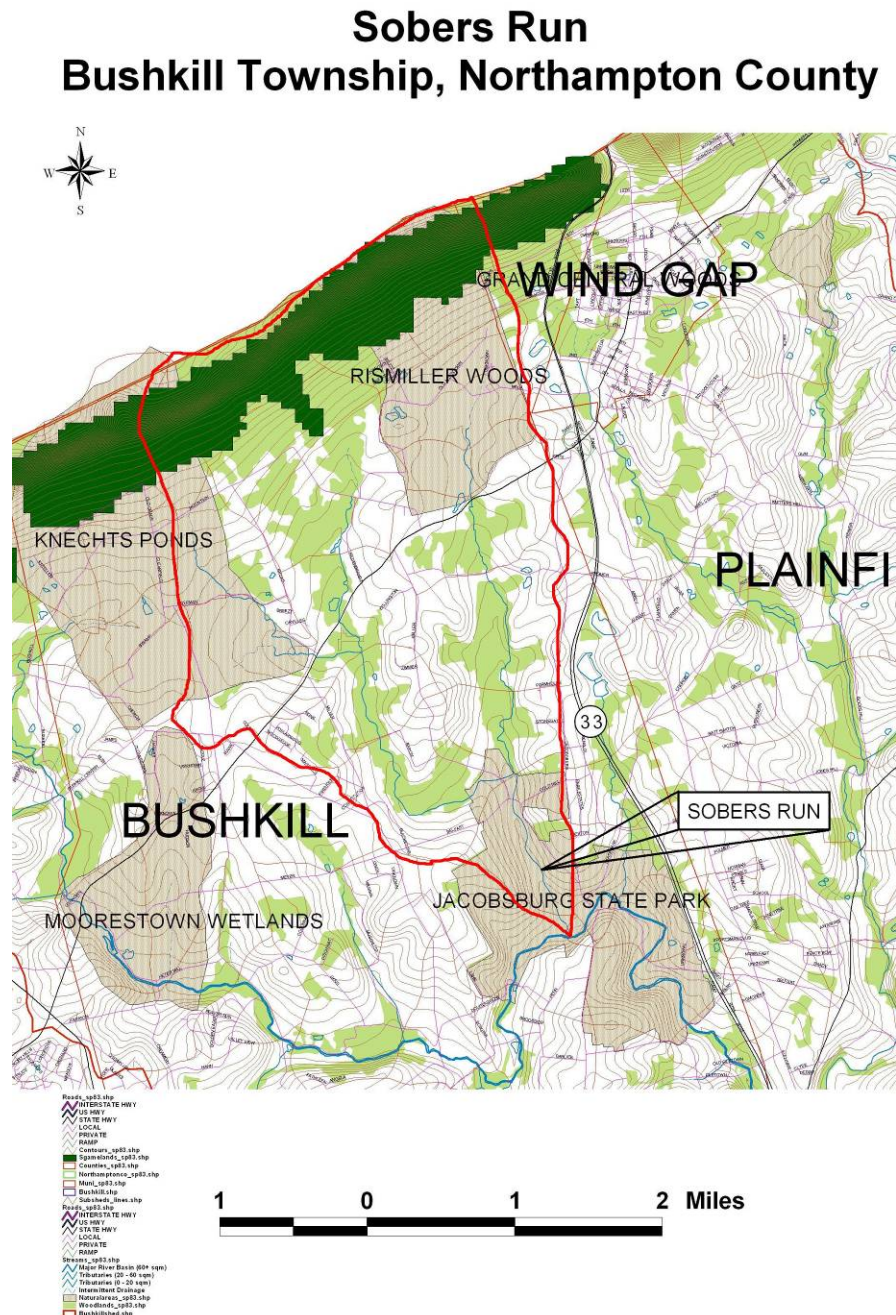


II. Petition Information _ Sobers Run Petition Upgrade, Bushkill Township, PA

E. Narrative for questions #1-9

1. Watershed delineation



Sobers Run (stream code 04646) is located within the Bushkill Creek Watershed, in Bushkill Township, Northampton County, Pennsylvania. Sobers Run flows approximately 4 miles south from its origin of spring seeps, wetlands, and vernal pools at the base of the Blue Mountain until it meets the Bushkill Creek within the heart of Jacoburg Environmental Education Center (Jacoburg EEC), a DCNR State Park. The watershed is approximately 9.5 square miles, with an eastern and western branch flowing into the main stem of Sobers Run within Jacoburg EEC.

2. Current designated use of the watershed

Sobers Run, a relatively small tributary within the larger Bushkill Creek watershed is classified in Chapter 93 as Designated Use is a “High Quality – Cold Water Fishes (HQ-CWF)”. The Existing Use is Exceptional Value (EV), Qualifier as Special Protection Survey, in the location of Basin to T-615 on 7/19/06. Approximately 2 miles of the east branch of Sobers Run qualified as EV through biological data.

3. Requested designated use of the watershed

This petition seeks to upgrade the entirety (watershed) of Sobers Run from HQ- to EV waters. Bushkill Township is requesting the upgrade of Sobers Run (main stem, east and west branch) from High Quality (HQ) Stream to Exceptional Value (EV) through the category of **4.2 (c): Outstanding national, state, regional, or local resource water** in Chapter 93 Water Quality Standards. The Township is requesting the upgrade as a priority recommendation of the Sobers Run Coldwater Conservation Plan (2005) to best protect the stream from both point and non-point source discharges, as well as best control encroachments on the stream channel. In the past 5 years, five additional plans call for the protection of Sobers Run watershed. The Township meets both qualifiers by adopting *coordinated water quality protective measures along a watershed corridor and coordinated water quality measures with real estate interests*.

Redesignation will enable the Township to obtain higher level of protection to coincide with revised land use regulations and ongoing land conservation efforts to protect the Sobers Run watershed.

Chapter 93 antidegradation regulations will require that, when DEP reviews and decides whether to issue permits for activities in the area, the water quality of EV water will, without exception, be maintained and protected. The upgrade of EV will not prevent development, but when and if development occurs, developers must demonstrate that any discharge will maintain and protect existing water quality of the stream.

4. **Instream conditions technical data** - *The following information (tables) are excerpts from the Sobers Run Coldwater Conservation Plan (2005). Also see Appendix A in the back of this report for Macroinvertebrate Data provided in the Sobers Run Coldwater Conservation Plan.*

BIOLOGICAL STUDIES

Pennsylvania Fish & Boat Commission

The main stem of Sobers Run within Jacobsburg State Park and Environmental Education Center was electrofished in 1979. A 300 meter stretch north of the LR 48087 bridge produced 64 brown trout (*Salmo trutta*) with lengths between 75mm and 300mm, along with a diverse assemblage of other fish species listed in the following table:

FISH SPECIES OF SOBERS RUN (PAFBC, 1979)
Brook trout, <i>Salvelinus fontinalis</i> (reported)
Brown trout, <i>Salmo trutta</i>
Cutlips minnow, <i>Exoglossum maxilllingua</i>
Common shiner, <i>Notropis cornutus</i> ,
Largemouth bass, <i>Micropterus salmoides</i>
Blacknose dace, <i>Rhinichthys atratulus</i>
Longnose dace, <i>Rhinichthys cataractae</i>
American eel, <i>Anguilla rostrata</i>
White sucker, <i>Catostomus commersoni</i>
Margined madtom, <i>Noturus insignis</i>
Tessellated darter, <i>Etheostoma olmstedii</i>
Creek chub, <i>Semotilus atromaculatus</i>
Redbreast sunfish, <i>Lepomis auritus</i>
Bluegill, <i>Lepomis macrochirus</i>

Pennsylvania Department of Environmental Protection

More recently, several strategically located stations on Sobers Run were sampled for macroinvertebrate assemblages. The results of this sampling effort are included as Appendix A. Macroinvertebrate species collected and identified included:

**SOBERS RUN BENTHIC MACROINVERTEBRATE SPECIES*
BUSHKILL TOWNSHIP, NORTHAMPTON COUNTY, PA (PADEP, APRIL 19, 2005)**

MAYFLIES		TRUE FLIES	
		Ceratopogonidae	<i>Probezzia</i>
Baetidae	<i>Baetis</i>	Chironomidae	<i>sp.</i>
Ephemereillidae	<i>Drumella</i>	Empididae	<i>Chelifera</i>
	<i>Ephemerella</i>		<i>Clinocera</i>
	<i>Serratella</i>		<i>Hemerodromia</i>
Heptageniidae	<i>Epeorus</i>	Simuliidae	<i>Prosimulium</i>
	<i>Stenonema</i>		<i>Simulium</i>
Isonychiidae	<i>Isonychia</i>		<i>Stegopterna</i>
Leptophlebiidae	<i>Paraleptophlebia</i>	Tipulidae	<i>Antocha</i>
STONEFLIES			<i>Dicranota</i>
Chloroperlidae	<i>Sweltsa</i>		<i>Hexatoma</i>
Leuctridae	<i>Leuctra</i>		<i>Limonia</i>
Nemouridae	<i>Amphinemura</i>		<i>Tipula</i>
Perlidae	<i>Acroneturia</i>	BEETLES	
Perlodidae	<i>Isoperla</i>	Dryopidae	<i>Helichus</i>
	<i>Remenus</i>	Elmidae	<i>Dubiraphia</i>
Pteronarcyidae	<i>Pteronarcys</i>		<i>Microcylloepus</i>
CADDISFLIES			<i>Optioservus</i>
Brachycentridae	<i>Micrasema</i>		<i>Oulimnius</i>
Glossosomatidae	<i>Agapetus</i>		<i>Promoresia</i>
Hydropsychidae	<i>Chumatopsyche</i>		<i>Stenelmis</i>
	<i>Diplectrona</i>	Psephenidae	<i>Ectopria</i>
	<i>Hydropsyche</i>		<i>Psephenus</i>
Hydroptilidae	<i>Stactobiella</i>	Ptilodactylidae	<i>Anchytarsus</i>
Philopotamidae	<i>Chimarra</i>	MISC. INSECT TAXA	
	<i>Dolophilodes</i>	Cordulegasteridae	<i>Cordulegaster</i>
Polycentropodidae	<i>Polycentropus</i>	Corydalidae	<i>Nigronia</i>
Rhyacophilidae	<i>Rhyacophila</i>	Gomphidae	<i>Lanthus</i>

* Non-insect taxa included Cambaridae *cambarus*, Hydracarina sp., and Oligochaeta sp.

This sampling indicated that the uppermost reaches of the main stem of Sobers Run to its headwaters at the foot of the Blue Mountain Ridge qualified as Exceptional Value (EV) classification in Chapter 93 based on the biological criteria. Sampling at the other stations indicated that the primary tributary, locally referred to as the western branch of Sobers Run, and the remainder of the main stem of Sobers Run nearly qualified for EV classification, missing by only a few percentage points with the methodology used for the sampling date.

It should be noted that the PADEP sampling on April 19, 2005 was completed following severe weather and highly erosive streamflow conditions. Considerable bed scour was observed at the stations on the western branch tributary. Consequently, additional macroinvertebrate sampling following more stable and normal conditions may help to improve biological monitoring scores enough to qualify for the EV classification.

CHEMICAL STUDIES

Lafayette College

Lafayette College conducted a year long monitoring program on the main stem of Sobers Run within Jacobsburg State Park during 2000. Chemical data, along with limited physical data, are presented in the following table:

Summary of Water Quality Data for 2000

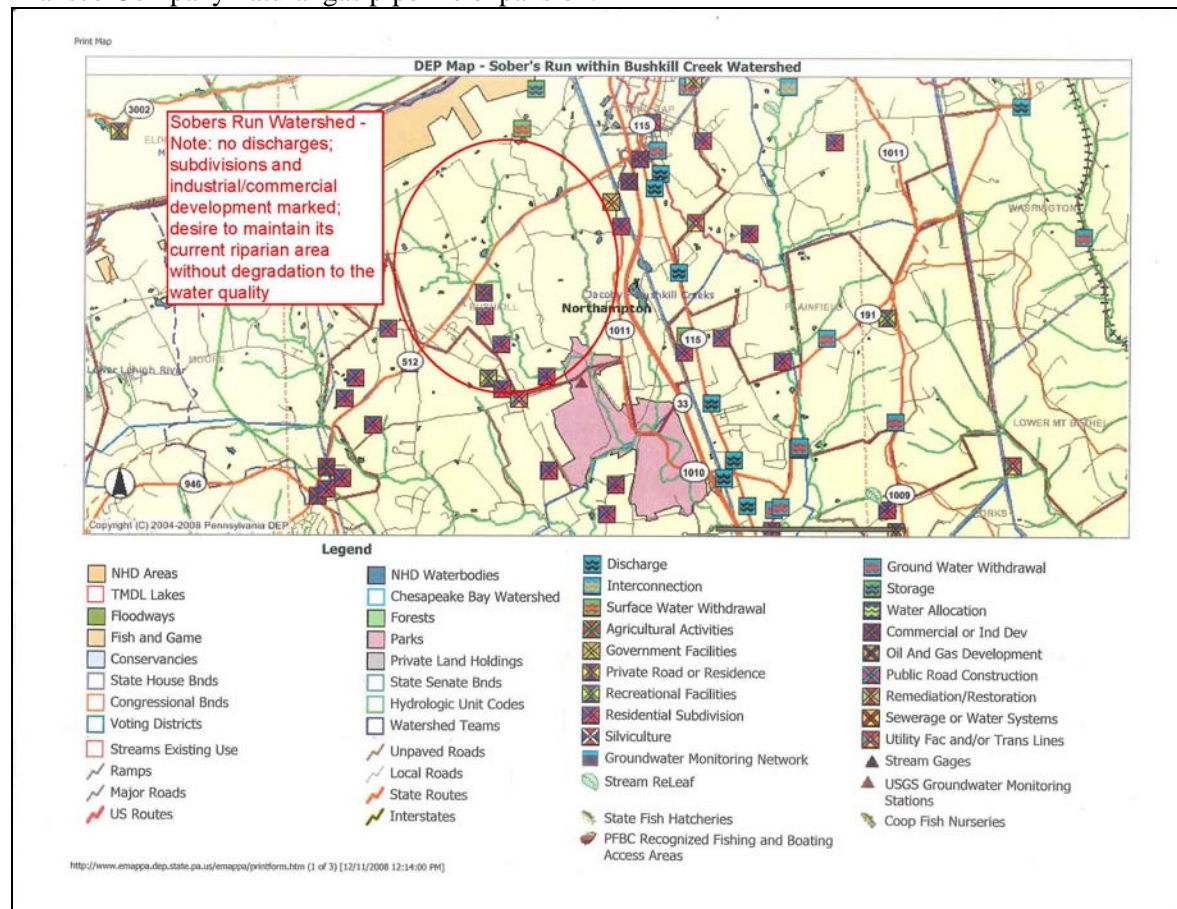
Sample Location	Sample Date	Anion Concentrations (mg/L)					Cation Concentrations (mg/L)						Field Parameters				
		F	Cl	NO ₃ ⁻	PO ₄ ⁻³	SO ₄ ⁻²	Li ⁺	Na ⁺	NH ₄ ⁺	K ⁺	Mg ²⁺	Ca ²⁺	Temp. (°C)	pH	Cond. (uS/cm)	Turb. (NTU)	D.O. (mg/L)
7	3/19/2000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
7	4/15/2000	0.04	9.53	10.06	ND	18.51	ND	4.10	ND	0.83	3.09	12.13	NA	NA	NA	NA	NA
7	5/24/2000	0.06	4.68	2.99	ND	16.10	ND	3.70	ND	1.13	2.64	12.32	NA	NA	NA	NA	NA
7	6/14/2000	0.04	5.84	5.22	ND	16.11	ND	4.37	ND	1.16	3.31	14.23	14.5	6.60	110	3	10
7	7/17/2000	0.04	6.79	4.73	ND	27.03	ND	4.41	ND	1.09	3.83	16.67	18.0	7.19	134	7	11
7	8/16/2000	0.02	7.10	13.10	ND	11.64	0.96	8.08	0.13	2.06	5.63	19.84	18.1	7.48	138	0.75	10
7	9/16/2000	0.04	6.10	6.44	ND	16.00	ND	5.16	ND	1.70	4.04	16.02	14.8	6.72	138	1.5	12
7	10/16/2000	0.01	6.53	10.38	ND	10.59	ND	3.96	0.06	1.17	4.00	14.72	15.9	6.90	140	0.7	10
7	11/19/2000	0.02	6.61	7.97	ND	19.30	ND	3.63	ND	0.99	3.82	15.06	4.5	7.20	140	0.5	12
7	12/18/2000	0.09	3.77	13.66	ND	20.81	ND	2.98	ND	1.54	3.18	13.25	2.0	7.30	124	8	14

NA = not analyzed
ND = not detected

Nutrient concentrations during the study period were relatively low with nitrogen and phosphorus at or near non-detect for all monitoring events. Other chemical parameters were also relatively low, with respectively little variability amongst seasons. Water temperature reached an observed maximum of 18.1°C during August, which is well below temperatures shown to be stressful for coldwater fish. Respectively, the dissolved oxygen remained very high, even during the most stressful summer months, with a minimum observed concentration of 10 mg/L which is several times higher than concentrations known to be stressful for coldwater fish. pH values were near neutral for all monitoring events, and both conductivity and turbidity values were relatively low and well within ranges for high quality and exceptional value streams in our region.

5. Existing and proposed point and nonpoint source discharges

According to DEP records, there are no proposed point and nonpoint source discharges. Northampton County Conservation District reported one active NPDES permit that they are monitoring for a Williams Transco Company natural gas pipeline expansion.



6. Qualifiers for designation as exceptional value waters

In the Streams Existing Use chart on DEP's EMAP site, Sober's Run is listed as Exceptional Value (EV) under Use Description from the Basin, Source to T-615 on Monday, December 11, 2006 – qualifier RBP-Antidegradation. This is a Basin delineation, which includes all tributaries draining into the segment described.

In Chapter 93, Section 4.2 (c): Qualifying as an Exceptional Value Water, the water is an **outstanding National, State, regional, or local resource water.**

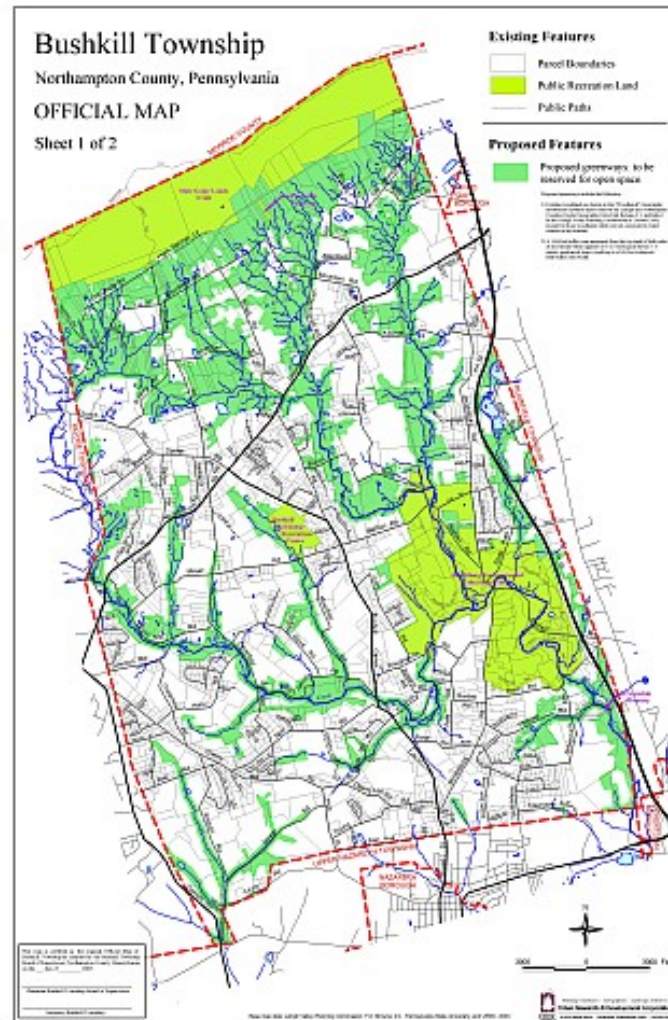
Qualifier for Outstanding National, State, regional, or local resource water include local governments have adopted a **coordinated water quality protective measures along a watershed corridor.**

Qualifier – *Coordinated water quality measures- Bushkill Township Supervisors adopted the following:*

A. **Ordinance No.2005-01** was passed on April 21, 2005 by the Township of Bushkill Board of Supervisors to adopt an **Official Map pursuant to the PA Municipalities Planning Code.** "The official map provides designation of parcel boundaries, public recreation land, Township facilities, public paths, existing roadway classifications, and proposed greenways to be reserved for open space. Any subdivision or Land Development Plan submitted to the Township must incorporate the identified features and

classifications." The Township Official Map designated a 150-foot buffer zone measured from the top bank of both sides of any stream which appears on the U.S. Geologic Survey quadrangle maps.

Implementation of the official map to date includes 25.47 acres of woodlands and riparian areas in conservation easement (dedication of open space) to the Township from subdivisions with a total parcel area of 81.74 acres.



B. Ordinance No.2007-02, Bushkill Creek Watershed ACT 167 Stormwater Management Ordinance, approved on April 5, 2007, is in response to placing strict regulations on stormwater management in Bushkill Township. “A comprehensive program of stormwater management, including reasonable regulation of development and activities causing accelerated erosion and loss of natural infiltration, is fundamental to the public health, safety and welfare and the protection of the people and the municipality and all of the people of the Commonwealth, their resources and environment.” The purpose of the Ordinance is to promote public health, safety, and welfare within the Bushkill Creek Watershed (Sobers Run is part of the Bushkill Creek Watershed) by minimizing the damages and maximizing the benefits described in Section 102 of this Ordinance by provisions designed to: manage stormwater runoff impacts, utilize natural drainage systems, encourage infiltration of stormwater, maintain existing flows and quality of streams, preserve and restore the flood carrying capacity of streams, provide for proper maintenance of all permanent stormwater management BMPs that are implemented in the municipality, prevent scour and erosion of streambanks and streambeds, and meet legal water quality requirements under state law, including regulations at 25 Pa.Code Chapter 93.4a to

Land Use 2006 (in acres)		
Residential	4,953.8	(30.1 %)
Commercial	108.9	(0.7 %)
Industrial	57.5	(0.3 %)
Wholesale & Warehousing	0.0 (0.0%)	
Transportation, Comm. & Utilities	715.1	(4.3 %)
Public & Quasi-Public	69.5	(0.4 %)
Parks & Recreation	2,603.5	(15.8 %)
Agriculture & Vacant	7,968.4	(48.4 %)
Total Acres	16,476.7 (100.0%)	
Area: 25.74 sq. mi.		
Population Density 2000: 271 persons/sq. mi.		

protect and maintain “existing uses” and maintain the level of water quality to support those uses in all streams and to protect and maintain water quality in “special protection” streams. This ordinance shall only apply to those areas of the municipality which are located within the Bushkill Creek Watershed(s) as delineated on an official map available for inspection at the municipal office. The following activities are defined as Regulated Activities and shall be governed by this Ordinance:

- A. Land Development
- B. Subdivision
- C. Construction of new or additional impervious surfaces (driveways, parking lots, etc.)
- E. Diversion or piping of any natural or man-made stream channel

- ✚ no portion of a site may be regraded between the Bushkill Creek Watershed and any adjacent watershed except as part of a “No Harm” or Hardship Waiver procedure
- ✚ best management practices, operations, and maintenance shall be shown in a plan describing how each permanent stormwater BMP will be operated and maintained and the identity of the person(s) responsible for operations and maintenance.
- ✚ an Environmental Resources Site Design Assessment
- ✚ Low Impact Development Practices, Alternate Approach for Managing Stormwater Runoff - to promote practices to minimize post-development runoff rates and volumes

C. Nazareth Area...2030 Multimunicipal Comprehensive Plan, prepared for the Nazareth Area Council of Governments by the Lehigh Valley Planning Commission, January 2006. The plan includes a 104 square mile area encompassing the Boroughs of Nazareth, Tatamy, Stockertown, Bath, and Chapman and the Townships of Bushkill, Upper Nazareth, Lower Nazareth, Moore, and East Allen. Eight municipalities signed an implementation agreement and are now in the process of making many of the newly recommended improvements.

✚ **Existing Land Use**

- Bushkill Township had the greatest loss (4,031 acres) in agricultural and vacant lands (1972-2002)
- Bushkill Township increased in residential acreage between 1992-2002. More than 70% of the area’s increase in residential acreage was in Moore and Bushkill Townships
- Wholesale and warehousing land use occurred in Moore, East Allen, and Bushkill Townships at a growth of 68.1 acres
- Bushkill Township has 6,160.3 acres (37.4%) of woodlands out of total acres 16,454, Source: Measurements by the LVPC using GIS

✚ **Implementation**

- municipalities to adopt or amend zoning ordinances or a single multimunicipal zoning ordinance as follows:
- The zoning maps should be revised as necessary to be consistent with the Future Land Use Plan map. The Future Land Use Plan include the following land use categories:
 - a. Environmental protection

- b. Agricultural Preservation
- c. Rural,
- d. Rural/potential Future Suburban Residential,
- e. Suburban Residential,
- f. Urban Residential...

- the plan states that no development should take place in the Environmental Protection areas
- regulations to prohibit development in floodplains, wetlands including a 50 foot buffer, Blue Mountain Natural Area, Slope of greater than 25%, 1st, 2nd, and 3rd order streams and water bodies including a 50 foot buffer, 4th order and higher streams including a 100 foot buffer, all very high and high conservation value areas, all riparian woodlands (woodlands within 100 ft. of streams), all woodlands that are within other significant natural areas, and the Jacobsburg Environmental Education Center (a DCNR State Park)
- zoning ordinances should provide for Conservation Design in those municipalities with areas designated as Rural, Agricultural Preservation, or Environmental Protection
- municipalities will consider the establishment of a municipally funded program to purchase properties designated for Environmental Protection
- municipalities will budget and provide municipal funding for the required match connected with the Open Space component of the Northampton County 21st Century Open Space Initiative. This program can be used to purchase properties designated for Environmental Protection

Open Space

- support the establishment of conservation greenways and greenbelt corridors, along the Bushkill Creek, Sobers Run and other appropriate locations
- Bushkill and Moore Township to follow the example set recently by Williams Township and establish a separate funding mechanism to preserve open space, important natural areas and farmland. Both Bushkill and Moore have thousands of acres in natural resource areas that are recommended for preservation. Two of the top significant natural areas in Northampton County are found in Bushkill Township
- Municipal officials will encourage landowners whose land includes waterways to maintain vegetated buffer zones along streams

Woodlands/Riparian Woodlands

- woodlands that are part of the a natural area identified in *A Natural Areas Inventory of Lehigh and Northampton Counties, Pennsylvania* should be preserved
- riparian woodlands and woodlands that, through combination with other natural features, are mapped very high or high conservation value should be preserved
- when development is planned for wooded tracts, site design and development should maximize preservation of trees
- Municipalities to adopt and enforce zoning and subdivision regulations to control tree removal and indiscriminate tree cutting during subdivision and land development activities
- Municipalities to adopt and enforce zoning and subdivision regulations to preserve natural area woodlands, and woodlands that are mapped very high or high conservation value
- important woodlands such as those on the Blue Mountain should be acquired by conservancies or State and local governments

NAZ COG PLAN ACTION:

- Adoption of an intergovernmental cooperative implementation agreement -8 municipalities signed the agreement; Bushkill Township signed April 7, 2007
- Lehigh Valley Planning Commission (LVPC) is the consultant hired to implement the plan by developing consistent zoning and providing changes to ordinances for the 8 municipality region in the Nazareth Area Council of Governments (COG)

Qualifier – Coordinated water quality measures with real estate interests

D. Bushkill Township Environmental Advisory Council (EAC) - The EAC is a viable and effective conservation advisory body active in current municipal and land use planning efforts. Bushkill has a strong natural and cultural heritage and its members are motivated to preserve this. In the face of a growing population and a disappearance of open space, farmland, and greenway connections it is important to maintain the beautiful landscape. In May 2002, the Township began a GIS-based Environmental Resource Inventory (ERI) in partnership with the EAC along with a Bushkill Stream Conservancy watershed protection Growing Greener grant. Bushkill Township EAC members completed the on the ground detail work needed to identify key natural and cultural features and land conservation targets for the ERI. The ERI has been used as an important tool in planning for development in a way that protects the resources of the township.

E. Bushkill Township Open Space Program – During the November 2005 general elections, the voters of Bushkill Township approved the Open Space Referendum placed on the ballot by a 2:1 majority. This referendum proposed a 0.25 percent increase in earned income tax of township residents to create a township open space fund specifically for the protection, preservation, and restoration of open space. The ordinance to establish this additional tax was then developed, Ordinance No. 2005-9 adopted December 22, 2005, advertised, and approved by the Township Supervisors. The Township estimates \$450,000 annually to use for open space. Township funds will be matched to the extent possible with funding through the Northampton County 21st Century Open Space Initiative, DCNR Community Conservation Partnerships Program, and the Lehigh Valley Greenways initiative.

F. Bushkill Township Open Space Plan - Heritage Conservancy completed the Bushkill Township Open Space Plan, adopted June 19, 2007, Ordinance No. 2007-01, addressing the environmental resources and farmland preservation inventory. Four public meetings/forums were held to explain the plan process and to collect public input which was used to develop Open Space preservation criteria and point system. Focusing on the purchase of conservation easements in addition to protection through regulation resonated strongly during the public process of the plan development. Plan recommendations included “protect critical habitats along the Bushkill Creek, Sobers Run... and their headwater areas...: and “the Township should plan to acquire specific properties or conservation easements, based upon the criteria established by the EAC”.

Implementation of the Official map, the Township holds conservation easements on 25.47 acres of woodlands and riparian areas as dedication of open space from subdivisions out of 81.74 acres total.

G. PPL Corridor Landowner Outreach – Heritage Conservancy conducted land conservation outreach to secure conservation easements or fee simple acquisition of high conservation value areas in Bushkill Township, specifically focused on the Sobers Run/PPL Corridor. This study was a recommendation of the Two Rivers Area Greenway Trail Plan (2005) to establish a multi-use trail and conservation greenway from Jacobsburg EEC to the Blue Mountain along a PPL Transmission line, adjacent to Sobers Run.

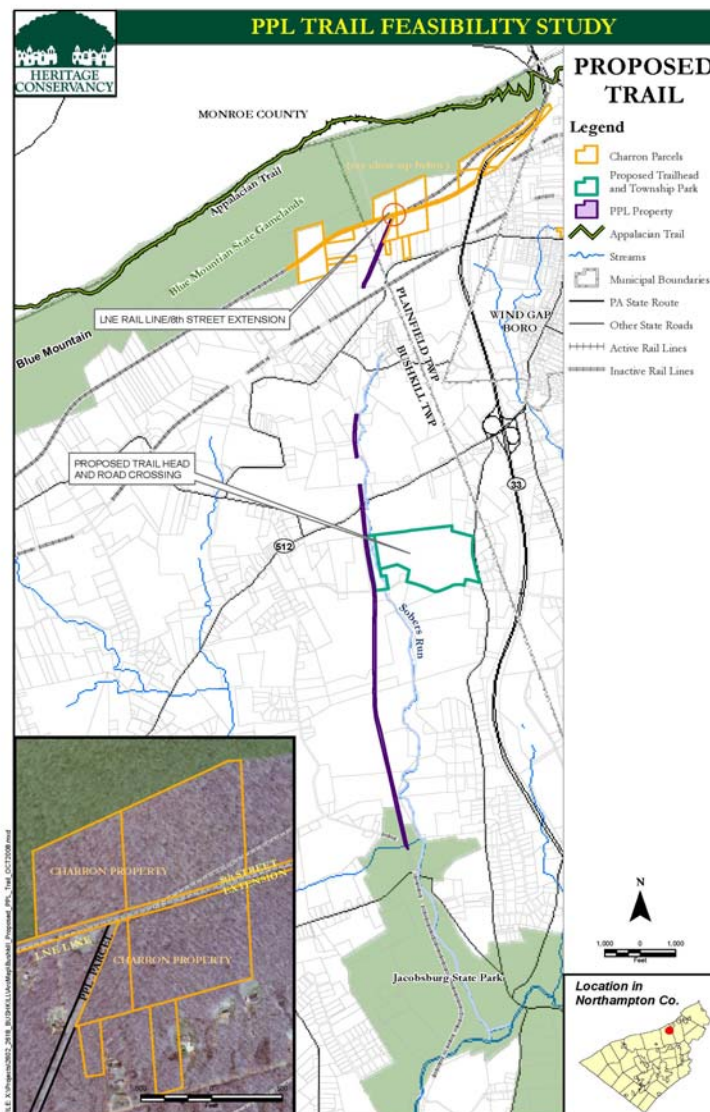
Over 20 properties were identified for land conservation along the greenway and landowner outreach was conducted to buffer Sobers Run by clustering properties adjacent to the spine. Starting in 2006, conservancies advanced land conservation efforts over 250 acres. To date in 2008:

- ✚ 47.7 acres are in conservation easement
- ✚ 119 acres acquired along Blue Mountain near Sobers Run headwaters; to be turned over to PA Game Commission; 1 mile of trail right-of-way to be turned over to Bushkill Township
- ✚ 15.9 acres donated PPL Transmission line corridor along Sobers Run to Bushkill Township

Since Sobers Run flows along the proposed PPL trail and is an important water source to residents and wildlife, it is recommended that any necessary support be given to have the stream upgraded to an “Exceptional Value Waterway”

A public meeting was held in November 2007 in Bushkill Township to educate residents on the benefits of land conservation, wildlife habitat, and environmentally sensitive trail development. Of the nearly 40 people in attendance the residents were supportive of the Township’s efforts to further protect the Sobers Run Watershed and PPL Corridor as a conservation and recreation corridor.

In October 2008 the PPL Corporation donated 15.9 acres to Bushkill Township to establish a conservation and recreation greenway (as identified in both the Two Rivers Area Greenway Plan and the Lehigh Valley Greenways Plan) along Sobers Run. In April 2008 the PA Department of Conservation and Natural Resources (DCNR) provided a \$200,000 grant award to the Township to construct Phase I of the trail 3 miles from Jacobsburg to Route 512, with a bridge over Sobers Run. The PPL Trail will be Bushkill Township’s first rail-trail to enhance its residents recreational opportunities and quality of life. It is a direct connection to the existing trail sections in Jacobsburg EEC which utilize environmentally sensitive trail design and construction standards.



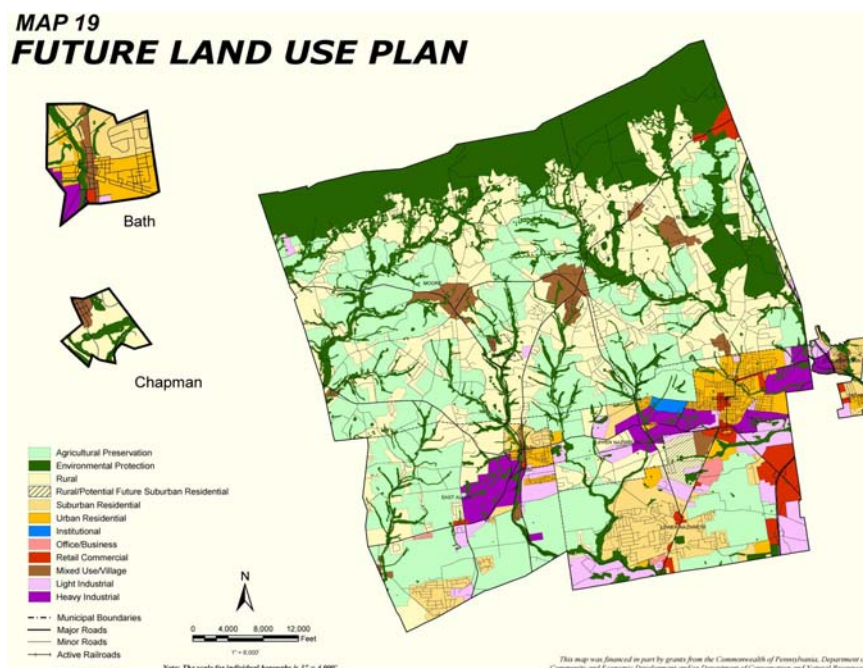
7. General description of land use and development patterns in watershed

The historical land-use in the Sobers Run Watershed has been primarily agricultural, including both livestock and crop farming, with some residential areas at the base of the Blue Mountain (Kittatiny Ridge). The riparian woodlands serve as highly valuable buffers for water quality and habitat impacts from a rapidly changing landscape. One important land use of the Sobers Run watershed is that it has been largely wooded and has helped to maintain good water quality. Development, as currently regulated, would change that. Urban sprawl, population growth, and an improved transportation system in recent years have shifted land-use throughout this region, converting the relatively poor agricultural lands, poor undrained soils, allowing land development with a reasonable amount of earthmoving and filling to residential development. The Township has no wastewater discharge to Sobers Run at this time, but it's conceivable that this could change with future development. Stormwater discharges are an inherent part of every subdivision development, in addition to direct impacts to the stream, wetlands, and vernal ponds with the installation of roads, driveways, lot clearing, and other land development activities.

A level of threat exists due to the development threats and loss of critical watershed and riparian habitat. Bushkill Township has 6,160.3 acres (37.4%) of woodlands out of total acres 16,454, *Source: Measurements by the LVPC using GIS*. Unless the lands that provide groundwater recharge or that surround water supplies are permanently protected, the natural resources and water quality will be degraded by development.

Current land use in Bushkill Township, based on data from the Lehigh Valley Planning Commission (LVPC) 2006 data includes 16,476 acres total. Primarily, 48.8% is agriculture and vacant, 29.9% residential, and 15.6% parks and recreation (includes 1111 acres in Jacobsburg EEC). According to the 2000 census, 6982 population, with a forecast of 8,562 in 2010 and 11,109 by 2030.

Utilizing GIS figures from Bushkill Township EAC, total woodlands in the Township are 9.4 square miles, with 3.8 square miles in public ownership and 5.6 square miles in private ownership. Woodlands within the Sobers Run watershed contain 6 square miles, with 2.5 square miles in public ownership (including Jacobsburg EEC and State Gamelands on the Blue Mountain) and 3.5 square miles in private ownership.



In an effort to control the level of impact to Sobers Run and Bushkill Creek, the Bushkill Stream Conservancy, Bushkill Township Environmental Advisory Council (EAC), and its partners completed the Sobers Run Coldwater Conservation Plan, the Two Rivers Area Greenways Plan and implemented the Bushkill Township Official Map to provide protection of the remaining riparian woodlands with the entire watershed of Sobers Run and adjacent areas of the Bushkill Creek watershed. A strong partnership and regional coordination exists with DCNR staff at Jacobsburg EEC and Bushkill Township representatives including EAC members, Township Manager, Zoning, and Supervisors.

8. Municipalities within watershed

The Sobers Run Watershed is entirely in Bushkill Township.

Contact (on behalf of Bushkill Township):

Sherry L. Acevedo

Resource Conservation Specialist

Delaware & Lehigh National Heritage Corridor

2750 Hugh Moore Park Rd.

Easton, PA 18042

610-923-3548

sherry@delawareandlehigh.org

9. Locational information on a map

See attached maps

ASSOCIATED PLANS and SUPPORT INFORMATION:

1. Coldwater Conservation Plan (2005) Sobers Run

Sobers Run is managed as a “Class A Wild Trout Waters”, and has long been a special local sport fishery, especially for flyfishing.

The greatest threat to Sobers Run is from imminent land-use change and development within its watershed. Stormwater runoff (quantity and quality) likely represents the greatest threat from such development

Recommendations:

- ✚ upgrade Sobers Run to Exceptional Value classification under the Pennsylvania Code Chapter 93 Water Quality Standards regulations which will best protect the stream from both point and non-point source discharges, as well as to best control encroachments on the stream channel – ***petition for stream upgrade Submitted to DEP 1/29/09***
- ✚ Bushkill Township to adopt the most feasible, stringent stormwater management regulations as part of their Act 167 stormwater management planning to protect Sobers Run from both water quality and quantity degradation problems. ***Bushkill Township updated stricter stormwater ordinance on April 5, 2007 Ordinance No.2007-02***
- ✚ All ‘greenways’ identified on the Bushkill Township Official Map should be preserved through the procurement of easements, purchase of development rights, and fee-simple purchase, amongst other possible means for land preservation. Additional environmentally sensitive lands within the Knechts Ponds, Rissmiller Woods, and Moorestown Wetlands natural areas, as well as other areas within the Sobers Run watershed, should be identified and targeted for preservation. ***PPL land donation along Sobers Run 15.9 acres complete October 31, 2008***

2. Two Rivers Area Greenway Plan – prepared for the Two Rivers Area Council of Governments, completed January 2005 was the first greenways plan completed in the Lehigh Valley.

Upper Watershed Goals: Areas to be protected as greenways in the Upper Watershed should include the following:

- the 100-year floodplain
- existing woodlands that are contiguous with riparian areas
- existing wetlands and hydric soils that are contiguous with riparian areas
- existing slopes greater than 25% that are contiguous with riparian areas
- 100-foot buffers of perennial streams
- 50-foot buffers of intermittent streams

- ✚ Conservation greenways along the Upper Bushkill Creek and Sobers Run, including their headwaters areas, joined with Jacobsburg Environmental Education Center and Blue Mountain, can form a greenbelt in Bushkill Township around an area zoned for medium-density residential development.
- ✚ Create conservation greenways along the Bushkill Creek, Sobers Run (including all tributaries). Greenways should promote water quality and wildlife habitat protection and connectivity, protect riparian woodlands, wetlands and floodplains, work to improve existing riparian buffers, secure agricultural easements for farmland adjacent to these stream corridors, work with landowners to reestablish riparian buffers where they have been removed
- ✚ Promote environmentally-sensitive development on brownfield sites near Sobers Run headwaters
- ✚ Establish unpaved multi-use trail on PPL owned R.O.W. connecting Jacobsburg E.E.C. –***DCNR Bureau of Facility and Design, Delaware and Lehigh National Heritage Corridor, Bushkill Township, and Collura Associates are working on trail design spring 2009 and expect environmentally sensitive trail construction fall 2009 for 3 miles of trail***
- ✚ Work with municipalities to amend zoning and subdivision and land development ordinances to protect greenways and to require the dedication of open space along greenway corridors, streams, steep slopes and other environmentally sensitive features. (high priority – continuous action)
- ✚ A major role of municipal governments will be to acquire additional land for open space and/or recreation purposes. This process may be as easy as requiring mandatory dedication of floodplains in new developments, or as difficult as raising property taxes to fund recreation and open space budgets
- ✚ Adopt and enforce environmental provisions in the zoning ordinance, subdivision and land ordinance (SALDO), and floodplain ordinance
- ✚ Create a greenbelt of the corridors along Bushkill Creek, Sobers Run, and incorporate Jacobsburg and Blue Mountain to promote sustainable growth in the Upper Watershed

4. Lehigh Valley Greenways Plan, prepared by the Lehigh Valley Planning Commission (LVPC), adopted May 24, 2007.

- ✚ 31 Corridors were reviewed by LVPC staff and the Study Advisory Committee, values were assigned for each component including rating factors, potential threats, and the number of interest groups. This evaluation advances the planning to implementation and enables more immediate protection and/or attention. A conclusion of this evaluation ranked the **Bushkill Creek Corridor as number one for early implementation** based on detailed planning studies that have either

been completed or underway, high natural resource conservation values, and/or a high level of interest at the county or municipal level. (page 94)

Recommendations:

- ✚ To create contiguous multi-use and conservation greenways within the Bushkill Creek Corridor through the protection and acquisition of high priority natural, recreational and culturally significant lands.
 - Preserve through acquisition or easement, the remaining high priority parcels not currently in public ownership or deed restricted within the Bushkill Creek Corridor.
 - Support wildlife habitat protection and connectivity by creating wooded conservation greenways along the upper reaches of the Bushkill Creek, Sobers Run, and all tributaries. Protect streams and natural floodplains of the Bushkill Creek Corridor by restoring riparian buffer widths of 100 feet along the main stem and 50 feet along all tributaries where feasible to undertake such measures. Utilize a variety of native vegetation in all buffers.

A NATURAL AREAS INVENTORY of LEHIGH & NORTHAMPTON COUNTIES, PENNSYLVANIA, The Nature Conservancy, 2002

In order to plan the wise use of Lehigh and Northampton counties' natural features, the Pennsylvania Science Office (PSO) of The Nature Conservancy (TNC) was contracted by the Lehigh Valley Planning Commission to provide an inventory of significant flora, fauna, and natural communities in Lehigh and Northampton counties. The following significant natural areas are all within the Sobers Run watershed:

- ✚ **Blue Mountain** is the most extensive relatively contiguous area of natural habitat in the two counties. It is one of the major corridors for the movement of biota in eastern Pennsylvania. It is an exceptional natural feature. The mountain is primarily upland forest it includes streams, seeps, springs, and vernal pools. The riparian and wetland areas are important habitat for a wide diversity of plant species as well as for many groups of animals, including birds, reptiles, amphibians, odonates (dragonflies and damselflies) and other aquatic insects. It ranks high for local area significance
- ✚ **Rismiller Woods (Top priority Natural Areas)** – an Ephemeral Fluctuating Natural Pools Natural Community and a good population of a PA Rare shrub species. The wetland microhabitats makes the area excellent breeding habitat for amphibians. The woods provide a forest corridor connecting Jacobsburg Environmental Education Center (DCNR State Park) with the Blue Mountain
- ✚ **Moorestown Wetland (Top priority Natural Areas)** – includes marsh and shrub swamp, which are fed by ground water seepage. It supports an animal species of special concern, and maintaining the hydrology is critical to its survival.
- ✚ **Knechts Pools** – includes an Ephemeral Fluctuating Pools Natural Community, with at least 12 vernal pools, and supports plant species of concern
- ✚ Both sites of Rismiller Woods and Moorestown Wetland are sites of statewide significance for the protection of the biological diversity

Lehigh Valley Greenways – *The Lehigh Valley Greenways is a collaborative state and local partnership striving to conserve and connect people to valued natural resources in the Lehigh Valley through targeted outreach, recreation, education, and land protection*

- ✚ A two-county PA Department of Conservation & Natural Resources (DCNR) Conservation Landscape Initiative that includes five sub-landscapes of concern including the Bushkill Creek Watershed/Two Rivers Area Greenway, Blue Mountain, Martins-Jacoby Watershed, Lehigh Valley Highlands, and the Jordan Creek Greenway

- ✚ Jacobsburg EEC serves as the hub for the Two Rivers Area sub-landscape and conservation efforts are focused to create a conservation and recreation greenway from Jacobsburg to the Blue Mountain, to eliminate Jacobsburg turning into an ecological island
- ✚ Secretary DiBerardinis committed seamless technical and financial assistance towards the implementation of greenway conservation and development
- ✚ **Vision:** By 2015, greenways and trails connect natural and cultural resources across the Lehigh Valley linking urban areas to outdoor experiences, protecting watersheds, and retaining the rural character of the landscape, the region's heritage and community
- ✚ Lehigh Valley Greenways Implementation Block Grants Phase I-V – DCNR funding administered through the Delaware & Lehigh National Heritage Corridor (D&L NHC) received over \$1.3 million to date to support the implementation of conservation projects in the Lehigh Valley. LVG Block grant funding was awarded to Heritage Conservancy to complete the Bushkill Township Open Space Plan, PPL Corridor Outreach, and to implement the plans in land conservation negotiations and education efforts
- ✚ DCNR funding over \$1.5 million in Northampton County towards the acquisition or conservation easement of key parcels of land. DCNR and Northampton County Open Space Program permanently conserved 200 acres of high conservation value natural resource parcels with an investment of \$1 million mainly in Bushkill Township and the adjacent Plainfield Township

APPENDIX A

Sobers Run Macroinvertebrate Data (Pennsylvania Department of Environmental Protection, 2005)

TABLE 1
STATION LOCATIONS
SOBERS RUN BASIN SURVEY (01F)
NORTHAMPTON COUNTY

STATION	LOCATION
1SR	Sobers Run (04646): 40 meters upstream of T615 bridge crossing. Bushkill Township, Northampton County Lat: 40 49 14.9 Long: 75 18 40.9 RMI: 2.88 Date: 4/19/05
2SR	Sobers Run (04646): 25 meters upstream of footbridge near confluence with Bushkill Creek. Bushkill Township, Northampton County Lat: 40 47 9.7 Long: 75 18 11.3 RMI: 0.11 Date: 4/19/05
1USR	Unt Sobers Run (04647): 250 meters upstream of SR0512 bridge crossing. Bushkill Township, Northampton County Lat: 40 49 3.0 Long: 75 19 51.9 RMI: 2.46 Date: 4/19/05
2USR	Unt Sobers Run (04647): 15 meters upstream of T611 bridge crossing. Bushkill Township, Northampton County Lat: 40 48 17.4 Long: 75 19 34.0 RMI: 1.46 Date: 4/19/05
3USR	Unt Sobers Run (04648): 25 meters upstream of SR0512 bridge crossing. Bushkill Township, Northampton County Lat: 40 48 47.7 Long: 75 20 3.4 RMI: 0.36 Date: 4/19/05
R1	Wild Creek (03959) reference station: 75 m upstream of SR1001 bridge crossing. Penn Forest Township, Carbon County Lat: 40 56 24.6 Long: 75 35 5.4 RMI: 6.38 Date: 4/19/05

FIGURE 1. SOBERS RUN STATION LOCATIONS.



**TABLE 2. SEMI-QUANTITATIVE BENTHIC MACROINVERTEBRATE
DATA AND RBP METRIC COMPARISONS:
SOBERS RUN WATERSHED, NORTHAMPTON COUNTY, APRIL 19, 2005.**

		1WC (REF)	1SR	2SR	1USR	2USR	3USR
MAYFLIES							
Baetidae	<i>Baetis</i>	15	14	12	4	12	14
Ephemerellidae	<i>Drunella</i>		2	35	5	8	1
	<i>Ephemerella</i>	24	43	49	20	15	35
	<i>Serratella</i>	2					
Heptageniidae	<i>Epeorus</i>	11	26	9	3	3	4
	<i>Stenonema</i>	5	1	9	6	8	1
Isonychiidae	<i>Isonychia</i>			1			
Leptophlebiidae	<i>Paraleptophlebia</i>	6	2			1	8
STONEFLIES							
Chloroperlidae	<i>Sweltsa</i>	1					
Leuctridae	<i>Leuctra</i>	6	2		1	1	1
Nemouridae	<i>Amphinemura</i>	10	3	6	22	20	32
Perlidae	<i>Acronuria</i>	3		6	1	1	1
Perlodidae	<i>Isoperla</i>	12	1	4		6	9
	<i>Remenus</i>				1		
Pteronarcyidae	<i>Pteronarcys</i>	3	1				
CADDISFLIES							
Brachycentridae	<i>Micrasema</i>	1				4	
Glossosomatidae	<i>Agapetus</i>				2		
Hydropsychidae	<i>Cheumatopsyche</i>	6			4	7	
	<i>Diplectrona</i>	1	6			1	
	<i>Hydropsyche</i>	9	3	7	8	14	1
Hydroptilidae	<i>Stactobiella</i>					2	
Philopotamidae	<i>Chimarra</i>				4	3	
	<i>Dolophilodes</i>	12			1	1	
Polycentropodidae	<i>Polycentropus</i>	1					
Rhyacophilidae	<i>Rhyacophila</i>	6	6	6	3	5	5
TRUE FLIES							
Ceratopogonidae	<i>Probezzia</i>		1			1	
Chironomidae	<i>sp.</i>	41	69	34	60	54	92
Empididae	<i>Chelifera</i>		1		1	1	1
	<i>Clinocera</i>			1		1	
	<i>Hemerodromia</i>			3	3	1	1
Simuliidae	<i>Prosimulium</i>	1	3	2	26	7	3
	<i>Simulium</i>	3	35	16	36	12	3
	<i>Stegopterna</i>				1		2
Tipulidae	<i>Antocha</i>					1	1

	<i>Dicranota</i>	4	1			1	
	<i>Hexatoma</i>	4	1	1			
	<i>Limonia</i>				1		
	<i>Tipula</i>		1				
BEETLES							
Dryopidae	<i>Helichus</i>				1		
Elmidae	<i>Dubiraphia</i>				1	1	
	<i>Microcylloepus</i>		1				
	<i>Optioservus</i>	1			4		
	<i>Oulimnius</i>	6		2	1	14	
	<i>Promoresia</i>	6	1	1	1	9	
	<i>Stenelmis</i>				1		
Psephenidae	<i>Ectopria</i>		1			1	
	<i>Psephenus</i>		2	5			
Ptilodactylidae	<i>Anchytarsus</i>	4					
MISC. INSECT TAXA							
Cordulegasteridae	<i>Cordulegaster</i>	1					
Corydalidae	<i>Nigronia</i>	5	1				
Gomphidae	<i>Lanthus</i>	1	3	2		2	
NON-INSECT TAXA							
Cambaridae	<i>Cambarus</i>			2		1	
Hydracarina	<i>sp.</i>	1	1		1		
Oligochaeta	<i>sp.</i>			1	1	2	
Subsample Size		211	231	216	215	219	236
T Rich.		31	27	25	24	37	26
score (c/r)		n/a	87%	81%	77%	119%	84%
bc score		8	8	8	7	8	8
mEPT		15	11	9	12	15	10
score (c/r)		n/a	73%	60%	80%	100%	67%
bc score		8	6	3	7	8	4
mHBI		3.13	3.70	3.03	4.15	4.11	4.10
score (c-r)		n/a	0.57	-0.1	1.02	0.98	0.97
bc score		8	8	8	4	4	5
%Dom		19.4	29.9	22.7	27.9	24.7	39
score (c-r)		n/a	10.5	3.3	8.5	5.3	19.6
bc score		8	8	8	8	8	2
m %Mayfly		22.7	32	47.7	15.8	16	20.8
score (r-c)		n/a	-9.3	-25	6.9	6.7	1.9
bc score		8	8	8	8	8	8
TOTAL SCORE		40	38	35	34	36	27
Comparison to Reference		n/a	95%	88%	85%	90%	68%
Ch 93 Designated Use		EV	HQ	HQ	HQ	HQ	HQ
Existing Use		n/a	EV	HQ	HQ	HQ	CWF

**TABLE 3. BIOLOGICAL CONDITION SCORING COMPARISONS,
SOBERS RUN WATERSHED, NORTHAMPTON COUNTY, APRIL 19, 2005.**

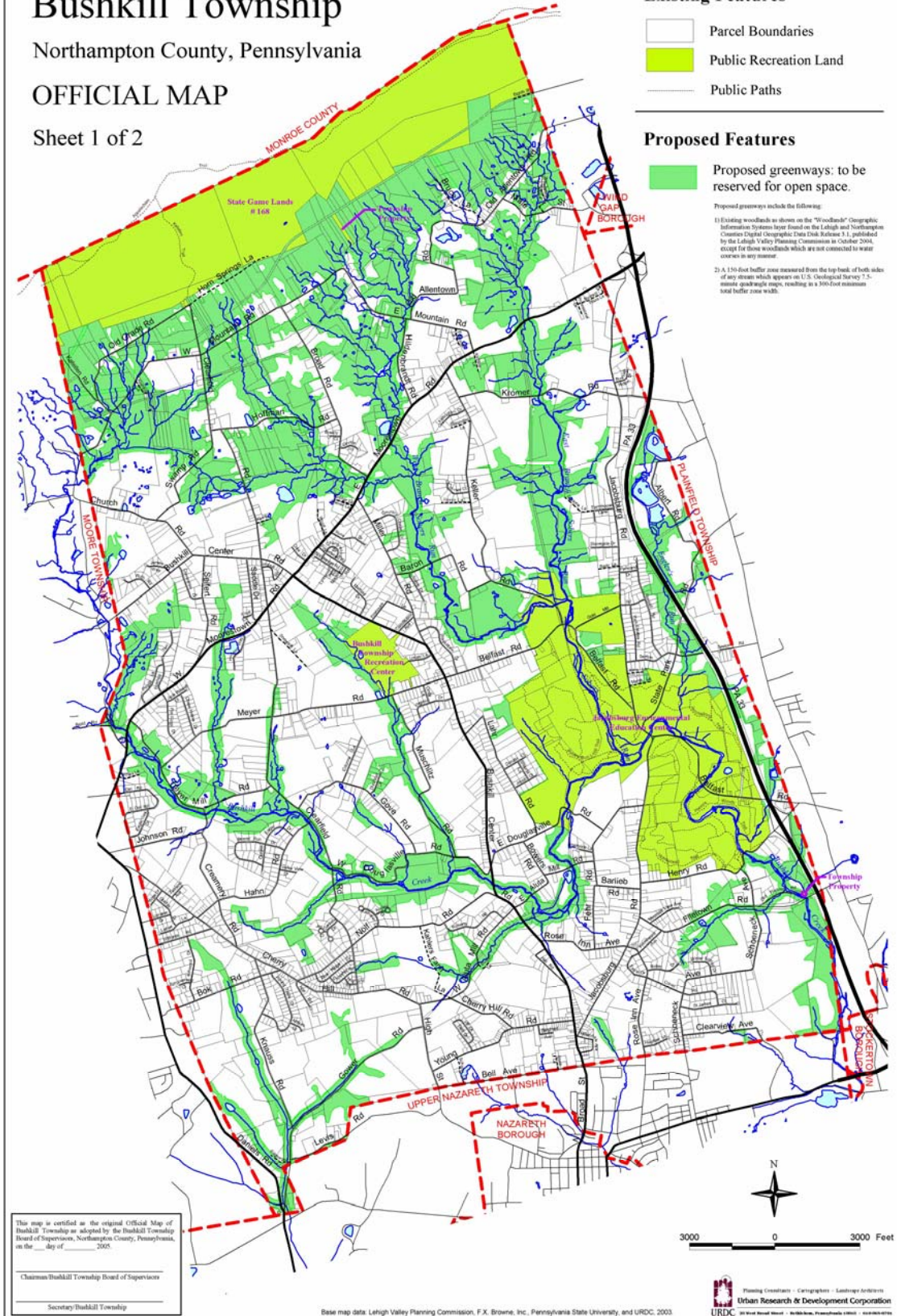
METRIC	STATIONS					
	1SR	2SR	1USR	2USR	3USR	R1
1. TAXA RICHNESS	27	25	24	37	26	31
Cand/Ref (%)	87	81	77	119	84	
Biol. Cond. Score	8	8	7	8	8	8
2. MOD. EPT INDEX	11	9	12	15	10	15
Cand/Ref (%)	73	60	80	100	67	
Biol. Cond. Score	6	3	7	8	4	8
3. MOD. HBI	3.70	3.03	4.15	4.11	4.10	3.13
Cand-Ref	0.57	-0.10	1.02	0.98	0.97	
Biol. Cond. Score	8	8	4	4	5	8
4. % DOMINANT TAXA	29.9	22.7	27.9	24.7	39	19.4
Cand-Ref	10.5	3.3	8.5	5.3	19.6	
Biol. Cond. Score	8	8	8	8	2	8
5. % MOD. MAYFLIES	32	47.7	15.8	16	20.8	22.7
Ref-Cand	-9.3	-25	6.9	6.7	1.9	
Biol. Cond. Score	8	8	8	8	8	8
TOTAL BIOLOGICAL CONDITION SCORE	38	35	34	36	27	40
% COMPARABILITY TO REFERENCE	95	88	85	90	68	N/A

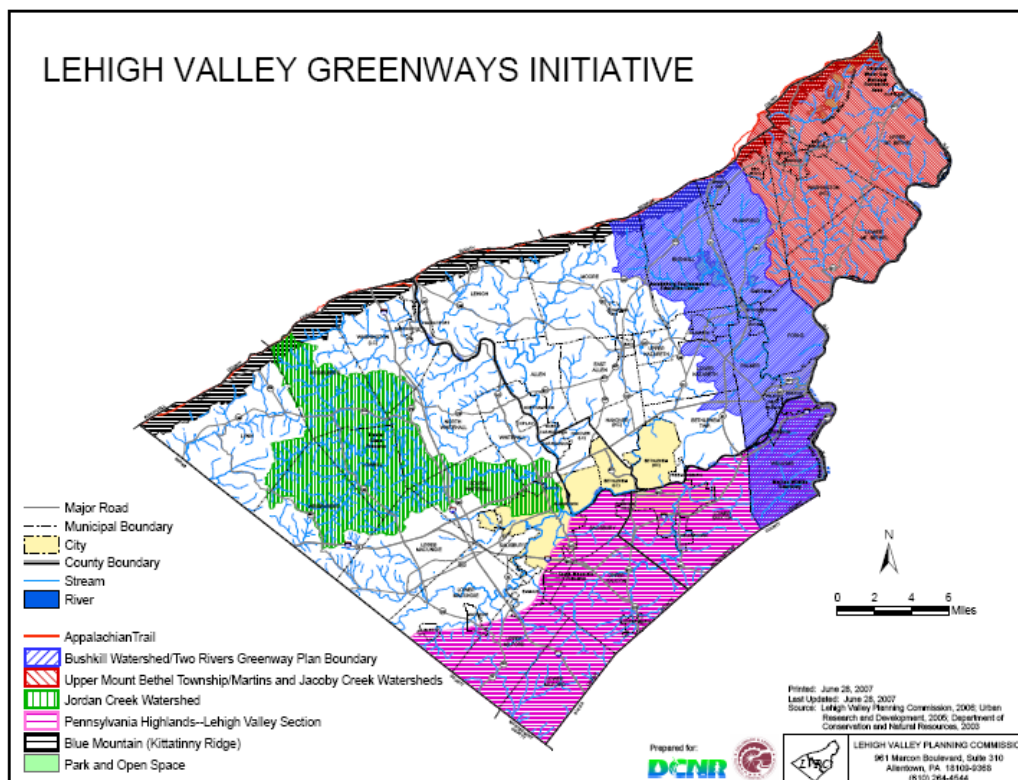
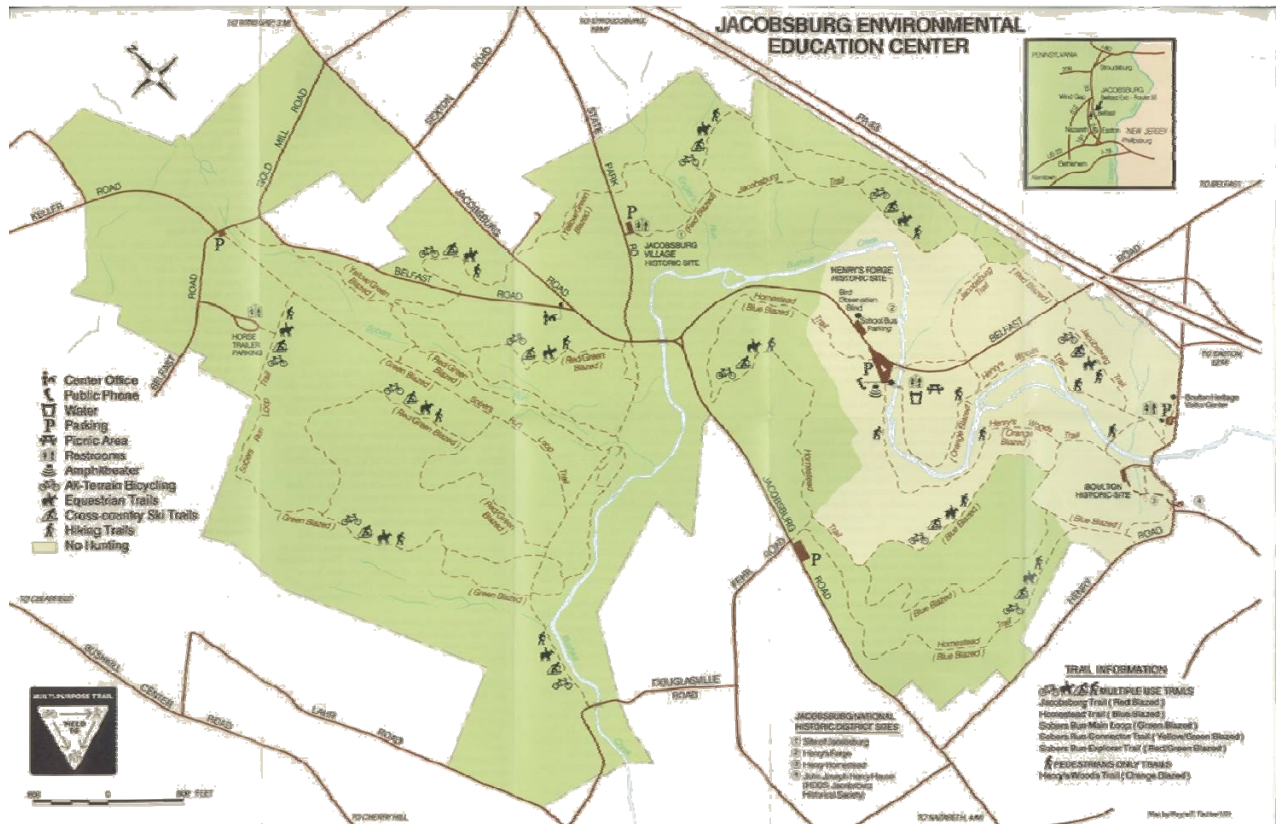
Bushkill Township

Northampton County, Pennsylvania

OFFICIAL MAP

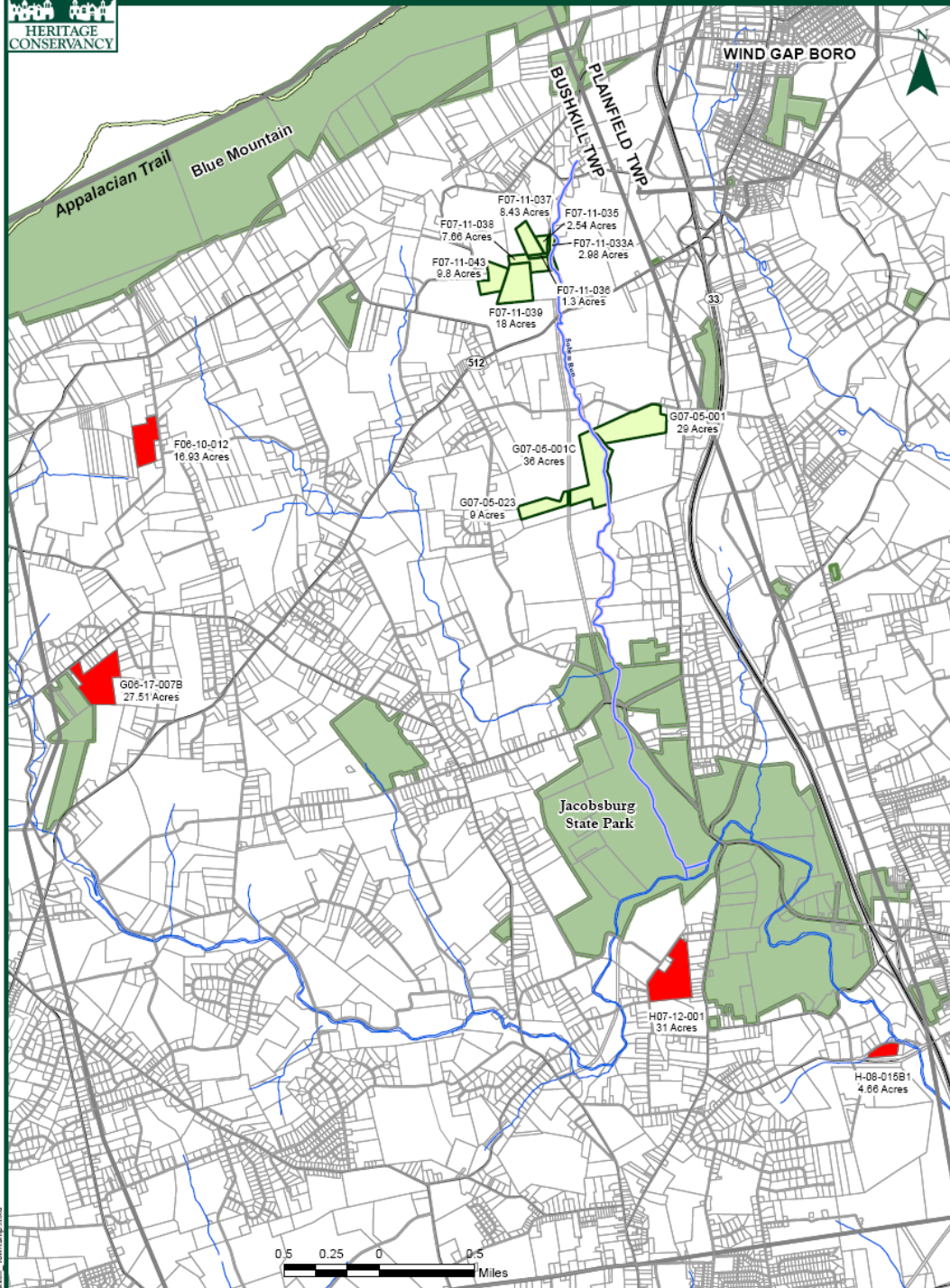
Sheet 1 of 2







PROPERTY PRESERVATION STATUS



Location in
Northampton Co.

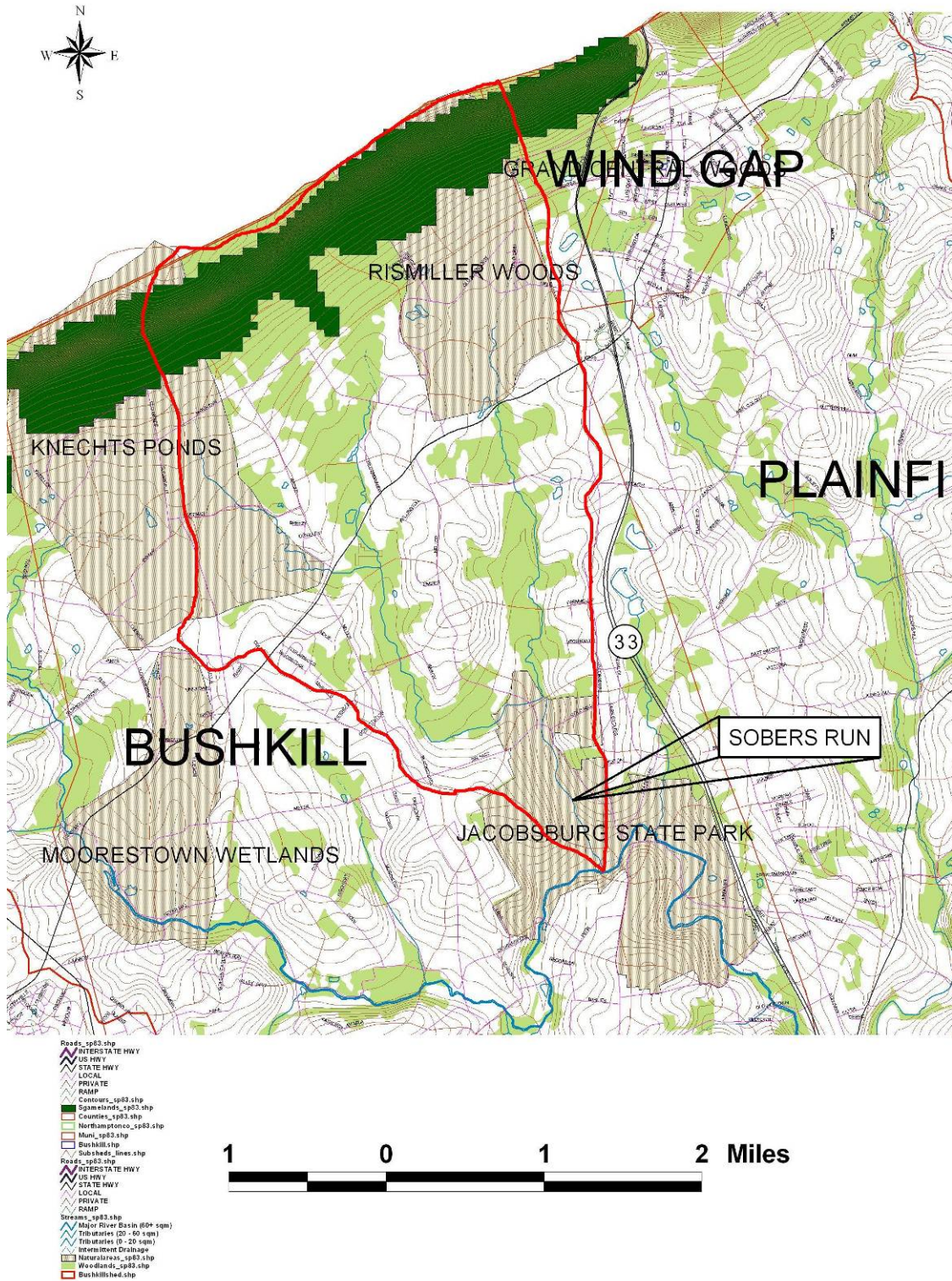


Legend

- Municipal Boundaries
- Parcels
- Preservation in Progress
- Bushkill Twp Held
- Conservation Easements
- Streams
- Sobers Run
- Local Roads
- PA State Route
- Other State Roads

PROPERTY
PRESERVATION
STATUS

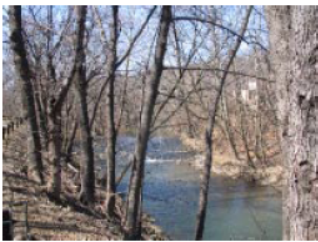
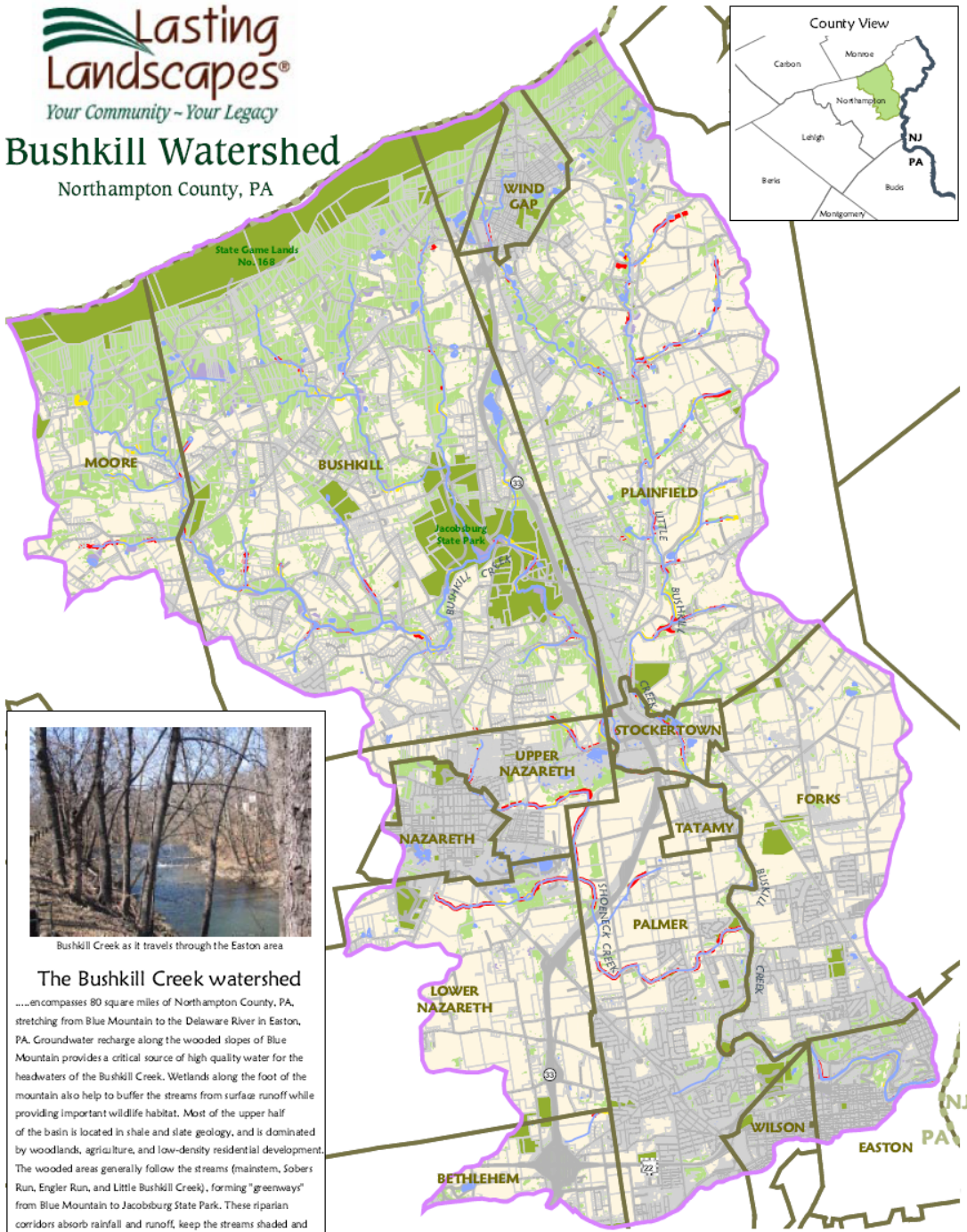
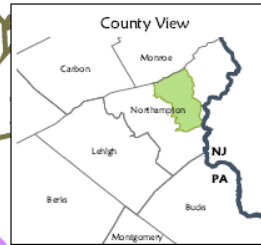
Sobers Run Bushkill Township, Northampton County





Bushkill Watershed

Northampton County, PA



Bushkill Creek as it travels through the Easton area

The Bushkill Creek watershed

.....encompasses 80 square miles of Northampton County, PA, stretching from Blue Mountain to the Delaware River in Easton, PA. Groundwater recharge along the wooded slopes of Blue Mountain provides a critical source of high quality water for the headwaters of the Bushkill Creek. Wetlands along the foot of the mountain also help to buffer the streams from surface runoff while providing important wildlife habitat. Most of the upper half of the basin is located in shale and slate geology, and is dominated by woodlands, agriculture, and low-density residential development. The wooded areas generally follow the streams (mainstem, Sobers Run, Engler Run, and Little Bushkill Creek), forming "greenways" from Blue Mountain to Jacobsburg State Park. These riparian corridors absorb rainfall and runoff, keep the streams shaded and cool, and provide important habitat for flora and fauna.

The peaceful Bushkill Creek meanders through Jacobsburg State Park



- Bushkill Creek Watershed Boundary
- Both Sides of stream in need of riparian buffer
- One Side of stream in need of riparian buffer
- Stream
- Street Right Of Way
- Forest Land
- Open Water
- Park
- Residential, Commercial or Industrial Land
- Agricultural Land
- Urban Recreational Grassland
- Wetland
- Parcel Boundary
- Municipal Boundary
- County Boundary

Data Sources: Lehigh Valley Planning Commission, USGS



Heritage Conservancy
85 Old Dublin Pike
Doylestown, PA 18901
215-345-7020
www.heritageconservancy.org

0 7000 14000 Feet
January 2005

