FOREWORD

The Conservation Plan for the Ridley Creek has been produced as part of an initiative by a partnership of the GreenSpace Alliance and the Chester/Ridley/Crum Watersheds Association. The plan is designed to be a guidebook for landowners, municipalities, conservation groups, and citizens interested in taking concrete steps to enhance the long-term health of the creek and its enjoyment by the public. A major portion of the plan is devoted to management recommendations for the Ridley Creek system. It also includes a summary of findings on existing physical conditions and regulatory restrictions in the watershed, and a summary of the input of municipal and county officials, institutional landowners, and private citizens (solicited through public workshops, questionnaires, and interviews).

The Conservation Plan was produced with financial assistance from the Pennsylvania's new "Rivers Conservation Program", which awarded a planning grant to the project in July, 1995. When the Pennsylvania Department of Conservation and Natural Resources (DCNR), which administers the program, approves the final conservation plan, the Ridley Creek will be submitted for inclusion on the "Pennsylvania Rivers Conservation Registry," providing the basis for DCNR matching grants to municipalities that have adopted the plan by resolution. These municipalities, or groups sponsored by them, will be eligible to apply for up to $50,000 per year to implement the recommendations in the report. Therefore, unlike the older State Scenic Rivers program, the incorporation of Ridley Creek into the Rivers Conservation Registry can provide monetary benefit to participating municipalities.

A Brief Case for Protection of Ridley Creek

Ridley Creek rises in eastern Chester County in East Whiteland Township, on the southern flanks of the South Valley Hills. The brow of the ridge which holds the central campus of Immaculata College is the northernmost edge of the watershed. It flows 24 miles southeast through Chester and Delaware Counties to its confluence with the Delaware River between the City of Chester and the Borough of Eddystone. Its many tributary streams are relatively short, creating a narrow, 38-square mile watershed within the jurisdiction of eleven townships, five boroughs, and one city (see Figure 1).

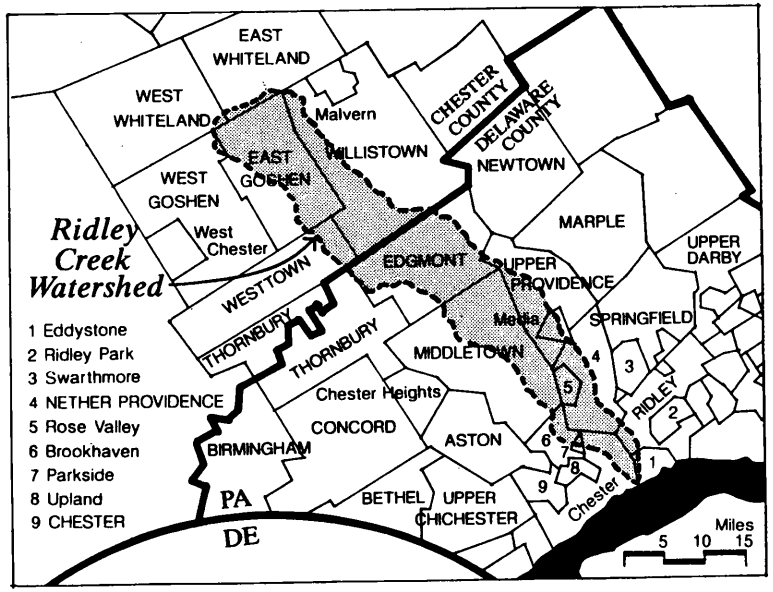


Figure 1: Ridley Creek Watershed Location

Rivers are used metaphorically to symbolize history, the lives of individuals, and life in general. We use rivers as symbols because they begin as small streams, then gather themselves into powerful entities before ending at a known place, the sea. Rivers connect places, like history connects many small incidents, into a single, common narrative.

In the waters of the Ridley Creek we can read the history of events from the side of a hill in East Whiteland, to a long arm of the Atlantic Ocean that is the tidal Delaware River. It is a complex tale. The *Ridley Creek Conservation Plan* is an attempt to make sense of many subplots; patterns of ownership, forests, laws, floods, and many others. In it a reader will find consistent themes:

- Ridley Creek is mostly a beautiful stream,
- Landowners, communities and the Commonwealth of Pennsylvania largely recognize its importance and attempt in many ways to protect it, and
- Much more can be done.

The overwhelming majority of the Ridley Creek watershed's residents are urban and suburban. Awareness of the creek's role in daily life is not required to turn on a faucet, flush a toilet, or to notice a flock of migrating birds. Unless we take a walk in a streamside park, or a major flood pushes it out of its banks, we are not ***called on*** to notice the Ridley Creek. This *Conservation Plan* asks that we all start paying more attention to how the stream works, because by doing so, the complex interconnectedness of natural, cultural, and geologic patterns is revealed, and as it is, ideas for improvement will surely surface.

Because Ridley Creek passes through practically every kind of land use and neighborhood found outside of Philadelphia, the creek's valley represents well the beautiful and the stricken landscapes of our region. In the northern headwaters are the eastern suburbs of West Chester (illustrating the growth of Chester County since the 1960's), and the "hunt country" west of the Radnor Hunt Club. In Willistown and Edgmont are the rolling pastures, wooded hills, historic farms and estate homes once more common in southeastern Pennsylvania. The middle section passes through Ridley Creek State Park and the mature, leafy suburbs surrounding Media, where the stream has carved a steep, heavily wooded valley. A few homes cling to the steep slopes but most are perched high above, leaving the valley to trees and winding old roads. At the Creek's southern end, in and just outside the City of Chester, it enters a long-urbanized, mixed commercial and residential area. Here homes and businesses are built close to the stream, parking lots and service drives often stop at the top of its banks, and the banks and streambed are littered with refuse. At the mouth, the former Sun ship building factory straddles its confluence with the Delaware River. Here in the port district of what was once one of the most prosperous industrial cities in the country, the stream, now tidal, muddy, and slow, little resembles its modest pastoral beginnings.

Strung along the main stem and the tributaries are a number of streamside parks. Even in the urbanized southern section there are several large public parks, private preserves and recreation areas. The crown jewel of the public open spaces is the state park named after the stream. The 2,606 acre Ridley Creek State Park straddles the mid-section of the creek at the northern end of Delaware County, mostly in Edgmont Township, and extends across the full width of the watershed. It is almost entirely wooded. Its rolling hills provide miles of multi-purpose trails and important habitat areas for indigenous plants and animals. But despite the many parks, recreational studies have found that all the municipalities but two lack the acreage of parkland recommended by regional standards.

The *Conservation Plan* discusses a number of approaches to increasing the acreage of parkland. These approaches, as well as many of the other recommendations in the plan, are largely in the hands of local municipalities; seventeen separate entities as diverse as the region itself. Therein lies the largest challenge of instituting the *Conservation Plan*. The stream is practically the only thing that connects seventeen communities together, so how can a comprehensive approach occur? For instance, the townships in the upper watershed in Chester County are concerned with protecting their remaining open landscapes and providing adequate services for increasing numbers of largely affluent citizens, while the most urban municipalities in Delaware County are saddled with, among other things, aging infrastructure, an eroding tax base, and a loss of population. The plan addresses this diversity by recommending a balanced, practical approach, wherein a mechanism to allow the seventeen to regularly discuss common concerns would be created and would operate as each community continues to pursue internal interests. State and Federal agencies, the Counties and the non-profit conservation community are called on to participate with the municipalities and to undertake their own watershed-wide projects. This approach is balanced by other recommendations for public education to bring the creek to citizens' attention, who may, in turn, choose to work with their representatives on conservation initiatives.

The compelling possibilities for a successful conservation effort on Ridley Creek make the challenge worthwhile. If, while this slice of southeastern Pennsylvania transforms itself during the next twenty years, a corridor of natural land solidifies along the stream banks, protected and cared for by private citizens and local governments, the seventeen municipalities that control a piece of the "Ridley Creek Greenway" will have helped themselves to inexpensive parkland, stable property values, clearer water, and an appreciative citizenry.

PRINCIPLES OF THE CONSERVATION PLAN

The Ridley Creek Conservation Plan is constructed on the general principles listed below. Throughout the report, more specific goals, objectives and recommendations developed from these primary principles are described:

- **General Awareness.** The Ridley Creek system should come to be widely understood as a common, connecting resource of local importance and great beauty.

- **Coordinated Action.** Through the coordinated actions of all parties- municipalities, agencies, landowners, citizens, institutions, and private groups- the ecology and scenic beauty of the Ridley Creek, its tributaries and watershed should be preserved and, where possible, improved.

- **Central Role of Municipalities.** Municipalities, and organizations sponsored by municipalities, should pursue the recommendations found in this Conservation Plan, using matching funding sources such as the Pennsylvania Rivers Conservation Program.

MAJOR ISSUES
FOR THE
RIDLEY CREEK CONSERVATION PLAN

The topics that follow are organized according to the primary issues that affect the conservation of any Pennsylvania stream. Each section begins with one or more goal statements specific to the Ridley Creek, followed by a series of "Management Objectives" that are based on the goals. These objectives identify ways to strengthen current regulations, land management, public education, etc., that would increase protection of the creek. Following the Management Objectives are Background sections that explain the rationale for the objectives. Finally, there is a brief description of specific recommendations to achieve these objectives.

It is important to realize that the issues that affect stream conservation tend to overlap, making their separation into these discrete topics at times artificial. Quite often a Management Objective for one issue is also an objective for another. In fact, the most important objectives, for example a commitment to preserving and enhancing riparian buffers, are those that address most of the issues simultaneously. Rather than repeating similar information, the recommendations are placed under what seem to be the most fitting issue.

1

FLOODING & STORM DRAINAGE

GOALS

- *"Normal" flooding of the Ridley should not cause property damage.*
- *Stormwater drainage systems should be designed, or redesigned, to level off flood surges throughout the* ***entire*** *watershed and promote groundwater recharge.*
- *Stormwater systems, old and new, should be designed to use wetlands, riparian buffers and vegetated swales to supplement or replace engineered structures, and should be designed to fit into the landscape.*

MANAGEMENT OBJECTIVES

1 Tighten existing municipal floodplain ordinances to eliminate further floodplain development that would either subject properties to flooding or would increase flooding downstream.

2 Reduce the amount of existing property improvements subject to flooding through attrition and incentive.

3 Update the existing Act 167 Stormwater Management Plan for the Delaware County section, and expand the Plan to include the Chester County section of the watershed.

4 Promote natural approaches to stormwater retention such as the preservation and creation of wetlands, riparian buffers, and vegetated swales through the stormwater management plan, ordinances and best management practices.

5 Study the cost/benefit of dredging the lower stretches of the creek.

BACKGROUND

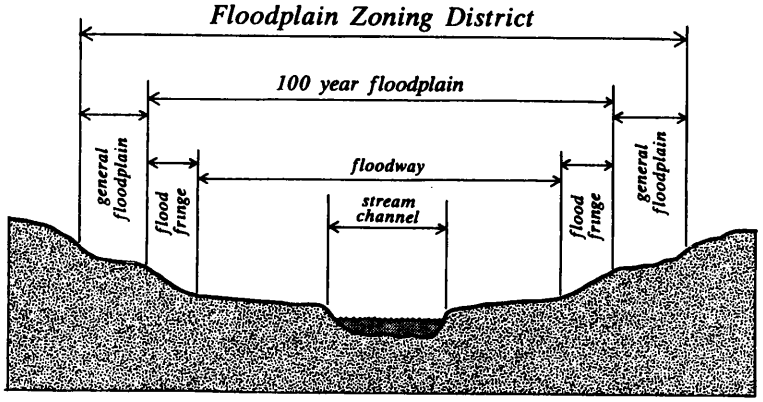
The Ridley Creek has a long history of flooding, marked in part on the wall of the Philadelphia Suburban Water Company Treatment Plant (former Media Water Company) in Middletown. The highest flood on record occurred August 5, 1843, when a summer thunderstorm poured onto already sodden ground. In places, the creek rose 21 feet above its banks (US Army Corps of Engineers, *Flood Plain Information, Ridley Creek*, April, 1970, page 2). Its mark on the water plant wall is 5.5 feet higher than the next highest flood of November, 1950. Another flood, less than a foot lower, occurred in 1954. The tidal portion, which can be flooded by high tides from the Delaware River, received its highest floods in the same November, 1950 flood and in August 1933.

Floodplain Ordinances and Development

The protection of the floodplain was one of the most important items to the municipal and citizen respondents to the survey questionnaire (see Appendix C), in which nearly all gave this item an "important" or "very important" response. Since the passage in 1978 of Act 166, the Pennsylvania Floodplain Management Act, municipalities in the state have been required to pass floodplain ordinances that meet minimum standards in order for their citizens to be eligible for federal flood insurance and for the municipalities to continue receiving state funding . Every municipality in the watershed with flood-prone areas (as identified by federal floodplain maps) has passed at least these minimum standards. The standards are designed to protect property value and pubic health. They accomplish this by regulating what can be built in the floodplain and how it is to be built.

A floodplain is divided into three zones which are locally regulated in conformance with state and federal regulations. The zones are depicted on Flood Insurance Rate Maps prepared by the Federal Emergency Management Agency. The first is called the floodway. This is the area closest to the stream, where floodwaters move quickly and can cause severe damage to structures (see figure 2 below). It is technically defined as the minimum area necessary to pass the waters of the 100-year flood (the flood that has a statistical probability of occurring every one-hundred years). The second is called the flood-fringe. The fringe will not have the damaging velocities of the floodway, yet it will still be inundated in the 100-year flood. The third category is called by various names but includes the rest of the 100-year flood area from the federal flood maps and, occasionally, the wet soils identified by the county soil maps.

Figure 2: Generalized Floodplain Schematic



(adapted from "Delaware County Waterfront Resources Management Plan", Delaware County Planning Department, 1992, page 20)

The floodplain ordinances prohibit any uses or construction that would cause an increase in the height of the floodwaters. However new construction that would not increase flood heights is generally permitted, if it is properly flood-proofed. In broad outline the ordinances all:

- severely restrict development in the floodway
- require floodproofing of building interior space below the flood elevation
- limit filling that would raise flood elevations
- prohibit certain uses such as nursing homes, hospitals, jails, and manufactured homes
- prohibit the storage of dangerous chemicals in the floodplain

An important unintended consequence results from the federal law. Because the floodplain ordinances of the Ridley Creek watershed municipalities meet the minimum standards, conventional development is not slowed by the unavailability of insurance. Most development can occur with only slight modification, so it makes economic sense and is therefore inevitable that the floodplains are developed. In a sense, the federal standards encourage development rather than letting the private insurance market eliminate construction in a marginal setting by charging exorbitant rates. The end result of the construction of buildings and parking lots can be that the natural capacity of the floodplain to absorb and dissipate floodwaters practically disappears. Piggy-backed onto construction in the floodplain is the fact that development in general within a watershed tends to increase the volume and the duration of floods, both by lessening natural absorption of rainwater, and also by increasing the amount of eroded sediments in the stream channel. So the actual width of the 100-year floodplain can widen with development, increasing the number of structures exposed to flooding.

Floodplain Ordinance Recommendations

Recognizing the problem with minimum standards, municipalities approach floodplain restrictions with varying degrees of strictness. Some do not allow any principal structures in the floodway (ex: Willistown Twp., Middletown Twp.), some do not allow any construction within 50 feet of any stream (e.g., Edgmont Twp., Upper Providence Twp.), some do not allow clearing of trees or vegetation in the floodway (Middletown Twp.). These restrictions further reduce the impact of flooding on property improvements and maintain the health of the floodplain ecosystem. They could be further improved if they consistently featured the following standards:

- No construction of structures or impervious surfaces within the entire 100-year floodplain. East Goshen Township has made this a feature of the Zoning Ordinance (Louis F. Smith Jr., Twp. Manager, East Goshen Twp pers. com. 3/13/96)
- A minimum setback for all impervious construction of 50' (measured from the top of the bank) from all streams having either no 100-year floodplain or a 100-year floodplain of less than 50' in width, (Edgmont Township).
- Existing nonconforming structures (those in the floodplain) to be subject to conditional use review upon submission for any permits that would be required under relevant zoning codes. The standards for review to include no additional impact on the floodplain.
- Allowance for water dependent use, agricultural use, open space and forestry in the floodway

Obviously, many of the buildings along streams in the Ridley watershed were built before the passage of Act 166. For these structures tightened floodplain ordinances will have little effect. Instead municipalities that have persistent problems with flood-prone buildings should adopt a program mixing incentives for owners to demolish or move the structures, with strict

occupancy standards so long-unused structures can be removed by the municipality. Exceptions for historic structures would be appropriate.

The Pennsylvania Emergency Management Agency, through its Hazard Mitigation Program, provides funding for municipalities to purchase homes that are persistently and heavily damaged by floods in declared disaster areas. Because the entire state was declared a disaster area after the flooding in January, 1996, the Ridley Creek watershed municipalities are eligible for a portion of the federal funds allocated to the Hazard Mitigation Program for that disaster (Janet Foor, PaEMA, pers.comm. 8/2/96). The program also considers requests for community flood-proofing projects, and improved storm drainage and streambank stabilization. The municipalities in the lower watershed should develop projects proposals to utilize this funding.

Pennsylvania Act 167 and Stormwater Management

Stormwater drainage systems designed since 1978 in Pennsylvania generally feature means to detain the first portion of rainstorms on-site. This is due to the passage of the Stormwater Management Act (Act 167) in that year. The Act required that the rate of runoff from new development not exceed the rate of runoff that occurred before development. Because rooftops and parking lots shed water at a faster rate than fields and forests, engineers have generally designed basins or underground holding tanks to capture the extra water. The basins are a common sight throughout the Ridley Creek watershed. They are present at office parks, shopping centers, and residential subdivisions. Stormwater runoff systems that predate Act 167 were designed to rapidly remove stormwater from the site to the nearest waterbody. These systems do not feature retention basins.

The holding facilities release stormwater at a controlled rate equal to the pre-development rate. It is important to note that it is the ***rate*** that is controlled, not the ***amount***. The increased area of impervious surface inevitable with development causes a proportional increase in the total amount of runoff produced during a storm. The cumulative affect of many basins within a single watershed releasing this increased amount of water over a long period may not cause the same degree of property damage as the sudden flush of water that would occur in the absence of the facilities, but this prolonged increased flow can nevertheless be damaging to stream banks.

The Ridley Creek in Delaware County is one of the few streams in the Commonwealth with a plan that was developed under Act 167 and adopted by the county government. Chester County has not undertaken a plan for its part of the watershed. Act 167 requires that, if a management plan is adopted by a county, all the affected municipalities in that county must also adopt the plan. Therefore the Ridley Creek watershed municipalities in Delaware County passed ordinances incorporating the management plan's standards and criteria for the management of stormwater runoff into their zoning ordinances by 1990. The plan prescribes the rate that water can be released from every sub-watershed of the Ridley. Sub-watersheds are the smaller, component watersheds that comprise the total drainage area of the stream.

The focus of the plan is on control of flood damage and, to a lesser extent, on the maintenance of base flow to the Philadelphia Suburban Water Company Ridley Creek plant. The emphasis, as it should be, is on managing the timing and quantity of water passing through the watershed, not on the quality of that water. The plan sets a release rate for stormwater in each sub-watershed in order to distribute the stormwater

release over a greater period during the storm than would occur without the plan, thereby avoiding a sudden, damaging rise in water level on the creek.

Due to the Act 167 plan's focus on water quantity management, there are unintentional consequences for the quality of creek water. For example, the plan allows for the direct release of stormwater to the Ridley from properties abutting the stream because the water would not be likely to increase the chance of downstream flooding, as it can travel downstream faster than water entering from the tributary system (Act 167 Stormwater Management Plan for the Ridley Creek Watershed, Volume I Executive Summary, June 1988, page 15). It also allows existing storm sewers to carry water directly to the creek if steps are taken to ensure that the water will not cause increased downstream flooding (*ibid.*, page 15). More discussion of this issue is found in the subsequent Water Quality section of this conservation plan.

Also worth noting is the fact that the plan does not require any reduction in the rate that stormwater leaves a site being redeveloped, which is common in the lower watershed. In other words, a commercial property owner is not required to install new stormwater detention devices if no increase in impervious surface is created by the redevelopment -- which is a typical situation. Unless Act 167 is rewritten, there will be little opportunity to require an increase in the retentive capacity of the lower watershed through the redevelopment process. In the meantime, municipalities may successfully request the installation of these devices if other variances or exceptions are necessary for a plan's approval (Ann E.Hutchinson, Planning Director, Lower Merion Twp., pers comm. 8/29/96).

While the presence of a comprehensive stormwater management plan for the creek in Delaware County is remarkable, it would be even more useful if the entire watershed were included in the management plan. In this way release rates for every sub-basin could be established. This is an issue of some importance to the communities in the lower watershed, where flooding remains a major concern (Peter J. O'Keefe, Ridley Township Recreation Director. pers. comm., 2/21/95). Delaware County and Chester County are currently working cooperatively on an Act 167 plan for the Chester Creek. This will not be complete before 1997. Due to limited resources an update of the Act 167 plan for Ridley Creek that would include both counties will not be started before the conclusion of the Chester Creek study (Wayne Clapp, Chester County Planning Commission , pers. com., 1/25/96). It is not clear whether or not Ridley Creek will be a priority for completion even when Chester Creek is finalized.

Dredging of the lower reaches of the stream have been mentioned as a possible means to lessen flooding (Sandy Walton, Brookhaven Borough Municipal Engineer, pers, comm. 2/6/96). The premise being that a dredged channel would increase the capacity to carry flood waters. The channel's size has been diminished by accumulated sediments from centuries of farming and construction.

Stormwater Management Recommendations

The primary recommendation of the Conservation Plan with regard to stormwater management is to accelerate the scheduling of the updated Act 167 Stormwater Management Plan so that it begins immediately upon the completion of the Chester Creek plan. The revised plan should:

- recommend, within its statutory limits, to increase protection of water quality and aquatic habitat.The Act 167 plan guidelines have been modified since the original study, allowing more attention to water quality issues (Karen Holm, Delaware County Planning Department, pers. comm., 7/28/96).

- recommend a comprehensive decrease in the release rates for the sub-basins to encourage infiltration of stormwater where it is now discouraged, e.g. on property next to the main channel
- establish a mechanism to inspect, retrofit, or repair existing detention basins (as wetlands if appropriate), and storm drainage systems that are causing erosion
- include a study of the cost/benefit of dredging the lower channel

2

SEWAGE TREATMENT

GOAL

- *Existing and future sewage treatment facilities, including residential septic systems, should not degrade water quality.*

MANAGEMENT OBJECTIVES

1 Ensure that existing sewage treatment facilities are maintained to the standards of their current DEP permits, and that new permits meet higher standards where feasible.

2 Require that new or expanded treatment facilities are constructed using the highest available technology where feasible.

3 Avoid construction of new sewage treatment facilities in the lower watershed, where existing development is served by other facilities.

4 Prevent water quality degradation due to cumulative failure of septic systems by promoting on-lot system maintenance programs and adherence to standards.

5 Maintain a system of regular local inspections of septic systems.

BACKGROUND

Sewage treatment is an aspect of water quality that is considered separately in this report because it is a well understood "point source" of pollution that, due to its potential impact on public health, is closely regulated by all levels of government. Thanks largely to the Federal Clean Water Act with its attendant "National Pollution Discharge Elimination System" (NPDES) permitting system, the outflow from sewage treatment plants and industry (the two most recognizable point sources) is no longer the primary cause of pollution in streams. The Ridley Creek currently has no permitted industrial discharges, leaving treated sewage as the primary point source. The permitting process for sewage treatment is widely considered the most expensive and time consuming aspect of the development process (Al Gianantonio, Yerkes Associates, pers. comm. 3/13/96). However, there remains room for improvement in the regulation of sewage treatment.

Sewage Treatment Plants

Three municipal sewage treatment plants and nine private treatment plants discharge into the Ridley Creek, its tributaries, or its groundwater (see Figure 3). East Goshen, Media and Rose Valley own and manage municipal treatment plants. The Media and Rose Valley plants discharge treated wastewater directly into the stream. The East Goshen plant releases into a constructed wetland 400' from the stream (Al Gianantonio, Yerkes Associates, pers. comm. 3/13/96). The municipal plants regularly meet the terms of their NPDES permits, which are administered by DEP. The East Goshen plant is newer and must meet higher standards because it discharges into "High Quality Waters" (the DEP designation for the stream's water above the PSWC water treatment plant, see the Water Quality section of this plan for more details. The "HQ" status of the stream is a result of a request made by the Chester/Ridley/Crum Watersheds Association to elevate the designation). The sewage treatment plants are inspected twice a year and must renew their permits every five years (Rich Brightenstein, PaDEP, pers. comm., 4/25/96).

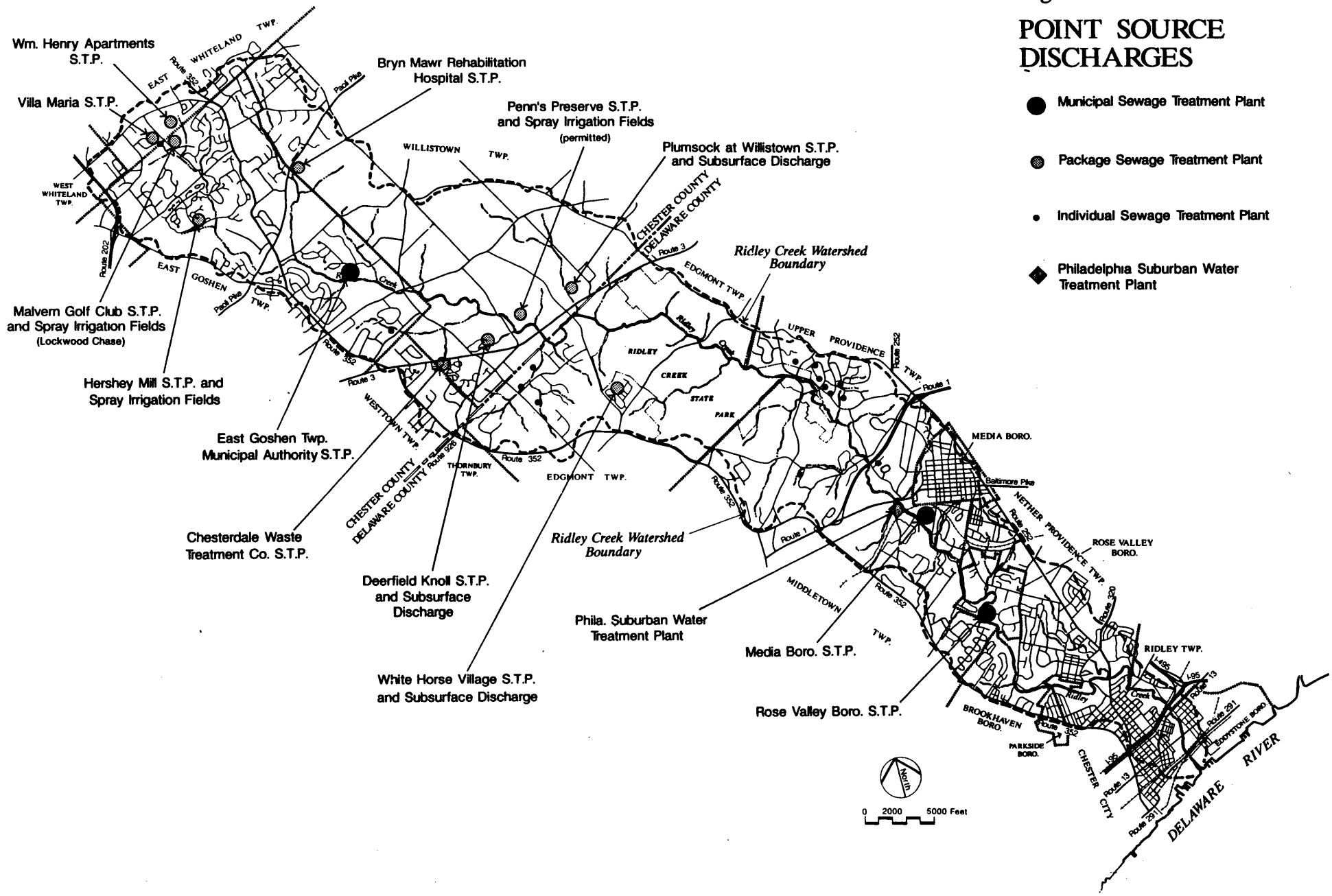
Responses to the Landowner Survey (Appendix C) from several downstream landowners indicated that water quality below the Media wastewaster treatment plant is a concern. Despite the plant's excellent adherence to permit requirements (Rich Brightenstein, pers comm., 4/25/96), occasional sewage odors, especially after storms, and a difference in the stream's appearance above and below the plant were specifically mentioned. The landowners concerns, along with additional evidence from a PaDEP study cited on page 21, suggest the need for further study to determine what specific impacts the plant (as well as the older and less sophisticated Rose Valley Borough plant) is having on the stream, and what additional steps state regulators, the plant operator and customers can make to reduce those impacts.

Five of the private plants are package treatment plants that use land application of the treated wastewater, rather than the more traditional method of discharging directly into a stream. In these facilities wastewater is treated in a traditional fashion of filtration, aeration and biological action, and then either sprayed above ground in the nature of an irrigation system (Hershey's Mill in East Goshen Township is the largest facility using this technique), or released underground in a large septic field (Plumsock at Willistown in Willistown Township is an example of this technique).

Land treatment provides additional cleansing through the action

Figure 3

POINT SOURCE DISCHARGES



of soil microbes before the water, by then groundwater, reaches the Ridley Creek. Land application of treated wastewater has long been advocated by the Chester County Planning Commission because this additional treatment can effectively remove excess nitrogen and phosphorus from the wastewater and can help maintain groundwater levels (Chester County Planning Commission, "*Utilization of Spray Irrigation in Wastewater Treatment*", 1990). Nitrogen and phosphorus are common causes of algal blooms and the resultant degradation of aquatic habitats. They are expensive to remove from wastewater by conventional means. Land treatment allows terrestrial plants to use these nutrients for growth, thus taking the nutrients out of the hydrologic cycle before they reach a stream. Wastewater released in underground septic fields does not expose wastewater to the same number of plant roots as land treatment and can therefore add increased nutrients to groundwater.

Land treatment is sensitive to soil type and season and requires a fairly large parcel, but DEP is confident enough in the technology to make spray irrigation the preferred technological solution, followed by subsurface disposal, for sewage treatment discharge to High Quality Waters (PaDEP, "*Special Protection Waters Implementation Handbook*", page V-1, 1992). Spray irrigation therefore remains an excellent choice for sewage treatment in the upper watershed.

Small treatment facilities share an important maintenance drawback that the Chester County municipalities have recognized and are addressing . Historically, the initial maintenance responsibility has been left with the homeowners association served by the plant. When the plant requires expensive repairs or fails, the association may be unwilling or unable to pay for the repairs, and the municipality is forced to take it over to protect public health (William A. Rosenberry, Willistown Twp., pers comm. 3/16/96). PaDEP urges municipalities to be involved in the initial design and to be the permittee. East Goshen now requires that it be the permittee for small plants, and that they be designed to Township specifications, in case the township is forced to take over the plant. Chester County has suggested that municipalities avoid this interim step altogether and directly manage all package treatment plants as public facilities from the outset (Chester County Planning Commission, "*Utilization of Spray Irrigation in Wastewater Treatment*", 1990).

In the lower watershed below Rose Valley sewage is actually transported out of the watershed to other treatment plants. Gravity sewer lines exist along the Ridley and its tributaries to transport sewage to force mains. Some of these sewage lines are quite old, and the changing course of the stream has actually left a few exposed manholes in the channel. Maintenance of older lines is very important to prevent accidental spillage caused by blocked lines. The accidental release of even small amounts of contaminants can impact aquatic life in long stretches of the stream or require a long recovery period (Preston Luitweiler, PSWC, pers. com., 5/2/96). Prompt reporting by concerned citizens is often necessary to catch spills.

Private Septic Systems

Many residences in the watershed above Baltimore Pike are served by individual septic systems. These systems are monitored by local health officers. County health officials in Chester County and municipal health officers in Delaware County follow strict regulations, promulgated by PaDEP (Title 25, Chapters 71,72,73) regarding the location of the fields and the suitability of the soils. Even so, the systems do fail occasionally, either through poor siting or lack of maintenance, allowing incompletely treated wastewater to enter the groundwater of surface water. Individual septic systems are not systematically inspected by health officers. Even in the case of individual systems permitted by DEP (see figure 3) a yearly

report from the owner is all DEP requires. This lack of direct oversight is an understandable calculated risk taken by public officials with more responsibility than budget. It is far easier to police a few larger facilities than many smaller facilities.

Unfortunately the lack of oversight may be hiding a large number of failing systems. In Upper Providence Township a number of residences have been found to have failing septic systems (Upper Providence Twp. Comprehensive Plan, October 1989, page 11). Other townships may be having similar problems with individual septic fields. The number of "Single Residence Sewage Treatment Plants" permitted by PaDEP in the upper watershed (six of the private facilities outside of Upper Providence are of this type) may be indicative of areas of marginal soils where more existing systems are failing. Homeowners seem to require periodic education regarding on-lot sewage disposal efficiency and maintenance. Pa. Act 537, the law that requires municipalities to comprehensively plan their sewage systems, makes funding available to municipalities to include plans to manage private, on-lot sewage disposal systems. Maintenance can be addressed through personal communication and education that stresses the fact that run-off from poorly maintained facilities affects public drinking water, and likely the offender's own water (Preston Luitweiler, PSWC, pers. com., 5/2/96). Such a citizen education program could be partially funded through the Act 537 planning grant program.

Sewage Treatment Recommendations

Sewage treatment regulations seem adequate to protect the water quality of the Ridley Creek watershed. The area for improvement seems to be in enforcement of the regulations. The following recommendations are drafted to help regulators.

- Use the NPDES permit renewal process to study the feasibility of upgrading the discharge standards for the Media and Rose Valley treatment plants.
- Conduct baseline surveys of existing septic systems in each municipality in the watershed to determine the number of failing systems.
- Provide homeowners with fact sheets on septic systems, signs of failures and means to correct them, and the impact of poor maintenance and outright failures on general water quality and drinking water.
- Publish a fact sheet on citizen monitoring of sewage systems, describing how to report spills, etc. with maps showing the location of sewer lines in the watershed.
- Where appropriate, institute municipal regulations requiring the periodic pumping of on-lot systems to ensure proper functioning (refer to London Grove, New Garden, and East Nantmeal Townships' regulations for existing models).
- Make use of improved water quality monitoring data to locate sources of pollution (see Water Quality Section for a description of data needs).

5

ZONING, LAND DEVELOPMENT & REDEVELOPMENT

GOALS

- *Municipal land use zoning district regulations for lands adjacent to the Ridley Creek and its tributaries should ensure that the type and intensity of development occurring adjacent to the stream is not detrimental to the stream system.*
- *The process of approving subdivision and land development proposals should result in the conservation of sensitive environmental features.*
- *Regulations should provide flexible incentives to restore streamside habitat and preserve historic structures during the redevelopment process*

MANAGEMENT RECOMMENDATIONS

1 Ordinances should provide incentives to shift house sites and yards away from sensitive environmental features associated with the stream system and to set aside streamside lands as permanent open space.

2 The construction of impervious surface should be minimized by revising subdivision ordinances to permit narrower road widths and smaller parking lots within safety limits.

3 Construction of curbless streets should be encouraged where possible by removing automatic requirements for curb and gutter and underground stormwater systems on new streets.

4 Ordinances should provide incentives to remove structures and pavement adjacent to stream channels, and to revegetate the riparian buffers during renovation or redevelopment of "brownfields" or any other existing establishment in older communities.

5 Ordinances should not allow new high density uses adjacent to the stream without providing a full riparian forest buffer

BACKGROUND

The municipalities that have jurisdiction over the Ridley Creek watershed have all passed zoning ordinances to control the location, type and density of development in their communities. Of particular interest to this study are the ordinances that affect development adjacent to the Ridley and its tributary system. First are the basic zoning districts that set out type of development allowed (residential, commercial, industrial, etc.), and the minimum sizes of lots and setbacks. Often these ordinances are enhanced by "lot averaging" and "cluster" provisions that allow development to be concentrated on part of a site, if the site is of a certain minimum size and if the remaining undeveloped land is set aside as permanent open space.

Ordinances which create districts that "overlay" the basic districts where environmental restrictions are present are also commonly used. Steep slope districts and floodplain districts are two of the more common overlay districts, but other locally important features can be identified as overlay districts as well (overlay districts are discussed throughout the report under the topics that they were designed to address). Other engineering regulations (such as sedimentation and erosion control ordinances, which are discussed in the Water Quality section of the report -- pages 20 et seq.) are found in a separate document called the subdivision and land development ordinance. This document contains design standards for roads, utilities, stormwater control systems, and, most importantly for this section of the report, the standards and process for reviewing land development proposals.

The discussion in this section is limited to a summary of the current zoning districts adjacent to the waterways, recommendations on ways to improve cluster provisions and the development review process to ensure that critical open space is set aside, and finally, recommendations on improving already developed sites upon their redevelopment.

The zoning districts abutting the Ridley allow for smaller lot sizes and more commercial and industrial uses in the municipalities closer to the Delaware River, following the overall pattern of increasing density of development downstream. The mouth of the Ridley is surrounded by a large industrial district in both Eddystone and Chester. The remainder of Eddystone Borough is zoned for single family homes, twins and townhouses, except at the bridge crossing of Route 13, where a small lot is commercially zoned. The City of Chester is similar except that the commercial zone at Route 13 is larger, permitted lot sizes are smaller and apartment complexes are allowed. The area along the Creek in Ridley Township is entirely zoned for general commercial uses, except for one residential lot abutting Nether Providence Township.

Brookhaven Borough and Nether Providence have similar residential zones, allowing single family homes on approximately quarter-acre lots along most of the stream. In Brookhaven very little development opportunity remains along the creek. Nether Providence requires a larger lot size (20,000 sf) closer to Chester, and a former mill site abutting Rose Valley (Sackville Mills) is presently zoned "Industrial", but has been proposed for a townhouse project. Nether Providence also allows for mixed, clustered housing in its single-family detached residential zones so long as 50% of the property is left in open space. Only two properties along the Ridley would meet the Township's twenty-acre minimum property size requirement for cluster. One is the Taylor Memorial Arboretum, the other is the former Houston Estate, which had been the subject of a number of development proposals over the years by its owners, Donald Gaster (now deceased) and Mary Anne Gaster, and is now under sales agreement to the township for use as open space.

To the north of Nether Providence, Rose Valley is a completely residential borough (except for the School in Rose Valley, and Hedgerow Theatre, both private institutions, and the Borough Hall). Lot sizes are one-acre on the eastern bank and 30,000 square feet on the western bank.

The Ridley Creek watershed in Middletown Township is also mostly taken up with single-family residential zoning. The R-1 district, with a minimum lot size of one acre, occupies the residentially zoned acres north of Bortondale Road.There are a number of large properties remaining in this area that might be subject to future subdivision (the Balderston Tract being the largest - see the Master Plan, page 57). A cluster option allows the reduction in lot size to one-half acre if public sewer is available and 30% of the site is set aside as common open space (Heilbron was approved under this provision). R-2 zoning applies to two large parcels south of Fox Road (Delco Sportsmen Club and Suburban Est. Development Corp -- see Master Plan). One acre zoning is required in R-2 unless sewers are provided, in which case lots drops to one-half acre. R-2 has a cluster option allowing quarter-acre lots if public water and sewer are provided and 30% of the site is common open space. The area between Route One and Baltimore Pike, an important natural area identified in the Delaware County Natural Areas Inventory as "Mineral Hill Woods" (see Land Stewardship section, page 26) is zoned for light industry, office buildings, laboratories, or mobile home parks (Special Use District 2). Middletown also has given the state park and Tyler Arboretum their own zoning category (Outdoor Recreation District-1) that limits permitted uses to passive recreation, conservation and agriculture. The district allows subdivision and residential development as a conditional use only. The township lands and homeowners association lands along the creek are in a similar category (OR-2), the difference being in the additional permitted use of active recreation in OR-2.

Upper Providence Township's districts are less dense to the north. The entire northern half, above Rose Tree Road is in a one-acre single-family detached residential zoning category (R-1). Between Rose Tree Road and Baltimore Pike and below the Borough of Media, south of Orange Street, is a half-acre single-family detached residential zoning district (R-3). In between the two R-3 districts are high-density housing districts, business and industrial districts.

Edgmont Township has little private land along the Ridley, as the bulk of Ridley Creek State Park is in the township. However, an extensive tributary system that flows from the west along Stackhouse Road, meeting the Ridley on the county line west of Delchester Road, drains a large two-acre, single-family detached residentially zoned area (R-1). On the main stem north of the park, the eastern half of the Edgmont Country Club is zoned to allow a mobile home park, and single-family detached or attached homes, with a 40% open space provision.

Except for an area of denser highway-type zoning along Route 3, most of the watershed in Willistown Township is zoned for four-acre residential lots, the largest lot zoning in the Ridley watershed. Further north, ringing Malvern, the lot size decreases to two acres (R-A) and then again, inside the R-A ring, to one-acre (R-1). A cluster provision allows grouping homes on reduced lots, if 70% of the site is designated as open space. Along Route 3 is a 1450' wide overlay zone for mixed professional uses, subject to conditional use approval and strict design standards. It does allow the re-use of historic structures for small-scale commercial uses. Two multi-family (apartment) zones underlie the highway overlay south of Route 3.

East Goshen Township's portion of the Ridley Creek forms from numerous tributaries that meet south of Boot Road in the township open space that was dedicated by the developers of the Bow Tree community. Most of the tributaries are in a one-acre zoning category (R-2). Important exceptions would be; 1) the Smith Kline Beecham Laboratories property between Paoli Pike

and East Boot Road, which is in a planned light industrial/professional/research zone, 2) Goshen Village Shopping Center, and 3) Hershey Mill Village, a planned residential zone with a base density of up to 3.5 dwellings/acre and required open space. The most important undeveloped residential property remaining on the creek is the Grace Estate (see Upper Section, Master Plan), although there are a number of smaller properties north of Hershey Mill Village that remain developable under current zoning.

Cluster Development/ Conservation Subdivision

The municipal zoning district codes described above often include provisions for concentrating development in part of a property, and leaving the remainder in a form of open space, either public parkland or commonly owned by the homeowners' association of the development . "Cluster" development (or conservation subdivision, or compact development) has been permitted in modern zoning codes for several decades because smaller lots generally require less roadway and utility lines to service the homes, meaning less municipal maintenance, and they provide a public amenity in the preserved open space.The use of cluster provisions is ideally suited to the protection of stream corridors because the floodplain can be easily included in the open space.

To protect municipal taxpayers from the public costs of poorly conceived designs, cluster ordinances lay out a number of standards that the developments must meet. They generally include:

- either common water or public sewers, or both (because the lots are too small to contain a well and septic tank)
- minimum tract size, usually at least twenty acres (to prevent the creation of unusable small pieces of open space)
- a minimum percentage of open space, typically 50%
- the percentage of open space usable for active recreation (so that not all of the open space would be undevelopable even under a standard proposal)
- a mechanism to establish the number of units that can be built on the site
- density bonuses for developers that exceed the minimum standards of the ordinance (to reward good design).

The cluster provisions are more widely used in the upper watershed, where the basic zoning districts call for large lots in the absence of public utilities. East Goshen's Bow Tree and Willistown's Plumsock at Willistown are examples of successful developments that took advantage of the cluster provisions and set aside streamside open space. In the lower watershed clustering is little used because it is difficult to profitably reduce already small minimum lot sizes, and remaining undeveloped properties are too small to meet the size requirements. Recognizing these constraints, Middletown's cluster provisions only require 30% open space, whereas Willistown requires 70% in its four-acre zoning district (R-A).

It is unfortunate that a minimum tract size is used to limit clustering because it eliminates many small developable properties from this subdivision option. Properties fives acres and larger should be eligible for this option, even if the resulting open space takes the form of conservation easements on larger backyards, instead of common open space on a separate lot. Another disincentive is a density penalty imposed upon developers that might select this option. Upper Providence Township imposes a penalty of 20% fewer residences than in the underlying zoning district when the cluster option is selected in the Ridley Creek Watershed District (the area subject to the stormwater management plan). The ordinances can also be very complex, with much greater detail required for the plan documents, making the approval process more costly and time-consuming than a standard subdivision.

Cluster Recommendations

- Numerous townships in Chester and Montgomery County are rewriting their zoning ordinances to encourage the use of compact subdivision design. The County Planning Commissions have encouraged the enactment of these ordinances. Lower Merion Township, in Montgomery County, which is as densely developed as the municipalities in the middle section of the Ridley watershed, has instituted an "Open Space Conservation District" which is an overlay district covering the entire township. In this district all parcels of five acres or greater are subject to cluster provisions. It is should be considered as a model for Middletown and Upper Providence.

- Wallace Township in Chester County has developed a set of cluster ordinances that discourage standard subdivisions and encourage cluster. It should be considered as a model for Edgmont and the Chester County municipalities in the watershed.

Redevelopment of Urban Sites

The more developed townships of the lower watershed can make scant use of clustering, but they can increase their ability to improve existing conditions when properties are reviewed for redevelopment, and they can tighten their environmental ordinances so that when the few remaining developable properties are planned, streamside riparian buffer is set aside. Redevelopment in this section means renovating existing structures or demolishing old structures and rebuilding new facilities. Subdivision would not typically be a part of this process. Generally speaking, the Subdivision and Land Development Ordinance (SLDO) will control vehicular circulation, grading and storm drainage, and the Zoning Ordinance will control the building setback, buffer requirements, and required number of parking spaces. These two documents should work together to provide incentives to reduce the amount of pavement near the stream, and to install stormwater devices that pass water through vegetation before it reaches the creek.

New standards (especially lot coverage and stream setback standards) could be established that render much of the existing development along the stream system non-conforming. Then any proposals for expansions or changes in use could be held to the new standards unless they took advantage of incentives such as allowing a reduced front yard setback and lowered parking requirements, in return for removal of streamside pavement and installation of a buffer planting. The ordinances must be carefully crafted to allow flexibility, to prevent rendering property unprofitable to renovate. The example of the federal "Superfund" law (the Comprehensive Environmental Response, Compensation, and Liability Act, or CERCLA) is an important example of a law that was drafted with too little flexibility and therefore did not accomplish what it set out to do. Incentives to utilize Best Management Practices (BMP's) are a good technique because the initial development established a precedent that makes requiring complete adherence to new standards unreasonable.

Urban Redevelopment Recommendation

A model redevelopment incentive ordinance with BMP's should be developed. The Delaware County Planning Department would be an ideal choice for developing this text.

6

ENVIRONMENTAL EDUCATION

GOALS

- *Citizens and municipal officials in the Ridley Creek watershed should be aware of the value of freshwater ecosystems such as Ridley Creek, the streamside landscape, the effects of human disturbance, and the means to restore damage.*
- *Municipal officials and citizens should have a basic understanding of the environmental laws that protect the Ridley Creek.*
- *School Districts should use the Ridley Creek in their environmental curriculum*

MANAGEMENT OBJECTIVES

1 The Ridley Creek should be utilized as a laboratory for the environmental education programs of local school districts at every grade level.

2 Schools and scout groups should use Ridley Creek as a site for community service projects.

3 Environmental Advisory Committees, or Planning Commissions should assist their townships in disseminating information on stream natural history and protection.

4 The importance of riparian buffers should be disseminated through educational programs and model projects.

5 A unified signage system identifying sites on the "Ridley Creek Greenway" should be developed for roadways along or crossing the creek.

6 Local, state, and federal environmental laws that protect the Ridley Creek's water should be explained to watershed citizens through publications.

7 Active citizen involvement in protecting the Ridley Creek should be encouraged through annual events such as cleanups, and educational and recreational activities.

8 A municipally-endorsed "Ridley Creek Day", or week, or month should be instituted to allow coordinated municipal involvement in building awareness of environmental issues.

9 A watershed newsletter should be developed as the vehicle for public education.

BACKGROUND

The manner in which the Ridley Creek demonstrates the mingling of natural processes and cultural influences makes it an ideal candidate for use in environmental education. As a doctor tests the body fluids to make inferences about the health of a patient, so testing the water of the Ridley Creek is diagnostic of its watershed's health. The number and kinds of animals that use its woodlands and live in its water also are indicators of health. Watching the stream downstream of a forest and then a construction site is a clear demonstration of the effect of land clearing. The differences in geometry of the channel in a pasture and in a forest tell a story of the effects of agriculture on streams. These are just a few examples of the topics that can be developed in the three main branches of environmental education: school curriculums, programs for municipal officials and citizen programs. They are obviously related, in that students will grow into voting citizens who, when knowledgeable about the importance of protecting aquatic environments, will elect officials that understand and are sympathetic to the same concerns. The challenge then is to develop an integrated program that will not rely on the interest of a few individuals to sustain itself, but will be incorporated into the regular operations of school systems, municipalities, and conservation organizations.

School Curriculum

There are nine elementary schools, three middle schools, two high schools, and seven parochial or other private schools in the watershed, as well as Immaculata College, Widener University, and the Pennsylvania Institute of Technology. The public schools fall within seven different school districts, but all are subject to state requirements to include environmental education in their curriculums.

The Ridley Creek offers a local opportunity to study the environment at any grade school level. Within an easy day's field trip are the headwaters in Chester County at Hershey's Mill and the wetland boardwalk at the Bow Tree Open Space, Ridley Creek State Park, the Media Wetland at Gleave Baker Park, and the tidal section accessible at Sun Village Park in Chester. The stream literally flows right through the grounds of East Goshen Elementary School, Willisbrook Preserve and its serpentine barrens are right across Sugartown Road from Sugartown Elementary School, and small tributaries are close to many other primary schools. Wallingford-Swarthmore and Rose Tree-Media School Districts have the special distinction of having elementary, middle and high schools within the watershed. In these two districts a long-term educational relationship with the stream could be developed, where understanding of freshwater ecosystems deepens with the students' ability to understand more complex material. Conestoga High School's Advanced Research Biology Students will be studying the Ridley in fine detail in the 1996-97 school year, under the direction of Norman E. Marriner. Mr. Marriner's students study a local stream each year as a means to understand scientific process, report production and limnology. Their report on Crum Creek from 1995 is a fine piece of work that could be used as a model by the high schools in the area.

The impact of human activities can be clearly demonstrated on the Ridley Creek, with trips to sewage treatment facilities, mapping and labeling storm drainage systems, or viewing farmland and urban areas. There are opportunities for interested students and teachers to develop or participate in restoration or cleanup projects as a community service and learning experience. Scouting groups and other service organizations should also be made aware of the possible projects.

Curriculum Recommendation

- Local School Districts, either working through their intermediate units or private environmental education contractors, should develop curriculum materials that incorporate the available resources of the Ridley Creek Watershed. The work of Norman Marriner at Conestoga High School and the elementary school program of the Brandywine Valley Association (see Appendix D for contact person) could serve as models .

Watershed Citizens' Education Recommendations

- The responsibility for educating citizens falls on local conservation organizations, local officials, and to some extent, Philadelphia Suburban Water Company. A practical approach to accomplishing this would be to organize the effort around an annual period of events. This "Ridley Creek Week" or month, or series of events would allow otherwise busy, and probably unpaid, coordinators to concentrate their attention during an anticipated time. The kinds of activities might include stream cleanups, park and trail maintenance, ecological studies at public parks, labeling of storm sewer inlets, bike tours, guest speakers, or tours of riparian buffer planting demonstration sites. Whatever the imagination of the sponsors would produce, the focus would be on projects that allow participants to see the Ridley Creek's many assets, and what we do, good and bad, to effect them.

  Chester-Ridley-Crum Watersheds Association (CRC) is the ideal candidate for leading this effort, through "The Friends of Ridley Creek" affiliate. CRC could solicit assistance from the municipalities, land conservancies, private foundations, and utilities to fulfill aspects of the integrated program. Important partners for CRC would be Trout Unlimited and the Delco Anglers, fishing organizations which already conduct stream cleanups and restoration projects on the creek.

- Another means to educate citizens is through municipal mailings. Fact sheets could be produced on topics such as monitoring sewage and stormwater systems, wildlife in the valley, signs of failing septic systems, directions for planting a riparian buffer, state and federal laws, etc. Again, it would likely fall to CRC to produce the text for such documents, which could then be put into the appropriate format by the municipalities. Planning Commissions and Environmental Advisory Boards would likely have members with the professional experience and interest to assist in the creation of these documents.

- The regular production of a watershed newsletter is an alternate means to achieve citizen education. Possibly quarterly, a newsletter could cover the material mentioned as topics for the fact sheets. Municipal sponsorship of the newsletter would be an excellent way to lend it weight. It would also allow municipalities to make their citizens aware of environmental issues. Modest contributions to the cost of producing the document by participating townships, along with help from the Rivers Conservation Program, would make the newsletter possible.

- A powerful means to introduce riparian buffers and bank stabilization would be a series of demonstration projects on public or quasi-public lands. Here CRC, municipalities, and the fishing organizations could show citizens how the plantings are installed and maintained. Ideally the sites would be adjacent to existing forest buffers and lawn or pasture, to have all three conditions within an easy walk. Bow Tree Open Space, Gleave Baker Park, Elwyn Institute,

and Chester Park are all excellent candidates for demonstration sites.

- A unified signage system would help residents identify public areas within the watershed outside of their neighborhood. Very few residents of the area currently organize their "mental map" by watershed. This can only happen if they are presented with reminders that, for example, a trail in Brookhaven follows the same stream that flows through the park in Middletown, or when every bridge on the Ridley has a similar sign. Such a system should be married to the historic site marker system so that, in daily travels on watershed roads, residents build up a solid understanding of where the Ridley comes from and goes to, and the beautiful parks and historic structures in the watershed.

7

PUBLIC ACCESS & RECREATION

GOAL

- *As a major open space resource, access to the Ridley and its tributaries should be sufficient to satisfy demand, so as to discourage trespass on private lands.*

MANAGEMENT OBJECTIVES

1 Local governments should acquire, or otherwise make available to the public, selected streamside tracts.

2 New trails along the stream or in the rights-of-way of adjacent roads should be developed, and where possible, connect noncontiguous protected lands.

3 Modest facilities for parking, wildlife observation, fishing, and other passive activities should be constructed on public streamside lands.

4 Public lands should be consistently policed to discourage abuse through vandalism and littering.

5 Public and private landowners should be made aware of the liability protection offered by state law for opening their land to public use.

6 Local governments should encourage private landowners to provide public access to the stream assisting them in risk management.

7 Non-profit institutions with large land holdings in the Ridley Creek watershed should be provided technical assistance to develop public access to their property (e.g., walking trails).

BACKGROUND

There are twenty-two public parks in the watershed, with twelve providing direct access to the Ridley Creek. East Goshen Township (242 acres), the City of Chester (112 acres), and Rose Valley Borough (26 acres) have the largest municipal systems within the watershed. Nether Providence will soon surpass Rose Valley when it completes its purchase of the 44 acre Houston Tract (bringing its total to 53 acres). Figure 5 shows the distribution of parks throughout the watershed.

A number of the public parks and semi-public properties allow access to the stream system. East Goshen has developed an elevated boardwalk over a wet meadow along the creek beside Paoli Pike to allow residents to view common wetland meadow plants without compacting the soil. The former Gleave Baker Park owned by Media Borough, now leased to Philadelphia Suburban Water Company, features a trail along the stream and an observation platform built over the "Media Wetland", a County Natural Area . Middletown Township (4.5 acres along the creek) and Ridley Township (8 acres), and Parkside Borough (6.2 acres) also have access points to the creek from public parks.

The giant of the parks is Ridley Creek State Park, with its 2,606 acres stretching completely across the watershed and three-mile frontage on the creek. The state park, in the opinion of DEP, is an important reason for the continued high quality of the creek's water (Steve T. Schubert, PaDEP Water Pollution Biologist, "Aquatic Biology Investigation, Ridley Creek", 11/20/95). Its multi-purpose loop trail on the former Sycamore Mills and Forge Roads is heavily used all year. Unfortunately, demand is so high that vehicles routinely park by the stream on the shoulders of Bishop Hollow Road, Barren Road and Chapel Hill Road to gain access to the trail entrance.

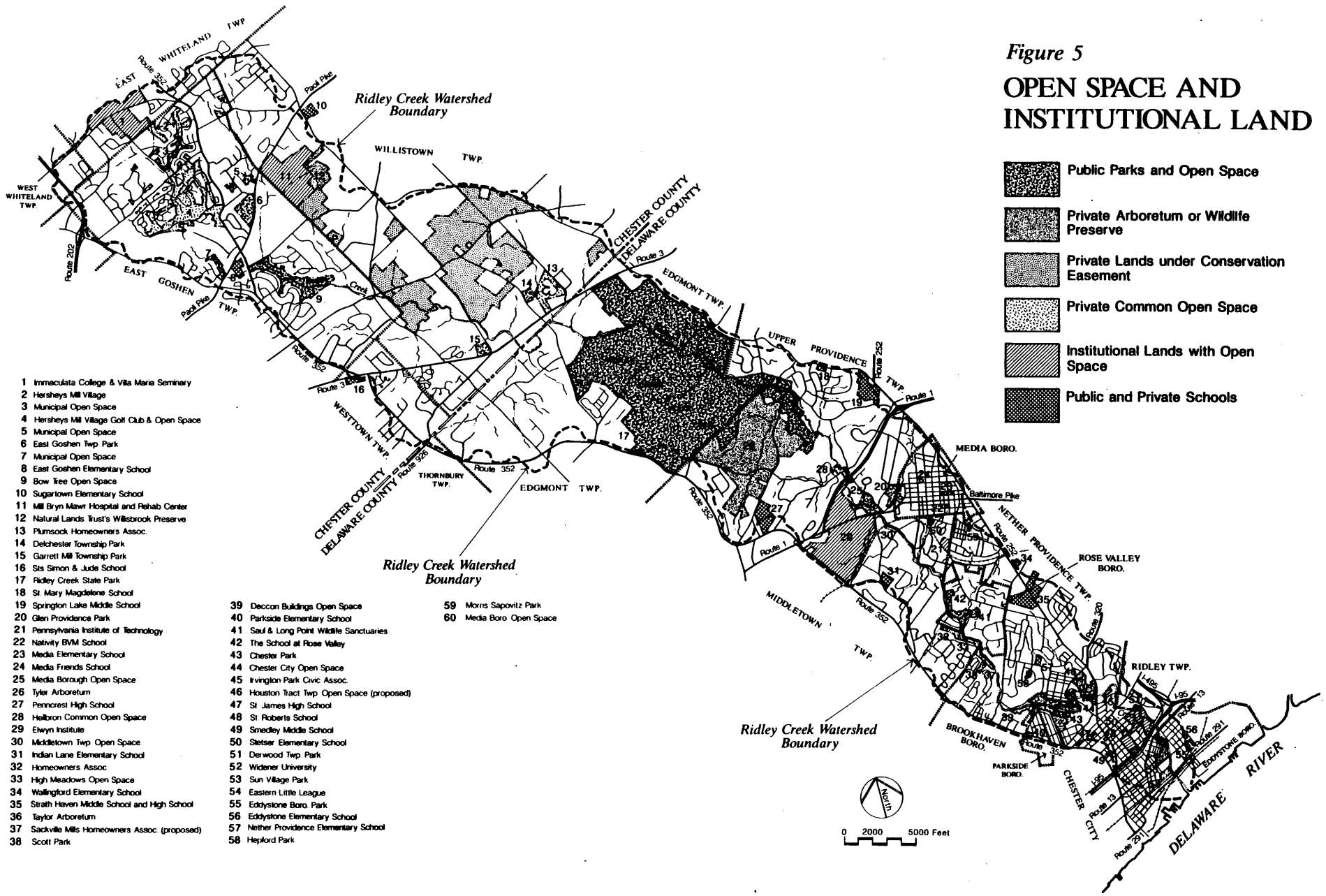
In addition to the public parks there are seven homeowners association or civic association properties that provide common access for their residents, and three private preserves, Tyler Arboretum, Willisbrook Preserve and Taylor Memorial Arboretum (the latter two managed by Natural Lands Trust). Figure 5 also shows the locations of the twelve public and eight private schools in the watershed which provide varying amounts of recreational facilities. Immaculata College, Widener University, Pennsylvania Institute of Technology, Bryn Mawr Rehabilitation Center and Elwyn Institute are also shown because of their large, quasi-public acreage.

Despite the number of existing municipal parks and school grounds, assessments of the adequacy of existing parkland to meet the regional standards have found that every municipality in the watershed (save two-- Middletown and Rose Valley Borough) is lacking sufficient parkland. Delaware County itself, as opposed to its constituent municipalities, was shown to have only 15% of the parkland it should possess for its population.The standards for parkland used in these assessments were adapted from national standards by the Delaware Valley Regional Planning Commission and are widely used throughout the Philadelphia metropolitan area. The Chester County municipalities conducted their assessments as part of their "Open Space, Recreation and Environmental Resources Plans", which were done under the county open space program. Delaware County Planning Department conducted an assessment of the entire county in 1995 ("Delaware County Open Space Project, Recommended Strategy", February 1995).

Assessments such as these are an inexact science. For instance the presence of Ridley Creek State Park in Middletown and Edgmont does not affect their requirements for neighborhood and community parks, nor does Glen Providence Park, a county

Figure 5

OPEN SPACE AND INSTITUTIONAL LAND



1 Immaculata College & Villa Maria Seminary
2 Hersheys Mill Village
3 Municipal Open Space
4 Hersheys Mill Village Golf Club & Open Space
5 Municipal Open Space
6 East Goshen Twp Park
7 Municipal Open Space
8 East Goshen Elementary School
9 Bow Tree Open Space
10 Sugartown Elementary School
11 Mill Bryn Mawr Hospital and Rehab Center
12 Natural Lands Trust's Willisbrook Preserve
13 Plumsock Homeowners Assoc.
14 Delchester Township Park
15 Garrett Mill Township Park
16 Sts Simon & Jude School
17 Ridley Creek State Park
18 St. Mary Magdelene School
19 Springton Lake Middle School
20 Glen Providence Park
21 Pennsylvania Institute of Technology
22 Nativity BVM School
23 Media Elementary School
24 Media Friends School
25 Media Borough Open Space
26 Tyler Arboretum
27 Penncrest High School
28 Helbron Common Open Space
29 Elwyn Institute
30 Middletown Twp. Open Space
31 Indian Lane Elementary School
32 Homeowners Assoc.
33 High Meadows Open Space
34 Wallingford Elementary School
35 Strath Haven Middle School and High School
36 Taylor Arboretum
37 Sackville Mills Homeowners Assoc. (proposed)
38 Scott Park
39 Deccon Buildings Open Space
40 Parkside Elementary School
41 Saul & Long Point Wildlife Sanctuaries
42 The School at Rose Valley
43 Chester Park
44 Chester City Open Space
45 Irvington Park Civic Assoc.
46 Houston Tract Twp. Open Space (proposed)
47 St. James High School
48 St. Roberts School
49 Smedley Middle School
50 Stetser Elementary School
51 Derwood Twp. Park
52 Widener University
53 Sun Village Park
54 Eastern Little League
55 Eddystone Boro. Park
56 Eddystone Elementary School
57 Nether Providence Elementary School
58 Hepford Park
59 Morris Sapovitz Park
60 Media Boro. Open Space

park, influence the municipal park totals required for Media Borough and Upper Providence, where it is located. But regardless of these shortcomings, the consistent findings demonstrate that, while the exact acreage needed is disputable, the simple need for additional parkland in the watershed is not.

Evidence of trespassers on private property corroborates the findings of the parkland adequacy assessments. Non-formal access points are being utilized throughout the stream corridor. The following are examples:

- The intersection of Ridley Creek Road and Rose Tree Road in Upper Providence and Middletown at spring trout stocking time may have more than a score of anglers' vehicles parked on the shoulders. The banks here, owned by a homeowners association, Elwyn Institute, Media Borough and a private nursing home, are well worn during the season.
- Near the Leslie Quick Stadium at Widener University in Chester a network of footpaths connect the stubs of public streets to the campus grounds along the creek.
- At Goshen Village Shopping Center on Boot Road in East Goshen a trail wends through the streamside forest that splits the shopping center.
- Trails run on both sides of the creek, through private property, below the Irvington Mills dam in Chester and Ridley Township.

Along some of these trails there is evidence of littering by their users. When asked about trespassers and littering, 67% of those landowners that responded to the opinion survey (see Appendix C) checked that they considered trespassers a problem on their property. Unfortunately for the many responsible people who fish the Ridley Creek, some landowners report isolated incidents of littering or trespassing by fishermen. This is particularly problematic because anglers are an important constituency with much to contribute to the improvement of the creek. Numerous discussions with anglers during the course of the study revealed an intimate knowledge of favorite sections of the stream, concern for evidence of diminished water quality, a desire to make improvements that would improve in-stream habitats for fish, and a strong desire to gain greater access to the stream (Peter Stunzi, President, Delco Anglers, pers. comm. 11/5/96). It is important for fishing organizations such as Trout Unlimited and the Delco Anglers to de-link the landowner misperception that connects fishing and litter by continuing and expanding their cleanup, education, and restoration projects. By demonstrating their commitment to clean streams, responsible anglers will earn the well deserved goodwill of streamside landowners.

Recommended Sites for Additional Public Lands and Trails

With the advent of the State's "Key 93" funding program, State funds have become available to municipalities (or counties) that wish to acquire public parkland or develop trails. Upon the Ridley Creek Conservation Plan's acceptance by DCNR, the stream will be added to the state "Rivers Conservation Registry". This will increase a municipality's chances of receiving acquisition and development funding from the state for parks related to the creek, particularly if the municipality has endorsed the plan.

The open space plans of Willistown and East Goshen, and the Delaware County Open Space Project Report emphasize the need for more neighborhood parks. These are small parks of 5-15 acres with little active recreation, which should be scattered evenly throughout a municipality's residential areas.

A Note on Trails- Proposals for development of public trails often causes contentious debate among trail advocates and

private property owners adjacent to the proposed trail. Private property owners fear increased litter, vandalism and loss of privacy. The experiences of other communities throughout the country have consistently shown that:

- a majority of trail users live in adjacent neighborhoods
- well-used trails are generally self-policing
- well-used trails are those that have a logical beginning and end, that actually provide a desired route for pedestrians
- the initial fears of property owners of increased crime and litter are not borne out
- unsupervised pets and litter are the two most widely reported problems
- limiting access from parking areas decreases disorderly conduct
- dead ends have a greater tendency to become a nuisance

Bearing in mind these findings, the only trails that should be formalized in the Ridley watershed are those that:

- begin and end at public rights-of-way or parkland
- will be the responsibility of a municipality or county
- will not be provided parking exclusively for the trail

The Willistown, East Goshen, and Middletown open space plans show proposed trails throughout the watershed (see Upper Section, Master Plan). The Master Plan also shows a few additional locations where existing informal trails could be formalized according to the standards above.

A number of candidate sites for parks and trails are listed below as a means to assist the selection process for parkland. Many have already been identified in other municipal plans as being potential park and trail sites (these are indicate by an *). The Master Plan illustrates the relationship of these sites to existing parks.

- **East Whiteland**
  - *Immaculata Connector Trail*- to connect East Goshen's proposed trail on Hershey Mill Road to the main campus of the college, through Villa Maria House of Studies
  - *Great Valley Little League Trail*- to connect East Goshen's proposed trail from its end at the Township boundary to the little league fields on King Road

- **East Goshen**
  - *Grace Estate**- stream valley portion of this largest remaining undeveloped property on the Ridley has been targeted for township open space upon its eventual development.
  - *Smith-Kline-Beecham property**- Township has offered to purchase a portion of this property to expand its municipal park and to connect it to the Bow Tree Open Space
  - *Forest Lane tract**- two properties were identified as being potential parks, the northern as a township (community) park and the southern as a neighborhood park. The southern parcel is now being developed, but the northern remains a potential community asset.
  - *Hershey Mill Road tract**- potential neighborhood park at the northern boundary of the township, would connect Villa Maria House of Studies in East Whiteland to the Township greenway system.
  - *Township Greenways system**- a trail system identified in the Township open space plan

- **Willistown**
  - *Dutton Mill Marsh tract*- wetland site identified in County Natural Area Inventory,would meet a recognized need for a park in that quadrant of Willistown if sensitively improved as a passive park
  - *Penn's Preserve/Okehocking Tract*- portion of a large development proposal, corridor along Ridley Creek and

proposed trail link should be protected in township or land conservancy ownership.
- *Proposed Trail Links**- trail system along rights-of-way and across large properties, as identified in open space plan

- **Edgmont**
  - *Ridley Creek State Park to Route 3 Trail*- would connect the State Park to the proposed trail system in Willistown along the stream, through the Edgmont Country Club, US Army Reserve Center and two private parcels.

- **Middletown**
  - *Gleave Baker Park/Mineral Hill Woods/Media Wetlands*- All parcels contained within a continuous triangular natural area bounded by Baltimore Pike, Rose Tree Road, and Ridley Creek Road and recognized in the County Natural Areas Inventory. Township is now considering sub-lease agreement with PSWC on the Gleave Baker Park. The steep wooded portion of the property owned by Elwyn Institute close to the creek should be set aside permanently.

  - *Ridley Creek Trails**-Township called for a continuous trail along the Ridley in its 1988 open space plan. Three separate links are logical first priorities: *Barren Road to Rose Tree Road Trail* link the Heilbron Open Space to Ridley Creek State Park, *Elwyn Loop Trail*, circling the perimeter of the main campus, with spurs to Gleave Baker Park and Brookwood (see below), and a portion of the *Brookhaven Trail* through the Highmeadows Open Space to Long Point Sanctuary in Rose Valley.

- **Rose Valley**
  - *Rose Valley Sanctuaries* - Rose Valley Borough already holds 26 acres of donated preserves on which it maintains nature trails. These preserves could be expanded through the acceptance of additional parcels along the stream. Undeveloped lands along the east bank of the Ridley Creek across from Long Point Sanctuary are particularly appropriate due to proximity to existing Borough-owned land, scenic beauty, and the remnant of the Minquas Indian Trail that traverses the area.

- **Upper Providence**
  - *"Pines" Property*-Owned by Media Borough and leased to PSWC. It is a wetland and wooded tract that forms part of the large County natural area described above, in Middletown section.
  - *"Brookwood"*- a 36-acre property straddling the creek between the Pines and land owned by Elwyn Institute. Would provide linkage should the Pines and the Elwyn piece be set aside as public open space. Acquisition could be limited to area along the creek.
  - *Kirk Lane and Highland Road site*- Large undeveloped woods and old pasture would provide connection between Glen Providence Park and the Pines property.
  - *West Street to Rose Tree Road Trail*- Through Glen Providence Park to the Kirk Lane Tract and the Pines and Brookwood Properties, ending at the Media Borough land at Rose Tree Road.

- **Nether Providence**
  - *Houston Tract* *- a 44-acre woodland estate with a tributary stream valley, recognized by Township as a critical piece of open space, was purchased by the Township in August of 1996. The Township plans to develop trails and other possible recreational facilities on the site.
  - *Nether Providence Trails*- The Township should consider a walking trails development study to plan a trails system and determine the means to maintain them. Such a plan should include an assessment of citizens' recreational needs.

- **Brookhaven**
  - *F & T Investment tract-** A seven acre streamside parcel, apparently a remnant of the adjacent residential subdivision. It connects the Ohev Sholom Cemetery to Scott Park and the proposed open space of the Sackville Mills townhouse development in Nether Providence, creating a continuous corridor of open space north from Brookhaven Road, all the way to Long Point Sanctuary in Rose Valley Borough. Mentioned as future conservation land in the Brookhaven Comprehensive Plan.
  - *Brookhaven Trail-* a trail connection from Brookhaven Road north to Ridley Creek Drive in Highmeadows.
  - *Meadowbrook Lane to Williamson Avenue Trail-* starting from the Parkside Borough Woodlot, through the Deccon Buildings common open space and the Texas Eastern Co. pipeline yard to Williamson Avenue

- **Chester**
  - *Mellon Bank/Chestnut Street bridge tract-* a ten acre piece that would link Chestnut Street to Route 320 in continuous Chester City parkland, Houston tract is on the other side of the creek.
  - *Chester Park to MacDade Boulevard Trail-* From Chester Park to Chestnut Parkway to Chestnut Street Bridge, through Mellon Bank property and city-owned open space to Route 320, and through vacant land and Irvington Civic Association land along creek to Irvington Mills and 25th Street, across 25th, through vacant land and Chester Redevelopment Authority property to MacDade.

- **Ridley**
  - *MacDade to Chester Pike Trail-* From service drive of Woodlyn Shopping Center on MacDade to Derwood Park to lands of Widener University, under Blue Route to Chester Pike

* already targeted for acquisition in municipal plans

Public Use of Institutional Lands

Opportunity exists for greater public use of the large acreage held by institutions in the Ridley Creek watershed. As a current example, the Greater Chester Valley Soccer Association will be using a portion of the Bryn Mawr Rehabilitation Center grounds to construct a number of soccer fields. Also, Elwyn Institute has expressed a qualified interest in opening a perimeter loop trail to the public (Dr Sandra Cornelius, Elwyn Institute, pers. comm., 5/31/96). Immaculata College and Widener University may also be convinced that opening a portion of their properties to public traverse may allow them to channel existing public trespass into known and managed locations. Municipal construction and patrolling of such trails would certainly increase institutional interest and would provide municipalities with public trails without the cost of purchasing the land.

Another means of public/institutional cooperation could be in land management. This could take the form of a planting program on the grounds of the institutions, but it could also include technical assistance from Widener and Immaculata to municipal programs for other private properties, including perhaps buffer designs and plant lists.

Public Use of Private Land/Liability Issues

When a private landowner considers opening the property to some form of public use, concern regarding liability for the personal injuries of the users is paramount. Unfortunately, this

concern can prevent a well-intentioned landowner from providing a public service that, thanks to Pennsylvania state law, carries very little liability. The Recreation Use of Land and Water Act (1966) was passed to encourage landowners to make land and water areas available to the public by limiting their liability to tort claims. The act states that a landowner has no "duty of care to keep the premises safe for entry or use by others for recreational purposes, or to give any warning of a dangerous condition, use, structure, or activity..." Allowing entry does not give the user status as an invitee or licensee, or implies that the property is safe. The only requirements for the landowner are that no fee for use of the land is charged, and that known dangerous conditions are not hidden willfully or maliciously. Willfulness has been defined in case law as voluntarily, intentionally or knowingly hiding a condition that is not obvious to someone entering the premises (*"Pennsylvania Land Conservation Handbook"*, Allegheny Land Trust, 1996, page VI-3). This same protection has been extended to local governments on their recreational lands. The Pennsylvania Rails-to-Trails Act provides the same protection for private landowners who provide free trails for the public.

Liability Recommendations

The clear protection these laws provide may not prevent an injured person from pursuing a spurious claim against a property owner. Protecting innocent property owners from the cost of defending such suits should be seen as a challenge by local governments to support their citizens' charitable public service. There are no easy solutions to this problem in a litigious society. However a municipality may be able to provide a free risk assessment of the property through its insurance carrier. Such a service may consist of a site inspection and a review of owner's current insurance to ensure its adequacy.

9

COORDINATION AND ADMINISTRATION

GOAL

- *A means to implement the recommendations of the Conservation Plan should be found that involves a cooperative effort of the major stakeholders, with or without the creation of new institutions.*

MANAGEMENT OBJECTIVES

1 Each municipality within the watershed should adopt the Ridley Creek Conservation Plan.

2 One municipal body per municipality (e.g., Planning Commission or Environmental Advisory Commission), should be charged with the responsibility to monitor and initiate projects recommended in the Conservation Plan.

3 An organization with a mission throughout the Ridley Creek watershed, in the nature of a inter-municipal body, watershed association, or land trust, should assist in municipal implementation of the recommendations and become an advocate and implementor of recommendations that cross municipal boundaries.

4 The Pennsylvania Rivers Conservation Program should consider supporting multi-year funding of a program that would build the institutional framework for implementation.

5 County, State, and Federal agencies with responsibility within the watershed should become familiar with the recommendations in the Conservation Plan and implement its recommendations within the context of their specific missions.

BACKGROUND

A practical means to carry the Conservation Plan from a series of recommendations into actual implementation is tremendously important to its ultimate usefulness. The Rivers Conservation Program, under which this plan was developed, requires that the matching funds for implementation be requested by municipalities, or by organizations that are sponsored by the municipalities. Only municipalities that have passed the plan by a resolution of the governing body will be eligible for the funding (see Appendix F for a sample resolution). The Rivers Conservation Program therefore encourages municipalities to be the primary implementers of the plan.

The form that municipal support can, or should, take is the topic of this section. There are probably four general forms that municipal implementation could take. A description of each form follows. Each has unique strengths and weaknesses, and further study may find a hybrid form that would best suit the Ridley Creek.

Individual Municipalities

The first administrative model is simply the initiative of individual municipalities taking advantage of whatever aspects of the Conservation Plan that suit their particular priorities. In this method a local government body, either the Planning Commission, Park and Recreation Board, or Environmental Advisory Commission would be responsible for implementing the plan. Due to the nature of the Township and Borough system, there is sure to be a measure of this form of implementation regardless of whatever other forms occur. The greatest advantage to this implementation model is its simplicity. There is no need for intermunicipal cooperation or new institutions. The Ridley Creek Conservation Plan simply becomes another planning tool to be used when the municipality has a need the River Conservation Program can help address.

However, individual municipal action has the drawback of being uncoordinated with the needs of the entire watershed. Intermunicipal cooperation is usually given higher ratings than individual municipal actions by grant-making agencies because it can address issues that cross jurisdictions. Individual action is also dependent on interested individuals within each municipality to advance the conservation plan. Over time individuals on Boards and Commissions change and institutional memory can be lost. But for certain items, for instance the acquisition of public open space, the development of a streamside trail, construction of an observation platform, or other site specific improvements, individual municipal action seems to be the most logical form of implementation.

Intermunicipal Committee

A second model for implementation is an intermunicipal body. Such a body could be a simple coordinating committee of appointed representatives of each municipality (and possibly Philadelphia Suburban Water Company, the Conservation Districts and the two County Planning Commissions). It would be charged with developing an implementation agenda to address issues that cross jurisdictions and that would balance the needs of the various municipalities. This could be particularly important if several municipalities would be interested in receiving funding in a single cycle. In such cases the committee could package the requests under a single project submission to avoid competition within the Ridley watershed. It could develop proposals for intermunicipal joint projects. The committee would be responsible for amending the Conservation Plan

recommendations as new project priorities develop, ensuring that state funding could continue to be put to work on the Ridley. It could have regular meetings chaired by rotating representatives, or meetings timed to funding cycles called simply to discuss the projects for which funding would be sought. The Lancaster Intermunicipal Committee is an example of such a cooperative venture in southeastern Pennsylvania (see Appendix D for contact name and phone number).

Pennsylvania State Law actually provides for such a committee through Act 148 (1973), which established the right of municipalities to set up Environmental Advisory Boards (EAC), also authorized them to set up multi-municipal EACs.

An intermunicipal committee is well-suited to address watershed-wide issues, such as a non-point source pollution management program (which might include a riparian buffer planting program, educational outreach to homeowners, commercial and institutional properties on reducing nutrient and pesticide use, and model ordinances for buffers, erosion control, and other environmental protection). It could be particularly useful for efforts to influence state and federal actions in the watershed. It could make sure that state and federal officials are aware of the findings and recommendations of the Conservation Plan and incorporate the recommendations into their permitting decisions. For instance, reviews of water quality designations, permitting for new sewage treatment facilities, comprehensive stormwater management plans, road and bridge improvements, and Coastal Zone Management projects all could benefit from the support (or opposition, as the case may be) from an intermunicipal committee.

The intermunicipal committee would benefit from the official sponsorship of Chester and Delaware Counties. The County Planning Commissions would be ideal organizations to provide the administrative support necessary for calling the meetings and preparing minutes, agendas, grant requests, annual reports, etc. Central coordination by the Counties is quite important because more immediate, local, and competing demands for time and resources tend to divert local governments' attention. The greatest limitation on a committee is likely to be the amount of existing County and local government staff time and funding that can be diverted from other programs, or new funding that can be found to devote to the Ridley Creek watershed.

The Department of Conservation and Natural Resources would increase the chances of a model Rivers Conservation Program Conservation Plan being established on the Ridley Creek by finding state and federal sources of funding to underwrite the beginning years of the committee's work. The municipalities' contributions to the committee could be a flat rate, or could be based on some formula using land area within the watershed, population, and total assessments.

Ridley Creek "Greenway" Authority

A second type of intermunicipal cooperation could take the form of a municipal authority charged with implementing the Conservation Plan. While municipal authorities are more commonly used for expensive infrastructure projects such as water and sewer systems, the Pennsylvania Municipal Authorities Act allows their creation for both flood control and park and recreation facilities ("*Municipal Authorities in Pennsylvania*", Department of Community Affairs, page 1). Just such an Authority was created for the LeTort Spring Run watershed in Cumberland County in the wake of flooding by Hurricane Agnes (see Appendix D for contact name and phone number). Authorities are a familiar and efficient means to manage projects in the public interest that naturally cross municipal boundaries.

Municipalities create authorities and appoint members to their

boards, but authorities are not part of municipal government. They are charged with a specific mission and are given the responsibility to finance the mission through bonds, special assessments on property in the service area, user fees, or by contributions from member municipalities.

A Ridley Creek "Greenway" Authority could be given the mission of making long-range plans for the corridor, owning streamside lands (either fee simple or easement), educating officials and citizens in watershed protection, managing the watershed public lands, and assisting municipalities in applying and administering grants.

An authority could be an attractive holder of common open spaces that it either purchased outright or that was produced by cluster developments. It could also hold conservation easements on common open spaces to ensure that homeowners associations do not neglect their management responsibilities. As previously mentioned, when Nether Providence Township required the developer of the Sackville Mills property to dedicate an easement on the common open space along the Ridley Creek, Natural Lands Trust, Inc., a local public charity, agreed to hold the easement. Natural Lands Trust was under no obligation to accept the easement and may have decided against it. Furthermore, the Township may have preferred to have a public agency more directly accountable to the Township hold the easement (accountable in the sense that Nether Providence would have an appointee on the board and would provide some of the base funding). In other situations a township may not wish to hold additional open space but would support public ownership by another agency.

As a long-range planner, grant administrator, and educator the Authority could function in the same capacity as the intermunicipal committee described above. Its by-laws should be written to insure that municipalities have a strong voice in plans that would effect lands in their jurisdiction.

The funding of an authority needs careful consideration. In the cases of sewer or transportation authorities there are clear sources of revenue, in service fees and tolls, to pay for the cost of constructing improvements and administration. A Ridley Creek Greenway Authority would not have the same ability to retrieve its costs proportionately from individual beneficiaries. For basic operations a likely funding source could be as described in the intermunicipal committee section, i.e., a proportional municipal contribution based on area in the watershed, population, and real estate assessment. As the authority became an easement holder and land manager it could receive additional income from monitoring funds required from easement donors, and contract fees from the municipalities in which the managed lands were located. It could also retain a certain portion of grant awards for administrative overhead. A detailed study of the likely costs and sources for funding should be done before choosing -- or rejecting -- an Authority as the best means of implementation.

The single greatest advantage of the Authority may be its ability to hold land and easements. Secondarily it has advantages similar to the intermunicipal committee: an organization focused on implementing the recommendations of the Ridley Creek Conservation Plan, undistracted by competing demands. Permanent funding would appear to be the most important hurdle to its implementation, followed by the crafting a structure that respects member municipalities' autonomy while still implementing programs that benefit the entire watershed.

Private Non-Profit

The last form of implementation body considered here is a private non-profit conservation organization, either a watershed

association or land conservancy (often called a land trust). Both types of organizations are public charities. There are numerous organizations of these types in the Philadelphia metropolitan area.

A land conservancy's mission is to protect natural areas in a defined geographic area through acquisition of title, holding easements, or assisting governments and private landowners with conservation planning. Donations of land to land conservancies are considered a charitable donation by the Internal Revenue Service if they meet certain requirements. Local land conservancies include the Brandywine Conservancy, Natural Lands Trust, the Middletown Township Land Conservancy, and The Nature Conservancy.

The Brandywine Conservancy (see Appendix D for contact and Phone number) and Natural Lands Trust are the most active in the general area of the watershed. They are also two of the largest and oldest land trusts in the nation. While their missions overlap to a large extent, generally speaking the Brandywine Conservancy is centered in the Brandywine watershed, holds many more conservation easements (including many in the watershed in Willistown Township) than preserves, and focuses its public work on assisting municipalities with conservation planning and ordinance writing (including a strong emphasis on land treatment of sewage, and zoning based on the water holding capacities of soils). Natural Lands Trust's geographic range is wider (including southern New Jersey), it is more committed to owning and managing a private preserve system (including Taylor Arboretum in Nether Providence and Willisbrook Preserve in Willistown), but it also holds easements and assists a wide variety of public and private clients in conservation planning and zoning ordinances.

Watershed associations tend to address wider issues, but with a sharper geographic focus. They may do many of the things that land conservancies do, but they are also more likely to be an advocate for issues that transcend concentration on land as property, such as improved sewage treatment, stormwater management, and the other watershed-wide issues discussed in this report, and they are less likely to have professional staff. The Ridley has long enjoyed the attention of the Chester-Ridley-Crum Watershed Association (CRC). CRC is a volunteer effort, and has relied, since its founding in 1970, on a series of dedicated and creative citizens to accomplish its mission. It was instrumental in the designation of the upper Ridley as a State High Quality Stream (see Sewage Treatment and Water Quality Sections). CRC has remained primarily an advocacy and educational organization. It does not hold land and has no paid staff. For purposes of promoting and implementing this report CRC formed a subcommittee "The Friends of Ridley Creek" in 1995. Its mission remains to be finalized, as its members are awaiting the publication of this plan.

Each watershed association evolves differently. The Wissahickon Valley Watershed Association (WVWA) is a local example of a much larger watershed association (see Appendix D for contact and phone number). WVWA, unlike CRC, owns a considerable amount of property, has a paid staff and headquarters, and runs environmental and advocacy programs. It has also been in existence for many years and has enjoyed the generous philanthropy of Wissahickon Valley residents. It presents a model of an organization the Friends of Ridley Creek could become, given the right circumstances.

Whether the non-profit is a land conservancy or a watershed association, such an organization would have some of the advantages of both an intermunicipal committee and an authority: ability to seek and administer grants, ability to buy land and hold easements, and, especially with a watershed association: focus on the watershed. It also adds another advantage municipal bodies do not have: flexibility to modify programs and focus, without revising statutory responsibilities or facing the electorate. A land conservancy may also have a larger staff of

professionals than most municipalities can afford to keep on retainer. In this they are similar to the Chester and Delaware County Planning Commissions, except that their expertise includes land management, along with planning and zoning.

These advantages are balanced by disadvantages the municipal bodies do not have: no source for new operating funds besides grants, no official standing to seek state River Conservation grants without the sponsorship of municipalities, and less influence on state and federal decision-making in the watershed.

Land trusts generally do offer the public use of their preserves. However, land purchased or eased by private conservation organizations without the use of public money does not have to be opened to the public if the organization does not wish to. For a landowner who wishes to permanently protect his or her land's natural resources without sacrificing complete privacy, conveying a conservation easement to a land trust is advantageous. But if public access is a critical reason for protecting a piece of property, public agencies or local governments should be involved in their acquisition. Public funding programs such as Key 93 require public access, even when the funds are granted to land trusts.

Administrative Recommendations

The particular strengths that each implementation form possesses argues for a hybrid implementation strategy utilizing their benefits and mitigating their disadvantages. The Management Objectives are a reflection of this.

In summary the recommendations are as follows:

- Each municipality should choose a body responsible for the Conservation Plan. This body should determine what projects it would like to pursue, either as a single municipality, or as part of a joint project.
- An Intermunicipal Ridley Creek Environmental Advisory Committee, under the auspices of the Chester and Delaware County Planning Commissions should be formed to:
  - review and select potential projects that cross municipal boundaries, especially a riparian buffer enhancement program
  - apply for matching grants for high priority items
  - investigate the feasibility and interest in maintaining itself as a permanent body, and/or creating a Ridley Creek Greenway Authority
  - develop cooperative agreements with the CRC and a local land conservancy
- The CRC and an interested local land conservancy should develop an understanding to:
  - support CRC's continued work with advocacy and environmental education
  - develop a means to effectively offer land conservancy expertise to individual municipalities and the intermunicipal committee
  - develop a list of potential projects and offer grant administration assistance to the committee for these projects.

AN ACTION PLAN

FOR THE

RIDLEY CREEK

The Action Plan is composed of three sections:

- *A "Master Plan" of site-specific recommendations from the Major Issues section*
- *A proposed "Schedule of Implementation"*
- *"Generic Designs for Riparian Buffers" along the Ridley Creek are shown in cross-section*

MASTER PLAN

The Master Plan illustrates the site-specific recommendations of the Conservation Plan. The length of the Ridley makes mapping a comprehensive plan difficult at a small scale. Therefore the watershed has been split into three sections: upper, middle and lower.

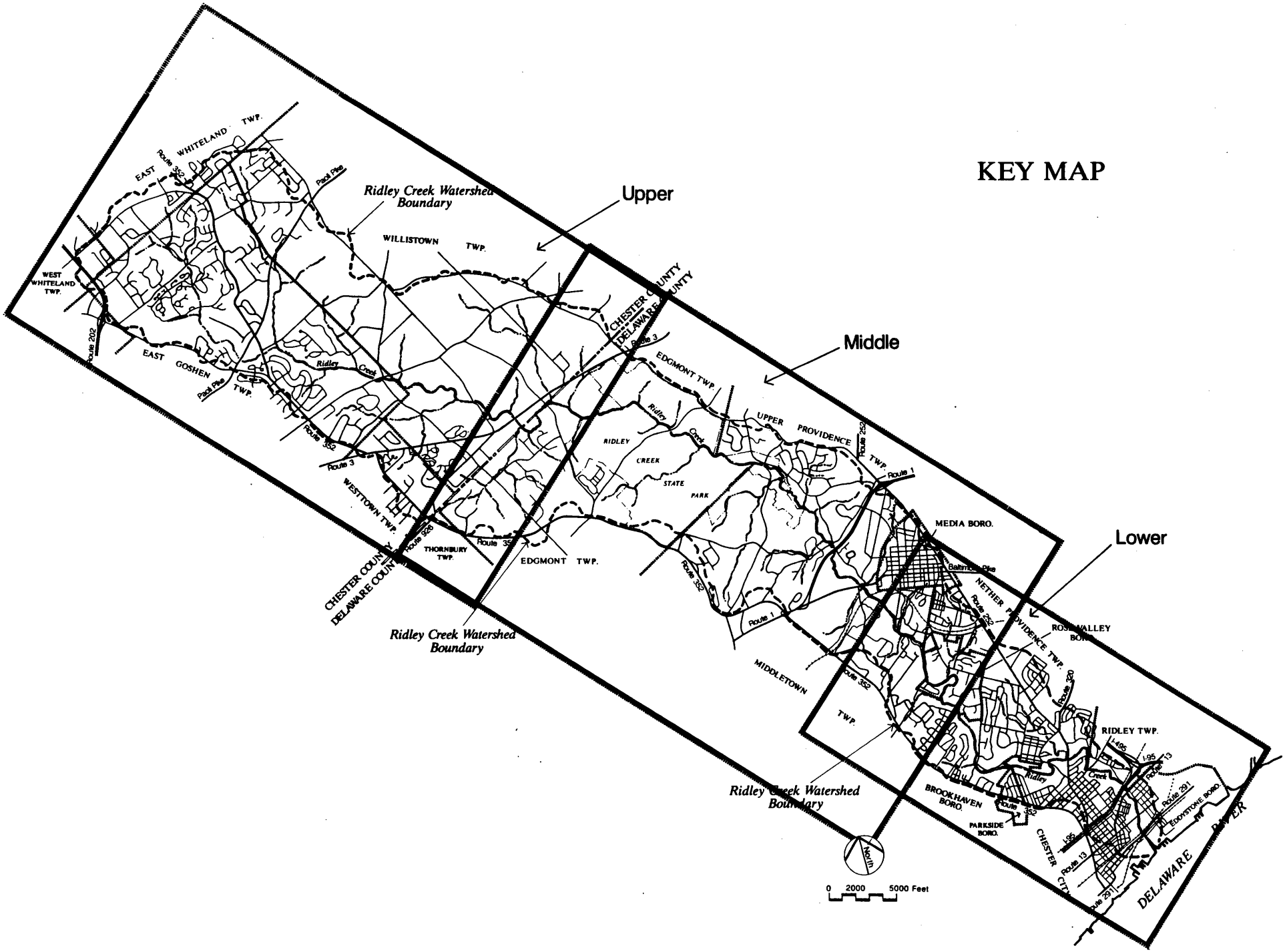
Much of the information on the plan has been discussed in the Major Issues portion of the report (particularly the recommendations from the Public Access & Recreation section) and should be readily understandable on the maps.

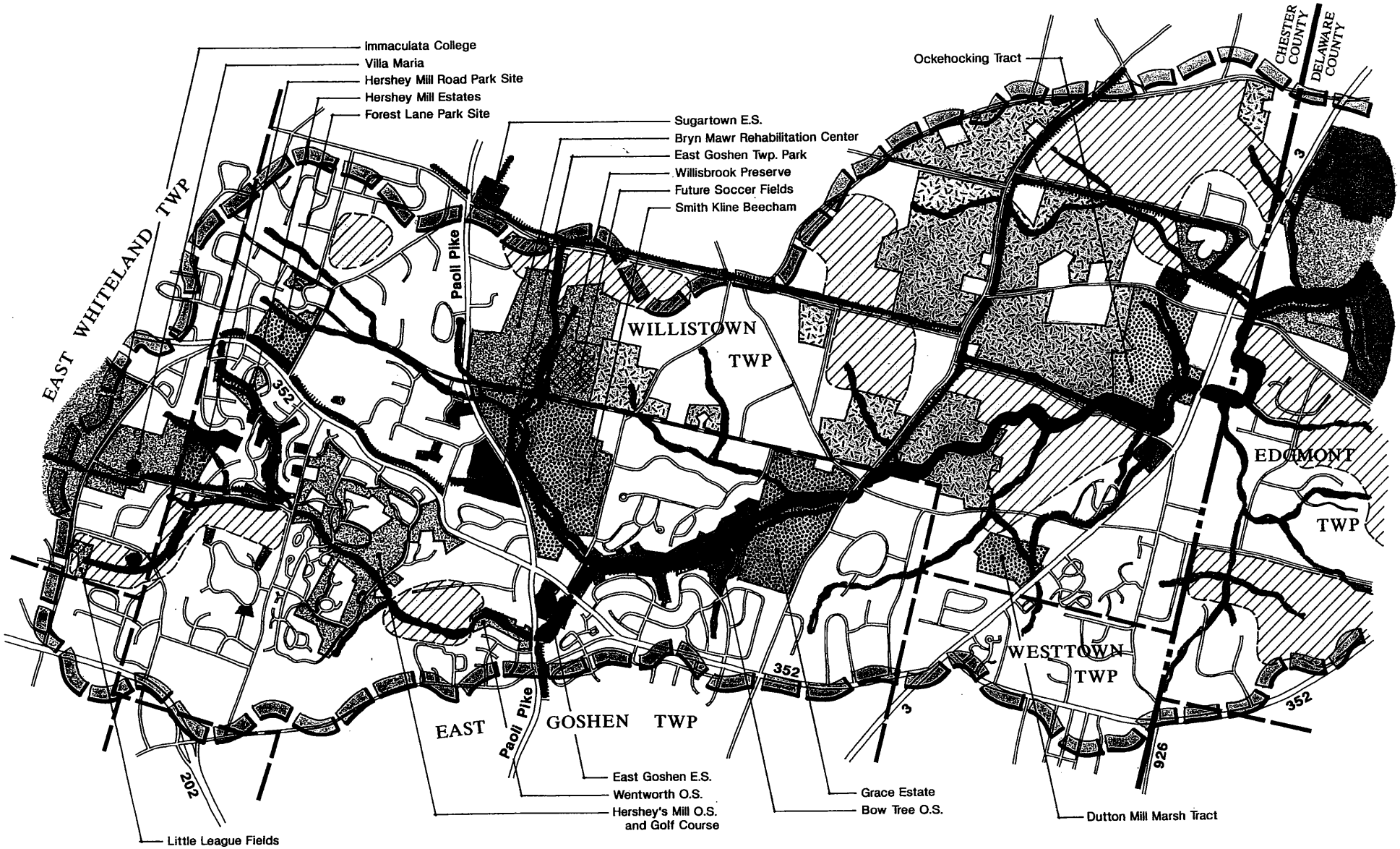
A significant new item shown on the map is a number of **"Conservation Neighborhoods"** *throughout the watershed. These are areas where local initiatives should be undertaken to ensure that the existing character of the neighborhoods is maintained. For instance, in Edgmont, East Goshen and Willistown Townships, the areas where large, as yet unsubdivided, rural properties are concentrated are shown as Conservation Neighborhoods. Here conservation easements would maintain the neighborhoods' beauty and environmental health without new development, or failing that, utilizing cluster designs in new subdivisions could protect sensitive environmental features when development occurs. The valley walls centered on Rose Valley Borough are shown as a Conservation Neighborhood in the hope that the landowners there might come together to protect, through easements and retention of existing woodlands and historic structures, the most beautiful section of the lower Ridley Creek.*

The Conservation Neighborhood concept is suggested in Chester City and Ridley Township between Chester Park and Widener University to call attention to the potential of this area. Citizen action is needed to clean up the litter spoiling the substantial beauty of this stretch of stream. Regular volunteer cleanups and improved maintenance of service areas in commercial establishments and apartment complexes would help tremendously. Municipal enforcement of litter laws in this area would be helpful as well.

For Conservation Neighborhoods to be successful, citizens must first recognize the importance of their neighborhood, and then work with each other and with local officials to realize its permanent protection, through the techniques described in the Conservation Plan.

KEY MAP


Upper
Middle
Lower
Ridley Creek Watershed Boundary
Ridley Creek Watershed Boundary
Ridley Creek Watershed Boundary
EAST WHITELAND TWP.
WEST WHITELAND TWP.
EAST GOSHEN TWP.
WILLISTOWN TWP.
WESTTOWN TWP.
THORNBURY TWP.
EDGMONT TWP.
UPPER PROVIDENCE TWP.
NETHER PROVIDENCE TWP.
MIDDLETOWN TWP.
RIDLEY TWP.
MEDIA BORO.
ROSE VALLEY BORO.
BROOKHAVEN BORO.
PARKSIDE BORO.
EDDYSTONE BORO.
CHESTER CITY
RIDLEY CREEK STATE PARK
CHESTER COUNTY
DELAWARE COUNTY
DELAWARE RIVER
Ridley Creek
Route 202
Route 352
Route 3
Route 926
Route 1
Route 252
Route 320
Route 291
Route 13
I-95
I-476
Pack Pike
Baltimore Pike
North
0 2000 5000 Feet



LEGEND

- Watershed Boundary
- Public and Quasi-Public Lands
- Conservation Easements
- Important Undeveloped Properties
- Conservation Neighborhoods
- Existing Public Trails
- Proposed Public Trails
- *Immaculata Trail*
- *G.V. Little League Trail*

NORTH

0 2000 4000 FEET

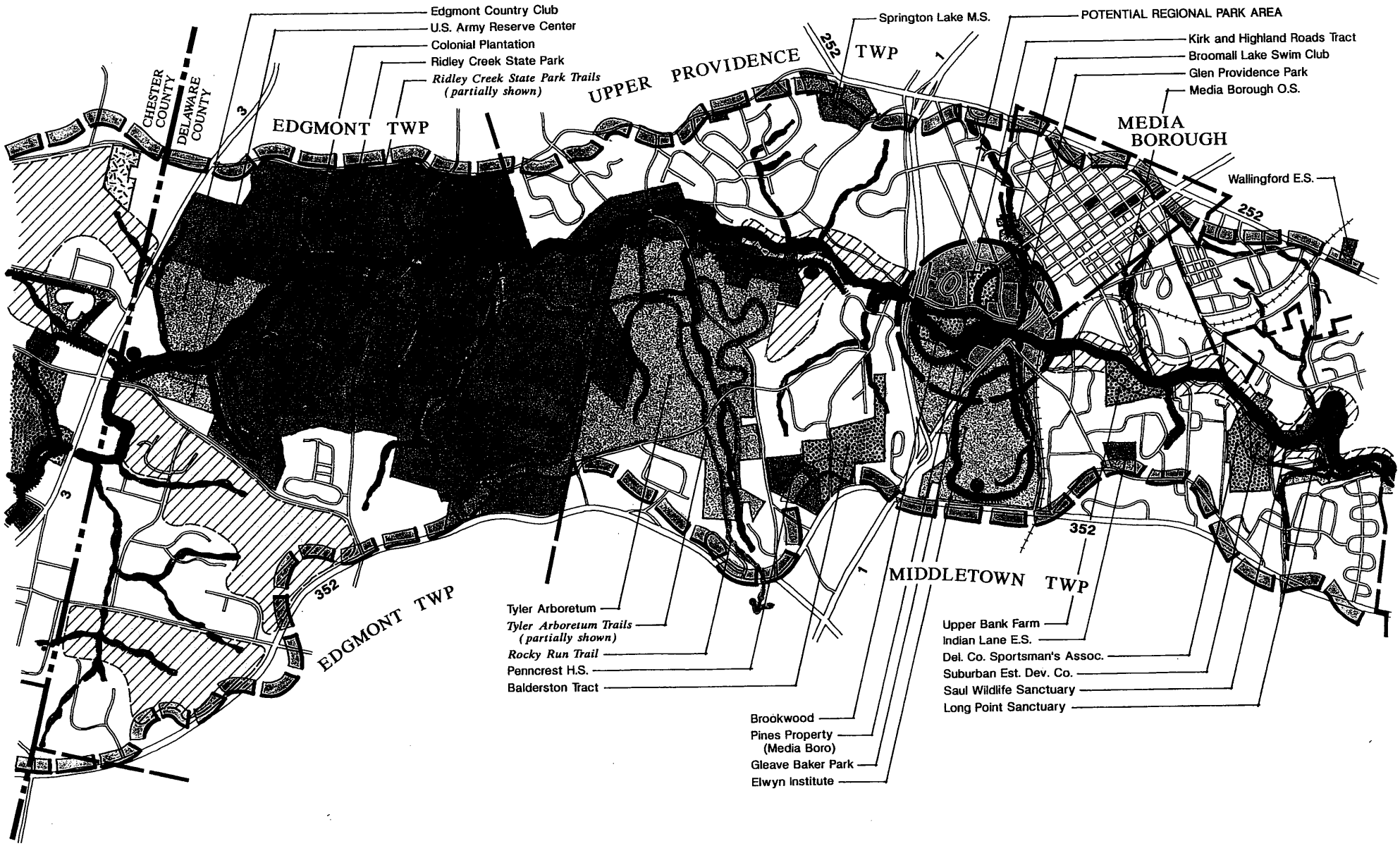
Upper Section

RIDLEY CREEK

CONSERVATION PLAN

NATURAL LANDS TRUST

02-97



LEGEND

- Watershed Boundary
- Public and Quasi-Public Lands
- Conservation Easements
- Important Undeveloped Properties
- Conservation Neighborhoods
- Existing Public Trails
- Proposed Public Trails
- *Willistown Connector Trail*
- *Barren Road to Rose Tree Road Trail*
- *Elwyn Loop Trail*

NORTH

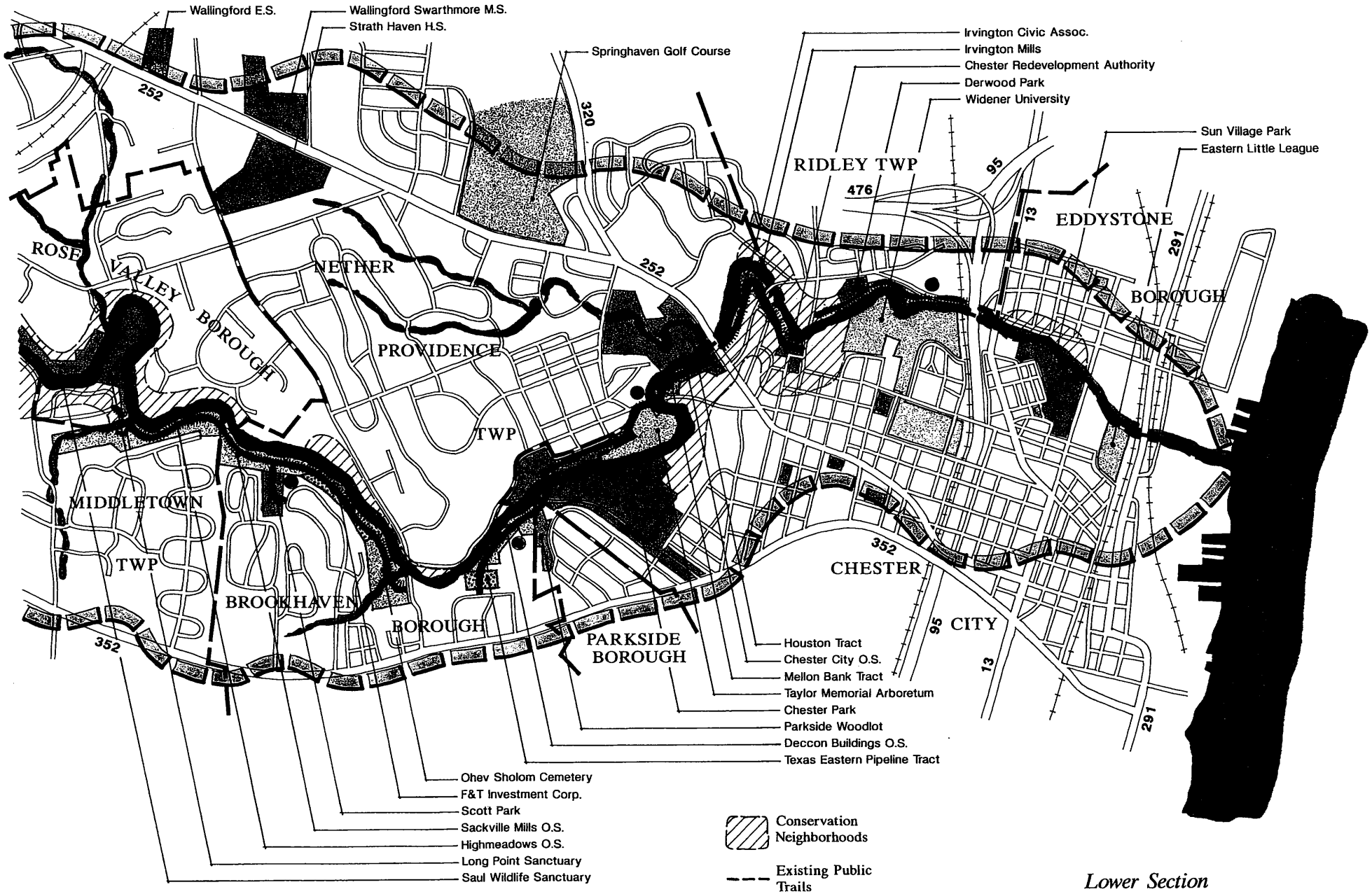
0 2000 4000 FEET

Middle Section

RIDLEY CREEK
CONSERVATION PLAN

NATURAL LANDS TRUST

02-97


Wallingford E.S.
Wallingford Swarthmore M.S.
Strath Haven H.S.
Springhaven Golf Course
Irvington Civic Assoc.
Irvington Mills
Chester Redevelopment Authority
Derwood Park
Widener University
Sun Village Park
Eastern Little League
RIDLEY TWP
EDDYSTONE
BOROUGH
ROSE VALLEY BOROUGH
NETHER PROVIDENCE TWP
MIDDLETOWN TWP
BROOKHAVEN BOROUGH
PARKSIDE BOROUGH
CHESTER CITY
252
320
476
95
13
291
352
Houston Tract
Chester City O.S.
Mellon Bank Tract
Taylor Memorial Arboretum
Chester Park
Parkside Woodlot
Deccon Buildings O.S.
Texas Eastern Pipeline Tract
Ohev Sholom Cemetery
F&T Investment Corp.
Scott Park
Sackville Mills O.S.
Highmeadows O.S.
Long Point Sanctuary
Saul Wildlife Sanctuary
Conservation Neighborhoods
Existing Public Trails
Proposed Public Trails
Brookhaven Trail
Williamson Avenue to Parkside Trail
Chester Park to MacDade Blvd Trail
MacDade Blvd to Chester Pike Trail
NORTH
0 1000 2000 FEET
LEGEND
Watershed Boundary
Public and Quasi-Public Lands
Conservation Easements
Important Undeveloped Properties
Lower Section
RIDLEY CREEK
CONSERVATION PLAN
NATURAL LANDS TRUST
02-97

IMPLEMENTATION SCHEDULE

The following table displays the recommended method of implementing the Conservation Plan. Its basic premise is that less expensive organizational and educational matters should be completed first. More expensive projects, involving land purchases and capital improvements should occur after the implementation structure is in place and municipal officials have become familiar with the plan.

The "Participating Parties" on the table are individuals or organizations with a logical connection to the projects with which they are listed. They may be able to provide staff support or funding (e.g., the County Planning Commissions or Pennsylvania Emergency Management Agency), undertake the project as part of their mission (e.g., Trout Unlimited), or may simply be directly affected by the project (e.g., landowners).

It is important to note that opportunities often arise "off schedule", and that the table is only a guide. Any otherwise worthy project should not be discarded simply because it comes up before the schedule indicates it should.

Priority Level	General Description	Specific Tasks Involved	Participating Parties
FIRST (first year)	Establish an Initial Implementation Structure	Each Municipality Adopts the Plan	M, PC, CRC
		Assign a Responsible Municipal Body in Each Municipality	M
		Initiate an Intermunicipal Committee	M, PC, CRC, LC, DVRPC
		Establish a Committee to Coordinate Private Conservation Activities	CRC, LC
	Build Awareness Among Decision Makers	Distribute Plan to State and Federal Agencies with Notice of Municipal Endorsements	CRC
		Institute a Ridley Creek Newsletter	CRC, M, PC, CD, LC, EAC

Key To Participating Parties

CCHD	Chester County Health Department
CD	County Conservation Districts
COE	US Corps of Engineers
CRC	Chester Ridley Crum Watersheds Association
CPC	County Park Commissions
CZM	Coastal Zone Management
DVRPC	Delaware Valley Regional Planning Commission
DCNR	Pennsylvania Department of Conservation and Natural Resources
DEP	Pennsylvania Department of Environmental Protection
EAC	Environmental Advisory Council Network (Pa Environmental Council)
EPA	US Environmental Protection Agency
FC	Pennsylvania Fish and Boat Commission
I	Private Institutions
L	Private Landowners
LC	Land Conservancy
M	Municipalities
PC	County Planning Commissions
PEMA	Pennsylvania Emergency Management Agency
PFO	Private Fishing Org.- Trout Unlimited/Delco Anglers
PSWC	Philadelphia Suburban Water Company
SD	School Districts
USGS	US Geological Survey

SECOND (within 3 years)	*Develop Program Implementation Schedule*	Establish Schedule for Update of Ridley Creek Act 167 Stormwater Management Plan	PC
		Determine High Priority Projects for Grant Applications within each Municipality	M, CRC, PFO, L
		Determine Initial List of Watershed-wide Projects for Grant Applications	M, PC, CPC, CD
		Develop a "Ridley Creek Month" Plan	CRC, PFO, FC, L
	Complete and Make Available Model Ordinances and Revise Municipal Ordinances as Necessary	•Floodplain •Riparian Buffers •Steep Slope •Local Stormwater •Erosion Control •Conservation Subdivision •Commercial/Industrial Site Redevelopment •Natural Areas •Pond Design Standards •"Pooper Scooper" •Historic Structures	M, PC, CD, LC, EAC
	Establish Public Models of Good Management	Modify Management of Public Parkland and/or Institutional Land to Establish Riparian Buffers	M, I, CRC, CPC

Key to Participating Parties

CCHD	Chester County Health Department	FC	Pennsylvania Fish and Boat Commission
CD	County Conservation Districts	I	Private Institutions
COE	US Corps of Engineers	L	Private Landowners
CRC	Chester Ridley Crum Watersheds Association	LC	Land Conservancy
CPC	County Park Commissions	M	Municipalities
CZM	Coastal Zone Management	PC	County Planning Commissions
DVRPC	Delaware Valley Regional Planning Commission	PEMA	Pennsylvania Emergency Management Agency
DCNR	Pennsylvania Department of Conservation and Natural Resources	PFO	Private Fishing Org.- Trout Unlimited/Delco Anglers
DEP	Pennsylvania Department of Environmental Protection	PSWC	Philadelphia Suburban Water Company
EAC	Environmental Advisory Council Network (Pa Environmental Council)	SD	School Districts
EPA	US Environmental Protection Agency	USGS	US Geological Survey

THIRD (within 4 years)	*Program Development*	Water Quality Monitoring	DEP, EPA, USGS, PSWC, L, I, SD, CD
		Ridley Creek Month • Stream Cleanups • School Programs • Events	CRC, PFO, FC, SD, M, PC, LC, PSWC, L, I
		Non-Point Source Pollution Education • Citizen Awareness/Monitoring Responsibilities • Commercial Operator Contact	M, PC, CRC, CD, FC, L, PSWC, EPA
		Landowner Technical Assistance • Riparian Buffer Planting Design • Bank Stabilization Design • Subsidized Plant and Material Program • Easement Education • Liability Education and Protection • In-Stream, Wetland, and Streamside Habitat Improvement	L, CD, FC, CRC, M, LC, PC,PFO
		Assistance to Private Institutions • Trail Design and Policing	M, I, LC, CRC, PFO
		Septic Systems • Municipal Inspections • Owner Education	M, DEP, PC, CRC, L, CCHD
		Ridley Creek Authority Feasibility Study	M, PC, DCNR
	High Priority Acquisitions	Acquire Previously Identified Critical Lands	M, DCNR, LC, CPC

FOURTH (within 5-10 years)	*Acquisitions and Capital Improvements*	**Land Acquisition/Park Improvements (e.g. trails)**	**M, CPC, DCNR**
		Public/Private Land Management Agreements	**M, CPC, DCNR, LC, PFO**
		Stormwater System Improvements • **Replace Stormwater Inlets with Water Quality Inlets** • **Refashion Existing Detention Basin Outlets**	**M, CD, DEP, CZM, PC, PEMA, EPA**
		Purchase and Remove Flood-prone Structures	**M, CZM, PEMA**
		Lower Ridley Creek Flood Control Study	**M, CZM, COE**
		Develop and Install "Ridley Creek Greenway" signage system	**M, DCNR, CRC, PC**
	Long-Range Planning	**Other Tasks Identified by Municipalities and Other Partners**	**M, PC, CPC, CRC, LC, SD, PFO, PSWC, FC**

Key to Participating Parties

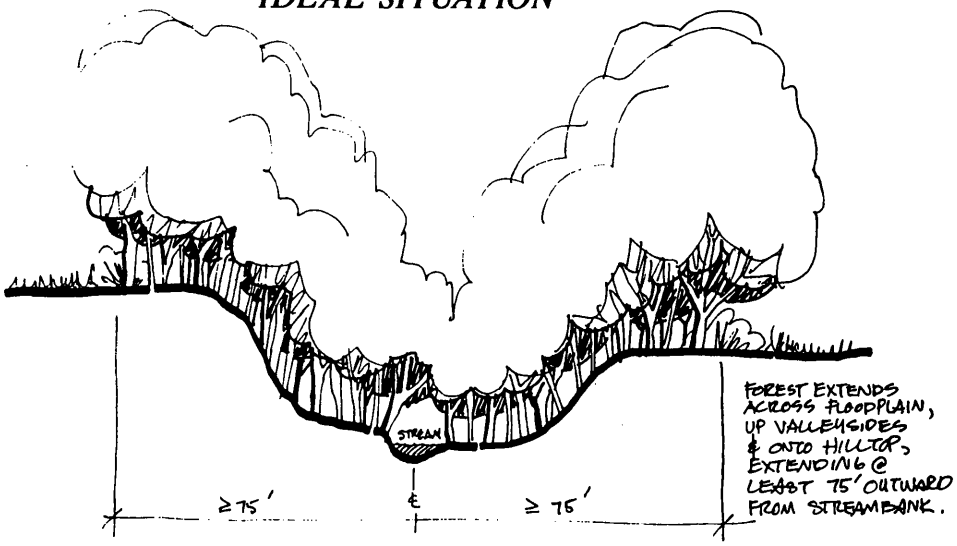
CCHD	Chester County Health Department
CD	County Conservation Districts
COE	US Corps of Engineers
CRC	Chester Ridley Crum Watersheds Association
CPC	County Park Commissions
CZM	Coastal Zone Management
DVRPC	Delaware Valley Regional Planning Commission
DCNR	Pennsylvania Department of Conservation and Natural Resources
DEP	Pennsylvania Department of Environmental Protection
EAC	Environmental Advisory Council Network (Pa Environmental Council)
EPA	US Environmental Protection Agency
FC	Pennsylvania Fish and Boat Commission
I	Private Institutions
L	Private Landowners
LC	Land Conservancy
M	Municipalities
PC	County Planning Commissions
PEMA	Pennsylvania Emergency Management Agency
PFO	Private Fishing Org.- Trout Unlimited/Delco Anglers
PSWC	Philadelphia Suburban Water Company
SD	School Districts
USGS	US Geological Survey

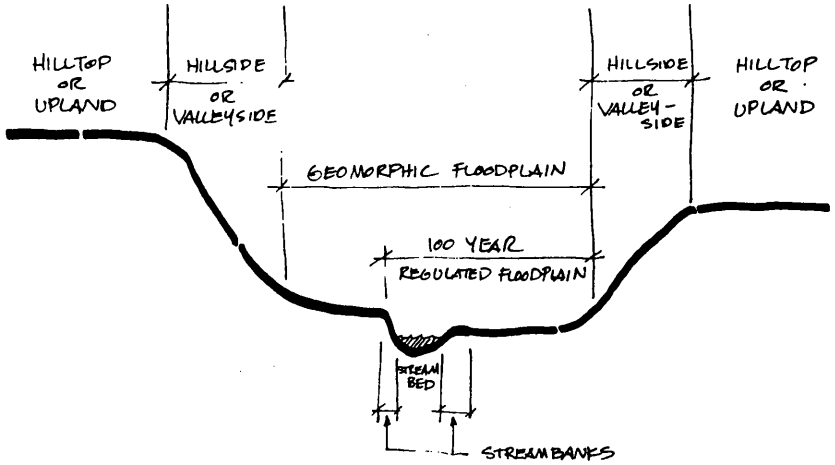
GENERIC DESIGNS FOR RIPARIAN BUFFERS: CROSS SECTIONS

The following sketches are applications of the land management recommendations found throughout the Major Issues segment to common situations along the waterways of the Ridley Creek watershed. They should help landowners and officials understand how riparian landscapes can be improved to protect water quality and provide habitat.

For further information, copies of the publication, "A Streambank Stabilization and Management Guide for Pennsylvania Landowners", are available to streamside landowners interested in reducing erosion and enhancing wildlife habitat. Contact the Pennsylvania Scenic Rivers Program, P.O. Box 8475, Harrisburg, PA 17105-8475

FORESTED RIPARIAN BUFFER IDEAL SITUATION

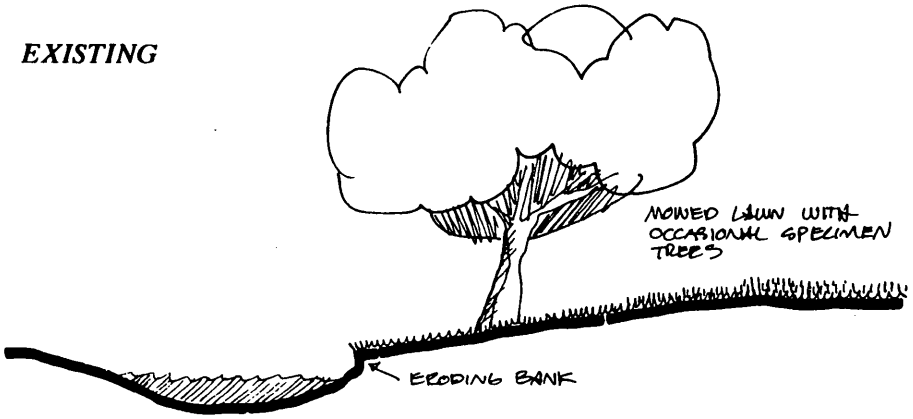




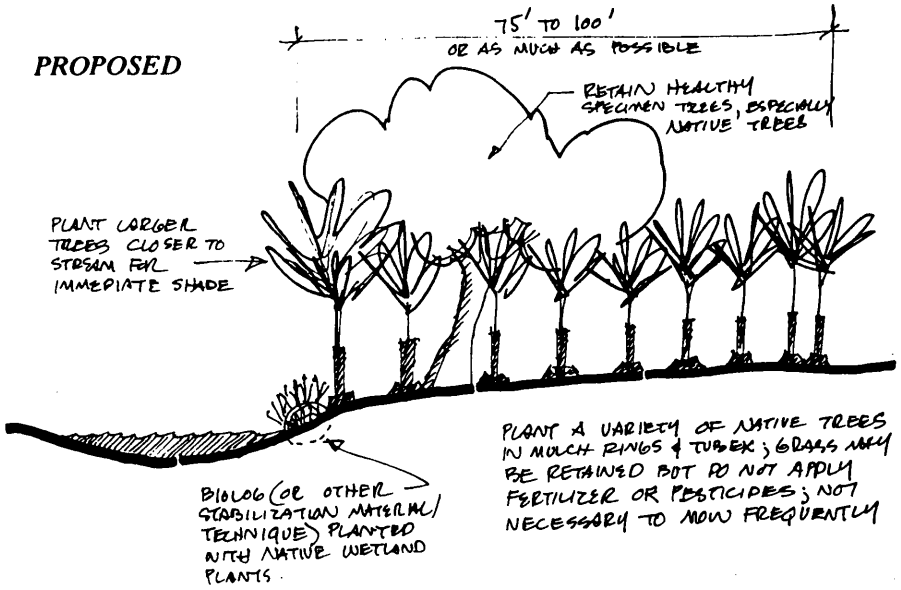
A NATURAL STREAM VALLEY, TYPICAL OF MOST OF THE RIDLEY CREEK VALLEY

LAWNS DOWN TO CREEK
(RESIDENTIAL, PARKS, GOLF COURSES)

EXISTING

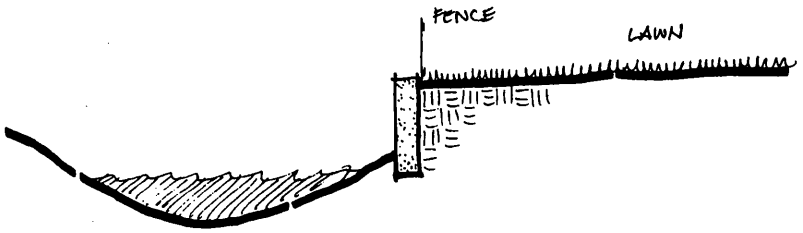


PROPOSED

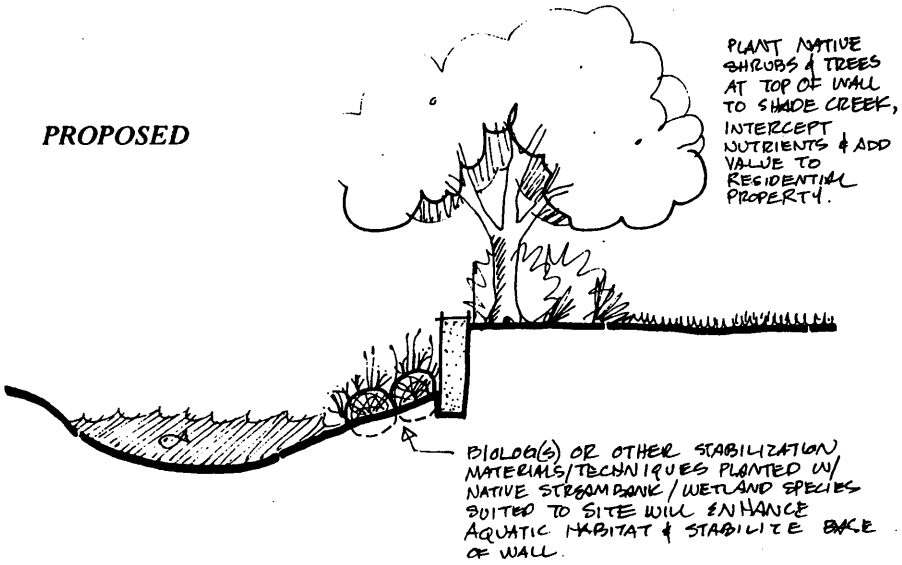


BULKHEADED BANK
SMALL LOT RESIDENTIAL

EXISTING

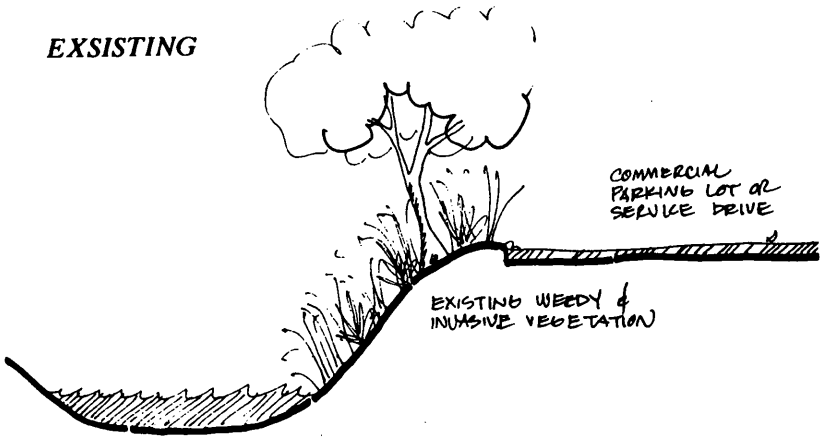


PROPOSED

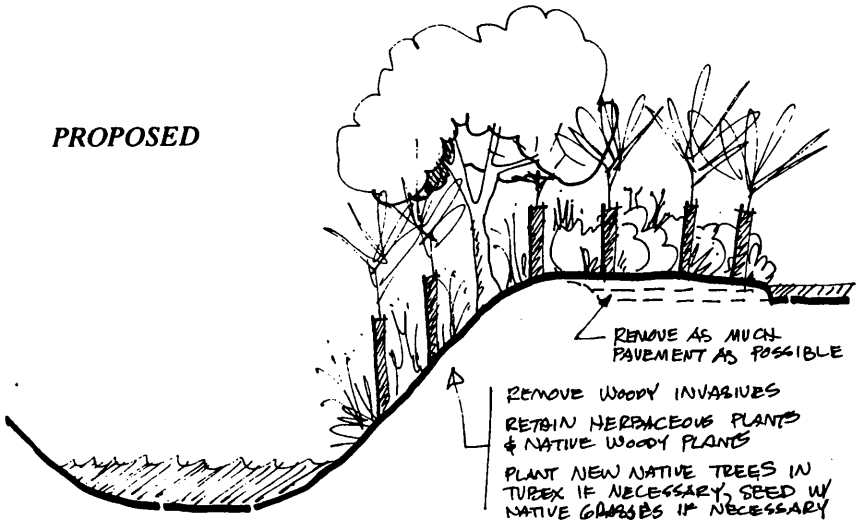


COMMERCIAL

EXSISTING

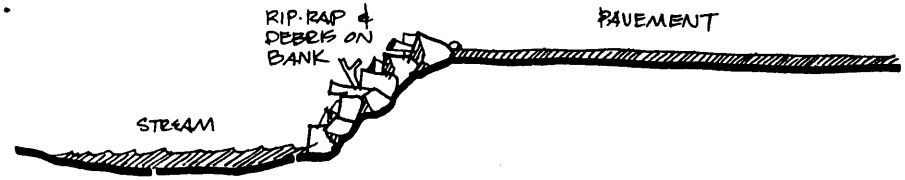


PROPOSED

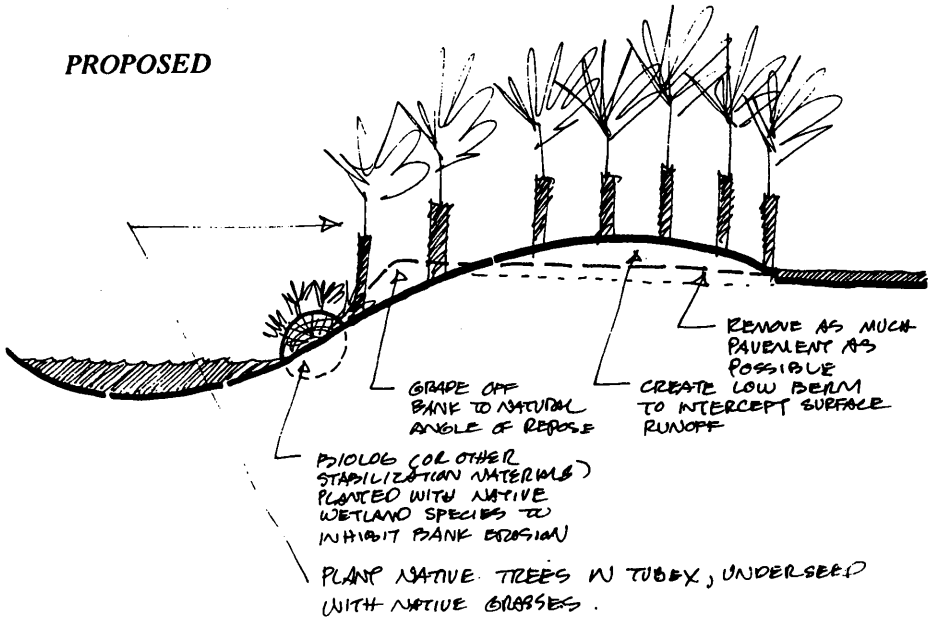


INDUSTRIAL

EXISTING

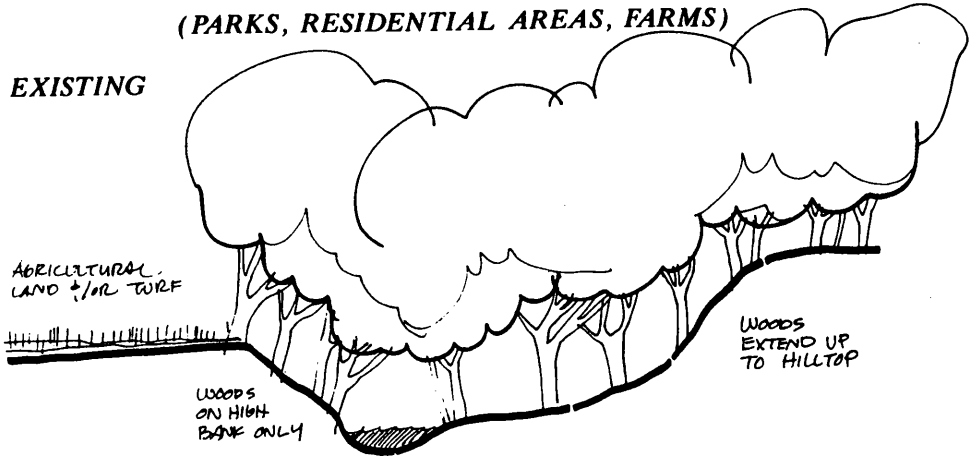


PROPOSED

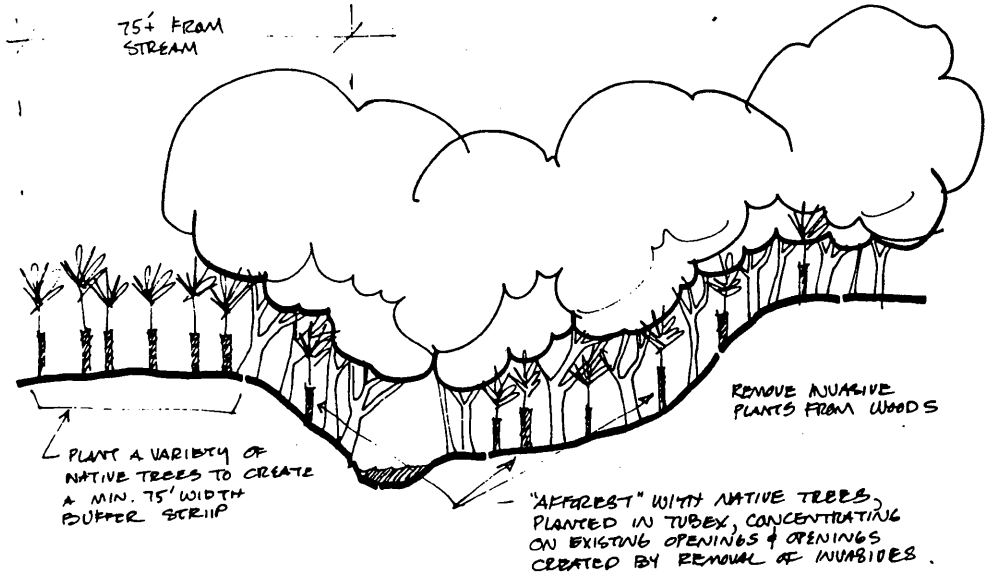


EXISTING WOODLANDS
(PARKS, RESIDENTIAL AREAS, FARMS)

EXISTING

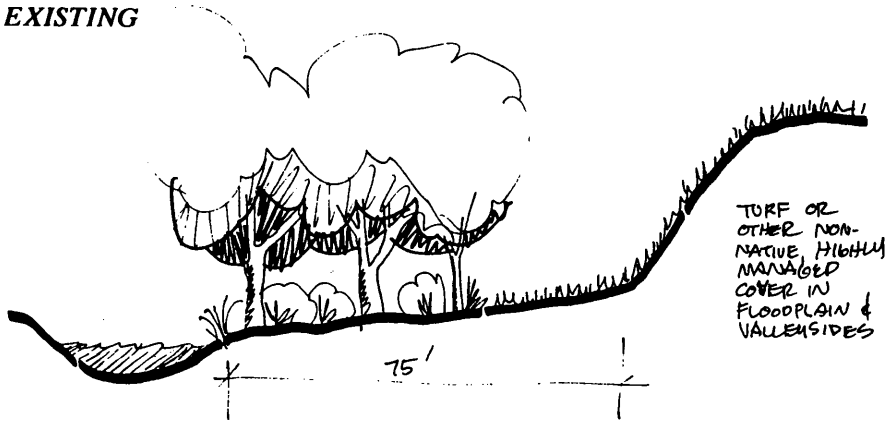


PROPOSED

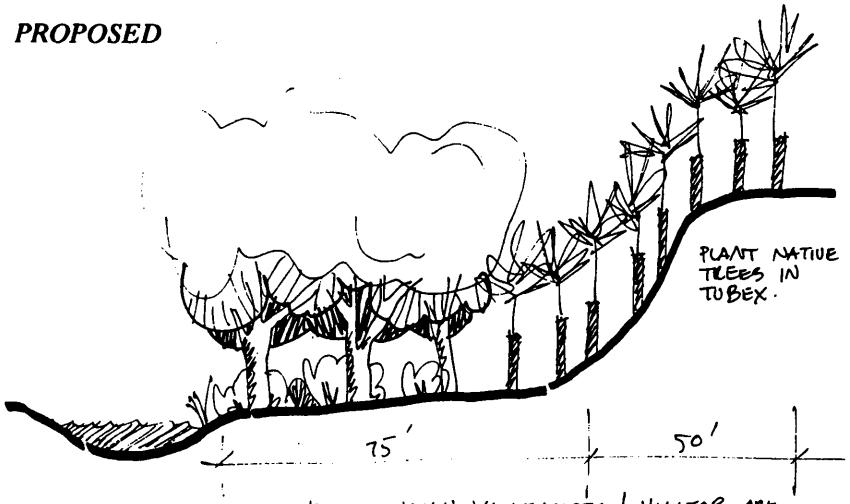


REFORESTING VALLEY SIDES

EXISTING



PROPOSED



EVEN THOUGH VALLEYSIDES & HILLTOP ARE MORE THAN 75' FROM STREAM; NATIVE FOREST COVER IS RECOMMENDED TO PREVENT NUTRIENT FLOW & PREVENT EROSION

APPENDICES

A: *Project History*
B: *Public Participation Program*
C: *Opinion Surveys*
D: *Sources of Further Information*
E: *Bibliography*
F: *Sample Municipal Resolution in Support of the Ridley Creek Conservation Plan*

APPENDIX A: Project History

In autumn of 1994, GreenSpace Alliance of Southeastern Pennsylvania, which is a project of the Pennsylvania Environmental Council (PEC) and functions as an advocacy group for open space conservation in the metropolitan Philadelphia area, received matching funds from the National Park Service and the Delaware County Council for a study of the feasibility of instituting a "greenway" along the main stem of the Ridley Creek.

GreenSpace Alliance formed a partnership with the Chester-Ridley-Crum Watersheds Association to lead this initiative. Chester-Ridley-Crum Watersheds Association (CRC) is an all-volunteer, non-profit conservation and advocacy group founded in 1970 to work for the protection of the Ridley and its two adjacent streams (CRC made the 1989 application for Scenic River status). CRC recently formed a free-standing committee, the Friends of the Ridley Creek, to, among other initiatives, be the primary advocates for the greenway study recommendations. Natural Lands Trust, a regional land trust with expertise in greenway planning, was chosen to be the professional consultant in February, 1995.

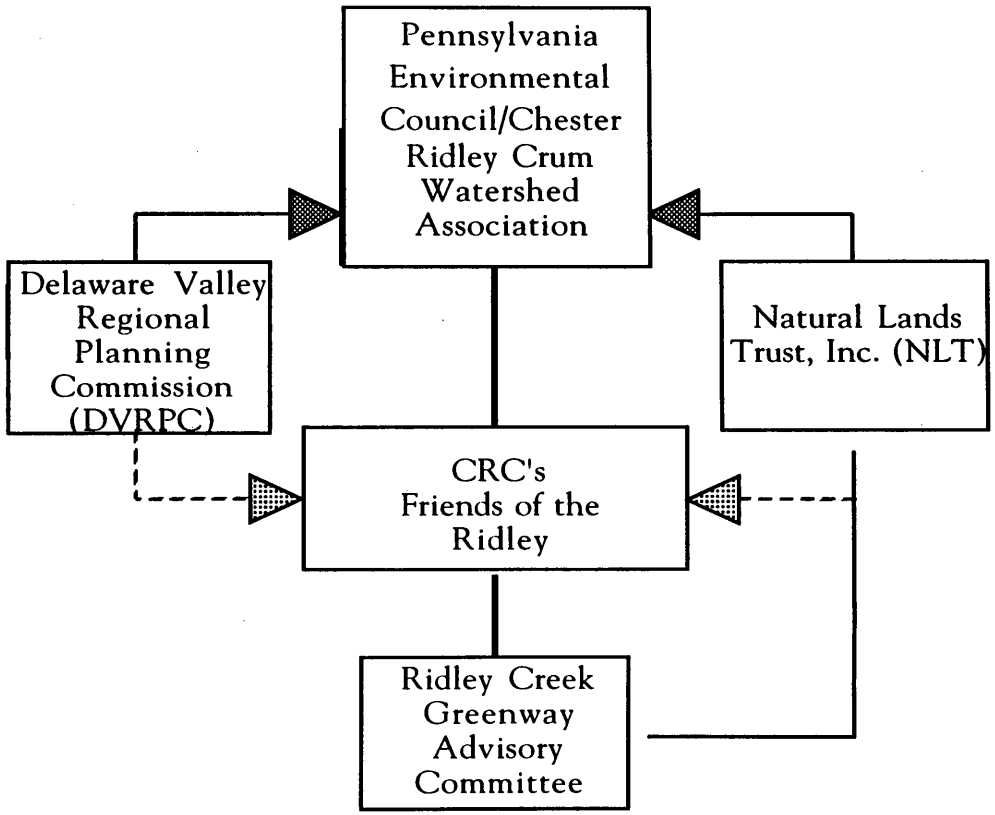
The Delaware Valley Regional Planning Commission (DVRPC) committed pro-bono staff time to produce a series of Ridley Creek corridor maps on their Intergraph® Geographic Information System. The mapping was developed in two phases, the first showing the stream in Delaware County and the second showing the stream in Chester County. The DVRPC mapping package also includes a data base of information on properties with frontage on the creek. This mapping is available upon request from DVRPC. The mapping in the Conservation Plan Report is by Natural Lands Trust.

After the initiation of the project, the GreenSpace/Chester-Ridley-Crum partnership prepared an application to the Pennsylvania Department of Conservation and Natural Resources (DCNR) Rivers Conservation Program for additional planning funds through a "Rivers Conservation Planning Grant". The partnership received positive notice of the grant award in July, 1995. The Conservation Plan is modeled on the requirements of the state grant.

The state program asks for the creation of a "River Conservation Advisory Committee" to facilitate planning for the Ridley Creek Conservation Plan. The Greenway Advisory Committee of the Friends of the Ridley Creek, the free-standing committee of the CRC, has functioned in this capacity through the life of the study. A graphic description of the relationship between the organizations involved in the study is shown as Figure A-1.

FIGURE A-1

Organization of the Ridley Creek Conservation Plan Committee



Site Visits

Members of the project partnership and Natural Lands Trust surveyed the Ridley and its tributaries via automobile and walking. As much as possible the project team walked the banks of the creek. It was during these visits that the evidence of persistent pedestrian use of the stream banks was discovered. The tributary system has not been studied in equal detail. As these tributaries, especially in the headwaters of Willistown, East Goshen and East Whiteland, are important determiners of water quality, they need to be studied in greater detail by those implementing the Conservation Plan.

Interviews

A number of local, state, federal and utility officials were interviewed during the development of the Conservation Plan. They are cited throughout the report.

DVRPC Mapping

At the beginning of the study the Delaware Valley Regional Planning Commission (DVRPC) undertook a detailed mapping study of the Ridley Creek using their Intergraph® Geographic Information System (GIS). The maps are in two sections, one section covering Delaware County, and the other covering Chester County. Each map shows the roads system, municipal boundaries, and the outline of all the properties that abut the creek. The maps are in a series, being:

- **Land Use**
  These maps show land use divided into general categories such as single family residential, multi-family, commercial/services, manufacturing, agriculture, etc. Each type is color-coded. The delineations were derived from interpretation of aerial photographs.

- **Type of Ownership**
  Displays the ownership type of the properties that touch the creek. The properties are divided into private, public and quasi-public properties. The quasi-public properties are institutional owners such as Widener University in Chester City, and private common areas such as contained in Hershey's Mill, a Planned Unit Development in East Goshen. Also included on the map are historic mill sites and other historic resources, primarily homes, that are contained within the creekside properties.

- **Type of Zoning**
  DVRPC depicted the zoning districts of the creekside properties by grouping the various districts of the different municipalities into general groups. The groups were low, medium and high density residential, commercial/industrial, institutional, and recreation/open space. Where a residentially zoned property met the standards for clustered housing provisions (where homes would be placed on smaller lots in exchange for common open space) a special color coding was used.

- **Natural Resource Areas**
  The extent of woodlands, wetlands, and floodplains are shown on this map.

The DVRPC maps were not included in the Conservation Plan due to the cost of color reproduction and because they do not include the entire watershed.

The DVRPC maps have been reduced to 11" x 17" size and are available to interested readers from Natural Lands Trust. A small fee will be charged to cover the cost of color reproduction. Full-sized maps are available from DVRPC.

APPENDIX B - Public Participation Program

Public participation is an essential aspect of river conservation planning. The plan is to be implemented by the municipalities through their own initiative with the encouragement and support of their residents. A plan which does not reflect what communities want and need has little hope of being implemented.

Public input was solicited in a variety of ways at every stage in the two year planning process. Citizens were encouraged to comment by phone, in writing, at meetings and by returning questionnaires. A database was created which included all homeowners who own property along the creek, members of the Chester-Ridley-Crum Watersheds Association who live in the watershed or who are especially active, members of the Delaware County Environmental Network who might have an interest, anyone who answered a questionnaire or attended a meeting, members of the Friends of Ridley Creek and anyone who contacted us over the duration of the planning process and wished to be included on the mailing list. Including municipal representatives and County planning representatives, the mailing list is about 375 names.

Initial press releases and organizational newsletters announced that the plan was being undertaken. All meetings were announced by the local press, in the newsletters of local environmental, civic and sportsmen's groups, and at their regular meetings. Presentations and displays were prepared for meetings of the Delaware County Environmental Network and other environmental and civic groups. At every function and on every flyer a name, address and phone number appeared so that anyone who wished to make further comments could do so. Many individuals did choose to comment in this manner.

A freestanding committee of the Chester-Ridley-Crum Watersheds Association called the Friends of Ridley Creek, chaired by Judith Auten, was formed in 1995 with a mission to protect the creek. They chose to support and comment on the conservation plan and to provide further information to interested individuals and to their municipal representatives. They met five times between the fall of 1995 and the final public hearing in the fall of 1996. The group will continue to meet monthly to encourage municipalities to endorse the plan and implement its recommendations. They are particularly interested in organizing a stream clean-up and a buffer demonstration project.

When the draft plan became available in September of 1996 it was distributed for public review to all of the local libraries and municipal buildings which serve the communities in the watershed. The report included the name, address and phone number where comments on the plan could be made. Everyone on the database was informed of its availability. At subsequent public meetings many of the participants indicated that they had reviewed the plan at their local library or municipal building.

A series of presentations were made to the public, as follows:

Informational public meetings:
12-20-94 This first meeting announced the Greenway Feasibility Assessment, prior to the award of the Rivers Conservation Grant. At this meeting we discussed past preservation efforts along the Ridley Creek, answered questions such as, "what is a greenway?", "what is the value of establishing a greenway?" and discussed the scope of the assessment. Discussion followed. Minutes are attached.

2-21-95 The second meeting was a progress report for the Greenway Feasibility Assessment. The GIS mapping was presented, the consultant presented an outline of the planning process. Discussion followed. Minutes are attached.

In the months that followed, the scope of the plan was expanded through the procurement of the Rivers Conservation Grant and the plan was renamed. Grant administrators indicated that the two meetings for the feasibility assessment would fulfill the grant requirement for an initial public meeting for the conservation plan.

Presentation of Preliminary Findings:
11-8-95 and 11-11-95 Identical presentation were made on a week night and a weekend to obtain a wider audience. The Natural Lands Trust presented a twin slide show which highlighted the beauty of the Creek, how the Creek is used and general problems such as erosion, and point and non-point sources of pollution. Slides taken in the late 1970's and photos taken recently illustrated how the creek changed in that period of time. The presentation was followed by small group discussions. Participants were asked to complete a questionnaire. Questionnaire Results are presented in Appendix C. A summary of the meeting is attached.

Presentation of the Draft Rivers Conservation Plan:
9-30-96 and 10-1-96 Similar presentations were made in Delaware County and Chester County to obtain a wider audience. The Natural Lands Trust presented a twin slide show. A review of the character of the watershed was followed by a review of the major topics discussed in the plan along with recommendations. A panel of three individuals from Delaware County commented on the plan at the first meeting and a different panel of three from Chester County commented on the plan at the second meeting. A discussion followed. Participants were asked to complete a questionnaire. Questionnaire Results are presented in Appendix C. A summary of the meeting is attached.

Final Public Hearing:
11-19-96 A public meeting with a court stenographer was held to receive public comment. The plan was available for public review at libraries and municipal buildings which serve the watershed. A transcript of this hearing is attached.

Ridley Creek Greenway Feasibility Assessment

Minutes of the initial meeting held December 20, 1994 at 7:30 p.m.
Middletown Township Municipal Building

Participants

Government Representatives
Nora Anderson - Middletown Twp Council
Eve Beehler - Middletown Twp Council
Sara Petrosky - Nether Providence Twp Council
Sandra Purcell - Upper Providence Twp Council

Planning Bodies:
Barry Seymour - DVRPC
Patty Elkis - DVRPC
John Pickett - DCPD-Director
Karen Holm - DCPD
Patricia Nilsson - Chester County Planning Comm

Non-profit organizations:
Patrick Starr - GreenSpace Alliance
Ginnie Newlin CRC, E. Goshen Conservancy
Judith Auten - CRC-Vice-President
Daniel Barringer - Taylor Arboretum
Amy Nabut - Del Co Open Space Project
Carl DuPoldt - CRC-President
Paul Stubbe - Brandywine Valley Assn

1) Judith Auten opened the meeting.

2) Amy Nabut presented a history of preservation activities along Ridley Creek dating to the early 1970's when the Chester-Ridley-Crum Watersheds Association was established. In 1978 the Delaware County Planning Department performed the *Open Space, Parks and Recreation Study* which proposed the *Conceptualized Creek Valley Preservation Program* for the creek valleys. Since that time many citizen groups and governmental planning bodies have advocated the protection of the Ridley Creek valley. A revised copy of preservation history is enclosed for your use. Additions are welcome.

3) Patrick Starr addressed the questions "What is a greenway? What is the value of establishing a greenway?". **A greenway is what the name implies, a green corridor, that links historic, natural and recreational sites akin to pearls on a necklace. It is not a trail, although trails may lie in greenways. Public access of any kind is optional. Greenways are usually owned by a variety of owners, both public and private. They are protected by a variety of techniques, including public or private acquisition, conservation easements, subdivision set-asides or municipal regulation of natural features such as floodplains and steep slopes.**

There are many benefits, environmental, recreational and economic. Homes and businesses next to protected greenways are usually more valuable because many property owners love to be near protected open space. Environmental benefits run the gamut, from reduced flooding, reduced non-point source

pollution to better water quality and improved habitat for animals and plants. Recreational benefits depend on what the communities provide for - potentially, trails, picnic sites, access for fishing and canoeing, as well as whatever recreation is provided at existing sites to be linked along a greenway.

Patrick Starr stated that $ 35,000 has been allocated for this feasibility assessment. The DVRPC is providing about $20,000 in services described below. A $7,500 grant is allocated from the National Park Service and $7,500 has been allocated from Delaware County Council.

4) Patty Elkis presented the preliminary research performed by the DVRPC for the feasibility assessment. The DVRPC is mapping over 200 plats of land which are adjacent to the creek. These parcels are being entered on their GIS (geographic information system) computer mapping system along with descriptive information regarding natural features, topography, zoning, historic features and more. Patty presented an annotated aerial photo of the Ridley Creek Watershed. Participants at the meeting filled in a areas in which information was missing.

5) Patrick Starr outlined the major elements of the Feasibility Assessment and the consultant selection process. Judy Auten, John Pickett and a member of the GreenSpace Alliance Steering Committee were selected to review and select the consultant who will complete the feasibility assessment.

6.) During the discussion period some participants raised the concern about the future costs to the municipality for liability and maintenance of preserved lands. These issues will need to be addressed in the study.

7.) It was agreed to meet sometime after February 1 to review the DVRPC's GIS mapping and to learn about the selection of the Feasibility consultant.

Ridley Creek Greenway Feasibility Assessment

Minutes of meeting held February 21, 1995 at 7:30 p.m.
Middletown Township Municipal Building

Participants

Government Representatives
Peter O'Keefe - Ridley Twp
Paula Healy - Rose Valley Borough
Penny Sass - Rose Valley Council
James Morash - UP Twp Council
Maryann Foster - UP Twp Envt Comm

Natural Lands Trust
Richard Sprenkle - Natural Lands Trust
Peter Williamson - Natural Lands Trust
Daniel Barringer - Taylor Arboretum

Planning Bodies
Patty Elkis - DVRPC
Rich Boyers - DVRPC
John Pickett - DCPD-Director
Karen Holm - DCPD
Patricia Nilsson - Chester County Planning Com

Other
Robert Feuer - Phila. Suburban Water Co.
Bill Hale

Non-profit organizations:
Patrick Starr - GreenSpace Alliance
Judith Auten - CRC-Vice-President
Carl DuPoldt - CRC-President
Andy Saul - CRC
Amy Nabut - Del Co Open Space Project
Ginnie Newlin - CRC, E. Goshen Conserv
Linda Polishuk - E. Goshen Conservancy
Paul Stubbe - Brandywine Valley Assn

1) Judith Auten opened the meeting by reviewing what a greenway is.

2) Patty Elkis presented the large and colorful computerized Geographic Information System (GIS) base maps prepared by the DVRPC for the feasibility assessment. The first map showed information gathered from the Delaware County Office of Deeds and Records. Over 200 parcels of land which are adjacent to the creek have been mapped and given a number which corresponds to a document of information regarding ownership. A second map shows land use for the whole region: residential, commercial, industrial, parkland and so forth. A third map shows natural features, and a fourth map shows zoning. The computerized information will be made available to the consultant, The Natural Lands Trust and to the Delaware County Planning Department (DCPD). The map shows the portion of the Ridley Creek which lies in Delaware County. Information regarding the portion of the creek in Chester County will be added next by the DVRPC.

3) Patrick Starr of the GreenSpace Alliance explained that bids for the feasibility assessment were received. A committee comprised of Judith Auten, John Pickett and a representative from the GreenSpace Alliance Steering Committee reviewed the submissions. They selected the Natural Lands Trust to perform the study.

4) Richard Sprenkle of the Natural Lands Trust (NLT) stated that they will be attempting to gain the participation of the all of the municipalities along the creek. He stated that NLT will apply for a State Rivers Conservation Grant for additional funds which will be necessary to complete the project. The application deadline is April 7. If they receive the grant each municipality along the Ridley Creek will be eligible for implementation dollars in a 50/50 match.

Peter Williamson of NLT told us about other greenway projects that NLT has been performed including one for Hershey Trust, one for Dauphin County and one in Lower Merion Township. Peter described a four phase strategy for the *Ridley Creek Concept Plan and Implementation Strategy.*

Phase One: A preliminary inventory will include a study of the configuration and attributes of streamside lands and a study of the existing legal framework regulating the use of those lands i.e. comprehensive plans and local ordinances. It will also include a field survey and photo documentation.

Phase Two: The data will be presented at a public workshop convened by CRC. The DVRPC and NLT will present the findings of their inventory and will present slides. Participants will be asked to share their ideas on the type of greenway they would like in their communities.

Phase Three: NLT will develop a series of options for greenway implementation ranging from modest improvements to municipal regulations to comprehensive programs. NLT will prepare the text for an informational brochure to be presented by CRC.

Phase Four: The findings and recommendations will be presented to representatives of each municipality. NLT will discuss the options available to each municipality in order to implement their recommendations.

5) Carl DuPoldt announced that the Conservation Fund has acknowledged receipt of CRC's request for funding for the educational brochure. The brochure has received endorsements from every municipality along Ridley Creek.

Ridley Creek Greenway Project

PUBLIC WORKSHOP
PRESENTATION OF PRELIMINARY FINDINGS

Step 4 of the Pennsylvania Rivers Conservation Plan requires that a Preliminary Findings Report be presented to the public at workshops. Public workshops were held on Wednesday, November 8, 1995 at 7:30 p.m. and Saturday November 11, 1995 at 9:30 a.m. at the Middletown Township Municipal Building. Two times were offered for the convenience of the public and municipal officials. The workshop was publicly announced, as required, in a variety of ways. The following is a list of announcements. Copies of these announcements are enclosed.

- A public notice appeared in the Delaware County Daily Times three weeks prior to the workshop.
- A trifold brochure prepared by the Friends of Ridley Creek. The brochure was distributed to a mailing list of about 80 which includes at least one representative from each municipality along the creek as well as county and regional governmental bodies. Also included on the mailing list are representatives from various nonprofits. The brochure was also distributed at a few local nonprofit groups' annual meetings.
- The workshops were announced at two meetings of the Friends of Ridley Creek held September 19 and October 11, 1995.
- The workshops were announced in the Delaware County Environmental Network Newsletter, a quarterly publication with a circulation of about 500 individuals and nonprofits in the County. The Newsletter also appear on-line.
- The Delaware County Times published an article on the Ridley Creek Greenway Project in which the workshops were announced.
- An announcement of the workshops appeared in the Town Talk, a weekly publication serving central Delaware County.
- One hundred sixty landowners along the creek were notified by letter and an additional 160 individuals in the county (which included the 80 who had previously received the trifold brochure) received a notice as well.
- The workshops were announced on the Internet home page of the Delaware County Leagues of Women Voters.

Twenty five people attended the workshop Wednesday night. Eleven attended on Saturday morning. Judith Auten, Vice President of CRC Watersheds Association opened the workshops with a brief description of the history of preservation efforts along the Ridley Creek and the activities of the CRC which pertain to the Creek. Patrick Starr, Director of the GreenSpace Alliance described why they selected the Ridley

Creek for a greenway effort and how they hired the consultant, Natural Lands Trust and applied for the Rivers Conservation Grant. Peter Williamson of the Natural Lands Trust presented a slide show which highlighted the beauty of the Creek, how the Creek is used and general problems such as erosion, point and non-point sources of pollution. Using slides taken by CRC in the late 1970's and photos taken recently he was able to illustrate how the creek has changed in that period of time.

The slide show was followed by a refreshment period and then by break-out group discussions. On Wednesday night there were three small groups, the upper Ridley, middle Ridley and lower Ridley. Patrick Starr and Mark McGuigan of the GreenSpace Alliance and Katherine Miller of the League of Women Voters acted as facilitators. Facilitators were given printed instructions (a copy of which is enclosed) and met prior to the workshop. The goal of each small group was to brainstorm ideas about what they would like to see happen on the Creek and to prioritize these ideas, which they did in a three step process. Each group had a large scale work map of the watershed on which significant features were identified. The group was invited to add their comments directly onto the map. On Wednesday night the three groups rejoined and each group presented their findings to each other. On Saturday there was one discussion group. People from the whole corridor worked together which provided an interesting contrast to the smaller groups. The sessions were interesting and informative with the active participation of the attendees. The lists of ideas created and prioritized by attendees is attached.

Each attendee received an agenda and a copy of the Preliminary Findings Report. Other materials included a *History of Preservation Efforts along the Ridley Creek, How to Care for Your Stream* (an informational sheet on good stream stewardship for landowners along the Creek), announcements of upcoming Friends of Ridley Creek meeting, an announcement of an upcoming Watershed Protection Conference, membership forms for CRC, and information from the Environmental Advisory Committee (EAC) Network.

Each attendee will be receiving a summary of the workshop in the mail shortly.

Ideas and Priorities

11-8-96 and 11-11-96 Workshops

The goal of each small group was to brainstorm ideas about what they would like to see happen on the Creek and to prioritize these ideas. This is an exercise which generates creative ideas. Not all ideas may be practical or achievable. They have not necessarily been incorporated into the plan. The ideas that group members came up with are as follows:

Of Highest Priority:

* Land acquisition and procurement of easements; create additional easements on large parcels to fill in the missing links, preserve the open space and mature woods of Widener University, the Houston Tract, Elwyn Institute, Sackville Mills, and the woods opposite the Saul Wildlife Sanctuary, Middletown strip across from Rose Valley and the Media Wetland.
* Enhance trail system; include trail to Ridley Creek State Park through Lafferty Tract.
* Create a buffer of trees and vegetation along the entire length of Ridley Creek. Make owners aware of plants used to create buffer zones to make them ecologically sound. Form a buying collective. Plant native species.
* Restrict development from Ridley Creek State Park to the river and create a buffer zone.
* Create a tree ordinance and minimize cutting.
* Remove trash around Woodland Shopping Center, above Chester Pike/Sun Hill and in Chester Park/Spring site.

* Respect private property concerns
* Improve fish habitat

Of High Priority:

* Create trail in South Willistown along Route 3 and connecting through culvert under Route 3 to new development.
* Preserve the old army site
* Protect the stream corridor at the Smith Kline site (future Applebrook Farm).
* Allow no encroachments in Ridley Creek State Park.
* Control and treat stormwater runoff to contain the first flush. Minimize flooding by creating stormwater detention facilities.
* Allow creek to return to natural state by removing dams to allow fish migration and canoeing.
* Create an easement to connect the Media Wetland with Glen Providence Park, connect to Gleave Baker Park. Create trail through Gleave Baker Park north through Heilbron. Create a loop trail.
* Determine the impact of on-site septic systems and package treatment plants on water quality. Improve water quality to develop native species so that stocking is no longer required.
* Allow more recreational use. Encourage canoeing and tubing.
* Create guidelines for natural resource protection.
* Enhance water quality and stream habitat - work with state agencies.
* Favor cluster ordinances.

Also Mentioned:

* Create a bicycle trail like the New Hope Trail.
* Create a diversified trail system for wheel chairs, children, elderly, bicycles, etc.
* Preserve part of the Upper Bank nursery
* Identify additional historic and cultural sites, even just a display where structures no longer exist.
* Control parking lots on the creek, control runoff with swales.
* Fish ladders at dams.
* Repair the dams that we think are important to keep.
* Use PA state money to improve the creek.
* Preserve the old Nike site as a passive park. The site includes a tributary and a pond.
* Municipalities should adopt more stringent zoning in the floodplain. Require setbacks on new construction
* More education about what environmental groups are doing in the Ridley Creek.
* Promote history, especially the mills.
* High school education about the needs and value of the creek.

Ridley Creek Greenway Project

PUBLIC WORKSHOP
PRESENTATION OF THE DRAFT RIVERS CONSERVATION PLAN

Public workshops were held on Monday, September 30 at 7:30 p.m. at the Middletown Township Municipal Building and Wednesday, October 1, 1996 at 7:30 a.m. at the East Goshen Township Municipal Building. Two locations were offered for the convenience of the public and municipal officials. The workshop was publicly announced, as required, in a variety of ways, as follows:

- One hundred sixty landowners along the creek were notified by letter and an additional 200 individuals in the county received a notice as well.
- All township managers were given advance notification at the end of August. Other municipal officials were included in the mass mailing of early September.
- Local nonprofit groups were notified at the end of August. Some of these notices made it into their respective newsletters, e.g.: the Media Area Leagues of Women Voters, Trout Unlimited, DelCo Anglers.
- Local newspapers received two-week notice.

Thirty-four people attended the workshop Monday. Sixteen attended on Wednesday.

At both meetings the following presentation was made:

On display was a 7-foot long colored-in copy of the Master Plan and three 24" x 36" colored-in copies of maps from the document which illustrated the Natural Areas, point source discharges and protected open space. Copies of the plan were available for review only, as people were encouraged to go to their libraries and municipal buildings.

Judith Auten, Vice President of CRC Watersheds Association opened the workshops.

Peter Williamson of the Natural Lands Trust presented a dual-slide show. He began by reviewing the character of the watershed. He then reviewed the major subjects discussed in the plan along with recommendations. He discussed:

- Water quality - We need a body to maintain data...
- Forested riparian buffers
- Conservation neighborhoods
- Targeted acquisition of public land
- Environmental Education
- Implementation

At the Monday meeting in Middletown Township the following comments were made:

Patrick Starr, Director of the GreenSpace Alliance introduced a response panel:

Ed Magargee of the Delaware County Conservation District stated that he supports the idea of raising public awareness about the Ridley Creek. Stream stabilization by private citizens is a good idea. He said the report shied away from recommending detention basins. He believes basin technology is basically good but needs to be modified. He cites a conflict in the state and federal regulations regarding seepage beds and sediment traps. He is also concerned that compliance may be lax now that the DEP has taken a new approach.

Peter O'Keefe, Recreational Director of Ridley Township, was concerned about pollution and flooding caused upstream from his township and would love to see the recommendations of the plan implemented. They would be happy to work with Widener on a trail project. He was concerned about the cost of projects

Robert Scott, a councilman from Nether Providence was primarily concerned about the 40-acre Houston tract on Ridley Creek recently purchased by the township. Two adjacent structures were not purchased, but should be considered as historic sites. The township is trying to decide how to use the park and has sent a questionnaire to area residents. He was concerned because the township did not have specific projects to incorporate into the conservation plan at this time and wondered if funding would be available if these projects were not specifically mentioned. He wondered who actually makes application for implementation funds. And he wondered who decides where grant money goes when several municipalities make application to the state at the same time. He wondered if trails through riparian buffers could be damaging.

Peter Williamson responded to Scott's questions. He stated that it is better if a proposed project is mentioned in the plan, however the DCNR has stated that the plan should be an evolving document, revised annually. Peter stated that ideally an intermunicipal management body should make application for funding, however practically it may be the municipalities who apply. If municipalities work together competition could be reduced. Damage to riparian buffers can be minimized if trails are used for activities which minimize soil compaction, such as walking and fishing.

Patrick Starr opened up the meetings for questions.

Andy Saul asked if there would be funding available for the removal of invasives. Williamson responded that under the technical assistance program for landowners, forested riparian buffers could include control of invasives.

Mike Fusco supports the plan and its timeliness to preserve a stream in the crossroads. He asked how we can encourage intermunicipal cooperation. Starr stated that we can encourage them, but we can't force them. He stated that the Pennsylvania Environmental Council (PEC) works with Municipal Environmental Advisory Councils (EACs) and suggested that intermunicipal EACs might manage the program. Judy Auten informed the group that the Friends of Ridley Creek will be meeting October 30 and this could be a topic of discussion.

Ruth Brusstar asked if we have sent a request for support of the plan to municipal representatives. Patrick informed her of the two years of communication that we have had with municipal representatives. We will be officially requesting their support and re-sending them *Appendix F - Sample Municipal Resolution.*

John D'Amicus of Wallingford gave a personal testimonial of how citizens need to step in and take action in order to make

things happen. D'Amicus contacted Mr. Peterson who finds jobs for DUI offenders in Delaware County. He arranged for them to work picking up debris in the lower Ridley in Chester and Nether Providence. He then got a small grant for a trail and bridge and got Williamson Trade School to build the bridge.

Paula Healey, Secretary of Rose Valley, asked what would a township be required to do if they choose to support the plan. Williamson and Starr stated that there is no force of law with the plan. There is no obligation to participate. Once support is obtained the plan is submitted to the state for inclusion on their Rivers Conservation Registry. A municipality can endorse at a later time and still receive funds.

Bruce Clark, manager of Middletown Township, said he thought the plan was good and was happy to see that the authors included comments made by the township. He said that some new opportunities may be opening up for a trail south of Baltimore Pike as residents have notified the township of their interest in allowing a right-of-way. He was hoping that the plan could be revised to reflect this. Starr indicated that it can be revised. He also pointed out that the plan does not call for a continuous trail along the Ridley Creek because it did not appear to be possible. Trails through private properties are strictly voluntary.

Patty Elkis of the Delaware Valley Regional Planning Commission (DVRPC) stated that the plan was outstanding in its breadth and depth. She urged citizens and municipalities to participate. She stressed that they can only benefit from their participation.

At the Wednesday meeting in East Goshen the following comments were made:

Patrick Starr, Director of the GreenSpace Alliance introduced a response panel:
Virginia Newlin of the East Goshen Conservancy was impressed with the overall plan but was concerned about persuading landowners that implementation of the plan would not adversely effect the value of their land due to due to increased usership of the greenway and proposed trails

Response: This concern was evident from the very start of the planning process and was taken into account in the development of the plan. Proposed trail systems in the plan include only those which already existed in municipal plans and those which are widely used but not officially designated. The current situation where there are trails being used but not maintained as part of a connected system pose a far greater nuisance than the proposed system. Also, endorsement of the plan does not require any municipality to carry out any specific portion of the plan including the development of trails.

Ms. Newlin then asked what would be done to generate support from the landowners for the implementation of the stream maintenance recommendations of the plan as well as the public access and recreation recommendations.

Response: This issue is dealt with in the public education section of the plan. Riparian buffer workshops, possible buffer planting workshops and programs to help with the cost of planting buffers. Start where there is willingness to implement the plan and proceed by example.

Steve Kosiak talked about the activities of the DelCo Anglers and how they might be able to help homeowner's control erosion of the streambank. He stated that he was in favor of the plan.

Bill Wade asked what was being done with the Bow Tree open space areas where homeowners do not own land right up to the stream and public lands already exist. He asked if there were proposed trails in these and other eased areas where the threat of detrimental affects to private property are minimized.

Response: Again, the plan only recommends the development of trails where they had been proposed by municipal plans. Also, the importance of publicizing the benefits of the creek is vital to the minimization of concern over public access and private property. Providing access builds a constituency for the healthy maintenance of the creek and promotes positive uses.

Mr. Brendon McGillicutty asked if the plan dealt with the problem of over development near streams and how it can be controlled.

Response: The plan deals with this issue by promoting the development of ordinances and comprehensive plans that take into consideration which areas should be preserved prior to the submission of development plans. If the plans and guidelines are in place prior to the introduction of development proposals it is much easier to control where and how land is developed in a particular area.

Audrey Aikins and Dick Schumaker both voiced their concern over the sedimentation problems on their properties and asked what can be done by homeowners to help the problem.

The plan deals with this issue both from the individual land owner perspective and from the larger watershed perspective. For landowners the practices of planting and maintaining riparian buffers can be the most effective way of maintaining the integrity of a streambank. The plan also deals with this issue from a wider perspective by recommending the updating of the Stormwater Management Plan for Delaware County and the inclusion of Chester County in the plan to encompass the entire watershed. The updated plan should promote the passage of ordinances which encourage the slow infiltration of stormwater into the natural system of the Ridley.

The issue of education was discussed. Important aspects of a public education program about the Ridley Creek and its conservation include the development of a widespread awareness of the benefits of the Ridley to its citizens which in turn will create a sense of stewardship for the creek and, the development of a monitoring system which will allow for the continued awareness of increases or decreases in water quality and indicate possible reasons for those changes.

Sean Moyer asked where the program was going from here with regard to the implementation of the recommendations within the plan.

The process of the creek's inclusion on the Pennsylvania Rivers Conservation Registry through submission of the plan with municipal endorsements was described, as well as the subsequent potential for municipalities that had endorsed the plan to receive implementation grants from DCNR.

In conclusion, at both meetings:

Judy stated that written comments were requested by October 16th. The final hearing will be held on November 19th.

Each attendee received an agenda, a summary of the plan and a questionnaire. Other materials included a *History of Preservation Efforts along the Ridley Creek, How to Care for Your Stream* (an informational sheet on good stream stewardship for landowners along the Creek), announcements of upcoming Friends of Ridley Creek meeting, a DER fact sheet on the Pennsylvania Rivers Conservation Grant Program, and a list of libraries and municipal buildings where they could go to review the plan.

September 30 and October 1, 1996 Public Workshops
Summary of questionnaire results:

Thirty-five questionnaires were returned. Homeowners were not as well represented as municipal representatives, private citizens and organizations. Most of the participants had heard about the meeting through a mailing. Newspaper articles were second. Municipal representatives heard about the meeting through municipal mailings. A few heard about the meeting from their organizational newsletter. No one heard about it from their local library.

Twenty people had read the draft plan or sections of the draft prior to the meeting and 19 intended to read or reread the draft after the meeting. A few planned to comment by phone or letter after the meeting. Because of the complexity of the draft plan and the breadth of the recommendations, a majority of the participants did not feel that the presentation adequately informed them about the plan.

Twenty-one supported the draft plan as presented and eight supported the draft with some modification. One unidentified person opposed the plan and did not explain why they did opposed it. Eleven people wished to volunteer for the project.

APPENDIX C: OPINION SURVEYS

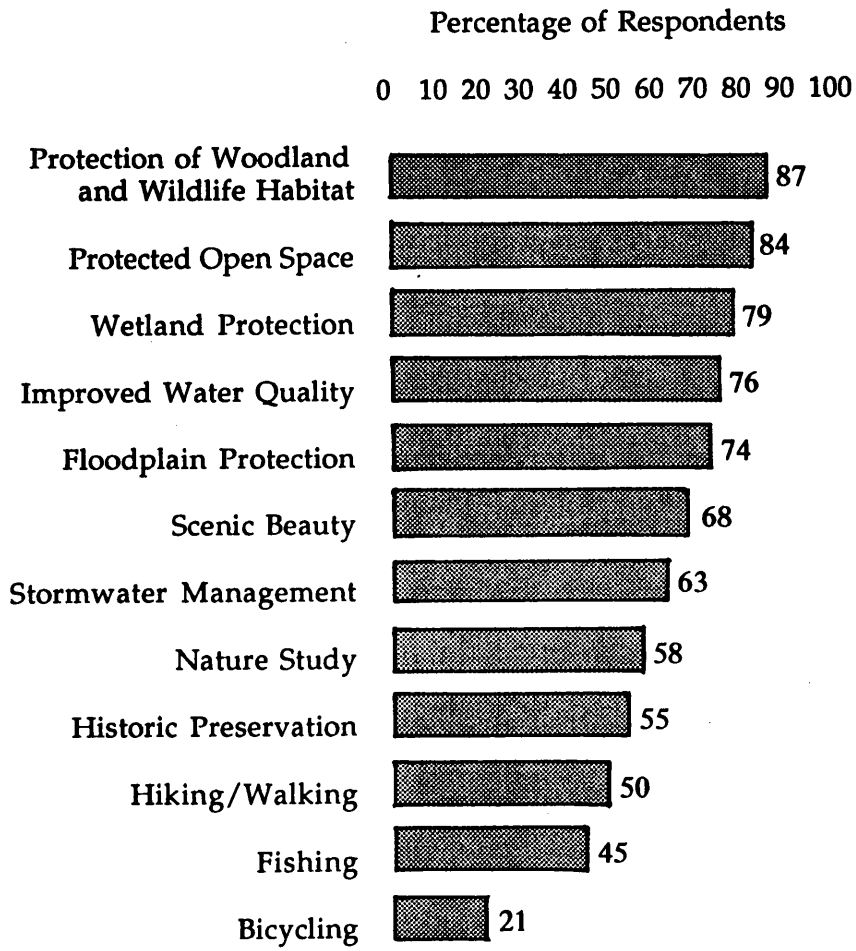
Three different written surveys have been distributed to date. The first was mailed in the beginning of September, 1995 to municipal officials in the watershed. The second, an adaptation of the first, was sent to the members of the Friends of the Ridley in mid-September, 1995. The third, an entirely new and greatly simplified survey, was sent to the private landowners on the main stem at the end of October.

Response to the municipal survey has been good, with 70% (13 out of 19, including the two county planning commissions) returning the completed questionnaires. The Friends of the Ridley sent in 23 surveys. Of the nearly 170 landowner surveys mailed, 31 were received to date, a 18% return.

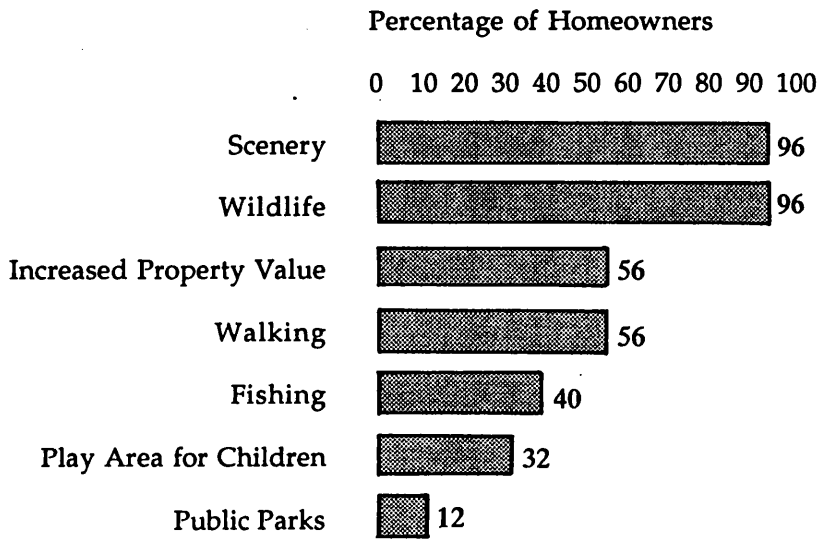
The following pages show:

- *graphs depicting some interesting results from the surveys*
- *The two survey forms, with the total responses filled in*

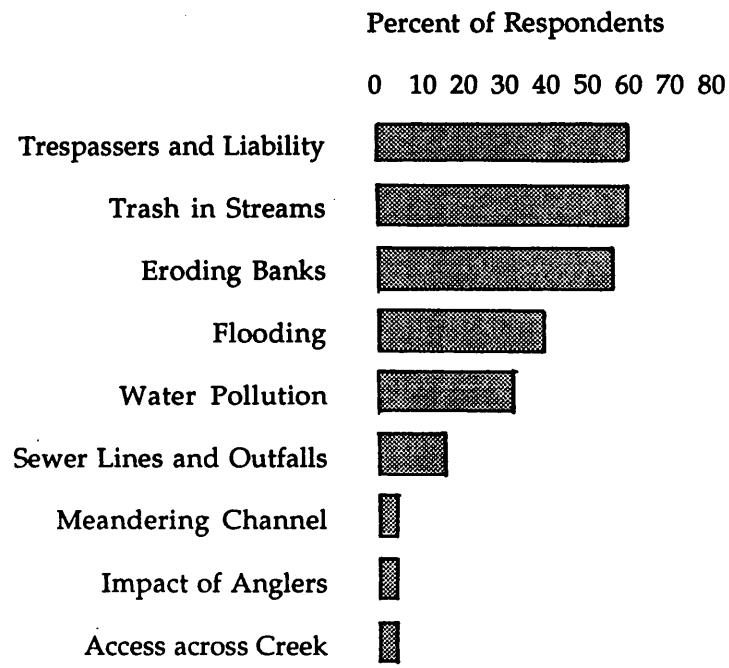
Citizens and Municipalities were asked which benefits and uses they would like to see emphasized in a greenway.



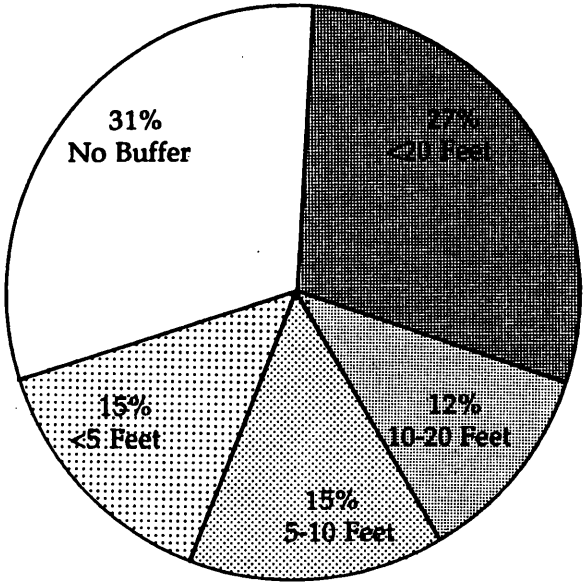
Homeowners were asked what the benefits were of living along a creek.



Problems experienced by homeowners.

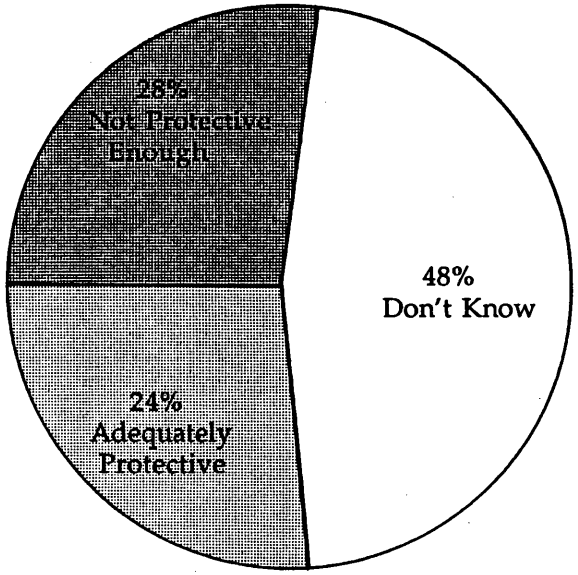


Homeowners were asked the width of their stream side buffer.



73% of homeowner respondents said they have less than a 20-foot buffer of natural vegetation along the Creek.

Homeowners along the Creek were asked about the protection provided by their municipality's ordinances.



Half of the respondents did not know the effectiveness of thier municipality's ordinances.

Ridley Creek Greenway

Questionnaire
(For Municipal Officials)

*Name of Municipality :*_____

*Completed by:*_____

1. *Which of these benefits and uses would you like to see emphasized in a Ridley Creek Greenway? (Please check box of any that apply - either to your individual municipality or the entire length of the creek - as appropriate)*

In Your Municipality	*For the Entire Creek*	
2	9	*fishing*
7	9	*hiking/walking*
6	9	*nature study, birdwatching, etc.*
4	5	*bicycling*
11	13	*protection of woodlands & wildlife habitat along stream*
5	11	*historic preservation*
10	12	*stormwater control and management*

In Your Municipality	*For the Entire Creek*	
9	11	*floodplain protection*
9	12	*improved water quality*
8	10	*scenic beauty*
10	12	*protected open space*
10	12	*wetland protection*
0	0	*other* _____
0	0	*other* _____
0	0	*other* _____

2. *What methods of protection does your municipal favor or not favor?*

	Favor	Not Favor	Need More Information
Voluntary, private conservation efforts			
Landowner education in good land stewardship	14	0	2
Donation of trail/access easements	12	1	2
Donation of conservation easements	12	1	2
Municipal zoning and land use regulations			
Special greenway zoning with reduced density & increased setbacks	6	3	5
Enhanced floodplain zoning	8	2	3
Natural resource protection of woodlands, steep slopes, riparian buffer	12	0	2
Open space zoning (permitting smaller lot sizes & requiring common open space)	11	1	2
Enhanced stormwater management & erosion control requirements	9	0	4
Density transfer provision (for example, Transfer of Development Rights)	7	0	6
Land acquisition			
By nonprofit conservation organizations	12	0	3
By municipalities	9	2	3
By county	11	1	2
By state	9	2	3
By federal agency	6	2	5
Other: _____	0	0	0

3. *What would be an acceptable means for managing the greenway? (Please circle preferred responses. You may indicate more than one "yes")*

	Yes	No
No management necessary	1	4
Individual municipalities with appropriate coordination	10	1
Joint municipal authority or commission	8	2
County level agency. If so which one_____	8	1
New nonprofit greenway association.	8	1
Existing nonprofit. If so, which one _____	8	0
State Park	4	1
Other:_____	0	0

4. What are the major issues related to Ridley Creek and the possible establishment of a Greenway along it?

	Not Important	Somewhat Important	Important	Very Important
Cultural resources protection	0	6	8	1
industrial heritage	2	13	2	0
agricultural heritage	3	8	3	3
protection of mills & mill ponds	1	7	6	3
Farmland protection	2	4	10	2
Habitat protection and enhancement	0	1	3	11
loss of riparian (streamside) forest	0	0	9	7
protection of PNDI sites from County Natural Area Inventories	0	1	3	7
habitat enhancement/stabilization/ in stream/streambank	0	0	9	7
invasive vegetation	0	4	10	1
funding for stream improvements/habitat	0	2	10	3
steep slope protection	0	3	6	7
Floodplain protection	0	0	7	9

	Not Important	Somewhat Important	Important	Very Important
Land ownership, management, stewardship	0	0	9	3
lawn down to the stream	1	6	6	2
poor management of common open space	1	3	9	2
management of public lands	0	3	8	4
private owner stewardship	0	6	6	3
institutional owner stewardship	0	5	5	5
litter/dumping	0	3	3	10
liability	1	2	5	7
unauthorized use of private property	0	1	9	6
rehabilitating industrial sections/tidal marsh	1	1	10	2
easements	0	1	6	5
Land development	0	0	2	7
inappropriate development near stream	0	0	3	12
Stormwaters/Flooding	0	0	10	4
flooding	0	1	11	4
floodwater damage	0	1	10	4
stormwater surges/management	0	0	10	8
increased absorption of stormwater	0	0	12	5
minimized impervious surface	0	0	9	7
Quality of life	1	2	3	4

	Not Important	Somewhat Important	Important	Very Important
Recreation	1	2	8	3
swimming access	8	3	5	1
fishing access/impacts	4	6	5	0
canoeing	3	6	5	1
general public access	0	3	7	5
hiking trails	0	4	7	4
connect neighborhoods to stream open space	2	1	8	4
Regulations	0	1	7	6
state regulations	0	5	6	3
local regulations/enforcement/efficacy	0	1	7	7
septic fields/regulation/enforcement	0	1	3	10
Scenic Quality	0	1	5	5
aesthetic preservation/viewsheds	0	1	5	8
Stream and water quality and quantity	0	0	4	9
channelization	0	3	11	1
dams	0	6	7	1
ground water quality	0	0	4	10
nonpoint source pollution	0	0	6	8
stream water quality	0	0	4	10
sewage discharges	0	0	5	10
siltation/erosion of banks	0	0	12	1
water intakes	0	1	10	1
upgrade DER designation of Ridley Creek	1	1	6	6
Wetlands	0	0	5	5
wetland protection/changing definitions	0	0	11	4

RIDLEY CREEK SURVEY *(for landowners)*

Please feel free to add additional information in the spaces provided. If we have not included an important item or if you would like to emphasize a certain point, please make changes as you see fit.

Living beside a creek can have benefits. Do you consider any of the following creek-related advantages to be a benefit for you?

26 :Scenery
25 :Wildlife
9 :Play area for children
3 :Public Parks
11 :Fishing
14 :Increased Property Value
14 :Walking
Other_____

Living beside a stream can have drawbacks. Have any of the following issues caused you problems?

10 :Flooding
14 :Eroding banks
1 :Meandering channel
7 :Water pollution
15 :Trespassers/Liability
15 :Trash in stream
4 :Sewer lines/outfalls
Other: *Access Across Creek, Water Quality, Impact of Anglers*

Recently scientists have learned that the presence of a band of natural vegetation along a stream (called a "buffer") can absorb stormwater and pollutants and decrease erosion. Do you have a streamside buffer?

Yes- 18 No- 8

How wide is it?

4 :less than 5 feet **4** :5-10 feet **3** :10-20 feet **7** :over 20 feet

Local municipalities are responsible for most of the regulations that can help protect creeks and their watersheds. In your opinion are municipal ordinances:

7 :Adequately protective
8 :Not protective enough
0 :Too restrictive
8 :Don't Know
1 :No opinion

Would you favor having the all the municipalities work together to improve the quality of the Ridley Creek?

Yes- 26 No- zero

What would be the most important recommendation(s) to include in a plan for conserving Ridley Creek?

Maintain clean & natural state
Education of users
Clear out trash regularly
Bank restoration
Water Quality
Wildlife encouragement
Watershed control
Get Rose Valley Borough to accept property as gift
10' buffer requirement.
Stream bed cleanup
Access limited to public r/w
Erosion central assistance
Keep pedestrian traffic to minimum
Sanitary Sewer monitoring
Monitoring Sackville Mills development & cleanup of damaged & existing buildings along Ridley Creek

OPTIONAL

How long have you lived at your property?

Average 19.9 years

Would you like more information on:

12 :Managing your streamside land for wildlife and water quality
8 :Stabilizing stream banks
14 :Local government regulations on the Ridley Creek
14 :Land preservation techniques with potential tax advantages to landowners

Would you like to become involved with protecting the Ridley Creek?

6 :As a creek monitor
3 :As a liaison with your local government
3 :In public education
4 :In stream cleanup
3 :By joining a watershed group
3 :Other *Donor of property*
Will see
Provide limited legal advice

Have you done something to protect the Ridley Creek or do you have expertise or acquired knowledge that you would share?

Yes- 4 **No- 6**

Bank erosion control, Path Building, Reported violations to EPA

Name:

19 respondents

If you want to discuss this questionnaire or the Ridley Creek Conservation Plan, please contact:

Peter Williamson
Natural Lands Trust
1031 Palmers Mill Road
Media, PA 19063

Additional Comments

- *Increase the flow of Ridley Creek possible?(Moylan)*
- *All seems fine along the creek (Malvern)*
- *Interested in pond maintenance & management (West Chester)*
- *Water quality situation bank restoration, etc. is a disgrace*
- *Love to see the "scintillating stream at High noon in summertime."*
- *Options for use of land that is not developable*

APPENDIX D: *Sources of Further Information*

Rivers Conservation Program

Bureau of Recreation and Conservation, DCNR
P.O. Box 8475
Harrisburg, PA 17105-8475
(717) 772-3321

Riparian Buffers

Ordinances

Montgomery County Planning Commission
Montgomery County Courthouse
Norristown, PA 19404
(610) 278-3722

Functions

Stroud Water Research Center
512 Spencer Road
Avondale, PA 19311
(610) 268-2153

Innovative Sewage Treatment

Chester County Planning Commission
601 Westtown Road
Suite 270
West Chester, PA 19382-4501
(610) 344-6285

Erosion Control and Stormwater Management

Delaware County Conservation District
1521 N. Providence Road
Media, PA 19063
(610) 892-9484

Watershed-Based Environmental Education

Brandwine Valley Association
1760 Unionville-Wawset Road
West Chester, PA 19382
(610) 793-1090

Intermunicipal Committees

Lancaster Inter-Municipal Committee
P.O. Box 8347
Lancaster, PA 17604-8347
(717) 397-7313

Watershed-Based Municipal Authorities

LeTort Regional Authority
415 Franklin Street
Carlisle, PA 17013
(717) 245-0508

Environmental Advisory Commissions

Pennsylvania Environmental Council
1211 Chestnut Street
Suite 900
Philadelphia, PA 19107
(215) 563-0250

Watershed Associations

Wissahickon Valley Watershed Association
12 Morris Road
Ambler, PA 19002
(215) 646-8866

Chester-Ridley-Crum Watersheds Association
P.O. Box 972
Edgmont, PA 19028-0972
(610) 353-2926

Conservation Easements & Land Conservancies

Brandywine Conservancy
P.O. Box 141
Chadds Ford, PA 19137
(610) 388-2700

Natural Lands Trust
Hildacy Farm
1031 Palmers Mill Road
Media, PA 19063
(610) 353-5587

Water Quality Testing Programs

Crum-Ridley-Chester Volunteer Monitoring
613 Academy Lane
Swarthmore, PA 19081
(215) 597-4283

United States Geological Survey
111 Great Valley Parkway
Malvern, PA 19355
(610) 647-9008

Flood Hazard Mitigation Program

Pa Emergency Management Agency
Disaster Field Office
3600 Vartan Way
Harisburg, PA 17110

Conservation Subdivisions

Planning Department
Lower Merion Township
75 Ardmore Avenue
Ardmore, PA 19003
(610) 645-6115

Natural Lands Trust
Hildacy Farm
1031 Palmers Mill Road
Media, PA 19063
(610) 353-5587

APPENDIX E: Bibliography

Allegheny Land Trust, ***"Pennsylvania Land Conservation Handbook"***, 1996

Ayres, William and Brown, Ann Barton, ***A Poor Sort of Heaven A Good Sort of Earth, The Rose Valley Arts and Crafts Experiment*** , Brandywine Conservancy, 1983

Borough of Brookhaven, **Zoning Ordinance**, 1990, as amended

Chesapeake Bay Program, ***Water Quality Functions of Riparian Forest Buffer Systems in the Chesapeake Bay Watershed*** , 1995

Chester County Planning Commission, ***"Utilization of Spray Irrigation in Wastewater Treatment"***, 1990

Delaware County Planning Department:

- ***"Brookhaven Borough Comprehensive Plan"***, October, 1991
- ***"Delaware County Open Space Project, Recommended Strategy"***, February 1995
- ***"Delaware County Waterfront Resources Management Plan"***, 1992
- ***"Edgmont Township Historical Resources Survey"***, 1994
- ***"Media Borough Comprehensive Plan"***, September, 1986

Delaware County Planning Department, Satterthwaite Associates and Green International, ***"Act 167 Stormwater Management Plan for the Ridley Creek Watershed"***, June 1988

East Goshen Township, ***"Open Space, Recreational and Environmental Resources Plan"***, July 1993

Edgmont Township, ***Zoning Ordinance***, 1984, as amended

Environmental Law Institute, ***"Using Pollution Control Authorities to Protect Threatened and Endangered Species and Reduce Ecological Risk"***, 1992

Middletown Township:

- ***Comprehensive Plan,*** July 1981
- ***"Guidelines for Open Space Management and Development"***, August 1988
- ***Subdivision and Land Development Ordinance,*** 1982, as amended

- ***Zoning Ordinance,*** 1986, as amended

Media Borough, ***Zoning Ordinance***, 1989, as amended

Montgomery County Planning Commission:
- ***"Riparian Corridor Conservation District"***, 1995

- ***"Riparian Corridor, The Benefits of Protection"***, 1995

- ***"Stormwater Basins, Making Them More Functional and Attractive"***, October 1992

Moore, Craig R., ***"Determination of Benthic-Inverterbrate Indices and Water Quality Trends of Selected Streams in Chester County, Pennsylvania, 1969- 80"***, United States Geological Survey and Chester County Water Resources Authority, 1987

National Estuary Program, ***"Comprehensive Conservation and Management Plan for the Delaware Estuary"***, Public Review Draft, December 1994

National Park Service, ***"Economic Impacts of Protecting Rivers, Trails, and Greenway Corridors"***, 1992

Nether Providence Township:
- ***Open Space Plan***, 1990

- ***Subdivision and Land Development Ordinance***, 1991, as amended

- ***Zoning Ordinance***, 1991, as amended

Pennsylvania Department of Community Affairs, ***"Municipal Authorities in Pennsylvania"***, 1991

Pennsylvania Department of Conservation and Natural Resources, ***"Pennsylvsania Rivers Conservation Program Policy, Procedures and Implementation Manual"***, January 1995, as amended

Pennsylvania Department of Environmental Protection:
- ***A Streambank Stabilization and Management Guide***, 1986

- ***"Erosion and Sediment Pollution Control Manual"***, 1990

- ***Pennsylvania Code, Title 25, Environmental Resources, Chapters 71, 72, 73, 93, & 105***

- ***"Special Protection Waters Implementation Handbook"***, page V-1, 1992

Schubert, Steven T., ***"Aquatic Biology Investigation, Ridley Creek"*** Pennsylvania Department of Environmental Protection, 11/20/95

Schueler, Thomas R., ***Controlling Urban Runoff: A Practical Manual for Planning and Designing Urban BMPs***, Metropolitan Washington Council of Governments, 1987

Sweeney, Bernard W., ***"Streamside Forests and Physical, Chemical and Trophic Characteristics of Piedmont Streams in Eastern North America"***, Water Science Technology, Vol 26, No.12, 1992

The Nature Conservancy- Pennsylvania Science Office:
- ***"Natural Areas Inventory Delaware County"***, 1992

- ***"A Natural Areas Inventory of Chester County Pennsylvania"***, 1994

Rose Valley Borough, ***Zoning Ordinance of 1983***, as amended

Upper Providence Township:
- ***Comprehensive Plan***, October 1989

- ***Zoning Code***, 1992, as amended

United States Army Corps of Engineers, ***"Flood Plain Information, Ridley Creek"***, April, 1970

Welsch, David J., ***Riparian Forest Buffers***, United States Forest Service, 1991

Webster,, Holly R., ed., ***A History of Nether Providence Township, Delaware County Pennsylvania, 1687-1987***, Nether Providence Tricentiennial Commission, 1987

West Whiteland Township;
- ***Subdivision and Land Development Ordinance***, 1991

- ***Update to the 1983 Open Space and Recreation Plan***, July 1992

- ***Zoning Ordinance***, December 1992, as amended

Willistown Township:
- ***Environmental Protection Ordinance***, 1995

- ***"Open Space, Recreational and Environmental Resources Plan"***, March 1993

- ***Subdivision and Land Development Ordinance***, as amended throught October 1992

- ***Zoning Ordinance***, as amended through November, 1995

APPENDIX F: *Sample Municipal Resolution*

WHEREAS, *the Board of Supervisors (Board of Commissioners, Borough Council) recognizes the importance of conservation and improvement of the Ridley Creek and its tributaries to the continued quality of life in _____ Township (Borough), and*

WHEREAS, *Resolution _____, passed on _____, 1994 stated _____ Township's (Borough's) support and endorsement for the efforts of the Chester-Ridley-Crum Watersheds Association (CRC) and GreenSpace Alliance (GSA) to secure funding for a "Ridley Creek Conservation Plan" from the Commonwealth of Pennsylvania's Rivers Conservation Program, and*

WHEREAS, *the grant was received by CRC and GSA and the Conservation Plan has been completed, and*

WHEREAS, *the Conservation Plan contains a number of conservation recommendations suitable for utilization in _____ Township (Borough), and throughout the entire Ridley Creek Watershed, and*

WHEREAS, *the Conservation Plan has been reviewed and found acceptable by the Board of Supervisors (Board of Commissioners, Borough Council),*

NOW, THEREFORE, *the Board of Supervisors (Board of Commissioners, Borough Council) of _____ Township (Borough) do hereby endorse the Ridley Creek Conservation Plan, and will endeavor to take appropriate action to implement its recommendations.*

Resolved this _____th day of _____, 19____