

Quakertown Swamp Resource Protection Plan

September 2000



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Table of Contents

Acknowledgements	i
Table of Contents	iii
I. Background and Purpose for the Plan	1
The Quakertown Swamp Partnership	3
II. Resource Inventory	5
Geology and Soils	5
Water Resources	6
Plant Communities	7
Wildlife Habitat	8
III. Land Use, Zoning and Planning	11
Richland Township	11
East Rockhill Township	12
West Rockhill Township	14
Summary	15
IV. Protecting the Wetland Resource	17
Land Conservation	17
Federal, State and Local Regulations	17
Resource Threats and Management Issues	19
V. Resource Protection Priorities	23
Wetland Protection	23
Wetland Buffer Protection	23
Education and Outreach	24
Public Access	25
Management	25
Communication	25
Action Plan	26
References	31
Appendix A. Partnership Activities and Public Involvement	33
Appendix B. Plants Identified within Quakertown Swamp	49
Appendix C. Wildlife of the Quakertown Swamp	55
Appendix D. Funding Sources	59

Maps

- 1. Location Map**
- 2. Wetland and Water Resources**
- 3. Zoning**
- 4. Resource Protection Priorities**

I. Background and Purpose for the Plan

Quakertown Swamp is a large natural wetland, unique to upper Bucks County. In the 1980's, Heritage Conservancy, through the Significant Natural Areas Preservation Program, identified Quakertown Swamp as one of the most significant natural resources in the county. According to the Pennsylvania Natural Diversity Inventory (PNDI), it is one of the largest intact, inland wetlands in southeastern Pennsylvania and is exceptional for its broadleaf deciduous shrubs and excellent bird habitat. The entire Quakertown Swamp wetland community is imperiled in the state because of rarity. The Pennsylvania Game Commission recognizes this extensive swamp as significant habitat for nesting and migrating waterfowl. Quakertown Swamp is listed by the U.S. Fish and Wildlife Service as an important wetland area in Pennsylvania. The Bucks County Planning Commission named Quakertown Swamp as a significant natural area in its natural resources plans (1986 and 1999) and in its Natural Areas Inventory (1999).

A nationwide cooperative conservation program led by the National Audubon Society designated the swamp as a Pennsylvania Important Bird Area. The swamp is the only known nesting area of the Sora Rail and Marsh Wren in the region, two Species of Special Concern in Pennsylvania. The Pennsylvania Breeding Bird Census in 1985 identified 74 species nesting in this natural area. The largest Great Blue Heron rookery in eastern Pennsylvania is found here and the Least Bittern and American Bittern, both threatened in Pennsylvania, are seen in the swamp during migration.



Wetlands such as Quakertown Swamp are a valuable and significant resource wherever they naturally occur, providing not only a rich and diverse habitat for plants and wildlife but also

providing groundwater recharge, flood control and pollutant filtration, not easily duplicated by human engineering. Natural wetlands make a substantial contribution to a healthy and high-quality environment.

Quakertown Swamp is located 2 miles southeast of Quakertown Borough and includes parts of three municipalities, East Rockhill, West Rockhill and Richland townships. It originates in woodlands just west of Route 309 and extends northeast 4.5 miles to join Tohickon Creek east of Quakertown Borough. The swamp encompasses an area of approximately 518 acres bordering Bog Run, a tributary to Tohickon Creek. About two-thirds of the wetland occurs just north of Rich Hill Road, an area of critical wildlife habitat of shrub swamp and emergent cattail marsh. Geologically, Quakertown Swamp is located on an ancient formation created by impermeable igneous intrusions into older sedimentary shale, forming a surface water table. In spite of 300 years of human activity, Quakertown Swamp remains remarkably intact.

Through a program of voluntary commitment by individual residents, and increasing awareness of local interest groups and regulatory agencies, Heritage Conservancy and the Quakertown Swamp Partnership are working to conserve this unique natural resource. In the 1980's several landowners made a voluntary commitment to protect the resources on their land by joining the Bucks County Natural Areas Registry. Heritage Conservancy, Bucks County Audubon Society and other groups have held educational walks through the wetland and created an interpretive brochure for use by local citizens and students.

Numerous studies of the Quakertown Swamp have been carried out over the past twenty years. Among them are two of major importance, the Advanced Identification Wetland Site Evaluation undertaken by the US Environmental Protection Agency (1993) in conjunction with Heritage Conservancy and the Quakertown Swamp Partnership, and the Natural Areas Inventory by Bucks County (Rhoads and Block 1999).

Quakertown Swamp provides a unique resource in eastern Pennsylvania, supporting an abundant and diverse biotic community. Due to its location between two rapidly developing regions, Quakertown and Doylestown, the Bog Run watershed is in the path of development. Continued development in the region could affect both water levels and water quality in the Bog Run watershed. The wetland is vulnerable to the cumulative impacts of

land use and development due to its dependence on surface water supplied by the watershed.

Existing federal and state wetland regulations apply only to activities within the boundaries of the wetland. The maintenance of the Quakertown Swamp, however, is dependent on land use and water flows from the entire watershed of Bog Run, involving three municipalities and many private landowners. Interagency cooperation is essential in establishing protection guidelines and increasing public awareness to ensure implementation and support for the permanent protection of this resource.

The Quakertown Swamp Partnership

The Quakertown Swamp Partnership, consisting of federal, state, municipal and local agencies, conservation groups, legislators, landowners and concerned citizens, was formed in November 1996. The mission of the Partnership is “to create a cooperative effort involving federal, state, municipal, local and private entities, to protect Quakertown Swamp and its unique natural and wild resources”. The partnership meets on a monthly basis to implement the following goals:

- Provide legal protection of the wetland proper;
- Develop a management plan;
- Protect areas buffering or draining to the wetland proper through best management practices, conservation education and outreach;
- Provide public access;
- Develop an on-going education/outreach program;
- Establish funding sources to achieve goals;
- Continue communication between members of the partnership and the local community.

The Partnership has sponsored several very successful public programs and walks to inform neighbors and the community about this unique resource and how it can be preserved. Heritage Conservancy has provided individual landowners throughout the swamp with land protection options in an effort to promote the use of conservation easements and secure permanent protection of the wetland.

Swamp Partners Include:

Bucks County Audubon Society
Bucks County Conservation District
Bucks County Planning Commission
Bucks County Park and Recreation Department
East Rockhill Township
Habitat by Design
Heritage Conservancy
Milford Township
Paletown Rod & Gun Club
PA Game Commission
PA Representative Paul Clymer
Richland Township
Southeastern PA Resource Conservation & Development Council
West Rockhill Township
Wildlands Conservancy
US Environmental Protection Agency

Recent efforts to expand interest in the swamp have included the reprinting of a Self-Guided Tour of Quakertown Swamp and the posting of the Quakertown Swamp as a “wetland worth visiting” on the Society of Wetland Scientists web page. Copies of these materials are included in Appendix A.

II. Resource Inventory

Geology and Soils

Quakertown Swamp is located on an ancient formation created by igneous diabase intrusions into older sedimentary shales. Diabase is an igneous rock of the Jurassic period that intruded the existing Triassic shales and siltstones to form a series of subsurface dikes and sheets. Dark, gray rounded surface boulders and nearly flat valleys with slow-moving streams that spread to form extensive wetlands are conspicuous features of the diabase areas. The boulder-strewn landscape results from exposure of the underlying rock to erosion and is present where there is even the slightest slope.

The flat valleys are a result of the diabase forming an impermeable sheet and shallow soils, creating a perched water table near the soil surface. The properties of the bedrock aquifer indicate that the wetland system is not groundwater dependent, but principally maintained by surface flows (PADER 1989). The valleys may represent areas of sediment accumulation or of accelerated weathering of the underlying rock due to frequent inundation. Quakertown Swamp is the largest wetland in the diabase region. Similar, but smaller areas occur along Butter Creek, Dimple Creek, and Ridge and Valley Creek.

Where diabase intrusions contacted the surrounding sedimentary rock, alteration occurred resulting in localized concentrations of copper, lead and other minerals. Diehl's mine near Rockhill Station was found to have a small amount of gold (Wherry 1908). Other early mines yielded small, but recoverable amounts of copper and lead (Evans 1980).



Soils derived from diabase are of the Towhee – Neshaminy – Mount Lucas association (USDA 1975). The Towhee soils are poorly drained soils with restricted permeability located in concave positions at the base of slopes and depressions. These soils are present bordering Quakertown Swamp in many locations. Stoniness and poor drainage have limited their use for agriculture. The Towhee soils tend to have higher pH and higher magnesium levels than surrounding soils. The soils of the swamp are primarily Hatboro silt loam, a floodplain soil formed from alluvium washed from the surrounding uplands. The Neshaminy soils are deep and well drained, found on ridges and slopes. The Mount Lucas soils are located on the lower slopes between the Neshaminy and Towhee.

Water Resources

The Quakertown Swamp is located in the watershed of Bog Run, a tributary to Tohickon Creek. Bog Run is classified by the Pennsylvania Department of Environmental Protection Chapter 93 Water Quality Standards, with all headwaters of the Tohickon Creek, as a trout stocked fishery (TSF). Bog Run is a low gradient, meandering channel that reverts to sheet flow in some locations. Intermittent streams originating in the surrounding woodland also feed into Bog Run. Several man-made crossings have created impoundments along the length of flow. The most significant of these is the elevated railroad bed which bisects the wetland. Additional temporary impoundments are created by beavers resulting in a mosaic of vegetation types in the wetland.

The water source for the wetland is from the surface drainage in the watershed, an area of approximately 3500 acres. Rainfall and runoff are perched on the underlying impermeable diabase. The diabase unit is fracture-controlled, more so than other geologic units. Aquifer recharge depends primarily on surface water, making the unit highly susceptible to contamination from septic systems and nonpoint sources. The diabase generally has shallow soil cover which provides little or no role in filtering pollutants. Diabase can be very complex allowing flows across watershed boundaries. Subsurface flow in the Bog Run watershed has not been studied in detail.

Only one public water system is documented in the watershed. This source supplies 35 residential units in the Greentop Trailer Park from two wells. All remaining water sources are supplied by individual on-lot wells. Domestic wells in this area are primarily in

the underlying geologic units and are not likely to adversely affect the water supply to the swamp.

Potential threats to the water supply of the swamp are primarily contamination from septic systems, and changes in runoff quantity and quality related to increased impervious surface and changes in land management resulting from development. In addition to residential septic systems, there is one permitted wastewater discharge to Bog Run from the Bethel Baptist Church.

Plant Communities

Wetland plant communities are mapped and described by the U.S. Fish & Wildlife Service based on a hierarchical system reflected by vegetation, water regime, and substrate conditions (Cowardin 1979). The Advanced Identification completed in 1993 mapped the plant communities based on this system, delineating four distinct wetland classes:

- Palustrine forested broad-leaved deciduous
- Palustrine scrub/shrub broad-leaved deciduous
- Palustrine emergent
- Palustrine emergent farmed

Palustrine wetlands include all nontidal wetlands containing trees, shrubs, and herbaceous vegetation, as well as tidal freshwater wetlands and shallow water bodies, such as ponds. Where the natural vegetation has been modified by agriculture and the wetland hydrology remains, the wetlands are classified as farmed. These areas could potentially be restored to wetland plant communities.

A more recent survey of some portions of the Quakertown Swamp was conducted for the Natural Areas Inventory of Bucks County. This survey indicates that the swamp contains diverse natural plant communities (Fike 1999, Rhoads and Block 1999) including the following:

- Buttonbush swamp
- Red maple - mixed shrub palustrine woodland
- Cattail marsh
- Tussock sedge marsh
- Tuliptree - beech - maple forest
- Bottomland oak - hardwood palustrine forest
- Black willow scrub/shrub wetland



A list of plant species recorded during various surveys is included in Appendix B.

Pennsylvania Natural Diversity Inventory records for the swamp include the following plant species:

Scientific name	Common name	Global /State rank
<i>Eriophorum gracile</i>	slender cotton-grass	G5/S1
<i>Lysimachia hybrida</i>	lance-leaved loosestrife	G5/S1
<i>Iris prismatica</i>	slender blue iris	?/S2
<i>Lythrum alatum</i>	winged loosestrife	G5/S1
<i>Ranunculus pusillus</i>	pursh buttercup	G5/S2
<i>Filipendula rubra</i>	queen-of-the-prairie	G4G5/S1S2

Historic records for some of these plants have not been confirmed during recent surveys.

A Texas Eastern pipeline right-of-way that closely parallels Bog Run has brought a severe infestation of common reed (*Phragmites australis*) into the swamp. This pipeline traverses approximately 6800 linear feet of the wetland. A second easement for AT&T traverses approximately 1440 linear feet of wetland. Other weed problems exist along the railroad track where Japanese plumegrass (*Miscanthus sinensis*) has spread over several acres and in many parts of the wetland where purple loosestrife (*Lythrum salicaria*) is established.

Wildlife Habitat

The Quakertown Swamp has long been known as an important site for bird species. The site has been included in a variety of censuses conducted over the years by Bucks County Audubon Society. These studies include:

Audubon Christmas Count - tally of total bird populations, conducted annually one day each winter;

North America Migratory Count (NAMC) – population count conducted annually during the peak of spring migration;

Breeding Bird Atlas of Pennsylvania - five-year study of breeding birds, including several blocks that were studied 1983 through 1988;

County Birdathon records - the Swamp has been visited annually at night by teams listening for Rails for over 14 years;

Bucks County Natural Areas Inventory - conducted in 1998 similar to Breeding Bird Census to update information.

Appendix C includes a breeding bird list compiled for Quakertown Swamp. This list represents a combination of the Bucks County Audubon Pennsylvania Breeding Bird Atlas completed in 1990 and the Bucks County Natural Areas Inventory completed in 1999. It includes known nesting species during those years that the Quakertown Swamp was inventoried. Ornithological criteria were used for collecting breeding records.

The status for bird species of special concern in Bucks County is also listed. The swamp contains more of these "coded" species of special concern than any other site in Bucks County, 14 rare breeders, eight Species of Special Concern, and four of uncertain nesting status. The swamp has a large Great Blue Heron rookery, the only one in Bucks County and the largest in eastern Pennsylvania. The swamp is also the only known nesting area for Sora Rails and Marsh Wrens in the region. Least Bittern and American Bittern, both threatened in Pennsylvania, are seen in the swamp during migration. Although not confirmed on the breeding bird list, these two species are believed to nest in the Swamp.

In addition to birds, many amphibians and reptiles are dependent on the swamp habitat. Although no comprehensive survey of herpetofauna has been conducted, incidental records of amphibians and reptiles indicate that the swamp provides habitat for five species of turtle, seven species of frog, three species of salamander, and five species of snake. A listing of species sighted is included in Appendix C.



III. Land Use, Zoning and Planning

The swamp and the Bog Run watershed are contained within three municipalities. The following provides a summary of the zoning districts and land use regulations that apply to the properties within the Quakertown Swamp.



Richland Township

The majority of the Quakertown Swamp is situated in Richland Township. The swamp is located on portions of properties situated in the RA Rural Agriculture and RP Resource Protection zoning districts. The RA district permits single-family detached dwellings on a minimum lot area of two acres. Single-family cluster developments are also permitted on a minimum site area of four acres with 50 percent preserved as open space. An average lot area of at least 30,000 square feet is required for individual lots in a cluster arrangement.

The RP district permits single-family detached dwellings on a minimum lot area of five acres. Single-family cluster developments are also permitted on a minimum site area of 10 acres with 75 percent preserved in open space.

Other permitted uses in these two zoning districts include agricultural uses, medical offices, institutional uses (i.e., places of worship, schools, cemeteries, etc.) and accessory uses. Each permitted nonresidential use is required to comply with specific regulations such as lot size, setbacks, and parking requirements.

The natural resource protection standards require the protection of floodplains, floodplain soils, lakes, ponds and watercourses, and wetlands. These areas are required to remain undisturbed except for minor road crossings where design approval is obtained from the township, state, and/or federal agency, and where no other reasonable access is available. Wetlands of less than one acre in size may be altered if state and federal permits are obtained.

Special yard setbacks are required on lands containing wetlands. The minimum building setbacks and yard requirements are to be measured from the closest wetlands limits, rather than from the lot lines so that all required minimum yards are free from lands with this natural resource; provided however, that the maximum required setback from the wetland limits are 50 feet for front yard, 25 feet for the side yard and 50 feet for the rear yard.

A portion of the shore area surrounding a lake or pond is required to be protected. The shorelines of lakes, to a distance of 300 feet, shall not contain more than 10 percent impervious surfaces. At least 70 percent shall remain undeveloped and unaltered, unless approved by the township. The shorelines of ponds, to a distance of 100 feet, shall contain no more than 10 percent impervious surfaces and at least 80 percent shall remain undeveloped unless approved by the township.

In areas of steep slopes, the following standards apply:

- 8 to 15 percent grade - no more than 40 percent may be altered, regraded, cleared or built upon.
- 15 to 25 percent grade - no more than 30 percent may be altered, regraded, cleared or built upon.
- Slopes of 25 percent or steeper - no more than 15 percent may be altered, regraded, cleared or built upon.

Areas of steep slope that are less than 3,000 square feet are exempt from meeting these standards.

No more than 20 percent of woodland areas shall be altered, regraded, cleared or built upon unless approved by the Government Body in its sole discretion. The remaining 80 percent shall be maintained as permanent woodland. Tree protection standards for existing trees to remain are also required by the zoning ordinance.

The zoning ordinance does not contain any protection standards for wetland margins, headwater streams, or riparian corridors.

East Rockhill Township

The portion of the swamp contained in East Rockhill is located in the RP Resource Protection District with a small area also situated within the VR Village Residential zoning district. The RP district permits single-family detached dwellings (Use B-1) on a minimum lot area of 1.8 acres. Site capacity calculations are required to be

submitted for all B-1 single-family detached dwelling uses. The calculations require that certain natural features be excluded from the lot area in order to determine the net buildable site area. A maximum density of 0.5 dwelling units per acre is permitted based on the net buildable site area in the RP district. A minimum building envelope consisting of 8,500 square feet is also required for each lot. For uses with on-lot sewage systems, an additional area consisting of 3,000 square feet is required.

Cluster subdivisions are also permitted in the RP district on a minimum site area of 10 acres with 60 percent preserved in open space. A minimum lot area of 20,000 square feet is allowed for a residential lot in a cluster subdivision.

Other permitted uses in the RP district include agriculture, municipal buildings, recreational facilities, veterinarian offices, and golf courses. Institutional uses such as schools, places of worship, and emergency services are allowed by conditional use. Each permitted nonresidential use is required to comply with specific regulations such as lot size, setbacks, and parking requirements.

The VR district allows single-family detached dwellings on a minimum lot size of 10,000 square feet with a building envelope consisting of at least 3,500 square feet. For uses with on-lot sewage systems, an area consisting of at least 3,000 square feet in addition to the building envelope must be provided. A maximum density of 3.48 dwelling units per acre is permitted based on the net buildable site area (excluding protected natural features).

A performance standard subdivision (Use B-3) is also permitted in the VR district on a minimum site area of five acres. A variety of housing types are allowed under the B-3 use at a maximum density of three dwelling units per acre with 25 percent open space.

Other uses permitted in the VR district include agriculture, places of worship, and schools. Community centers and emergency services are allowed by conditional use. Specific area and dimensional requirements apply to each nonresidential use.

The natural resource protection standards require the protection of floodplains, floodplain soils, streams, watercourses, wetlands, lakes and ponds. These areas are required to remain undisturbed except for minor road crossings where design approval is obtained from the township, state, and/or federal agency, and where no other reasonable access is available. In addition, no more than 20 percent

of a wetlands margin (measured 100 feet from the wetland boundary or to the limit of the hydric soil, whichever is shorter) and lake or pond shoreline may be altered, regraded, filled or built upon.

Steeply sloping areas consisting of 15 percent to 25 percent grade are required to be protected in 70 percent open space. For slopes of 25 percent or steeper, no more than 20 percent may be altered, regraded, cleared or built upon.

No more than 20 percent of wooded areas may be altered, regraded, cleared or built upon.

The zoning ordinance does not contain any standards for the protection of headwater streams or riparian corridors.

West Rockhill Township

The properties that the Quakertown Swamp traverses in West Rockhill Township are located in the RC Rural Conservation District. This district permits single-family detached dwellings on two acres with a maximum net density of 0.5 dwelling units per acre. A building envelope consisting of at least 8,500 square feet is required. An additional area of 3,000 square feet is required for a lot served by an on-lot sewage system.

Single-family cluster is permitted on a minimum site area of 20 acres with a minimum lot area of one acre and 60 percent open space. A performance subdivision is also permitted on 50 acres with at least 60 percent open space. Various housing types are permitted at a maximum density of 2.3 dwelling units per acre.

Other permitted uses in the RC district include agricultural and institutional uses by right or conditional use on at least three acres unless the nonresidential use requires a larger lot size.

The natural resource protection standards require the protection of floodplains, floodplain soils, streams, watercourses, wetlands, lakes and ponds. These areas are required to remain undisturbed except for roadways and utilities crossings where design approval is obtained from the township, state, and/or federal agency. In addition, no more than 30 percent of a lake or pond shoreline, measured at a distance of 100 feet from the spillway crest elevation, may be altered, regraded, filled or built upon.

In areas of steep slopes, the following standards apply:

- 10 to 15 percent grade - no more than 40 percent may be altered, regraded, cleared or built upon.
- 16 to 25 percent grade - no more than 30 percent may be altered, regraded, cleared or built upon.
- Slopes of 26 percent or steeper - no more than 15 percent may be altered, regraded, cleared or built upon.

No more than 40 percent of any forest may be cleared or developed. The remaining 60 percent are required to be permanently protected and remain undeveloped.

The zoning ordinance does not contain any protection standards for wetland margins, headwater areas, or riparian corridors.

Summary

Population growth in the three townships averaged 49 percent between 1980 and 1999. Increasing development pressures may be greatest along the travel corridors of Routes 309 and 313, both of which pass through the wetland. Although the area around the wetland is not currently serviced by public water or sewer, a planned expansion of public water service is noted in the County Water Supply Plan to service properties along Paletown Road between Route 309 and Axe Handle Road near the Bog Run watershed boundary.

The land use in the watershed affects the swamp, its vegetation, animal communities, water quality and water flows in many ways. The fragmentation of the swamp habitat and the maintenance of water quality and flow are two factors which are controlled to a great extent by land use decisions.

Fragmentation of the habitat occurs when there are significant disruptions in the habitat or when there are barriers to plant and wildlife movement. Currently there are eight roadway crossings of the wetland. In addition, transportation improvements proposed in the region, including the extension of Paletown Road to Route 309 and the re-activation of passenger rail service, may increase development pressures. At least two additional utility rights of way bisect the wetland, the Texas Eastern gas pipeline and the AT&T transmission line. All of these features fragment the habitat, alter the flow of surface and subsurface water, and provide pathways for the introduction of pollutants and invasive plant species. Future decisions regarding the location of linear utilities and

transportation routes should be made with consideration of the cumulative impacts of such facilities on the resource.

Although natural resource protection standards are in place at the municipal level, these mechanisms alone will not effectively protect the function and integrity of the wetland system as development continues in the watershed. In addition to fragmentation, the most immediate threat to the sustainability of the wetland may be changes in the hydrology resulting from increasing impervious surfaces, loss of woodland cover, and increasing nutrient loads from septic systems and other land uses. Both East Rockhill and West Rockhill Townships are evaluating new stormwater management ordinances based on the model ordinance prepared for the Tohickon Creek Watershed Stormwater Management Plan. Additional mechanisms may be required to manage and sustain the water quality and flow to the wetland.

IV. Protecting the Wetland Resource

Land Conservation

The organizations of the Quakertown Swamp Partnership have been working for many years to reach out to local landowners and municipal officials to encourage their support for the protection of the swamp through landowner education, land acquisition and open space protection.

The PA Game Commission currently owns and manages 261 acres within the Bog Run watershed, effectively protecting 76.2 acres of wetland. These parcels are actively managed for upland game species and for use by the hunting public, providing the only public access to the swamp. Heritage Conservancy owns 2.64 acres in the watershed, directly protecting 1.95 acres of wetland.

Many landowners within the swamp have been contacted by Heritage Conservancy to determine their interest in conservation of their land. As a result, more than one-third of the swamp landowners expressed a desire to protect this natural area. Over the years, several of these landowners expressed their interest in conservation by participating in the Bucks County Natural Areas Registry. The development of the Bucks County open space program and the identification of the Quakertown Swamp as a high priority natural area in the County have provided additional opportunities for conservation through allocation of land protection funds.

One objective of the Swamp Partnership is to obtain conservation easements on properties to permanently protect significant portions of the swamp. To that end, Heritage Conservancy is currently discussing land conservation options with five interested landowners with the potential of permanently protecting in excess of 100 acres of land in the watershed including more than 50 acres of wetland.

Federal, State and Local Regulations

Wetlands and other aquatic resources are regulated at the Federal, State and local level. Section 404 of the Clean Water Act prohibits the unauthorized fill of waters of the United States including wetlands. Permits for activities in waters and wetlands are authorized by the U.S. Army Corps of Engineers with oversight from the EPA. The Corps of Engineers also enables the Pennsylvania Department of Environmental Protection (PADEP) to issue permits without federal review under the state programmatic general permit

program. The PADEP has jurisdiction for the encroachment on streams and wetlands under Chapter 105 of the Dam Safety and Encroachments Act of 1978. The county conservation district also oversees the issuance of many of the state general permits for activities in streams and wetlands. Although these regulatory programs do afford some protection to the wetland resource, they also routinely permit activities such as filling of wetlands, construction of bridges, dams, docks, roads, dredging of water bodies and enclosure of streams. Questions regarding activities permitted in the Quakertown Swamp should be directed to the following agencies:

Department of the Army
Philadelphia District Corps of Engineers
Wanamaker Building
100 Penn Square East
Philadelphia, PA 19107-3390
(215) 656-6734

Pennsylvania Department of Environmental Protection
Southeast Regional Office
Lee Park, Suite 6010
555 North Lane
Conshohocken, PA 19428
(610) 832-6000

Bucks County Conservation District
924 Town Center
New Britian, PA 18901-5182
(215) 345-7577

Municipal regulation of wetlands and waters is afforded by the Pennsylvania Municipal Planning Code (MPC). Section 603 of the MPC authorizes local governments to regulate, permit, prohibit, restrict and determine uses of land, including wetlands. Each of the municipalities in the Quakertown Swamp area have adopted natural resource protection standards requiring the protection of floodplains, floodplain soils, lakes, ponds, watercourses and wetlands. These areas are to remain undisturbed except for minor road crossings where design approval is obtained and where no other reasonable access is available. In addition, East Rockhill Township protects wetland margins, allowing no more than 20 percent of the area within 100 feet of the wetland to be altered, regraded, filled or built upon.

Permitted activities can have a cumulative effect on the water source and the wetland, causing a direct loss of wetland, fragmentation of habitat, and changes in hydrology. In addition, many activities outside the wetland and stream system and the reach of regulatory authority can significantly affect the functioning and integrity of the wetland. Wetland regulation alone does not provide permanent protection to the Quakertown Swamp.

Resource Threats and Management Issues

Potential threats to the wetland resource have been identified by various members of the swamp partnership and the community. Threats such as unauthorized fills and dumping in the wetland can be remedied by enforcement of existing state and federal regulations. Environmental education and advocacy efforts raise the awareness of residents as to the value of the wetland and the loss which results from destruction of the wetland by fills. This education has two effects: it may reduce the incidence of wetland violations and it develops citizen advocates to assist regulatory agencies in early identification of violations. Members of the Quakertown Swamp Partnership can assist in protecting the swamp by notifying regulatory agencies of potential violations and ensuring enforcement of existing regulations. The EPA Advanced Identification study of the wetland provides a baseline to verify suspected unauthorized activities in wetland.

More subtle, are the cumulative impacts to the wetland that may result from additional development in the Bog Run watershed. The addition of impervious surfaces from roads, rooftops, driveways and other hard surfaces will result in increasing volumes of stormwater runoff. In addition, as land uses change from forest and agricultural to low density residential permitted by current zoning, pollutants in the stormwater runoff can also be expected to change. Conventional stormwater practices rarely address changes in stormwater volumes or quality and the incremental impacts of these changes are often not recognized until the aquatic environment is severely damaged. The particular characteristics of the aquifer and shallow soils of the Bog Run watershed also make the swamp susceptible to nutrient loading from on site septic disposal.

Habitat fragmentation due to development in the watershed and the region may result in the loss of a critical mass of habitat required by some wildlife species. Road crossings interrupt movement of wildlife and increase the incidence of roadkills.



Management of road and utility rights of way introduce herbicides, de-icing chemicals, and other potential pollutants to the wetland system. Continued inventory of the flora and fauna and increased understanding of the relationship between the swamp and the surrounding habitat will assist in evaluating the impact of development and management activities on the wildlife and plant communities of the swamp.

It is estimated that 56 percent of Pennsylvania's wetland habitat has been lost during the last 200 years (Welsch 1995). Restoration of areas which were historically wetland habitat may mitigate some of the impacts to the Quakertown Swamp resulting from fragmentation and

hydrologic changes. Lands which are suitable for restoration are generally those which contain hydric soil but do not currently support wetland vegetation. In the Quakertown Swamp these areas occur primarily along the eastern edge of the wetland in locations which were farmed or cleared for other uses. Wet areas that are mowed, cultivated, or used for pasture may be restored by implementing changes in the land management practices alone. Restoration of these lands would enhance the wildlife value of the swamp and improve the potential for maintenance of water quality in the future.

Restoration of previously drained hydric soils on the edge of the swamp provides additional opportunities for maintaining the functions of the wetland. Marginal farmlands were often drained or ditched to increase agricultural productivity, prior to enactment of state and federal wetland regulations. Plugging ditches and breaking tile outlets are simple measures that enable the return of a seasonal high groundwater table and the return of wetland vegetation to drained lands. The added benefit of restoring drained lands is the return of the flood storage capacity of the hydric soil. Waters which had been efficiently removed from the land by ditches

and drains are now slowly filtered through wetland vegetation and soils before reaching the stream.

The integrity of the plant communities of the Quakertown Swamp and the wildlife dependent on those plants are also threatened by the expansion of invasive non-native plant species into the wetland. It was recently estimated that 37 percent of the plants in Pennsylvania are non-native (Rhoads and Klein 1993). Non-native plants that are considered invasive are those that grow and spread in a way that displaces native vegetation. In Quakertown Swamp, control of the following plants is needed:

- | | |
|---------------------|-----------------------------|
| Common reed | <i>Phragmites australis</i> |
| Japanese plumegrass | <i>Miscanthus sinensis</i> |
| Purple loosestrife | <i>Lythrum salicaria</i> |

Infestations of common reed are especially evident along utility rights-of-way.



V. Resource Protection Priorities

Resource protection priorities for the Quakertown Swamp are outlined in the summary table and described briefly below.

Wetland Protection

Permanent protection of the swamp through voluntary conservation efforts is ongoing. Continued landowner contacts may encourage permanent protection of additional wetland and buffer areas. Partners critical to this effort are the townships, the county, and state and private conservation funding sources.

Enforcement of wetland regulations is also ongoing. Regulators at the PADEP, USEPA and Corps of Engineers should be encouraged to resolve violations quickly and to require restoration and mitigation for unauthorized activities in wetlands. Suspected violations for unauthorized dumping and filling of the wetland have sometimes gone unresolved for months and years. Existing regulations will only protect the swamp if they are consistently enforced. The swamp partners and regulators should maintain ready access to the Advanced Identification study results which indicate the wetland boundaries.

Wetland Buffer Protection

A complete evaluation of the water quality and flow characteristics should be initiated to determine the present condition of Bog Run and the swamp, and to establish environmental indicators for the maintenance of water quality and quantity.

The model stormwater management ordinance prepared for the Tohickon Creek Watershed Stormwater Plan should be evaluated for its effectiveness in protecting the unique water resources of the Bog Run watershed.

If appropriate, a wetland overlay district should be considered as a tool to guide future development in the watershed. The overlay district should be based on the principles of watershed-based zoning and include the following:

- 1) conduct a monitoring program to assess the current quality of the stream and wetland, identify the most sensitive systems, and define the relationship between land use and the aquatic environment;
- 2) project the future condition of water resources based on forecasted growth and zoning;

- 3) modify the existing land use plan if necessary to ensure that future growth is consistent with the protection goals for the swamp; and
- 4) adopt specific resource objectives for the swamp.

Specific polices and practices related to impervious cover limits, best management practices, and buffers can then be instituted to meet the resource objectives that are to be directly applied to future development projects. Watershed-based zoning should provide communities with greater confidence that resource protection objectives can be met in the face of future development.

Education and Outreach

The Swamp has been a popular field trip for those interested in birding and botany and is listed in a number of area guides. Each spring, the Quakertown Swamp Partnership leads a swamp walk, giving an overview of conservation efforts and touring the publicly accessible areas. The Bucks County Audubon Society and Bowmans Hill Wildflower Preserve also lead field trips to the swamp. Additional opportunities for adult education, wildlife viewing and nature study should be pursued to increase the awareness and appreciation of this resource.

A number of elementary and secondary schools are near the swamp both in the Quakertown community and Pennridge School Districts. In the past, Bucks County Audubon Society has used the site in its teacher enrichment workshops to familiarize teachers with some of the natural habitats in Bucks County. The organization also conducted an in-service workshop for the Quakertown School District.

Awareness and appreciation of the swamp can also be improved by conducting public talks, providing fact sheets and other outreach materials, as well as erecting appropriate signage in the watershed.

Additional studies to determine the status of wildlife and plant communities of the swamp should be conducted. A herpetological survey should be coordinated with volunteer programs such as the statewide Herpetological Atlas project and the nationwide North American Amphibian Monitoring Program. Site screening criteria for conservation prioritization should be applied to document the regional significance of the Quakertown Swamp.

Public Access

Because of the interest and unique habitat, the site offers wonderful education opportunities. Unfortunately, site access is limited. The only parking area is a small lot on State Game Lands #139 or through special permission of the Paletown Rod and Gun Club. The best viewing over the swamp and of the Heron rookery is from Muskrat Road or from an active railroad line that crosses the middle of the swamp. Both present safety concerns, particularly for large groups. Publicly accessible viewing areas, including a boardwalk or a viewing platform would allow for expanded use of the swamp for education and recreation. Opportunities for additional public access should be investigated on State Game Lands and on other permanently protected lands. Public access should be limited or controlled in particularly sensitive areas to protect natural features. The impact of additional public access should be determined in developing management plans for protected properties and for the swamp as a whole.

Management

Management of the Quakertown Swamp for the maintenance and protection of this unique resource is the responsibility of private landowners, local, state and federal regulators and resource managers, public utility companies and others who enjoy the benefits the wetland provides. A management plan which describes the functions of the wetland and methods and responsibilities for maintaining and protecting those functions should be prepared and implemented.

Control of exotic invasive species within and around the swamp should be addressed with landowners and utility land managers.

Restoration of wetland vegetation and hydric soil functions by landowners should be encouraged. Technical assistance and grants for implementation of restoration activities should be provided by the Swamp Partnership members.

Communication

Regular meetings of the Swamp Partnership are on-going. Several members of the swamp partnership have expressed interest in formalizing the functioning of this group. A more formal framework will be needed to complete some of the actions and activities recommended in this resource protection plan. The partnership should continue to act as a coordinating entity for protection of the swamp and seek to adopt a more formal structure, if necessary, to

address public access, education and outreach, and management of the swamp.

Action Plan

(see following table)

Action	Potential Partners	Potential Funding Sources	Priority / Implementation Schedule
Goal: Legal protection of the wetland			
1. Continue landowner education and enforcement of state and federal wetland regulations	PA DEP, U.S. Army Corps of Engineers, Bucks County Conservation District	N/A	On-going
2. Secure funding for purchase of development rights and land acquisition	Heritage Conservancy, Municipalities, Bucks County, Pa Game Commission	County, Municipalities, National Fish & Wildlife Foundation, Wildlands Trust Fund, Game Commission, U S Fish & Wildlife Service North American Wetlands Conservation Council, private foundations	On-going
3. Continue landowner contacts to facilitate permanent protection of the wetland	Heritage Conservancy, Municipalities, PA Game Commission	Legislative initiative grants, private foundations	On-going
Goal: Protect areas buffering or draining to the wetland through best management practices, conservation education and outreach			
1. Evaluate water quality and flow characteristics of the wetland	US Geological Survey, Heritage Conservancy, Municipalities, Bucks County Planning Commission	PA DEP, U S EPA	Year 1 - 3
2. Review the effectiveness of the Tohickon Creek Stormwater Management Plan model ordinance for protection of the swamp	Municipalities, Bucks County Planning Commission	PA DCNR	Year 2 -3
3. Develop a wetland overlay district	Municipalities, Bucks County Planning Commission		Year 3
Goal: Develop an on-going education / outreach program			
1. Continue guided public walks	Bucks County Audubon Society, Heritage Conservancy	Foundations, local businesses	On-going
2. Provide teacher training workshops for local schools	Bucks County Audubon Society, Heritage Conservancy	PA DEP Environmental Education program	Year 2 -3

Action	Potential Partners	Potential Funding Sources	Priority / Implementation Schedule
3. Incorporate wetlands education into local school curriculum	Bucks County Audubon Society, Heritage Conservancy	PA DEP Environmental Education program	Year 3
4. Provide signage to raise awareness of the importance of the swamp and its watershed	Heritage Conservancy, Bucks County Audubon Society, Bucks County Conservation District	Foundations, local businesses	Year 2 -3
5. Encourage additional studies of wildlife and plant communities	Heritage Conservancy, Bucks County Audubon Society, PA Game Commission, Bowmans Hill Wildflower Preserve, Lehigh Valley Herpetological Society, Churchville Nature Center, Delaware Valley College	EPA, National Fish & Wildlife Foundation	Year 1-3
Goal: Provide public access			
1. Evaluate additional opportunities for public access on State Gamelands	PA Game Commission		Year 1-3
2. Provide wildlife observation areas, viewing platform or boardwalk	PA Game Commission, Heritage Conservancy, Bucks County Audubon Society, Bucks County Conservation District	PA Fish & Boat Commission	Year 2 -3
3. Provide additional access points and trails	Heritage Conservancy, Bucks County Parks & Recreation, Bucks County Conservation District	PA DCNR, Bucks County Parks & Recreation	Year 3 -5
Goal: Develop a management plan			
1. Encourage landowners to participate in wetland restoration programs	Heritage Conservancy, U S Fish & Wildlife Service, PA DEP, NRCS	U S Fish & Wildlife Service North American Wetlands Conservation Council, PA DEP, NRCS, Fish & Wildlife Foundation, Corporate Wetlands Restoration Partnership	Year 1-3
2. Develop and implement an invasive species control program	landowners, utility companies, Bucks County Conservation District, Morris Arboretum	National Fish & Wildlife Foundation	Year 2 -5
3. Develop and implement a management plan for the swamp	all partnership members	PA DCNR, PA Game Commission	Year 3-5

Action	Potential Partners	Potential Funding Sources	Priority / Implementation Schedule
Goal: Continue communication between members of the partnership and the local community			
1. Continue regular meetings and activities of the Swamp Partnership	all partnership members	N/A	On-going
2. Formalize the partnership to function more effectively in implementing the protection plan	Heritage Conservancy, Bucks County Audubon	PA DEP, River Network Watershed Assistance program	Year 1
3. Provide information to the public through the news media	all partnership members	local business sponsors	Year 1-5

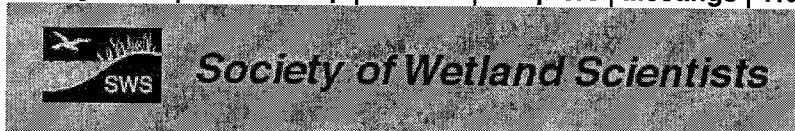
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Appendix A. Partnership Activities and Public Involvement

April 25, 1998	Swamp Walk
April, 29, 1998	Partnership Meeting
May 14, 1998	Teacher Program - Quakertown School District
May 21, 1998	Partnership Meeting
July 16, 1998	Evening Supervisors Meeting and Walk
September 11, 1998	Partnership Meeting
October 14, 1998	West Rockhill Township Meeting
October 23, 1998	Partnership Meeting
December 1998	National Fish and Wildlife Foundation Grant
February 26, 1999	Conservation Science Forum
March 12, 1999	Partnership Meeting
April 6, 1999	Press Conference
April 9, 1999	Partnership Meeting
May 1, 1999	Swamp Walk
June 11, 1999	Partnership Meeting
November 18, 1999	Partnership Meeting
February 17, 2000	Partnership Meeting
May 6, 2000	Swamp Walk
June 15, 2000	Partnership Meeting
September 21, 2000	Partnership Meeting
September 30, 2000	Swamp Walk

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Québec 2000

Annual Meetings
 1999:Norfolk, Virginia
 2000:Québec, Canada
 2001:Chicago, Illinois

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 Wetlands: Journal
 abstracts - Sept 2000 NEW!
 SWS Bulletin

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 Wetland Jobs (8/17/00)
 Conferences (8/15/00)
 Training (8/1/00)
 Message Board (8/17/00)
 Wetland Links (3/30/00)
 Guestbook (8/11/00)
 College Programs (5/2/00)
 Wetland Concerns (4/6/99)
 Teaching Aids (4/6/00)
 Website News (4/5/99)

**Québec 2000 Early
 Registration Deadline is
 May 1st!**

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 Page-more current**

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 Pages**

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 Convenors**

SWS Symposia

SWS Symposium -
Neotropical wetlands:
 Building links among wetland
 scientists

Wetlands Worth Visiting



Quakertown Swamp - Pennsylvania, USA



Canelo Hills Cienega - Arizona, USA



Wetland Certification
 Program

Wetland Tools (8/16/00)

Regional Chapters
 Alaska (2/25/00)
 Central (4/7/99)
 Mid-Atlantic (7/29/00)

**SWS Online
 Membership Renewals!**

Due to a server error on the Allen Press web site, any on-line application or renewal submitted between March 27 and April 24 was not received. This error has been corrected. Members and new applicants may resubmit from this site. Applicant and renewal information may also be faxed to me at 785-843-1274. For questions or concerns regarding your

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Rocky
Mountain (9/26/99)
South Atlantic (7/17/00)
South Central (7/19/00)
Western (7/28/97)
Canada (3/7/00)
International (4/13/00)
Australia^{NEW!} (7/3/00)

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Tracy Jones Association
Manager

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Society of Wetland
Scientists

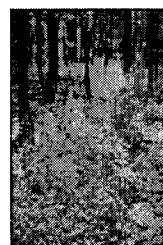
Quakertown Swamp

The largest freshwater inland wetland in southeastern Pennsylvania

The Quakertown swamp is the largest freshwater inland wetland in southeastern Pennsylvania, containing over 400 acres of diverse plant and animal communities. The swamp is home to a significant Great blue heron rookery and provides habitat for 91 additional bird species, including 14 rare breeders. The Audubon Society has designated the swamp as an Important Bird Area. A recent natural areas inventory of the swamp confirmed the presence of three globally rare species and several unusual local wetland plant communities. The diverse habitat includes open water, shrub wetland, cattail marsh, wet meadow and forested swamp. The entire swamp is underlain by diabase, or trap-rock, an igneous intrusion that forms the boulder-strewn landscape in this part of Bucks County and creates a perched water table that supports the wetland.



In the 1990's the swamp was the subject of an Advanced Identification (ADID) study conducted by Heritage Conservancy and the EPA in an effort to increase public awareness of the wetland and provide additional regulatory protection. The swamp is located in upper Bucks County, Pennsylvania, two miles southeast of Quakertown along Bog Run, a tributary to Tohickon Creek. The swamp spans the townships of West Rockhill, East Rockhill and Richland. It includes wetlands all along Bog Run from just west of Route 309 to its confluence with the Tohickon Creek north of Route 313.



To Visit the Swamp

With the exception of the State Game Lands, Quakertown Swamp is entirely on private property. Do not enter private property without the landowner's permission. Start your tour at State Game Lands #139 near the intersection of Muskrat and Rich Hill Roads. A small parking area is located on Muskrat Road near the intersection. Walk past the gate and follow the trail to a man-made pond. On the far side of the pond is one of the largest scrub-shrub wetlands in southeastern Pennsylvania. You may see a variety of turtles, frogs, ducks and possibly muskrat or beaver. Songbirds, including warblers and flycatchers, can be heard in the woodlands to the south. When you return to the parking area turn to the right and walk along Muskrat Road for 50 yards. Look to the left to view an extensive heron rookery. Great blue herons have created a growing nesting colony here since 1994. If you

are adventurous, walk back to the intersection and turn left onto Rich Hill Road. Follow Rich Hill Road to the overpass. Before the overpass, climb up the embankment on the left to reach the railroad tracks. Be alert! One of the two tracks is still active and extreme care should be used in walking along the tracks. At the tracks continue to the left for about 100 yards until you see a culvert that drains water under the tracks. From this point enjoy the panoramic view of the swamp. In the distance, on the left, you see the heron rookery and the pond on the Game Lands. To the right is an extensive cattail marsh. To obtain a copy of A Self-Guided Tour of Quakertown Swamp, contact Heritage Conservancy, 85 Old Dublin Pike, Doylestown, PA 18901, 215-345-7020, www.heritageconservancy.org.

Sharon Yates

Heritage Conservancy

Have you been to a wetland worth visiting? Contact the [SWS webmaster](#) if you have a brief story with photos you would like to submit.

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Quakertown Swamp gets conservation cash

The government and private grants are part of an effort to preserve an area rich in wildlife.

By Mark Binker
INQUIRER SUBURBAN STAFF

RICHLAND TOWNSHIP — At least \$150,000 has been set aside to preserve land near the Quakertown Swamp, a 400-acre tract that is home to scores of species of birds and wildlife and has been threatened by development.

The money, from a combination of federal, state and private sources, was announced yesterday by a group of government officials and representatives of local preservation groups.

Quakertown Swamp, situated between Quakertown and Lake Nockamixon, has been designated by the National Audubon Society and several state agencies as a sensitive and important wetland. As housing development accelerates in the central and upper sections of the county, those agencies say construction and pollution threaten to damage the swamp's natural habitats.

"We're in a race with the bulldozer," said U.S. Rep. James C. Greenwood (R., Bucks), reiterating what has become a theme of those seeking funds to preserve open space. Standing in front of one of the northernmost sections of the swamp, Greenwood and other presenters were upstaged by honking geese.

Quakertown Swamp is home to 74 bird species and is the largest nesting site in Southeastern Pennsylvania for the great blue heron. Other species found there include deer, muskrat, raccoon, beaver and a number of reptiles and amphibians.

The money to preserve land in the area will be given to the Doylestown-based Heritage Conservancy and will come in three \$50,000 chunks. The first was from the federal Fish and Wildlife Foundation, a nonprofit agency established by Congress for the preservation of natural areas. The William Penn Foundation and the state Department of Conservation and Natural Resources donated the other \$100,000.

Over the next several years, the amount of money pumped into preservation of the swamp area likely will increase, said Jeff Marshall, the conservancy's vice president for resource protection. Marshall said he was hopeful that among other funding sources, Bucks County might chip in some of the \$9 million it has set aside for the conservation of natural areas from a 1997 bond issue.

There are about 40 parcels of land near the swamp that the conservancy considers important to preserving the area, Marshall said. In most cases, he said, property owners will be asked to enter into conservation easements, agreements by which an owner keeps a property but is paid to place restriction on its deed that keeps it from ever being developed. But some land would be bought in hopes of giving the public access to the swamp, much of which is a nearly impenetrable mix of muddy marsh, brush and trees.

The conservancy is negotiating with one property owner, Marshall said, and expects to start talking with others soon.

Phila. Inquirer - Neighbors - 4/7/99

July - for US file

Swamp will beat the bulldozers

*A fund of \$150,000
so far will begin
protecting the
wetlands of the
Quakertown Swamp.*

BY CHRISTOPHER JOHNSON
Staff Writer

RICHLAND — Ah, the sights and sounds of a lovely spring Tuesday morning on Maurers Lake, an over-stated pond behind the Paletown Gun Club off Axe Handle Road.

Geese squawking as they paddle. Cattails, their ends a cottony fluff, reaching from the pond into the bright sky.

And a group of politicians and environmentalists promising to get money to keep it that way.

"We're in a race with the bulldozers," said U.S. Rep. James Greenwood, R-8.

Greenwood, state Rep. Paul Clymer, R-145, and others used the manmade lake as a backdrop to announce they had procured \$150,000 to begin protecting from development 80 or so private properties covering wetlands known collectively as the Quakertown Swamp.

The total includes a \$50,000 from the National Fish and Wildlife Foundation, a private, nonprofit organization that Congress gives \$6 million each year to spend on preservation. That

grant was matched by \$100,000 already committed to the project by the state Department of Conservation and Natural Resources and the William Penn Foundation.

The swamp, habitat to 74 bird species including the largest great blue heron rookery in Southeastern Pennsylvania, covers 400 acres in three Upper Bucks townships: Richland, East Rockhill and West Rockhill. It follows the trail of Bog Run, a four-and-a-half-mile tributary of Tohickon Creek, which empties into Lake Nockamixon.

The Heritage Conservancy, a Doylestown-based nonprofit preservation group, will use the money to buy conservation easements within and around the swamp. Easements allow property owners to keep their land, but restrict them from developing it.

"The expenditure of these funds will be driven, by large measure, by what property owners will step up to the plate and negotiate," Greenwood said.

Added Jeffrey Marshall, the conservancy's vice president for resource protection, "Once we get the first one done, once they see their neighbor has done this, hopefully it will be a domino effect."

Much of the swamp is protected state game lands and other undevelopable property, but Marshall said officials also hope to use preservation money to buy land and create a buffer around the swamp to protect the waters seeping into Bog Run.

Marshall said he couldn't estimate how many easements \$150,000 could buy.

"Truly, what you see is a start," he said.

Marshall said grant money could be parlayed with dollars assigned to the three swamp-home townships through Bucks County's open space program. Other private sources could also be tapped, he said.

Once the easements are in place, preservation officials will work with property owners to create scheduled tours and other ways residents can visit the scenic swamp. Bruce McNaught, executive director of the Bucks County Audubon Society, said birders enter part of the state game lands area through a parking area at Muskrat and Rich Hill roads.

"A lot of it is virtually impenetrable," Marshall said.

The Pennsylvania Natural Diversity Inventory gives the swamp an "imperiled" ranking. It's inhabited by deer, fox, beaver and other mammals, amphibians and reptiles, conservancy officials said.

During the past 10 years, Bucks County has lost more than 5,400 acres of farmland each year to residential and commercial development, Greenwood said.

◆
Conservation officials, including members of the Audubon Society, will conduct a public tour of the swamp from 9 a.m. to noon Saturday, May 1. The group will meet at the Paletown Gun Club, situated about a one-quarter mile from Route 313 off Axe Handle Road.

Intelligencer Record 4/1/99

Opinion



The Free Press

Upper Bucks Publishing Company, Inc.

312 West Broad Street, Quakertown, PA 18951

Barbara E. Walck, *Publisher*

Sara J. Hauff, *Editor*

Citizens assure swamp will be preserved

As a direct result of the diligent work of local citizens, State Rep. Paul Clymer, and the four municipalities where the swamp is located, the Quakertown Swamp will be preserved.

The \$7,500 in state funds handed over Friday are part of a matching grant from the Land Trust Grant Program, with \$15,000 going into a project to develop a Resource Protection Plan for the swamp.

The plan will analyze the natural resources of the swamp, such as vegetation, soil, wildlife and water, allowing the Conservancy to establish goals and objectives for its preservation. The main goal is to provide a coordinated approach to the long-term protection of the swamp, which is now considered a critically endangered habitat.

Within the state gamelands there are rookeries, or colonies of nests of the Great Blue Heron that only breed in two places in Pennsylvania. Besides these environmental concerns, the swamp is a significant part of Quakertown's history. Settled in the early 1700s by English Quakers, Quakertown was once known as the Great Swamp. And despite 300 years of human activity, the swamp remains remarkably intact. However, continued development in its drainage basin could begin to affect its water levels.

The swamp is a valued resource in times of flooding because it helps to hold water. The dense growth in the area absorbs and filters pollutants, helping to keep the area's water supply clean.

Residents who live in the municipalities where the swamp is located should be especially grateful to those who persevered.

OUR TOWNS

State contributing to swamp research

The 400-acre area near Quakertown is home to deer and wild turkey. Pennsylvania wants to help preserve it for future visitors.

By DAMON LEVINE
Staff Writer

To many people, swamps are unpleasant, humid, alligator-infested bodies of water.

To Charles Krikory, a member of the Paletown Rod and Gun Club, though, the swamp is a place to get in touch with and experience the beauty of nature.

That's because 14 acres of Krikory's 80-acre Richland property is Upper Bucks County's very own Quakertown Swamp.

The swamp, a 400-acre area, connected through streams and wetlands, runs through East Rockhill, West Rockhill, Milford and Richland townships.

Krikory plants corn near the swamp for deer, wild turkey and other animals to eat during the winter.

"I let so many rows out for deer and turkey," he said.

In an effort to protect the swamp for future visitors, representatives from the state Department of Conservation and Natural Resources came here Friday to present a check for \$7,500 to state Rep. Paul Clymer and representatives from the Heritage Conservancy to continue research on the swamp.

"When you want to protect land and do conservation, it takes more than saying, 'I want to do this,'" said Karen Deklinski, deputy secretary of administration for DCNR. "It takes a plan."

The conservancy will use the money - a matching grant from the state - to develop a resource protection plan for the swamp.

The DCNR allotted \$3.7 million in 1998 for environmental projects throughout the state, Deklinski said.

"Land protection doesn't take place overnight," said Heritage Conservancy president Clifford C. David Jr. "It takes years and years."

There will be money available in the future for the project, Clymer said.

The conservancy has done various studies on the swamp since the county planning commission suggested a protection plan in the late 1980s, David said.

"The purpose of the funding is to bring all this together," he said of the conservancy's various studies. "We have done pieces. Now, we want to bring this all together."

According to the conservancy, the protection plan will involve public awareness and participation in the project, an inventory of the swamp's significant resources and the establishment of goals and objectives to protect those resources.

"You can see how Quakertown and Doylestown are just expanding," said Gary Bowles, a geographic information specialist and resource planner for the Heritage Conservancy. "We're trying to protect this before development comes right up on it."

And the swamp is more than just pretty scenery.

"It acts as a filter when you have heavy rains like we had this year," Bowles said. "The Audubon Society has deemed Quakertown Swamp as one of its important bird areas."

An "important bird area" designation identifies significant areas of bird habitat, according to Nancy Jones, director of development for the Bucks County Audubon Society.

There are 70 important bird areas in the state.

Quakertown Swamp is a habitat for the blue heron, Jones said.

"There are birds here that aren't anywhere else" in the county, she said.

The conservancy will rely on property owners like Krikory - who own portions of the swamp - to allow them access to those areas when needed.

"It's a beautiful place, it's a magnificent place," David said. "Instead of stopping to smell the roses, we should stop to smell the swamp."

Media Advisory

CONTACT: Lois Ash, 215-345-7020, ext. 101

Press Conference Heritage Conservancy to Receive Award from Pennsylvania DCNR to develop Quakertown Swamp Resource Protection Plan

11:30 a.m.

Friday, March 27, 1998

Paletown Rod & Gun Club, Quakertown

(From Doylestown, turn right on Paletown Road,
go approximately 1/4 mile, Clubhouse on left hand side of road)

Ms. Karen DeKlinski, Deputy Secretary of Administration, Pennsylvania Department of Conservation and Natural Resources (DCNR), will present Clifford C. David Jr., President of Heritage Conservancy, and PA Representative Paul Clymer with a check in the amount of \$7,500 as a state match for a project aimed at developing a Resource Protection Plan for Quakertown Swamp.

Invited guests include:

Bucks County Audubon Society - Bruce McNaught
Bucks County Conservation District - Lisa Ishimuro
Bucks County Parks & Rec - Bill Mitchell
Bucks County Open Space Program Manager - Mike Kane
PA Game Commission - David Mitchell
East Rockhill Township - John Cornell
West Rockhill Township - Nelson Heffelfinger
Milford Township - Jeff Vey
Richland Township - Neil Erkert
Wildlands Conservancy - Dennis Collins
Southeast PA RC&D - Bill Van Ingen
Nockamixon State Park - Art Moeller

News Release

Date: April 21, 2000
Release: Immediate
Contact: Lois Ash, 215-345-7020, ext. 101; Gary Bowles, ext. 117.

4th Annual Quakertown Swamp Walk Set for May 6, 2000

Join Heritage Conservancy and the Bucks County Audubon Society when they sponsor the 4th annual Quakertown Swamp Walk on Saturday, May 6, 2000. Participants will meet at the Paletown Rod & Gun Club on Axe Handle Road in Richland Township at 9 a.m. Bruce McNaught, executive director of the BCAS, will lead the three-hour tour through the swamp.

The walk will begin by the beaver dam behind the club. Participants will car pool and continue the walking tour along the railroad tracks through the swamp and to the heron rookery. A valuable and significant resource, the 400-acre Quakertown Swamp is one of the largest intact, inland wetlands in southeastern Pennsylvania, exceptional for its broadleaf deciduous shrubs and excellent bird habitat.

A cooperative conservation program led by the National Audubon Society designated the swamp as one of only two Pennsylvania Important Bird Areas in Bucks County, due to the number and variety of nesting bird populations, including herons, bitterns, rails, ducks and other marsh birds.

Participants should wear comfortable and sturdy shoes. Binoculars are encouraged. The walk is free and open to the public and will take place rain or shine. For more information about the walk, contact Gary Bowles at Heritage Conservancy, 345-7020, ext. 117, or call the Bucks County Audubon Society at 297-5880.

RICHLAND

BECT 6/2/80
Conservancy wants to buy Great Swamp

The rare refuge is the nesting ground for great blue herons and 90 other bird species.

By JAMES F. DUFFY
COURIER TIMES

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The Heritage Conservancy wants to make sure the great blue heron continues to have a place to nest in the county.

Not to mention providing a home for about 90 other bird species, beaver and various reptiles, amphibians and plants.

With the help of a \$70,000 grant from the state Department of Conservation and Natural Resources' Community Partnership Initiative, the conservancy, based in Doylestown, is working toward acquiring 25 acres of the Quakertown Swamp.

"We are trying to establish a greenway along the swamp to protect the swamp itself," said Jeffrey Marshall, the conservancy's vice president of resource protection.

"This is a significant area as wetlands and as habitat. It will be kept as natural open space."

The Quakertown Swamp, or Great Swamp as it is also known, is a 400-acre natural area in Richland, and East and West Rockhill and, according to experts, is the only known great blue heron rookery in the county. The rookery consisted of 48 nests in 1999, making it the largest in eastern Pennsylvania.

The swamp is listed as a "priority one" site for preservation in the Natural Areas Inventory, a study conducted for the county by the Morris Arboretum of the University of Pennsylvania.

"Quakertown Swamp is the largest inland wetland in Bucks County," according to the study. "It contains diverse natural communities ranging from open water to shrub swamp, cattail marsh, tussock sedge marsh and swamp forests."

Richland Township manager Bruce Fosselman called the swamp a "one of a kind" for the region. As development moved in over the years, he said, areas of the swamp were filled in and never replaced.

"If you go down there and see all of the birds, the water fowl, the beavers, you realize this isn't just an important location for Richland," he said. "It impacts the entire aquifer and we have to keep it protected. If it wasn't there it would have ramifications throughout the ecosystem."

According to the Heritage Conservancy, the habitat potential of the swamp is severely threatened by fragmentation due to heavily traveled roadways, a railroad easement and a pipeline easement and encroaching development. Marshall said while typical wetlands are federally protected, "marginal" lands, such as the swamp, tend not to be federally preserved.

"That's what we are trying to do," he said. "We are trying to protect several natural areas at once using funding from the DCNR, the county Natural Areas Inventory program, and the National Fish and Wildlife Foundation."

It will likely cost a total of about \$170,000 to purchase the 25-acre piece of the swamp, which adjoins another 25-acre portion Heritage received \$65,000 from the DCNR for preserva-

tion efforts last year. "We should have (negotiations) on that 50 acres complete by the end of the summer," Marshall said. "We are in discussions for a total of about 100 to 120 acres (of the swamp) which would be a combination of fee simple purchase and purchasing development rights."

Richland actually has the swamp to thank for its name, Marshall added, since the swamp provided such "rich land" for farming to early settlers. Swamp Road, obviously, is also a nod to the habitat.

"This (preservation effort) is all part of a much larger project," he said. "We are also doing work with Cooks Creek in Durham and Springfield townships."

Marshall said Heritage is also negotiating to purchase the development rights to about 45 acres at the fork where the Neshaminy and Little Neshaminy Creek meet in Warwick. The county preserved about 15 to 18 acres in the same area, he said.

"That's also a large area to preserve so this is another a first step," he said. "These other projects are in various stages of completion."

Appendix B. Plants Identified within Quakertown Swamp

West Rockhill, East Rockhill, Richland Townships
Buck County, Pennsylvania

Trees

Red maple	<i>Acer rubrum</i>
Sugar maple	<i>Acer saccharum</i>
Black birch	<i>Betula lenta</i>
Hazelnut	<i>Corylus sp.</i>
American beech	<i>Fagus grandifolia</i>
White ash	<i>Fraxinus americana</i>
Green ash	<i>Fraxinus pennsylvanica</i>
Ash	<i>Fraxinus sp.</i>
Black walnut	<i>Juglans nigra</i>
Eastern red cedar	<i>Juniperus virginiana</i>
Tulip poplar	<i>Liriodendron tulipifera</i>
Black gum	<i>Nyssa sylvatica</i>
Hop hornbeam	<i>Ostrya virginiana</i>
Black cherry	<i>Prunus serotina</i>
White oak	<i>Quercus alba</i>
Swamp white oak	<i>Quercus bicolor</i>
Pin oak	<i>Quercus palustris</i>
Black willow	<i>Salix nigra</i>
Sassafras	<i>Sassafras albidum</i>
Basswood	<i>Tilia americana</i>
American elm	<i>Ulmus americana</i>
Slippery elm	<i>Ulmus rubra</i>

Shrubs

Box elder	<i>Acer negundo</i>
Smooth alder	<i>Alnus serrulata</i>
Serviceberry	<i>Amelanchier sp.</i>
Barberry	<i>Berberis thunbergii</i>
Ironwood	<i>Carpinus caroliniana</i>
Buttonbush	<i>Cephalanthus occidentalis</i>
Silky dogwood	<i>Cornus amomum</i>
Gray dogwood	<i>Cornus foemina</i>
Witch hazel	<i>Hamamelis virginiana</i>
Winterberry	<i>Ilex verticillata</i>
Privet	<i>Ligustrum vulgare</i>

Spicebush	<i>Lindera benzoin</i>
Multiflora rose	<i>Rosa multiflora</i>
Swamp rose	<i>Rosa palustris</i>
Elderberry	<i>Sambucus canadensis</i>
Arrowwood	<i>Viburnum dentatum</i>
Blackhaw	<i>Viburnum prunifolium</i>

Herbs

Small-flowered agrimony	<i>Agrimonia parviflora</i>
Agrimony	<i>Agrimonia sp.</i>
Water plantain	<i>Alisma subcordatum</i>
Annual ragweed	<i>Ambrosia artemisiifolia</i>
Sarsaparilla	<i>Aralia nudicaulis</i>
Jack-in-the-pulpit	<i>Arisaema triphyllum</i>
Wild ginger	<i>Asarum canadense</i>
Swamp milkweed	<i>Asclepias incarnata</i>
New England aster	<i>Aster novi-angliae</i>
Rough-leaved aster	<i>Aster puniceus</i>
Aster	<i>Aster sp.</i>
Tickseed sunflower	<i>Bidens coronata</i>
Beggar-ticks	<i>Bidens sp.</i>
False nettle	<i>Boehmeria cylindrica</i>
Grape fern	<i>Botrychium sp.</i>
Rattlesnake fern	<i>Botrychium virginianum</i>
Long-awned woodgrass	<i>Brachyelytrum erectum</i>
Fringed sedge	<i>Carex crinita</i>
Inland sedge	<i>Carex interior</i>
Bladder sedge	<i>Carex intumescens</i>
Shallow sedge	<i>Carex lurida</i>
Sedge	<i>Carex sp.</i>
Tussock sedge	<i>Carex stricta</i>
Turtlehead	<i>Chelone glabra</i>
Water carpet	<i>Chrysoplenium americanum</i>
Stout woodreed	<i>Cinna arundinacea</i>
Enchanter's nightshade	<i>Circaea lutetiana</i>
Horse balm	<i>Collinsonia canadensis</i>
Lady's slippers	<i>Cypripedium sp.</i>
Woodfern	<i>Dryopteris sp.</i>
Evergreen woodfern	<i>Dryopteris intermedia</i>
Spikerush	<i>Eleocharis sp.</i>
Purple-leaved willow herb	<i>Epilobium coloratum</i>
Horsetail	<i>Equisetum sp.</i>
Fireweed	<i>Erechtites hieracifolia</i>
Microstegium	<i>Eulalia viminea</i>
Joe-pye-weed	<i>Eupatorium maculatum</i>

Boneset	<i>Eupatorium perfoliatum</i>
Grass-leaved goldenrod	<i>Euthamia graminifolia</i>
Manna grass	<i>Glyceria sp.</i>
Sneezeweed	<i>Helenium sp.</i>
Golden-seal	<i>Hydrastis canadensis</i>
Marsh St. Johnswort	<i>Hypericum virginicum</i>
Bottle brush grass	<i>Hystrix patula</i>
Jewelweed	<i>Impatiens capensis</i>
Iris	<i>Iris sp.</i>
Soft rush	<i>Juncus effusus</i>
Wild lettuce	<i>Lactuca canadensis</i>
Rice cutgrass	<i>Leersia oryzoides</i>
Whitegrass	<i>Leersia virginica</i>
Duckweed	<i>Lemna minor</i>
Cardinal flower	<i>Lobelia cardinalis</i>
Indian tobacco	<i>Lobelia inflata</i>
Shining clubmoss	<i>Lycopodium lucidulum</i>
Bugleweed	<i>Lycopus sp.</i>
Lance-leaved loosestrife	<i>Lysimachia lanceolata</i>
Whorled loosestrife	<i>Lysimachia quadrifolia</i>
Purple loosestrife	<i>Lythrum salicaria</i>
Monkey flower	<i>Mimulus ringens</i>
Spatterdock	<i>Nuphar luteum</i>
Sensitive fern	<i>Onoclea sensibilis</i>
Cinnamon fern	<i>Osmunda cinnamomea</i>
Wild ginger	<i>Panax quinquefolia</i>
Royal fern	<i>Osmunda regalis</i>
Virginia creeper	<i>Parthenocissus quinquefolia</i>
Lousewort	<i>Pedicularis sp.</i>
Beardtongue	<i>Penstemon sp.</i>
Ditch stonecrop	<i>Penthorum sedoides</i>
Reed canary grass	<i>Phalaris arundinacea</i>
Common reed	<i>Phragmites australis</i>
Clearweed	<i>Pilea pumila</i>
Halberd-leaved tearthumb	<i>Polygonum arifolium</i>
Water pepper	<i>Polygonum hydropiper</i>
Smartweed	<i>Polygonum hydropiperoides</i>
Arrow-leaved tearthumb	<i>Polygonum sagittatum</i>
Smartweed	<i>Polygonum sp.</i>
Christmas fern	<i>Polystichum acrostichoides</i>
Tall rattlesnake root	<i>Prenanthes altissima</i>
Marginal woodfern	<i>Pryopteris marginalis</i>
Swamp buttercup	<i>Ranunculus septentrionalis</i>
Dewberry	<i>Rubus sp.</i>
Arrowhead	<i>Sagittaria sp.</i>

Dark green bulrush	<i>Scirpus atrovirens</i>
Woolgrass	<i>Scirpus cyperinus</i>
Nutsedge	<i>Scleria</i> sp.
Skullcap	<i>Scutellaria</i> sp.
False Solomon's seal	<i>Similacina racemosa</i>
Carriion flower	<i>Smilax herbacea</i>
Goldenrod	<i>Solidago</i> sp.
Burreed	<i>Sparganium</i> sp.
Sphagnum moss	<i>Sphagnum</i> sp.
Narrow-leaved meadowsweet	<i>Spirea alba</i>
Skunk cabbage	<i>Symplocarpus foetidus</i>
Meadow rue	<i>Thalictrum</i> sp.
Broad beech fern	<i>Thelypteris hexagonoptera</i>
New York fern	<i>Thelypteris noveboracensis</i>
Marsh fern	<i>Thelypteris thelypteroides</i>
Jumpseed	<i>Tovara virginiana</i>
Poison ivy	<i>Toxicodendron radicans</i>
Grease grass	<i>Tridens flavus</i>
Narrow-leaf cattail	<i>Typha angustifolia</i>
Broad-leaved cattail	<i>Typha latifolia</i>
Blue vervain	<i>Verbena hastata</i>
New York ironweed	<i>Veronia noveboracensis</i>
Violet	<i>Viola</i> sp.

Appendix C. Wildlife of the Quakertown Swamp

Aou	Species
28	Mute Swan
34	Canada Goose
35	Wood Duck
39	Mallard
73	Broad-winged Hawk
75	Red-tailed Hawk
78	American Kestrel
84	Ring-necked Pheasant
87	Northern Bobwhite
91	Virginia Rail
92	Sora
101	Killdeer
130	American Woodcock
157	Rock Dove
159	Mourning Dove
164	Black-billed Cuckoo
166	Barn Owl
168	Great Horned Owl
177	Chimney Swift
178	Ruby-throated Hummingbird
181	Red-headed Woodpecker
182	Red-bellied Woodpecker
184	Downy Woodpecker
185	Hairy Woodpecker
188	Northern Flicker
191	Eastern Wood Pewee
195	Willow Flycatcher
197	Eastern Phoebe
199	Great Crested Flycatcher
202	Eastern Kingbird
205	Purple Martin
206	Tree Swallow
210	Barn Swallow
211	Blue Jay
213	American Crow
216	Black-capped Chickadee
219	Tufted Titmouse
221	White-breasted Nuthatch
223	Carolina Wren

225	House Wren
228	Marsh Wren
232	Eastern Bluebird
234	Veery
238	Wood Thrush
239	American Robin
241	Gray Catbird
242	Northern Mockingbird
243	Brown Thrasher
246	Cedar Waxwing
249	European Starling
250	White-eyed Vireo
255	Red-eyed Vireo
256	Blue-winged Warbler
264	Yellow Warbler
279	Black-and-White Warbler
280	American Redstart
286	Louisiana Waterthrush
287	Kentucky Warbler
290	Common Yellowthroat
294	Yellow-breasted Chat
296	Scarlet Tanager
298	Northern Cardinal
299	Rose-breasted Grosbeak
303	Indigo Bunting
308	Rufous-sided Towhee
310	Chipping Sparrow
312	Field Sparrow
321	Song Sparrow
323	Swamp Sparrow
332	Red-winged Blackbird
333	Eastern Meadowlark
339	Common Grackle
340	Brown-headed Cowbird
342	Northern Oriole
346	House Finch
352	American Goldfinch
355	House Sparrow

Source: Bucks County Audubon Society

Amphibians and Reptiles

Common Name	Scientific Name
Eastern American toad	<i>Bufo americanus</i>
Painted turtle	<i>Chrysemys picta</i>
Eastern box turtle	<i>Terrapene carolina carolina</i>
Common snapping turtle	<i>Chelydra serpentina serpentina</i>
Common musk turtle	<i>Sternotherus odoratus</i>
Spotted turtle	<i>Clemmys guttata</i>
Gray tree frog	<i>Hyla versicolor versicolor</i>
Spring peeper	<i>Hyla crucifer</i>
Bull frog	<i>Rana catesbeiana</i>
Green frog	<i>Rana clamitans</i>
Pickerel frog	<i>Rana palustris</i>
Wood frog	<i>Rana sylvatica</i>
Northern dusky salamander	<i>Desmognathus fuscus</i>
Northern two lined salamander	<i>Eurycea bislineata</i>
Red backed salamander	<i>Plethodon cinereus</i>
Northern black racer	<i>Coluber constrictor</i>
Northern water snake	<i>Nerodia sipedon</i>
Eastern garter snake	<i>Thamnophis sirtalis</i>
Eastern milk snake	<i>Lampropeltis triangulum</i>
Ring necked snake	<i>Diadophis punctatus edwardsii</i>

Source: Lehigh Valley Herpetological Society records from 1999 and 1992

Appendix D. Funding Sources

National Fish & Wildlife Foundation

The National Fish & Wildlife Foundation (NFWF) supports projects that conserve the nation's wetland resources, in particular habitat for wetland dependent fish and wildlife. NFWF generally funds three program types:

- acquisition of wetland resources, both in fee-title and conservation easements;
- wetland restoration and enhancement projects, particularly those on private lands; and
- applied research on wetland management techniques, restoration or enhancement practices or other wetlands related applied conservation.

In addition to these general program emphases, NFWF seeks innovative partnerships including local conservation or landowner interests; community groups or other land user groups and partnerships that bridge gaps between economics and wildlife conservation. NFWF also stresses on-the-ground conservation projects that accomplish tangible results in terms of acres acquired, restored, improved, enhanced or managed for wildlife benefit. Finally, NFWF encourages projects that address conservation of multiple wetland functions and values, including erosion control, flood retention and flood-damage protection, water quality improvement, habitat for multiple species, aquifer protection and sediment trapping.

EPA Five-Star Restoration Challenge Grant Program

The Five-Star program provides financial assistance to support community-based wetland and riparian restoration projects. Projects must involve diverse partnerships of at least five organizations.

North American Wetlands Conservation Council Program

The U.S. Fish & Wildlife Service provides grants for conservation of wetlands and associated upland habitat through the North American Wetlands Conservation Council. Financial assistance is provided for protection, restoration or enhancement of wetlands consistent with the North American Wetlands Conservation Act and the North American Waterfowl Management Plan.

Pennsylvania Keystone Land Trust Acquisition Grant Program

Grants can only be used for projects involving natural areas, defined in the Keystone Legislation as any area of land, water or both land and water which is important in preserving flora, fauna, native ecological systems, geological, natural, historical, open space, scenic or similar features of scientific or educational value benefiting the citizens of this Commonwealth. Grants may be used to purchase fee simple title or a less-than-fee interest in real property, such as conservation easements. Grants will be awarded to land trusts for two types of acquisition projects:

- Critical Habitat Areas - acquisition of critical habitat for rare, threatened or endangered plant or animal species or communities which are at risk of destruction or substantial degradation. Selection criteria for acquisition grants will give priority to critical habitat area projects.
- Open Space Areas - acquisition of natural areas which are not considered critical habitat.

County and Municipal Open Space Bond Funds

Passage in 1997 of the \$59 million Open Space Bond Issue by Bucks County and subsequent municipal open space bond issues have provided a financial means for Bucks County and its municipalities to permanently protect significant natural areas. Quakertown Swamp spans three municipalities that have approved open space plans in accordance with the Bucks County Municipal Open Space Program. Completion of the plan makes the municipality eligible for the following county open space funds:

Richland Township	\$461, 287
West Rockhill Township	\$355,103
East Rockhill Township	\$313,727
TOTAL	\$1,130,117

In addition to the above funds, Bucks County has made available approximately \$9 million dollars to preserve natural areas. The funds are available for protection of critical natural areas as delineated in the Bucks County Natural Areas Inventory completed in 1999.

Both East and West Rockhill townships have a 0.125 percent earned income tax which generates on an annual basis \$80,000 and \$130,000 respectively, for open space. Representatives of each of

the municipalities, and Bucks County, are members of the Quakertown Swamp Partnership.

PA Game Commission

The PA Game Commission has limited funds available for acquisition of property for State Game Lands. The Game Commission is currently the single largest landowner, in terms of acres, in Quakertown Swamp. The Game Commission has been amenable to partnering with local land conservation groups in order to collectively acquire lands and transfer them to Commission ownership and into the State Game Lands program. The Game Commission is currently a member of the Quakertown Swamp Partnership.

Pennsylvania Growing Greener Program

The Watershed Protection and Environmental Stewardship Fund authorizes the Department of Environmental Protection to allocate over the next five years \$240 million in grants to protect and restore watersheds, reclaim abandoned mines and wells, and make improvements to the state's water and sewer infrastructure.