

Chapter Nine

Natural Resources Protection Plan

INTRODUCTION

Chapter Four provided an inventory of the Region’s natural resources, their importance to the Region’s environment, and analyzed issues relating to their protection. This chapter provides recommendations on how to best protect these resources and achieve the planning policies identified by the Region for natural resources protection. The recommendations of this chapter provide a unique opportunity to implement consistent resource protection requirements on a region-wide basis. If adopted and enforced uniformly, these resource protection standards can provide protection of the Region’s most valued natural features whether or not regional zoning is implemented. Because a combination of measures is often needed to effectively protect any one resource, these recommendations would be most effective if implemented as an integrated package.

This chapter is divided into three main headings:

- Coordination of ordinance protection measures
- Specific resource protection measures
- Other protection measures

The Region identified the following overall goal for Natural Resources Protection:

Protect and conserve the natural resources and open spaces that are so important in defining the character of the Region.

The focus of this Natural Resources Protection Plan is how to best achieve this goal and its related policies in Chapter One at the regional level.

A complete summary of natural resources recommendations is located in Chapter Fourteen, Implementation Strategies. The **numbers** next to each recommendation section below correspond to those in the Chapter Fourteen.

The planning implications from Chapter Four, Natural Resources, are shown in the boxes below and followed by specific recommendations for addressing the identified issues.

COORDINATION OF ORDINANCE PROTECTION MEASURES

This section provides general recommendations for the coordination of ordinance revisions that would more effectively protect the Region’s natural resources. In particular, gaps in specific municipal resource protection measures are identified.

❑ **Resource Protection Standards** - To most effectively protect sensitive environmental resources on a regional basis, resource protection standards should be made consistent between municipalities and include specific disturbance limits. The identification and protection of natural resources should be the primary determinant for the location of appropriate development in the Region.

Consistency in Resource Protection Measures - The primary approach to protecting environmental resources on a regional level is to coordinate the protection standards within and between each municipal zoning ordinance and subdivision and land development ordinance. This requires that each participating municipality revise their ordinances so that they are consistent in both the types of resources they protect and the degree of protection each resource is afforded. Based on the gaps in protection identified in the inventory section, the following resource protection measures are recommended for addition to municipal ordinances.

Figure 9-1: Needed Additions to Municipal Resource Protection Measures

Protection Measure	Municipalities without Measure	Ordinance Where Typically Located ¹
Riparian Buffer/Stream Protection	East Marlborough, Kennett Square, Pennsbury, Pocopson	Zoning and/or Subdivision
Wetlands/Wetlands Margin Protection	East Marlborough ⁵	Zoning Ordinance
Tree/Woodlands Protection	Kennett Square, Pocopson ²	Zoning and/or Subdivision
Groundwater Protection Standards ³	Kennett, Pocopson, Kennett Square	Zoning Overlay (if district) and Subdivision Ordinance
Stormwater Management/Erosion Control	Kennett Square	Subdivision Ordinance
Minimum Buildable Area per Lot ⁴	East Marlborough, Kennett, Kennett Square, Pocopson	Zoning Ordinance
Other Vegetation Protection (hedgerows, specimen vegetation)	East Marlborough, Kennett Square, Pocopson	Zoning and/or Subdivision Ordinance

Source: Chester County Planning Commission

¹ All resources should be identified on the site analysis plan (or its equivalent) in the subdivision ordinance. The advantage of including the actual protection standards in the zoning ordinance is that they apply to all land uses, not just where a subdivision or land development is proposed.

² Standards not specific in zoning.

³ Pennsbury and East Marlborough may want to consider expanding their groundwater protection standards to address groundwater withdrawal as well as the protection of groundwater resources from contamination. See discussion under groundwater protection.

⁴ Requires a minimum building envelope in which no protected resources or other constraints are located, thereby ensuring a buildable lot.

⁵ Standards do not specifically prohibit development or encroachment on wetlands.

⇒ **Recommendations for the coordination of resource protection measures**

9.1.1 **Consistent Protection Standards** -Implementation of consistent protection standards by each municipality will provide the most effective regional strategy for resource preservation. It is strongly recommended that even those municipalities identified as already protecting a

particular resource review the protection measures recommended in the remainder of this chapter to determine if their ordinances contain adequate and specific standards. Any ordinance that does not contain a specific limit on the disturbance of the resource in question may not be effective in its protection. The implementation of specific disturbance limits will allow the Region's municipalities to apply protection standards consistently to proposed developments throughout the Region. In addition to the adoption of consistent protection measures, it is equally important that these measures be enforced at a consistent level throughout the Region.

- 9.1.2 Direct Growth to Appropriate Areas - In addition to individual resource protection standards, the future land use plans and zoning ordinances in the Region (whether adopted at the local or regional level) should direct the most intensive development away from areas with the highest concentration of sensitive resources. The Land Use Plan in Chapter Eight addresses this issue on a regional level.

SPECIFIC RESOURCE PROTECTION MEASURES

This section provides recommendations for specific protection measures for individual resources within the Region.

Water Resources

Water is the single most important resource in the Region and its protection in both terms of quality and quantity is a primary goal of the Natural Resources Protection Plan. A wide variety of recommendations are outlined below for the protection of both ground and surface water resources.

- Watershed Protection** - Planning and management of water resources is most effectively carried out at the watershed level. The Region should monitor the watershed studies currently being conducted to determine the implications for water resource protection and follow through with their recommendations where appropriate.

The following actions should be considered for the protection of the Region's watersheds:

Christina River Basin Study – The Phase I and II Report of the Christina River Basin Water Quality Management Strategy was published in May 1998 (See Chapter Four for additional information on this report). The purpose of the study is to improve the water quality of the Christina Basin streams which provide drinking water for over a half-million people in Pennsylvania, Maryland and Delaware. The Phase I and II Report includes a number of recommendations that are considered “interim” pending the completion of the 5-year water quality strategy that is expected to culminate in the year 2000 with the completion of a watershed management plan and the adoption of “Total Maximum Daily Loads” of the major streams of the Christina River Basin. Once the Total Maximum Daily Load Model sets specific goals in point and nonpoint source loads, a specific strategy of Best Management Practices (BMP's) can be established and implemented in the Christina Basin.

Because of its location within the Christina River Basin, it would be appropriate for the Region to implement the applicable recommendations of the strategy. The majority of the Report's recommendations that apply to the Region's municipalities are similar to or consistent with those discussed elsewhere in this chapter. These strategies include:

- Implementation of stormwater Best Management Practices;
- Restoration and protection of riparian habitats and stream corridors;
- Reforestation of watershed lands;
- Water Resource Protection Area Overlay Zoning Districts for limestone aquifers, wellhead, and recharge areas;
- Steep slope protection;
- Infiltration practices and reduction of impervious surface;
- Use of conservation design techniques and cluster development;
- Natural drainage measures and detention basin designs.

Chester County Water Resources Management Plan – The Chester County Water Resources Authority is currently in the process of developing a Water Resources Management Plan for the County. The plan will provide “the County, its municipalities, utilities, and stakeholders with technically sound policies, strategies, approaches, and implementation techniques” to achieve a number of goals. These goals include the protection of the hydrogeologic systems of all Chester County watersheds, guiding the locations and expansion of water and wastewater infrastructure, managing stormwater from existing and future land uses, protection of groundwater and stream quality, and encouraging the implementation of integrated resources planning by municipalities.

⇒ **Recommendations for water resources studies**

- 9.2.1 Implement the applicable recommendations of the Christina River Basin Study and monitor future implications as the final stages of the study are completed.
- 9.2.2 Because the future recommendations of the Chester County Water Resources Management Plan should be of benefit to water resources planning and management for the Kennett Area Region, the KARPC should follow its progress and consider implementation of any recommended actions applicable at the regional level.

Stormwater Management – The management of stormwater runoff can be accomplished through a series of techniques commonly referred to as “Best Management Practices” or BMP’s. The first BMP’s were developed during the late 1970’s and field tested in the Washington D.C. area. These field tests demonstrated that BMP’s could both control non-point source pollution and provide effective stormwater management. The first definitive guide on how to plan and design BMP’s was published by the Washington Metropolitan Water Resources Planning Board in 1979. Since this initial publication, the types of BMP’s and information available on the subject has expanded dramatically. The regional implementation of Best Management Practices (BMP’s) for the control of stormwater would be an excellent approach to promoting watershed protection by the Region. The goal of BMP’s is to employ the most suitable technique or combination of techniques that will best manage the stormwater flow and protect water quality based on an evaluation of site conditions and planning requirements. The implementation of BMP’s provides several benefits including: minimizing surface water runoff from development; minimizing increases to downstream flooding; increasing groundwater recharge; increasing pollutant removal of stormwater for groundwater recharge and surface water discharge; and, enhancing stream and riparian corridor management and aquatic habitats. In general, BMP methods are also less intrusive and blend in better with the landscape.

Best Management Practices are implemented through the stormwater management section of the subdivision and land development ordinance. A hierarchy of techniques is listed in the ordinance with the most acceptable techniques at the top of the hierarchy. Techniques at the top of the list emphasize infiltration practices over detention practices. The ordinance requires that an applicant prove that soils and site conditions are not suitable to accommodate infiltration facilities before the use of traditional detention basins can be considered. Examples of more current BMP's that are gaining recognition for their effectiveness include: retention basins, infiltration basins, sand filters, biofilters, grassed swales, pervious pavements and walkways, curbless streets, and pollutant prevention practices. There is also increasing emphasis on homeowner landscape practices that can be designed into the initial site plan with the homeowner accepting responsibility for maintenance. These BMP's are usually implemented in combination for the most effective management of stormwater runoff.

⇒ **Recommendations for stormwater management**

- 9.2.3 If each municipality in the Region adopts BMP requirements for stormwater management, a cohesive and effective method for controlling stormwater and protecting water quality would be advanced on a regional basis. Ideally, to achieve maximum effectiveness, all municipalities within each watershed (whether members of KARPC or not) should adopt these stormwater management practices. In Pennsylvania, the current state-of-the-art publication on BMP alternatives for the northeastern United States is entitled the Pennsylvania Handbook of Best Management Practices for Developing Areas. The BMP's included in the Handbook have been tailored to Pennsylvania regulatory and environmental conditions and each BMP description includes requirements for complying with State and Federal regulations. It is recommended that the Region use this Handbook as a primary resource for developing and implementing Best Management Practices for stormwater control. It is also recommended that BMP's for the mushroom industry be implemented wherever appropriate within the Region.

Erosion and Sedimentation Controls - In addition to stormwater control, BMP's also emphasize the reduction of soil erosion and sedimentation during and after the construction phase. The Region should encourage the adoption of the most currently recommended provisions for erosion and sedimentation control. The Chester County Conservation District reviews any project that disturbs more than five acres of land during the life of the project. However, municipalities can enter into a memorandum of understanding with the Conservation District that enables them to review erosion and sedimentation controls proposed on smaller development sites. The Conservation District can also review municipal erosion and sedimentation standards to ensure they are adequate.

⇒ **Recommendation for erosion and sedimentation control**

- 9.2.4 The Region should encourage all participating municipalities to take advantage of the review service offered by the Chester County Conservation District.

Riparian Buffers – “Riparian” refers to the vegetated area of land adjacent to a pond, lake, stream, creek, river, marsh, wetland, or shoreline. The use of riparian buffers is one of the most effective techniques for the protection of surface water and wildlife habitats. By protecting these buffers of trees, shrubs, and other vegetation, waterways can be protected from the impacts of human activities such as farming, grazing, lumbering, and urban development. The vegetation intercepts polluted and sediment-laden stormwater running off the land before it reaches the waterbody. These buffers are most critical in watershed headwater areas, including smaller first and second order streams. Riparian buffer standards

can be implemented through the zoning or subdivision ordinance and generally limit or prohibit disturbance within a specified distance from the stream or waterbody. Some ordinances divide the riparian buffer into more than one zone, with the most stringent requirements applied to the zone closest to the stream. The Montgomery County Planning Commission has developed a model for riparian corridor conservation districts that uses a two zone approach. Within the Region, only Kennett Township has enacted riparian buffer standards.

⇒ **Recommendation for riparian buffers**

- 9.2.5 The Region should undertake a unified approach to protecting riparian buffers as the restoration and preservation of these critical resource areas is one of the most important and effective actions the Region can implement in the protection of water resources.

Floodplain Protection - Because disturbance of the floodplain creates a high potential for detrimental environmental impacts and threats to life and property, floodplains and areas of alluvial soils should remain undeveloped to the greatest extent possible. Floodplains should also be conserved for their potential Regional recreational value in terms of the creation of trails and greenways.

Floodplain Protection Measures - All municipalities in the Region currently provide protection for identified floodplain areas. By including alluvial soils in the floodplain definition, unmapped floodplain areas typically associated with first order streams and headwaters will also be protected.

⇒ **Recommendation for floodplain protection**

- 9.2.6 The definition of floodplain should be made consistent throughout the Region, using areas of alluvial soils as well as the floodplain areas mapped by FEMA.

Wetlands Protection - Wetlands and areas of hydric soils are important ecosystems, providing both wildlife habitat and storage and filtering areas for ground and surface water. While regulated at the State and Federal level, local requirements for identification and protection of wetlands throughout the Region is the most effective method for preserving this valuable resource.

Wetland Protection Measures - The Region's municipalities should specifically require 100 percent protection of wetlands within their zoning ordinance. Municipal subdivision and land development ordinances should require that wetlands and hydric soils (another indicator of wetlands) be identified on proposed subdivision and land development plans. Where a parcel may contain wetlands, based on the applicable indicators, the applicant should be required to submit a wetland study conducted by a qualified professional to determine the location and extent of the wetlands. The wetland margin should also be protected by establishing a minimum setback around the mapped wetland within which little or no earth disturbance may take place. Where some disturbance of the wetland margin is permitted, it should be limited to not more than 20 percent.

⇒ **Recommendation for wetland protection**

- 9.2.7 Municipal zoning ordinances in the Region should be made consistent in their protection of wetlands and wetland margins. Subdivision ordinances should also require that both wetlands and hydric soils be identified on proposed plans.

Headwater Protection - Protection of headwater areas is important for maintaining the overall quality of the watershed. Consideration should be given to how these areas can best be protected consistently throughout the Region.

Headwater Protection Measures - The best approach to the protection of headwater areas is through a comprehensive set of water related resource protection measures. As noted above, the use of riparian buffers is an important component of headwater protection measures. Also, because headwaters often coincide with hydric soils, a wetlands indicator, the implementation of local wetland protection standards will assist in the preservation of headwater areas.

⇒ **Recommendations for headwater protection**

- 9.2.8 The region-wide adoption of Best Management Practices for stormwater management and erosion control, the protection of steep slopes, floodplains, and preservation of vegetation, in addition to riparian buffers and wetlands protection, would provide a comprehensive protection program for headwater areas. Also, a more detailed mapping of first order streams than is currently available in the Region would help to more precisely identify the location of headwaters, thereby allowing better protection of this resource.

Groundwater Protection - Because of its susceptibility to contamination and its high potential for groundwater yields, special protection measures are needed for the Cocksylville Marble formation. Such protection measures are currently in place in East Marlborough and Pennsbury townships. Protection for areas traversed by fault lines should also be considered. Consistent standards for the protection of groundwater, and these vulnerable areas in particular, should be adopted within the Region.

The following actions should be considered for protecting the Region’s groundwater resources:

Groundwater Protection Measures – East Marlborough, Pennsbury, Kennett Township and Kennett Square Borough are the four municipalities in the Region that contain the Cocksylville Marble formation. Of these municipalities, only East Marlborough and Pennsbury have measures in place for the protection of groundwater in the area of carbonate formations.

In addition to concerns with potential contamination of groundwater, the Region’s groundwater drinking supply should be protected from excessive withdrawals of water. This may include preventing the export of large quantities of groundwater out of the Region’s watersheds. One possible approach is to adopt a water withdrawal ordinance that would regulate the withdrawal of water above a certain amount. For example, a model ordinance created by the Lehigh Valley Planning Commission regulates large water withdrawals as a conditional use in each zoning district. The object of the ordinance is to ensure continuous water availability and prevent adverse impacts on existing users. West Vincent Township also recently amended their zoning ordinance to create groundwater protection zones. The ordinance regulates well development and specifies the contents of hydrogeologic impact studies. Permits, application information, and other applicable requirements vary depending on the amount of groundwater proposed for withdrawal. The adoption of ordinances such as these would probably be most defensible if preceded by the water resources and development impacts assessment discussed below.

⇒ **Recommendations for groundwater protection**

- 9.2.9 Ordinance standards similar to those in place in East Marlborough and Pennsbury should be considered for inclusion in all municipal zoning ordinances that contain carbonate geology. Existing ordinances should also be examined to determine where they may need to be improved to better protect groundwater in vulnerable areas. Finally, the implementation of wellhead and source water¹ protection zones should be considered to protect community water supplies from potential contaminants.
- 9.2.10 The Region develop and adopting a water withdrawal ordinance to limit the export of water out of the Region’s watersheds.

Water Resources Assessment - A water resources assessment quantifies the potential impacts that can result from land development. The purpose of such an assessment is to develop a sound scientific basis for establishing water resources management criteria that can be integrated into land use and development decision-making. Information gained from the assessment can assist in planning and defining the most suitable type and location of land development to minimize impacts that will be sustained by the existing water resources. By understanding the magnitude of the potential impacts (such as decreased groundwater recharge), planning and design can be adjusted to minimize the potential adverse affects. While the water resources assessment can be valuable in the protection of both ground and surface water, such assessments require technical studies, computer modeling, GIS applications, and are data intensive (and therefore costly).

⇒ **Recommendation for water resources assessment**

- 9.2.11 The Region could consider conducting an assessment of water resources sustainability on a watershed basis. Such a study would provide data and support for other water resource management projects, such as the water withdrawal ordinance discussed above.

Red Clay Groundwater Flow Model - As described in Chapter Four, the Red Clay Valley Association has already developed a pc-based groundwater flow model using the results of the extensive studies of the Red Clay Creek Basin undertaken by the U.S. Geological Survey. This tool is suitable for use by local planners to evaluate the potential impacts of withdrawal and land application projects or proposed developments.

¹ “Source water protection” would include the protection of groundwater, as well as lakes, rivers, streams that serve as sources of drinking water.

⇒ **Recommendation for use of groundwater flow model**

- 9.2.12 Because the Red Clay Creek Basin encompasses a large portion of Kennett Township, East Marlborough Township, and all of Kennett Square Borough, these municipalities may want to take advantage of the Red Clay Valley Association’s groundwater flow model in evaluating proposed subdivisions and land developments.

Other Methods of Promoting Groundwater Protection - Groundwater can be protected indirectly using a variety of methods. The use of the BMP stormwater management practices described under “Watershed Protection” (9.2.3) would help to protect groundwater through the emphasis on both infiltration and pollutant removal. By limiting impervious surfaces to the minimum necessary, the recharge of groundwater can be further enhanced through ordinance standards.

At least three of the Sewage Facilities Plans in the Region emphasize the use of sewage treatment methods that promote groundwater recharge. Such sewage treatment methods are particularly important in areas that rely on groundwater for their water supply. These practices, in combination with the individual natural resource protection recommendations of this chapter (i.e. wetlands, woodlands, steep slopes, etc.), minimum ground disturbance, and directing more intensive growth to the most appropriate areas will promote the protection of both groundwater quantity and quality in the Region.

⇒ **Recommendations for additional groundwater protection measures**

- 9.2.13 The Region may want to review parking standards to ensure that they are not requiring more spaces and impervious surface than are really necessary. Other impervious surface standards for various uses and districts could also be reviewed on a regional basis. The use of BMP’s should also be promoted as another method of protecting groundwater quantity and quality.
- 9.2.14 The Region’s municipalities should continue to support sewage treatment methods that promote groundwater recharge.

Land And Biotic Resources

This section of the Plan discusses protection measures for the plants and wildlife in the Region and their habitats. Maintaining a diversity of habitats is a primary goal of these recommendations and can best be accomplished through protection measures that encompass a full range of resources. Sensitive or important land areas, such as steep slopes and prime agricultural soils, are also addressed in this section of the Plan.

□ **Steep Slope Protection** - Limiting development of steep slopes is important for preventing erosion and sedimentation of streams. Consistent standards for limiting the disturbance of steep slopes should be incorporated into all municipal ordinances.

Steep Slope Protection Measures - While all municipalities in the Region have some provisions for the protection of steep slopes, some are less precise than others. Specific limitations to the disturbance of steep slopes should be included in zoning ordinance provisions. For example, no more than 30 percent disturbance should be permitted on areas with a slope of 15 to 25 percent and no more than 15 percent disturbance should be permitted to steep slopes areas of greater than 25 percent. As an alternative for

slopes of greater than 25 percent (which are generally considered to fall into the category of “very steep”), permitted disturbance could be limited to that which is needed to accommodate an access road or planned trail network, but which in no case would exceed disturbing more than 15 percent of the steep slope area.

The plan information requirements of the subdivision and land development ordinance should always require that areas of steep slopes (15 to 25 percent and greater than 25 percent) be included on the site analysis plan. The ordinance may provide an exemption for steep slope areas below a certain size or that encompass less than three contour intervals. Each municipality should also ensure that their subdivision ordinance contains adequate erosion and sedimentation controls to limit soil erosion on those portions of steep slopes that are disturbed during construction. (See erosion and sedimentation controls discussion under “Watershed Protection.”)

⇒ **Recommendation for steep slope protection**

- 9.3.1 The Region’s municipalities should include specific and consistent slope protection measures in their zoning ordinances and require steep slopes to be identified in subdivision and land development plans. Subdivision ordinances should also include erosion and sedimentation controls that minimize erosion on disturbed slopes to the maximum extent possible.

Prime Agricultural Soils - Prime agricultural soils, once developed, are lost forever for crop production. Unfortunately, the characteristics of the soil also make it most suitable for building. Measures for protecting this valuable economic and natural resource should be implemented, particularly in areas of the Region with continued active farming.

Protection of Prime Agricultural Soils - Prime agricultural soils are a somewhat more difficult natural resource to protect because they do not involve the development constraints or safety issues that accompany such resources as steep slopes, wetlands, or floodplains. In fact, such soils tend to be ideal for supporting development and on-site sewage facilities. Generally, the best approach to agricultural protection is through the various farmland protection programs available within the State and County. (Protection of agriculture as a land use is discussed in Chapter Eight, Future Land Use Plan.) In terms of specifically protecting prime agricultural soils, there are some options the Region’s municipalities can consider. For example, where open space (cluster subdivisions) are proposed, the ordinance can list the resources, including prime agricultural soils, that should be included in the protected open space. Where transferable development rights are employed, the ordinance can list prime agricultural soils as a resource that should be included in the portions of the tract in the restrictive covenant agreement. The use of agricultural zoning also uses the presence of significant amounts of prime agricultural soils as one basis for its implementation. Again, this issue is discussed further in Chapter Eight.

⇒ **Recommendation for protection of prime farmland**

- 9.3.2 In addition to farmland protection programs, the Region should consider ordinance based standards, such as clustering, transferable development rights, and agricultural zoning, to help protect significant areas of prime farmland.

Maintaining Natural Diversity - Protecting the variety of habitats in the Region is vital to maintaining the natural diversity of plants and animals found here. Areas of contiguous woodlands,

wooded stream corridors, wetlands, fields and pastures, and hedgerows are the primary vital habitats that need to be protected if the Region is to continue to maintain healthy ecosystems. Actions for addressing the issues of non-native invasive plant species and white tailed deer over-population on a Regional basis should be considered.

The following actions should be considered for maintaining natural diversity within the Region.

Maintaining Diverse Habitats - Providing connected high quality habitats that are large enough to sustain a variety of wildlife and plant species is needed to maintain natural diversity. Implementing and enforcing consistent protection standards for a broad range of natural resources throughout the Region will help to preserve many of these important habitats. By allowing cluster subdivisions and lot averaging as options in the zoning ordinance, the integrity of larger areas of habitat can be maintained. The implementation of a transferable development rights program, while more difficult, is another option for preserving large areas of open space. The ordinance measures, in combination with the other open space protection measures discussed in this plan, should allow the Region to maintain diverse natural habitats.²

The County's "Greenways Grant Program" could also be used to help preserve connecting corridors. This program, which is administered by the Parks and Recreation Department, reimburses a maximum of 50 percent of the approved cost (up to \$100,000) for greenway acquisitions, access facilities, or biodiversity improvement projects. Eligible projects include: fee simple land or easement purchases for conservation, preservation, and public access; development of trail linkages; new facility projects for public access on municipally controlled land; and biodiversity projects within an existing permanently protected publicly accessible greenway. A biodiversity project may include the removal of invasive exotic species like Multiflora Rose and Japanese Honeysuckle that have disrupted a greenway's natural habitat. (For more information contact the Parks Department at 610-344-6415.)

⇒ **Recommendations for maintenance of diverse habitats**

- 9.3.3 Maintaining natural diversity can be promoted through an integrated program for the protection of wetlands, riparian buffers, woodlands, hedgerows, steep slopes, and floodplains. The use of clustering and TDR's can also be used to target the preservation of open space containing diverse habitats. Grant programs should be explored that help to further the goal of natural diversity. The completion of a more detailed inventory of important habitats and a determination of the specific steps needed to maintain or improve natural diversity could be considered as a future regional effort.

Important Habitats Inventory - A Regional inventory of important habitats could be used in conjunction with each municipality's open space preservation efforts. This inventory should include the PNDI sites discussed in Chapter Four and other locally important vegetation, such as historic trees, hedgerows, and significant woodlands, identified in municipal open space plans. If this inventory were completed, identified habitat areas could be targeted for preservation through whatever means the municipality is using to promote open space preservation. For example, where cluster development or lot averaging is proposed, developers should be encouraged to locate preserved open space where important habitats or habitat connections have been identified. Land trust preservation efforts could also focus on

² Appendix E of the Pennsbury Open Space Plan includes an extensive discussion of the conservation of biodiversity that is applicable to the larger Region; this source can be consulted for additional information.

areas that contain habitats identified for protection. In addition, the specific woodlands protection standards discussed below could be expanded to include large specimen trees and the preservation of hedgerows.

⇒ **Recommendations for preserving important habitats**

- 9.3.4 The Region should consider undertaking a regional inventory of important habitat areas and targeting those areas for preservation through both municipal ordinances and private means such as land trusts.

Woodlands Protection – Woodlands play an important role in maintaining natural diversity, providing important wildlife habitats, and protecting stream quality. Because many of the Region’s remaining woodlands are located on steep slopes, the implementation of slope protection standards will also help to protect these woodlands. The protection of hedgerows could also be incorporated into the woodlands protection standards. A specific limit on the disturbance of woodlands or individual trees above a certain size should be included in the zoning and/or subdivision and land development ordinance.³ Specific limits on disturbance could be no more than 20 percent disturbance where woodlands overlap with other sensitive resources (wetlands, steep slopes, floodplains) and no more than 50 percent disturbance in other areas. The replacement of trees where their removal is unavoidable is also required by some ordinances.

Another very important consideration in woodlands protection is the implementation of measures to ensure that the trees identified for preservation are not damaged during the construction phase. To accomplish this, a tree protection zone (generally encompassing the dripline of the trees) should be delineated on both the site plan and on the ground through the use of colored tape or fencing. Encroachment of heavy equipment into this area is prohibited. Without these additional protection measures, many of those trees which were to be preserved are not likely to survive the construction phase.

⇒ **Recommendations for woodlands and hedgerow protection**

- 9.3.5 Woodland preservation efforts should include ordinance standards limiting the total area of woodlands that can be disturbed and construction phase protection standards for those trees that are to remain on the site. The protection of hedgerows through ordinance standards should also be considered.

Non-Native Plant Species – The use of native plants provides several benefits over exotic species including their adaptation to local climate, less susceptibility to insects and disease, and promotion of biological diversity. Landscaping and street tree ordinances adopted by the Region’s municipalities should require the use of native species in planting schemes. A list of acceptable plants should be included in the appendix of municipal subdivision and land development ordinances. A woodland protection ordinance could also include the prohibition of planting of exotic, invasive vegetation where the replacement of vegetation is required. Finally, the Region could provide residents with a list of native plant species and encourage them to choose these plants when landscaping. (See “Education”

³ For example, Pennsbury’s Zoning Ordinance defines woodlands as “A lot or portion thereof one-quarter (1/4) acre or greater in area, having more than one (1) viable tree of a caliper of six (6) inches or greater per one-thousand (1,000) square feet of lot area.”

below.) The Chester County Planning Commission publication, Native Plants in the Chester County Landscape, (Planning Bulletin #51) contains a comprehensive listing of native trees and shrubs divided into ten sub-groups. The Environmental Management Center of the Brandywine Conservancy also has information on the preservation of native plants.

⇒ **Recommendation for limiting non-native plant species**

- 9.3.6 Where the Region’s ordinances deal with landscaping, the use of native plant species should be strongly encouraged and a list of preferred plant materials included in the ordinance appendices. The use of exotic, invasive plant species should be prohibited. Residents should also be provided with information explaining the benefits of using native plants in their own landscaping.

OTHER PROTECTION MEASURES

The following additional protection actions can contribute to the preservation of a wide variety of natural resources in the Region.

Private Measures - The townships of Pennsbury, East Marlborough, and Kennett have established local land trusts for the preservation of open space. Pocopson could also consider undertaking such an effort. In addition to municipal land trusts, the Brandywine Conservancy and the Natural Lands Trust are two other private conservation organizations in the area that accept conservation easement donations. Education and discussion with land owners on the benefits of using the land trusts is important to the success of these efforts. The Region’s land trust members should consider meeting on an bi-annual or quarterly basis to share their experiences so they might learn from each other’s successes and failures. Contact could be made with trusts outside the immediate Region such as the Willistown Conservation Trust which operates in several municipalities in Chester and Delaware counties and has acquired approximately 80 conservation easements, preserving some 3,000 acres. In addition to providing information on local land trusts, the Region could assemble and distribute information on other options for landowners who wish to preserve open space.

⇒ **Recommendations for promoting private preservation measures**

- 9.4.1 Coordination and communication should be promoted between the Region’s existing land trusts. Information on the full range of options that landowners’ have for preserving open space could be distributed by the Region.⁴

Education - Municipal land owners, whether they own large or small properties, can benefit from learning about the importance of natural resources protection and what they can do on an individual basis to protect water and land resources. Information on such topics as the protection of vegetation along stream banks (riparian buffers), woodlands management, control of non-native plant species, or the potential damage to local streams through the indiscriminant use of lawn fertilizers and pesticides could be included in municipal newsletters, websites, or brochures distributed to residents. Libraries containing resource protection information useful to homeowners could be made available at municipal

⁴ The CCPC is currently working on a publication on land stewardship. This document will discuss ways landowners can gain an economic return on their land while preserving open space.

buildings. These information centers should also include information on State natural resource programs available to landowners such as the Forest Stewardship Program directed by the PA-DEP Bureau of Forestry that assists forest landowners with better management their forest lands.

⇒ **Recommendations for citizen education**

- 9.4.2 Information should be made available to the Region’s residents on the importance of protecting natural resources on an individual basis and programs available to private citizens that promote resource preservation. Such information could be distributed through local newsletters, websites, and through resource information centers at municipal buildings.

CONCLUSION

The Region should develop consistent ordinance standards for resource protection to be adopted by each municipality. The protection of natural resources is one area where the Region can successfully implement its policies on a municipality-by-municipality basis without necessarily adopting a regional zoning ordinance. By adopting the same levels of natural resource protection and stormwater management control measures, these resources can effectively be protected on a regional basis. In some cases, excellent resource protection measures have already been adopted by an individual municipality in the Region and these could provide the basis for the regional protection standards.

NOTES:

1. Cultural resources, including historic, scenic, and open space resources, are discussed in Chapter 10, Cultural Resources Protection Plan.
2. A detailed discussion of and sample ordinance provisions for most of the resource protection measures listed in this chapter can be found in the Community Planning Handbook: A Toolbox for Managing Change in Chester County.