until development plan approval, erosion/sedimentation plans, stormwater management, retention of forested canopy along waterbody corridors. Provide for maximum lot coverage requirements and minimum open space areas in residential subdivisions.	

Groundwater	The broadest definition for groundwater would be all water that resides below the surface. This water flows from subsurface into our streams, springs, and waterbodies, as well as flows through aquifers into wells.
Protection Importance: Groundwater is a source of potable water supply. Groundwater is integrally connected to surface water providing the "base flow" for	**Development Implications:** Maintenance of both quality and quantity of groundwater reserves sufficient for providing potable water supplies will require proper management as development occurs. Increased impervious surfaces affect the 'recharge' zone for groundwater supplies increasing the potential groundwater

streams. This base flow is extremely important to the regular stream flows and aquatic communities within them most particularly during drought periods.	may become contaminated. Potential underground and surface water sources of contamination can directly impact groundwater quality. Increased withdrawals from groundwater aquifers can affect existing supplies and stress future provision of adequate supplies. Improper siting and construction of wells during development can impact potential for groundwater contamination.
Protection Strategies: Identify key groundwater recharge areas and create protection zones for these critical areas. Create wellhead protection districts to protect recharge zones from harmful development or land-use. Development of programs which seek to prevent groundwater contamination before it occurs. Provide ordinance standards for water well construction including stormwater treatment and infiltration and open space conservation standards. Require wetland delineations and consider buffers for wetlands or other identified primary groundwater recharge zones. Establish a groundwater monitoring program to observe any changes in aquifers levels and quality. Develop a public education and outreach program which highlights groundwater conservation, identification of potential sources of contamination, proper sewage system management and other areas.	

Hydric Soils	These are soils that are wet frequently enough to produce anaerobic (without oxygen) conditions and support unique habitats and influence the biology of the soil. Hydric soils may be an indication of the presence of a wetland.

Protection Importance: Hydric soils provide natural groundwater recharge areas which can reduce flooding and manage stormwater runoff. The biologic organisms in hydric soils filter contaminants from water.	**Development Implications:** Hydric soils are associated with seasonally high water tables and may cause flooding in developed areas. These soils are unsuitable for development and on-lot sewage disposal. Hydric soils provide poor foundation stability if built upon.
Protection Strategies: Provide ordinance standards requiring wetland delineations by qualified professionals. Consider buffers for wetlands.	

Steep Slopes	Steep Slopes of 15-25% have 15-25 feet of vertical change in elevation over 100 feet or horizontal distance. Very steep slopes of greater than 25% have a vertical change greater than 25 feet over 100 feet of horizontal distance. The steepest slopes are often located along ridgelines or stream banks.
Protection Importance: Preserving natural vegetation on steep slopes not only protects the natural habitat along the slope but also helps protect adjacent areas from stormwater runoff related damage. Ridgelines are important scenic resources and protecting these areas from development preserves the vistas for all citizens and visitors to enjoy. Ridgelines and steep slopes provide important wildlife and plant habitats. Certain species of trees and plants are nly capable of thriving on ridgelines.	**Development Implications:** These areas are prone to erosion if disturbed by development or timbering practices. In addition, changes in vegetation on steep slopes will effect the concentration time of stormwater runoff, potentially increasing flood, and storm damage to developments downslope. Once disturbed these areas are difficult to mitigate. These slopes present increased costs in development engineering and severe limitations with on-site sewage disposal and general road maintenance. Roadways and drives along steep slopes present many driving hazards, especially during the winter months.
Protection Strategies: Identify ridgelines and scenic views as conservation areas. Link zoning standards to protecting land values and local economy. Limit development on slopes greater	

than 25%. Require detailed engineering plans for any developments proposed on steep slopes. Require stormwater managements for individual building lots. Require deduction of steep slopes from minimum lot size. Make use of conservation subdivision design to focus development away from steep slopes.	

Wetlands	Wetlands are areas where the soil is generally saturated with water for part or most of the year; and has had a significant impact on soil development and the types of plant and animal communities living within the area, which are specially adapted to residing in the moist habitat.
Protection Importance: Wetlands protect water quality by acting as a natural pollutant filter removing contaminants which may be conveyed into groundwater or other surface water if not filtered by the wetland. Wetlands are important groundwater recharge areas. Wetland areas reduce potential flooding by detaining and infiltrating stormwater. Many unique species of plants and animals are only capable of survival in wetland habitats.	**Development Implications:** Potential encroachment into, filling in or draining of wetlands during development inhibits the continued important values and functions of wetlands. Disturbance of wetlands and surrounding areas by development increases the potential for introduction of non-native invasive plant species that crowd out beneficial native wetland plants. Development adjacent to wetlands can release pollutants that impact the water quality and the groundwater recharge capacity of wetlands. Groundwater withdrawals can impact water levels that would otherwise sustain wetlands, particularly during dry periods
Protection Strategies: Create buffer areas adjacent to wetland areas to supplement state and federal regulations. Provide ordinance standards requiring wetland delineations by qualified professionals before development. Limit the amount of impervious surface permitted in developments adjacent to wetland areas.	

Inventory the plant and animal species in wetland habitats to monitor changes caused by development.	

Watercourses	Watercourses encompass bodies of water on the move, most commonly stream and rivers. These watercourses serve as habitat for aquatic plants and animals. In addition, streams and rivers are important for the tourism and recreation economy.
Protection Importance: Water resources serve an important role in protecting and increasing land values. Protection of surface water quality directly protects groundwater quality. High quality streams, rivers, lakes and other water bodies provide critical aquatic species breeding areas and habitat. Watercourses serve as important wildlife corridor connections and plant, bird and wildlife habitats.	**Development Implications:** Removal of the natural vegetated riparian buffer along streams and rivers increases potential for water contamination from surface runoff and erosion. Erosion and storm runoff from development can deteriorate stream banks and cause sedimentation of waterways. Sedimentation of streambeds decreases habitat for aquatic life. Development can impact the aesthetic and recreational value of the waterways.
Protection Strategies: Develop programs and standards to retain riparian forest buffers along high quality and exceptional value watercourses. To lessen the impact on scenic and environmental value, limit the types and density of development along streams and rivers. Encourage smart growth for developments along streams.	