
MIDDLE DELAWARE RIVER CONSERVATION PLAN



Prepared For:

*Bridgeton Township
Durham Township
City of Easton
Forks Township
New Hope Borough
Nockamixon Township*

*Plumstead Township
Riegelsville Borough
Solebury Township
Tinicum Township
Upper Makefield Township
Williams Township*

Funded by:



Pennsylvania Department of Conservation and Natural Resources

Prepared by:



Executive Summary

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Executive Summary

Introduction

The Middle Delaware River Conservation Plan (MDRCP) represents the culmination of a multi-year joint planning effort involving state, county, and local municipal organizations and residents for the 48.4 mile segment of the Delaware River extending from Forks Township, Northampton County to Upper Makefield Township in Bucks County. The purpose of a river conservation plan is to provide a comprehensive inter-municipal approach to improving, conserving, and making better use of the river's resources and surrounding land in this particular river segment.

Study Area Location

The MDRCP study area includes all or a portion of 12 municipalities across two counties and is approximately 105 square miles or 67,279 acres in size. The study area generally follows the prominent ridgeline on the west bank of the river, encompassing all direct drainage ways to the Delaware River, not previously or currently under study in a RCP. The study area is shown on Map 1 and includes the following named tributaries: Frys Run, Rodges Run, Gallows Run, Wild Cat Hollow Run, Falls Creek, High Falls Creek, Mine Spring Creek, Swamp Creek, Smithtown Creek, Hickory Creek, Cuttalossa Creek, Primrose Creek, Rabbit Run, Aquetong Creek, Dark Hollow Run, Pidcock Creek, Jericho Creek, Houghs Creek and Dyers Creek.

Planning History

This particular study area was selected to complete coverage of the Delaware River Watershed included as part of the Lower Delaware National Wild and Scenic River System. Separate river conservation plans have been completed, or are nearing completion for the following adjacent waterways within the Delaware River Watershed: Cooks Creek, Paunacussing Creek, Tinicum Creek, and Tohickon Creek in Bucks County, and Bushkill Creek and the Lehigh River in Northampton County.

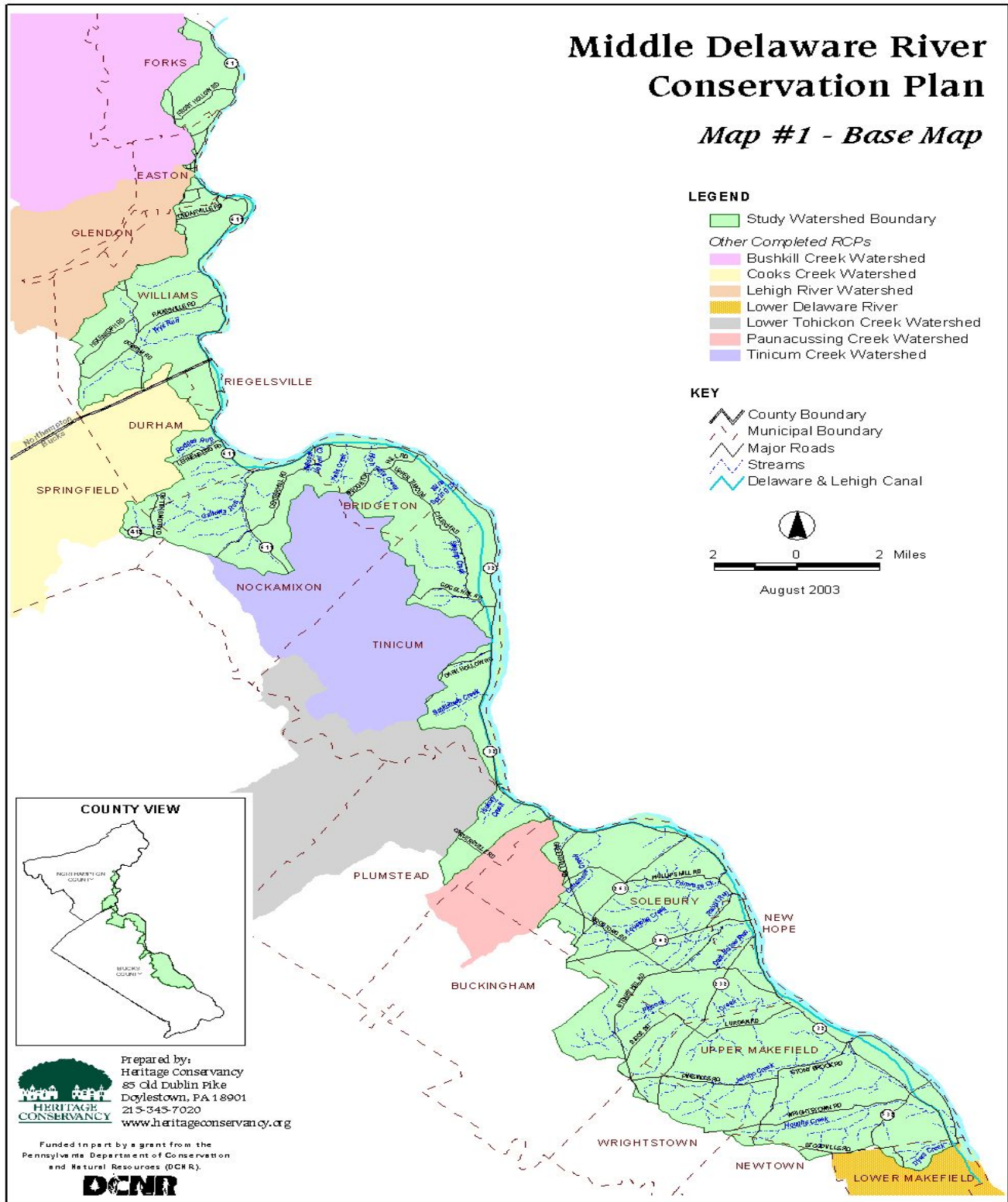
The Planning Process

A Middle Delaware River Planning Advisory Committee (PAC) was appointed from the municipalities, conservation organizations, the two counties, and the business community in order to represent the broad range of interests within the study area. The purposes of the PAC were to identify issues and concerns, and to develop goals and objectives for this river conservation plan. A series of public involvement activities were also held to solicit input on the plan.

At the outset of the project, the PAC undertook an extensive goals preparation process to identify critical matters that might be addressed through the planning process. The process was designed to ensure that a wide variety of issues (i.e., environmental, economic, infrastructure, community form, and regulatory options) were addressed. These goals set the foundation for the development of the management options for this plan.

Middle Delaware River Conservation Plan

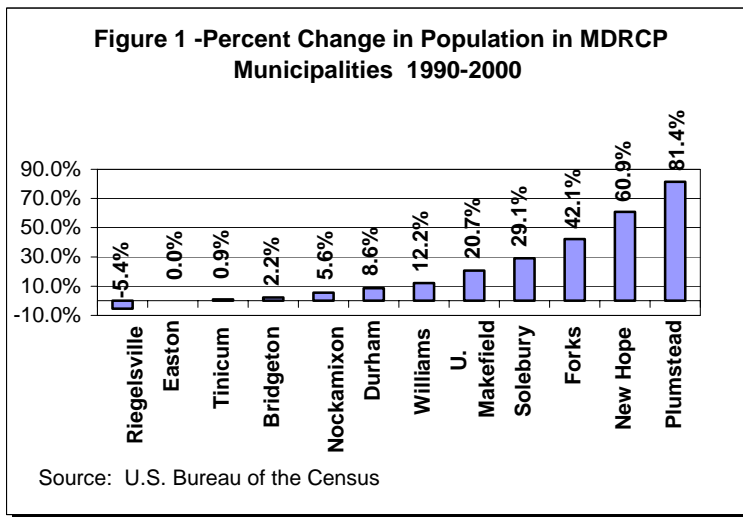
Map #1 - Base Map



Study Area Characteristics

Demographic Trends

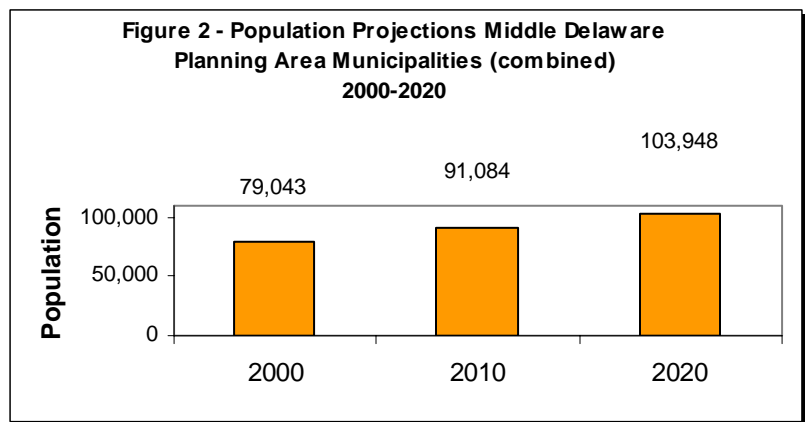
The Middle Delaware River study area includes communities experiencing varying rates of population and housing change, as shown on Figure 1. When viewed collectively, the study area municipalities have been exhibiting moderate growth, but still retain low population densities representative of suburban and rural areas. The study area municipalities have a total population of approximately 79,043 people (2000 census) and an average population density of 440 persons per square mile.¹ This density is slightly higher than the State's average of 274 persons per square mile but lower than both Bucks County and Northampton County, which are 984 and 715 persons per square mile respectively.



Housing unit data from the 2000 census shows that over 5,000 new units were either constructed or formed in the past decade within the study area municipalities. This represented a 19.2% increase from 1990.

The regional planning agencies project that the overall population of the communities within the Middle Delaware River study area will increase by 31.5 percent or 24,905 people by 2020. This increase is shown on Figure 2.

Population increases are projected to be most significant in the townships of Forks, Solebury, and Upper Makefield.

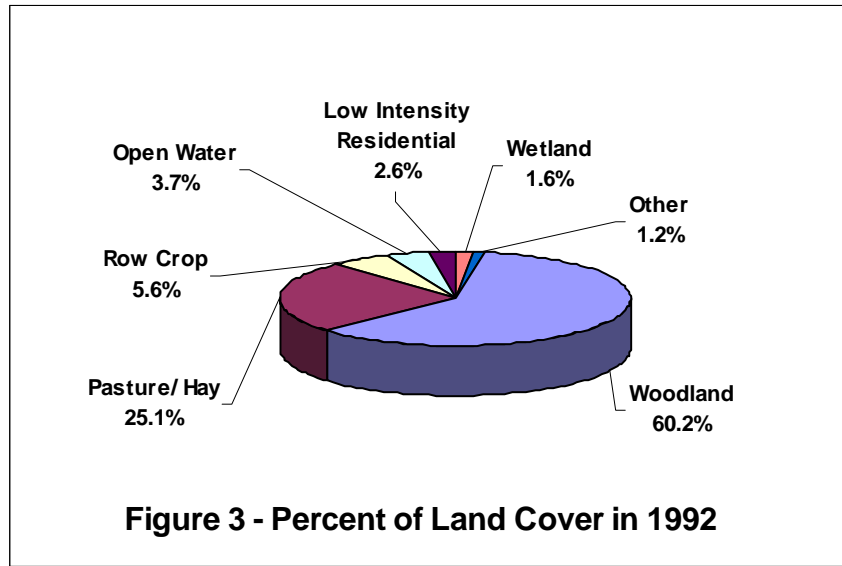


The increasing demand for development in the Middle Delaware River communities may place additional stress on the river's natural and cultural resources. However, most of the Middle Delaware River communities have adopted strong resource protection ordinances and

¹ Population and housing figures reflect totals for the municipalities, not just portion within study area.

much of the land within the study area possesses physical constraints (i.e. geology, soils, topography) that limit the intensity and type of use permitted.

Land Resources of the Middle Delaware



According to 1992 land cover information developed by the United States Geological Survey (USGS), over 60 percent (60.2% or 40,356 acres) of the Middle Delaware River study area was classified as woodlands/forest. Agricultural lands comprised the second largest land cover category, representing about 31% of the total study area. The percent of land cover within the Middle Delaware is illustrated in Figure 3.

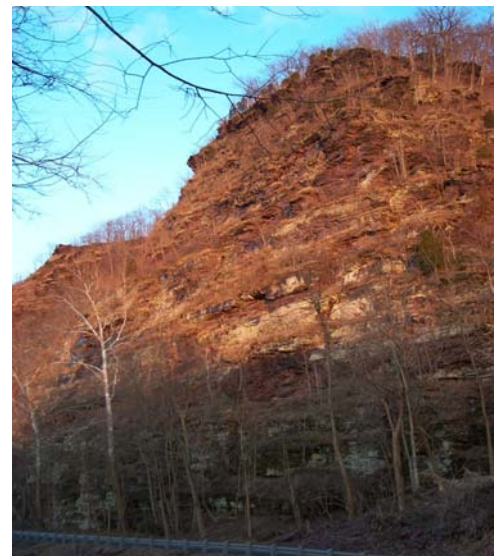
Woodlands/Forests

Woodlands and forests provide numerous important functions in nature such as providing shelter for wildlife, and helping reduce erosion and sedimentation in the area's streams. The vegetative cover softens the impact of falling rain, facilitates groundwater recharge, and reduces the volume and rate of runoff. Woodlands also play a role in filtering air pollutants and in moderating microclimates.

Geology and Topography

The geology of the study area is extremely varied and directly affects land use and environmental conditions. Geologic data also aids in locating sources of quality groundwater as well as defining areas where groundwater can be stored and re-used. The majority of the study area is characterized by the undulating valleys and hills of the Triassic Lowland section of the Piedmont Province. The predominant geologic formations of the study area include the Brunswick (47.7%), Lockatong (10.3%), Allentown (8.6%), Diabase (8.3%), and Stockton (8.1%) Formations.

The study area contains a number of special geologic sites such as Hexenkopf Rock, Monroe Border Fault, Nockamixon Cliffs, Ringing Rocks, Bowman's Hill, and



Nockamixon Cliffs

Jericho Mountain. The Pennsylvania Geological Survey has designated two of these sites as Outstanding Scenic Geologic Features of Pennsylvania: Ringing Rocks in Bridgeton Township, and Nockamixon Cliffs in Nockamixon Township. The U.S. Department of the Interior has designated the Monroe Border Fault in Durham Township as a National Natural Landmark. Portions of two major carbonate geologic formations are found within the study area, located in Durham Valley and in Buckingham Valley.

Soils

Soils are an integral and vital part of our environment. The differences in soil properties determine different management techniques, and exhibit different suitability characteristics when used for agriculture, forestry, sewage disposal, development, and other purposes.

Soils are classified into four categories (A, B, C, and D) based upon the rate at which water enters and moves through them. “A” soils have properties that allow for rapid infiltration, while “D” soils have properties that allow for very slow infiltration. The study area is composed primarily of hydrologic soil groups B and C soils. Soils in the Triassic Lowland Section of the Piedmont are generally silt loams, well drained, and located on sloping land. The hydrologic soil groups are important in determining areas of aquifer recharge and in calculating an area’s potential storm water runoff rate.

Prime Agriculture Soils

Prime agricultural soils are abundant in the Middle Delaware River study area. These soils are typically found in the stream valleys and within the lands underlain by limestone. Prime agricultural land is generally more productive than other land under the same management practices.

Ironically, prime soils are not only ideal for farmland but, they are also the most easily and least costly soils to develop. The number of farms and the amount of acreage devoted to agriculture has been declining.

However, many of the study area municipalities participate in agricultural preservation programs and regulate development on important farmland soils.



Stoudt's Valley, Williams Township

Soils Suitable for On-Lot Disposal Systems

Soils conditions are one of the most important elements in site evaluation and system design for on-lot wastewater systems. A large proportion of the study area soils exhibit properties that limit the use of conventional on-lot disposal systems. This suggests that communities should monitor existing systems and educate residents on the benefits of regular inspection and maintenance of their individual systems. For new development, alternative methods of wastewater treatment and disposal such as drip irrigation or evapotranspiration should be investigated and encouraged to best meet the restrictions of underlying soil characteristics.

Water Resources

Watercourses and Floodplains

Floodplains are areas that adjoin watercourses and are subject to the 100-year recurrence interval flood. Floodplains serve as ideal areas for managed aesthetic and recreational activities. Floodplain areas, especially along the Delaware River, often contain resources such as historic heritage and archaeological sites. The natural function of watercourses and floodplains is to accommodate floodwater. The natural vegetation supported by floodplains helps trap sediment from upland surface runoff, stabilizes stream banks for erosion control, and provides shelter for wildlife and proper stream conditions for aquatic life. Due to their unique characteristics, ecological significance, and susceptibility for adverse impacts, development within floodplains and floodplain soils is prohibited or strictly controlled by the municipalities within the Middle Delaware.

Wetlands

Wetlands are undrained, saturated soils which support wetland vegetation, where the water table is at or near the surface, or where shallow water covers the area due to permanent or seasonal inundation of surface or groundwater.

Wetlands play a key role in maintaining and improving water quality by filtering out sediments and transforming nutrients such as nitrogen and phosphorus. They can also perform flood control and storm water management functions by trapping and storing water during storms and floods. Finally, wetlands are important habitats. Many threatened or endangered plants and animals depend on wetland areas for survival.

At the local level, wetland areas are protected through the use of wetland protection ordinances and wetland buffer zone ordinances. Most municipalities within the study area prohibit development in wetland areas. In addition, many regulate the intensity of development in wetland buffer areas.

Riparian Buffer Areas

Riparian buffers are the areas of vegetation that grow along stream banks. Riparian buffers serve as natural filters of storm water and help to stabilize stream banks and reduce erosion. The plant material helps hold the soils in place and removes sediment, nutrients and pollutants before they reach the water. The velocity of storm water is reduced and some groundwater recharge takes place in the riparian zone. Shade from the trees cools the water, which increases oxygen in the water and supports aquatic life. The vegetation provides wildlife habitat. Many study area municipalities have adopted riparian buffer ordinances to protect these areas from disturbance.

Water Quality

Pennsylvania sets forth water quality standards for surface waters of the Commonwealth. These standards are important indicators of the biological health of the waterway as well as its recreational potential and aquatic life diversity. The standards are based upon water uses, which are to be protected and considered by the Pennsylvania Department of Environmental Protection (PA DEP) in its regulation of discharges such as those from wastewater treatment plants or industry.



Delaware River from Nockamixon Cliffs

As shown on Table 1, the majority of the streams in the study area have Trout

Stocking or TSF designations. This requires maintenance of stocked trout, and maintenance and propagation of fish species, flora, and fauna that are indigenous to a warm water habit. There are two special protection designations: High Quality (HQ) waters and Exceptional Value (EV) waters. Within the study area, Aquetong and Cuttalossa Creeks and Frys Run have been designated as HQ waters. A petition to re-designate Smithtown Creek to EV is still pending with PA DEP.

The PA DEP is required by the Federal Clean Water Act to list stream segments in the state that are not meeting their designated use. This list is commonly referred to as the 303(d) list. According to the PA DEP's Watershed Restoration Action Strategy (WRAS), a small, unnamed tributary to Houghs Creek in Upper Makefield Township is considered impaired, based on the 2001 assessment results. This is the only stream within the study area to be included in the 303(d) list for 2001. All other assessed streams and tributaries within the study area attained water quality standards.

Table 1– Water Quality Designations of Named Streams and Tributaries in Middle Delaware River Study Area		
Name of Stream or Tributary	Location	Chapter 93 Designation
Frys Run (a.k.a. Frya Run)	Williams Township	High Quality Waters
Rodges Run	Durham Township	Trout Stocked Fishery
Gallows Run	Nockamixon Township	Cold Water Fishery (CWF)
Wild Cat Hollow Run (a.k.a. Narrows Run)	Bridgeton Township	Trout Stocked Fishery
Falls Creek	Bridgeton Township	Trout Stocked Fishery
High Falls Creek	Bridgeton Township	Trout Stocked Fishery
Mine Spring Creek	Bridgeton Township	Trout Stocked Fishery
Swamp Creek	Tinicum Township	Trout Stocked Fishery
Smithtown Creek	Tinicum Township	Trout Stocked Fishery
Hickory Creek	Plumstead Township	Trout Stocked Fishery
Cuttaloosa Creek	Solebury Township	High Quality Waters, CWF
Primrose Creek	Solebury Township	Trout Stocked Fishery
Rabbit Run	Solebury Township	Trout Stocked Fishery
Aquetong Creek	Solebury Township	High Quality Waters, CWF
Dark Hollow Run	Solebury Township & New Hope Borough	Trout Stocked Fishery
Pidcock Creek	Solebury & Buckingham Townships	Warm Water Fishery
Jericho Creek	Upper Makefield & Wrightstown Townships	Warm Water Fishery
Houghs Creek	Upper Makefield	Warm Water Fishery
Dyers Creek	Upper & Lower Makefield Townships	Warm Water Fishery

Sources: 25 Pa. Code Chapter 93. Bucks County Planning Commission, 1982. Delaware River Corridor Study.

Point and Non-point Sources of Pollution

Point sources of water pollution are specific discharges that are traceable to distinct sources (pipe, ditch, etc.), such as from wastewater treatment plants or industry. Non-point source pollution does not come from a distinct discharge source, but results from contaminants that are carried to watercourses in storm water runoff. Point sources must be permitted under National Pollutant Discharge Elimination System program or NPDES and meet varying degrees of treatment, based on point of discharge. The regulation of non-point source pollution has been a major topic of concern and regulatory programs have gradually shifted from point source to non-point source control as a way to address water quality on a watershed basis.

One of the more effective ways to mitigate the problems of non-point source pollution is through local ordinances, which require storm water management and protection of stream buffers and other environmentally sensitive areas. Most of the study area municipalities have enacted storm water management standards either through participation in the state's storm water management planning program or individually through zoning and subdivision requirements. These standards are being updated to mandate water quality measures in addition to managing the volume of runoff.

Water Supply

Surface Water Resources

The Delaware River is a major source of surface water supply for the city of Easton and its surrounding municipalities. Another major withdrawal area within the Middle Delaware River study area is at Point Pleasant. Both Philadelphia Electric Company (PECO) and Forest Park Water Treatment Plant utilize water drawn from the Delaware for potable water supply and electric power generation.

Groundwater Resources

The major source of water supply in the Middle Delaware River communities is through groundwater accessed via individual wells. Thus, the management and protection of groundwater resources is a prime issue within the Middle Delaware River communities and has been addressed in a variety of studies. Groundwater is stored in the openings, pores, and cracks in rock formations. Within the study area, the Stockton Formation tends to be a good source of groundwater, while the Brunswick formation tends to be a fair source. The Allentown Formation is a carbonate formation, which generally provides good storage for groundwater. Locketong and Diabase formations are generally poor storage areas for groundwater. The planning, monitoring, and permitting of groundwater and surface water withdrawals is regulated by the Delaware River Basin Commission.

Biological Resources

Significant Wildlife and Natural Areas

According to the Natural Areas Inventories for both Bucks and Northampton Counties, the study area contains 34 sites of significance. Although all sites listed in the inventories contain natural resources worthy of protection, they are prioritized based on individual characteristics. Priority 1 sites, for example, are sites of state and countywide significance based on the uniqueness or exceptionally high quality of the natural features they encompass. Three Priority 1 sites are found in the Middle Delaware River study area:

- Nockamixon Cliffs – Nockamixon Township
- Rapp Creek (Upper Portion) – Nockamixon and Bridgeton Townships
- Braided Channel Islands - Tinicum Township

Vegetation/Critical Habitat

The Middle Delaware River study area includes a variety of vegetation resulting from the differences in elevation, climate, physiography, geology, hydrology, and land use. Vegetation along the river provides valuable habitat for birds and other animals and shade for fish in the river.

The Lower Delaware River National Wild and Scenic Study reported a number of dominant tree species along the river corridor including: black, gray, river and yellow birch; red and sugar maple; red oak; white ash; large-toothed and trembling aspen; tulip tree; beech; black locust; walnut, and black cherry; sycamore; and hemlock. Shrubs include willow, spirea,

silky dogwood, and alder. Woody species above the floodplain include spicebush, blueberry, huckleberry rhododendron, mountain maple, staghorn sumac, sweet fern, and witch hazel. Some areas within the Middle Delaware River study area contain special vegetation features including rare plant species, unique or unusual floral habitats, or outstanding individual species. The National Wild and Scenic Report identified several “critical habitats” present within the Middle Delaware River study area:

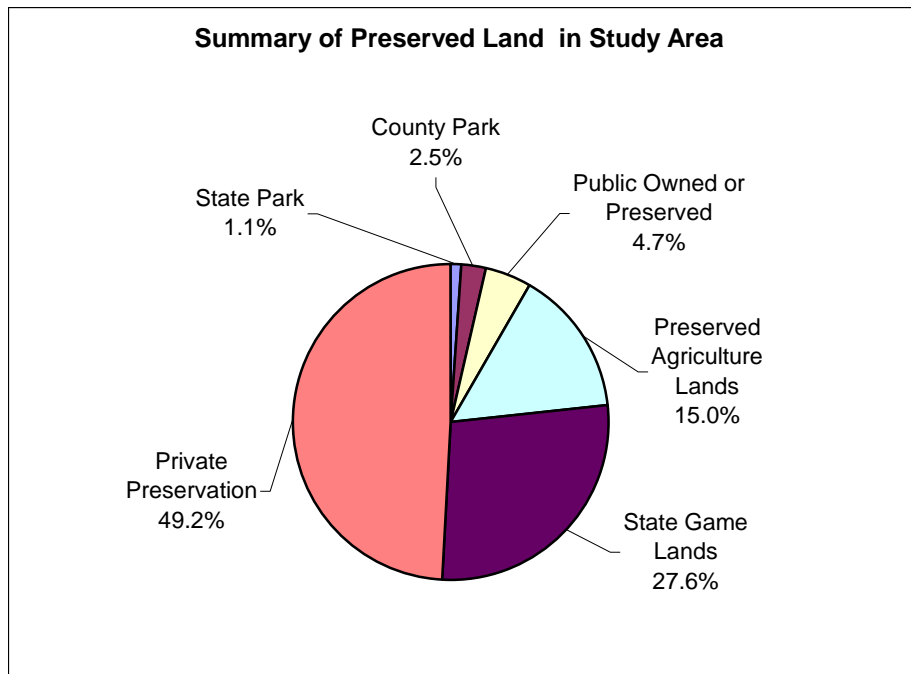
- Fry’s Run
- Hendrick Island
- Mariton Wildlife Sanctuary
- Marshall Island
- Nockamixon Cliffs
- Scudders Falls Islands



Fry’s Run- Williams Township

Open Space/Preserved Land

Open space preservation is a basic tool for preserving the outstanding resources in the study area. Maintaining natural open space is critical to water quality and protects vital habitat areas for rare and endangered plant and animal species. Agricultural resources are also an important component of open space. Properly managed agriculture lands preserve many natural and cultural values such as rural character, prime farmland soils, and scenic landscapes.



About 24% (16,185 acres) of the total study area lands are in some form of preservation. Lands privately protected represent the highest percentage of preserved land in the study area. Currently 7,957 acres or 11.8% of the study area lands are privately preserved, representing 49.2 % of the total preserved land in the study area.

Cultural Resources

Recreation and Parkland

Recreational resources of the Middle Delaware River study area are widespread and diverse. The study area lies within the Lower Delaware National Wild and Scenic River system and includes the Delaware and Lehigh National Heritage Corridor and State Heritage Park. Private recreational attractions include canoeing, kayaking, floating down the river in inner tubes, and camping. The Delaware and Lehigh Canal National Heritage Corridor and the canal towpath provide great recreational and cultural opportunities for visitors and residents.



Washington Crossing State Park

The river presents many options for water related activities, such as fishing, swimming, boating, and bird-watching. The area is located along the Atlantic Flyway, one of four major waterfowl migratory routes in the United States. Bald Eagles use the river's shoreline and islands for winter habitat and the state endangered Osprey are making a comeback.



Delaware Canal State Park

County and State Parks In Middle Delaware River Study Area

- Frost Hollow Overlook
- Wy-Hit-Tuk
- Fry's Run
- Tincum County Park
- Prahls Island Group
- Ringing Rocks
- Hal H. Clark
- Washington Crossing State Park
- Delaware Canal State Park

Historic Resources

The historic resources of the study area are significant and include Native American archeological sites from the Lenni-Lenape Indians to structures from the colonial and revolutionary periods. The study area includes 49 properties and/or districts that are listed on, or determined eligible for listing on the National Register of Historic Places, including many villages and towns.

Villages represent an important part of the county's culture and heritage, and their preservation has become more important as continued population and housing growth impact village land use patterns.



Village of Lumberville, Solebury Township

Villages and Towns of the Middle Delaware River Study Area with Historic Districts*

- City of Easton
- New Hope
- Point Pleasant – Plumstead and Tincum Townships
- Aquetong, Centre Bridge, Lumberville and Phillips Mill – Solebury Township
- Uhlerstown – Tincum Township
- Brownsburg, and Dolington – Upper Makefield Township

* Districts listed or determined eligible for listing on the National Register of Historic

SUMMARY

The Middle Delaware River study area contains a wide range of significant natural and cultural, resources. These resources contribute to the quality of life for residents of the area and the quality of experience of the visitor to the area. Farmland, woodlands, stream valleys, hilltops, historic places, and parkland are some of the resources that are visually

attractive, have important ecological functions, and provide a sense of our cultural heritage. As with any asset, these resources must be preserved, maintained, nurtured, and enhanced. There are both regulatory and non-regulatory methods that the federal, state and local governments may employ to protect these resources. Most importantly, decisions made by property owners will determine what the long-term qualities of the natural and built environments shall be.

Management Options and Action Plan

Goals and Objectives

The Planning Advisory Committee (PAC) undertook an extensive goals preparation process to identify critical matters that might be addressed through the planning process and the funding opportunities that would follow. The list of goals and objectives developed by the PAC reflects the diversity and breadth of the members' interests as well as the size, shape and diversity of the study area. Using a ballot process, the PAC identified the objective under each of the ten stated goals that was thought to have the highest priority for implementation, based on three criteria:

1. **Importance.** A project that would maintain or enhance the quality of life within the corridor.
2. **Ability to Implement.** A project that has the practical possibility of being achieved.
3. **Time Frame.** A project that could either be completed in the five-year period or, for on-going activities, that the mechanisms or procedures would be established within that five-year period for their continued use.

These top priority objectives are highlighted in bold below along with other objectives that the committee identified as important. It should be understood that if a funding opportunity arose, if any issue became critical, or if a municipality, organization or other group would assume the initiative to implement an activity or a project not identified as a top priority, that opportunity and effort would be supported, encouraged and, hopefully, pursued.

Goal 1: Natural Resources – Protect the people's right to clean air, pure water, and other natural resources of the environment, and to guarantee a quality environment to the present and future residents and visitors of the corridor.

Objectives:

1. **Require the conservation of groundwater and surface water resources through proper sewage facilities planning, water resources planning, effective erosion control measures, storm water management techniques that recharge groundwater resources, enforcement of natural resource protection standards and sound development standards, and promotion of high quality site design.**
2. Protect specific natural features of the landscape through municipal plans and land use ordinances.

3. Investigate guidelines related to the carrying capacities of critical natural resources.
4. Require the evaluation of environmental impacts for major development or zoning proposals.
5. Develop standard assessment criteria, organize the watershed groups and undertake visual assessments along all watercourses within the area.
6. Work with state and county agencies to require proper collection, transmission, treatment and disposal of wastewater.
7. Preserve woodlands and provide connecting corridors where they do not exist.
8. Identify and promote land use practices to reduce flood impacts downstream. Acquire flood-prone properties that could be put to beneficial community uses.

Goal 2: Agricultural Resources – Ensure that farmland remains an integral part of the landscape within the corridor.

Objectives:

1. **Incorporate zoning techniques that protect agricultural soils and provide options to the landowners.**
2. Encourage municipalities to recognize farmland resources and actively farmed areas in municipal planning.
3. Encourage participation in the Agricultural Security Districts and support landowners who are members of these districts.
4. Encourage farmland protection through the purchase of agricultural easements in areas recommended for farmland preservation.

Goal 3: Historical and Cultural Resources – Ensure the preservation of the corridor's historic and cultural resources by accommodating future growth in a manner that recognizes, protects and incorporates structures and sites of historic, architectural, archeological and cultural significance.

Objectives:

1. **Promote the unique culture of towns and villages that are oriented to the river and the canal. Preserve the character and scale of the towns and villages through community planning and regulatory measures.**
2. Promote the historic and current resources of the arts community and encourage growth of diverse artistic activities through community and private events.

3. Protect the historic buildings, sites and landscapes through community planning, incentives and regulations, and the pursuit of supportive funding.
4. Preserve and enhance villages through the use of planning guidelines developed by the Bucks County Planning Commission and others, and enact ordinance standards that implement those techniques.
5. Identify and map view sheds and scenic vistas and protect them through planning and regulatory measures such as conservation based development, cluster housing, transfer of development rights and the purchase of conservation easements.
6. Preserve and maintain the diversity of the corridor's historic resources, which include buildings, sites, views and vistas, tree stands, hedgerows, bridges, water bodies, rural roads, and Native American sites.
7. Reconstruct a pedestrian bridge on the foundations of the Point Pleasant-Byram Bridge.
8. Identify and protect Native American sites and trails.
9. Support the reconstruction of pedestrian bridges and the viaduct over the Tohickon Creek so that it is passable by boats.

Goal 4: Wildlife Resources Goal – Protect the wildlife that inhabits and uses the Delaware River and the land along the river and its tributaries.

Objectives:

1. **Identify critical wildlife habitats and corridors. Enact measures for their protection.**
2. Protect the aquatic habitats of local fish populations and encourage the opportunities for fishing, a part of the local heritage.
3. Permanently preserve sites identified in the Natural Area Inventories of Bucks and Northampton counties.
4. Encourage municipalities to enact riparian buffer standards.
5. Restore and preserve riparian buffers to provide wildlife habitat.
6. Promote the use of native plant species and work to eliminate invasive species.
7. Attempt to address the sensitive issues related to the significant growth in the populations of deer, Canada geese and other problematic wildlife species.

Goal 5: Recreational Resources Goal – Foster the provision of active and passive recreation opportunities for the use and enjoyment of current and future residents and visitors of the corridor.

Objectives:

1. Ensure that recreational areas and facilities are compatible with the protection of natural resources. Develop guidelines that identify the carrying capacity of the landscape.

2. Assess the needs for recreation facilities and programs. Undertake this evaluation on a municipal basis. Pursue grant funding for this assessment. Identify major recreation facilities or attractions beyond the geographic boundaries of the study area.

3. Undertake and implement greenway and trail planning.

4. Encourage municipalities to prepare and implement park and recreation plans.

5. Encourage cooperation among the municipalities to avoid unnecessary duplication of recreational facilities and programs. Promote a broad and comprehensive view of these facilities to include meeting places and libraries.

6. Include open space, recreation and bikeway provisions in municipal land development ordinances. During the development review process, encourage or require developers to incorporate trails and open space linkages.

7. Identify and pursue funding to enhance and protect the Delaware Canal State Park.

8. Identify and provide river access points in suitable locations.

9. Identify ways to reduce or eliminate the impact of motorized vehicles, including jet skis and four-wheel vehicles, on the river, wildlife, natural environment, area residents and on other recreation users. Prohibit off-road vehicles in creeks.

10. Foster tourism at locations (such as Bowman's Hill Wildflower Preserve, Washington Crossing State Park and the county parks) that are equipped to handle sizeable numbers of visitors. Discourage heavy use of locations that lack parking and other infrastructure to accommodate many users.

11. Oppose any proposal for riverboat gambling within this section of the Delaware River.

Goal 6: Sustainable Economic Development – Encourage economic activities that are based on the unique natural, historic, cultural, and recreational resources of the corridor, and ensure that these activities remain compatible with and enhance the resources.

Objectives:

1. Through municipal ordinances, avoid the development of incompatible office, industrial and “big-box” commercial uses in the rural areas and the villages of the corridor. In the more urban communities, encourage the development or redevelopment of nonresidential uses that support the economies and residents of these centers.
2. Seek to provide and to maintain roadways, bridges and other improvements that are compatible with the protection of the natural, historic and cultural resources.
3. Encourage the reuse and redevelopment of brownfields for appropriate, nonpolluting uses and activities.
4. Support agriculture as a sustainable business.
5. Investigate the establishment of a “Corridor Market Towns Initiative” which blends conservation and development efforts to sustain local economies and focuses on the heritage and cultural resources of the corridor’s towns, villages and city.

Goal 7: Education and Conservation Participation – Promote and enhance the understanding of the historic, cultural, economic, and natural resources of the corridor.

Objectives:

1. Identify target audiences for educational efforts to achieve the plan’s priority goals and objectives.
2. Work with the school districts to coordinate, in partnership with nonprofit organizations, curricula on the river’s resources.
3. Identify or provide access to the river for school groups.
4. Provide information, such as overlay maps and information sheets, for the use of key decision makers.
5. Hold VIP tours for corporate officers, municipal officials, legislators and others to stress the importance of the corridor’s historic, cultural, economic and natural resources.
6. Promote a “sense of place” among the corridor’s residents that stresses the unique characteristics and qualities of their home environment.
7. Promote pride in the Delaware River’s wild and scenic designation.
8. Institute an “Adopt a Stretch” clean-up program for sections along the river and other watercourses in the area.

9. Work with PENNDOT to phase-out the roadside spraying practices.
10. Distribute (if necessary, prepare) information on the elimination of invasive plant species.
11. Distribute (if necessary, prepare) information on practices that will help deal with negative impacts of wildlife (e.g. discontinuance of deer feeding).
12. Distribute (if necessary, prepare) information on proper disposal of solid waste.

Goal 8: *Water Quality/Water Quantity* – Maintain and enhance the water quality of the river and its tributaries.

Objectives:

1. **Ensure all municipalities to protect wetlands, wetland margins and groundwater recharge areas through their ordinances.**
2. Encourage all water quality and quantity planning efforts to be undertaken on a regional, watershed basis.
3. Restore and preserve riparian buffers.
4. Use the Delaware River Source Water Assessment for the identification of water quality deficits when that study is completed.
5. Provide maintenance and problem solving information to property owners related to on-site septic systems.
6. Develop plans to address existing storm water management problems that have been identified within the area.
7. Under recent amendments to the PA MPC, develop regulations for logging and forestry activities, including storm water and water quality standards and procedures.
8. Review the impervious surface provisions of the municipal ordinances and provide recommendations for revisions where warranted.
9. Work to develop Total Maximum Daily Load (TMDL) standards.
10. Seek funding for existing and new water quality monitoring systems.
11. Promote education on point and non-point sources of pollution. Sponsor training sessions on stream protection techniques.
12. Organize river clean-up events.

13. Identify and expedite the clean-up of polluted sites located within the corridor.
14. Research, distribute and implement model ordinances on techniques for the protection of water quality and quantities.
15. Share information among watershed groups within the corridor. Sponsor a watershed forum that will facilitate the discussion of common objectives and sharing of techniques.

Goal 9: Land Management – Ensure that land use planning and regulation by local governments and the land use practices of the property owners maintain and enhance the unique natural, historic, cultural, aesthetic and recreational resources of corridor.

Objectives:

1. **Evaluate alternatives to low density, sprawl forms of residential development. Research, distribute and implement model ordinances for consideration by the municipalities.**
2. Encourage multi-municipal planning among the municipalities. Investigate funding and other incentives.
3. Sponsor training sessions on bioregional approaches to conservation.
4. Sponsor training sessions on the use of conservation easements for open space protection.
5. Prepare a summary of planning and zoning techniques, including Bucks County Planning Commission's Performance Zoning and Tinicum Township's Overlay Zoning, as a source of information for municipal officials.

Goal 10: Implementation Resources – Establish a structure, mechanism or information system for continued cooperation and secure funding for projects and programs to maintain and enhance the unique natural, historic, cultural, and recreational resources of corridor.

Objectives:

1. **Identify leadership and establish a structure or information system to facilitate the implementation of the river conservation plan.**
2. Provide copies of the river conservation management plan to each municipality and the legislators whose districts encompass the corridor along with a summary of funding needs.
3. Promote public support for conservation funding.

4. Sponsor public information sessions on municipal funding initiatives for open space and watershed initiatives.
5. Build the capacity (volunteers, staff, resources, etc.) to implement the river conservation plan.
6. Focus on the top priorities among all the goals and objectives included in this plan and seek to implement them within the designated time frames.
7. One year after the adoption and approval of the river conservation plan, hold a meeting of the advisory committee and other interested parties to evaluate progress on the implementation projects. After five years, meet to evaluate progress on the priority projects and activities.

Management Options Table

On the following pages, the list of goals and objectives has been expanded to identify general tasks, primary partners, supporting partners and projected implementation timing. The table identifies the roles each partner can play in planning and implementing conservation actions. Implementation timing has been generally determined based on the complexity and funding requirements of the recommended actions. As with any planning effort, the actual timing of a proposed action can be affected by other variables such as state or national economic policies, political will, and unrelated projects requiring limited municipal resources.

Management Options Table				
<i>Issues and Concerns</i>	<i>Conservation Actions</i>	<i>Primary Partners</i>	<i>Supporting Partners</i>	<i>Projected Implementation</i>
1. Natural Resource Goal - Conservation of Groundwater Resources				
<i>Sewage Facilities Planning</i>	Review and Update Act 537 plans for consistency with local land use planning decisions and natural resource protection goals. Emphasize techniques that provide groundwater recharge. Encourage land application as an alternative to stream discharge.	Municipalities – review individual plans and update if necessary DEP: technical assistance, funding through 537 process. BCHD: Technical Assistance	PSCES: technical assistance for on-lot septic users BCPC/LVPC: technical assistance, sample ordinances for on-lot maintenance and repair.	1-2 years
	Work with state and county agencies to require proper collection, transmission, treatment and disposal of wastewater. Provide on-lot disposal system (OLDS) education to residents. Establish OLDS maintenance ordinances.	Municipalities/Authorities – review current systems to identify concerns Update OLDS education materials, adopt OLDS maintenance ordinances. BCHD/SEO – identify problem areas and determine remediation actions. Watershed Groups – education and outreach.	PSCES: technical assistance for on-site treatment system users DEP – technical assistance	1-2 years
<i>Water Resources Planning</i>	Protect headwaters areas and subwatersheds. Conduct source water assessments. Evaluate areas appropriate for recharge techniques.	Municipalities/EACs – organization and Planning. DCNR/DEP: technical assistance, funding Watershed Groups – volunteer efforts, public education	BCPC/LVPC – technical assistance DRBC – technical assistance Consultants – planning studies, technical assistance	2-5 years
<i>Erosion and Sedimentation Control</i>	Establish recommended BMPs to meet at least minimum criteria or better for effective soil erosion and sediment control	Municipalities – support adoption of required BMPs CCD – determine most effective BMPs, technical assistance	Watershed groups – provide innovative ideas and strategic sites needing attention Scout troops – volunteers School groups – volunteers	1-2 Years

Management Options Table				
<i>Issues and Concerns</i>	<i>Conservation Actions</i>	<i>Primary Partners</i>	<i>Supporting Partners</i>	<i>Projected Implementation</i>
	Enforce erosion and sedimentation plans during new construction	Municipalities – clearly document new construction activities CCD – plan review, provide on-site inspections, enforcement	DRG – technical assistance DRK – technical assistance	Ongoing
	Adopt mandatory controls in municipal ordinances.	Municipalities – adopt strict controls for new construction HC – technical assistance	BCPC/LVPC – technical assistance DRG – technical assistance	2-5 Years
Storm water Management	Update infiltration/water quality requirements for new development. Work closely with BCPC and LVPC on Act 167 updates.	Municipalities – adopt strict controls through local ordinances to achieve greater management DEP - technical assistance BCPC/LVPC - planning/technical assistance	HC – design Engineers – design, technical assistance Landscape architects – design, technical assistance Homebuilders association	2-5 Years
	Implement incentive program for volunteer homeowner BMP implementation to encourage recharge.	Municipalities – seek funding to implement a cost-share program Watershed groups – promote program and educate	DEP/DCNR – funding Private landowners – implement program DRG – technical assistance DRK – technical assistance	Ongoing
	Retrofit existing BMPs in existing developments, explore infiltration and filtering practices	NRCS - design/technical assistance CCD - technical assistance Homeowners associations – implement strategies through incentive program Private landowners – implement strategies through incentive program	Engineers – design, technical assistance Landscape architects – design, technical assistance	5-10 Years
2. Agricultural Resource Protection				
Protect Agricultural Soils	Review existing agricultural zoning ordinances to enhance protection of important farmland soils based on recommendations of this plan.	Municipalities – review current ordinances HC – technical assistance BCPC – technical assistance	DCNR – funding Consultants – technical assistance CRP – technical assistance NRCS – soils mapping information	1-2 years

Management Options Table				
<i>Issues and Concerns</i>	<i>Conservation Actions</i>	<i>Primary Partners</i>	<i>Supporting Partners</i>	<i>Projected Implementation</i>
	Update or adopt zoning techniques to protect agricultural soils as recommended in this plan. (Class I soils: 80%, Class II soils: 75%, Class III soils: 70%)	Municipalities – review current ordinances NRCS – Soil mapping assistance HC – technical assistance	DCNR - funding BCPC/LVPC – model ordinances Consultants – technical assistance CRP – technical assistance PSCES – technical assistance	2-5 years
Encourage farmland protection.	Sponsor local tax initiatives to raise money for purchase of agricultural easements in all municipalities.	Municipalities/landowners – identify areas, public education County– technical assistance, land owner outreach Local conservancies and land trust Organizations – technical assistance	BCPC/LVPC – technical assistance CRP – technical assistance	ongoing
	Purchase agricultural easements in areas recommended for agricultural preservation.	Municipalities/landowners – identify areas, public education HC – technical assistance	BCPC/LVPC – technical assistance CRP – technical assistance	Ongoing
Support agriculture as sustainable business	Recognize farmland resources and areas of farm activities in municipal planning.	Municipalities – initiate studies	CRP – technical assistance DCNR – funding	1-3 years
Community supported agriculture	Develop “Buy local” programs.	PSCES – technical assistance Local farmers – product	CRP – technical assistance BCPC/LVPC –technical assistance Local conservancies, land trusts – technical assistance, funding opportunities.	1-3 years
3. Protection of Historical and Cultural Resources				
Historic /Archaeological Resource Preservation	Promote river towns and villages through planning and regulatory measures	Municipalities/historic commission – initiate studies	PHMC/HC –technical assistance and funding Cultural resource consultants – technical assistance FDC, LDRMC – regional promotion, planning	2-5 years

Management Options Table				
<i>Issues and Concerns</i>	<i>Conservation Actions</i>	<i>Primary Partners</i>	<i>Supporting Partners</i>	<i>Projected Implementation</i>
	Identify and protect Native American sites of significance (trails, encampments, ritualistic sites, and villages within study area.)	Municipalities/historic commissions – initiate studies	PHMC/HC – technical assistance and funding Resource Consultants – archaeological	2-5 years
	Adopt (or update) historic preservation or historic district ordinances.	Municipalities/planning commission HC – technical assistance	BCPC/LVPC – model ordinances	2-5 years
	Support nomination of historic structures and districts	Municipalities – pass resolutions supporting nominations Non-profit organizations – prepare nominations HC – technical assistance	Private landowners – support local efforts Historic societies – provide local knowledge	Ongoing
	Promote historic areas through tourism initiatives	PA Tourism and Promotion Chamber of commerce – provide local funding and promotion County tourism promotion – regional distribution	Municipalities – promote resources Historic societies – provide local knowledge FDC, LDRMC – regional promotion	1-2 Years
	Link trails of BHWP to those of the Delaware Canal to promote New Hope area as destination site for natural, and cultural resource aspects of region.	BHWP/D&L/PHMC and municipalities – initiate planning studies, coordination, funding. Local Chamber of commerce – provide local funding and promotion. County tourism promotion – regional distribution		2-5 years
	Promote adaptive reuse of historic structures	Municipalities – flexibility in zoning and plan reviews Historic societies – promote preservation of structures Non-profit organizations – develop reuse alternatives	HC – technical assistance	2-5 Years

Management Options Table				
<i>Issues and Concerns</i>	<i>Conservation Actions</i>	<i>Primary Partners</i>	<i>Supporting Partners</i>	<i>Projected Implementation</i>
	Reconstruct a pedestrian bridge on the foundations of the Point Pleasant-Byram NJ Bridge for possible trail link.	Tinicum and Plumstead Townships – seek and raise funding, select consultant Historic consultant – design	PHMC, DCNR – Technical assistance and funding.	2-5 years
	Establish Historic Architectural Review Boards (HARBs) where absent.	Municipalities – appoint review boards HC – technical assistance	BC – technical assistance	1-2 years
	Perform historic site surveys	Historic societies – provide local knowledge	HC – technical assistance Non-profit organizations – provide regional expertise	1-2 years
Preserve Scenic Views	Protect view sheds and corridors through planning and regulatory measures. Conduct viewshed assessments. Consider purchase of easements to protect views.	Municipalities/EACs – identify potential view sheds. Seek and raise funding for easement purchase. HC/land trusts – technical assistance, property-owner outreach/purchase and easement negotiation.	DCNR – funding Consultants – planning and technical assistance	2-5 years
4. Protection of Wildlife Resources				
<i>Identify critical habitats and corridors</i>	Review county priority sites and identify or update other areas. Provide species diversity assessments.	Municipalities/EAC – initiate planning studies Watershed groups - volunteer assessments, sponsor studies Ecologists – technical expertise HC/BHWP – technical Assistance	DCNR – funding	1-2 years
<i>Protect Natural Areas</i>	Enact measures to protect and preserve identified natural areas and habitats. Amend natural resource protection ordinances in accordance with recommended protection standards of this plan, where absent.	Municipalities – adopt/strengthen natural resource protection ordinances and standards. Seek or raise funding to purchase property or easements for protection Land trust organizations – assist in purchase/easement negotiations HC – technical assistance	DCNR – funding Counties – cost sharing Consultants – technical assistance	2-5 years

Management Options Table				
<i>Issues and Concerns</i>	<i>Conservation Actions</i>	<i>Primary Partners</i>	<i>Supporting Partners</i>	<i>Projected Implementation</i>
	Protect native plant communities throughout the study area. Projects may include repair and upgrade of Pidcock Creek Gates at BHWP.	BHWP – planning, sponsor study. BCPC/LVPC – technical assistance	DCNR – funding Consultants –technical assistance	1-2 years
Enforce Natural Resource Protection Standards	Review municipal ordinances and enforcement records with respect to landscape recommendations and use of native species. Develop model native plant list and offer to municipalities to reduce use of non-native species.	Municipalities/EAC/planning commissions – planning and organization BCPC/LVPC – technical assistance HC/BHWP – technical assistance	Consultants – develop or update ordinances. DCNR – funding	2-5 years
5. Protection of Recreational Resources				
<i>Greenway/Trail Enhancement and Development</i>	Upgrade and enhance existing trails and greenways throughout Middle Delaware Study Area.	Municipalities, EAC's – identification, planning, local support BHWP – planning	FDC, DRG, - planning, technical assistance, coordination BCPC/LVPC – technical assistance DCNR, NPS –funding	2-5 years
	Conduct trail feasibility studies including trail linking Pt. Pleasant, Lake Nockamixon, North Branch Neshaminy Creek through Landis Park, Peace Valley Park and Lake Galena. Investigate feasibility of trail from Pt. Pleasant to Byrum NJ. across timber frame foot bridge.	Municipalities, EAC's, Park and Recreation Commissions – identification, planning, local support Land Trusts: technical assistance, coordination, land acquisition assistance.	FDC, DRG, - planning, technical assistance, coordination BCPC/LVPC – technical assistance DCNR, NPS –funding	2-5 years

Management Options Table				
<i>Issues and Concerns</i>	<i>Conservation Actions</i>	<i>Primary Partners</i>	<i>Supporting Partners</i>	<i>Projected Implementation</i>
	Develop municipal greenway/trail plans compatible with natural resource protection goals. Coordinate with regional planning efforts.	Municipalities – initiate local studies and planning HC/conservancies – planning, technical assistance Landscape architects – planning, technical assistance DRG – planning, liaison to regional efforts	DCNR – funding NPS – technical assistance DRG, FDC, LDRMC – coordination, planning, data BCPC, LVPC, DVRPC – planning and coordination, technical assistance	1-2 years
	Develop regional trail network links.	County planning – initiate regional trail planning Non-profit organizations – provide vision for future trail connections NPS – planning, technical assistance DRG – planning, visioning	Local Residents LDRMC – regional outreach FDC/DRG – planning, technical assistance	5-10 years
	Implement trail projects	Municipalities – plan and organize construction HC – design, planning, land owner outreach DRG – planning, liaison to regional efforts	NPS – design, planning, funding BCDPR/LVPC – design, planning DCNR – funding Scout troops – volunteers School groups – volunteers	2-5 years
<i>Recreation Development Compatible with natural resource protection</i>	Develop 150-acre Giving Pond (Tinicum Quarry Site): <ul style="list-style-type: none"> • Improve public access to river and D&L trail • Construct environmental education and information center for visitors • Develop natural resource inventory 	Local Municipalities – initiate planning process, seek funding DCNR/DEP – funding Delaware Canal State Park – technical assistance, planning Watershed Associations – volunteers, planning, outreach events.	Ecologists –inventory of site Consultants – design, construction BCPC – technical assistance	2-5 years

Management Options Table				
<i>Issues and Concerns</i>	<i>Conservation Actions</i>	<i>Primary Partners</i>	<i>Supporting Partners</i>	<i>Projected Implementation</i>
	Identify and pursue funding to enhance and protect the Delaware Canal State Park.	Local Municipalities – initiate planning process, seek funding DCNR/DEP – funding Delaware Canal State Park – technical assistance, planning Watershed Associations – volunteers, planning, outreach events.	BCPC/LVPC – technical assistance	2-5 years
	Investigate feasibility for development of environmental education centers along canal, river and tributaries in study area such as Ingham Spring Site .	Local Municipalities –initiate planning process, seek funding Watershed Associations – technical assistance, outreach, planning BCPC, BCDPR – technical assistance	DCNR/DEP – technical assistance, funding Consultants – design and planning	2-5 years
	Support development of new active and passive recreation facilities within study area including Brownsburg Park in Upper Makefield Township.	Local Municipalities – initiate planning process, seek funding BCPC, LVPC – planning, technical assistance County Park Departments – planning, design and construction	DCNR – technical assistance, funding Consultants – design and planning	2-5 years
	Include open space, recreation and bikeway provisions in municipal land use ordinances.	Municipalities – revise ordinances HC – technical assistance	DCNR – funding BCPC/LVPC – model ordinance, technical assistance	1-2 years
<i>River Access</i>	Support river access studies	Municipalities – participate in regional planning effort NPS – technical assistance BCPC/LVPC – funding, planning, technical assistance Recreation interest groups – provide local knowledge DRG – regional planning, support and promotion	Private enterprise – provide public access where feasible DEP/DCNR – funding D&L Canal Commission, planning Delaware Canal State Park - planning FDC, LDRMC, DRG, DRK – planning PAF&BC – funding, technical assistance	1-2 years

Management Options Table				
<i>Issues and Concerns</i>	<i>Conservation Actions</i>	<i>Primary Partners</i>	<i>Supporting Partners</i>	<i>Projected Implementation</i>
	Assure coordination of river access facility construction with adjacent municipalities, County Dept. of Parks and Recreation, and state parks.	Municipalities – planning, acquisition and construction County parks departments – acquisition and construction State parks and PA FBC – coordination and planning	BC/LVDPR – technical assistance PAF&BC – technical assistance DCNR – funding Consultants – planning, design, technical assistance. FDC/LDRMC – coordination, planning	2-5 years
	Provide and support additional public river access sites and facilities, including the Delaware River Experience at Keller's Landing	Municipalities – acquisition and construction County parks – acquisition and construction Private landowners – allow access easements	BC/LVDPR – planning Consultants – design DCNR – funding PAF&BC – funding, design and construction	5-10 years
6. Sustainable Economic Development				
<i>Avoid incompatible non-residential uses in rural or village areas</i>	Revise ordinances to avoid incompatible office, industrial, and commercial uses.	Municipalities – initiate planning studies BCPC/LVPC – planning, technical assistance	DCNR – funding	2-5 years
	Participate in D& L Corridor Commission's economic initiatives and programs.	Municipalities – investigate feasibility	DCED & DCNR – planning – technical assistance & funding D&L Corridor Commission – technical assistance HC, PA Downtown Center – technical assistance	2-5 years
<i>Brownfields Development and Redevelopment</i>	Identify candidate sites for Brownfields redevelopment.	Municipalities – identify possible sites County Redevelopment Authorities – technical assistance, funding County Economic Development Agencies – technical assistance, funding.	PA DCED – funding, technical assistance PA DEP – technical assistance, funding PEC – technical assistance	2-5 years
	Develop plans to reuse or redevelop existing industrial sites and infrastructure for appropriate nonpolluting	Private enterprise – design and implement reuse plans County Redevelopment Authorities – technical assistance, funding	BCPC/LVPC – technical assistance Consultants – technical assistance DEP – funding	2-5 years

Management Options Table				
<i>Issues and Concerns</i>	<i>Conservation Actions</i>	<i>Primary Partners</i>	<i>Supporting Partners</i>	<i>Projected Implementation</i>
	uses and activities.	County Economic Development Agencies – technical assistance, funding.	DCED – technical assistance, funding PEC – technical assistance	
7. Conservation Education				
<i>Education of Public</i>	Raise public awareness and develop education materials on BMPs and watershed conservation targeting homeowners, property managers and public works employees	Municipalities/EACs – design and implement program Watershed groups/BHWP – promote program, distribute materials, provide local expertise Non-profit organizations – design program materials	NRCS – materials CCD – materials, technical assistance HC – technical assistance DRK, FDC, DRG – technical assistance PSCES – technical assistance	Ongoing
	Organize lecture series addressing watershed conservation strategies. Establish speaker's bureau to provide local and national expertise.	Municipalities/EACs – host Watershed groups – local experts Non-profit organizations – solicit regional experts HC, BHWP – Host lecture series and provide lecture coordination Continue Land Ethics Symposium	DRK, FDR, DRG – technical assistance	Ongoing
<i>Education of youth</i>	Work with local schools to include watershed conservation in the curriculum.	Municipalities/EACs – raise local awareness BCAS – curriculum Watershed groups – provide local knowledge	School Districts -curriculum Scouts School groups DEP/DCNR – funding	Ongoing
	Develop a children's environmental camp at BHWP to serve as an outdoor laboratory to study native species and their contribution for sound ecological landscaping and watershed protection.	BHWP – initiate study, design program materials Municipalities/EAC's – raise local awareness Watershed groups – promotion	School Districts – assist in curriculum HC and other conservation organizations – technical assistance DEP/DCNR – funding	2-5 years

Management Options Table				
<i>Issues and Concerns</i>	<i>Conservation Actions</i>	<i>Primary Partners</i>	<i>Supporting Partners</i>	<i>Projected Implementation</i>
	Support existing education programs such as the Delaware River Experience at Keller's Landing.	Watershed groups, local citizens – raise awareness	School Districts – assist in curriculum HC and other conservation organizations – technical assistance DEP/DCNR – funding	2-5 years
	Develop curriculum for school teachers that promotes the value of native species as an effective way to protect and preserve Middle Delaware River and its waterways. Target economically disadvantaged schools that might not have opportunity for on-site training.	Watershed groups –provide local expertise, volunteers School Districts – Planning, curriculum development BCAS, BHWP – curriculum development, volunteers, study sites.	NRCS/CCD – materials, technical assistance HC and other conservation organizations –technical assistance. DEP/DCNR –funding	2-5 years
	Institute an “Adopt a Stretch” program for sections along the river, and tributaries.	Watershed groups – provide local expertise	FDC, DRK – materials, technical assistance Scouts School groups	Ongoing
8. Protect Water Quality				
Non-Point Source Pollution	Educate local citizenry about impacts of non-point source pollution	Watershed groups – promote program, distribute information NRCS – materials CCD – provide expertise DRK and DRG with DRBC – non-point source pollution monitoring	CCD – materials, expertise PEC – expertise PSCES – technical assistance DEP - funding	1-2 years
	Undertake NPS assessment studies	Watershed groups – provide local knowledge Municipalities – adopt recommended strategies Consultants – technical assistance	CCD - technical assistance DEP – funding NRCS - technical assistance HC – technical assistance DRBC/DRK/DRG – technical assistance	2-5 years

Management Options Table				
<i>Issues and Concerns</i>	<i>Conservation Actions</i>	<i>Primary Partners</i>	<i>Supporting Partners</i>	<i>Projected Implementation</i>
	Implement model NPS projects	Municipalities/EACs – coordinate projects Watershed groups – provide local knowledge and projects Local conservancies/land trusts – plan and design demonstration projects Consultants – design, technical assistance	CCD- technical assistance NRCS - technical assistance Homeowners associations – implement projects Private landowners – implement projects Private enterprise – implement projects	2-5 years
<i>Stream Corridor Improvement/Restoration</i>	Initiate/review stream bank assessment studies. Verify with on-site “truthing”/site inspections.	Municipalities/EACs – planning and organization of areas HC – Provide county riparian buffer assessment information Watershed groups – planning, organization of volunteers, local knowledge	DCNR/DEP – technical assistance, funding	1-2 years
	Continue on-going stream restoration programs such as in Swamp Creek Watershed and Gallows Run..	HC – Provide county riparian buffer assessment information, assist in obtaining funding. Watershed groups/conservancies – planning, organization of volunteers	DCNR/DEP – technical assistance, funding DRK – Technical Assistance	ongoing
	Plant riparian buffers using native plantings where needed. Possible sites include (but not limited to) tributaries along Frys Run, Gallows Run, Primrose Creek, Pidcock Creek and Houghs and Creek	Municipalities/EACs – planning and organization Watershed groups – planning, organization and volunteers DEP/DCNR – funding, technical assistance DRG – planning and organization	NRCS - technical assistance BHWP - native plant selection and materials, technical assistance PEC - planning, coordination, education Scout troops – volunteers School groups – volunteers DEP, PA Stream Re-leaf – technical assistance	1-2 years
	Protect existing riparian buffers at 100% level as recommended in this plan.	Municipalities – adopt or update local riparian buffer ordinances, plan greenways Non-profit organizations – negotiate purchase or easement of properties	HC/local conservancies – protection strategies County - land management DCNR – funding DRG – protection strategies	2-5 years

Management Options Table				
<i>Issues and Concerns</i>	<i>Conservation Actions</i>	<i>Primary Partners</i>	<i>Supporting Partners</i>	<i>Projected Implementation</i>
		Homeowners associations – donate easements, manage riparian areas on common land Private landowners – manage riparian areas, donate easements		
	Educate adjacent property owners on managing stream corridor areas	Municipalities/EACs – initiate volunteer programs NRCS – programs, materials, public awareness Watershed groups – administer programs	PSCES – materials DCNR – funding HC/local conservancies – expertise	Ongoing
9. Land Management				
<i>Zoning Ordinances</i>	Review existing natural resource protection ordinances based on recommendations of this plan.	Municipalities – solicit reviews of current ordinances HC - technical assistance BCPC/LVPC - technical assistance	DCNR – funding Consultants – technical assistance	1-2 years
	Update applicable ordinances to implement watershed conservation to incorporate recommendations of this plan for floodplain and floodplain soils, watercourses, wetlands, riparian buffers, lakes and ponds, steep slopes, woodlands and prime agricultural soils, where absent.	Municipalities – draft and adopt new ordinances HC, BCPC/LVPC – technical assistance	BCPC/LVPC – model ordinances Consultants - technical assistance DCNR – funding	2-5 years
<i>Development Plan Reviews</i>	Promote inter-municipal reviews of development plans affecting adjacent and/or downstream communities	Municipalities – respond to regional issues Consultants – planning	State Government - incentive program Watershed groups – raise awareness of regional issues	5-10 years

Management Options Table				
<i>Issues and Concerns</i>	<i>Conservation Actions</i>	<i>Primary Partners</i>	<i>Supporting Partners</i>	<i>Projected Implementation</i>
<i>Land/Resource Protection Strategies</i>	Work with local non-profit organizations to assess benefits of various protection strategies	Municipalities – review available strategies Private enterprise – funding, implement protection measures Non-profit organizations – negotiate protection measures DRG – support and promote actions	HC – technical assistance BC - cost-sharing DCNR – funding	1-2 years
<i>Open Space Preservation</i>	Utilize county open space preservation program funds and/or raise local money for open space preservation/land acquisition to protect critical resource areas and promote watershed conservation	Municipalities – develop plans, purchase property or easements for protection Non-profit organizations – assist in purchase/easement negotiations. HC – technical assistance	County - cost-sharing DCNR - funding	1-2 years
	Implement municipal open space plans	Municipalities – prepare plan and follow recommendations HC – technical assistance	County - cost-sharing	2-5 years
<i>Flood Control</i>	Study impacts of flooding on local waterways	Municipalities – initiate local study Watershed groups – provide local knowledge and expertise of conditions DRK – provide planning and expertise	NRCS – technical assistance USGS – data BCPC/LVPC – technical assistance DRBC – technical assistance Consultants – planning, technical assistance DRG – coordination	2-5 years
<i>Land Development</i>	Provide incentives to encourage "Green" techniques in new developments (e.g. low-impact development, sustainable practices, smart growth principles, conservation subdivision)	Municipalities – adopt, and offer innovative zoning options for design Consultants - planning and design, technical assistance Land Trusts- provide technical assistance with “conservation by design” planning techniques	State government – funding and cost-sharing Economic development councils Chambers of Commerce National and regional conservation organizations – technical assistance, sample ordinances	2-5 years
10. Implementation of Plan Goals and Objectives				

Management Options Table				
<i>Issues and Concerns</i>	<i>Conservation Actions</i>	<i>Primary Partners</i>	<i>Supporting Partners</i>	<i>Projected Implementation</i>
<i>Facilitate Regional Implementation</i>	Establish an organizational or information system to discuss regional concerns and address inter-municipal communication and to disseminate information.	Municipalities - delegate representative to regional review committee Consultants – planning HC – technical assistance DRG – planning, coordination	State government - incentive program DRBC – technical assistance for watershed planning LDRMC – liaison to regional efforts EACs, watershed groups	2-5 years
<i>Disseminate Information</i>	Distribute copies of MDRCP plan to all municipalities. Make study available via electronic media.	HC – prepare summary of findings, hard and electronic copies.	EAC, watershed groups – outreach and education DRG, LDRMC – regional outreach	Upon approval of final plan
	Sponsor public information sessions on funding open space/watershed projects.	Municipalities – host sessions HC – assist in funding source identification		Ongoing
	Update zoning and planning regulations for municipalities on both sides of the river and perform outreach program to support the municipalities.	Municipalities LDRMC – Coordinate outreach effort	BCPC, LVPC – technical assistance	2-5 years
Abbreviations: BCAS – Bucks County Audubon Society, CCD – County Conservation Districts (both Bucks and Northampton), BCDPR – Bucks County Dept. of Parks and Recreation, BCPC – Bucks County Planning Commission, BCHD – Bucks County Health Department, BHWP – Bowman’s Hill Wildflower Preserve, CRP – Center for Rural Pennsylvania, DCED – Pennsylvania Department of Community and Economic Development, DEP – Pennsylvania Department of Environmental Protection, DCNR- Pennsylvania Department of Conservation and Natural Resources, DRBC – Delaware River Basin Commission, DRG – Delaware River Greenway, DRK – Delaware River Keeper Network, DVRPC – Delaware Valley Regional Planning Commission, FDC – Friends of the Delaware Canal, HC - Heritage Conservancy, LDRMC – Lower Delaware River Management Committee, LVPC - Lehigh Valley Planning Commission, NPS – National Park Service, NRCS – Natural Resources Conservation Service, PAF&BC – Pennsylvania Fish and Boat Commission, PEC – Pennsylvania Environmental Council, PSCES – Penn State Cooperative Extension Services, USGS – U.S. Geological Service, US EPA – U.S. Environmental Protection Agency				

