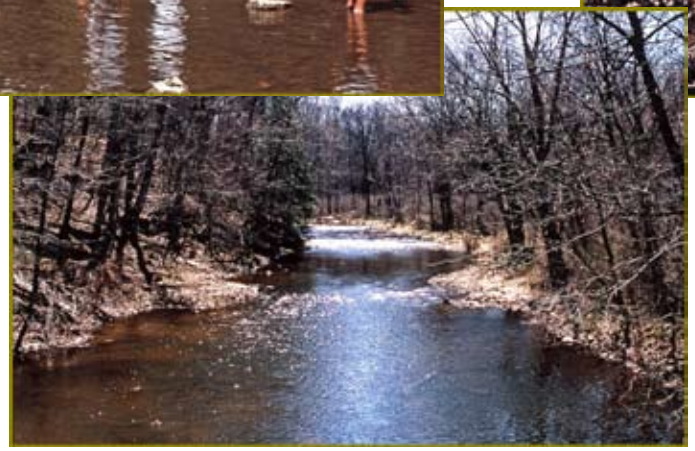
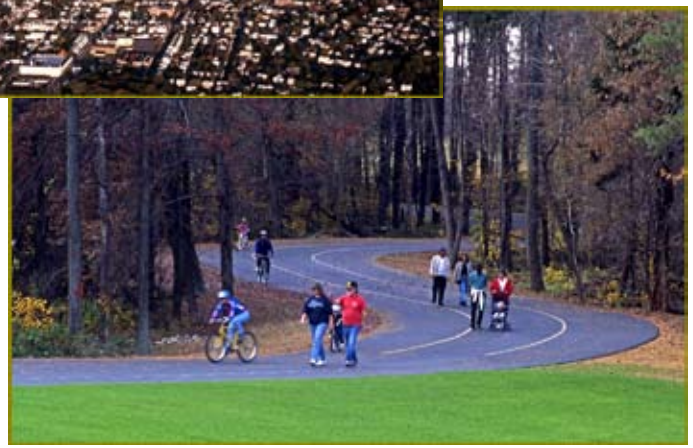
Lehigh Valley Greenways Plan

A Regional Greenways Plan
for
Lehigh and Northampton Counties





Lehigh Valley Planning Commission
2007

Lehigh Valley Greenways Plan

A Regional Greenways Plan
for
Lehigh and Northampton Counties

Lehigh Valley Planning Commission
Adopted: May 24, 2007

This plan was financed in part by a grant from the Community Conservation Partnerships Program under the administration of the Pennsylvania Department of Conservation and Natural Resources, Bureau of Recreation and Conservation.

LEHIGH VALLEY PLANNING COMMISSION

Nils Hovik, Chair
Terry J. Lee, Vice Chair
Steven L. Glickman, Treasurer

Ron Angle
Arthur F. Barwick
Norman E. Blatt, Jr.
Becky Bradley (Alternate)
John B. Callahan
Donald Cunningham
Michael D. D'Amore
Kurt J. Derr
John N. Diacogiannis
Percy H. Dougherty
Liesel Dreisbach
Ira J. Faro
Cindy Feinberg (Alternate)
James E. Flemming
Charles L. Fraust
Galen L. Freed
George F. Gemmel
Matthew Glennon
Michael C. Hefele (Alternate)
Darlene Heller (Alternate)
Benjamin F. Howells, Jr.
Robert A. Lammi
Joyce H. Losee
Earl B. Lynn
Ross Marcus (Alternate)
Joyce K. Marin
Daniel T. McNeill
Philip B. Mitman
Kathleen Palmer
Edward Pawlowski
Stephen Repasch
Linda L. Stocklas
John Stoffa
Glenn M. Taggart
Andrew Twiggar
David A. Unterberg
Sandra Vulcano
Joyce V. White

LEHIGH VALLEY PLANNING COMMISSION

*	Michael N. Kaiser, AICP	Executive Director
	Geoffrey A. Reese, P.E.	Assistant Director
	Joseph L. Gurinko, AICP	Chief Planner
	Olev Taremäe, AICP	Chief Planner
	Thomas K. Edinger, AICP	GIS Manager
	Lynette E. Romig	Senior GIS Analyst
*	Teresa Mackey	Senior GIS Analyst
*	Susan L. Rockwell	Senior Environmental Planner
	Michael S. Donchez	Senior Transportation Planner
	Travis I. Bartholomew	Stormwater Planner
**	Melanie A. Martin	Senior Planner
*	David P. Berryman	Senior Planner
	Cara N. Purcell	Land Use Planer
	Anne L. Esser, MBA	Administrative Assistant
*	Alice J. Lipe	Planning Technician
	Kathleen M. Sauerzopf	Secretary
	Devan M. Stewart	Secretary
	Wilmer R. Hunsicker, Jr.	Senior Planning Technician
	Bonnie D. Sankovsky	GIS Technician

**Project Planner
*Staff for this report

CONTENTS

ACKNOWLEDGEMENTS vi

EXECUTIVE SUMMARY viii

INTRODUCTION 1
Defining a Greenway . . . 3
Types of Greenways . . . 3
Cultural/Recreational Greenways . . . 3
Conservation Greenways . . . 6
Multi-Use Greenways . . . 9
Scenic Greenways . . . 9
Greenway Components . . . 10
Hubs . . . 10
Nodes . . . 10
Corridors . . . 11

GREENWAYS VISION 12
Statewide Greenways Vision . . . 12
Regional Greenways Vision . . . 13
Lehigh Valley Greenways Plan Vision . . . 15
Public Opinion Surveys . . . 15
Municipal Survey . . . 16
Study Advisory Committee . . . 17

GREENWAY FRAMEWORK 18
Community Resources . . . 19
Demography . . . 19
Economy, Transportation and Housing . . . 20

Natural Resources . . . 22
Topography . . . 22
Geology . . . 23
Steep Slopes . . . 25

Natural Resources (cont'd.)
Woodlands . . . 25
Interior Woodlands . . . 27
Riparian Woodlands . . . 27
Hydrography . . . 29
Floodplains . . . 33
Wetlands . . . 33
Natural Areas Inventory . . . 35
Natural Resources Plan . . . 37

Cultural, Historical and Scenic Resources . . . 37
Cultural Resources . . . 38
Historical Resources . . . 39
National Register of Historic Places . . . 41
Historical Marker Program . . . 44
Scenic Resources . . . 45

Recreational and Open Space Resources . . . 47
Parks and Other Outdoor Recreation . . . 47
Open Space . . . 54
Open Space Preservation . . . 54
Agricultural Preservation . . . 55

GREENWAYS PLAN 57
Planning Process . . . 57
Envision the Greenways Network . . . 58
Inventory Existing Resources . . . 59
Identify Greenway Components . . . 60
Hubs . . . 60
Nodes . . . 64
Corridors . . . 67

Planning Process (cont'd.)
Evaluate the Corridors . . . 91
Rating Factors . . . 91
Potential Threats . . . 92
Interest Groups . . . 92
Priority Corridors . . . 93
Recommend Goals and Actions . . . 94
Recommended Actions for the Entire Greenways Network . . . 95
Recommended Actions for Conservation Greenways . . . 95
Recommended Actions for Cultural/Recreational Greenways . . . 96
Recommended Actions for Scenic Greenways . . . 97
Recommended Actions for Priority Greenways . . . 98
Coordiate with Surrounding Counties . . . 110

IMPLEMENTATION STRATEGY 111
Land Conservation Techniques . . . 111
Fee Simple Acquisition . . . 112
Conservation Easement . . . 112
Land Management/Stewardship . . . 113
Regulatory Measures . . . 113
Comprehensive Plan . . . 113
Official Map . . . 114
Municipal Ordinances . . . 115
Zoning Techniques . . . 118
Financial Implementation . . . 122
County Implementation Measures . . . 123
Municipal Implementation Measures . . . 124
State Support for Municipal Implementation . . . 125

REFERENCES 127

MAP 1: REGIONAL SETTING x
FIGURE: Ecological Functions of Corridors 7
FIGURE: Edge Habitat Scenarios 9
MAP 2: LEHIGH VALLEY GREENWAYS INITIATIVE 14
TABLE: Population Forecasts 20
MAP 3: TOPOGRAPHY 24
MAP 4: STEEP SLOPES 26
MAP 5: WOODLANDS 28
FIGURE: Recommended Riparian Buffer Widths 29
MAP 6: STREAM QUALITY 30
MAP 7: FLOODPLAINS, WETLANDS, & HYDRIC SOILS 32
MAP 8: IMPORTANT NATURAL AREAS 34
MAP 9: NATURAL RESOURCES PLAN 36
MAP 10: PROPERTIES LISTED ON THE NATIONAL REGISTER OF HISTORIC PLACES 40
TABLE: Historical Resources in Lehigh and Northampton Counties Listed on the National Register of Historic Places 42
MAP 11: PARKS & OUTDOOR RECREATION 48
TABLE: NRPA Recommended Classification System for Local and Regional Recreation Open Space 49
TABLE: All Local, Close-to-Home Recreation Space 50
MAP 12: TRAILS 52
MAP 13: AGRICULTURAL CONSERVATION EASEMENT PURCHASES 56
TABLE: Greenway Nodes by Municipality 65
GREENWAY CORRIDOR MAPS
Allegheny Creek Greenway 68
Bertsch Creek Greenway 68
Blue Mountain/Kittatinny Ridge Greenway 69
Bushkill Creek Corridor Greenway 70
Cedar Creek Greenway 71
Cooks Creek Greenway 71
Delaware River Greenway 72
East Branch Saucon Creek Greenway 73
Fry's Run Greenway 73
Greater Minsi Lake Corridor Greenway 74
Hokendauqua and Indian Creek Greenways 75

Ironton Rail-Trail Greenway 76
Jacoby Creek Greenway 77
Jordan Creek Greenway 77
Lehigh River Greenway 79
Leibert Creek Greenway 80
Little Lehigh Creek Greenway 80
Lyon Creek Greenway 82
Macungie-Alburtis Trail Greenway 82
Martin's Creek and Mud Run Greenways 83
Monocacy Creek Greenway 84
Nor-Bath Trail Greenway 85
Ontelaunee Creek Greenway 85
Palmer-Bethlehem Bikeway Greenway 86
Pennsylvania Highlands Greenway 86
Saucon Creek Greenway 88
Shochary Ridge Greenway 89
Slate Heritage Trail/Trout Creek Greenway 89
South Bethlehem Greenway 90
PRIORITY GREENWAY CORRIDORS LAND PROTECTION SUMMARY TABLES
Early Implementation Greenways
Bushkill Creek Corridor Greenway 98
Blue Mountain/Kittatinny Ridge Greenway 100
Greater Minsi Lake Corridor Greenway 101
Jordan Creek Greenway 102
Pennsylvania Highlands Greenway 104
Other Priority Greenways
Delaware River Greenway 105
Lehigh River Greenway 106
Little Lehigh Creek Greenway 108
Monocacy Creek Greenway 109
TABLE: Municipal Natural Resource Protection Ordinances 116
MAP 14: LEHIGH VALLEY GREENWAYS PLAN . . . . . following page 128

Lehigh Valley Planning Commission staff for this report:

Melanie Martin	**author, project planner**
Michael Kaiser	**editor, contributing photographer**
Teresa Mackey	**GIS mapping, contributing writer, co-editor**
Alice Lipe	**publishing**
David Berryman	**contributing writer**
Susan Rockwell	**co-editor**

The Study Advisory Committee (committee) for this plan was comprised of volunteers from across the Lehigh Valley, including various government agencies, private nonprofit conservation groups, watershed associations and other stakeholder groups. The role of the committee was to review and comment on the information and mapping developed by the Lehigh Valley Planning Commission staff and to act as a resource for localized activities pertaining to open space and greenways. The following committee members provided essential insight and input into the planning process:

Sherry Acevedo	Delaware and Lehigh National Heritage Corridor
Martin Boksenbaum	Lehigh Township
Kate Brandes	Northampton County Conservation District
Marvin Charles	Lynn Township Environmental Advisory Council
Mel Charles	Lynn Township Environmental Advisory Council
Jan Creedon	Lehigh County
Andrew Curtis	Northampton County Federation of Sportsmen
Jeanette DeRenee	City of Easton
Karen Dolan	Monocacy Creek Watershed Association, Illicks Mill
Cindy Feinberg	Lehigh County
Cyndie Geosits	City of Allentown
Matthew Glennon	Plainfield Township
Janet Goloub	Allentown Hiking Club
Michael Hefele	City of Allentown
Darlene Heller	City of Bethlehem
Gordon Heller	Northampton County Department of Parks and Recreation
Amanda Jensen	Palmer Township
Janet Keim	Little Lehigh Watershed Coalition, South Mountain
Barbara Kowitz	City of Easton
Dan Kunkle	Lehigh Gap Nature Center
Debra Lermitte	Wildlands Conservancy
Jeff McGuire	Williams Township Land Preservation Board
John Mauser	Martins/Jacoby Watershed Association

Sandra Merwarth	Bushkill Stream Conservancy
Bill Mineo	Delaware and Lehigh National Heritage Corridor
Dale Prinkey	Jacobsburg Environmental Education Center
Lorie Reinert	Lehigh Wheelmen Association
Barbara Stader	City of Allentown Bureau of Health
Michael Stershic	Lehigh Valley Convention and Visitors Bureau
Jeff Stout	City of Allentown Bureau of Health
William Sweeney	Jacobsburg Environmental Education Center
Irene Woodward	City of Bethlehem
Harold Wright	Allentown Hiking Club
Sandra Yeager	Lower Saucon Township, Heritage Conservancy
Sallie Urffer	Lehigh Wheelmen Association

The Lehigh Valley Planning Commission would also like to give special thanks to the following professionals, organizations and support staff that provided their valuable time and resources to the development of the Lehigh Valley Greenways Plan. Their contributions were greatly appreciated.

Becky Bradley	City of Easton
Frederic Brock	retired Lehigh Valley Planning Commission staff
Michael Frank	Heritage Conservancy
Tom Gettings	contributing photographer, Wildlands Conservancy
Anne Hutchinson	Natural Lands Trust
Diane Kripas	Pennsylvania Department of Conservation and Natural Resources
John Lunger	contributing photographer, ArtsQuest
Laura Masi	contributing photographer
Olev Taremäe	contributing photographer, Lehigh Valley Planning Commission staff

The *Lehigh Valley Greenways Plan* begins with the understanding that there are many valuable cultural and natural resources worthy of discovery and preservation throughout Lehigh and Northampton counties. This two-county region can be seen as an intricate fabric of interconnected threads. Each thread represents a resource that is woven together to create the composite community fabric that surrounds us. The fabric of the Lehigh Valley is made up of rivers and streams and the industry they supported, wooded ridgelines and fertile agricultural valleys, a rich historic and cultural heritage, and a diverse population that is increasing with each passing year.

Lehigh and Northampton counties include 62 municipalities that consist of three cities, 27 boroughs and 32 townships and a population forecasted to reach over 750,000 persons by the year 2030. Much of this growth will occur in the suburbs surrounding the cities of Allentown, Bethlehem and Easton; however, there is considerable evidence that residential growth is consuming agricultural lands and open space at a rate of over four square miles per year. The surrounding market areas of Philadelphia, New York and New Jersey exert strong economic, demographic, social and environmental impacts on the area's resources. It is projected that the Lehigh Valley will be 55% urban by 2030; sprawl is a growing concern and the natural resources of the Lehigh Valley are at risk. The creation of a sound greenways network will preserve many of the remaining features Lehigh Valley residents treasure.

Lehigh Valley residents have been outspoken in their desire to maintain and improve their quality of life created by the pastoral scenery, cultural bounty and recreational resources available to them. This has been documented through regional public opinion surveys conducted by the Lehigh Valley Planning Commission (LVPC) in 1974, 1988 and 1999. The latest survey revealed that nearly 70% of the population agreed that more parks, recreation facilities and open space should be acquired and/or developed in their county. Lehigh Valley voters also have strongly supported state and county referendums to fund the creation of parks, protect important natural areas and preserve farmland. The increasing development pressures in many parts of the Lehigh Valley have resulted in this increased awareness and interest in preserving open space. Many valuable resources would have already been developed from their natural undisturbed state had it not been for this realization. Local governments have begun to collaborate with local land trusts to acquire and protect land identified by the LVPC as high priority resource lands.

Adopted by both counties in 2005, the *Comprehensive Plan for the Lehigh Valley … 2030* (Comprehensive Plan) contains a thorough inventory of the natural, recreational, cultural, historical and scenic attributes of the Lehigh Valley and establishes priorities and provides recommendations on how to protect them. This plan, funded, in part, by a grant from the Pennsylvania Department of Conservation and Natural Resources (DCNR), Bureau of Parks and Recreation, stems from the inventory and analysis of the Comprehensive Plan identifying the resources that serve as the framework for a regional greenways network and provides recommendations on how to take full advantage of the opportunities they present. The development of the *Lehigh Valley Greenways Plan* vision involved many partners and groups that are interested in greenway and conservation efforts for some of the region's major waterways and natural areas. The LVPC worked closely with these entities to encourage the creation of greenway and trail linkages, the long-term preservation and protection of priority natural resources, and the enhancement and creation of natural, recreational, cultural, historical and scenic areas of interest in the Lehigh Valley.

A greenway is defined as a corridor of open space, that may vary greatly in scale from narrow strips of green that run through urban, suburban and rural areas to wider corridors that incorporate diverse natural, cultural and scenic features. Greenways are a critical component of any landscape. They protect the environment, supply recreational opportunities and connect natural and cultural areas to one another providing a linear resource for a variety of users. Connectivity is the defining characteristic that distinguishes greenways from isolated paths and pockets of open space. While individual parks, preserved lands, undisturbed natural areas and waterways are valuable resources in and of themselves, their conservation and recreation value is compounded when

they are linked together. Greenways come in a variety of forms and serve many functions. This plan identifies four types of greenways in the Lehigh Valley.

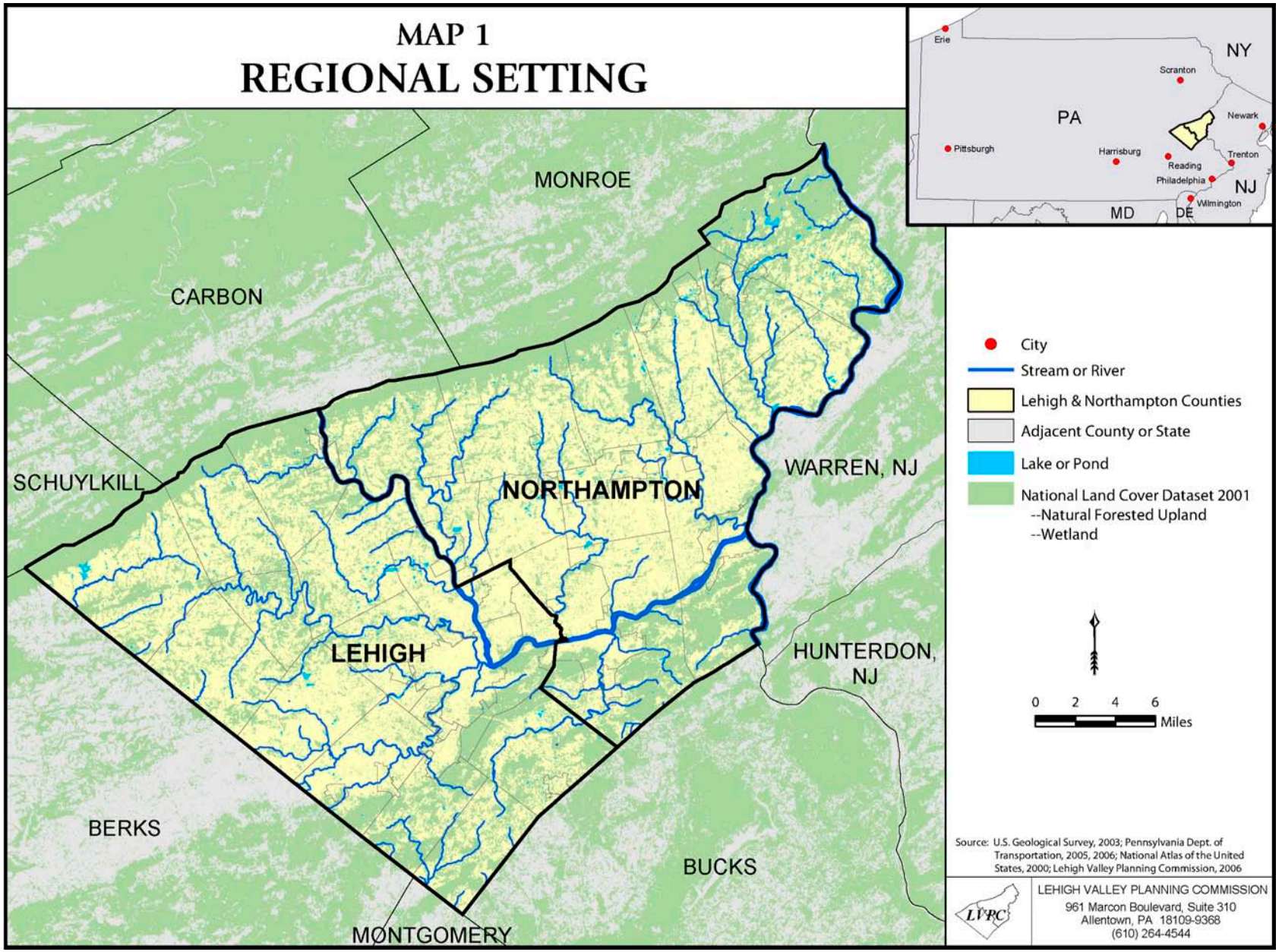
1) Cultural/recreational greenways, which support human activity
2) Conservation greenways, which support ecological purposes
3) Multi-use greenways, which support a combination of human and conservation activities
4) Scenic greenways, which provide a visual connection across the landscape

Using greenway function as a guide, the Lehigh Valley greenways network was identified using a Geographic Information System (GIS) mapping program. Many maps of the existing resources present in the Lehigh Valley were produced using GIS and analyzed to decide the location of the greenways network of hubs, nodes and corridors. Hubs are large centers of activity (e.g., parks, cities, boroughs) that serve to anchor the greenway network; nodes are natural, recreational, cultural or historic places of interest; and corridors are the linear connecting elements, linking hubs and nodes. The Lehigh Valley greenways network consists of 31 corridors, eight hubs and 63 nodes. Each corridor was evaluated using a priority ranking system that looked at location, connectivity, potential threats and stakeholders to identify nine Priority Greenways in the Lehigh Valley. Additionally, the plan identifies five Early Implementation Greenways (shown in bold text below) that offer the most opportunity for advancement of implementation projects as there has already been studies prepared and stakeholder groups mobilized currently purchasing and/or working with the municipalities to protect the resources identified. The Priority Greenways are:

1) **Blue Mountain/Kittatinny Ridge**
2) **Bushkill Creek Corridor**
3) Delaware River
4) **Greater Minsi Lake Corridor**
5) **Jordan Creek**
6) Lehigh River
7) Little Lehigh Creek
8) Monocacy Creek
9) **Pennsylvania Highlands**

This plan also provides information on a range of techniques that can be used to conserve open space from absolute to minimal protection. Permanently protecting environmentally sensitive, historically important and/or culturally significant lands from undesirable development is the ultimate goal identified in the *Lehigh Valley Greenways Plan*. To sustain this challenging goal, it is necessary for local governments to maintain public interest and to identify and secure funding over time. Since it is neither practical nor desirable for local government to purchase every acre of important land throughout Lehigh and Northampton counties, this plan assigns priority to the greenway corridors to narrow the task and assure the most sensitive and at-risk natural resources are identified and given suitable goals and recommendations to accomplish local conservation objectives. This plan aims to provide the municipalities, government entities, conservation organizations, business community and citizens alike with a visually enhanced look into the greenways of the Lehigh Valley and provides specific and feasible recommendations for improvement and future success .

The *Lehigh Valley Greenways Plan* will be Lehigh and Northampton counties' first regional plan to examine the physical framework of natural, recreational, cultural, historical and scenic resources that make up a multiform network of corridors, hubs and nodes. Our goal is to connect these resources with existing and planned pathways that are permanently protected and carefully managed to form an interconnected network to benefit a myriad of users.


MAP 1
REGIONAL SETTING
MONROE
CARBON
SCHUYLKILL
NORTHAMPTON
WARREN, NJ
LEHIGH
HUNTERDON, NJ
BERKS
BUCKS
MONTGOMERY
Erie
NY
Scranton
PA
Newark
Pittsburgh
Harrisburg
Reading
Trenton
Philadelphia
NJ
Wilmington
MD
DE
City
Stream or River
Lehigh & Northampton Counties
Adjacent County or State
Lake or Pond
National Land Cover Dataset 2001
--Natural Forested Upland
--Wetland
0 2 4 6
Miles
Source: U.S. Geological Survey, 2003; Pennsylvania Dept. of Transportation, 2005, 2006; National Atlas of the United States, 2000; Lehigh Valley Planning Commission, 2006
LVPC
LEHIGH VALLEY PLANNING COMMISSION
961 Marcon Boulevard, Suite 310
Allentown, PA 18109-9368
(610) 264-4544

INTRODUCTION

The *Lehigh Valley Greenways Plan* begins with the understanding that there are many valuable natural and cultural resources worthy of discovery and preservation throughout Lehigh and Northampton counties. This two-county region, located in eastern Pennsylvania (Map 1) is rich with high quality waterways. Its history and development were shaped by the Lehigh and Delaware rivers. Also situated between two large Pennsylvania mountain ranges, our residents and frequent visitors enjoy breathtaking views of fertile stream valleys, bountiful fields and deep woodlands. The Kittatinny Ridge and Pennsylvania Highlands create a beautiful backdrop to the viewpoints of the cities of Allentown, Bethlehem and Easton where culture and history abound.

Lehigh Valley residents have long been interested in parks, recreation, open space and farmland preservation. This has been documented through regional public opinion surveys conducted by the Lehigh Valley Planning Commission (LVPC) in 1974, 1988 and 1999. The latest survey revealed that nearly 70% of the Lehigh Valley population agreed that more parks, recreation facilities and open space should be acquired and/or developed in their county. Lehigh Valley voters also have strongly supported state and county referendums to fund the creation of parks, protect important natural areas and preserve farmland. Recent trends in population growth and land use change show the region is experiencing a development boom that threatens to destroy much of what residents find appealing about the Lehigh Valley. The development of a sound greenways network will go a long way to preserve many of the remaining features Lehigh Valley residents treasure.

The *Lehigh Valley Greenways Plan* is being funded, in part, by a grant from the Pennsylvania Department of Conservation and Natural Resources (DCNR), Bureau of Parks and Recreation. The Commonwealth of Pennsylvania has long been committed to the protection of its natural, cultural and historical assets and has designated DCNR as the lead agency responsible for implementation of this initiative. DCNR identifies greenways by the following definition:

> *"A greenway is a corridor of open space. Greenways vary greatly in scale, from narrow ribbons of green that run through urban, suburban, and rural areas to wider corridors that incorporate diverse natural, cultural and scenic features. They may follow old railways, canals, or ridge tops, or they may follow stream corridors, shorelines, or wetlands, and include water trails for non-motorized craft. Some greenways are recreational corridors or scenic byways that may accommodate motorized and non-motorized vehicles. Others function almost exclusively for environmental protection and are not designed for human passage. Greenways differ in their location and function but, overall, a greenway will protect natural, cultural, and scenic resources, provide recreational benefits, enhance natural beauty and quality of life in neighborhoods and communities, and stimulate economic development opportunities."*

The *Lehigh Valley Greenways Plan* incorporates the statewide vision for Pennsylvania's greenways into a regionally specific and valuable network of corridors, hubs and nodes. Our goal is to provide the municipalities, government entities, conservation organizations, the business community and citizens alike with a visually enhanced look into the greenways of the Lehigh Valley and concise recommendations for success and improvements.

Lehigh River Greenway — looking north from Catasauqua Borough to the Kittatinny Ridge

A greenway is defined as a corridor of open space, that may vary greatly in scale from narrow strips of green that run through urban, suburban and rural areas to wider corridors that incorporate diverse natural, cultural and scenic features.

Greenways are a critical component of any landscape. They protect the environment, provide alternate routes of transportation, supply recreational opportunities, and connect natural and cultural areas to one another providing a linear resource for a variety of users. A greenway is defined as a corridor of open space, that may vary greatly in scale from narrow strips of green that run through urban, suburban and rural areas to wider corridors that incorporate diverse natural, cultural and scenic features.

Connectivity is the defining characteristic that distinguishes greenways from isolated paths and pockets of open space. While individual parks, preserved lands, undisturbed natural areas and waterways are valuable resources in and of themselves, their conservation and recreational value is compounded when they are linked together.

Types of Greenways

Greenways come in a variety of forms and serve many functions. The Pennsylvania Greenways Program identifies three major types of greenways: 1) cultural/recreational greenways, which support human activity; 2) conservation greenways, which support ecological and conservation purposes; and 3) multiuse greenways, which support a combination of human and conservation activities. The LVPC has identified a fourth type of greenway present in the Lehigh Valley; 4) scenic greenways, which provide a visual connection for humans to enjoy. Using these categories as a guide, the following is a comprehensive description of each type of greenway found in the Lehigh Valley:

Cultural/Recreational Greenways

Cultural/recreational greenways supply the human population with an array of low-impact recreational opportunities and quality of life benefits. They provide solace from the hustle and bustle of city life and undisturbed interfaces with nature. In suburbanized areas subject to sprawl, they offer alternative transportation routes and provide linkage to close-to-home exercise opportunities. Natural, cultural and historical areas of interest can be preserved, interpreted and enjoyed through these corridors. Types of cultural/recreational greenways are:

Trails

Trails are the most widely recognized recreational feature associated with greenways; however, some greenways do not include trails. They are normally described by the predominant activity taking place, such as hiking, biking or horseback riding. Trails range from long corridors that connect residential and commercial areas with natural, recreational, cultural and historical amenities to a small paved loop in a local park. Their designation depends on a variety of factors from type, length, location, access and jurisdiction. Types of trails found in the Lehigh Valley and identified by the Pennsylvania Greenways Partnership in *Creating Connections, The Pennsylvania Greenways and Trails How-To Manual* include the following:

Bike Trials

Bike trails are flat, wide trails with improved surfaces that appeal to bicycles, skates and other users on wheels but not motorized vehicles. Designated bike paths provide cycling opportunities without vehicular interference. A successful bike path in Northampton County is the Palmer-Bethlehem Bikeway.

Another type of bike trail is known as a bike route. A bike route is typically found alongside a street or highway. The routes are often scenic and engage the user with local culture and history. In 1996, the LVPC combined efforts with the Lehigh Wheelmen Association to create *Bike Rides The Lehigh Valley*, a publication featuring 17 bike rides throughout the Lehigh Valley. A popular ride begins at the Lehigh Valley Velodrome and travels westward into Berks County before returning to the Velodrome in Upper Macungie Township.

Rodale Cycling and Fitness Park *Tom Gettings, Wildlands Conservancy*

Exercise Trails

Exercise trails are generally much shorter in length than hiking trails. These trails are used primarily for exercise and often contain workout stations with equipment designed to provide a complete workout. Many of the larger county and municipal parks in the Lehigh Valley have exercise trails that often form a loop. Examples include the 1.5 mile walking/jogging loop trail in the City of Allentown's Trexler Memorial Park and the Rodale Cycling and Fitness Park in Lower Macungie Township.

Heritage Trails

Heritage trails are designed to educate the user on the cultural and historical heritage of a region or community. They follow paths of history through interpretive signage and destinations. The Slate Heritage Trail in Lehigh County follows along the former Lehigh Valley Railroad right-of-way from lower Slatington Borough to the Village of Slatedale in Washington Township. The trailhead in Slatington Borough is located near and will eventually connect with the developing Delaware and Lehigh National Heritage Corridor.

Heritage corridors are areas designated by the United States Congress where "natural, cultural, historic and recreational resources combine to form a cohesive, nationally distinctive landscape arising from patterns of human activity shaped by geography." However, heritage corridors are not necessarily greenways. They are considered a type of greenway when they run along a physical spine, such as a canal path or stream corridor. An example is the Delaware and Lehigh Canal Heritage Park Corridor (referred to locally as the D&L Trail) which travels throughout Lehigh and Northampton counties. The D&L Trail is both a National Heritage Corridor and a Pennsylvania State Heritage Park.

Hiking Trails

Hiking trails are designed to provide adventure and challenge; they are often found in the wilderness and are several miles in length. The footpath commonly follows a natural landform, such as a ridgeline or stream. Hiking trails are known for their spectacular scenery and opportunity for escape from day to day life. Most trails are used by the day hiker; however, backpackers seeking a multi-day hiking experience can find longer hiking trails with places to set up camp. The best example of a hiking trail in the Lehigh Valley is the Appalachian Trail.

Nature Trails

Nature trails are designed to engage the user with nature. These trails are enhanced with interpretive signage designed to educate and entertain. Locally, nature trails can be found at the Rodale Cycling and Fitness Park in Upper Macungie Township, the Pool Wildlife Sanctuary in Lower Macungie Township, and at Bear Swamp Archery Complex and Minsi Lake in Upper Mt. Bethel Township. Many nature trails are developed and maintained by popular outdoor organizations such as the Audubon Society, e.g., the Lehigh Gap Nature Center trails at the Lehigh Gap Wildlife Refuge.

Rail-Trails

Rail-trails are trails that have been built on abandoned railroad rights-of-way. These trails are designed for use by an array of users from hikers and bikers to horseback riders and nature watchers. The Lehigh Valley has many rail-trails; examples in Lehigh County include the Ironton Rail-Trail and the Slate Heritage Trail, and in Northampton County the Nor-Bath Trail and the Forks Township Recreation Trail. A number of other rail-trails are in the planning and development stage.

Ironton Rail-Trail *Tom Gettings, Wildlands Conservancy*

Another type of trail in this category are the lesser known rails-with-trails. Unlike rail-trails, rails-with-trails occur along active rail lines. The closest example is the Heritage Rail-Trail in southern York County. This trail runs beside the active line of a seasonally operated scenic train ride. Once completed, this trail will extend over twenty miles, connecting the historic district of York, PA with Maryland's Northern Central Railroad Trail. The development of a rail-with-trail has been considered for a section of the RJ Corman rail line along the Lehigh River in Whitehall Township.

Towpaths

A towpath is a road or trail that runs along the banks of a river, canal or stream. The towpaths of the Delaware Canal and Lehigh Canal were once used by mules or land vehicles to tow a boat or barge and have since provided recreational opportunities to area residents for many years. These two canal towpaths are an important part of the D&L Trail. The trail will be a 165-mile path for hikers and bikers, that extends from Bristol Borough in lower Bucks County to Wilkes-Barre in Luzerne County. Through much of our region the D&L Trail follows the towpaths of the Delaware and Lehigh Navigation Canals.

Utility Corridors

Utility corridors are continuous and often managed for vegetation growth. Since both overhead and underground utility lines lend themselves to trail development, they can be good opportunities for trail implementation in suburbanized areas. Many utility companies will work with municipalities or private agencies to either donate the corridor or the right-of-way for recreational activity. An example in Northampton County is the Plainfield Township

Recreation Trail. The municipality worked in concert with the Transcontinental Gas Pipeline Corporation and the GPU Energy Company to create this widely used trail.

Water Trails

Water trails are primarily recreational corridors that occur through streams and rivers. Water trails are suitable for canoes, kayaks and small motorized watercraft. Each trail is designed to be a reflection of the region's diverse history, ecology, geology and wildlife. The Lehigh and Delaware rivers are designated Pennsylvania Water Trails.

Conservation Greenways

Conservation greenways exist primarily to protect natural resources. They are undisturbed corridors that fulfill their ecological potential by serving as habitat, buffers, filters, sources and/or destinations. Enabling greenways to fulfill their conservation role depends on a thorough understanding of landscape ecology. A useful resource on the ecological functioning of greenways is *How Greenways Work: A Handbook on Ecology* by Jonathan Labaree. According to the handbook, a conservation greenway can operate in six basic ways:

1. as **habitat** for plant and animal communities;
2. as a **conduit** for plants, animals, water, sediment and chemicals;
3. as a **barrier** preventing movement;
4. as a **filter** allowing select things to pass while inhibiting others;
5. as a **source** for animals or seeds moving to other parts of the landscape; and
6. as a **sink** for trapping sediment.

Conservation greenways represent the majority in the Lehigh Valley network. Many of these corridors are the streams and rivers and their associated woodlands. Types of conservation greenways found in the Lehigh Valley are:

Blueways

Blueways are essentially rivers and streams which are effective wildlife corridors in areas where they remain undisturbed by development. Many species of wildlife utilize the forested banks of rivers and streams as a place of refuge and a primary food source. An example of a blueway is the Slateford Creek in Upper Mount Bethel Township, Northampton County. This Exceptional Value waterway is lined on both sides with deep woodlands.

Natural Areas

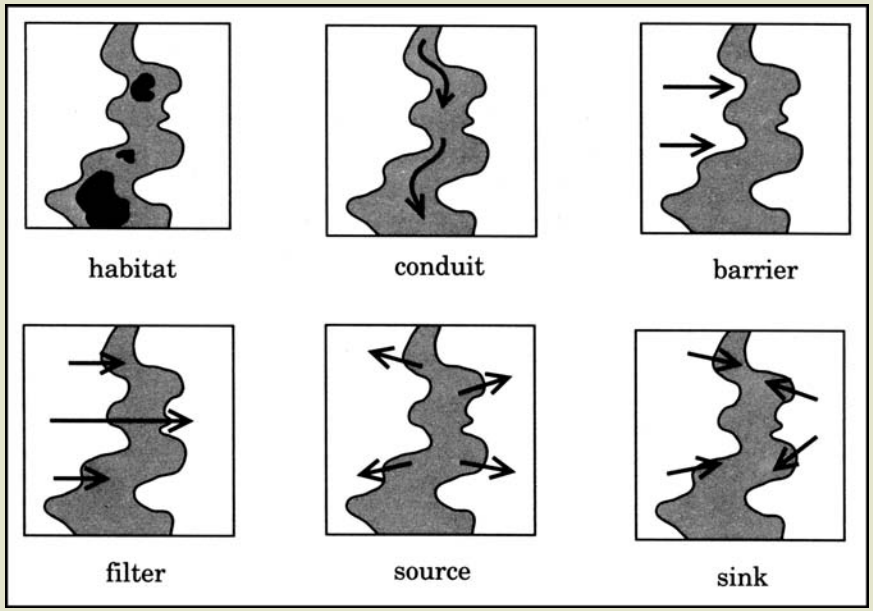
Natural areas are primarily greenspaces along greenways that provide flood control, habitat or water resource protection functions. Examples of natural areas are floodplains, wetlands, riparian habitat and forest patches. These natural resources are incorporated into conservation greenways enabling them to be used as habitat, open space, or nature observation and environmental education sites. Local examples of natural areas with an educational component are Jacobsburg Environmental Education Center in Bushkill Township and the Mariton Wildlife Sanctuary in Williams Township.

Ecological Functions of Corridors

Greenways as habitat:
A species' habitat may include many different types of vegetation and geography, such as wetlands, upland forests, and fields. A greenway's ability to provide habitat will depend upon its size, location and the needs of native species. A greenway that is 200 feet wide will generally contain habitat for fewer species than one in a similar location that is half a mile wide.

Greenways as conduit:
Conduits are areas in the landscape along which water, animals, plants, and people move. A river is among the most obvious examples of a conduit. Water carries sediment, nutrients, leaves, insects, bacteria, and plankton along with it. Acting as a conduit to connect otherwise isolated parts of the landscape is an important function of greenways.

Greenways as barrier:
While a greenway may be a conduit to some things, it presents a barrier to others. Again, a river or stream serves as an example. Small animals or those that prefer a drier habitat may be unable to cross a river. Even very narrow corridors, such as hedgerows, can present a physical barrier of impassable habitat for some species.



Greenways as filter:
A filter prevents the passage of some things but allows the passage of others. Filtering can occur in a greenway either perpendicular to its axis or along its length. Large animals, able to traverse a river, for example, can pass across a riparian greenway, but small ones may not. Additionally, is the greenway's potential to filter sediments and nutrients from surface and groundwater.

Greenways as source:
A greenway may act as a source, providing the surrounding land with a variety of things. For example, a riparian greenway may be the only source of water in an otherwise arid landscape. In human-dominated areas, even narrow strips of relatively undisturbed land, such as hedgerows or steep slopes, may be a source of seed or habitat for native species.

Greenways as sink:
A greenway acts as an ecological sink when something moves into it but does not travel back out into the surrounding land. Perhaps the most significant way a greenway can be a sink is by trapping sediments and nutrients carried in surface and groundwater. This function is, however, dependent upon a specific time frame because sediments may eventually wash downstream during a dramatic flood, or nutrients absorbed by vegetation will re-enter the soil and atmosphere when the plant decays.

Source: *How Greenways Work: A Handbook on Ecology*, Jonathan Labaree, National Park Service

Riparian Buffers

Riparian buffers play a major role as conservation greenways in the Lehigh Valley. A riparian buffer is an area of trees and other natural vegetation adjacent to a watercourse that forms a transition area between the aquatic environment and the adjacent disturbed land. Generally, the greater the width, the greater the protection; the LVPC recommends buffer widths of 100 feet along rivers and major streams and 50 feet along all other waterbodies. Buffers should be based on the site and designed accordingly incorporating a variety of native plants and sustainable practices. Establishment of conservation greenways along waterways can protect water quality, provide flood protection, and act as a water recharge area. Encouraging farmers and private landowners to incorporate riparian buffers between active agricultural land or residential development and waterbodies can protect environmentally sensitive areas and restore wildlife habitat. Riparian buffers of varying width and quality exist along many of our rivers and streams.

Riparian Buffer on the Bushkill Creek

Wildlife Corridors

Wildlife corridors provide natural pathways connecting larger habitat areas to one another allowing species movement, such as migration or dispersal of young. Depending on the corridor's width, the pathway may consist of both interior and edge habitat or only edge habitat. The edge habitat is created where the natural areas of the greenway meet the adjacent disturbed land. Many wildlife species use the unique conditions found in edge habitats as their preferred or secondary habitat. A good example of a wildlife corridor is the Jordan Creek and surrounding riparian woodlands between Blue Mountain and the State Game Lands No. 205/Trexler Nature Preserve.

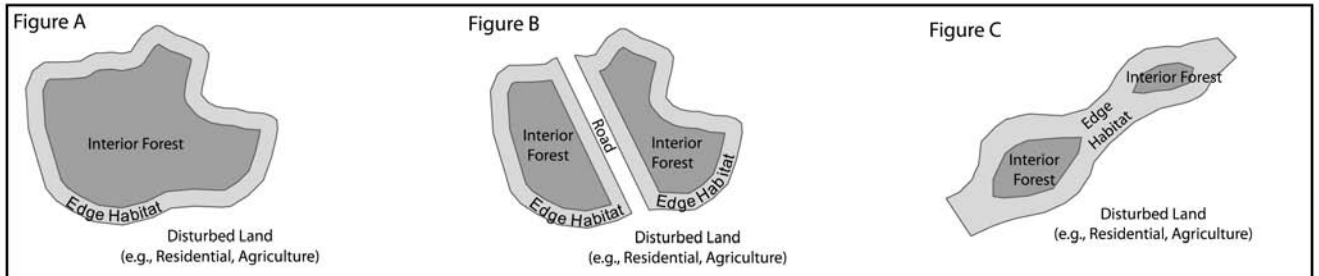


Figure A illustrates a patch of intact interior forest with edge habitat around the perimeter. Some of the effects found in the edge habitat include increased wind, light and predation.
Figure B illustrates a patch of interior forest intersected by a roadway resulting in an increase of edge habitat.
Figure C illustrates how a greenway corridor may consist primarily of edge habitat but may connect smaller patches of interior forest enabling wildlife movement.

Edge Habitat Scenarios

Multi-Use Greenways

Multi-use greenways accommodate a multitude of recreational activities and provide cultural and/or conservation opportunities. Multi-use greenways are multipurpose since they serve both human and wildlife interests. These greenways are not only valued for their recreational, conservation and cultural functions, but for their ability to connect people to the many features that make a community unique providing a much needed and desired sense of place in a rapidly developing region.

Scenic Greenways

Scenic greenways enhance the quality of life by providing scenery for residents and visitors to enjoy. Greenways provide connections linking origins to destinations, and scenic greenways provide visual connections across the landscape so people can enjoy the natural environment around them. The Lehigh Valley is framed by the Kittatinny Ridge, locally known as the Blue Mountain, and the South Mountain, a ridge of the Pennsylvania Highlands region. These geographic assets are local examples of scenic greenways that span the width of both counties, and they provide a beautiful backdrop to almost any view in the Lehigh Valley.

The Lehigh Valley also has an abundance of scenic resources that form and reinforce the Valley's identity. They include scenic waterways, roads, views, features and areas. Scenic resources differ from scenic greenways in that they are scenic from specific vantage points and do not provide the long range connectivity that defines a greenway.

Another corridor concept in the scenic greenway category is a scenic byway. Scenic byways, also known as scenic drives, are either roadways that have cultural or historical significance where the view provides a glimpse of this heritage or roadways where the surrounding landscape is natural and pastoral,

and the area is relatively protected from visual clutter. The Pennsylvania Department of Transportation has initiated the Pennsylvania Scenic Byways program, which designates "independent routes that have scenic, historic, cultural, archeological, natural or recreational features that are considered representative, unique, irreplaceable or distinctly characteristic of an area." The 14th Pennsylvania Scenic Byway located in Lower Mount Bethel Township, Northampton County, includes Route 611, the Martins Creek-Belvidere Highway and Little Creek Road. Tourist stops along the roads include the Delaware River, the Hunter Martin Settlement Museum, Martins Creek Ferry, Hunters Ferry and outdoor recreational opportunities, such as boating, biking, hunting, fishing, walking and many acres of preserved farmland.

Greenway Components

Pennsylvania's greenways network will ultimately take the form of "hubs and spokes." The "hubs" of this network will include national, state, or local parks, forests and gamelands, lakes and headwaters, and historical, cultural and other significant destinations, including our communities. The "spokes" will be corridors connecting these destinations to our communities, including greenways of statewide significance, as well as local and regional networks.

The Lehigh Valley greenways network has taken a similar shape and will include hubs: large centers of activity focused around recreational, cultural and/or historical destinations, including densely populated communities; nodes: natural, recreational, cultural and/or historical places of interest, origin or destination; and corridors: greenways connecting natural areas, recreation facilities, cultural and historic sites, and other significant destinations with the places where we live and to one another.

Hubs

Hubs are large centers of activity, including parks, forests, game lands, conservation areas, lakes, cities and boroughs. These areas feature a large agglomeration of resources and facilities that serve to anchor the greenways network and provide an origin or destination for humans and wildlife. The hubs of the Lehigh Valley greenways network naturally developed around the cities and in areas where a concentration of community, natural, historical and scenic elements are found.

The three major cities (Allentown, Bethlehem and Easton) found in the Lehigh Valley are mixed-use and multifunction hubs which developed along auto accessible corridors. Key issues involving cities include redevelopment, urban infill, pedestrian oriented activity and economic development. These traditional downtowns offer recreational, cultural, historical, residential and retail opportunities for locals and visitors alike. Other hubs include activity centers which entail a variety of resources that create an attraction for people and a destination for wildlife. These areas of regional importance affect the surrounding community and environment in positive ways. They not only provide a destination and habitat, they improve the overall quality of life by furnishing open spaces for scenic, recreation, and environmental preservation.

Nodes

The nodal concept is mainly a subset of hubs. Nodes also exist where there are natural, recreational, cultural and historical places of interest, origin or destination. They differ from hubs in that they are smaller destinations and typically contain only one facility in addition to the greenway it enhances.

Many nodes in the Lehigh Valley greenways network are parks or other outdoor recreation sites that fall in or near the greenway corridors. However, they can also be historic districts and structures or cultural places of interest, places that people want to go to add to their quality of life experience. Nodes can also represent wildlife destinations, or habitat areas that are currently protected or are recommended for future preservation. These nodes supply a much-needed resource for wildlife in a rapidly developing region such as the Lehigh Valley.

Corridors

Corridors are linear connecting elements that act as linkages between the hubs and nodes of the region. They connect cities and boroughs, residential areas, nodes, natural areas and other greenway corridors to one another. They also serve as buffers helping to define and separate communities and natural areas from adjacent noncompatible land uses. The Lehigh Valley's corridors relate directly to the high priority natural, recreational, cultural, historical and/or scenic resources which they follow or support and are divided into the following four categories (detailed above): cultural/recreational, conservation, multiuse and scenic.

Delaware and Lehigh National Heritage Corridor Towpath

The formation of a greenways vision is based on a thorough analysis of the current state of recreation and open space in a region and the existing pressures that threaten it. Lehigh and Northampton counties include 62 municipalities that include three cities, 27 boroughs and 32 townships and a population forecasted to reach over 750,000 persons by the year 2030. Much of this growth will occur in the suburbs surrounding Allentown, Bethlehem and Easton; however, there is considerable evidence that residential growth is consuming agricultural lands and open space at a rate greater than four square miles per year. It is projected that the Lehigh Valley will be approximately 55% urban by 2030; sprawl is a growing concern, and the natural resources of the Lehigh Valley are at risk.

Lehigh Valley residents have been outspoken in their desire to maintain and improve their quality of life created by the pastoral scenery, cultural bounty and recreational resources available to them. Forming the *Lehigh Valley Greenways Plan* vision involved intensive community input through opinion surveys, several stakeholder meetings, and collaboration within the land conservation community. Also, the effort involved extensive Geographic Information Systems analysis and mapping and coordination with the statewide greenways planning effort.

Statewide Greenways Vision

Under Executive Order 1998-3, the Governor of Pennsylvania called for a network of greenways across the state to preserve environmental values and protect the natural, cultural, historical and scenic assets. Recognizing that the development of a network of greenways requires the formulation of partnerships which include government agencies, nonprofit organizations, business interests and property owners, the order called for the organization of the Pennsylvania Greenways Partnership Commission (Partnership). Created in 1998, the Partnership supports the Secretary of the Pennsylvania Department of Conservation and Natural Resources (DCNR) in the promotion of greenways throughout Pennsylvania. The DCNR has prepared an action plan that includes recommendations designed to provide a coordinated and strategic approach to the development of greenways in the Commonwealth. *Pennsylvania Greenways: An Action Plan for Creating Connections* (Action Plan) defined the following statewide vision for Pennsylvania greenways:

Pennsylvania Greenways Partnership Commission

Pennsylvania Environmental Council
Pennsylvania Organization for Watersheds and Rivers
Pennsylvania Rails-to-Trails Conservancy
Pennsylvania Recreation and Parks Society
Pennsylvania Planning Association
Pennsylvania Chamber of Business and Industry
Pennsylvania Land Trust Association
Pennsylvania Heritage Parks Association
Pennsylvania Recreational Trails Advisory Board

> *"Pennsylvania and its many partners will develop an outstanding network of greenways across the Commonwealth, creating an asset highly valued by Pennsylvanians and enhancing the quality of life for all. This network of greenways will connect Pennsylvania's open space, natural landscape features, scenic, cultural, historic and recreational sites, and urban and rural communities. Greenways will become one of the Commonwealth's most powerful tools to achieve sustainable growth and livable communities."*

The DCNR has identified 34 major greenways (i.e. greenways that are greater than fifty miles in length, pass through two or more counties, and are recognized in an official planning document) in Pennsylvania. Five are found in the Lehigh Valley:

1. Appalachian National Scenic Trail/Kittatinny Ridge
2. Delaware & Lehigh (D&L) Trail
3. Delaware River Water Trail
4. Lehigh River Water Trail
5. Pennsylvania Highlands

The DCNR commitment to establish a greenways network that includes greenways of statewide significance as well as local and regional networks honors the tradition set by William Penn in the 1600s to foster a rich cultural heritage, improve the quality of life, and create connections between nature and community. The Action Plan states that "Greenways can provide a strategic approach for our municipalities and regions to plan for 'smarter' growth, enhance community character, provide for alternative transportation and provide educational opportunities in conservation, ecology and history." Calling for a greenways demonstration project to be selected and underway in each county of the Commonwealth by 2007, the DCNR's Bureau of Recreation and Conservation has committed to a sustained investment of time and money to enable careful coordination among state agencies and local partners.

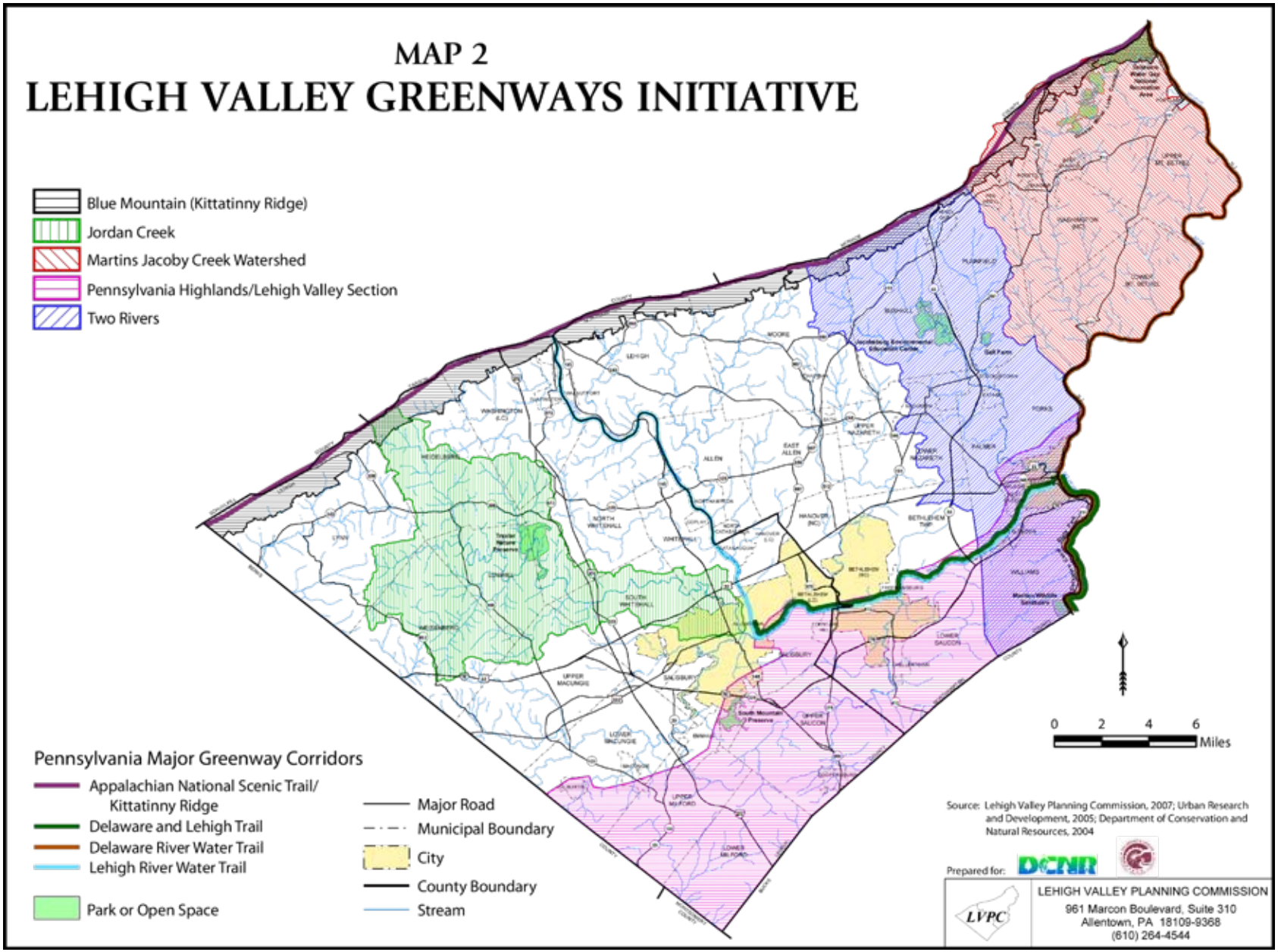
Lehigh Valley Greenways Partnership

Bushkill Stream Conservancy
Bushkill, Plainfield and Williams townships
Cities of Allentown, Bethlehem and Easton
Delaware and Lehigh National Heritage Corridor
Heritage Conservancy
Jacobsburg Environmental Education Center
Jacobsburg Historical Society
Lehigh County
Lehigh Valley businesses
Lehigh Valley colleges/universities
Lehigh Valley Convention and Visitors Bureau
Lehigh Valley Planning Commission
Martins-Jacoby Watershed Association
Natural Lands Trust
Northampton County Conservation District
Northampton County Department of Parks and Recreation
PA Department of Conservation and Natural Resources
PA Department of Environmental Protection
PA Fish and Boat Commission
Wildlands Conservancy

Regional Greenways Vision

In 1985, Jacobsburg State Park, Bushkill Township, Northampton County, was dedicated as one of four Pennsylvania Environmental Education Centers. The Jacobsburg Environmental Education Center's (EEC) mission is to "develop a citizenry that is aware of and concerned about the environment and its problems, and also has the knowledge, attitude, motivation, commitment and skills to work individually and collectively toward solutions of current problems and the prevention of new ones." In addition to its many recreational opportunities, the EEC is able to reach a variety of Lehigh Valley's citizenry through field learning experiences, workshops and ecological research. DCNR views the EEC as a model for demonstrating how the DCNR can holistically and strategically assist a region with its conservation and recreational needs.

This strategic approach to applying DCNR time and money has morphed into a full-fledged initiative in Lehigh and Northampton counties. The Lehigh Valley Greenways (LVG) 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." The LVG partnership strives to accelerate regional conservation work among the conservancies, land trusts and community organizations, working closely with DCNR staff and other state agencies, local municipalities, and the Lehigh Valley Planning Commission (LVPC) to advance their collective mission. LVG originated from the Bushkill Creek/Two Rivers Area of Northampton County where DCNR's Jacobsburg EEC is a major ecological and


MAP 2
LEHIGH VALLEY GREENWAYS INITIATIVE
Blue Mountain (Kittatinny Ridge)
Jordan Creek
Martins Jacoby Creek Watershed
Pennsylvania Highlands/Lehigh Valley Section
Two Rivers
Pennsylvania Major Greenway Corridors
Appalachian National Scenic Trail/ Kittatinny Ridge
Delaware and Lehigh Trail
Delaware River Water Trail
Lehigh River Water Trail
Park or Open Space
Major Road
Municipal Boundary
City
County Boundary
Stream
0 2 4 6 Miles
Source: Lehigh Valley Planning Commission, 2007; Urban Research and Development, 2005; Department of Conservation and Natural Resources, 2004
Prepared for:
LVPC
LEHIGH VALLEY PLANNING COMMISSION
961 Marcon Boulevard, Suite 310
Allentown, PA 18109-9368
(610) 264-4544

recreational hub, serving as a focal point for public outreach and education efforts related to the LVG initiative. It has since become a two-county initiative that includes five focus areas (Map 2):

1. Blue Mountain (Kittatinny Ridge)
2. Jordan Creek
3. Martins Jacoby Creek Watershed
4. Pennsylvania Highlands/Lehigh Valley Section
5. Two Rivers Area (Bushkill Creek Watershed)

The DCNR designated Delaware and Lehigh National Heritage Corridor and State Heritage Park as the lead coordinating agency for their regional collaboration, leadership and capacity building abilities. Their staff will help local partners with project development, secure project funding, and provide overall leadership and coordination of local activities, education and outreach. Additionally, DCNR, geologists, biologists, engineers and marketing specialists will be tapped to assist the planning team and the communities in their respective roles.

Lehigh Valley Greenways Plan Vision

The LVPC has worked closely with DCNR and the LVG in the early phases of the *Lehigh Valley Greenways Plan*, considering the overall intent of the LVG is to establish greenways and recreation areas through the implementation of local greenways and watershed plans. Since early implementation occurs simultaneously with the planning process, the mission and identification of focus areas for the LVG initiative reflects many of the LVPC priorities and goals in this plan. Nonetheless, the LVPC method included public opinion surveys, a municipal survey, and a study advisory committee including many community groups not represented by the LVG.

The LVPC recognizes the importance of public support in the future success and implementation of the *Lehigh Valley Greenways Plan*. Accordingly, the LVPC has conducted many public opinion surveys, workshops and studies over the years to gauge interest in and to discover the issues facing the parks, recreational and open space resources in the Lehigh Valley. The input and opinions of the Lehigh Valley municipalities and residents are reflected in the goals and recommendations provided throughout this plan. The *Lehigh Valley Greenways Plan* will be Lehigh and Northampton counties' first regional plan to examine the physical framework of natural, recreational, cultural, historical and scenic resources that make up a multiform network of corridors and destinations to benefit a myriad of users. Our goal is to connect these resources with existing and planned pathways that are protected and carefully managed to form a continuous green route throughout both counties.

Public Opinion Surveys

The LVPC has learned that one of the best ways to gauge public opinion on a variety of planning issues is to conduct a survey of a sizable number of Lehigh Valley residents. The process involves a mail-out/mail-back survey to 3,500 to 4,000 registered voters in Lehigh and Northampton counties. This method was used successfully in 1974, 1988 and 1999 prior to updates to the *Comprehensive Plan The Lehigh Valley … 2030* (Comprehensive Plan). The most recent, 1999 Public Opinion Land Use Survey, was mailed to 4,000 registered voters, representing 1.25% of all registered voters in the Lehigh Valley. Approximately 27% of the surveys were returned for processing. The survey contained two types of questions: socioeconomic/demographic and attitudinal. The responses

to all questions were tabulated to determine the number and percentage of the respondents answering each question. A summary of the major findings pertinent to greenways planning follows:

- The three most important planning issues are the preservation of farmland, the preservation of environmentally sensitive areas, and the renewal of cities.
- The three most significant consequences of growth are felt to be: increasing traffic congestion, loss of open space, and overcrowding schools.
- Almost 47% of the survey respondents believe the quality of life in the Lehigh Valley has gotten worse during the past ten years.
- Over 90% of registered voters mandate the preservation of farmland.
- About 70% of the survey respondents believe more parks, recreation facilities and open space are needed.
- The most needed park and recreation facilities are felt to be large regional parks, trails for hiking and biking, and nature reserves.
- To preserve the natural environment, priority should be given first to protecting rivers, creeks, streams and lakes.
- What people like most about the Lehigh Valley is its proximity to New York City, Philadelphia, and shore points; its convenience to many things; and its farmland, open spaces and rural areas.

Municipal Survey

In March 2005, the Lehigh Valley Planning Commission surveyed the 62 municipalities in Lehigh and Northampton counties for their input on existing and potential greenways within their municipality. A map of the municipality was provided for their use to indicate the location of the greenways; thirty municipalities (fifteen townships, twelve boroughs, and the three cities) responded to the questionnaire. Many of the responding municipalities referred to existing park, recreation and open space plans for the identification of greenways. Additional information received regarding the location of existing and potential greenways is represented by the following categories:

- Connections between existing parks and residential areas
- Connections to existing bike paths and walking trails
- D & L Trail
- Inactive rail lines
- Lehigh Canal
- Ridges (e.g., Blue Mountain, Shochary Ridge)
- Rivers, streams and floodplains
- Scenic Byways

Study Advisory Committee

The LVPC formed a study advisory committee (Committee) comprised of volunteers from across the two counties, including various government agencies, private nonprofit conservation organizations, watershed associations, and other stakeholder groups. The role of the Committee was to provide insight and input into the planning process, to comment on information and mapping developed by the LVPC staff, to act as a resource for localized activities pertaining to open space and greenway planning, and to suggest alternatives and make recommendations to the *Lehigh Valley Greenways Plan*.

Study Advisory Committee

Allentown Hiking Club
Bushkill Stream Conservancy
City of Allentown
City of Bethlehem
City of Easton
Delaware and Lehigh National Heritage Corridor
Heritage Conservancy
Hokendauqua Chapter of Trout Unlimited
Illicks Mill Partnership for Environmental Education
Jacobsburg Environmental Education Center
Lehigh County Administration
Lehigh Gap Nature Center
Lehigh Township, Northampton County
Lehigh Valley Convention and Visitors Bureau
Lehigh Valley Planning Commission
Lehigh Wheelmen Association
Little Lehigh Watershed Coalition
Lower Saucon Township, Northampton County
Lynn Township, Lehigh County
Martins/Jacoby Watershed Association
Monocacy Creek Watershed Association
Northampton County Conservation District
Northampton County Department of Public Works
Northampton County Federation of Sportsmen
PA Department of Conservation and Natural Resources
Palmer Township, Northampton County
Plainfield Township, Northampton County
Salisbury Township, Lehigh County
Wildlands Conservancy
Williams Township, Northampton County

Beginning in April 2005, four meetings were held at the LVPC office to review the project and gather comments. To initiate the Committee in the Lehigh Valley greenways planning process, they were provided with a copy of the Natural Resources Plan from the Comprehensive Plan and documentation from other regional activities involving greenways, including the DCNR Lehigh Valley Greenways initiative, Highlands Coalition and Kittatinny Ridge Conservation Project.

The LVPC report entitled *Comprehensive Plan The Lehigh Valley … 2030* (Comprehensive Plan) is the foundation document that establishes a framework for this greenway plan. The report contains a thorough inventory of the natural, recreational, cultural, historical and scenic attributes of the Lehigh Valley and it maps natural resources within the Valley that should be protected and preserved in the future. Moreover, the Comprehensive Plan shows how natural resources and recreational resources in the region relate to patterns of urban and rural development. This plan was officially adopted by Lehigh and Northampton counties in June 2005.

The *Lehigh Valley Greenways Plan* stems from the inventory and analysis of the Comprehensive Plan identifying the resources that serve as the framework for the regional greenways network and provides recommendations on how to take full advantage of the opportunities they present. The location of the linear greenways and the associated destinations were, in many instances, determined by the location of existing natural, recreational, cultural and historical elements of value.

Jordan Creek Parkway — Whitehall Township

A brief analysis of the demographic and socioeconomic characteristics of the region provides an overview of the people being served by the greenway network and their land development preferences and needs. Growth trends and forecasts are useful in developing recommendations for resolving issues and capitalizing on opportunities created by existing greenway resources. Over the years, the LVPC has supported economic and community development initiatives that aim to diversify and strengthen the economy, protect resources and the environment, develop and improve infrastructure, and enhance the quality of life.

Demography

The Lehigh Valley is a 725 square mile area which includes Lehigh and Northampton counties. It is located in eastern Pennsylvania, 80 miles west of New York City and 50 miles north of Philadelphia. The two counties form the core of a metropolitan area defined by the United States Bureau of the Census as the Allentown-Bethlehem-Easton Metropolitan Statistical Area.

In the 30 year period between 1970 and 2000, the region's population grew by 23%. During the period between 2000 and 2005, this growth rate began to accelerate. According to the Census, the region added 39,000 people in five years, a growth rate of nearly 7% for the first half of the decade, compared with a 7.6% rate of growth from 1990 to 2000. Much of this growth is due to migration from New Jersey where land is more expensive, taxes are higher, and the land regulatory system is tougher. In the Lehigh Valley, accelerated growth has produced a robust housing market, increased subdivision of land, escalation of housing and land prices, and increasing pressures on natural resources in the region. In decades prior to the 1990s, land was converted at a rate of 3.0 square miles per year. This increased to 3.5 square miles per year during the 1990s and 4.0 square miles per year after 2000. Clearly, this is a time when the two counties, the state and local municipalities need to craft and implement programs for the preservation of farmland and natural resources.

It is not likely that population pressure from New Jersey and the Philadelphia region will stop in future decades.

The LVPC periodically creates projections of future populations for the Lehigh Valley for use in the Comprehensive Plan. Population projections are calculated to identify growth issues associated with land use, resource protection and infrastructure planning. These projections provide the necessary data to forecast future transportation, sewer, water and park/open space needs for the region. The LVPC has created population forecasts using a demographic model to project growth trends through 2030. The model accounts for future migration, births and deaths at the county level, local development data, land resources information, and existing infrastructure. The LVPC's most recent population forecast update shows that the Lehigh Valley could grow to over 750,000 persons by 2030. If current trends continue, much of this growth will be in the suburbs surrounding the cities of Allentown, Bethlehem and Easton. Development pressures will be particularly high in eastern Northampton County because of its proximity to New Jersey. The preservation of a quality of life worth experiencing is dependant on community planning and concerted conservation efforts in response to increasing population growth pressures.

POPULATION FORECASTS

Area	2000 Census	2010 Forecast	2020 Forecast	2030 Forecast	Change 2000-2010		Change 2000-2030	
					No.	%	No.	%
Lehigh Valley	579,156	644,348	704,026	767,856	65,192	11.3	188,694	32.6
Lehigh County	312,090	342,932	370,644	399,721	30,842	10.0	87,631	28.1
Northampton County	267,066	301,416	333,382	368,135	34,350	12.9	101,069	37.8

Source: *U.S. Census Bureau, Lehigh Valley Planning Commission*

Careful consideration of the region's population characteristics provides a snapshot of expected and potential users of the regional greenway network. User groups and associated preferred activities are defined by the age distribution and economic health of a region. The median age of the Lehigh Valley population, as it is with Pennsylvania and the nation, has been increasing for decades. Between 1970 and 2000, the median age for residents of the Lehigh Valley went from 33.0 years to 38.4 years and by 2000, a little over one-half of the population were adults age 25 through 64. Between 2000 and 2030 there will be important changes in the population of age groups. The age distribution will be changing dramatically over the projection period as the baby boomers move from the midyears of the population to the older years. Dramatic growth in the populace over age 65 is projected and modest growth in those under 30. As businesses and institutions in the Valley begin to prepare for this change in demographics, so should development related to recreation and the community experience.

Economy, Transportation and Housing

The Lehigh Valley was settled in the early 1700s by German and Scotch-Irish farmers who established farmsteads and small villages in the southern part of Lehigh and Northampton counties. Over time, the region benefited from an increasingly prosperous agricultural economy. Road and bridge improvements around the turn of the century facilitated trade and travel over stagecoach routes, and farmers prospered while villages increased in number.

In the early 1800s, the industrial revolution in the Lehigh Valley was characterized by the mining of anthracite coal, slate, iron and zinc ore, and the building of canals and railroads. The transportation potential of the canals created a greatly expanded trade area for the products of the agricultural economy of the Lehigh Valley. The Lehigh Canal was a major force in land use changes and the creation of new commercial settlements. The growth of mining, particularly anthracite, led to the growth of railroads in the region. The railroads were an improvement in transportation over the canals in that they were less affected by weather and terrain and less restricted in routing. With the growth of the railroads, the industries of the region increased the value of their products and employment increased significantly.

No company has affected physical growth in the region as profoundly as Bethlehem Steel Corporation. By the late 1800s, success in the iron and steel industry required tremendous capital, worldwide markets, research, sophisticated marketing, and control of production from mining to consumer. Bethlehem Steel was the only company in the region to meet these requirements and survive. By 1930, Bethlehem Steel was the second largest producer of steel in the United States. Bethlehem Steel's primary impact on physical growth has been in the Bethlehem area. The presence of Bethlehem Steel, however, has also encouraged companies fabricating iron and steel products to locate in the region. By 1920, metal and metal products were well established as the principal industry of the Lehigh Valley.

During the twentieth century, the growth of industry and changes in lifestyle greatly increased the demand for retail and wholesale trade and services. New products and marketing techniques enhanced the appeal of electrical appliances, automobiles, gasoline and home heating furnaces. Around the turn of the century, department stores began to appear in downtown areas. In the 1920s, chain stores began replacing the neighborhood variety and grocery stores. Consequently the Valley experienced the rise of the shopping center and suburban discount store following residential growth in suburban areas.

The building of U.S. Route 22 created great opportunity for development of the suburban perimeter north of the Valley's urban core. The highway improved travel between the cities and brought a wider labor pool accessible to local employers. U.S. Route 22 was a direct link to New Jersey and New York City. With the completion of PA Routes 309 and 33 (both connecting to U.S. Route 22), interregional transportation was improved to the markets of suburban Philadelphia. The continuing dispersal of the regional population to suburban and rural areas and the reliance upon automobiles have resulted in the decline in use of mass transit and the discontinuation of passenger rail service connecting the region to New York and Philadelphia. Beginning in the late 1960s, there has been a long period of rapid suburban industrial construction. The establishment of suburban industrial parks drew companies away from their urban locations, and these areas continued to decline.

The national recession of 1980 lingered in its effects on the Lehigh Valley through mid-decade. People began to realize that a new, diverse regional economy must be built to shelter citizens from the high unemployment caused by cycles in demand for durable products such as steel and transportation equipment. In the early 1980s, numerous economic development organizations were created, including the Northampton County Development Corporation, the three cities' economic development corporations, the Ben Franklin Partnership, the Lehigh Valley Partnership, and the Lehigh Valley Convention and Visitor's Bureau. Their roles differ, but they share the goal of a healthy future Lehigh Valley economy. In the late 1990s, the Lehigh Valley Economic Development Corporation (LVEDC) was created to promote economic growth activities regionally. LVEDC has a vigorous marketing program that promotes Lehigh Valley interests nationally and internationally. LVEDC has also become the prime point of contact for the retention and attraction of business in the Lehigh Valley.

A strong economy has created redevelopment interest in the Lehigh Valley's three third class cities, Allentown, Bethlehem and Easton. All three have faced the challenges of disinvestment in cities seen throughout the nation. In recent years, however, all three have also seen renewed interest and substantial redevelopment projects proposed or underway. The City of Allentown is presently recognizing nearly $375 million in new residential and commercial development, including three major hospital expansions and a new AAA Minor League Baseball franchise. The City of Bethlehem has the largest brownfield in the nation, the 1,600 acre former Bethlehem Steel site. The redevelopment of the site into a casino complex with a 200,000-square-foot mall of shops and restaurants is the lynchpin of the City's economic rebirth. The City of Easton plans to eliminate blight through the remediation of environmental problems along the Bushkill Creek corridor, including the adaptive reuse of abandoned buildings and brownfields, the preservation of open space, and the linkage of recreation areas along existing and proposed trail corridors along the Bushkill Creek.

Natural Resources

The natural world that surrounds us is made up of rivers and streams, wetlands, floodplains, mountains and woodlands. The Natural Resources Plan of the *Comprehensive Plan The Lehigh Valley … 2030* identifies and evaluates the important natural resources in the Lehigh Valley and what should be done to preserve them. This information is based on careful studies conducted by the Lehigh Valley Planning Commission (LVPC), Pennsylvania Science Office of The Nature Conservancy (TNC), Pennsylvania Department of Environmental Protection (DEP) and others. The important resources identified include DEP designated special protection waters, over 40,000 acres of interior woodlands and 79 sites designated by TNC as important natural areas of statewide significance. Interconnected natural resources provide numerous benefits. They provide habitat and maintain biodiversity; protect and enhance water quality; provide aesthetically pleasing areas to experience; filter pollutants from water, soil and air; recharge groundwater aquifers; provide recreation opportunities; and buffer developed areas from flooding ultimately saving lives, money and property.

Topography

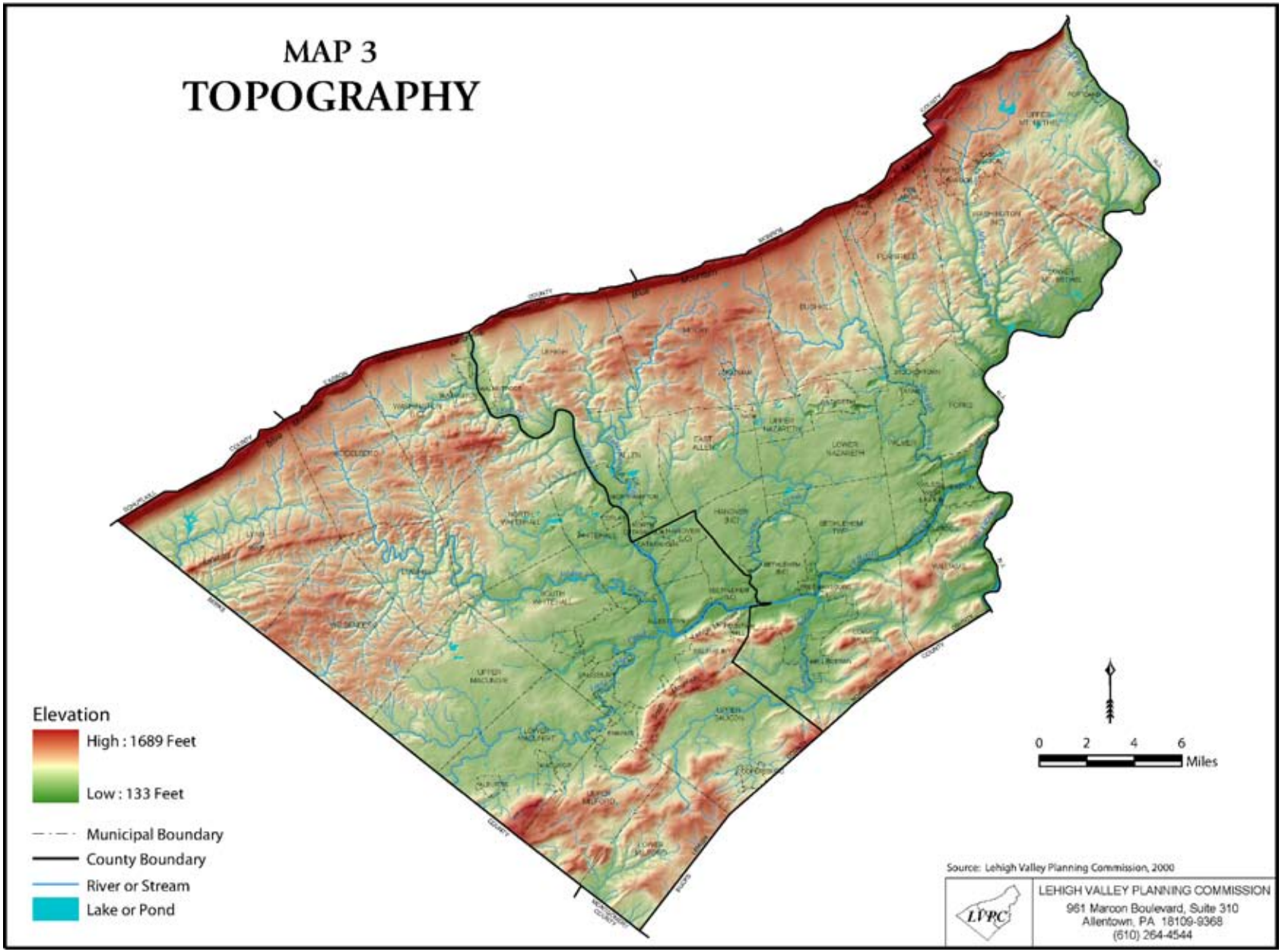
The predominant geographic features of the Lehigh Valley include the Kittatinny Ridge, referred to locally as the Blue Mountain, at an elevation of 1,700 feet separating Lehigh and Northampton counties from Monroe and Carbon counties to the north and the South Mountain at an elevation of 1,000 feet which forms a scenic mountainous backdrop for the cities of Allentown, Bethlehem and Easton and separates the cities from the suburban areas to the south. Providing a boundary to the east, the Delaware River flows between New Jersey and Pennsylvania, and to the west low, rolling hills rise to form a divide between lands drained by the Lehigh and Schuylkill rivers. The Lehigh River runs south from the Blue Mountain to Allentown and then east to

the Delaware River at the City of Easton. Between the ridges and rivers is a seven mile wide limestone valley where most people in the Lehigh Valley live and work. The topography ranges from 1,700 feet above sea level along the northern ridge to 200 feet above sea level in the river valleys and creates a landscape with many natural landmarks and scenic beauty (Map 3).

Blue Mountain — Heidelberg Township

Geology

Pennsylvania is a state rich with exceptional geologic features and heritage. The DCNR's Pennsylvania Geological Survey is striving to promote the awareness, appreciation and conservation of such outstanding geologic features by documenting their presence. The geologic mapping service has mapped six physiographic provinces throughout Pennsylvania. Each province is made up of sections characterized by terrain, subsurface rock type, soil and history. The Lehigh Valley contains three physiographic provinces: the Ridge and Valley, New England and Piedmont.


MAP 3
TOPOGRAPHY
Elevation
High : 1689 Feet
Low : 133 Feet
Municipal Boundary
County Boundary
River or Stream
Lake or Pond
0 2 4 6
Miles
Source: Lehigh Valley Planning Commission, 2000
LVPC
LEHIGH VALLEY PLANNING COMMISSION
961 Maroon Boulevard, Suite 310
Allentown, PA 18109-9368
(610) 264-4544

Characterized by forested, flat topped ridges and fertile valleys, the Ridge and Valley Province contains seven sections, two of which, the Blue Mountain and Great Valley sections, can be found in Lehigh and Northampton counties. The Kittatinny Ridge, otherwise known locally as the Blue Mountain, forms the easternmost edge of the Appalachian Mountain chain and the Ridge and Valley physiographic province. Extending southwest from New York to the Maryland border, the Kittatinny spans 11 counties in Pennsylvania and forms the northern boundary of Lehigh and Northampton counties. To the south of the Blue Mountain is the Great Valley, a very broad lowland area characterized by carbonate geology and well-drained fertile soils. The flat, undulating terrain of the central portion of the Lehigh Valley is used intensively for agriculture, and most of the areas where urban development has taken place are underlain by limestone.

The New England Province has one section, the Reading Prong, and consists of isolated hills and ridges divided by stream valleys. The Lehigh Mountain and South Mountain, two landmark ridges on the southern border of the City of Allentown, are part of the Reading Prong that runs the width of both counties south of the Lehigh River. They are parts of a larger region of mountains called the Highlands which extend from eastern Pennsylvania through New Jersey and New York to northwestern Connecticut, forming a vital linkage between the Berkshires and the Blue Ridge Mountains.

Also located in the Pennsylvania section of the Highlands is the Piedmont Province/Gettysburg-Newark Lowland Section. Beginning along the southernmost boundary of Lehigh County and continuing through most of Montgomery and Bucks counties to the south, the Gettysburg-Newark Lowland Section is characterized by rolling low hills and valleys and isolated ridge tops. The fascinating geology of Pennsylvania and the unique features it affords the Lehigh Valley contribute to greenway development. The conservation and scenic resource value of exceptional geologic features provide destinations for recreational and sight seeing opportunities as well as the necessary protection for sensitive natural resources.

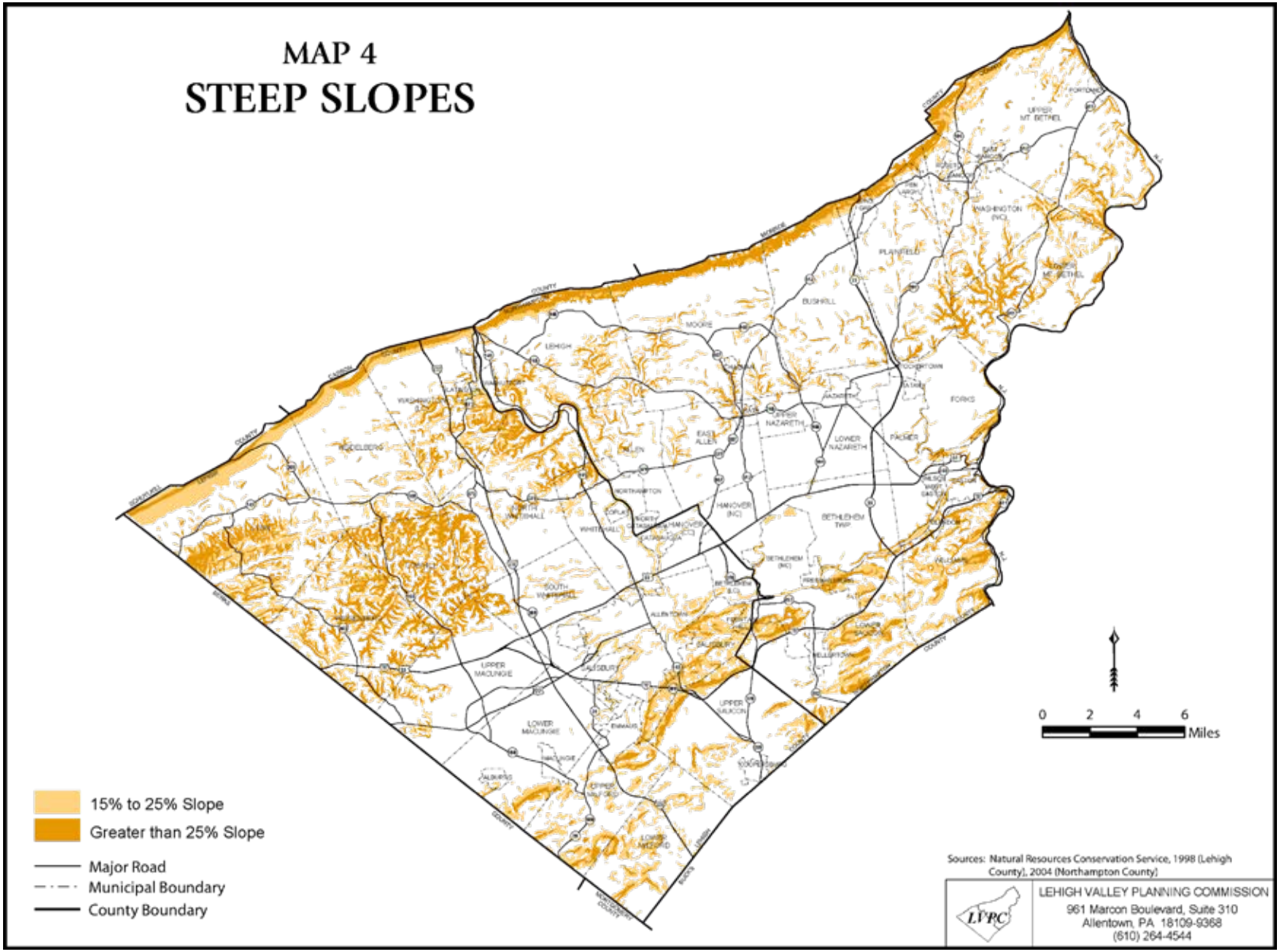
Steep Slopes

Slopes with grades of 15% to 25% are considered steep; slopes with grades greater than 25% are very steep. Steep slopes are vulnerable to damage resulting from site disruption, particularly related to soil erosion. Erosion of steep slopes can be a serious problem as all soils are subject to movement as the slope of the landscape increases. If disturbed, these areas can yield heavy sediment loads on streams and wetlands degrading water quality and disturbing aquatic habitat. Increased sedimentation also increases flood hazards by reducing the floodwater storage capacity of drainage ways.

The steepest slopes in the Lehigh Valley are found along the Blue Mountain and South Mountain (Map 4). There are sizable areas of steep slope along the hillsides of Weisenberg and Lowhill townships in Lehigh County and in townships beside the Lehigh and Delaware rivers. A notable characteristic of steep slope areas is that they are nearly all wooded; very few steep slopes are used for cropland or pastures due to their lack of suitability for agriculture. The LVPC does not recommend development of slopes greater then 25% and encourages the use of special erosion control measures on slopes of 15 to 25%. Controlling the erosion potential occurs in the education and regulation phases of implementation at the municipal level. The identification and protection of these areas protect communities from hazards related to steep slope disturbance, provides open space, and maintains biodiversity.

Woodlands

Woodlands are valued for many reasons. They provide recreational opportunities for nature study, hunting, hiking and horseback riding to name a few. Woodlands can be used for firewood harvesting, commercial timbering, and as land use buffers and boundaries between noncompatible land uses.


MAP 4
STEEP SLOPES
15% to 25% Slope
Greater than 25% Slope
Major Road
Municipal Boundary
County Boundary
0 2 4 6
Miles
Sources: Natural Resources Conservation Service, 1998 (Lehigh County), 2004 (Northampton County)
LVPC
LEHIGH VALLEY PLANNING COMMISSION
961 Marcon Boulevard, Suite 310
Allentown, PA 18109-9368
(610) 264-4544

Trexler Nature Preserve *Tom Gettings, Wildlands Conservancy*

Many species of birds and wildlife depend on large, unbroken wooded tracts for survival. Woodlands also mitigate environmental stressors by reducing stormwater runoff, filtering groundwater recharge, controlling erosion and sedimentation, moderating local microclimates, and purifying the air.

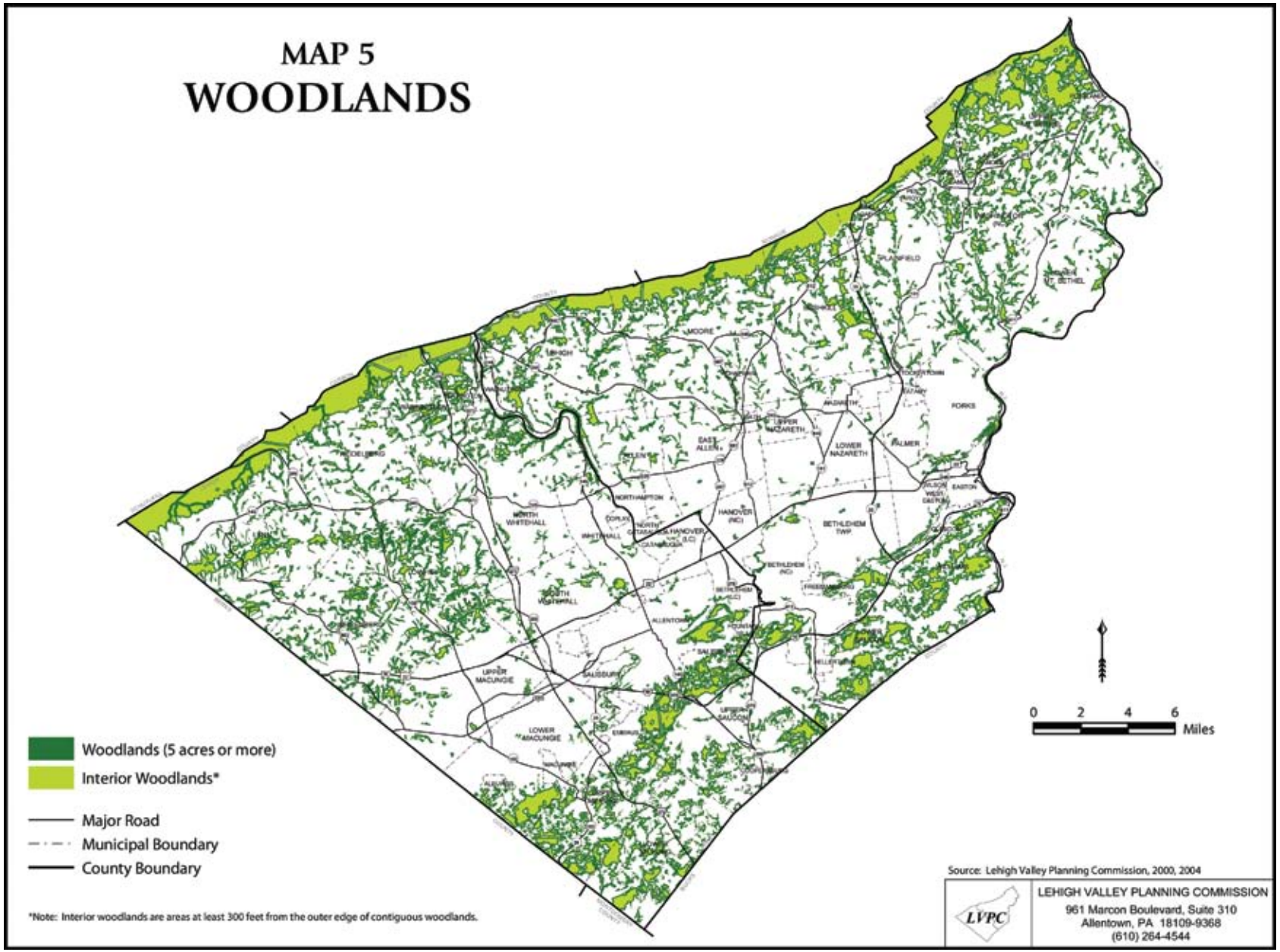
There are over 185 square miles of woodlands greater than five acres in size in Lehigh and Northampton counties. The largest concentrations are found along the mountain ranges and hillsides adjacent to major stream and river corridors (Map 5). Woodlands are commonly found on other environmentally sensitive areas such as steep slopes and floodplains, adding to their significance and need for protection. Communities can mitigate the loss of the region's woodland resources with land development and site design ordinances or policies.

Interior Woodlands

Interior woodlands are areas within forests that are not affected by the conditions that exist along the edges of the woodland. The conditions found in these edge transition zones between the woodlands and the adjacent areas are known as edge effect (see Edge Habitat Scenarios on page 9). The habitat characteristics — light, wind, moisture, predation rates, tree density and composition—found at the edges are quite different from the conditions found in the forest interior. Many wildlife species require the habitat characteristics provided in interior woodlands for survival, e.g., certain songbird species. The size of the forest interior is a factor in determining the number of species that exist, i.e., higher species biodiversity is found in larger tracts. The majority of interior woodlands in the Lehigh Valley are found on the Blue Mountain, along the many isolated ridgetops of the Highlands, on Shochary Ridge in Lynn Township, and the northern part of Upper Mount Bethel Township (Map 5). Many forested areas in the two counties have been fragmented, a trend across Pennsylvania and other historically forested states. Development is constantly encroaching along the edges of the woodlands, increasing the area where the edge effects dominate. On the other hand, some isolated wooded areas may become reconnected due to succession (the change of vegetation through time) occurring when farmland is abandoned. Striving to keep large tracts of interior woodlands intact will help to preserve native ecosystems across the landscape and provide habitat for many wildlife species.

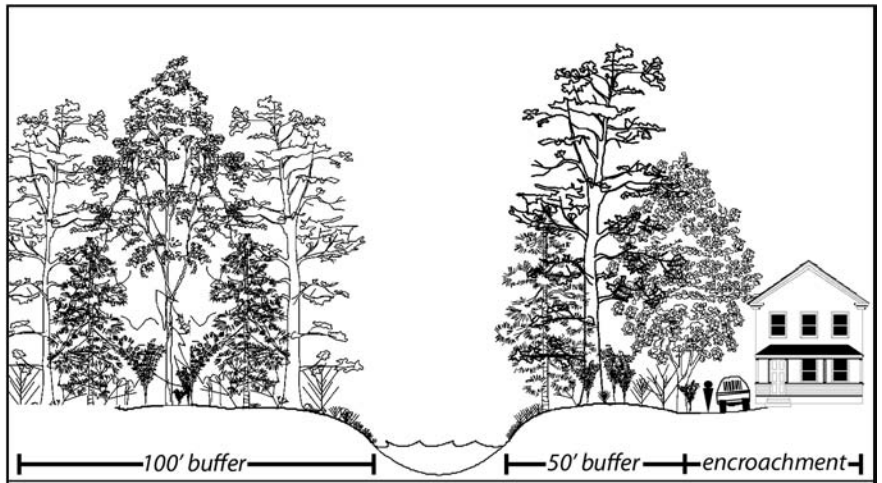
Riparian Woodlands

Riparian woodlands (a.k.a. riparian buffers) are recognized as a vital feature for protecting and reclaiming waterways. A riparian buffer is an area of natural vegetation that is maintained along the shore of a water body to protect water quality and stabilize channels and banks. The riparian vegetation affects the stream channel shape and structure, as well as the stream's canopy cover, shading, nutrient inputs, and amount of large woody debris entering the


MAP 5
WOODLANDS
Woodlands (5 acres or more)
Interior Woodlands*
Major Road
Municipal Boundary
County Boundary
*Note: Interior woodlands are areas at least 300 feet from the outer edge of contiguous woodlands.
0 2 4 6
Miles
Source: Lehigh Valley Planning Commission, 2000, 2004
LVPC
LEHIGH VALLEY PLANNING COMMISSION
961 Marcon Boulevard, Suite 310
Allentown, PA 18109-9368
(610) 264-4544

stream. The buffer serves to reduce the amount of runoff pollutants entering the stream by trapping sediment and reducing soil erosion. Both grassland and forested buffers are effective at trapping sediment, however forested buffers provide many additional benefits as well.

Riparian woodlands supply food for aquatic organisms in the form of leaf-litter and debris, maintain and cool water temperatures through shading, and provide habitat for many desirable species of amphibians, reptiles, mammals and birds. If wide enough, riparian buffers function as corridors for migrating large and small mammals. The LVPC recommends native vegetation buffers of 100 feet along rivers and major streams and 50 feet along all other water bodies. Riparian buffers also provide numerous benefits to landowners and the community by protecting groundwater recharge areas, providing flood control, providing stormwater management potential, and stimulating economic opportunities by creating valuable open space that may increase land values and the tax base.

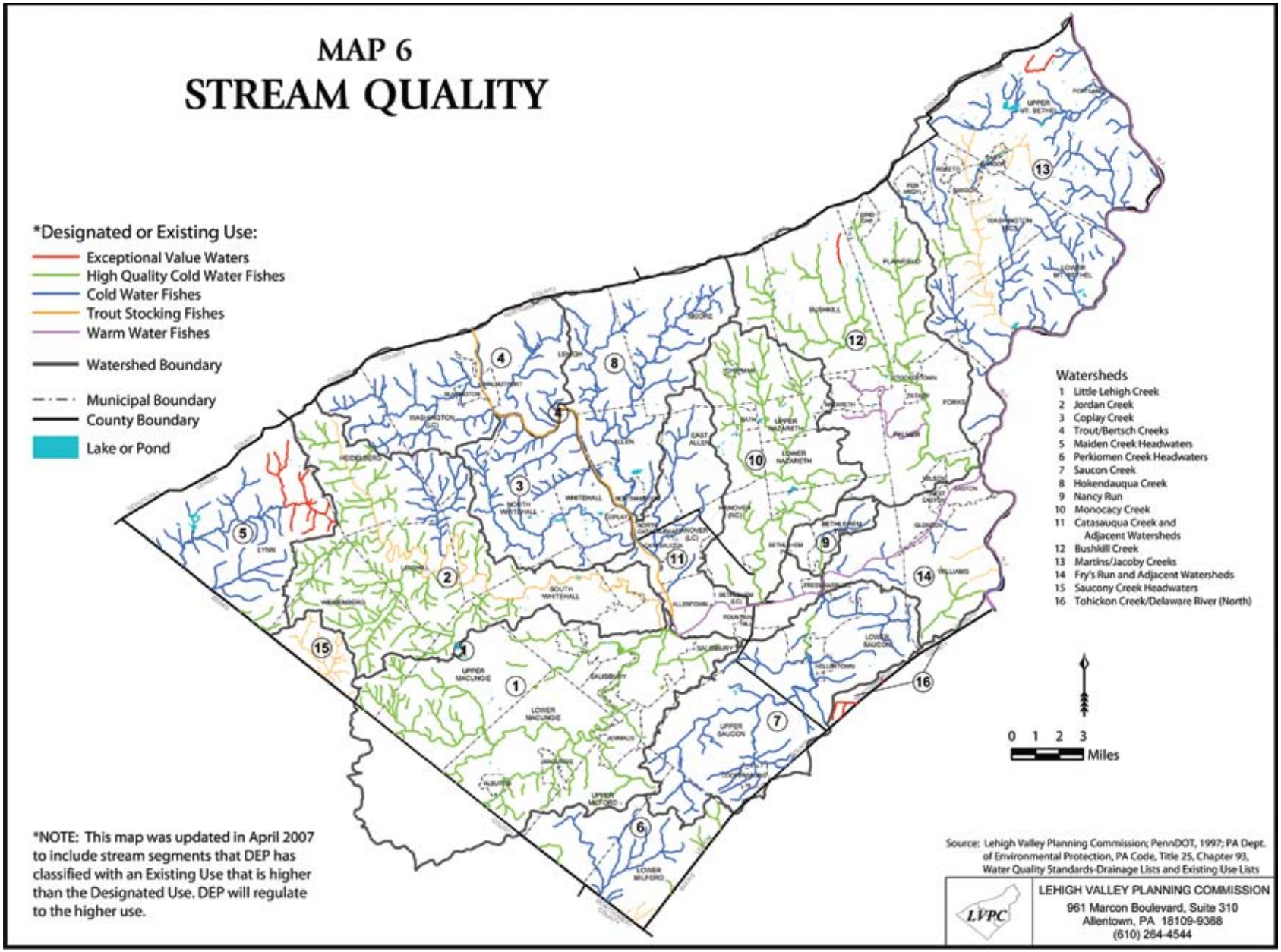


Recommended Riparian Buffer Widths

Riparian buffers in the Lehigh Valley have been seriously disrupted over the years. Farming operations often have been practiced with little regard to protecting streams. More recently, residential and other forms of urban development have put serious stress on local streams as structures creep closer and closer to stream edges. With proper planning and education this does not have to happen. The LVPC encourages the restoration of riparian buffers on lands that border rivers and streams whether they are privately owned or owned by local government. The LVPC also recommends the education of local officials and landowners on the importance of riparian buffer protection. The establishment of conservation greenways along waterbodies is a top priority of this plan and will provide natural resource and water quality protection, habitat connectivity, and floodplain management for years to come.

Hydrography

The rivers and streams of the Lehigh Valley have played a significant role in its history and development. The area's three cities and some of its major boroughs grew along the banks of the Lehigh or Delaware rivers as major industries began their existence along the Lehigh and Delaware Navigation Canals. Today, the industrial heritage of the region is reflected and interpreted by commemorative parks, historical remnants and museums. Many of the best walking and biking trails in the Lehigh Valley are located near rivers and streams and along canal towpaths. Municipal parks and parkways have also been developed adjacent to rivers, streams and canals. The most notable are the Little Lehigh Parkway in the City of Allentown, Jordan Creek Parkway in Whitehall and South Whitehall townships and Cedar Creek Parkway East and West in the City of Allentown and South Whitehall Township. Rivers and streams can also serve, or have the potential to serve, as linkages between recreation areas. The multitude of recreational activities associated with waterways is high on the list of important regional assets. The Lehigh and Delaware rivers are large enough to provide boating opportunities, including some fine canoeing and good fishing. Wildlands Conservancy's annual Lehigh River Sojourn is a week long paddling adventure down the Lehigh River


MAP 6
STREAM QUALITY
*Designated or Existing Use:
Exceptional Value Waters
High Quality Cold Water Fishes
Cold Water Fishes
Trout Stocking Fishes
Warm Water Fishes
Watershed Boundary
Municipal Boundary
County Boundary
Lake or Pond
Watersheds
1 Little Lehigh Creek
2 Jordan Creek
3 Coplay Creek
4 Trout/Bertsch Creeks
5 Maiden Creek Headwaters
6 Perkiomen Creek Headwaters
7 Saucon Creek
8 Hokendauqua Creek
9 Nancy Run
10 Monocacy Creek
11 Catasauqua Creek and Adjacent Watersheds
12 Bushkill Creek
13 Martins/Jacoby Creeks
14 Fry's Run and Adjacent Watersheds
15 Saucony Creek Headwaters
16 Tohickon Creek/Delaware River (North)
0 1 2 3
Miles
*NOTE: This map was updated in April 2007 to include stream segments that DEP has classified with an Existing Use that is higher than the Designated Use. DEP will regulate to the higher use.
Source: Lehigh Valley Planning Commission; PennDOT, 1997; PA Dept. of Environmental Protection, PA Code, Title 25, Chapter 93, Water Quality Standards-Drainage Lists and Existing Use Lists
LVPC
LEHIGH VALLEY PLANNING COMMISSION
961 Marcon Boulevard, Suite 310
Allentown, PA 18109-9388
(610) 264-4544

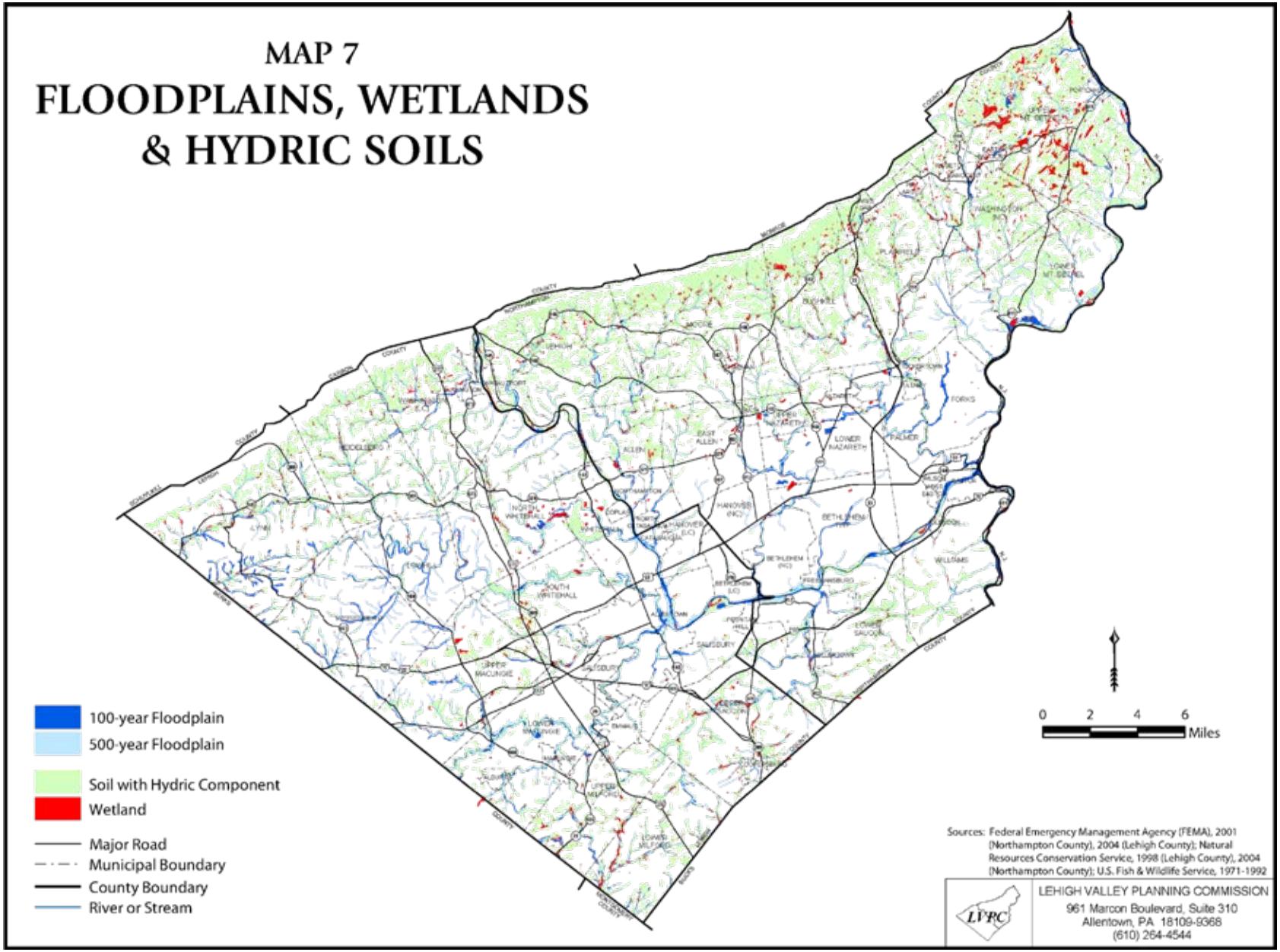
from Luzerne County to Sand Island in the City of Bethlehem. More than 300 people have participated in this recreational opportunity to learn about and experience the river.

Lehigh River Sojourn *Tom Gettings, Wildlands Conservancy*

In addition to their historical and recreational benefits, the waterways of the Lehigh Valley provide critical wildlife habitat areas. Many species of birds, aquatic animals and mammals depend on river and stream corridors for travel, cover and nesting places. The Delaware River and its adjacent forested watersheds comprise one of the major corridors for the movement of biota in eastern Pennsylvania. The Forks of the Delaware Shad Fishing Tournament and Festival, held in late April each year in the City of Easton, is a locally important event that depends on the yearly shad migration up the Delaware River. Additionally, some of the best trout habitat and fishing holes in eastern Pennsylvania can be found in Lehigh and Northampton counties along the Little Lehigh, Monocacy and Bushkill creeks. Consequently, high quality rivers and streams are of critical importance for the preservation of wildlife and the recreational opportunities they support.

Recognizing the importance of water quality to the preservation of Pennsylvania's water supply and wildlife, the Pennsylvania Department of Environmental Protection (DEP) established a Water Quality Standards program in 25 Pa. Code, Chapter 93, as required by the federal Clean Water Act. The standards are based upon water use: 1) Designated Use — specified for each water body or segment whether or not the use is being attained, and 2) Existing Use — the use actually attained in the water body on or after November 28, 1975, whether or not the use is included in the water quality standards. All Commonwealth waters are protected for a designated aquatic life use as well as a number of water supply and recreational uses as listed below:

- EV (Exceptional Value Waters) — waters that constitute an outstanding national, state, regional or local resource, such as waters of national, state or county parks or forests, or waters that are used as a source of unfiltered potable water supply, or waters that have been characterized by the Fish Commission as "Wilderness Trout Streams," and other waters of substantial recreational or ecological significance.
- HQ (High Quality Waters) — a stream or watershed with exceptional quality waters and environmental features that require special protection.
- CWF (Cold Water Fishes) — maintenance and/or propagation of fish species and flora and fauna that are native to cold water habitats.
- TSF (Trout Stocking) — maintenance of stocked trout from February 15 to July 31 and maintenance and propagation of fish species and flora and fauna which are native to warm water habitats.


MAP 7
FLOODPLAINS, WETLANDS
& HYDRIC SOILS
100-year Floodplain
500-year Floodplain
Soil with Hydric Component
Wetland
Major Road
Municipal Boundary
County Boundary
River or Stream
0 2 4 6
Miles
Sources: Federal Emergency Management Agency (FEMA), 2001 (Northampton County), 2004 (Lehigh County); Natural Resources Conservation Service, 1998 (Lehigh County), 2004 (Northampton County); U.S. Fish & Wildlife Service, 1971-1992
LVPC
LEHIGH VALLEY PLANNING COMMISSION
961 Marcon Boulevard, Suite 310
Allentown, PA 18109-9368
(610) 264-4544

- MF (Migratory Fishes) — passage, maintenance and propagation of fishes which ascend to flowing waters to complete their life cycle.
- WWF (Warm Water Fishes) — maintenance and propagation of fish species and flora and fauna that are native to warm water habitats.

The majority of streams in the Lehigh Valley have a Designated Use of CWF and HQ-CWF, e.g., Little Lehigh, Cedar, Monocacy and Bushkill Creeks (Map 6). Northampton County has two streams with a Designated Use of EV — Slateford Creek in Upper Mt. Bethel Township and Cooks Creek headwater tributaries in Lower Saucon Township. Four stream segments have an Existing Use classification higher than their Designated Use: northern part of Sobers Run in Bushkill Township, Stoney Run in Lynn and Weisenberg townships, and School Creek and the upper reaches of Ontelaunee Creek in Lynn Township. DEP is evaluating these stream segments to determine if the Designated Use should be upgraded to match the Existing Use. The associated riparian buffers and surrounding floodplains of streams and rivers lend themselves to greenway development.

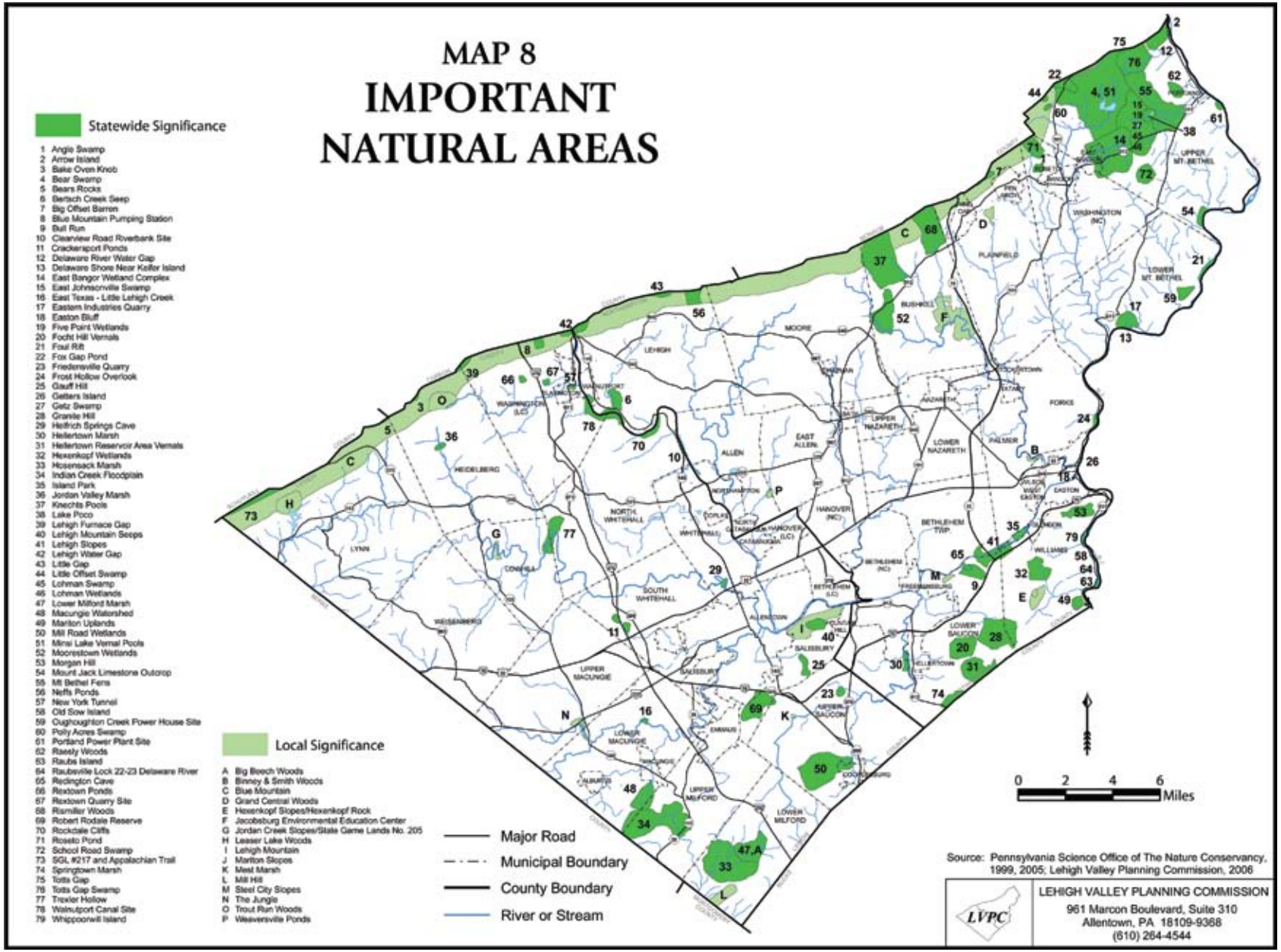
Floodplains

A floodplain is the low lying area adjacent to a stream, river or watercourse that is subject to periodic flooding. Naturally vegetated areas supported by floodplains help to trap sediment from upland surface runoff ultimately leading to the creation of proper down stream conditions required for aquatic life. These areas also store large amounts of water which can be a source of aquifer recharge and prevent loss of life, health hazards and property damage. Many of the most scenic areas in Lehigh and Northampton counties are found within the floodplains of the Lehigh and Delaware rivers and many of the larger streams (Map 7).

Regulation of floodplains helps to protect open space and critical habitat areas, preserve and enhance water quality and quantity, and reduces the threat to human life and property caused by periodic flooding. For regulatory purposes, a floodplain is defined by the 100-year flood. The Federal Emergency Management Agency (FEMA) identifies the 100-year flood as the flood elevation that has a one percent chance of being equaled or exceeded each year. Thus, the 100-year flood could occur more than once in any given period of time. The 100-year flood, which is the standard used by most federal and state agencies, is used by the National Flood Insurance Program (NFIP) as the standard for floodplain management. The Pennsylvania Floodplain Management Act (Act 166 of 1978) requires municipalities identified as being flood-prone to enact floodplain regulations which, at a minimum, meet the requirements of the NFIP. To minimize flood damage and protect floodplains, the Comprehensive Plan recommends municipalities prohibit new structures and fill in the 100-year floodplain except for certain infrastructure as recommended by the Pennsylvania Code.

Wetlands

Wetlands are areas that are inundated by surface or ground water at a frequency and duration sufficient to support a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands include swamps, marshes and bogs. Many of these areas are considered seasonal wetlands, in that they are dry during one or more seasons every year. The quantity of water present and the timing of its presence determine the functions of a wetland. Even wetlands that appear dry for significant portions of the year, e.g., vernal pools, can provide significant habitat for a variety of species. An excellent example of wetland habitat is found in the Minsi Lake Corridor of Upper Mount Bethel Township. The Minsi Lake Vernal Pools have been designated by The Nature Conservancy (TNC) as a natural area of statewide significance and are recognized by many conservation groups as a critical area for preservation.


MAP 8
IMPORTANT NATURAL AREAS
Statewide Significance
1 Angle Swamp
2 Arrow Island
3 Bake Oven Knob
4 Bear Swamp
5 Bears Rocks
6 Bertsch Creek Seep
7 Big Offset Barren
8 Blue Mountain Pumping Station
9 Bull Run
10 Clearview Road Riverbank Site
11 Crackerspport Ponds
12 Delaware River Water Gap
13 Delaware Shore Near Keller Island
14 East Bangor Wetland Complex
15 East Johnsonville Swamp
16 East Texas - Little Lehigh Creek
17 Eastern Industries Quarry
18 Easton Bluff
19 Five Point Wetlands
20 Focht Hill Vernals
21 Foul Rift
22 Fox Gap Pond
23 Friedensville Quarry
24 Frost Hollow Overlook
25 Gauff Hill
26 Getters Island
27 Gefz Swamp
28 Granite Hill
29 Heffrich Springs Cave
30 Hellertown Marsh
31 Hellertown Reservoir Area Vernals
32 Hexenkopf Wetlands
33 Hosensack Marsh
34 Indian Creek Floodplain
35 Island Park
36 Jordan Valley Marsh
37 Knechts Pools
38 Lake Poco
39 Lehigh Furnace Gap
40 Lehigh Mountain Seeps
41 Lehigh Slopes
42 Lehigh Water Gap
43 Little Gap
44 Little Offset Swamp
45 Lohman Swamp
46 Lohman Wetlands
47 Lower Milford Marsh
48 Macungie Watershed
49 Marlton Uplands
50 Mill Road Wetlands
51 Minsi Lake Vernal Pools
52 Moorestown Wetlands
53 Morgan Hill
54 Mount Jack Limestone Outcrop
55 Mt Bethel Fens
56 Neffs Ponds
57 New York Tunnel
58 Old Sow Island
59 Oughoughton Creek Power House Site
60 Polly Acres Swamp
61 Portland Power Plant Site
62 Raesly Woods
63 Raubs Island
64 Raubsville Lock 22-23 Delaware River
65 Redington Cave
66 Rexdown Ponds
67 Rexdown Quarry Site
68 Rismiller Woods
69 Robert Rodale Reserve
70 Rockdale Cliffs
71 Roseto Pond
72 School Road Swamp
73 SGL #217 and Appalachian Trail
74 Springtown Marsh
75 Totts Gap
76 Totts Gap Swamp
77 Trexler Hollow
78 Walnutport Canal Site
79 Whippoorwill Island
Local Significance
A Big Beech Woods
B Binney & Smith Woods
C Blue Mountain
D Grand Central Woods
E Hexenkopf Slopes/Hexenkopf Rock
F Jacobsburg Environmental Education Center
G Jordan Creek Slopes/State Game Lands No. 205
H Lesser Lake Woods
I Lehigh Mountain
J Marlton Slopes
K Mest Marsh
L Mill Hill
M Steel City Slopes
N The Jungle
O Trout Run Woods
P Weaversville Ponds
Major Road
Municipal Boundary
County Boundary
River or Stream
0 2 4 6 Miles
Source: Pennsylvania Science Office of The Nature Conservancy, 1999, 2005; Lehigh Valley Planning Commission, 2006
LVPC
LEHIGH VALLEY PLANNING COMMISSION
961 Marcon Boulevard, Suite 310
Allentown, PA 18109-9368
(610) 264-4544

According to the DEP and United States Army Corp of Engineers, a wetland must have hydrophytic vegetation (plant life that thrives in oxygen poor/saturated soil conditions) and hydric soils (soil formed when oxygen was lacking due to prolonged inundation or saturation) to be designated as such. Wetlands are one of the most biologically diverse systems in the world and perform a variety of important physical and biological functions. Wetlands have important filtering capabilities for collecting runoff before it reaches rivers and streams, maintain stream flow during periods of drought, and can assist in groundwater replenishment. Additionally, wetlands are ideal locations for environmental education opportunities and scenic viewsheds.

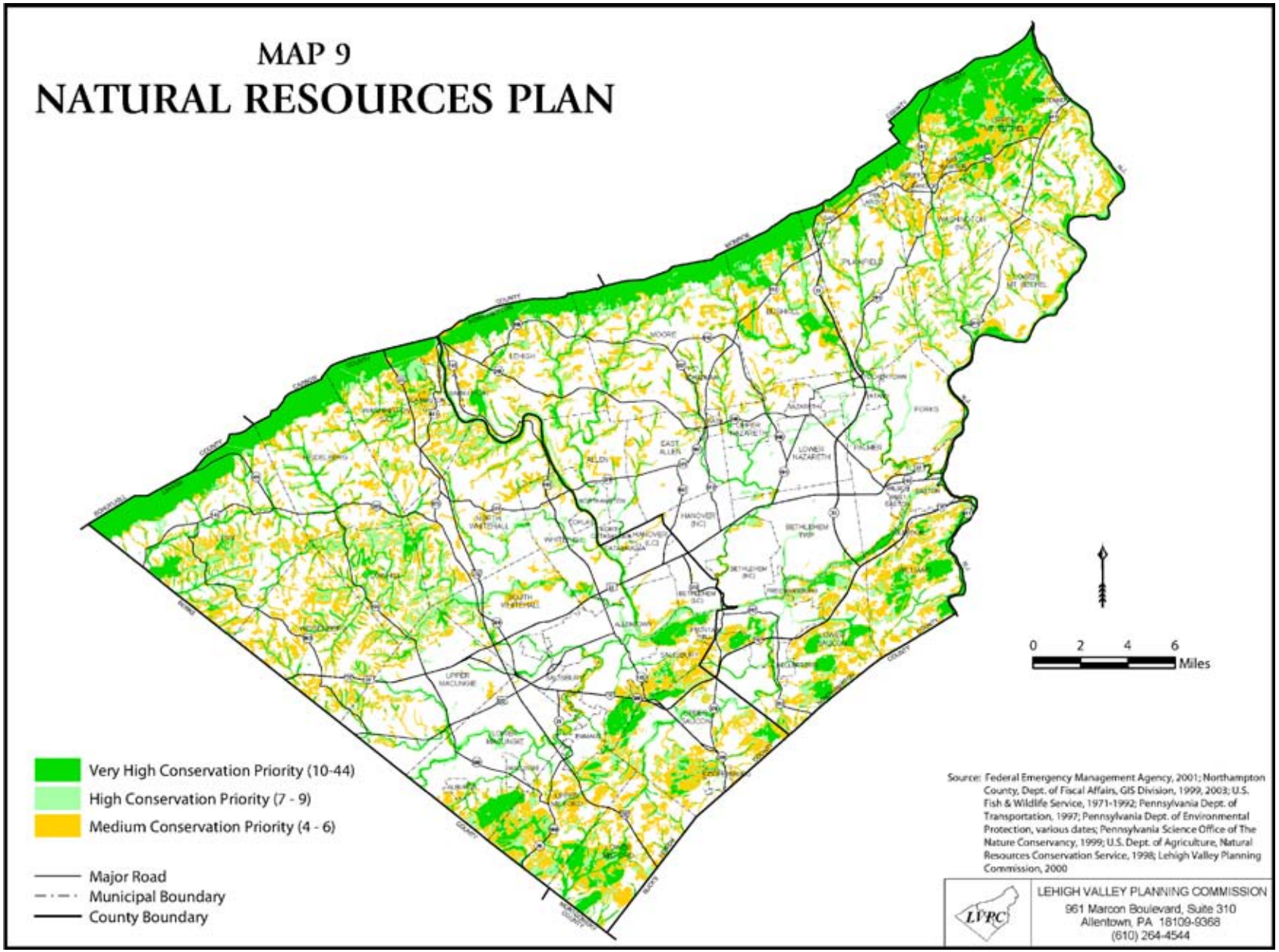
Lehigh and Northampton counties contain over 1,000 individual sites that can be classified as wetlands. Wetlands and their associated hydric soils are found in every municipality; however, the largest concentrations occur in Upper Mt. Bethel Township and along the base of Blue Mountain in both counties (Map 7). There are many problems associated with developing on or near wetlands and hydric soils, e.g. wetlands located in floodplains are often flooded, hydric soils are easily compacted, and high groundwater tables are not suitable for the installation of on-lot septic systems. Despite the many problems, the wetlands of the Lehigh Valley continue to be under threat. The LVPC recommends that wetlands are properly managed (i.e. 50-foot natural vegetation buffers) to maintain and enhance their environmental, scenic, scientific and educational values. The preservation of these areas and their incorporation into the greenways network is a major goal of this plan and the counties and municipalities are encouraged to identify and include provisions for the protection of wetland areas in local ordinances and comprehensive plans.

Natural Areas Inventory

The Lehigh Valley has many important natural areas worthy of protection, such as rare, threatened and endangered plant and animal species locations, highest quality natural habitats, and outstanding geologic features in the region. Areas like Bake Oven Knob in Heidelberg Township, Lehigh County, and the Mariton Wildlife Sanctuary in Williams Township, Northampton County, are well-known natural areas that are easily identified and add to the local character. Important natural areas should become part of the regional greenway system whenever possible. It is areas such as these that provide the hubs and nodes of the Lehigh Valley greenways network.

Bake Oven Knob — Heidelberg Township

In 1999, the LVPC contracted with the Pennsylvania Science Office of The Nature Conservancy (TNC) to complete a study titled *A Natural Areas Inventory of Lehigh and Northampton Counties, Pennsylvania*. This document identifies the outstanding floral, faunal and geologic features in the Lehigh Valley (Map 8). The project was financed in part by a Keystone Recreation, Park and Conservation Fund Program grant from the Pennsylvania Department of Conservation and Natural Resources Bureau of Recreation and Conservation. Lehigh and Northampton counties provided the local funding match for this project. The LVPC staff prepared a companion report titled *Lehigh and Northampton Counties Natural Areas Inventory Summary* that summarizes the TNC document. In 2005, TNC completed an update to the 1999 natural areas inventory for the two counties.


MAP 9
NATURAL RESOURCES PLAN
Very High Conservation Priority (10-44)
High Conservation Priority (7 - 9)
Medium Conservation Priority (4 - 6)
Major Road
Municipal Boundary
County Boundary
0 2 4 6
Miles
Source: Federal Emergency Management Agency, 2001; Northampton County, Dept. of Fiscal Affairs, GIS Division, 1999, 2003; U.S. Fish & Wildlife Service, 1971-1992; Pennsylvania Dept. of Transportation, 1997; Pennsylvania Dept. of Environmental Protection, various dates; Pennsylvania Science Office of The Nature Conservancy, 1999; U.S. Dept. of Agriculture, Natural Resources Conservation Service, 1998; Lehigh Valley Planning Commission, 2000
LVPC
LEHIGH VALLEY PLANNING COMMISSION
961 Marcon Boulevard, Suite 310
Allentown, PA 18109-9368
(610) 264-4544

The Natural Areas Inventory (NAI) identifies critical areas of plant and animal habitat and also includes inherently unique natural features (Map 8). Potential threats and suggestions for protection of the critical habitat areas are provided in the NAI. Additional information about individual species is available from the Pennsylvania Natural Heritage Program (PNHP) formerly known as Pennsylvania Natural Diversity Inventory (PNDI). This comprehensive database of outstanding natural habitats and sensitive plant and animal species is carefully monitored as rare plants and animals are sometimes subject to unauthorized collection and are consequently not identified in the text of the NAIs.

Natural areas are grouped into two categories by TNC: sites of statewide significance and sites of local significance. These sites are identified for the protection of biological diversity and contain exemplary natural communities and documented habitats of species of special concern. Sites of statewide significance have been given a county rank of 1 to 5 depending on their significance; those with a county rank of 1 or 2 are considered "top priority." In addition to sites of statewide significance, a number of sites of local significance have been identified. Sites of local significance are unique areas chosen because of size, diversity of wildlife and plant life, water quality protection, and recreational potential. The NAI identified 17 sites of local significance in the Lehigh Valley. The LVPC strongly suggests the consideration of TNC identified natural areas in all park, recreation and open space plans.

Natural Resources Plan

The Natural Resources Plan (Map 9) was developed as part of the *Comprehensive Plan The Lehigh Valley … 2030* (Comprehensive Plan). Eleven different natural resource elements were used to produce the Natural Resources Plan: floodplains, hydric soils, the Blue Mountain natural area, NAI, river resource areas, steep slopes, water quality, wetlands, woodlands, interior woodlands and riparian woodlands. The eleven elements were weighted and layered using a Geographic Information System mapping program. The calculations resulted in a range of values with the higher numbers indicating where the greatest combination of natural resources occurs in the Lehigh Valley. Three conservation priority levels were created within the range of values:

- Very High — areas that should be given first consideration for public and private conservation acquisition programs.
- High — areas that should also be considered for acquisition, especially if they are part of a larger natural feature identified as very high conservation priority. In some cases, such as floodplains and steep slopes, high priority areas might be adequately protected through municipal zoning.
- Medium — areas that should be protected through zoning regulations, conservation subdivision design and conservation farming practices. Many of these areas may include small stands of woodland, drainage swales or poorly drained soils that are either part of local farm operations or are part of larger residential lots.

Cultural, Historical and Scenic Resources

Cultural, historical and scenic resources offer a wide variety of activities and attractions for the enjoyment of both residents and visitors of the Lehigh Valley. These resources are found at the centers of our cities and in the rural countryside. Ranging from a visit to an art museum to a drive through a covered bridge

to attending a music festival to a fun day at a science center, there is something for everyone, young and old alike. The cultural resources offer a glimpse of who we are today, while the historical resources offer a glimpse of who we were in the past, and the scenic resources make the Lehigh Valley unique. Many of these activities are intentionally located within one of our greenway hubs, are identified as a greenway node, or are adjacent to a greenway corridor.

Cultural Resources

The Lehigh Valley has a wide range of cultural organizations and venues for residents and visitors to enjoy, including museums, universities, the arts (music, theater and dance), a science center, and a wine trail. In addition to these year-round attractions, annual festivals (e.g., Musikfest) draw thousands of residents and tourists to the Lehigh Valley.

Several different types of museums are located in the two counties—art, Native American, and company-sponsored museums. The art museums (e.g., Allentown Art Museum, Kemerer Museum of Decorative Arts in the City of Bethlehem) attract thousands of people each year to view a variety of fine and decorative art objects. The Museum of Indian Culture in the City of Allentown helps to educate visitors about the Northeastern Woodland Indians and other Native American tribes. Additionally, several local companies whose products are used worldwide sponsor museums throughout the Lehigh Valley (e.g., Allen Organ Company, The Crayola Factory, Mack Trucks Inc., and Martin Guitar Company). Visitors may see how the products are made and learn the background and history of the company.

Theater, music and dance venues and organizations exist throughout the Lehigh Valley (e.g., the State Theater Center for the Arts in the City of Easton, Civic Theater of Allentown, Pennsylvania Playhouse). Some of these art centers are associated with local colleges and universities, such as Baker Center for the Arts (Muhlenberg University), Zoellner Arts Center (Lehigh University) and The Labuda Center for the Performing Arts (DeSales University). The Baum School of Art in the City of Allentown and The Banana Factory in the City of Bethlehem both offer art instruction in addition to art galleries that are open to the public. The Allentown Symphony Orchestra, The Bach Choir of Bethlehem and the Pennsylvania Youth Theater in Bethlehem, along with several other organizations, offer many opportunities for experiencing the arts in the Lehigh Valley.

Other types of activities that residents and visitors can enjoy that are found across the Lehigh Valley include the Lehigh Valley Wine Trail which allows visitors to experience nine family-owned wineries and taste award winning wines. The Da Vinci Science Center in the City of Allentown provides hands-on opportunities for children to learn about science and have fun at the same time.

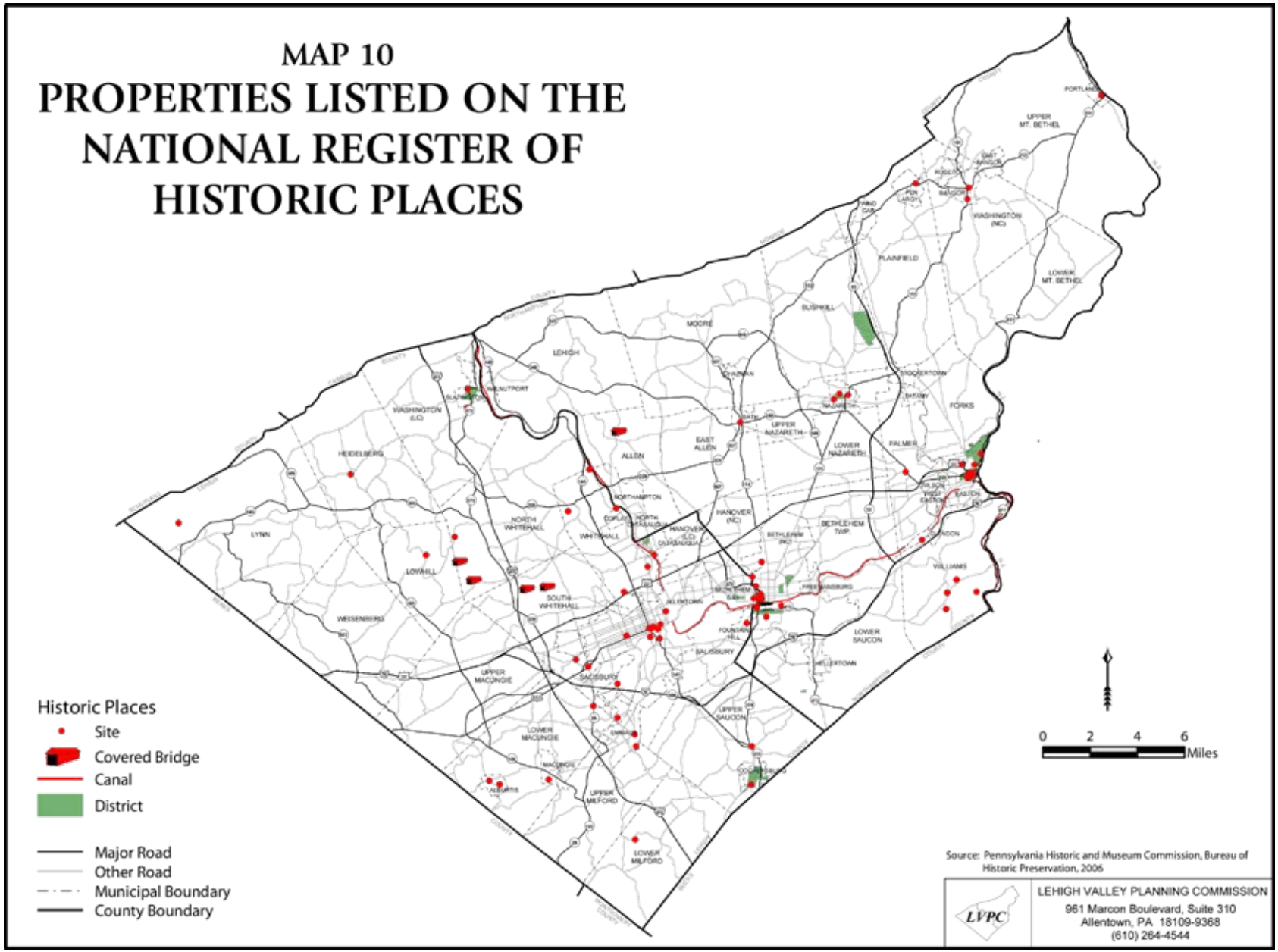
Musikfest *John Lunger, Arts Quest*

Historical Resources

Lehigh and Northampton counties have a wealth of historical resources (e.g., buildings, structures and canals) that are found throughout the region. These resources add to the beauty and attractiveness of the region, increase understanding and appreciation of our heritage, and improve the quality of life. Many significant historical features are of value to the local economy because they are tourist attractions.

The LVPC published a report in 1963 titled *History of the Lehigh Valley Region*, which focused on important events and persons and not the identification of historic sites and structures. In 1970, the LVPC completed a report titled *Historic Structures and Sites*. The report contains an inventory of the most important historic structures, buildings and sites that had been identified as of 1970. The report also includes general policy recommendations and recommendations for specific historic buildings and structures. Most of the recommendations of the report have been accomplished, thanks to public and private efforts.

There have been several major efforts since 1970 to identify and survey the remaining historical resources in Lehigh and Northampton counties. Some communities prepared thorough history studies for the 1976 bicentennial celebration. Another important effort in the 1970s involved a major study of the Lehigh Canal by the U.S. Department of the Interior, Heritage Conservation and Recreation Service titled *Lehigh Canal — an HCRS Project Report*. A few municipalities have conducted comprehensive historical resources surveys funded with state grants. Communities that took advantage of this grant program include Catasauqua Borough, Coopersburg Borough and Forks Township. The Pennsylvania Historical and Museum Commission has money available for funding comprehensive historical resources surveys. No Lehigh Valley municipalities have applied for the grants for a number of years.


MAP 10
PROPERTIES LISTED ON THE NATIONAL REGISTER OF HISTORIC PLACES
Historic Places
Site
Covered Bridge
Canal
District
Major Road
Other Road
Municipal Boundary
County Boundary
0 2 4 6 Miles
Source: Pennsylvania Historic and Museum Commission, Bureau of Historic Preservation, 2006
LVPC
LEHIGH VALLEY PLANNING COMMISSION
961 Marcon Boulevard, Suite 310
Allentown, PA 18109-9368
(610) 264-4544

National Register of Historic Places

The National Register of Historic Places (NRHP) is the official list of historical and cultural resources worthy of preservation in the United States and is administered by the National Park Service. The NRHP is part of a national program to coordinate and support public and private efforts to identify, evaluate and protect our historical and archeological resources. Places listed in the NRHP include districts, sites, buildings, structures and objects that are significant in American history, architecture, archeology, engineering and culture.

The Lehigh Valley has many important historical resources listed on the NRHP (Map 10) as of May 2006, 50 in Lehigh County and 46 in Northampton County. Many more historical resources have been recognized by the Pennsylvania Historical and Museum Commission as eligible for NRHP listing, 127 in Lehigh County and 109 in Northampton County. Before any of these properties can be listed on the NRHP, application forms are required to be completed and submitted for review.

Lockridge Furnace Complex — Borough of Alburtis

Many development projects now require an analysis of historical resources before they can proceed. Under state and federal law, state and federal agencies must consider the effects of their actions on all historic and prehistoric features eligible for inclusion on the NRHP. The federal legal mandates include Section 106 of the National Historic Preservation Act of 1966, Executive Order 11593 and the regulations of the Advisory Council on Historic Preservation. State legal mandates include the Environmental Rights Amendment, Article 1, Section 27 of the Pennsylvania Constitution and the Pennsylvania Historic Preservation Act of 1978. Agencies must meet their responsibilities to identify all eligible historical resources that may be affected by their actions. The

HISTORICAL RESOURCES IN LEHIGH AND NORTHAMPTON COUNTIES LISTED ON THE NATIONAL REGISTER OF HISTORIC PLACES			
COUNTY	MUNICIPALITY	NAME	YEAR LISTED
Lehigh	Alburtis	George F. Schlicher Hotel	1992
		Lock Ridge Furnace Complex	1981
	Allentown	Alburtes L. Meyers Bridge	1988
		Allentown Masonic Temple	2004
		Allentown National Bank Building	2005
		Americus Hotel	1984
		Bogart Covered Bridge	1980
		Dime Savings & Trust Company	1985
		Gauff-Roth House	1985
		High German Evangelical Reformed Church	1983
		Hotel Sterling	1984
		Neuweiler Brewery	1980
		Old Lehigh County Courthouse	1981
		Trout Hall	1978
		Zollinger-Harned Co. Building	1979
	Bethlehem	Bethlehem Armory	1991
		Burnside Plantation	1990
		Lehigh Valley Silk Mills	1993
		Mt. Airy Historic District	1988
	Catasauqua	Biery's Port Historic District	1984
		Catasauqua Residential Historic District	1984
		George Taylor House	1971
	Coopersburg	Coopersburg Historic District	1982
		Linden Grove Pavilion	1979
	Coplay	Coplay Cement Co. Kilns	1980
	Emmaus	Jacob Ehrenhardt Jr. House	2003
		The Shelter House	1978
	Heidelberg	Bridge in Heidelberg Township	1988
	Lower Macungie	Rodale Organic Gardening Experimental Farm	1999
	Lower Milford	Dillingersville Union School & Church	1979
	Lowhill	Frantz's Bridge	1988
	Lynn	Frederick Leaser Farm	2004
	Macungie	Valentine Weaver House	1984
	North Whitehall	Geiger Covered Bridge	1980
		Rex Covered Bridge	1980
		Schlicher's Bridge	1980
	Salisbury	Kemmerer House (Iron Gate)	1977
	Slatington	Fireman's Drinking Fountain	1981
		Slatington Historic District	2004

HISTORICAL RESOURCES IN LEHIGH AND NORTHAMPTON COUNTIES LISTED ON THE NATIONAL REGISTER OF HISTORIC PLACES (cont'd.)			
Lehigh (cont'd.)	South Whitehall	Dorneyville Crossroad Settlement	1977
		Haines Mill	1981
		Manasses Guth Covered Bridge	1980
		Wehr Covered Bridge	1980
	Upper Saucon	Centennial Bridge	1988
	Washington	Vigilant Fire Company's Firemen's Monument	2004
	Whitehall	Cold Spring Bridge	1988
		Dent Hardware Company Factory Complex	1986
		Helfrich's Springs Grist Mill	1977
		Troxell-Steckel House	1980
	multiple	Lehigh Canal	1979
Northampton	Allen	Kreidersville Covered Bridge	1980
	Bangor	Bridge in Bangor Borough	1988
		Real Estate Building	1986
	Bath	Daniel Steckel House	1982
	Bethlehem	Bethlehem Silk Mill	2005
		Bethlehem Steel Lehigh Plant No. 2/Merchant Mill No. 2	2004
		Central Bethlehem Historic District	1972
		Elmwood Park Historic District	1988
		Fountain Hill Historic District	1988
		Gemeinhaus-De Schweinitz Residence	1975
		Gristmiller's House	1973
		Illick's Mill	2005
		Lehigh Valley Railroad Headquarters Bldg.	1984
		Moravian Sun Inn	1973
		Old Waterworks	1972
		Packer Memorial Chapel	1979
		Pembroke Village Historic District	1988
		South Bethlehem Downtown Historic District	2006
		The Tannery	1972
	Bushkill	Jacobsburg Historic District	1977
	Easton	Chain Bridge (ruins)	1974
		College Hill Residential Historic District	1991
		Easton Cemetery	1990
		Easton Historic District	1983
		Easton House	1980
		Herman Simon House	1980
		Jacob Mixsell House	1980
		Jacob Nicholas House (Little Stone House)	1976

HISTORICAL RESOURCES IN LEHIGH AND NORTHAMPTON COUNTIES LISTED ON THE NATIONAL REGISTER OF HISTORIC PLACES (cont'd.)			
Northampton (cont'd.)	Easton (cont'd.)	Parsons-Taylor House	1980
		State Theatre	1982
		William Jacob Heller House	1982
		Zeta Psi Fraternity House	2001
	Lower Saucon	Ehrhart's Mill Complex Historic District	1987
	Nazareth	McCollum & Post Silk Mill	2005
		Nazareth Hall Tract	1980
		Nazareth Historic District	1988
		Whitefield House & Gray Cottage	1980
	Palmer	Seipsville Hotel	1977
	Pen Argyl	Weona Park Carousel	1999
	Portland	County Bridge #36	1988
	Williams	Arndt, Jacob, House and Barn	2005
		Bridge in Williams Township	1988
		Coffeetown Grist Mill	1977
		Isaac Stout House	2004
	multiple	Delaware Division of Pennsylvania Canal	1994
	multiple	Lehigh Canal	1979
Source: The Pennsylvania Historical and Museum Commission, 2006			

presence of historic sites sets a greater restriction on government actions than on private ones. If a site is listed or eligible to be listed on the NRHP, federal and state agencies must show there is no feasible and prudent alternative to avoiding the feature before it can be eliminated. Private property owners do not have to comply with federal and state mandates regarding NRHP sites. The table above lists historical resources found in Lehigh and Northampton counties.

Historical Marker Program

The Pennsylvania Historical Marker program was established in 1946. This popular Pennsylvania Historical and Museum Commission (PHMC) program is responsible for the blue and gold roadside markers that highlight people, places and events significant in state and national history. There are about 1,800 markers across the entire state. Ninety-six markers can be found in the Lehigh Valley (29 in Lehigh County and 67 in Northampton County). Any person or organization may submit nominations for historical markers. If the nominations are postmarked by January 5 each year, they will be evaluated the following spring by a panel of independent experts from across the state and reviewed by PHMC commissioners.

Scenic Resources

Lehigh and Northampton counties' outstanding scenic quality and sense of place is created from the interrelationship between the natural features, rural areas, undeveloped open space, and the cities and boroughs. The result is a rural character, punctuated by significant community, natural and historical resources. This character has made the Lehigh Valley a destination as a visitor attraction and also as an attractive place to live and work. Thus, the protection of scenic resources is critical to maintaining the sense of place.

Scenic resources that contribute to the local character are river and stream valleys, farmland, covered bridges, historic districts and linear parkways. Examples of these Lehigh Valley scenic resources include:

Scenic Waterways

- Delaware River
- Lehigh River
- Bushkill Creek
- Jordan Creek
- Little Lehigh Creek

Scenic Views

- Bake Oven Knob
- South Mountain lookout (Lehigh University)
- Stouts Valley

Scenic Features

- Bethlehem Historic District
- The Bethlehem Star
- Little Lehigh Parkway
- Nazareth town square
- Minsi Lake

Scenic roadways are another type of scenic resource, specifically byways and drives. The Pennsylvania Scenic Byways Program, administered by PennDOT's Bureau of Planning & Research, designates qualified roadways as scenic byways in support of local planning efforts. To qualify for this designation, a roadway must meet certain requirements regarding quality, outdoor advertising restriction, and local support. Local, state or federally-owned roadways may be nominated by any governmental entity provided the owner of the roadway agrees with the nomination. Currently, 15 scenic byways are designated in Pennsylvania, one of which is located along Rt. 611 in Lower Mount Bethel Township, Northampton County. Scenic drive is another type of scenic roadway designation found in Pennsylvania. In November 1987, Pennsylvania House Bill No. 1982 designated the Delaware River Scenic Drive, portions

of which are located within Northampton County. The aforementioned designated drive and byway, along with other scenic roadways within the two counties, are listed below:

Scenic Byways and Drives

- Pennsylvania Scenic Byway (Rt. 611, Little Creek Road and Belvidere Highway, Northampton County)
- Delaware River Scenic Drive (Route 611, Belvidere Highway, Riverton Road and River Road, Northampton County)
- Kistler Valley Road (Lynn Township, Lehigh County)
- Limeport Pike (Lower Milford Township, Lehigh County)
- Wassergass/Raubsville roads (Williams Township, Northampton County)

Stouts Valley Scenic Viewshed

Cedar Creek Parkway

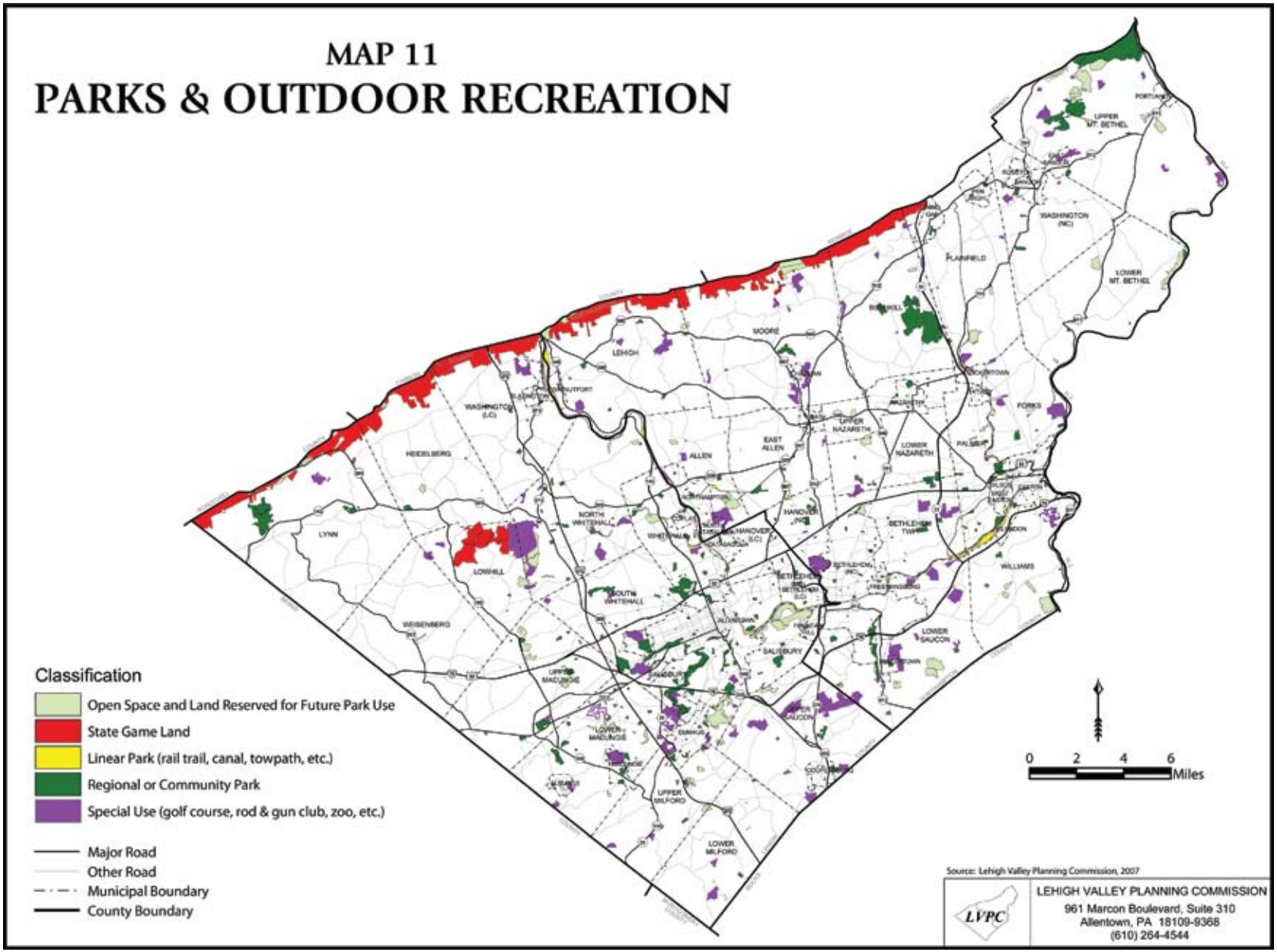
Residents of the Lehigh Valley have grown accustomed to high quality local and regional parks and pastoral natural settings. The cities of Allentown and Bethlehem and a number of smaller municipalities have long been committed to their park systems and preservation of open spaces. Protecting the natural environment and creating public parks are a Lehigh Valley tradition resulting in outstanding places like the Trexler Nature Preserve in Lowhill and North Whitehall townships, Little Lehigh Parkway in the City of Allentown and Salisbury Township, Hugh Moore Park in the City of Easton, Cedar Creek Parkway in the City of Allentown and South Whitehall Township and the Monocacy Complex in the City of Bethlehem.

In 2000, the Lehigh Valley Green Future Fund was created to explore the possibility of park and open space bond issues in each county. The group, composed of local civic leaders and government officials, recommended that each county adopt a $30 million bond issue. The monies from the bond would be used to: 1) acquire important natural areas, 2) create and improve parks, 3) enhance trail and greenway networks, and 4) preserve agricultural lands. In 2002, nonbinding referendums were put on the ballot and were strongly supported by voters in each county (70% in Lehigh and 64% in Northampton). These results, combined with the LVPC public opinion survey outcomes, provide a clear vision of what the residents value about the Lehigh Valley — the long-term preservation of its natural and cultural heritage.

Parks and Other Outdoor Recreation

In response to recommendations made by the LVPC, Lehigh and Northampton counties started major countywide park programs in the late 1960s. The counties and the LVPC have been actively involved in park planning, acquisition and development ever since. In 1971, the LVPC completed the first *Regional Recreation and Open Space Plan* (updated in 1980). Subsequently in 1997 LVPC staff prepared the report *Lehigh County Parks — 2005* for Lehigh County and in 2002 wrote *Northampton County Parks — 2010* for Northampton County. These reports serve as the official park plans for the two counties.

The amount of land in parks and other outdoor recreation has increased substantially since the LVPC completed the first recreation and open space plan for the Lehigh Valley (Map 11). Between 1970 and 2005, outdoor recreation acreage in the two counties increased by 80% (110% in Northampton County and 60% in Lehigh County). During the same 35-year period, the amount of parkland owned by the two counties increased 200%, and municipal park acreages grew by 130%. Other significant increases observed were largely due to acquisitions by the conservancies, and state and federal governments.


MAP 11
PARKS & OUTDOOR RECREATION
Classification
Open Space and Land Reserved for Future Park Use
State Game Land
Linear Park (rail trail, canal, towpath, etc.)
Regional or Community Park
Special Use (golf course, rod & gun club, zoo, etc.)
Major Road
Other Road
Municipal Boundary
County Boundary
0 2 4 6
Miles
Source: Lehigh Valley Planning Commission, 2007
LVPC
LEHIGH VALLEY PLANNING COMMISSION
961 Marcon Boulevard, Suite 310
Allentown, PA 18109-9368
(610) 264-4544

Another large contributor to the outdoor recreation acreage of the Lehigh Valley is golf course development. Accounting for over 4,000 acres, the Lehigh Valley golf courses are a significant component of the regional recreation inventory. With 18 public courses throughout Lehigh and Northampton counties and another 40 public courses spread from Bucks County to the Poconos, the region accommodates players of all abilities and budgets. Since the 1990s, a new trend in golf course development has emerged: golf course communities, where the golf presence is reduced to one of many amenities offered in residential neighborhoods. This trend is resulting in the conversion of hundreds of acres of recreation land into residential development. A healthy parks and recreation system is reliant upon the provision and maintenance of adequate space and facilities to meet the needs of current and future populations. The conversion of county and municipal recreation land and open space to other uses should be avoided.

Although community and ecological needs vary geographically, a standard set of criteria is useful to determine the health of a region's park and open space system. One measure comes from the National Recreation and Park Association (NRPA). The NRPA suggests that a core park system have 6.25 to 10.5 acres

NRPA RECOMMENDED CLASSIFICATION SYSTEM FOR LOCAL AND REGIONAL RECREATION OPEN SPACE			
TYPE	**SERVICE AREA**	**DESIRABLE SIZE (acres)**	**ACRES/1,000 POPULATION (A)**
LOCAL/CLOSE-TO-HOME SPACE			
Mini-Park	Less than ¼-mile radius.	1 acre or less	0.25 to 0.5 A
Neighborhood Park/ Playground	¼ to ½-mile radius to serve a population up to 5,000 (a neighborhood).	15+ acres	1.0 to 2.0 A
Community Park	Several neighborhoods. 1 to 2 mile radius.	25+ acres	5.0 to 8.0 A
CLOSE-TO-HOME SPACE RECOMMENDATION = 6.25-10.5 A/1,000			
REGIONAL SPACE			
Regional/Metropolitan Park	Several communities. 1 hour driving time.	200+ acres	5.0 to 10.0 A
Regional Park Reserve	Several communities. 1 hour driving time.	1,000+ acres: sufficient area to encompass the resource to be preserved and managed.	Variable
REGIONAL SPACE RECOMMENDATION = 15-20 A/1,000			
SPACE THAT MAY BE LOCAL OR REGIONAL AND IS UNIQUE TO EACH COMMUNITY			
Linear Park	No applicable standard.	Sufficient width to protect the resource and provide maximum use.	Variable
Special Use	No applicable standard.	Variable depending on desired size.	Variable
Conservancy	No applicable standard.	Sufficient to protect the resource.	Variable
Source: *Park, Recreation, Open Space and Greenway Guidelines*, National Recreation and Park Association			

of developed open space for recreation per 1,000 population. This is local/close-to-home space that includes Mini-Parks, Neighborhood Parks/Playgrounds and Community Parks. Additionally, the NRPA recommends another 15 to 20 acres per 1,000 population in regional space which includes Regional/ Metropolitan Parks and Regional Park Reserves. NRPA standards classify all parks into the five aforementioned categories based on use characteristics and recommend a minimum acreage relative to population size for each category.

Based on the NRPA 6.25 acres minimum recommendation for local/close-to-home space, both Lehigh and Northampton counties currently have enough acreage to meet needs through the year 2010. In 2005, the Lehigh Valley as a whole had 7.3 acres of local/close-to-home recreation space per 1,000 persons. Nonetheless, not every municipality meets the minimum guidelines, and there are several that have no applicable local/close-to-home space to meet the acreage recommendations. The following table provides an overview of the local, close-to-home recreation space needs of the Lehigh Valley:

ALL LOCAL, CLOSE-TO-HOME RECREATION SPACE

LEHIGH COUNTY

Municipality	Estimated 2005 Population[1]	Existing Local/Close-to-Home Space[2] Total Acreage	Existing Local/Close-to-Home Space[2] Acres/ 1000 Pop.	Acreage Need [3] Based on 6.25 Ac./ 1000 Pop.	Additional Acreage Need 6.25 Ac./ 1000 Pop.	2010[4] Acreage Need Based on 6.25 Ac./ 1000 Pop.	2010 Additional Acreage Need 6.25 Ac./ 1000 Pop.
Alburtis	2,203	14.5	6.6	13.8	(0.7)	13.5	(1.0)
Allentown	106,992	787.0	7.4	668.7	(118.3)	666.6	(120.4)
Bethlehem	19,360	79.6	4.1	121.0	41.4	118.9	39.3
Catasauqua	6,553	32.1	4.9	41.0	8.9	41.2	9.1
Coopersburg	2,570	51.9	20.2	16.1	(35.8)	16.1	(35.8)
Coplay	3,371	18.0	5.3	21.1	3.1	21.2	3.2
Emmaus	11,351	78.5	6.9	70.9	(7.6)	70.7	(7.8)
Fountain Hill	4,595	19.1	4.2	28.7	9.6	28.8	9.7
Hanover Twp.	1,915	29.7	15.5	12.0	(17.7)	12.1	(17.6)
Heidelberg Twp.	3,412	35.5	10.4	21.3	(14.2)	21.9	(13.6)
Lower Macungie Twp.	26,199	215.8	8.2	163.7	(52.1)	146.1	(69.7)
Lower Milford Twp.	3,839	23.9	6.2	24.0	0.1	24.5	0.6
Lowhill Twp.	2,121	6.4	3.0	13.3	6.9	14.1	7.7
Lynn Twp.	4,257	63.5	14.9	26.6	(36.9)	28.0	(35.5)
Macungie	3,111	61.6	19.8	19.4	(42.2)	19.0	(42.6)
North Whitehall Twp.	15,897	145.4	9.1	99.4	(46.0)	108.9	(36.5)
Salisbury Twp.	13,828	159.5	11.5	86.4	(73.1)	84.9	(74.6)
Slatington	4,413	12.7	2.9	27.6	14.9	27.7	15.0
South Whitehall Twp.	18,937	188.9	10.0	118.4	(70.5)	123.1	(65.8)
Upper Macungie Twp.	16,598	141.5	8.5	103.7	(37.8)	109.6	(31.9)
Upper Milford Twp.	7,388	59.2	8.0	46.2	(13.0)	44.8	(14.4)
Upper Saucon Twp.	13,935	68.0	4.9	87.1	19.1	83.7	15.7
Washington Twp.	6,934	53.7	7.7	43.3	(10.4)	45.5	(8.2)
Weisenberg Twp.	4,700	0.0	0.0	29.4	29.4	30.0	30.0
Whitehall Twp.	25,954	126.1	4.9	162.2	36.1	158.6	32.5
LEHIGH CO.	330,433	2,472.1	7.5	2,065.2	(406.9)	2,059.7	(412.4)

ALL LOCAL, CLOSE-TO-HOME RECREATION SPACE (cont'd)							
NORTHAMPTON COUNTY							
Municipality	**Estimated 2005 Population[1]**	**Existing Local/Close-to-Home Space[2]**		**Acreage Need [3] Based on 6.25 Ac./ 1000 Pop.**	**Additional Acreage Need 6.25 Ac./ 1000 Pop.**	**2010[4] Acreage Need Based on 6.25 Ac./ 1000 Pop.**	**2010 Additional Acreage Need 6.25 Ac./ 1000 Pop.**
		Total Acreage	**Acres/ 1000 Pop.**				
Allen Twp.	3,660	21.9	6.0	22.9	1.0	24.7	2.8
Bangor	5,305	40.4	7.6	33.2	(7.2)	33.6	(6.8)
Bath	2,768	35.1	12.7	17.3	(17.8)	17.4	(17.7)
Bethlehem	53,535	345.6	6.5	334.6	(11.0)	327.1	(18.5)
Bethlehem Twp.	23,562	98.5	4.2	147.3	48.8	150.6	52.1
Bushkill Twp.	7,880	77.6	9.8	49.3	(28.4)	51.1	(26.5)
Chapman	234	1.5	6.4	1.5	(0.0)	1.5	(0.0)
East Allen Twp.	4,992	71.4	14.3	31.2	(40.2)	33.4	(38.0)
East Bangor	995	25.0	25.1	6.2	(18.8)	6.5	(18.5)
Easton	26,267	154.7	5.9	164.2	9.5	164.2	9.5
Forks Twp.	12,853	72.1	5.6	80.3	8.2	65.9	(6.2)
Freemansburg	1,973	17.7	9.0	12.3	(5.4)	13.2	(4.5)
Glendon	364	0.2	0.5	2.3	2.1	2.3	2.1
Hanover Twp.	10,253	88.0	8.6	64.1	(23.9)	68.3	(19.7)
Hellertown	5,615	107.3	19.1	35.1	(72.2)	35.0	(72.3)
Lehigh Twp.	10,579	68.3	6.5	66.1	(2.2)	72.1	3.8
Lower Mt. Bethel Twp.	3,312	35.7	10.8	20.7	(15.0)	21.2	(14.5)
Lower Nazareth Twp.	5,654	39.3	7.0	35.3	(4.0)	44.0	4.7
Lower Saucon Twp.	11,043	68.2	6.2	69.0	0.8	68.3	0.1
Moore Twp.	9,328	106.1	11.4	58.3	(47.8)	62.1	(44.0)
Nazareth	6,023	51.6	8.6	37.6	(14.0)	38.3	(13.3)
Northampton	9,699	53.3	5.5	60.6	7.3	60.3	7.0
North Catasauqua	2,863	3.5	1.2	17.9	14.4	18.3	14.8
Palmer Twp.	18,510	145.7	7.9	115.7	(30.0)	114.9	(30.8)
Pen Argyl	3,670	28.0	7.6	22.9	(5.1)	22.8	(5.2)
Plainfield Twp.	6,055	20.9	3.5	37.8	16.9	42.9	22.0
Portland	573	6.4	11.2	3.6	(2.8)	4.1	(2.3)
Roseto	1,662	6.8	4.1	10.4	3.6	10.3	3.5
Stockertown	756	4.8	6.3	4.7	(0.1)	4.3	(0.5)
Tatamy	1,044	9.7	9.3	6.5	(3.2)	7.0	(2.8)
Upper Mt. Bethel Twp.	7,130	15.9	2.2	44.6	28.7	44.5	28.6
Upper Nazareth Twp.	5,313	13.2	2.5	33.2	20.0	36.7	23.5
Walnutport	2,136	11.0	5.1	13.4	2.4	12.8	1.8
Washington Twp.	4,702	41.2	8.8	29.4	(11.8)	32.3	(8.9)
West Easton	1,170	2.8	2.4	7.3	4.5	7.2	4.4
Williams Twp.	5,709	58.9	10.3	35.7	(23.2)	33.5	(25.4)
Wilson	7,753	28.5	3.7	48.5	20.0	48.0	19.5
Wind Gap	2,827	33.9	12.0	17.7	(16.2)	17.6	(16.3)
NORTHAMPTON CO.	287,767	2,010.7	7.0	1,798.5	(212.2)	1,818.2	(192.5)
LEHIGH VALLEY	**618,200**	**4,482.8**	**7.3**	**3,863.8**	**(619.1)**	**3,877.9**	**(604.9)**

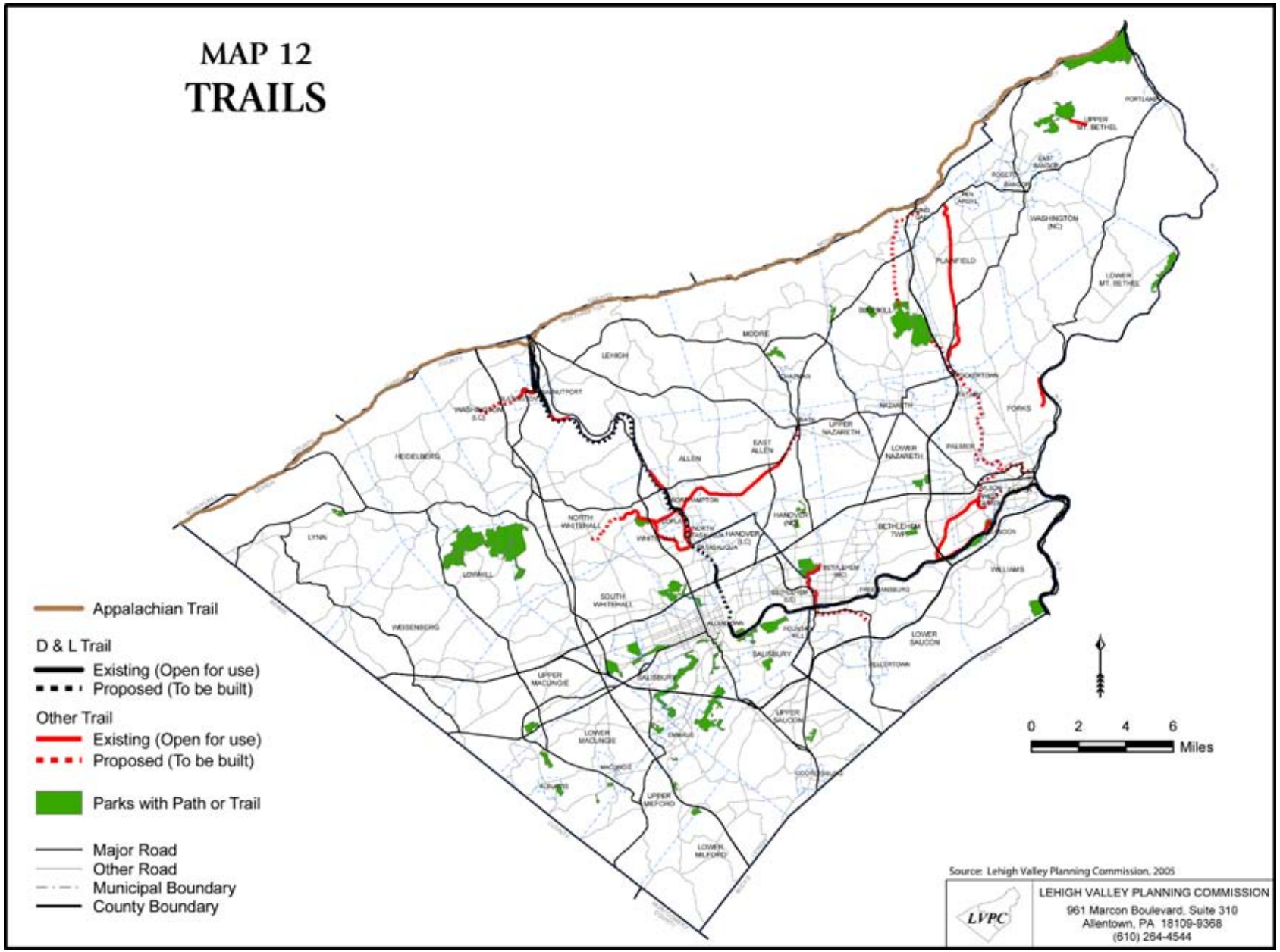
( ) = acreage surplus

(1) - July 1, 2005 U.S. Census Bureau Data.

(2) - Local/close-to-home space includes mini-parks, neighborhood parks/playgrounds, and community parks and is based on 2005 data.

(3) - Acreage need is based on the National Recreation and Park Association suggested minimum guideline of 6.25acres/1,000 population.

(4) - 2010 Acreage need is calculated using Lehigh Valley Planning Commission population forecasts.


MAP 12
TRAILS
Appalachian Trail
D & L Trail
Existing (Open for use)
Proposed (To be built)
Other Trail
Existing (Open for use)
Proposed (To be built)
Parks with Path or Trail
Major Road
Other Road
Municipal Boundary
County Boundary
0 2 4 6
Miles
Source: Lehigh Valley Planning Commission, 2005
LVPC
LEHIGH VALLEY PLANNING COMMISSION
961 Marcon Boulevard, Suite 310
Allentown, PA 18109-9368
(610) 264-4544

The NRPA classification system also accounts for regional space and space that may be local or regional and is unique to each community. This regional space includes areas of natural or scenic value that is utilized for outdoor recreation such as picnicking, fishing and swimming. It also includes areas designated for nature oriented outdoor recreation such as nature study. These areas generally have 80% of the land mass reserved for conservation with the remaining acreage used for recreation. In 2005, the Lehigh Valley had over 4,700 (4.7 acres/1000) acres in regional parks; however, both counties were below the NRPA minimum suggested guideline of 15 acres of regional space per 1,000 persons. The two counties will need another 5,200 acres in regional parks by the year 2020 to meet the minimum guideline. Recent proposals by both counties would reduce the deficit by several thousand acres — acquisitions in the greater Minsi Lake Corridor and the development of Weaversville County Park in Northampton County along with the proposed use of the Trexler Nature Preserve as a multiuse park in Lehigh County.

Space defined by the NRPA to be unique to each community and may be used to meet local recreational needs includes linear parks, special use areas and conservancy lands. These lands include natural and built trails, privately owned conservatories, golf courses, and rod and gun clubs. The NRPA recognizes the unique nature of these recreation areas and does not specify service area, size or acreage standards. The Lehigh Valley has over 9,700 acres (approximately 4,500 acres in private ownership) of parks and other outdoor recreation lands designated as special use.

It was noted earlier that trails are the most important recreational feature associated with greenways. From rail-trails and canal towpaths to hiking trails and bikeways, the Lehigh Valley has over 148 miles of existing linear parks within its border (Map 12). Fifty-three of those miles are part of the nationally significant Appalachian Trail (AT). The AT is a 2,175-mile long footpath stretching from Maine to Georgia that runs the length of both counties along the Kittatinny Ridge and is the best known trail in the area. Another 31 miles of the existing trail system is found along the D&L Trail. The Delaware and Lehigh National Heritage Corridor, a State Heritage Park and National Heritage Corridor, is hard at work acquiring additional lands to complete the 165-mile footpath from Bristol Borough to Wilkes-Barre, Pennsylvania. A number of other trail projects are in different stages of planning or development, including:

- An extension of the Ironton Rail-Trail west to the village of Ironton in North Whitehall Township
- An extension of the Slate Heritage Trail west from Slatington Borough to the Village of Slatedale in Washington Township
- A rail-trail along the west side of Bushkill Creek in Palmer Township
- A rail-trail extension from the Bushkill Creek in the City of Easton to Jacobsburg Environmental Education Center in Palmer Township, Forks Township, Tatamy Borough, Stockertown Borough and Plainfield Township
- An extension of the Palmer-Bethlehem Bikeway in Wilson Borough and West Easton Borough
- A rail-trail from the Village of Cementon in Whitehall Township north along the west side of the Lehigh River to Carbon County (to be part of the D&L Trail)
- A 1.75-mile rail-trail, to be designated as the South Bethlehem Greenway, in the City of Bethlehem

The LVPC completed its first comprehensive inventory of parks and other outdoor recreation sites in 1970. The first major update to the inventory did not occur until 1989; however, since that time, the LVPC staff has been monitoring changes to the outdoor recreation sites inventory on a yearly basis. This report contains data, organized by ownership and classification, for each municipality throughout Lehigh and Northampton counties. The inventory is widely used by municipalities, counties and local land trusts in their land planning and acquisition strategies and will continue to be updated by the LVPC in the coming years.

Open Space

Open space can be characterized as publicly or privately owned, undeveloped (left in a natural state) land adding ecological, scenic or recreational value to an area. Typically the land contains significant natural, cultural or scenic features that warrant protection. Open space enhances a community's aesthetic character and quality of life. The need for open spaces increases as the communities of the Lehigh Valley continue to grow. Uncontrolled growth leads to limited open space and the depletion of the existing natural resources. Important natural areas should be preserved as part of parks and open space areas whenever possible.

Open Space Preservation

The largest contiguous areas of public open space in the Lehigh Valley include significant natural areas owned by the state, such as the Jacobsburg Environmental Education Center in Bushkill Township and various Pennsylvania State Gamelands throughout Lehigh and Northampton counties. Federal and state land holdings comprise 40% of the total outdoor recreation acreage in both counties. Over the years, Lehigh and Northampton counties have been diligent in their efforts to increase county owned park and open space acreages. Examples of their efforts include: the Trexler Nature Preserve acquisitions in Lehigh County which added considerable acreage to the State Gameland holdings in Lowhill and North Whitehall townships and the greater Minsi Lake Corridor acquisitions in Upper Mount Bethel Township by Northampton County. Additionally, both counties have adopted funding programs to further this effort, the Green Future Fund in Lehigh County and the 21st Century Open Space Initiative in Northampton County.

Jacobsburg Environmental Education Center

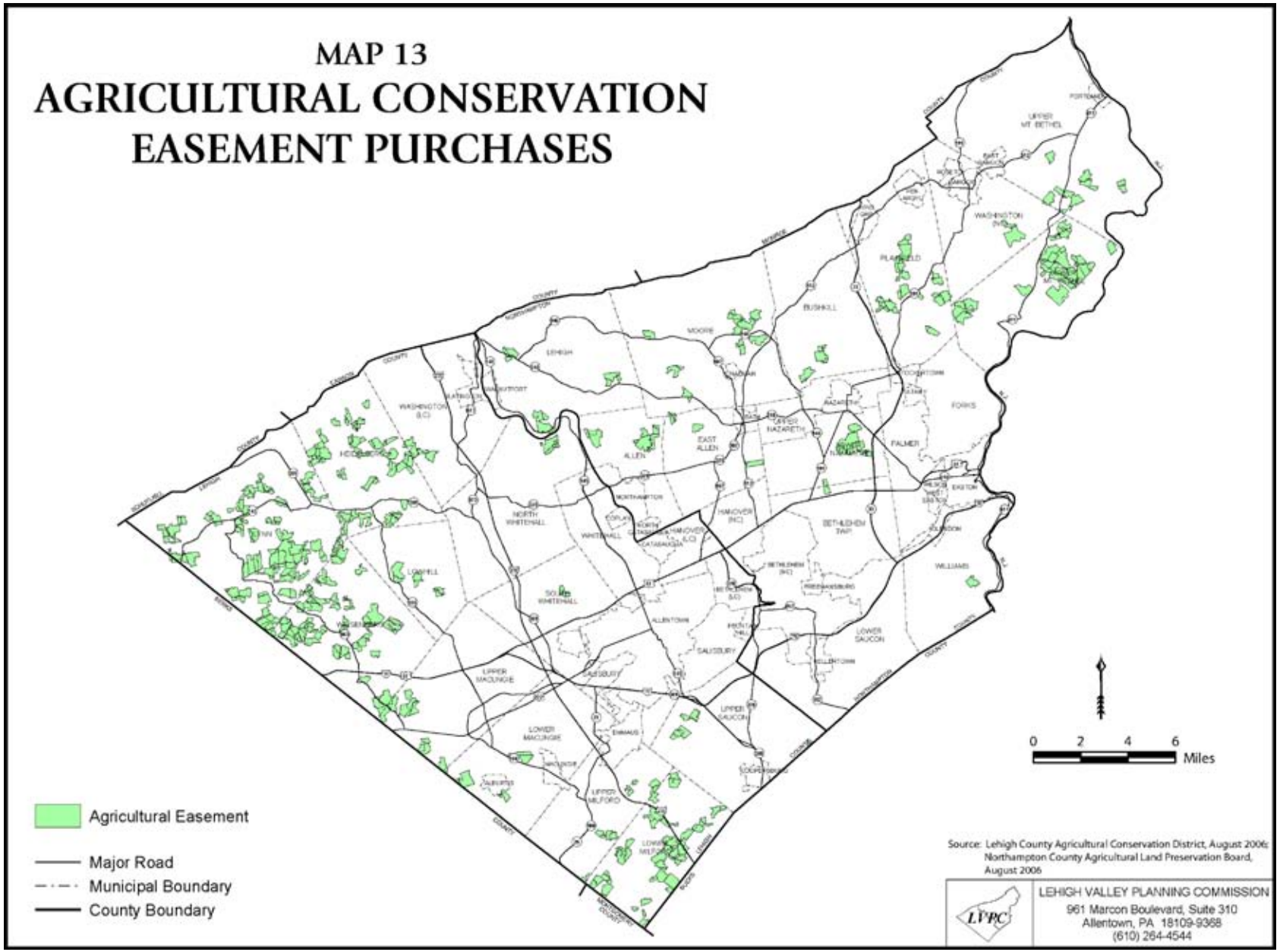
Agricultural Preservation

Lehigh and Northampton counties have some of the best farmland in Pennsylvania. Although farms are not natural landscapes, they can complement greenways by providing open space and adding to the pastoral scenery that residents treasure. In the Lehigh Valley, agricultural land is being converted to housing, commercial and industrial uses at a rate of four square miles per year. It is evident that most agricultural parts of the Lehigh Valley are under intense development pressure. The 1999 LVPC public opinion survey shows that over 90% of the voters favored preserving farmland. These voters have consistently and strongly supported open space and farmland preservation bond issues.

Farmland preservation efforts, focusing mainly on agricultural easement acquisition by the counties, in this region have been picking up momentum. An agricultural conservation easement is a legal restriction on development that limits the use of land to agricultural purposes. Under the agricultural easement program, the property owner sells rights to develop land for nonagricultural purposes to the county. The property owner continues to own the land and farm it. Lehigh County started acquiring easements on farms through the Agricultural Conservation Easement Program in 1991. Northampton County acquired its first agricultural conservation easements in 1993. As of August, 2006, 259 farms with a total of 24,125 acres (37 square miles) have been preserved in the two counties with assistance from the Pennsylvania Agricultural Conservation Easement Purchase Program (Map 13). The LVPC recommends the preservation of approximately 25% of the land in Lehigh and Northampton counties for agriculture. With only 20% of that goal accomplished, it is clear that the counties and municipalities have a long way to go if they intend to preserve a significant amount of land for agriculture in the future. Both Lehigh and Northampton counties have made a substantial financial commitment to continue these programs.

While the Pennsylvania Department of Agriculture is not as centrally involved in the greenway initiative as other state agencies, they support partnership opportunities through the Pennsylvania Greenways Program. Pennsylvania's farmland protection program is designed to "protect the agricultural economy of a community by protecting agricultural land from development." Pennsylvania's Agricultural Conservation Easement Program also helps local counties and municipalities to protect viable agricultural lands through the purchase of development rights on farm properties. Landowners within designated agricultural security areas can apply to sell perpetual conservation easements to the county where the land is located. Agricultural security areas have been designated in both counties on 93 square miles of land. In order to qualify for the agricultural easement program, land must be in an agricultural security area which is created under voluntary agreements between the property owner and the municipality.

Municipalities can preserve farmland through regulatory and stewardship approaches. For example, local zoning controls can exclude uses other than agriculture in rural areas. Additionally, the many farms that have woodlands or are located along streams contain important natural resources. Farmers can be encouraged or required to not plow land or raise livestock within a certain distance of streams. Wooded corridors along streams, unmowed grass inside swales, and woodland along slopes all contribute to the connectivity function of greenways.


MAP 13
AGRICULTURAL CONSERVATION EASEMENT PURCHASES
Agricultural Easement
Major Road
Municipal Boundary
County Boundary
0 2 4 6 Miles
Source: Lehigh County Agricultural Conservation District, August 2006; Northampton County Agricultural Land Preservation Board, August 2006
LVPC
LEHIGH VALLEY PLANNING COMMISSION
961 Marcon Boulevard, Suite 310
Allentown, PA 18109-9368
(610) 264-4544

The Lehigh Valley is experiencing a development boom that threatens to destroy much of what residents find appealing. The surrounding market areas of Philadelphia, New York and New Jersey exert strong economic, demographic, social and environmental impacts on the areas resources. The creation of a sound greenways network would help preserve many of the remaining features Lehigh Valley residents treasure.

The development of the Lehigh Valley Greenways Plan (Map 14, located in the pocket at the end of this document) involved many partners and groups that are involved in greenway and conservation efforts for some of the region's major waterways and natural areas. The LVPC worked closely with these entities to encourage the creation of greenway and trail linkages, the long-term preservation and protection of priority natural resources, and the enhancement and creation of natural, recreational, cultural, historical and scenic areas of interest in the Lehigh Valley.

Shochary Ridge — Lynn Township

Planning Process

The Lehigh Valley Planning Commission (LVPC) staff worked with the Study Advisory Committee, municipalities, counties and Pennsylvania Department of Conservation and Natural Resources (DCNR) to define a vision for the Lehigh Valley Greenway network. The purpose of this vision is to identify greenway components, provide connections and prioritize areas for implementation. Through public meetings, surveys, mapping exercises and hours of staff consultation, the *Lehigh Valley Greenways Plan* emerged. The following paragraphs detail the planning process from visioning through prioritization.

Envision the Greenways Network

As mentioned in the Introduction, the Study Advisory Committee (Committee) was created to provide insight and input into the planning process, comment on information and mapping developed by the Lehigh Valley Planning Commission (LVPC) staff, act as a resource for localized activities pertaining to open space and greenway planning, and suggest alternatives and make recommendations to the *Lehigh Valley Greenways Plan*. Four meetings were held in April, June, August, and October 2005; approximately 15 Committee members attended each meeting. The following is an overview of each of these meetings:

Meeting 1—April 20, 2005

Prior to the initial meeting, a packet of information was sent to all Committee members that included a contact list of Committee members and a draft document entitled "Lehigh Valley Greenways Plan, Background Information." For the meeting, several maps were posted for reference during the presentation of agenda items including: Important Natural Areas, Natural Resources Plan components, Floodplains and Environmental Zoning Overlays, Parks and Other Outdoor Recreation, Trails, and the *Two Rivers Area Greenway Plan*. Items presented during the meeting included an overview of background information, a status report on the responses to the Municipal Greenways Questionnaire, an overview of the *Comprehensive Plan The Lehigh Valley ... 2030* (Comprehensive Plan), and preliminary greenways report mapping. The LVPC staff requested input from the Committee on what should be included in a greenway and how would they prioritize the greenways. Comments and suggestions by the Committee included a wide range of topics from rail-trail issues and connectivity to the education of local officials and improvements to zoning. The Committee suggested the following topics for the next meeting agenda:

- Examples of zoning ordinances in the Lehigh Valley that effectively protect environmentally sensitive areas
- An identification and overview of threatened areas that conflict with current zoning

Meeting 2—June 22, 2005

Items presented during the second meeting included an update to the Municipal Greenways Questionnaire, an overview of the Natural Resources Plan section from the Comprehensive Plan, a review of municipal ordinances used by townships to protect riparian areas, steep slopes, wetlands, etc., the *Two Rivers Area Greenway Plan*, and the Bushkill Township Official Map. The Committee requested additional information about the:

- Draft *Comprehensive Recreation and Open Space Plan for Upper and Lower Saucon Townships*
- Proposed Macungie-Alburtis trail
- Proposed county greenways map from the *Allentown Parks and Recreation Master Plan*
- Proposed Forks Township recreation trail that uses a utility right-of-way
- Lower Mount Bethel Township Scenic Byway
- New steep slope zoning regulations from Williams Township
- Delaware River Greenway Partnership's Delaware River Water Trail
- Article IV (Official Map) of the *Pennsylvania Municipalities Planning Code*

Meeting 3—August 24, 2005

The LVPC staff presented a draft of the *Lehigh Valley Greenways Plan* map. After reviewing the map in detail, the Committee suggested the following edits and additions:

Edits

- Add existing parks and other outdoor recreation to the map
- Extend the northern reaches of the Plainfield Township Recreation Trail
- Change the Plainfield Township Recreation Trail corridor type from Cultural/Recreational to Multi-Use

Additions

- Allegheny Creek
- Cooks Creek headwaters
- East Branch Saucon Creek
- Fry's Run
- Leibert Creek
- Lyon Creek
- Mud Run
- School Creek
- West Branch Monocacy Creek

For the next meeting, the Committee wanted to review the edits and additions to draft map, discuss further the Official Map provisions of the *Pennsylvania Municipalities Code*, receive advice on habitat protection mechanisms, and discuss implementation measures.

Meeting 4—October 26, 2005

Prior to the final meeting, the following information was sent to the Committee members with the meeting notice: updated draft of the *Lehigh Valley Greenways Plan* map, draft prioritization ratings for the potential greenway corridors, the "Potential Greenway Ratings Methodology", hubs and spokes concept, and a document entitled *Lehigh River Crossing at Treichlers: A Possibility for Greenway Development*. Agenda items presented during the meeting included the draft prioritization ratings—methods and results, a discussion of hubs and their potential locations, and the Lehigh River Crossing at Treichlers proposal. The Committee had many additions to the interest group portion of the ratings process that gave the LVPC staff a more complete picture of greenway support in the two counties. Other suggestions regarding the greenways and hubs included combining the east and west Sobers Run, adding the Lehigh Gap as a hub, and adding several nodes to the existing list and map.

Inventory Existing Resources

The LVPC has acquired or developed many digital data sets over the years that were available to conduct an inventory of existing resources, both natural (e.g., woodlands, steep slopes, natural areas) and manmade (e.g., schools, historic sites, recreation facilities, population centers). A Geographic Information System (GIS) was a critical tool in preparing maps and analyzing data for this Plan. Many maps of the existing resources were produced to help the LVPC

staff and the Committee decide the location of the greenways network of hubs, nodes and corridors. The Natural Resources Plan from the *Comprehensive Plan The Lehigh Valley…2030* was a key data set used in the mapping, because the data used to develop the Natural Resources Plan (Map 9) included data that would be used in greenway planning (e.g., floodplains, steep slopes, water quality, natural areas and woodlands). Focus was given toward areas in the two counties where the two highest conservation priority values were predominant. Additional data used in these maps included an extensive park inventory, historical resources and base map data (i.e., municipal boundaries, major roads and hydrography).

Identify Greenway Components

Using the maps of existing resources for the two counties, the LVPC and the Committee were able to identify areas that should be included in the greenways network of hubs, nodes and corridors.

Hubs

Hubs, which are large centers of activity, were evident on the maps produced with the GIS. The centers of activity identified ranged from communities (our cities and boroughs) to large recreational facilities and extensive natural areas. Following is a detailed description of each of the eight hubs identified:

City of Allentown

Allentown is home to 106,000 residents who enjoy the abundance of nightlife, art, culture and history that the City provides. Commonly referred to as a "city in a park," Allentown boasts over 1,500 acres of outdoor recreation land. Additionally, the ridge tops of Lehigh and South Mountains form a beautiful backdrop from many vantage points throughout the city. Its location along the Lehigh River and the arrival of the Lehigh Canal and railroad that once made Allentown an industrial center now adds to the experience that makes this city a destination.

City of Bethlehem

Located directly to the east of Allentown, the City of Bethlehem spans both Lehigh and Northampton counties. The City of 71,000 is well known for its colonial and industrial heritage. Since the first Moravian settlement along the banks of the Lehigh River in 1742, Bethlehem has enticed visitors from around the world to experience the "Christmas City." The Lehigh River also helped shape the industrial heritage that is still present today. The Bethlehem Steel complex covers thousands of acres throughout the City and serves as a reminder of the once booming local steel industry that ended in 1995.

City of Easton

Situated at the confluence of the Lehigh and Delaware rivers, the City of Easton prospered as a center of industry, manufacturing and commerce for hundreds of years. Today, 26,000 people call Easton home and enjoy many of its cultural attractions. The heart of the Delaware and Lehigh National Heritage Corridor, a nationally significant corridor that includes 165 miles of America's history spanning five Pennsylvania counties, is located in Easton's Hugh Moore Park where the Corridor's office is found.

Coplay/Northampton Boroughs

Four greenway corridors converge at the county line in Coplay and Northampton boroughs. Together the boroughs have nearly 13,000 residents and over 120 acres of outdoor recreation areas. Including historical interpretation opportunities along the Lehigh Canal, the story of the Portland Cement industry is told in Coplay at the cement kilns of Saylor Park.

Slatington/Walnutport Boroughs

Containing approximately five miles of the D&L, Slate Heritage and Lehigh Canal trails, these boroughs are rich with history. In addition to canal locks, an interpretative towpath and the Slatington Historic District, this hub is home to the restored 1829 Lock Tender's House museum that holds an impressive collection of early 19th century artifacts.

Trexler Nature Preserve/Pennsylvania State Game Lands

The collection of open space created by the Trexler Nature Preserve, State Game Lands No. 205, and adjacent Lehigh County land holdings creates over 2,800 acres of wildlife habitat and natural areas that are unmatched anywhere else in the Lehigh Valley. Conveyed to Lehigh County by the philanthropic General Harry C. Trexler, the Trexler Nature Preserve provides a "safe, public space that fosters an understanding of man's relationship with and impact upon the natural environment."

Jacobsburg Environmental Education Center/Jacobsburg Historic District

Located along the Bushkill Creek Corridor, the Jacobsburg Hub provides visitors opportunities to relax and recreate and provides habitat for wildlife. Jacobsburg Environmental Education Center (EEC) offers over 1,100 acres of natural land to explore and discover. The EEC provides environmental education programming for students of all ages and promotes an awareness of the natural environment. The

Jacobsburg Historic District lies almost entirely within the park and offers scenic hikes and historical interpretation opportunities along many multiuse trails.

Delaware Water Gap National Recreation Area

The Delaware Water Gap National Recreation Area is 35 miles long from north to south and the southernmost tip sits in Northampton County. The Water Gap provides hundreds of recreational opportunities and is also home to hundreds of black bear. Originally established as an outdoor recreation facility, the area is rich with history and culture, too. The abundance of recreational, cultural, historical and wildlife habitat benefits provided by the Delaware Water Gap is unparalleled by any other recreation facility in the region.

Nodes

Nodes exist where there are natural, recreational, cultural and historical places of interest, origin or destination. Nodes differ from hubs in that they are smaller destinations and typically contain only one facility in addition to the greenway it enhances. Many of the Lehigh Valley's well known parks, outdoor recreation areas, and historical sites are nodes, as well as acres of natural areas and open spaces that provide critical wildlife habitat. The following list of 63 nodes were identified for this plan, however many more places of interest exist throughout the greenway network for all to enjoy.

GREENWAY NODES BY MUNICIPALITY				
COUNTY	**MUNICIPALITY**	**GREENWAY**	**NODE**	**HUB**
Lehigh	Alburtis Borough	Macungie-Alburtis Trail	Lock Ridge Park and Furnace Museum	
	Allentown City	Cedar Creek	Cedar Creek Parkway Trexler Memorial Park	
		Jordan Creek	Jordan Park	
		Lehigh River	D&L Trail Keck Park	Allentown Allentown
		Little Lehigh Creek	Fountain Park Little Lehigh Parkway	Allentown
		Pennsylvania Highlands	Lehigh Uplands Preserve	Allentown
	Bethlehem City	Lehigh River	D&L Trail	Bethlehem
		Monocacy Creek	Central Bethlehem Historic District	Bethlehem
	Catasauqua Borough	Lehigh River	Lehigh Canal Park	
	Coplay Borough	Ironton Rail-Trail	Coplay Parkway Keefer Field Saylor Park Cement Industry Museum	Coplay/Northampton Coplay/Northampton Coplay/Northampton
	Emmaus Borough	Leibert Creek	Emmaus Community Park	
	Hanover Township	Lehigh River	Canal Park	
	Heidelberg Township	Jordan Creek	Conrad Raker Wildlife Reserve	
	Lower Macungie Township	Little Lehigh Creek	Lower Macungie Community Park Pool Wildlife Sanctuary	
	Lynn Township	Blue Mountain	Leaser Lake	
		Ontelaunee Creek	Ontelaunee Park	
	Macungie Borough	Macungie-Alburtis Trail	Memorial Park	
	North Whitehall Township	Lehigh River	D&L Trail	
	Salisbury Township	Pennsylvania Highlands	Lehigh Uplands Preserve/Walking Purchase Park South Mountain Preserve	
	Slatington Borough	Lehigh River	D&L Trail	Slatington/Walnutport
		Slate Heritage Trail	Kern's Mill Park Slatington Historic District	Slatington/Walnutport Slatington/Walnutport
	South Whitehall Township	Cedar Creek	Dorney Park	
		Jordan Creek	Covered Bridge Park Jordan Creek Parkway	
	Upper Saucon Township	Pennsylvania Highlands	South Mountain Big Rock Park/ Scholl Woodlands Preserve	
		Saucon Creek	Stabler Center	
	Washington Township	Blue Mountain	Lehigh Gap Wildlife Refuge	
	Whitehall Township	Ironton Rail-Trail	Whitehall Parkway	
		Jordan Creek	Jordan Creek Parkway	
Northampton	Allen Township	Hokendauqua Creek	Confluence of Indian and Hokendauqua Creeks	
		Indian Creek	Confluence of Indian and Hokendauqua Creeks	
		Nor-Bath Trail	Weaversville County Park	

GREENWAY NODES BY MUNICIPALITY (cont'd)				
COUNTY	**MUNICIPALITY**	**GREENWAY**	**NODE**	**HUB**
Northampton (cont'd)	Bethlehem City	Lehigh River	D&L Trail	
		Monocacy Creek	Central Bethlehem Historic District Monocacy Complex	Bethlehem
		Saucon Creek	Saucon Park	
		South Bethlehem Greenway	South Bethlehem Downtown Historic District	Bethlehem
	Bethlehem Township	Lehigh River	D&L Trail	
		Monocacy Creek	Archibald Johnston Conservation Area	
	Bushkill Township	Bushkill Creek Corridor	Graver Arboretum Jacobsburg Historic District	Jacobsburg E.E.C.
	East Allen Township	Nor-Bath Trail	Bicentennial Park	
	Easton	Delaware River	College Hill Residential Historic District Delaware Canal State Park Easton Historic District	Easton
		Lehigh River	Hugh Moore Historical Park	Easton
	Freemansburg Borough	Lehigh River	Lehigh Canal Park	
	Glendon Borough	Lehigh River	Hugh Moore Historical Park	
	Hanover Township	Monocacy Creek	Monocacy Complex	
	Hellertown Borough	Saucon Creek	Water Street Park/Grist Mill Park	
	Lehigh Township	Blue Mountain	Lehigh Gap Wildlife Refuge	
	Lower Mount Bethel Township	Delaware River	PPL Martins Creek Environmental Preserve	
	Lower Nazareth Township	Monocacy Creek	Dutch Springs	
	Lower Saucon Township	Pennsylvania Highlands	Hellertown Reservoirs South Mountain Park	
	Northampton Borough	Lehigh River Nor-Bath Trail	Canal Street Park Nor-Bath Trail Access	Coplay/Northampton Coplay/Northampton
	Palmer Township	Bushkill Creek Corridor	Hackett Park	
		Lehigh River	Riverview Park	
		Palmer-Bethlehem Bikeway	Riverview Park	
	Plainfield Township	Bushkill Creek Corridor	Gall Farm	
	Upper Mount Bethel Township	Allegheny Creek	Mount Jack	
		Blue Mountain	Appalachian Trail Access	Delaware Water Gap
		Delaware River	Mount Jack	
		Greater Minsi Lake Corridor	Minsi Lake	Delaware Water Gap
		Jacoby Creek	Mount Bethel Fens	
	Walnutport Borough	Lehigh River	Lehigh Canal Park	Slatington/Walnutport
	Williams Township	Delaware River	Delaware Canal State Park Mariton Wildlife Sanctuary	
		Pennsylvania Highlands	Mariton Wildlife Sanctuary Hexenkopf Rock	
	Wilson Borough	Palmer-Bethlehem Bikeway	Hackett Park	

Corridors

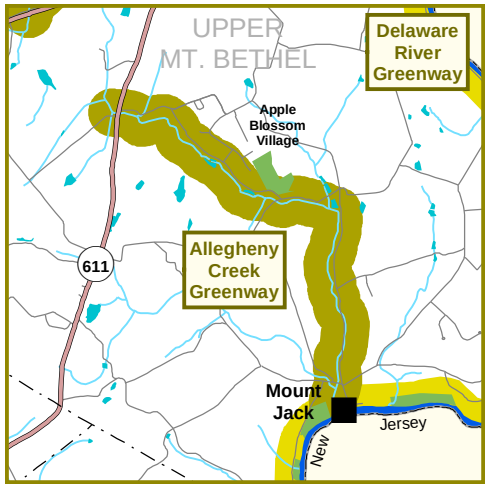
Corridors are linear connecting elements that act as linkages between the hubs and nodes and communities of the region. After several revisions of the corridor list by the Study Advisory Committee and LVPC staff, 31 greenway corridors were identified. Based on citizen, county and municipal input, these corridors were selected to provide connections to interesting destination points and attractions, increase recreational and tourism opportunities, and to provide connections from population centers to recreation and community facilities. Additionally, this plan aims to provide greenway corridors that serve to preserve open space and protect high priority natural resources while maintaining and enhancing the overall Lehigh Valley experience.

The majority of the corridors identified in this plan were riparian areas along streams and rivers, with the remaining corridors being ridgelines, collections of ridgetops, and significant natural areas. Each proposed corridor was then categorized as one of the following types: Cultural/Recreational, Conservation, Multi-Use and Scenic. The Scenic type was added as an overlay to two locally significant greenway corridors (Blue Mountain/Kittatinny Ridge and Pennsylvania Highlands greenway corridors) that offer remarkable panoramas along the northern and southern boundaries of the Lehigh Valley. Several of the corridors fell into more than one category based on the attributes present along each segment. This list provides the category assignments for each corridor described on the following pages:

Cultural/Recreational	Conservation	Multi-Use	Multi-Use and Conservation
Ironton Rail-Trail	Allegheny Creek	Blue Mountain/Kittatinny Ridge (Scenic)	Bushkill Creek Corridor
Macungie-Alburtis Trail	Bertsch Creek	Cedar Creek	Jordan Creek
Nor-Bath Trail	Cooks Creek	Delaware River	Little Lehigh Creek
Palmer-Bethlehem Bikeway	East Branch Saucon Creek	Greater Minsi Lake Corridor	Monocacy Creek
South Bethlehem Greenway	Fry's Run	Lehigh River	Saucon Creek
	Hokendauqua Creek		Slate Heritage Trail/Trout Creek
	Indian Creek		
	Jacoby Creek		
	Leibert Creek		
	Lyon Creek		
	Martins Creek		
	Mud Run		
	Ontelaunee Creek		
	Pennsylvania Highlands (Scenic)		
	Shochary Ridge		

Note: *The inset maps on the following pages are extracted from Map 14 located in the pocket at the end of this document. These maps show the corridors in greater detail and provide additional labels not found on Map 14.*

Allegheny Creek Greenway

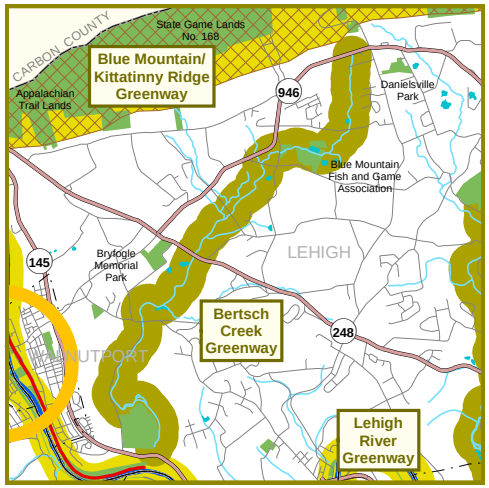


Type: conservation greenway
Length: 4 miles

Allegheny Creek is located entirely within Upper Mt. Bethel Township, Northampton County. This conservation greenway begins near the creek's headwaters southwest of the intersection of PA routes 611 and 512 and ends at the Village of Hartzells Ferry where the Allegheny Creek enters the Delaware River. Much of the stream valley is wooded with adjacent lands primarily in agriculture with a scattering of rural residential development.

The greenway contains one identified natural area; the report *A Natural Areas Inventory of Lehigh and Northampton Counties, Pennsylvania* lists the Mount Jack Limestone Outcrop as one of the most important natural areas in Northampton County. The site is located on the bluff overlooking the Delaware River and is part of Northampton County's Mt. Jack property. Mount Jack currently serves as open space and is not used for recreation. This tract and the surrounding area have potential for a riverfront park in an area where public access to the Delaware River is limited. The only other recreation facility near the greenway is Apple Blossom Village, a privately owned, open to the public, sports and recreation complex that includes miniature golf, a golf driving range and batting cages.

Bertsch Creek Greenway

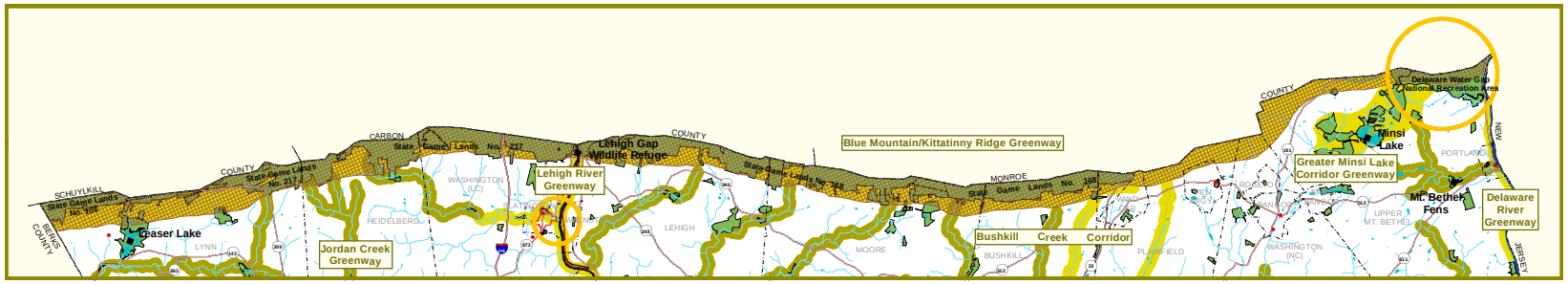


Type: conservation greenway
Length: 6 miles

Bertsch Creek is located entirely within Lehigh Township, Northampton County. This conservation greenway extends from the Lehigh River northeast to the base of the Blue Mountain. Most of the stream valley is wooded with the adjoining landscape in agriculture or rural residential development.

The greenway contains one identified natural area; the Bertsch Creek Seep is a seep fed tributary to the creek that supports a population of rare plant species. The greenway's primary function is to establish a conservation corridor between the Lehigh River and the extensive woodlands found along the Kittatinny Ridge, one of two sites in the region considered to have special significance because of its biological diversity.

Recreational opportunities along the Bertsch Creek Greenway include access to the Lehigh Canal Park trail which continues north into the Borough of Walnutport and the Blue Mountain Fish and Game Association lands which provide hunting opportunities when permitted by landowner.



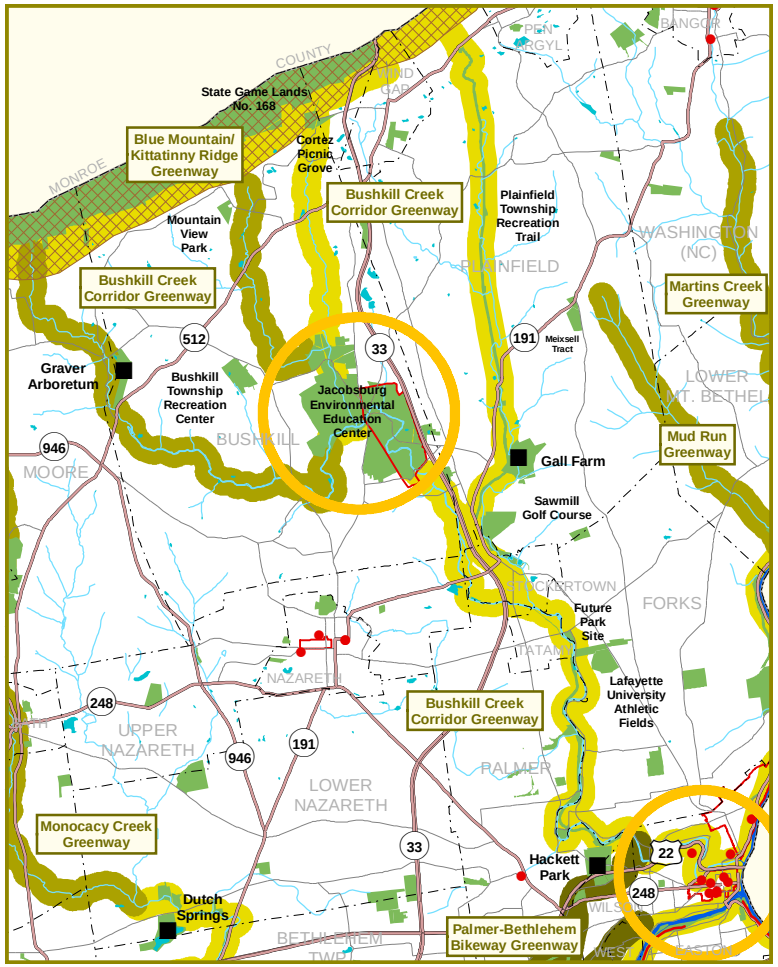
Type: multi-use and scenic greenway
Length: 46 miles

The Pennsylvania Department of Conservation and Natural Resources (DCNR) has identified the Kittatinny Ridge and the Appalachian National Scenic Trail (AT) as one of 34 major greenways in Pennsylvania. The Blue Mountain/Kittatinny Ridge Conservation Project is a collaborative effort organized by Pennsylvania Audubon that covers the entire 160-mile corridor through Pennsylvania and aims to draw public attention to the importance of the Kittatinny Ridge (known locally as the Blue Mountain). It has long been recognized as one of the major East Coast fall flyways for migrating raptors. The outcrops at Bake Oven Knob have been a major resource as a research station for collecting data on these migrations. Pennsylvania Audubon has designated the Blue Mountain as one of 81 Important Bird Areas (IBA) in Pennsylvania; to date, it is the only Important Bird Area in the Lehigh Valley.

The Nature Conservancy also identified the Blue Mountain as one of two exceptional natural features in the Lehigh Valley (the other is the Delaware River). Blue Mountain is the most extensive, relatively contiguous area of natural habitat in the two counties. It is also one of the major corridors for the movement of biota in eastern Pennsylvania. With its extensive forests, streams, seeps, vernal pools, rock outcrops and boulder fields, Blue Mountain is probably the wildest area remaining in southeastern Pennsylvania. Many other natural areas of statewide or local significance are found on Blue Mountain or at its base. An excellent example is Rismiller Woods in Bushkill Township; this unique natural area is known to have ephemeral natural pools of statewide conservation importance for wildlife.

Significant recreation areas along the Blue Mountain include over 10,000 acres of State Game Lands and the Delaware Water Gap National Recreation Area (1,200 acres) in Northampton County. The United States Government holds over 700 acres along the AT which provide hiking, nature study and sightseeing opportunities. Additional sites of recreational significance along this greenway include: Bears Rocks (Lynn Township), Lehigh Water Gap (Washington and Lehigh townships), and Totts Gap (Upper Mount Bethel Township). The Blue Mountain/Kittatinny Ridge Greenway connects with ten other greenways in Lehigh and Northampton counties making it a significant cultural, recreational and scenic resource worthy of further study and preservation.

Bushkill Creek Corridor Greenway



Type: conservation/proposed multi-use greenways
Length: 31 miles of combined corridor

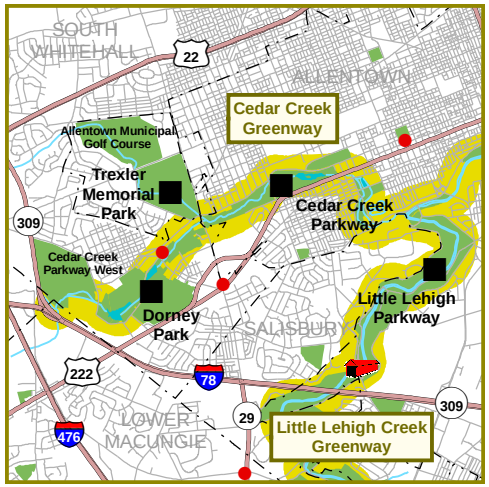
The Bushkill Creek Corridor extends from the Delaware River at Easton, north and west to the foot of the Blue Mountain in Moore, Bushkill and Plainfield townships. The Corridor includes Bushkill Creek, Little Bushkill Creek and both branches of the Sobers Run, all of which are designated as High Quality Waters by DEP.

The area through which the Bushkill flows from the City of Easton north to Stockertown Borough is mostly urbanized with minimal open space remaining in upper Forks Township and Tatamy Borough. Along this same stretch there is an abandoned railroad right-of-way along the west side of the Creek; this right-of-way will eventually become a rail-trail that connects the Palmer-Bethlehem Bikeway with the Plainfield Township Recreation Trail. North of Tatamy Borough the main stem branches off from the Little Bushkill and passes through an area of scattered farmland, woodland and residential development.

Important natural areas, identified in *A Natural Areas Inventory of Lehigh and Northampton Counties*, found in the Corridor include the Moorestown Wetland, Knechts Pools and Jacobsburg Environmental Education Center in Bushkill Township, and Easton Bluff and Binney and Smith Woods in the City of Easton. The Bushkill Creek Corridor establishes a connection between the Lehigh River and Kittatinny Ridge greenways.

The Bushkill Creek Corridor is a major part of the *Two Rivers Area Greenway Plan*. This plan, completed in January 2005 for the Two Rivers Area Council of Governments by Urban Research and Development Corporation, is the first of its kind to be accomplished in Lehigh and Northampton counties. The plan employs a comprehensive approach for the entire study area which consists of 17 municipalities within the Bushkill Creek watershed. The goals outlined in the plan reflect the input of numerous key individuals, including the Two Rivers Area Council of Governments and the Bushkill Stream Conservancy.

Cedar Creek Greenway

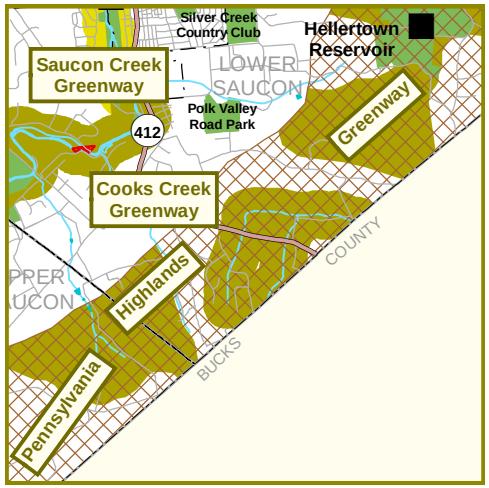


Type: multi-use greenway
Length: 4 miles

Cedar Creek is designated as a High Quality waterway that enters the Little Lehigh Creek west of the intersection of Martin Luther King Drive and 17th Street in Allentown. The stream extends west through the City of Allentown and South Whitehall Township to Schantz Springs, just west of Route 309.

The area through which this multi-use greenway flows is mostly urban and includes several large parks including Dorney Park and Wildwater Kingdom, Cedar Creek Parkway East/Cedar Creek Parkway West and the sports fields of Lehigh County in South Whitehall Township, and Trexler Memorial Park, Union Terrace and Cedar Creek Parkway in the City of Allentown. The Cedar Creek Parkway is an excellent recreation area that offers a variety of active and passive recreational opportunities including fishing, nature study, walking/jogging, bicycling, cross country skiing and picnicking.

Cooks Creek Greenway

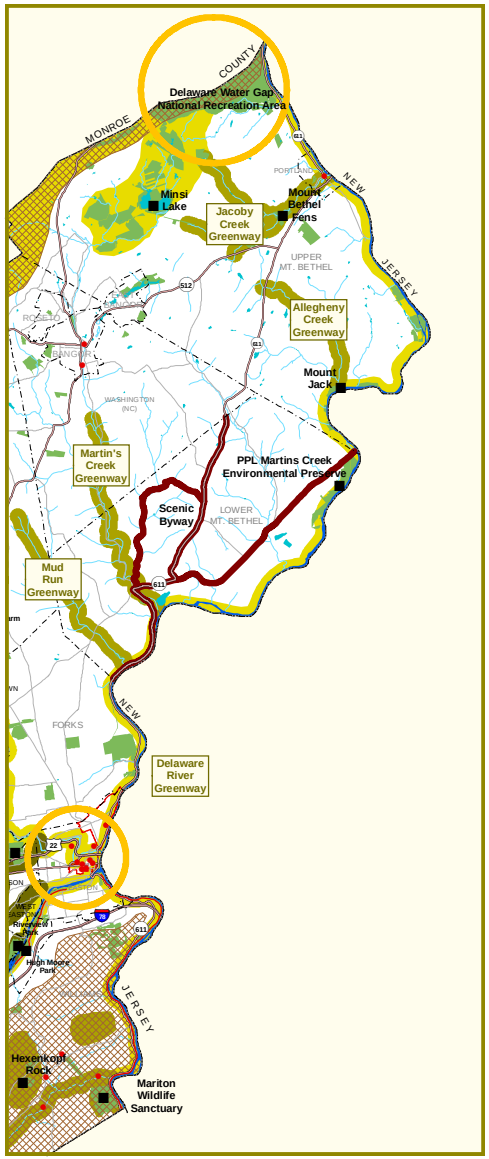


Type: conservation greenway
Length: 2 miles

This greenway, the Lehigh Valley's smallest, is located in Lower Saucon Township, Northampton County. The Cooks Creek Headwaters has regional significance when combined with the entire Cooks Creek watershed that is located in Bucks County. Adding to its significance, the Cooks Creek is one of only two streams (the other is Slateford Creek in Upper Mt. Bethel Township) in the Lehigh Valley that are rated as Exceptional Value Waters by the Pennsylvania Department of Environmental Protection. This designation constitutes about two percent of Pennsylvania's streams, provides unsurpassed environmental and aesthetic resources and promotes recreational and tourism opportunities.

The Cooks Creek Headwaters lie within the Springtown Marsh natural area and is part of the Pennsylvania Highlands conservation and scenic greenway corridor. Lower Saucon Township has targeted this significant natural resource for conservation in its 2005 *Mini Open Space Plan*. Goals set forth in the plan include the protection of Exceptional Value Waters through the protection of the headwater tributaries to Cooks Creek. The township has partnered with the Heritage Conservancy to begin preservation efforts in this priority conservation area. The first property funded by the Northampton County 21st Century Open Space Initiative was located in the Cooks Creek Greenway.

Delaware River Greenway



Type: multi-use greenway
Length: 35 miles

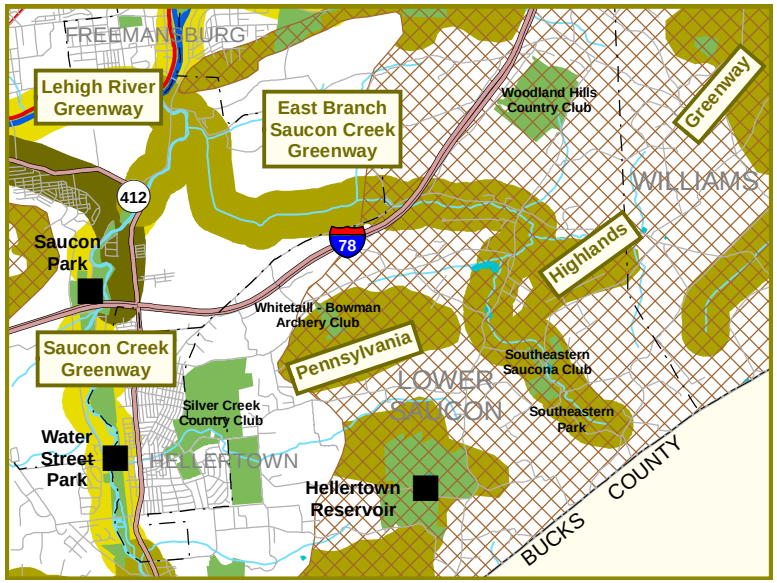
The Delaware River forms the boundary between and is a significant natural resource shared with New Jersey. The greenway extends the length of Northampton County from the Delaware Water Gap National Recreation Area in Upper Mt. Bethel Township beyond the Mariton Wildlife Sanctuary in Williams Township. The Pennsylvania Department of Conservation and Natural Resources (DCNR) has identified the Delaware River as one of 34 major greenway corridors in Pennsylvania. The Nature Conservancy has also identified the Delaware River as one of two exceptional natural features in the Lehigh Valley.

In 2000, the Lower Delaware River was designated a National Wild and Scenic River. The section of the river covered by the designation extends from the Delaware Water Gap south to Bristol Borough. The National Wild and Scenic River designation identifies selected rivers in the United States for possessing "outstandingly, remarkable scenic, recreational, geologic, fish and wildlife, historic, cultural, or other similar values." With the ultimate goal of maintaining the rivers character, designated rivers are to be preserved in their free-flowing condition and are not dammed or otherwise improved.

Between the Delaware Water Gap and the City of Easton, the Delaware River flows through a river valley that is primarily rural with a scattering of residential development, a small borough, Portland, and the villages of Riverton and Martins Creek. This section of the greenway is particularly scenic and includes portions of a designated Pennsylvania Scenic Byway Pennsylvania Route 611, Martins Creek — Belvidere Road and Little Creek Road in Lower Mt. Bethel Township. From the City of Easton south to the Northampton — Bucks County line, the area through which the greenway passes includes several small villages, the Delaware Canal, scattered residential and commercial development along Route 611 and wooded hillsides. In 1988, Governor Casey designated the entire length of Pennsylvania State Route 611 as the Delaware River Scenic Drive.

A significant feature of the Delaware River Greenway is the Delaware River portion of the Delaware and Lehigh Navigation Canal (D&L) which extends from Bucks County to the City of Easton, a distance of about 60 miles. Route 611 parallels the Canal for its entire length through Northampton County. The Delaware Canal/D&L Trail is part of the D&L National Heritage Corridor and State Heritage Park.

East Branch Saucon Creek Greenway

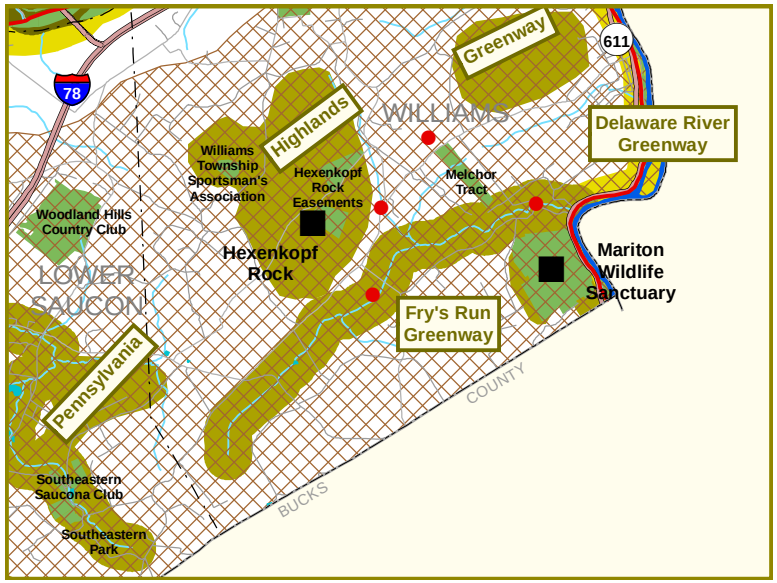


Type: conservation greenway
Length: 6 miles

The East Branch of the Saucon Creek enters Saucon Creek in the City of Bethlehem, several hundred yards before it empties into the Lehigh River. The headwaters of the East Branch Saucon Creek are located in Lower Saucon Township, not far from Southeastern Park at Wassergass Road and Crestline Drive. North of Interstate 78, the East Branch Saucon Creek Greenway flows through former Bethlehem Steel Company property. This section of the greenway offers minimal protection to the East Branch Saucon Creek; therefore, restoration of an adequate riparian buffer is strongly recommended. South of Interstate 78, much of the land along the greenway is heavily wooded with scattered rural residential development occurring throughout most of the area.

The upper reaches of the East Branch Saucon Creek conservation greenway include parts of the Granite Hill natural area and lie adjacent to sections of the Pennsylvania Highlands Greenway.

Fry's Run Greenway

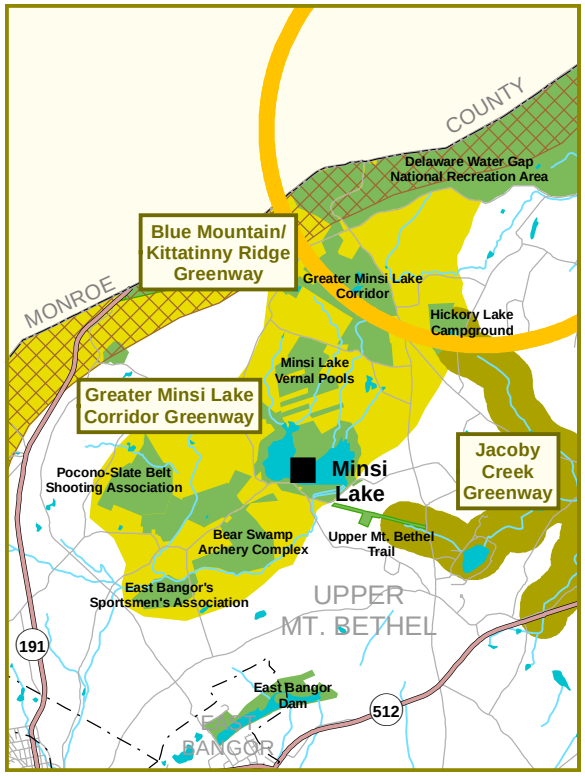


Type: conservation greenway
Length: 4 miles

This High Quality stream is located in the Stouts Valley which is entirely within Williams Township, Northampton County. It begins where Fry's Run empties into the Delaware River and extends upstream to the southwest corner of the Township. A substantial amount of residential development has taken place in the eastern portion of this conservation greenway; the remainder is nearly all in agriculture. Most of the farms in the Stouts Valley are part of the Township's Agricultural Security Area and are eligible for protection under the State's Agricultural Conservation Easement Program.

The Fry's Run Greenway connects with the Delaware River Greenway and parts of the Pennsylvania Highlands that include Hexenkopf Hill and the Mariton Wildlife Sanctuary.

Greater Minsi Lake Corridor Greenway

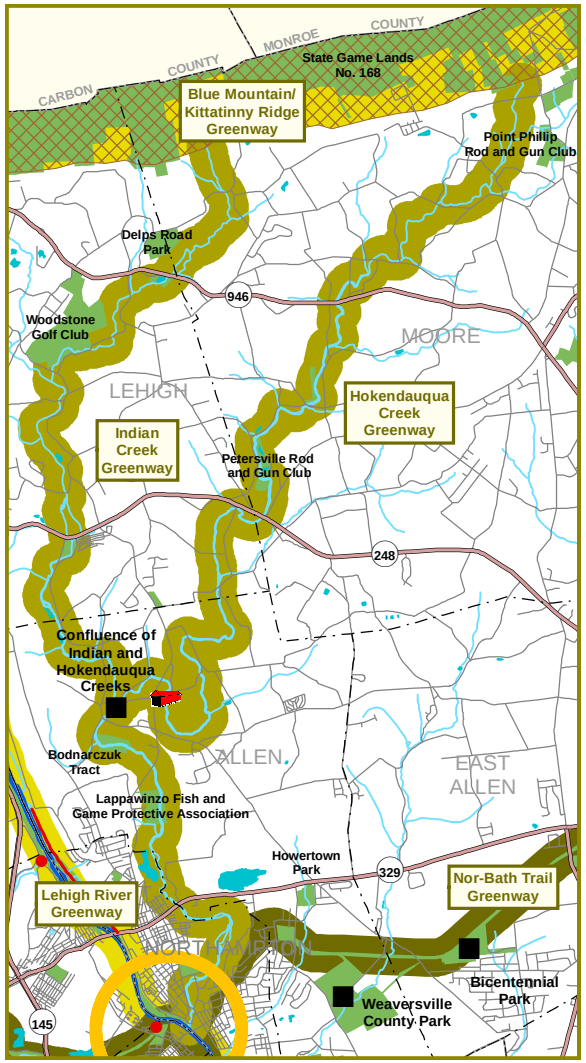


Type: multi-use greenway
Area: 3,200 acres

The Greater Minsi Lake Corridor is located entirely within Upper Mt. Bethel Township, Northampton County. This multi-use greenway extends from the base of the Blue Mountain southwest to Fox Gap Road. The Corridor is approximately 1.5 miles wide and is primarily woodland containing a variety of wetland microhabitats, including numerous vernal pools, springs and streams. The area has seen disturbance in the past from logging and the introduction of invasive species. Today, scattered residential development is beginning to occur along the roadways.

The Greater Minsi Lake Corridor includes many natural areas of statewide and local significance including two top priority sites, Bear Swamp and the Minsi Lake Vernal Pools. Although both areas have seen historical manipulation of the landscape, the swamp and vernal pools support a wide range of both plant and animal species. The greenway also boasts hundreds of acres of recreation land including well-known recreation areas like Minsi Lake, a 120-acre Pennsylvania Fish and Boat Commission lake that opened for public use in 1970 and is operated and maintained by Northampton County Department of Public Works, and the Bear Swamp Archery Complex, a 180 acre park reserve with hiking trails, wilderness and wetlands, archery complex and organized group camping. Other parks and outdoor recreation areas include: the Greater Minsi Lake Corridor lands, East Bangor Sportsmen's Association, Pocono-Slate Belt Shooting Association and Camp Charles. The greater Minsi Lake Corridor connects with the Jacoby Creek and Blue Mountain/Kittatinny Ridge greenways and shares recreation facilities such as the Delaware Water Gap National Recreation Area and Hickory Lake Campground.

Northampton County has focused acquisition efforts over the years on the corridor between Minsi Lake and the Delaware Water Gap National Recreation Area. As of 2006, over 500 acres had been acquired by the County with more pending. Aiding this initiative, The Nature Conservancy (TNC) acquired 115 acres of the Minsi Lake Vernal Pools natural area in 2001 and an additional 130 acres in 2006. TNC continues to acquire land and conservation easements throughout the Corridor. These acquisitions ensure protection of the many important natural resources present in the Minsi Lake watershed and beyond.



Hokendauqua Creek Greenway

Type: conservation greenway
Length: 16 miles

The Hokendauqua Creek begins at the base of the Blue Mountain and flows southwest to join the Lehigh River in the Coplay/Northampton Hub just south of Canal Street where the Nor-Bath Trail and D&L Trail will juncture. The lower reaches of this stream pass through an urban environment of residential and industrial land uses in the Borough of Northampton and should be carefully monitored for degradation. Further upstream, this conservation greenway connects with the Indian Creek Greenway before it flows beneath the historic Kreidersville Covered Bridge, built in 1839, in northern Allen Township. Known for its history and serene setting, it is the only covered bridge left in Northampton County. The upper reaches of the greenway then pass through an area of mixed farmland and rural residential development before connecting with the Blue Mountain/Kittatinny Ridge Greenway. Despite the many agricultural fields throughout this corridor, there are few agricultural easements, and much of the riparian area remains wooded.

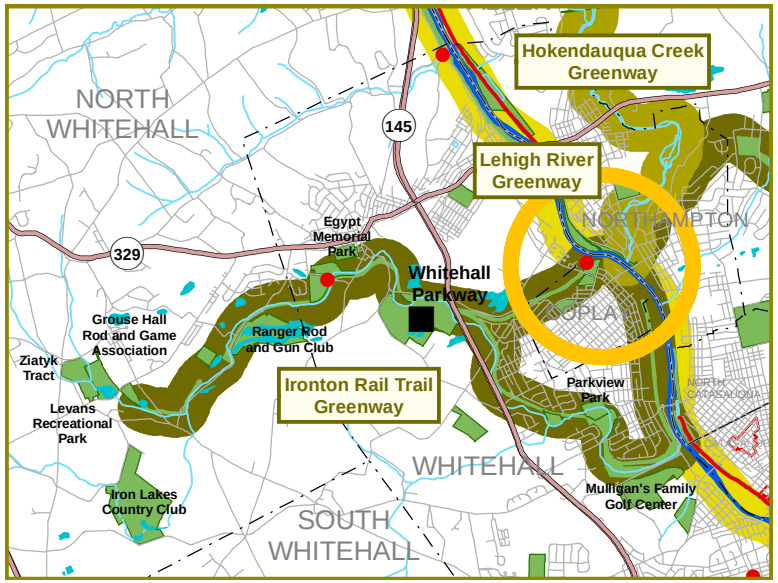
Significant parks and other outdoor recreation sites found in this greenway include: Canal Street Park in Northampton Borough, the Lappawinzo Fish and Game Protective Association lands, and the Bodnarczuk Tract Recreation Easement in Allen Township, and the Petersville and Point Philip Rod and Gun Clubs in Moore Township.

Indian Creek Greenway

Type: conservation greenway
Length: 8 miles

The headwaters of Indian Creek are in Lehigh Township, at the base of the Blue Mountain. Most riparian lands of the Indian Creek Greenway are wooded as the creek passes though a hilly terrain of mixed farmland and forest. Rural residential development is beginning to make a presence throughout this greenway, and efforts should be made to ensure the protection of this conservation corridor. Significant parks and other outdoor recreation sites found in this greenway include: the 200 acre Woodstone Golf Club and the 50 acre Delps Road Tract recently acquired by Lehigh Township for use as a municipal park.

Ironton Rail-Trail Greenway



Type: cultural/recreational greenway
Length: 9 miles

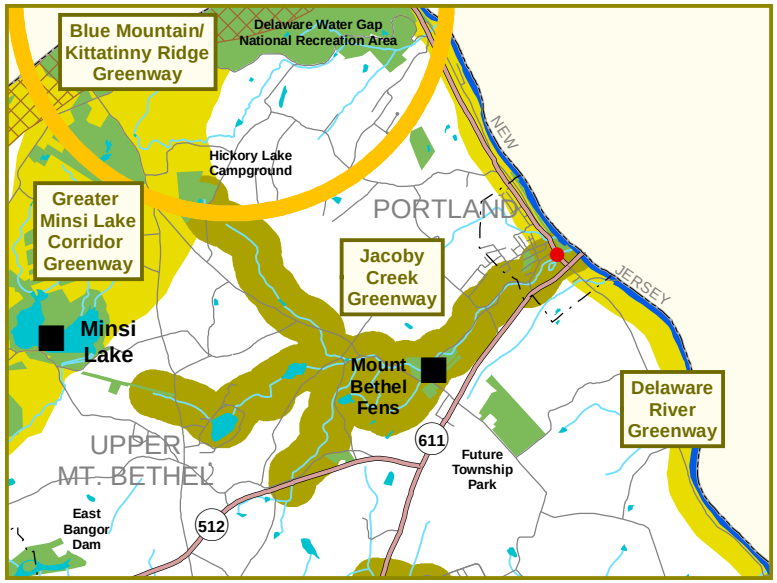
The Ironton Rail-Trail Greenway is an important cultural and recreational resource for the region. The corridor passes through a landscape that was shaped by the Lehigh Valley industrial boom. The presence of 19th century vertical cement kilns preserved at the Saylor Park Cement Industry Museum in the Borough of Coplay provides a direct link to the past. Another site of historic interest is the Troxell-Steckel House in Whitehall Township. This historic structure, built in 1756, is the region's only authentically complete Pennsylvania German farmhouse.

The most significant feature of this greenway is the Ironton Rail-Trail. Remnants of Lehigh Valley's industrial heritage lay scattered along the trail which uses the right-of-way of the former Ironton Railroad. The Ironton Railroad began in 1860 to transport coal, iron ore and limestone, but eventually the iron industry waned and the railroad owed its existence to shipping the products of the local cement industry. The line was officially abandoned in 1984. To preserve this important piece of history, Whitehall Township purchased the right-of-way in 1996. Developed by the municipalities of Whitehall Township, Coplay Borough and North Whitehall Township the Ironton Rail-Trail was the first rail-to-trail project in Lehigh County.

The 9.2 mile trail follows the Coplay Creek eastward from North Whitehall Township through the Whitehall Parkway to the Lehigh River. The trail then consists of a 5.5-mile loop that surrounds the Borough of Coplay and the Village of Hokendauqua before it reconnects with itself just before Route 145. Recognized as a regional spur of the Delaware and Lehigh National Heritage Corridor, the Ironton Rail-Trail is one of the most popular trails in the Lehigh Valley.

Connecting with the Lehigh River Greenway in the Coplay/Northampton Hub, this greenway provides access to many parks and other outdoor recreation areas including: Coplay Parkway and Saylor Field in the Borough of Coplay; Hokendauqua Park, Parkview Park, Millen Conservancy, Tate Meadows and the 110 acre Whitehall Parkway in Whitehall Township; and the Ranger Rod and Gun Club, Lehigh Valley Sporting Clays, Grouse Hall Rod and Game Association and the ballfields at the Township building in North Whitehall Township.

Jacoby Creek Greenway



Type: conservation greenway
Length: 8 miles

The Jacoby Creek Greenway is located entirely within Upper Mt. Bethel Township, Northampton County. The headwaters of the creek begin near the Hickory Lake Campground northeast of Minsi Lake and enter the Delaware River at the Borough of Portland. Much of the watershed is wooded; however, residential development is encroaching.

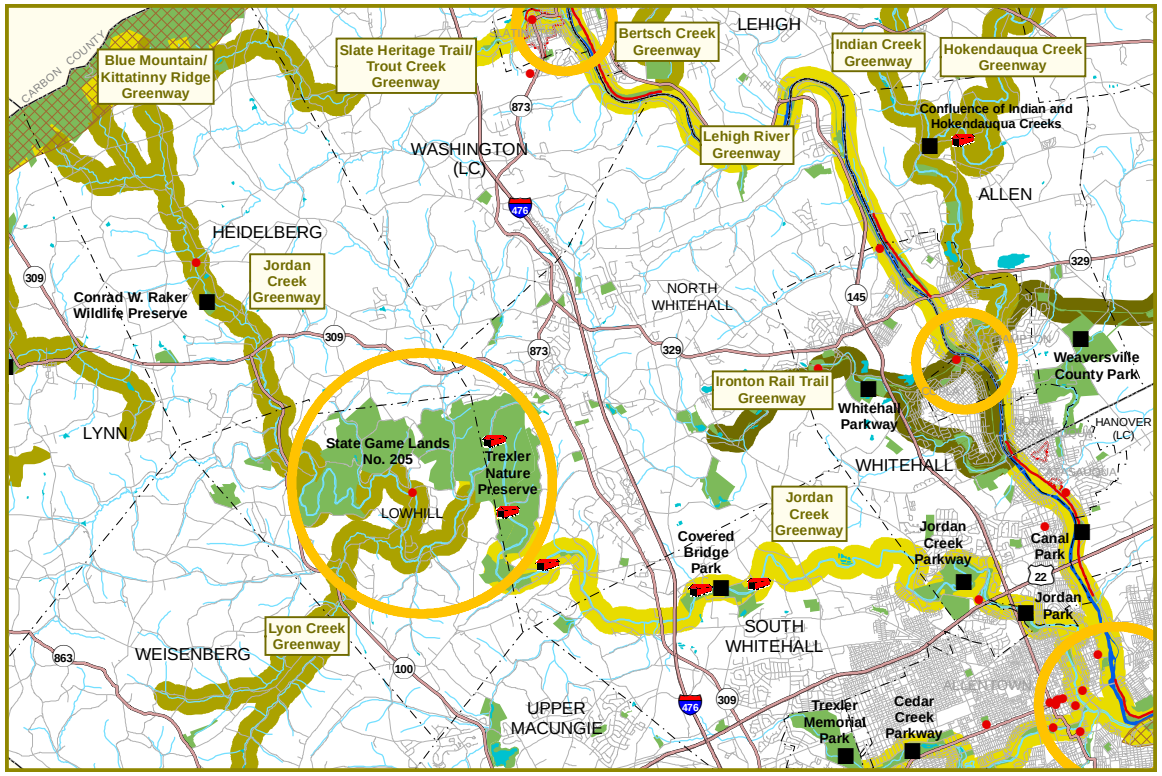
The Jacoby Creek Watershed contains the most important significant natural area in Lehigh and Northampton counties. The Mt. Bethel Fens are a complex of at least 10 rare wetland communities comprised of small calcareous fens and seeps (open meadowlike, permanently saturated wetlands), marshes and wooded swamps. Due to the combination of limestone and glaciation, this habitat is very rare, both in Pennsylvania and globally. To date, there are 15 rare plants, 3 rare animals and 2 rare mosses known to occur in the various fen communities. Offering more than just habitat for rare species, the fens also provide recreational opportunities such as bird watching, hunting and general open space for the enjoyment of all.

Jordan Creek Greenway

Type: conservation/multi-use greenway
Length: 37 miles

The Jordan Creek Greenway extends from the confluence of the Jordan Creek with the Little Lehigh Creek in the City of Allentown northwest through the heart of Lehigh County to the base of the Blue Mountain in Heidelberg Township. The area through which the creek flows in Allentown and Whitehall Township is highly urbanized with little to no protective buffer except where parkland occurs next to the stream. The area between Whitehall Township and the Trexler Nature Preserve in North Whitehall Township again is highly developed with a mixture of suburban development, farmland and scattered parkland. North of the State Game Lands, the greenway travels through two small villages and acres of agricultural land in Heidelberg Township. Most of this land is recommended for farmland preservation, and some of it is in an agricultural security area making it eligible for purchase under the State's Agricultural Conservation Easement Program.

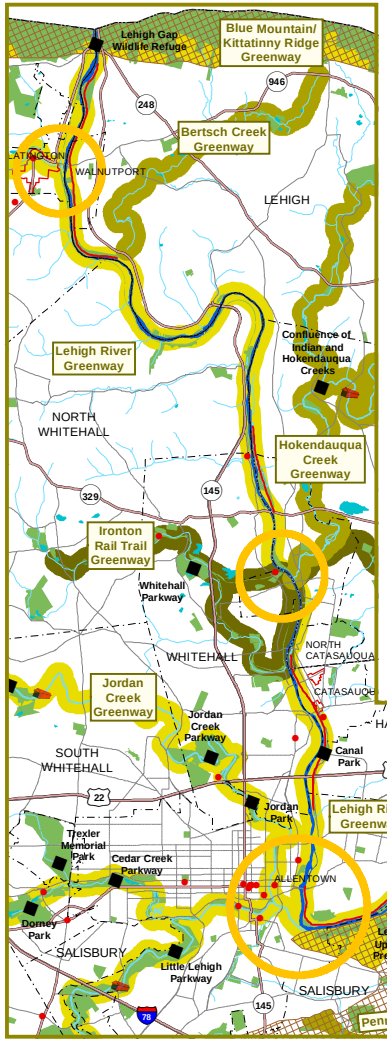
Important natural areas found in the Jordan Creek Greenway include: Helfrich Springs Cave in Whitehall Township, Trexler Hollow in North Whitehall and Lowhill townships, Jordan Creek Slopes/State Game Lands No. 205 in Lowhill Township, and Jordan Valley Marsh in Heidelberg Township. The Jordan Creek Greenway connects with the Little Lehigh Creek Greenway in the Allentown Hub, the Lyon Creek Greenway in Lowhill Township and the Blue Mountain/

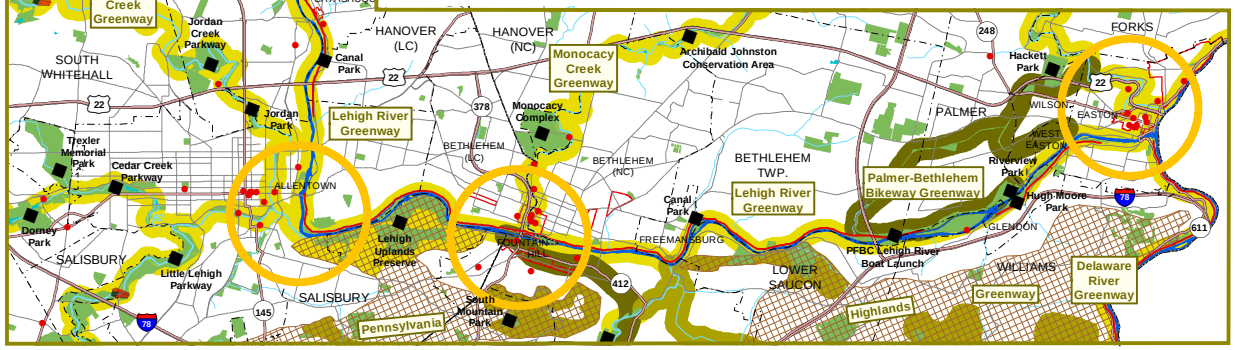


Kittatinny Ridge Greenway in Heidelberg Township. This conservation/multiuse greenway provides access to an impressive collection of parks and other outdoor recreation sites, totaling over 3,400 acres. Significant recreational resources include: Jordan Park in the City of Allentown; the Jordan Creek Parkway in Whitehall Township; Covered Bridge Park in North Whitehall Township; the Trexler Nature Preserve, county land adjacent to Trexler Nature Preserve and State Game Lands in Lowhill Township; and the Conrad W. Raker Biological Field Station and Wildlife Refuge in Heidelberg Township. Local history also makes a big presence in this greenway as it boasts five covered bridges and several other historic structures. The bridge that anchors the eastern end of South Whitehall Township's Covered Bridge Park is Manassas/Guth's Covered Bridge. It joins the Wehr's Covered Bridge as bookends to this diverse park along Jordan Creek. Geiger's and Schlicher's Covered Bridges also cross the Jordan within the Trexler Nature Preserve lands.

Lehigh County has made the acquisition of a large number of acres adjacent to the Trexler Nature Preserve a priority. In 2005, the County contracted with Wildlands Conservancy to conduct an ecological resource inventory and assessment specific to the 1,100 acres surrounding the zoo. Building upon the strong foundation of this inventory, the County later commissioned a master plan for the non-zoo portions of the park.

The Wildlands Conservancy has recently received grant monies to complete a feasibility study on the development of a trail along the Jordan Creek corridor connecting existing parks, game lands and greenways all while protecting significant open space. The Jordan Creek Greenway/Trail Feasibility Study will lead to the development of a 20-mile trail linking significant natural, recreational and cultural features within Lehigh County while providing recreational opportunities for the community and protection to the Jordan Creek.





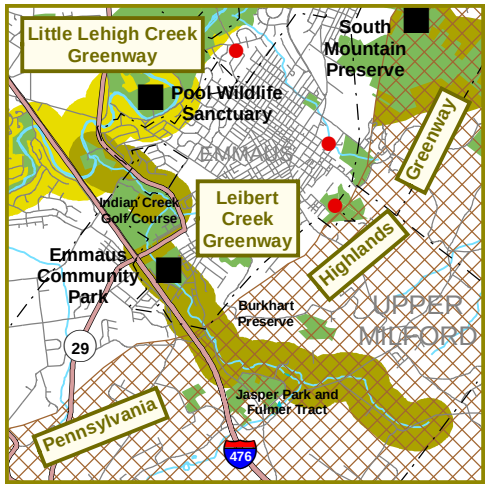
Type: multi-use greenway
Length: 36 miles

This greenway has the distinction of involving more municipalities (24) than any other greenway. The greenway extends from the confluence of the Lehigh and Delaware rivers in Easton upriver to the Lehigh Water Gap at the Carbon County line. This multi-use greenway passes through areas that are highly urbanized in the cities, boroughs and Whitehall Township, suburbanized in townships such as Palmer, and rural or semirural in the remaining. The DCNR has identified the Lehigh River as one of 34 major greenway corridors in Pennsylvania.

The D&L Canal, built in stages from 1817 to 1845, is a significant feature of this greenway. The Lehigh River portion of the canal extends from the City of Easton to Carbon County. In 1979, the U.S. Department of the Interior, Heritage Conservation and Recreation Service, completed the report *Lehigh Canal, An HCRS Project Report* to present recommendations regarding the canal study area as a cultural/recreation trail and suggests ways to implement that goal. The Lehigh River Greenway is part of the Delaware and Lehigh Navigation Canal National Heritage Corridor and State Heritage Park. A key element of the Corridor is the D&L Trail, which uses the Lehigh Canal towpath and abandoned railroad right-of-ways through the Lehigh and Northampton counties' portions of the Corridor.

Important natural areas include: Lehigh Water Gap, Walnutport Canal site, Rockdale Cliffs, Redington Cave, Island Park and the Steel City Slopes site. The Lehigh River Greenway makes a connection with 12 other greenways in the Lehigh Valley network. Additionally, many parks, private and public, are located within this greenway, including regionally significant parks such as: Hugh Moore Park, Riverview Park, Sand Island Park, Walking Purchase Park, Lehigh Uplands Preserve, Ironton Rail-Trail, Saylor Park Cement Industry Museum, Lehigh Gap Wildlife Refuge and Three Mile Boat Club lands. Most of the municipalities also have either a canal park or D&L Trail segments within their boundaries.

Leibert Creek Greenway



Type: conservation greenway
Length: 4 miles

Leibert Creek enters the Little Lehigh Creek in Lower Macungie Township, Lehigh County, at a point southwest of the intersection of Lower Macungie Road and Cedar Crest Boulevard (Route 29). The headwaters of Leibert Creek are found just east of the Village of Shimerville, Upper Milford Township. This stream valley experiences a mixture of urban development, woodlands, farmland and rural residential development.

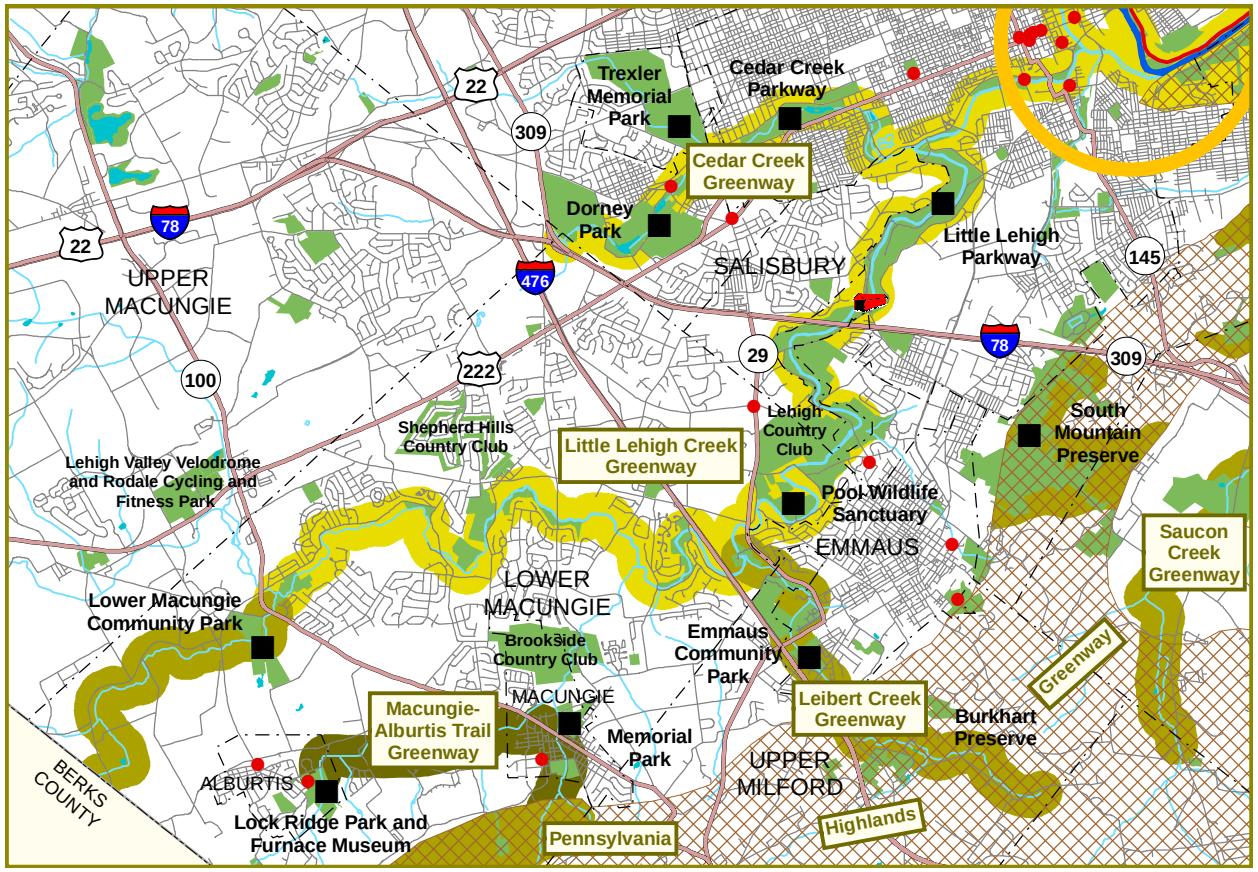
The Leibert Creek conservation greenway connects with the Little Lehigh Creek and the Pennsylvania Highlands greenways. Parks located within this corridor include: Emmaus Community Park, Indian Creek Golf Course, and the Fulmer Tract and adjacent Jasper Park. These facilities provide recreational activities such as nature study, field sports, basketball, tennis, golf and picnicking.

Little Lehigh Creek Greenway

Type: multi-use and conservation greenway
Length: 20 miles

The Little Lehigh Creek Greenway extends from where the Little Lehigh Creek enters the Lehigh River in the City of Allentown upriver through Lower Macungie Township and exits into Berks County. This multi-use and conservation greenway passes through an area that is highly urbanized in the City of Allentown and becomes suburban in Lower Macungie Township. Beyond Route 100, the corridor consists of a landscape that has remained rural. Agricultural conservation easements have been acquired on several large tracts at the western end of the greenway.

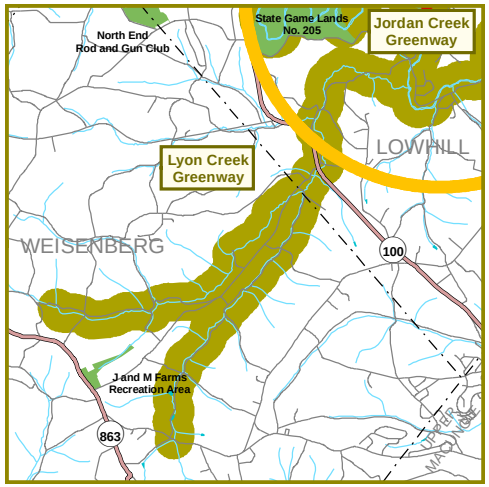
The only natural area of significance located in this greenway is East Texas-Little Lehigh Creek, which is located in Lower Macungie Township just east of the Village of East Texas. The Jungle, a natural area with high local significance, is located nearby on Spring Creek to the north. The Little Lehigh Creek watershed is an excellent natural, recreational and cultural resource for the Lehigh Valley. It supplies drinking water to approximately 137,000 people in the City of Allentown and surrounding areas. The Pennsylvania Department of Environmental Protection (DEP) classifies the Little Lehigh Creek as a High Quality waterway. However, current land uses are impacting the health of this stream and it requires remediation. The Alliance for the Little Lehigh Watershed is a grassroots effort established by the Wildlands Conservancy, the City of Allentown and DCNR's Growing Greener Initiative that aims to preserve, protect and enhance the environmental health of the Little Lehigh Creek watershed, through water quality monitoring, education, restoration and the formation of broad-based partnerships.



Wildlands Conservancy also completed a low-head dam removal and riparian buffer project on the Little Lehigh Creek at the Pool Wildlife Sanctuary in 2000. The objectives of this project were to improve water quality, improve aquatic habitat, provide educational opportunities and improve recreational resources, within the Little Lehigh Creek corridor. The Pennsylvania Fish and Boat Commission classifies the Little Lehigh Creek as a "Class-A Wild Trout Stream," supporting a naturally reproducing brown trout population. The Little Lehigh Creek is highly valued for its angling and other recreational opportunities. The Little Lehigh Creek is included on the PA Fish and Boat Commission's list of "Wild Trout Waters" in Pennsylvania.

The Little Lehigh Creek Greenway forms an excellent linear park in the City of Allentown and the Borough of Emmaus. The Little Lehigh Parkway has a covered bridge and walking trails along the creek and is well known for its fly fishing opportunities. This priority greenway connects with the Jordan Creek, Cedar Creek, Leibert Creek and Lehigh River greenways and offers many recreational and open space resources along its length. Parks and other outdoor recreation sites include: Little Lehigh Parkway, Lehigh Country Club, Pool Wildlife Sanctuary, Milbrook Farms Recreation Area, Danfield Run Passive Recreation Area, Winding Brook Manor Recreation Area, Bridle Path West Passive Recreation Area, and Lower Macungie Township Community Park.

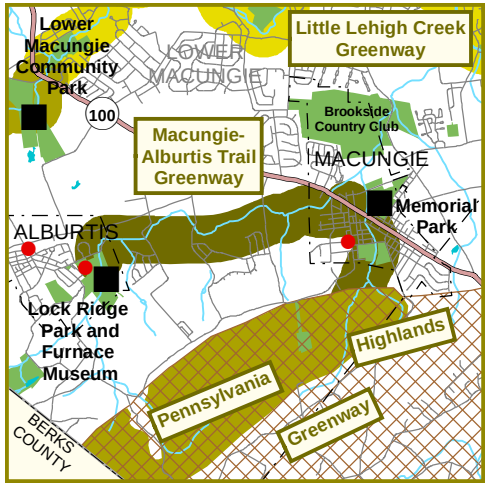
Lyon Creek Greenway



Type: conservation greenway
Length: 9 miles

The headwaters of Lyon Creek are located in Weisenberg Township, east of Route 863, and north of Interstate 78, the creek empties into the Jordan Creek just south of Game Preserve Road in Lowhill Township. This conservation greenway is mostly farmland with a scattering of woodlots and narrow, steep tributary valleys. Agricultural conservation easements have been purchased on several of the farms through which Lyon Creek flows, and many other farms are in the Weisenberg or Lowhill Agricultural Security Area and are eligible for acquisition. The Lyon Creek Greenway functions mainly as a conservation corridor and establishes a connection with the Jordan Creek Greenway. However, this corridor also provides the following passive recreational activities: nature study, bird watching and controlled hunting when permitted by landowner.

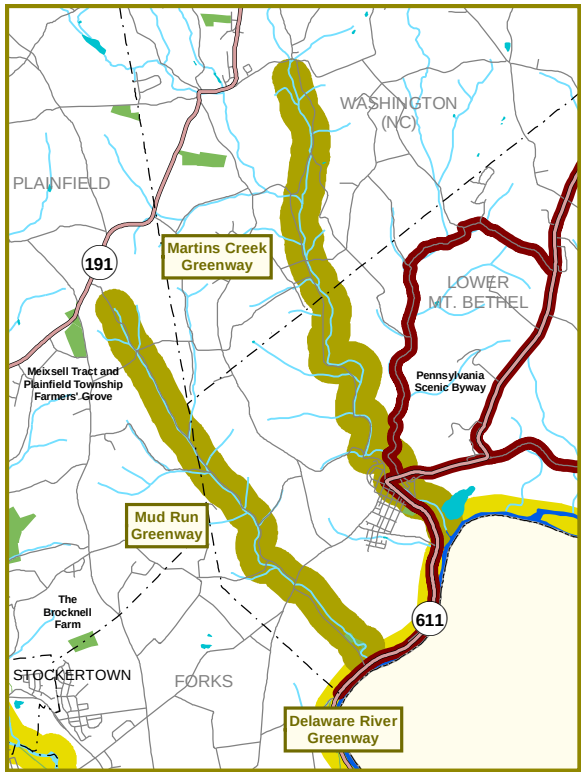
Macungie-Alburtis Trail Greenway



Type: cultural/recreational greenway
Length: 3 miles

This community trail network focuses on the area between the boroughs of Alburtis and Macungie. The two boroughs will eventually be connected by a trail on the south side of the railroad tracks, through the Hills at Lockridge subdivision in Lower Macungie Township. Several spur routes are also proposed, from Macungie Borough over the mountain to Sweetwood Drive and another along Alburtis Road and Route 100. This project was initiated by Macungie Borough and sponsored by Alburtis Borough, Lower Macungie Township, Emmaus Rotary Club and Mesko Sporting, Inc.

This greenway will eventually include an important natural area as a spur extends into the Macungie Watershed. The Macungie-Alburtis Trail Greenway connects with a portion of the Pennsylvania Highlands conservation greenway. Significant parks located within this corridor include the Lock Ridge Park and Furnace Museum in Alburtis Borough, and the Memorial and Kalmbach Memorial Parks in Macungie Borough.



Martins Creek Greenway

Type: conservation greenway
Length: 6 miles

The Martins Creek Greenway starts at the Delaware River, southeast of the Village of Martins Creek, Lower Mt. Bethel Township and extends north through Washington Township to the Village of Flicksville. Much of the landscape adjacent to the creek is woodland flanked by farmland. Scattered rural residential development is beginning to occur throughout the greenway.

The Martins Creek Greenway connects with the Delaware River Greenway and contains no parks or other outdoor recreation areas.

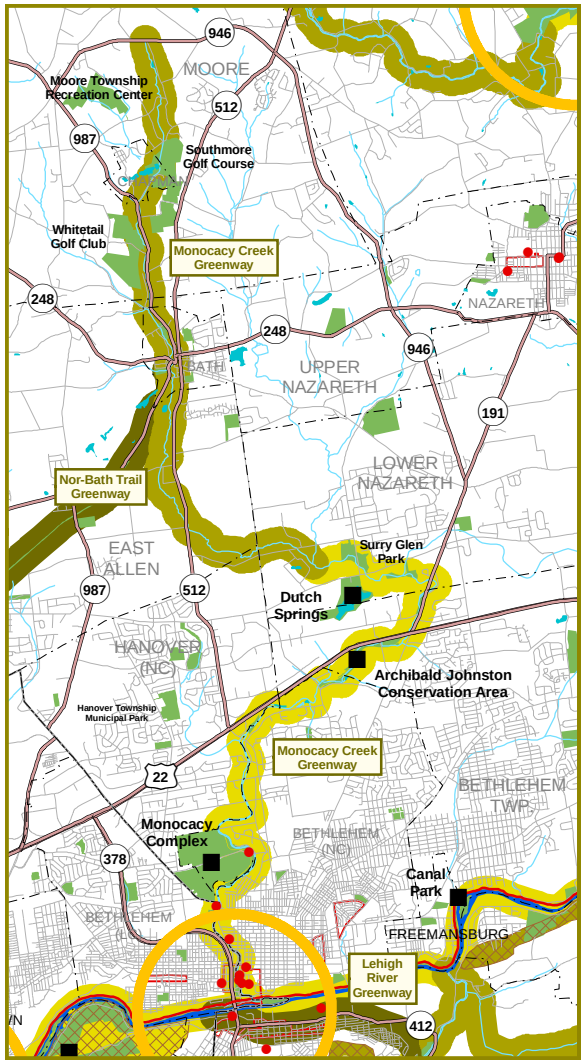
Mud Run Greenway

Type: conservation greenway
Length: 5 miles

This greenway begins where Mud Run meets the Delaware River at the Village of Sandt's Eddy in Lower Mt. Bethel Township. It extends northwest into Plainfield Township and ends just south of Route 191. Much of the stream valley is wooded, and the adjacent landscape is almost entirely in agricultural production. Several farms adjacent to Mud Run are in the State's Agricultural Conservation Easement Program, with a number of other farms in the Townships' Agricultural Security Area program. To date, there has been little rural residential development near the stream.

The Mud Run Greenway connects with the Delaware River Greenway at the Village of Sandt's Eddy and contains one outdoor recreation area, 12 acres of open space at Mud Run. This site is an unimproved natural area owned by Northampton County, just upstream from Route 611. Recreational activities that currently take place within the Martins Creek and Mud Run greenways include: fishing, nature study, bird watching, hiking and hunting when permitted by landowner.

Monocacy Creek Greenway



Type: multi-use and conservation greenway
Length: 18 miles

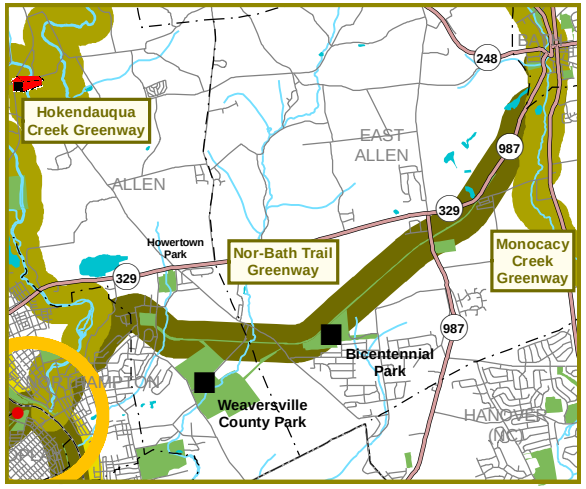
The Monocacy Creek Greenway extends from where the Creek enters the Lehigh River in the City of Bethlehem north to its headwaters near Route 946 in the slate belt. Land use in the area south of Route 22 and at Bath Borough is mostly urban. However, between Route 22 and the Borough of Bath, the Monocacy Creek meanders through mostly agricultural lands. North of Bath Borough, the creek valley is comprised of a mixture of hilly woodlands and scattered farmland.

The Monocacy Creek watershed encompasses 48.8 square miles in eastern Lehigh and western Northampton counties. Monocacy Creek, one of only 56 limestone streams in the state of Pennsylvania, is renowned for its ability to sustain a naturally reproducing trout population within the urban environment of the City of Bethlehem. An outstanding geologic formation known as Camel's Hump is critical to this ability and is essential to the Monocacy's classification as a High Quality waterway by DEP. Camel's Hump is a rocky outcrop that acts as an underground dam, forcing all of the ground water to the surface resulting in hundreds of small springs in an area called the Archibald Johnston Conservation Area.

Other significant parks and outdoor recreation areas exist along this greenway including: Sand Island Park, Burnside Plantation, Illick's Mill Park and Dutch Springs. The Monocacy Trail connects Sand Island Park along the Lehigh River with Illick's Mill Park. All these recreation areas offer a wide variety of active outdoor activities for residents and visitors such as walking/jogging, field sports, and swimming and a myriad of passive activities like fishing, historical/cultural interpretation and nature observation. This well preserved riparian corridor provides fantastic habitat for migrating and nesting birds, therefore making it an excellent location for bird watching.

Increased development and poor farming practices are causing degradation of this natural, recreational and cultural resource. To address this and other issues facing the watershed, interested citizens and landowners along the creek formed the Monocacy Creek Watershed Association (MCWA). Serving as a protector of the Monocacy Creek for more than two decades, the MCWA has actively tried to preserve this unique resource for the Lehigh Valley and promote the creek as an educational and recreational site.

Nor-Bath Trail Greenway

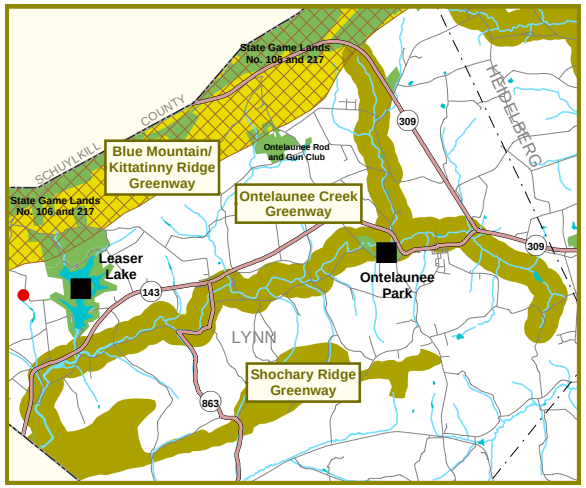


Type: cultural/recreational greenway
Length: 7 miles

The Nor-Bath Trail is a rail-trail, using the abandoned right-of-way of the Northampton-Bath Railroad. The trail extends from Northampton Borough on the west to about 1,500 feet north of Jacksonville Road in East Allen Township. The Nor-Bath Trail is owned and maintained by Northampton County.

The Northampton-Bath Railroad began operation in 1902 when the Universal Cement Company in the Village of Weaversville needed a rail line to haul cement. Abandonment of the rail line was completed in 1979, at which time Northampton County, with State and Federal grant assistance, purchased much of the original 8.5 miles of track. The first segment of trail opened for public use in 1995. In 2005, the trail was extended west from Savage Road in Allen Township to Horworth Road in Northampton Borough, a distance of almost one mile. The County would like to extend the north end from its terminus near Jacksonville Road into Bath Borough. One important natural area is located along the Nor-Bath Trail—Weaversville Ponds, a locally significant site. Bicentennial Park is the largest existing park within the greenway, with the Weaversville County Park not yet developed. The Nor-Bath Trail connects with the Hokendauqua Creek Greenway and the trail, when extended to Bath Borough, will connect with the Monocacy Creek Greenway on the east.

Ontelaunee Creek Greenway

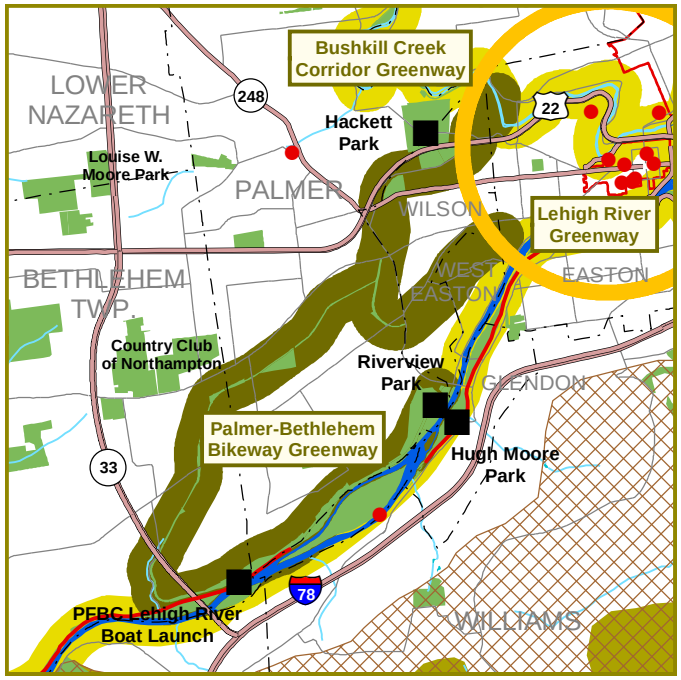


Type: conservation greenway
Length: 11 miles

The Ontelaunee Creek Greenway is located entirely within Lynn Township, Lehigh County. The headwaters of Ontelaunee Creek are formed at the base of Blue Mountain near Route 309. The creek enters Berks County about 1.5 miles north of the Village of Kempton. The area through which Ontelaunee Creek flows is a mixture of farmland and woodland with agriculture as the predominant land use. Some of the farms that are located on or near Ontelaunee Creek have been preserved through the State's Agricultural Conservation Easement Program. Other farms are in the Lynn Township Agricultural Security Area and are eligible for acquisition under the Agricultural Conservation Easement Program. There has been a small amount of rural residential development taking place outside of the villages of New Tripoli, Lynnport and Wanamakers located along the creek.

This conservation greenway connects with two other greenways in the Lehigh Valley network, the Shochary Ridge and the Blue Mountain/Kittatinny Ridge greenways. The following parks and other outdoor recreation areas are within or adjacent to this greenway: Ontelaunee Park, Ebenezer Church Ballfield, Olde Homestead Golf Club and Leaser Lake. Recreational activities that currently take place include fishing, hunting when permitted by landowner, nature study, walking/jogging and picnicking.

Palmer-Bethlehem Bikeway Greenway



Type: cultural/recreational greenway
Length: 10 miles

The improved parts of this rail-trail are located in Palmer and Bethlehem townships. Plans exist to extend the southern leg of the trail east from 25th Street into Wilson Borough, West Easton Borough and the City of Easton. The northern leg will be extended from 25th Street east to Bushkill Creek where it will connect with a proposed rail-trail along the western side of the creek.

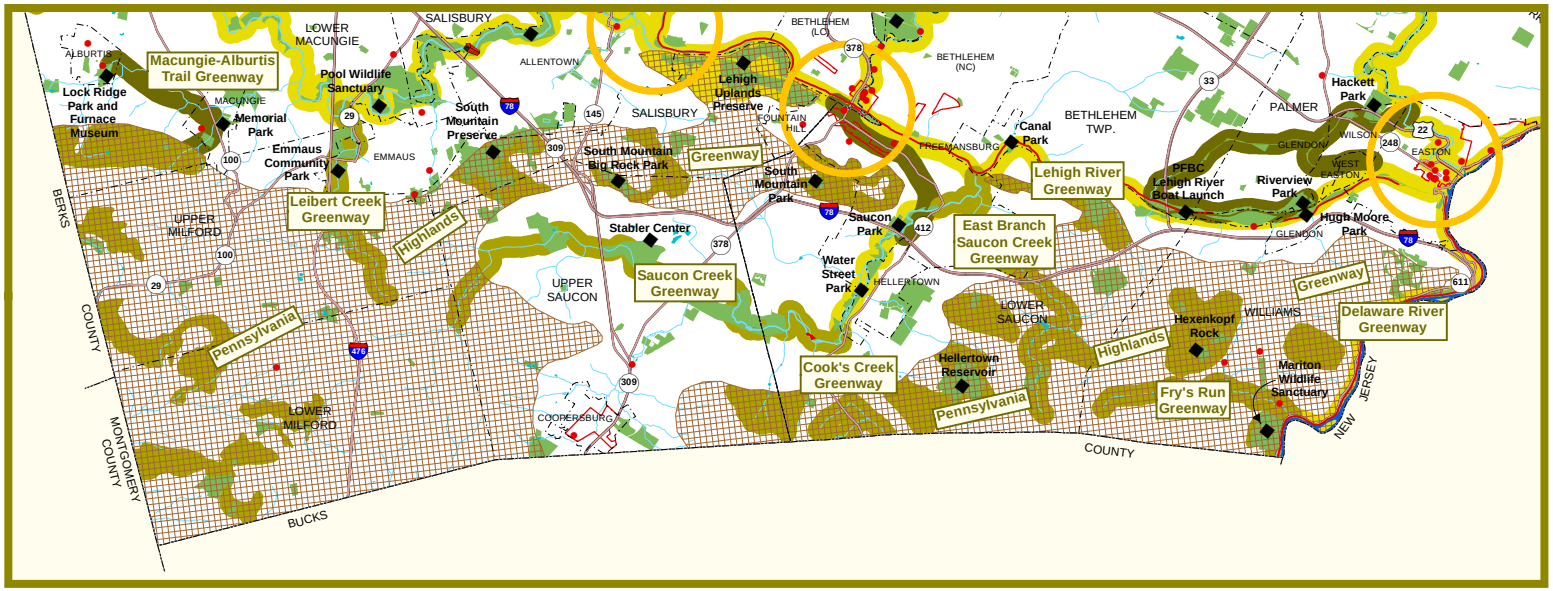
The Palmer-Bethlehem Bikeway is the oldest rail-trail in the Lehigh Valley and one of the first rail-trails in Pennsylvania. The trail incorporates trackage from an abandoned Central Railroad of New Jersey line and the Bethlehem and Easton interurban trolley. These lines were eventually swallowed up by Conrail in 1976 and abandoned several years later. The initial 7.8-mile section was opened in 1981. In 1998, the rail-trail was extended from its original eastern terminus south to 25th Street. In 1996, Palmer Township, Wilson Borough, West Easton Borough and the City of Easton initiated a joint venture to extend the trail east from 25th Street to Easton. That effort is still ongoing.

The Palmer-Bethlehem Bikeway connects with two other greenway corridors, the Lehigh River and Bushkill Creek greenways. Eventually, this cultural/recreational greenway will provide an important connector for hikers and bikers that desire to travel between the D&L Trail and other trails in northern Northampton County. Parks and other outdoor recreation areas found adjacent to the Palmer-Bethlehem Bikeway include: the Hugh Moore Park in the City of Easton; the Bethlehem Boat Club and Chetwin Terrace Park in Bethlehem Township and Riverview Park and Fairview Park in Palmer Township.

Pennsylvania Highlands Greenway

Type: conservation and scenic greenway
Area: conservation — 10,773 acres and scenic — 34,902 acres

The Highlands Region is part of the Appalachian Mountain chain that runs from Georgia to Maine. The Region stretches from northwestern Connecticut to the Maryland border southeast of Harrisburg, Pennsylvania. The Pennsylvania Highlands part of the Highlands Region is made up of a series of discontinuous steep sided ridges and narrow valleys. The Lehigh Valley portion of the Pennsylvania Highlands encompasses all of Northampton County south of the Lehigh River and Lehigh Mountain, South Mountain and everything south in Lehigh County. The DCNR has identified the Pennsylvania Highlands as one of Pennsylvania's Major Greenway Corridors.

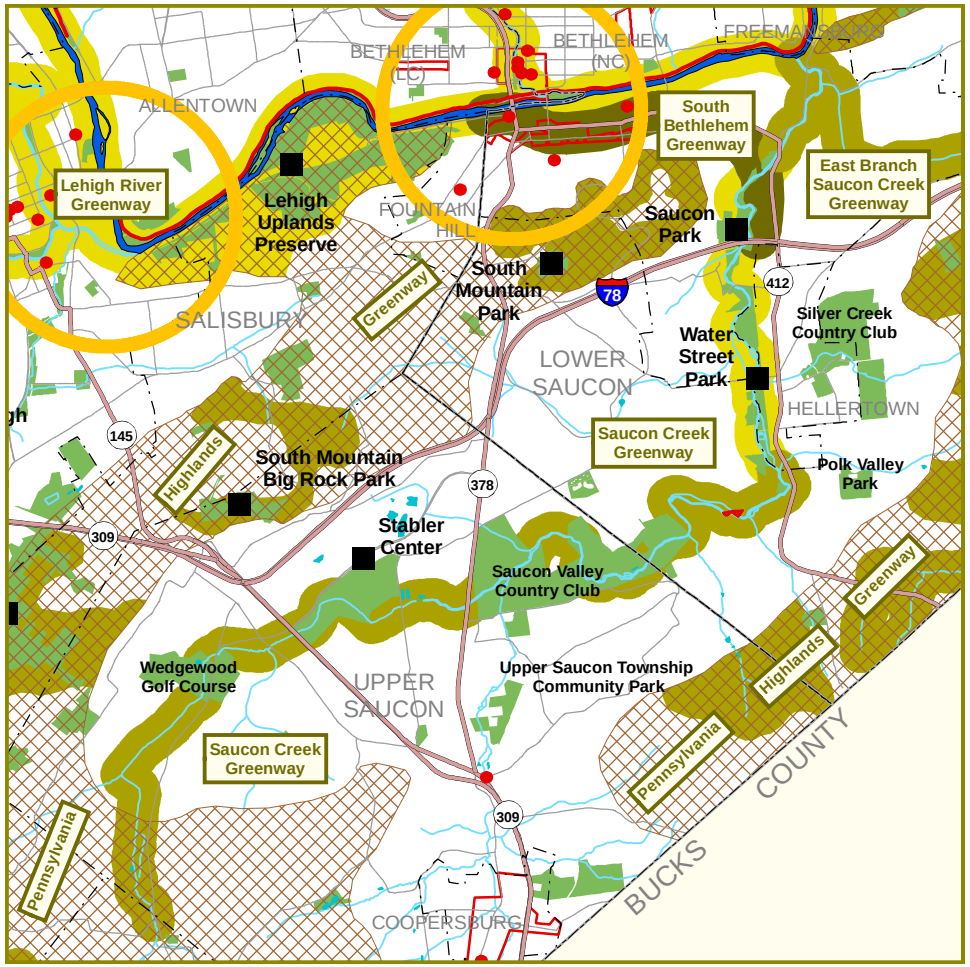


The Highlands Conservation Act of 2004 was signed into law on November 30, 2004. The Act designated the Highlands as "Nationally Significant" because it extends through four states (Pennsylvania, New Jersey, New York, Connecticut) and has many exceptional natural resources which are threatened by suburban sprawl. Part of the Act authorizes the USDA Forest Service to conduct a study of the Highlands Region and produce a map of lands with high conservation value based on six key resources: water, forests, agriculture, biodiversity, recreational and cultural. At the time this plan was being prepared, the USDA Forest Service, the Appalachian Mountain Club and various universities were working to complete the requirements of the Act.

Several important natural areas are found in the Pennsylvania Highlands including: Hexenkopf Wetlands and Slopes and Mariton Uplands in Williams Township; Hellertown Area Vernal Pools, Focht Hill Vernals and Granite Hill in Lower Saucon Township; Hosensack Marsh, Lower Milford Marsh, and Mill Hill in Lower Milford Township; Indian Creek Floodplain in Upper Milford Township; and Macungie watershed in Lower Macungie Township and Upper Milford Township. The presence of these wetlands, slopes, uplands, marshes and woodlands makes the Highlands Region a particularly scenic area of the region. Additionally, the many isolated ridgetops provide a picturesque backdrop to southern Lehigh Valley.

The Pennsylvania Highlands scenic greenway connects with several other corridors including: the Delaware River, Fry's Run, East Branch Saucon Creek, Leibert Creek, Cooks Creek, and Macungie-Alburtis Trail greenways. Many parks and outdoor recreation sites exist throughout the Pennsylvania Highlands (South Mountain Preserve, Center Valley Club, Water Street Park, Saucon Park, Lehigh Uplands, Mariton Wildlife Sanctuary), providing residents such activities as hunting when permitted by landowner, target shooting, golf, nature study and sightseeing.

Saucon Creek Greenway



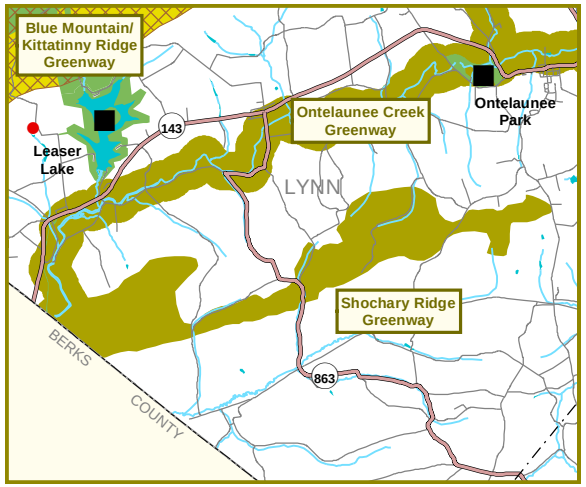
Type: multi-use and conservation greenway
Length: 15 miles

The Saucon Creek Greenway extends from the Lehigh River south and west to the Lower Milford Township border. The greenway is a mixture of residential and industrial development, farmland, parkland and an impressive acreage of golf courses. Agricultural conservation easements have been purchased on several farms within or adjacent to the Saucon Creek in Upper Saucon and Lower Milford townships. Many other farms in this area are eligible for acquisition.

Important natural areas include: Hellertown Marsh in Hellertown and Lower Saucon Township and Mest Marsh in Upper Saucon Township. The Saucon Creek connects with the Lehigh River, East Branch Saucon Creek, and the Pennsylvania Highlands greenways. Parks found within or adjacent to this cultural, recreational and conservation greenway include: Saucon Park in the City of Bethlehem; Grist Mill Park and Water Street Park in Hellertown Borough; Lower Saucon Creek Park in Lower Saucon Township; and Saucon Valley Country Club, The Center Valley Club and Wedgewood Golf Course in Upper Saucon Township. Recreational activities along this greenway include fishing, hunting when permitted by landowner, nature study, walking/jogging, field sports, basketball, tennis and golf.

Shochary Ridge Greenway

Type: conservation greenway



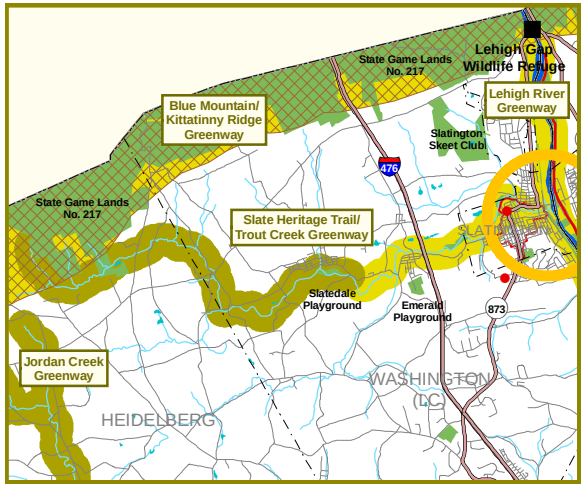
Area: 1,440 acres

The Shochary Ridge Greenway is located in Lynn Township, Lehigh County. The ridge extends out of Berks County across the central portion of Lynn Township. The highest point (1,060 feet) on the Ridge is known as the Donat located along the western edge of the ridge.

The ridge is primarily wooded, with some scattered farming activity taking place. Many of the farms on or near the ridge have been preserved and a number of other farms in the Lynn Township Agricultural Security Area are eligible. Lynn Township leads all 62 municipalities in the Lehigh Valley in preserved farmland. Much of this land is found in or near the Shochary Ridge conservation greenway. The Shochary Ridge connects with the Ontelaunee Creek Greenway near the Berks County border. Recreational activities along this greenway include nature study and hunting when permitted by landowner.

Slate Heritage Trail/Trout Creek Greenway

Type: multi-use and conservation greenway

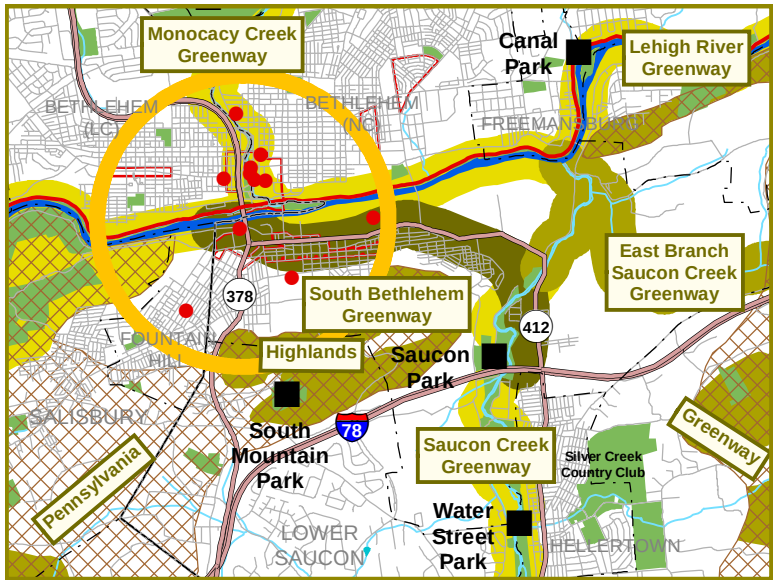


Length: 8 miles

Trout Creek enters the Lehigh River at a point just south of the Slatington – Walnutport bridge. The headwaters of the creek are located in Heidelberg Township at the base of Blue Mountain below Bake Oven Knob. Trout Creek flows through the Borough of Slatington and the Village of Emerald in Washington Township. West of the Village of Emerald, Trout Creek drains an area of mixed farmland and woodland.

The Slate Heritage Trail uses the abandoned right-of-way of the former Schuylkill & Lehigh Branch of the Reading Railroad. When complete, the Slate Heritage Trail will connect the Village of Slatedale with the D&L Trail in Slatington Borough. The first section of the trail, opened in 2004, extends from the D&L Trail west for 1.1 miles to the Trout Creek north of Church Street. The 2.2-mile Washington Township section of the trail is partially open, but trail improvements and a bridge over Trout Creek are needed before the trail is complete. Urban development and the remnants of a slate industry that has all but vanished characterize the eastern part of the greenway. This corridor contains the following parks: Kern's Mill Park, Slatedale Playground, Wildlands Tract on Trout Creek and State Game Lands No. 217.

South Bethlehem Greenway



Type: proposed cultural/recreational greenway
Length: 3 miles

The South Bethlehem Greenway, once constructed, will provide a multi-use trail through South Bethlehem's urban core. The greenway will begin near the former Union Station at the western end and continue past the Minsi Trail Bridge, a distance of about 1.75 miles. Eventually, the greenway could extend to Saucon Park near Hellertown Borough.

The idea for this greenway became public in 2001 when the City of Bethlehem expressed interest in acquiring the 3.5-mile, 43 acre abandoned Norfolk Southern Rail Corporation right-of-way in South Bethlehem. Since that time, the City has been working on an acquisition package to acquire the right-of-way. This community renovation project could exceed $5 million and includes: a public plaza; additional parking zones and a parking garage; repaired street crossings at greenway intersections; and the creation of new one-way streets to help enhance traffic flow.

The proposed greenway has the potential to connect with two other greenways — the Saucon Creek in the east and the Lehigh River in the west. There are no existing parks or other outdoor recreation areas located adjacent to the proposed trail; however, plans for a skate park, playgrounds and community gardens are all included in plans for the South Bethlehem Greenway Project. The greenway could connect some of the many proposals for South Bethlehem if they come to fruition. The greenway will provide a place where the people of South Bethlehem can participate in several recreational activities, such as walking, jogging and bicycling.

The City of Bethlehem has conducted extensive planning for the South Bethlehem Greenway. The *South Bethlehem Greenway Master Plan* identified the need for a phased approach to this project. Phase 1 extends from the Hill-to-Hill Bridge to the Lynn Avenue Bridge, Phase 2 extends from the Lynn Avenue Bridge to the city line, and Phase 3 would expand the width of the trail from the Lynn Avenue Bridge to the city line. The City intends to acquire land along this corridor to create linkages to other nearby recreational and cultural attractions.

Evaluate the Corridors

The next step in the process was to evaluate the corridors so open space and greenway planning efforts can be focused on areas that meet the characteristics of a successful greenway, have the level of support needed to advance the project from planning to implementation, and require more immediate protection and/or attention. This process consisted of ranking each greenway with regard to three components—rating factors, potential threats, and the number of interest groups. All 31 corridors were reviewed by LVPC staff and assigned values for each component, resulting in an overall score. Although parts of this process were subjective, efforts were made to assign values as accurately as possible. A draft of the completed evaluation was presented to the Study Advisory Committee (Committee) at the October 2005 meeting. Comments and suggestions of the Committee were incorporated into the evaluation and priority corridors became evident.

Rating Factors

A list of rating factors was developed as the first component in evaluating the corridors. The following 15 factors are characteristic and/or influence the creation of successful greenways:

1. Identified as a Major Greenway Corridor by the Pennsylvania Department of Conservation and Natural Resources
2. Designated as a National Heritage Corridor by the National Park Service
3. Connects county, state or national parks or recreation areas
4. Connects with existing trails
5. Connects municipal parks or recreation areas
6. Provides long distance recreation opportunities, e.g. hiking, biking, canoeing
7. Identified as a blueway (as defined on page 6 of this document)
8. Designated as a Pennsylvania Scenic Byway by the Pennsylvania Department of Transportation
9. Identified as an Important Bird Area by the Audubon Society
10. Provides a natural corridor/connector for wildlife, e.g., contiguous woodlands, wetlands or waterways
11. Contains or has the potential for multiple access points
12. Connects to a populated area, i.e. city or borough
13. Contains or connects historic resources
14. Identified in *A Natural Areas Inventory of Lehigh and Northampton Counties, Pennsylvania* by The Nature Conservancy
15. Contains a stream with a Pennsylvania Department of Environmental Protection rating of Exceptional Value, High Quality or Cold Water Fishes

Based on the overall importance of the factor and its contributions to a greenway, each rating factor listed above was assigned a weight value of 1 (low), 2 (medium), or 3 (high). All 31 corridors were evaluated with regard to each of these factors based on whether the condition was present in the corridor or

the extent of the factor in the creation of that greenway. The rating factor weights were totaled for each greenway and ranking points were assigned based on the following category breaks:

Rating Factor Total Value	Ranking Points Assigned
≥ 25	9
19 - 24	7
13 - 18	5
7 - 12	3
≤ 6	1

Potential Threats

The second component involved estimating the pressure of potential threats on the corridor. Each corridor was evaluated with regard to potential threats with a qualitative value of 1 (low), 3 (medium), or 5 (high). Potential threat factors included in the analysis were:

- Encroaching development and subdivisions
- Proximity to populated areas
- Availability of public water and/or sewer
- Development potential and history

Interest Groups

The third component in the corridor evaluation was tallying the number of interest groups for each greenway. The following interest groups were considered:

- Federal agencies, e.g., National Park Service
- State agencies, e.g., PA Department of Conservation and Natural Resources
- Counties
- Municipalities
- Delaware and Lehigh National Heritage Corridor
- Conservation organizations, e.g., Wildlands Conservancy, Natural Lands Trust, Heritage Conservancy
- Stream conservancies, e.g., Bushkill Conservancy
- Other, e.g., Delaware River Basin Commission, Trout Unlimited, The Nature Conservancy, Audubon PA, etc.

Ranking points were assigned based on the following category breaks:

Number of Interest Groups	Ranking Points Assigned
7 or more	4
5 to 6	3
3 to 4	2
1 to 2	1
0	0

Priority Corridors

After the above three reviews were completed, the ranking points assigned for each component were added together for a grand total for each corridor. The results, combined with input from the Committee, revealed nine priority corridors in the Lehigh Valley greenway network (Map 14, in the pocket at the end of this document).

1. Bushkill Creek Corridor
2. Blue Mountain/Kittatinny Ridge
3. Delaware River
4. Lehigh River
5. Greater Minsi Lake Corridor
6. Jordan Creek
7. Monocacy Creek
8. Pennsylvania Highlands
9. Little Lehigh Creek

Bushkill Creek Corridor

The assignment of priority to a greenway corridor serves to focus implementation and land acquisition efforts and assure the most sensitive and desired resources are emphasized and given prompt attention. Five of the nine priority greenways were selected for early implementation based on detailed planning studies that have either been completed or are underway, high natural resource conservation values, and/or a high level of interest at the county or municipal level. Initial efforts should focus on acquisition projects along the following corridors:

1. Bushkill Creek Corridor
2. Blue Mountain/Kittatinny Ridge
3. Greater Minsi Lake Corridor
4. Jordan Creek
5. Pennsylvania Highlands

Recommend Goals and Actions

The Lehigh Valley greenways network consists of the highest priority natural, recreational, cultural, historical and scenic resources identified in Lehigh and Northampton counties. Their promotion, preservation and appropriate use require ongoing support, management and funding. Counties, municipalities, residents and other stakeholders will need to integrate their roles and coordinate their efforts to bring an interconnected greenway network into existence.

Permanently protecting environmentally sensitive, culturally significant and/or historically important lands from undesirable development is the ultimate goal of this plan. Since it is neither practical nor desirable to purchase every acre of important land throughout Lehigh and Northampton counties, it is necessary for stakeholders to manage and protect lands in the short term through regulation and planning. Both counties and every municipality should look towards regulatory measures as a means of protecting their natural resources until acquisition can occur, specifically:

- Update and improve comprehensive plans, zoning, natural resource protection ordinances and review procedures to address the effects of development on and protection of significant resources.
- Prepare and utilize an Official Map, as described in the *Pennsylvania Municipalities Planning Code*, to identify the location of future public areas and preserve right-of-way areas for recreation and open space.
- Create Environmental Advisory Councils for the review of zoning and rezoning proposals, subdivision and site plans, and similar projects for their impact on the environment.

The Implementation Strategy section of this plan provides information on the status of municipal natural resource protection ordinances and offers a range of land conservation techniques that can be used to conserve land from absolute to minimal protection. Counties and municipalities are strongly encouraged to utilize this plan to identify what tools are available and determine the appropriate action to take for success in their communities. The following lists and tables provide specific goals and actions to which the various stakeholders (key stakeholders are in parentheses following the action) can work towards.

Recommended Actions for the Entire Greenways Network

GOAL: The protection and acquisition of high priority natural, recreational, cultural, historical and scenic lands.

- Provide adequate, long term financing for greenways, recreation, open space preservation, and farmland preservation. (county, municipality)
- Expand and improve staff capabilities to facilitate land acquisition. (state, county, municipality, local conservation groups)
- Coordinate county and municipal efforts with local land trusts, conservancies, school districts and the private sector to establish greenway connections through acquisitions and easements. (Lehigh Valley Greenways Partnership, county, municipality, local conservation groups, school districts, colleges and universities, local business community, LVPC)
- Coordinate the planning and development of the greenways network with transportation, economic development, tourism, recreation and open space priorities in the region. (state, county, municipality, LVPC)
- Foster the education of elected officials and the general public on the benefits of greenways to the environmental, economic and cultural health of a community. (state, county, municipality, local conservation groups, school districts, LVPC)
- Advocate conservation design techniques to protect natural resources and require developers to include open space or recreation land (or fee in lieu) as part of all new residential and commercial development proposals. (county, municipality, developers, landowners)

Recommended Actions for Conservation Greenways

GOAL: The creation of a regional network of interconnected corridors that preserves high priority natural resource areas and provides critical habitat connections.

- Maintain a GIS database that provides current information about natural resources and recommended resource protection measures. Assist local governments in the identification and mapping of existing natural resources. (county, municipality, local conservation groups, LVPC)
- Establish a municipally based program to purchase or accept donations of land for natural resource protection and passive limited recreation in and along high priority natural resource areas. (municipality)
- Encourage public and private landowners to place conservation easements on portions of their property that fall within designated natural resource protection areas. Promote the use of best management

practices in forestry, stewardship and lawn care activities in and along these areas. (county, municipality, local conservation groups, school districts, landowners, developers, concerned citizens)

- Limit development in areas designated for natural resources protection in the Comprehensive Plan or in habitat areas identified in *A Natural Areas Inventory of Lehigh and Northampton Counties, Pennsylvania*. (county, municipality, local conservation groups, developers, landowners)
- Protect rivers and streams and natural floodplains by preserving open spaces along riparian corridors. Install and restore riparian buffer widths of 100 feet along rivers and major streams and 50 feet along all other water bodies where feasible to undertake such measures. Utilize a variety of native vegetation in all buffers. (state, county, municipality, local conservation groups, landowners, developers, concerned citizens)
- Protect the remaining wetland habitat areas in the Lehigh Valley by preserving 100% permanent open space in all wetlands. Manage wetlands on publicly owned land to maintain and enhance their environmental, scenic and educational values. Improve and update existing wetland inventories. (county, municipality, local conservation groups , developers, landowners, LVPC)

Recommended Actions for Cultural/Recreational Greenways

GOAL: The creation of a regional network of greenways that provides an array of recreational opportunities and access to existing parks/outdoor recreation areas, open space, and areas with cultural/historical significance.

- Adopt separate recreation, greenway and open space plans with specific recommendations for acquisition and improvements to protect significant resources. (state, county, municipality)
- Utilize cultural/recreational greenways to provide local, close-to-home/work recreation opportunities. Promote the development of new recreation facilities at strategic locations throughout the greenway network. (county, municipality, LVPC)
- Utilize cultural/recreational greenways to meet the recommended National Recreation and Park Association acreage requirements of 10 acres per 1,000 population of recreation space in each municipality and county. (county, municipality)
- Develop a promotional brochure of active and passive cultural/recreational attractions to foster interest in and provide information about the many opportunities available. (convention and visitors bureau, LVPC)
- Protect and promote rivers and streams as a source of numerous recreational benefits to residents and visitors of the Lehigh Valley. Provide safe and easily accessible public access points along the Lehigh and Delaware rivers that encourage recreational use. (state, county, municipality, local conservation groups, landowners, LVPC)

- Protect and utilize floodplains and riparian buffers to provide contiguous and substantial trail mileage linking and adjacent to existing recreation areas. (county, municipality, local conservation groups, developers, landowners)
- Encourage dialogue with rail and utility companies on the use and/or acquisition of existing or abandoned right-of ways for trail development. Prioritize existing and abandoned rail corridors for their potential trail use and conduct feasibility studies for priority corridors. Complete a comprehensive bi-county inventory of existing and proposed utility corridors. (state, county, municipality, local conservation groups, LVPC)
- Work with PennDOT and local road departments to include bicycle and pedestrian friendly facilities when road improvements are planned. Incorporate trails and greenways into the design of proposed roadways where appropriate. (state, county, municipality, local conservation groups)
- Encourage historic preservation planning and adopt historic district regulations pursuant to the Pennsylvania Historic District Act (Act 167). Develop trails for historic interpretation and education. Update the LVPC National Register of Historic Places inventory yearly. (state, county, municipality, local conservation groups, LVPC)

Recommended Actions for Scenic Greenways

GOAL: The protection and acquisition of high priority natural, recreational, cultural, historical and scenic lands to provide visual connections across the landscape for residents and visitors to enjoy.

- Preserve, through acquisition or easement, large contiguous clusters of open space and farmland in areas that have not been substantially urbanized. (county, municipality, local conservation groups, landowners)
- Reduce impacts of urban sprawl in rural communities to retain the rural character of the Lehigh Valley. Where feasible utilize greenways to provide buffers between non-compatible land uses. (county, municipality)
- Update slope protection ordinances to make them more protective. (municipality)
- Protect forested slopes through acquisition and woodland preservation ordinances to maintain large stands of interior woodlands along ridges. (state, county, municipality, local conservation groups)
- Preserve scenic historic and transportation corridors. (state, county, municipality, local conservation groups)
- Promote scenic resources through an interconnected network of designated scenic routes and other roadways. Utilize appropriate signage and promotional brochures to educate and interest residents and visitors of the Lehigh Valley. (state, county, municipality, convention and visitors bureau, LVPC)

Recommended Actions for Priority Greenways

The *Lehigh Valley Greenways Plan* identifies a network of 31 greenway corridors throughout Lehigh and Northampton counties (Map 14, in the pocket at the end of this document). Based on input from the Study Advisory Committee, LVPC staff review, and the results of a priority ranking system specifically developed for this plan, nine priority greenways and five Early Implementation Greenways were selected in the network. This plan provides recommended actions for each of the nine priority greenways that build upon the studies and suggestions of the various planning partners and are intended for enactment by the key stakeholders (counties and municipalities through which the priority greenway is located) and the project partners listed. Additionally, this plan emphasizes the actions listed for each of the five early implementation greenways as they offer the most opportunities for advancement of implementation projects. The LVPC will continue to support the stakeholders and partners in the realization of their projects along all identified greenways as they relate to the goals and recommendations of this plan and the *Comprehensive Plan The Lehigh Valley...2030*.

Note: Assessing the number, size and location of protected lands along the corridors is important for achieving the goals set forth in this plan. Tables providing data on the status of land protection along each priority corridor are provided. Each table provides the assumptions used to calculate the data presented. Protected land is land that is in public ownership and utilized as parkland, other outdoor recreation land, open space and/or agriculture. Privately owned land that is utilized as open space and is under conservation easement, agricultural easement or deed restrictions is also considered protected. The remaining parcels data provided in the tables below gives a benchmark to work from in future land protection strategies. The numbers reflect those parcels that are along the priority greenway corridor but are not currently protected via the methods listed above. The majority of protected lands in the Lehigh Valley are publicly owned and located along or within the priority greenways. However, a quick look at the maps in this plan reveals that there is a long way to go to meet the ultimate goal of permanently protecting every acre of unprotected land from undesirable development.

Early Implementation Greenways

Recommended Actions for the Bushkill Creek Corridor

GOAL: The creation of 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.

Land Protection Summary: Bushkill Creek Corridor				
Total Greenway Area (acres):	**4,820**			
Acreage Protected [acres (%)]:			Number of Remaining Parcels by Size:	
Total Protected	697	(14%)	250 or more acres	1
Parks and Open Space	630	(13%)	100 - 249 acres	6
Publicly Owned	628	(13%)	50 - 99 acres	29
Privately Owned	2	(<1%)	49 acres or less	1,706
Agricultural Easements	67	(1%)		
Note: Data was calculated using GIS and was based on a 1,000-ft. corridor width.				

- Preserve, through acquisition or easement, the remaining high priority parcels not currently in public ownership or deed restricted within the Bushkill Creek Corridor. Emphasize the following project areas:

  — Extend the Plainfield Township Recreation Trail north of Route 512 to connect with the Blue Mountain/ Kittatinny Ridge Greenway (see map on page 70).
  — Establish a multi-use greenway along the Little Bushkill and Bushkill creeks to connect the Gall Farm to Jacobsburg Environmental Education Center (see map on page 70).
  — Continue to work with the various planning partners to establish a multi-use trail on the PPL Utility ROW connecting Jacobsburg Environmental Education Center to the Blue Mountain/Kittatinny Ridge Greenway.
  — Connect the Palmer Township trail system along the Bushkill Creek to the Plainfield Township Recreation Trail through the Boroughs of Tatamy and Stockertown.
  — Complete cultural/recreational greenways linking the Bushkill Creek Corridor trail system to existing recreational resources in the City of Easton. Support brownfield redevelopment proposals within the corridor to enhance recreation, tourism and downtown revitalization projects, e.g., Bushkill Creek Corridor Enhancement.

- Support wildlife habitat protection and connectivity by creating wooded conservation greenways along the upper reaches of the Bushkill Creek, Sober's 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.
- Develop tools and programs to implement the goals and recommendations of this plan and the *Two Rivers Area Greenway Plan* commissioned by the Two Rivers Area Council of Governments.

<u>Additional Planning Partners and Studies</u>
LEAD AGENCY: Bushkill Stream Conservancy — *Two Rivers Area Greenway Plan*

Delaware and Lehigh National Heritage Corridor
Graver Arboretum of Muhlenberg College
Heritage Conservancy
Jacobsburg Environmental Education Center
Jacobsburg Historical Society
Natural Lands Trust
PA Department of Conservation and Natural Resources
PA Department of Environmental Protection
PA Fish and Boat Commission
PA Game Commission
Trout Unlimited, Forks of the Delaware
Two Rivers Area Chamber of Commerce
Wildlands Conservancy

Recommended Actions for the Blue Mountain/Kittatinny Ridge Greenway

GOAL: The protection and acquisition of high priority natural resource lands along the Kittatinny Ridge.

Land Protection Summary: Blue Mountain/Kittatinny Ridge				
Total Greenway Area (acres):	**21,204**			
Acreage Protected [acres (%)]:			Number of Remaining Parcels by Size:	
Total Protected	11,169	(53%)	250 or more acres	3
Parks and Open Space	11,160	(53%)	100 - 249 acres	18
Publicly Owned	11,150	(53%)	50 - 99 acres	19
Privately Owned	10	(<1%)	49 acres or less	1,132
Agricultural Easements	9	(<1%)		

Note: Data was calculated using GIS. The Blue Mountain/Kittatinny Ridge Greenway boundary was defined using 2005 aerial photography as continguous forested tracts, excluding developed areas.

- Preserve, through acquisition or easement, the remaining high priority parcels not currently in public ownership or deed restricted along the Blue Mountain/Kittatinny Ridge Greenway. Emphasize the following project areas:

  — Establish a contiguous multi-use greenway to connect the Delaware Water Gap National Recreation Area to the PA State Game Lands No. 168 beginning west of Route 33 (see map on page 69). Coordinate the efforts of Northampton County, local conservation groups, and the PA Game Commission.
  — Establish multi-use and conservation greenway connections between the Kittatinny Ridge and the Bushkill Creek Corridor in and around the headwaters of Bushkill Creek, Sober's Run and their tributaries. Acquire remaining unprotected lands within the Rismiller Woods and Knechts Pools natural areas (see Map 8 on page 34).
  — Establish conservation greenway connectivity between the Kittatinny Ridge and the Jordan Creek Corridor. Encourage the PA Game Commission to acquire remaining unprotected lands in and around the headwaters of Jordan Creek and its tributaries.
  — Lehigh County should continue to work with the Leaser Lake Heritage Foundation and Wildlands Conservancy to acquire and protect the remaining high priority lands north of Leaser Lake connecting to State Game Lands No. 106 and 217 (see map on page 69).

- Initiate dialogue and forge partnerships with the various planning partners to protect and promote the recreational resources along the Kittatinny Ridge (i.e., Appalachian Trail, status as an Important Bird

Area, PA State Game Lands, Delaware Water Gap National Recreation Area, Lehigh Gap Wildlife Refuge). Inform and educate the general public about the significance of these recreational opportunities.

- Implement the goals and recommendations of this plan and the *Blue Mountain/Kittatinny Ridge Conservation Project* led by Audubon Pennsylvania.

Additional Planning Partners and Studies

LEAD AGENCY: Audubon PA — *Blue Mountain/Kittatinny Ridge Conservation Project*

Appalachian Mountain Club (Lehigh Valley Group)
Appalachian Trail Conservancy
Delaware and Lehigh National Heritage Corridor
Natural Lands Trust
PA Department of Conservation and Natural Resources
PA Environmental Council
PA Game Commission
The Nature Conservancy of PA
Wildlands Conservancy
Lehigh Gap Nature Center

Recommended Actions for the Greater Minsi Lake Corridor

GOAL: The creation of a multi-use greenway within the Greater Minsi Lake Corridor through the acquisition of unprotected land and/or conservation easements on the remaining high priority natural resource lands to connect it with existing protected areas.

Land Protection Summary: Greater Minsi Lake Corridor				
Total Greenway Area (acres):	**3,342**			
Acreage Protected [acres (%)]:			Number of Remaining Parcels by Size:	
Total Protected	962	(29%)	250 or more acres	0
Parks and Open Space	962	(29%)	100 - 249 acres	6
Publicly Owned	860	(26%)	50 - 99 acres	11
Privately Owned	102	(3%)	49 acres or less	264
Agricultural Easements	0	(0%)		

Note: Data was calculated using GIS. The Greater Minsi Lake Corridor boundary was defined by Northampton County and based on the Lehigh Valley Planning Commission's current parks data.

- Preserve, through acquisition or easement, the remaining high priority parcels not currently in public ownership or deed restricted in the Greater Minsi Lake Corridor. Emphasize the following project areas:

— Support Northampton County and The Nature Conservancy's efforts to acquire the additional lands necessary to create a contiguous corridor of protected acreage from the node at Minsi Lake to the Delaware Water Gap National Recreation Area (see map on page 74).
— Explore the possibility of creating a multi-use trail from Minsi Lake to the Delaware Water Gap National Recreation Area.
— Expand current Northampton County land holdings at the Bear Swamp Archery Complex (see map on page 74).

- Enhance recreation opportunities at Minsi Lake and Bear Swamp. Promote awareness with appropriate signage directing people to the recreation area.
- Limit development in areas designated for natural resources protection in the Comprehensive Plan or in habitat areas identified in *A Natural Areas Inventory of Lehigh and Northampton Counties, Pennsylvania* throughout the Greater Minsi Lake Corridor (see Map 8 on page 34).

Additional Planning Partners and Studies
LEAD AGENCY: Northampton County

Delaware and Lehigh National Heritage Corridor
Delaware Water Gap National Recreation Area
National Park Service
William Penn Foundation
PA Department of Conservation and Natural Resources
PA Fish and Boat Commission
The Nature Conservancy
Wildlands Conservancy

Recommended Actions for the Jordan Creek Greenway

GOAL: The creation of a multi-use greenway along the Jordan Creek through the acquisition of unprotected land and/or conservation easements on the remaining high priority natural, recreational and cultural resource lands to connect it with existing protected areas.

Land Protection Summary: Jordan Creek				
Total Greenway Area (acres):	**4,309**			
Acreage Protected [acres (%)]:			Number of Remaining Parcels by Size:	
Total Protected	1,221	(28%)	250 or more acres	1
Parks and Open Space	1,111	(26%)	100 - 249 acres	7
Publicly Owned	1,088	(25%)	50 - 99 acres	21
Privately Owned	23	(<1%)	49 acres or less	1,623
Agricultural Easements	110	(3%)		
Note: Data was calculated using GIS and was based on a 1,000-ft. corridor width.				

- Preserve, through acquisition or easement, the remaining high priority parcels not currently in public ownership or deed restricted along the Jordan Creek Greenway. Emphasize the following project areas:

  — Support Wildlands Conservancy's work to complete the *Jordan Creek Greenway/Trail Feasibility Study* leading to the development of a 20-mile trail linking significant recreational, natural and cultural resources providing recreational opportunities and protection to the Jordan Creek.
  — The City of Allentown and Whitehall Township should acquire additional high priority natural resources lands for open space and passive recreation along the creek between Jordan Meadows (between Jordan Creek and the American Parkway) and Jordan Park (along the Jordan Creek from 7th/MacArthur Road north).
  — Lehigh County should continue to work with South Whitehall Township to extend the Jordan Creek Parkway (at Mauch Chunk Road) to Covered Bridge Park (Covered Bridge Lane and Wehr Mill Road).
  — Explore the possibility of acquiring lands or conservation easements along the greenway from Covered Bridge Park to the Trexler Nature Preserve (see map on page 78) for recreational and conservation use. Encourage landowners to restore natural riparian buffers of 100 feet along the creek.
  — Establish a conservation greenway along the upper reaches of the creek creating a wooded wildlife corridor between State Game Lands No. 205 (Lowhill Township) and No. 217 (Heidelberg Township). Restore 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.

- Encourage implementation of the goals and recommendations of this plan and the *Jordan Creek Greenway/Trail Feasibility Study* when complete.

Local Planning Partners and Studies
LEAD AGENCY: Wildlands Conservancy — *Jordan Creek Greenway/Trail Feasibility Study* (underway)

PA Department of Conservation and Natural Resources
PA Game Commission
PA Historical and Museum Commission
Lehigh Valley Zoo
Lehigh Valley Convention and Visitors Bureau

Recommended Actions for the Pennsylvania Highlands Greenway

GOAL: The protection and acquisition of high priority natural, recreational, cultural, historical, and scenic lands within the Lehigh Valley section of the Pennsylvania Highlands Region.

Land Protection Summary: Pennsylvania Highlands				
Total Greenway Area (acres):	**10,855**			
Acreage Protected [acres (%)]:			Number of Remaining Parcels by Size:	
Total Protected	1,149	(11%)	250 or more acres	2
Parks and Open Space	948	(9%)	100 - 249 acres	15
Publicly Owned	98	(<1%)	50 - 99 acres	25
Privately Owned	850	(8%)	49 acres or less	1,309
Agricultural Easements	201	(2%)		

Note: Data was calculated using GIS. The Pennsylvania Highlands Greenway (Conservation Type) boundary was defined using 2005 aerial photography as continguous forested tracts, excluding developed areas.

- Preserve, through acquisition or easement, the remaining high priority parcels not currently in public ownership or deed restricted within the Pennsylvania Highlands Greenway. Emphasize the following project areas:

  — Lehigh County should continue to work with the City of Allentown, Salisbury Township and Wildlands Conservancy to acquire and protect the remaining high priority lands surrounding the Lehigh Uplands Preserve along Constitution Drive(see map on page 87).
  — Support Wildlands Conservancy's efforts to acquire remaining unprotected lands adjacent to South Mountain Preserve/Robert Rodale Reserve (see map on page 87). Implement the goals and objectives of the *South Mountain Preserve Conservation, Greenways, and Trails Plan*.
  — Continue to work with the various planning partners to establish a large contiguous protected area surrounding Hexenkopf Rock/Hexenkopf Slopes and the Cooks Creek headwaters/Springtown Marsh (see Map 8 on page 34).
  — Explore the possibility of acquiring lands or conservation easements along the tributaries of the Hosensack Creek within the Hosensack Marsh Natural Area (see Map 8 on page 34). Encourage landowners to restore natural riparian buffers of 100 feet along the creek and its tributaries.
  — Engage Lower Macungie Township to encourage conservation efforts along Macungie Mountain (between Mountain Road and Sweetwood Drive).
- Initiate dialogue and forge partnerships with the various planning partners to create and promote the recreational resources throughout the Lehigh Valley Highlands (i.e. Delaware River greenway, Mariton Wildlife Sanctuary, Saucon Park, South Mountain Park, South Mountain Big Rock Park). Inform the general public about these recreational opportunities.
- Educate government officials, landowners and citizens about the Pennsylvania Highlands. Implement the goals and recommendations of this plan and the *Lehigh Valley Highlands Project* (when complete).

Local Planning Partners and Studies
LEAD AGENCY: Wildlands Conservancy — *Lehigh Valley Highlands Project* (underway)

Appalachian Mountain Club
Cooks Creek Watershed Association
Delaware and Lehigh National Heritage Corridor Commission
Heritage Conservancy
Highlands Coalition
Lehigh University
Mariton Wildlife Sanctuary
Natural Lands Trust
PA Department of Conservation and Natural Resources
PA Game Commission
US Forest Service

Recommended Actions for the Delaware River Greenway

GOAL: The preservation and promotion of the existing multi-use greenway along the Delaware River through the protection and acquisition of high priority natural, recreational, cultural, historical and scenic lands.

Land Protection Summary: Delaware River				
Total Greenway Area (acres):	**2,148**			
Acreage Protected [acres (%)]:			Number of Remaining Parcels by Size:	
Total Protected	362	(17%)	250 or more acres	3
Parks and Open Space	362	(17%)	100 - 249 acres	7
Publicly Owned	244	(11%)	50 - 99 acres	11
Privately Owned	118	(5%)	49 acres or less	1,530
Agricultural Easements	0	(0%)		
Note: Data was calculated using GIS and was based on a 500-ft. corridor width (Pennsylvania side only).				

- Preserve, through acquisition or easement, the remaining high priority parcels not currently in public ownership or deed restricted along the Delaware River. Emphasize the following project areas:

  — Enhance recreation opportunities and public river access at Foul Rift (see Map 8 on page 34) and establish connections with the existing Tekening Hiking Trails within the PPL Martins Creek Environmental Preserve (see map on page 72).
  — Expand current Northampton County land holdings at Mount Jack along the Delaware River for the creation of a riverfront park as the opportunity arises (see map on page 72).
  — Northampton County should continue to acquire properties along the Delaware River and Canal as they become available.

— Encourage partnerships between the Delaware and Lehigh National Heritage Corridor, Northampton County and municipalities to provide additional public access to the Canal and towpath.

- Continue efforts to restore the canal and towpath through Delaware Canal State Park.
- Preserve and reclaim natural floodplains to improve flood hazard mitigation, water quality protection, and provide habitat, open space and recreational opportunities along the Delaware River.
- Preserve and enhance the scenic qualities of the Delaware River. Implement the goals and objectives of the LVPC *Delaware River Scenic Drive Plan* and the Heritage Conservancy publication, *Shaping the D&L Drive*.

Additional Planning Partners and Studies
LEAD AGENCY: Delaware River Greenway Partnership — *Delaware River Water Trail Plan*

Delaware and Lehigh National Heritage Corridor
Delaware Canal State Park
Delaware River Basin Commission
Delaware Water Gap National Recreation Area
National Park Service
PA Department of Conservation and Natural Resources
PA Department of Environmental Protection
PA Fish and Boat Commission

Recommended Actions for the Lehigh River Greenway

GOAL: The preservation and promotion of the existing multi-use greenway along the Lehigh River through the protection and acquisition of high priority natural, recreational, cultural, historical and scenic lands.

Land Protection Summary: Lehigh River				
Total Greenway Area (acres):	**4,369**			
Acreage Protected [acres (%)]:			Number of Remaining Parcels by Size:	
Total Protected	833	(19%)	250 or more acres	2
Parks and Open Space	819	(19%)	100 - 249 acres	7
Publicly Owned	801	(18%)	50 - 99 acres	13
Privately Owned	18	(<1%)	49 acres or less	2,792
Agricultural Easements	14	(<1%)		
Note: Data was calculated using GIS and was based on a 1,000-ft. corridor width.				

- Preserve, through acquisition or easement, the remaining high priority parcels not currently in public ownership or deed restricted along the Lehigh River. Emphasize the following project areas:

— Lehigh County should continue to work with the Delaware and Lehigh National Heritage Corridor Commission to acquire the Conrail right-of-way along the western side of the river for use as the D&L Trail as identified in the *Delaware & Lehigh Canal National Heritage Corridor and State Heritage Park Management Action Pla*n.
— Northampton County should continue to acquire properties along the Lehigh River and Canal as they become available. Encourage the completion of the D&L Trail, using a combination of trails in existing parks, the canal tow path, and abandoned railroad right-of-way.
— Establish a safe pedestrian connection between the Nor-Bath Trail (East Allen Township) and the D&L Trail at Canal Street Park in the Borough of Northampton.
— Encourage partnerships between the Delaware and Lehigh National Heritage Corridor, Counties and municipalities to provide additional public access to the Canal and towpath.

- Preserve and reclaim natural floodplains to improve flood hazard mitigation, water quality protection, and provide habitat, open space and recreational opportunities along the Lehigh River.
- Preserve and enhance the scenic qualities of the Lehigh River. Encourage the creation of a scenic drive along the D&L Drive. Implement the goals and objectives of the Heritage Conservancy publication, *Shaping the D&L Drive*.
- Continue to support and implement the recommendations outlined in the *Lehigh River Watershed Conservation Management Plan*, by Wildlands Conservancy.

Additional Planning Partners and Studies
LEAD AGENCY: Wildlands Conservancy — *Lehigh River Watershed Conservation Management Plan*

Delaware and Lehigh National Heritage Corridor
Heritage Conservancy
National Park Service
Natural Lands Trust
PA Department of Conservation and Natural Resources
PA Department of Environmental Protection
PA Fish and Boat Commission
Lehigh Gap Nature Center

Recommended Actions for the Little Lehigh Creek Greenway

GOAL: The preservation and continuation of the existing multi-use greenway and creation of a conservation greenway along the Little Lehigh Creek through the acquisition of unprotected land and/or conservation easements on the remaining high priority natural, recreational and cultural resource lands to connect it with existing protected areas.

Land Protection Summary: Little Lehigh Creek				
Total Greenway Area (acres):	**2,445**			
Acreage Protected [acres (%)]:			Number of Remaining Parcels by Size:	
Total Protected	737	(30%)	250 or more acres	0
Parks and Open Space	675	(28%)	100 - 249 acres	4
Publicly Owned	585	(24%)	50 - 99 acres	12
Privately Owned	90	(4%)	49 acres or less	1,321
Agricultural Easements	62	(3%)		
Note: Data was calculated using GIS and was based on a 1,000-ft. corridor width.				

- Preserve, through acquisition or easement, the remaining high priority parcels not currently in public ownership or deed restricted along the Little Lehigh Creek. Emphasize the following project areas:

  — Extend the parkway along the Little Lehigh Creek, providing an array of active and passive recreational opportunities, from Salisbury Township into Lower Macungie Township (see map on page 81).
  — Encourage agricultural landowners along the creek to restore natural riparian buffers to protect and enhance the environmental health of the Little Lehigh Creek watershed. Establish a wooded corridor along the creek west of Route 100 into Berks County.

- Support the Little Lehigh Creek as a Class-A Wild Trout Stream highly valued for angling and other recreational activities.

Additional Planning Partners and Studies

PA Department of Conservation and Natural Resources
PA Department of Environmental Protection
PA Fish and Boat Commission
Wildlands Conservancy

Recommended Actions for the Monocacy Creek Greenway

GOAL: The preservation and continuation of the existing multi-use greenway and creation of a conservation greenway along the Monocacy Creek through the acquisition of unprotected land and/or conservation easements on the remaining high priority natural, recreational and cultural resource lands to connect it with existing protected areas.

Land Protection Summary: Monocacy Creek				
Total Greenway Area (acres):	**2,167**			
Acreage Protected [acres (%)]:			Number of Remaining Parcels by Size:	
Total Protected	446	(21%)	250 or more acres	0
Parks and Open Space	184	(8%)	100 - 249 acres	4
Publicly Owned	184	(8%)	50 - 99 acres	16
Privately Owned	0	(0%)	49 acres or less	1,485
Agricultural Easements	262	(12%)		
Note: Data was calculated using GIS and was based on a 1,000-ft. corridor width.				

- Preserve, through acquisition or easement, the remaining high priority parcels not currently in public ownership or deed restricted along the Monocacy Creek greenway. Emphasize the following project areas:

  — Northampton County should revitalize efforts to create a Monocacy Creek parkway connecting Lower Nazareth Township's Surrey Glen Park to the Monocacy Complex in the City of Bethlehem (see map on page 84).

- Support the Illick's Mill Project's goals and objectives for the Illick's Mill Center for Environmental Education. Emphasize the following projects:

  — Protect and restore the physical and biological health of the Monocacy Creek by conducting a reassessment of the 100-year-floodplain, seeking better compliance with current regulations, and incorporating floodplains into a riparian buffer to ensure their protection.
  — Educate the community on local environmental preservation and protection. Encourage their involvement in hands-on restoration projects such as stream bank restoration, native planting, and clean-ups.
  — Promote the history of Illick's Mill and the connection these facilities and structures have with the industrial heritage of the Lehigh Valley.

- Educate landowners and farmers in the headwaters of the Monocacy Creek on the geological significance of this waterway and encourage the protection of ground and surface water quality through proper stewardship. Support the Monocacy Creek Watershed Association's efforts to educate and encourage landowners to use proper landscape maintenance and sustainable farming practices.
- Continue to support and implement the recommendations outlined in the *Monocacy Creek Rivers Conservation Management Plan*, by Wildlands Conservancy.

Additional Planning Partners and Studies
LEAD AGENCY: Monocacy Creek Watershed Association

Illick's Mill Partnership for Environmental Education
Monocacy Creek Chapter of Trout Unlimited
PA Department of Environmental Protection
PA Fish and Boat Commission
Wildlands Conservancy

Coordinate with Surrounding Counties

Connectivity is the defining characteristic that distinguishes greenways from isolated paths and pockets of open space. While individual parks, preserved lands, undisturbed natural areas and waterways are valuable resources in and of themselves, their conservation and recreation value is compounded when they are linked together.

In an effort to assure that the goals, objectives and recommendations of this Plan are coordinated with the plans and practices of surrounding counties, the greenways planning process included outreach to Monroe, Carbon and Schuylkill counties north of the Lehigh Valley; Bucks and Montgomery counties to the south; and Berks County to the west. Plans were reviewed and meetings arranged to assess coordination and consistency of potential greenway, recreation and open space development projects across county borders. Common values, objectives, and greenway and trail connections were considered in the development of this Plan.

The Lehigh Valley Greenways Plan supports continued cooperation and coordination with neighboring counties throughout implementation. A draft of this Plan was forwarded to representatives of the counties Berks, Bucks, Carbon, Monroe, Montgomery and Schuylkill counties for review and comment. Comments received on county connections to a regional greenway network were considered in the final draft and will continue to be used in future planning efforts to preserve and promote a greenway and open space network at regional and statewide levels.

Since August of 2001 members of the Lehigh Valley Planning Commission (LVPC) staff have met on 19 occasions with the Lehigh Valley/Berks Greenways Task Force to discuss and coordinate greenways planning in eastern Pennsylvania. These meetings have engaged numerous organizations and representatives of counties in eastern and southeastern Pennsylvania. It is expected that these meetings and others will be initiated as needed in the future.

The LVPC staff has also coordinated its local planning efforts with representatives of the Pennsylvania Highlands Coalition and the Appalachian Mountain Club concerning preservation efforts in the Pennsylvania Highlands and with Audubon Pennsylvania and the Appalachian Trail Conservancy concerning the Kittatinny Ridge Conservation Project. The Pennsylvania Department of Conservation and Natural Resources (DCNR) plays a key role in coordinating these efforts throughout their extent in Pennsylvania.

Increasing development pressures in many parts of the Lehigh Valley have resulted in increased awareness and interest in preserving open space. A range of techniques can be used to conserve open space from absolute to minimal protection. Since it is neither practical nor desirable for local government to regulate everything, a combination of landowner stewardship and public sector regulation is fundamental to the preservation of natural resources as conservation is most effective when various techniques are applied together. The options available to local governments include regulatory, non-regulatory and administrative measures. Any of the available measures described below should be carefully evaluated and implemented to meet the environmental and political needs of each municipality.

Land Conservation Techniques

Permanently protecting environmentally sensitive, historically important and/or culturally significant lands from undesirable development can be a challenging and time-consuming task. Choosing the appropriate method of preservation involves evaluating the landscape to identify the features needing protection, assigning priority to the land to assure the most sensitive and at-risk features are protected, and selecting suitable methods and entities to accomplish the conservation objectives.

Many valuable resources would have been developed from their natural undisturbed state had it not been for the hard work and collaboration of local governments and nonprofit organizations that aim to acquire and protect land identified by the Lehigh Valley Planning Commission (LVPC) as high priority resource lands. Land trusts that are actively protecting lands in the Lehigh Valley include:

Wildlands Conservancy **Emmaus, PA**

Since 1973, Wildlands Conservancy has been working to protect and enhance the quality of place that we all enjoy here in the Lehigh River watershed, as well as elsewhere in eastern Pennsylvania. As a non-profit, member-supported organization, we work on ways to protect water quality throughout the watershed, and we assist efforts to create, enhance, maintain, and promote parks and trails. We have protected more than 40,000 acres of critical farmland and wildlands in eastern Pennsylvania. We also foster responsible stewardship of our resources through education of our youth and by raising the environmental awareness of the general public.

Natural Lands Trust **Media, PA**

Natural Lands Trust is a non-profit land conservation organization protecting land in communities throughout the greater Philadelphia region. We envision and work to build an interrelated system of permanently protected open space comprised of the regions most important natural areas, cultural landscapes, and sustainable agricultural lands. Within this open space network, Natural Lands Trust: - Creates, owns and manages signature preserves; - Protects and monitors lands under conservation easement; - Helps conservation-minded partners and clients conserve land; - Actively manages thousands of preserved acres and teaches others best practices in land stewardship.

Heritage Conservancy **Doylestown, PA**
Heritage Conservancy preserves the open spaces and historic places that are so essential to our region's quality of life by working with citizens, community groups, private landowners, municipalities, and state and federal agencies to promote and implement open space and natural resource protection, green urban planning, agricultural land protection, innovative sustainable land use practices, preservation and/or adaptive re-use of historic structures, wildlife habitat restoration and best land management practices.

Appalachian Trail Conservancy **Boiling Springs, PA**
The Appalachian Trail Conservancy is a volunteer-based, private non-profit organization dedicated to the conservation of the 2,175-mile Appalachian National Scenic Trail, a 250,000-acre greenway extending from Maine to Georgia. Our mission is to ensure that future generations will enjoy the clean air and water, scenic vistas, wildlife and opportunities for simple recreation and renewal along the entire Trail corridor.

The most commonly used land conservation techniques are: fee simple acquisition, conservation easements and land management/stewardship.

Fee Simple Acquisition

Fee simple acquisition is the most straightforward method of preservation. A fee simple acquisition provides the greatest level of protection as a landowner sells their rights, title and interest in the property to the buyer, who then owns and maintains the land. Either by purchase or donation (tax benefits may apply to the donor), the receiving entity will hold the deed and be responsible for the insurance, taxes, liabilities and long term management of the property.

Through the Community Conservation Partnership Program (C2P2), DCNR provides technical assistance and grant funding to counties, municipalities, land trusts and preservation organizations for acquisition projects that preserve natural, cultural and recreational areas. The state and federal funds are available to encourage the preservation of publicly available open space and natural areas either through fee simple acquisition or acquisition of conservation easements.

Conservation Easement

A conservation easement is a method of protecting the significant resources of a property with deed restrictions that targets only those rights necessary to protect the land's conservation value. Through a conservation easement a landowner voluntarily assigns restrictions on the future use of the land; therefore, protecting sensitive environmental features, riparian buffers, greenways, historic resources, scenic vistas, and agricultural lands in perpetuity. Once again through purchase or donation a landowner conveys their development rights to the receiving entity yet retains ownership of the property, including the ability to sell or pass it on to heirs. Future owners of the land will also be bound by the conservation easement terms.

Conservation easements are a popular option amongst landowners as the responsibilities and rewards of ownership continue, thus the landowner retains full control over public access just as he did before granting the easement. However, in most instances when public dollars are used, this method of land preservation may require monitored public access when it is compatible to the conservation objectives. Also attractive to local governments, easement acquisition provides valuable open space to communities at a lesser cost to taxpayers than fee simple acquisition. This results in the generation of a significant public benefit through the permanent protection of more land using fewer funds.

Land Management/Stewardship

The least expensive land preservation technique is land stewardship through the careful management of land alteration to ensure that the natural (and cultural resources) are maintained and/or enhanced. This method of protection involves the thorough understanding of the value and roles of the resources present and incorporating this understanding into the development and maintenance of both privately and publicly owned land.

Conservation based development is one method of stewardship guided by the preservation of the conservation value of the property as well as the achievement of the economic goals of the landowner. Careful planning and design that incorporates open areas into a development site ensures that the highest priority natural areas are preserved. These areas can be used for recreation or preserved as open space. This method may use a combination of many land preservation techniques and is an alternative to traditional development.

Regulatory Measures

The *Pennsylvania Municipalities Planning Code* (MPC), in effect since 1969, and updated several times since, provides the enabling legislation to municipalities for the creation of comprehensive plans, and the establishment and use of regulatory land use ordinances. The general intent of the MPC is to give municipalities the police power to guide coordinated development; guide uses of land, structures, streets, and public facilities; and to promote preservation of natural and historic resources. Comprehensive Plans and regulatory ordinances are often the primary means a municipality uses to both guide potential open space acquisitions and enforce the protection of natural features from the development or use of a property.

Comprehensive Plan

The municipal Comprehensive Plan is a legal document that serves as a decision-making guide for both officials and citizens. It is intended to assist the municipality in making decisions about future growth and development. The process of developing the plan is perhaps as important as the final document. The process examines existing conditions and issues unique to the municipality and establishes goals and policies that support the municipality's desired future character and form. Relative to open space and environmental feature protection, the Comprehensive Plan can include objectives, strategies and recommended actions designed to ensure the provision of open space in the municipality. Further, it can include observations on general open space deficiencies and potential acquisition sites that would serve as the foundation for a municipal open space plan. Essentially a roadmap for the future, the goals and policies of the Comprehensive Plan serve as the document which the Official Map and/or municipal ordinances are based upon.

Official Map

Article IV of the *Pennsylvania Municipalities Planning Code* (MPC) enables municipalities to prepare an official map and take proactive measures in shaping important components of their future development, in contrast to simply reacting to developers' proposals. Adopted by ordinance, it serves as a visionary document that specifies properties the municipality wants to acquire for public improvements.

The official map is a seldom used land use management tool that can help municipalities plan the location and layout of future roads and public areas and preserve rights-of-way. By doing so, it reserves this land for future public use. When consistent with a municipal subdivision and land development ordinance (SALDO), zoning ordinance, and comprehensive plan, it can give strength and validity to a municipality's wants and needs for future growth. Further, it is an excellent supporting document for grant applications involving land or easements intended for open space or park facilities. For example, mapping future parks and recreation areas demonstrates that the municipality has proactively planned for these improvements, instead of reacting to unanticipated needs.

A wide variety of elements can be shown on the map as long as they are consistent with the MPC. The official map can include features such as:

- Existing and proposed public streets, watercourses, and public grounds, including widening, extensions, openings or closings
- Bikeway routes (both separate trails and those proposed along existing roads)
- Existing and proposed public parks, playgrounds, and open space reservations
- Pedestrian ways and easements
- Railroad and transit rights-of-way and easements (including those that may be vacated or abandoned and have potential use as trails)
- Stream valley corridors and other environmentally critical areas such as unique and scenic areas, or habitats of endangered species
- Flood control basins, floodways, and floodplain, stormwater management areas, and drainage easements
- Potential public well sites or groundwater resources areas
- Historical and archaeologically significant areas

The official map is not a taking of private land. If by virtue of the official map a landowner is denied reasonable use of his property, he or she can apply for a special encroachment permit that would allow them to build on the site. If a landowner notifies the municipality of their intention to develop a site identified on the map, the municipality has one year to acquire the site or the reservation of that land becomes invalid. The landowner is free to use any unmapped portions of the land in accordance with the municipality's zoning and subdivision regulations.

The official map need not be surveyed. A metes and bounds survey is not required until an actual purchase of land or easement is proposed by the municipality. It does not obligate the municipality to open, maintain or improve mapped roads or build the improvements cited on the map. It does not serve as the municipality's zoning map or comprehensive plan as it is a document of limited purpose and its legal impact is quite specific. The creation

of the official map is not necessarily an expensive undertaking. It can be simple or complex, with varying levels of detail. The level of complexity largely depends on the vision and the role of the map in helping elected officials make land use decisions.

In the Lehigh Valley, Lehigh County and the following municipalities have adopted official maps:

Allen Township (May 2000)
Bushkill Township (April 2005)
Hanover Township (Northampton County) (November 1996)
Moore Township (March 2003)
Whitehall Township (November 1998)

Municipal Ordinances

In addition to comprehensive planning, a municipality can enact regulatory measures to protect vulnerable natural resources through the following methods:

Subdivision and Land Development Ordinances (SALDO)
When a piece of land is divided into two or more lots, the land is considered to have been subdivided. Subdivision ordinances specify certain minimum requirements and standards that all land divisions must include. The municipality's SALDO can include a number of regulations that can preserve open space and protect environmental features.

Mandatory Dedication/Fee in lieu
The MPC provides for the mandatory public dedication of lands suitable for recreation purposes or the payment of fees in lieu of such lands. Municipal SALDOs can require fees paid by the developer to be deposited into a fund specifically for the construction of recreational facilities, reservation of land for parks or open space or a combination thereof. The MPC requires the formal adoption of a recreation plan as a prerequisite to implementation of these provisions. The fee in lieu of option ensures that all subdivisions provide for a proportionate share of the open space needs of the municipality. Both lands and fees obtained must be used to provide park or recreation facilities accessible to future residents of the development from which they were obtained.

Stormwater Management Best Management Practices (BMPs)
Preserving open space in a natural and undeveloped condition is an excellent best management practice (BMP) for groundwater protection, both for surface and groundwater supplies by filtering runoff and pollutants from impervious areas. It also provides additional area for other BMPs. They capture, treat and infiltrate stormwater on-site, helping to maintain the natural hydrology as development occurs. The LVPC recently developed a BMP manual as part of the *Global Act 167 Stormwater Management Plan Water Quality Update*. The Global Update was adopted by both counties and approved by the Pennsylvania Department of Environmental Protection in 2006.

The following table shows that a number of Lehigh Valley municipalities regulate, to some degree, the protection and preservation of natural features through municipal ordinances.

MUNICIPAL NATURAL RESOURCE PROTECTION ORDINANCES *										
	Rivers & Streams (Riparian Buffers)				Steep Slopes		Woodlands		Important Natural Areas[1]	
Municipality	Major Streams	Minor Streams	Floodplains	Wetlands	15 - 25%	25% +	Forestry	Preservation	Present	Provisions
LEHIGH COUNTY										
Alburtis Borough	No	No	**Yes**	No	**Yes**	**Yes**	No	**Yes**	No	No
Allentown City	No	No	**Yes**	**Yes**	No	No	**Yes**	**Yes**	No	No
Bethlehem City	No	No	**Yes**	No	**Yes**	**Yes**	No	No	No	No
Catasauqua Borough	No	No	**Yes**	**Yes**	No	No	No	No	No	No
Coopersburg Borough	No	No	**Yes**	**Yes**	**Yes**	**Yes**	No	**Yes**	No	No
Coplay Borough	No	No	**Yes**	No	No	No	No	No	No	No
Emmaus Borough	No	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	No	No	No	No
Fountain Hill Borough	No	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	No	**Yes**	No	No
Hanover Township	No	No	**Yes**	No	No	No	No	No	No	No
Heidelberg Township	No	No	**Yes**	**Yes**	**Yes**	**Yes**	No	**Yes**	**Yes**	No
Lower Macungie Township	No	No	**Yes**	**Yes**	**Yes**	**Yes**	No	**Yes**	**Yes**	No
Lower Milford Township	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	No
Lowhill Township	No	No	**Yes**	No	**Yes**	**Yes**	No	No	**Yes**	No
Lynn Township	No	No	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	No
Macungie Borough	No	No	**Yes**	No	No	No	No	No	No	No
North Whitehall Township	No	No	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	No
Salisbury Township	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	No
Slatington Borough	No	No	**Yes**	**Yes**	**Yes**	**Yes**	No	**Yes**	**Yes**	No
South Whitehall Township	No	No	**Yes**	No	No	No	No	No	**Yes**	No
Upper Macungie Township	No	No	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	No
Upper Milford Township	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	No	**Yes**	No
Upper Saucon Township	No	No	**Yes**	No	**Yes**	No	**Yes**	**Yes**	**Yes**	No
Washington Township	No	No	**Yes**	No	**Yes**	**Yes**	No	**Yes**	**Yes**	No
Weisenberg Township	No	No	**Yes**	**Yes**	**Yes**	**Yes**	No	**Yes**	No	No
Whitehall Township	No	No	**Yes**	No	No	No	No	No	**Yes**	No

MUNICIPAL NATURAL RESOURCE PROTECTION ORDINANCES * (cont'd.)										
	Rivers & Streams (Riparian Buffers)				Steep Slopes		Woodlands		Important Natural Areas[1]	
Municipality	Major Streams	Minor Streams	Floodplains	Wetlands	15 - 25%	25% +	Forestry	Preservation	Present	Provisions
NORTHAMPTON COUNTY										
Allen Township	No	No	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	No	No	No
Bangor Borough	No	No	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	No	No
Bath Borough	No	No	**Yes**	No	**Yes**	**Yes**	No	No	No	No
Bethlehem City	No	No	**Yes**	No	**Yes**	**Yes**	No	No	No	No
Bethlehem Township	**Yes**	**Yes**	**Yes**	No	**Yes**	**Yes**	No	No	**Yes**	No
Bushkill Township	**Yes**	**Yes**	**Yes**	No	**Yes**	**Yes**	No	**Yes**	**Yes**	No
Chapman Borough	No	No	**Yes**	**Yes**	No	No	No	**Yes**	No	No
East Allen Township	**Yes**	**Yes**	**Yes**	No	**Yes**	No	No	No	No	No
East Bangor Borough	No	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	No	**Yes**	No	No
Easton City	No	No	**Yes**	No	**Yes**	**Yes**	No	**Yes**	No	No
Forks Township	No	No	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	No	**Yes**	No
Freemansburg Borough	No	No	**Yes**	**Yes**	**Yes**	**Yes**	No	**Yes**	No	No
Glendon Borough	No	No	**Yes**	**Yes**	**Yes**	**Yes**	No	**Yes**	No	No
Hanover Township	No	No	**Yes**	No	No	No	No	No	No	No
Hellertown Borough	No	No	**Yes**	No	No	No	No	No	No	No
Lehigh Township	No	No	**Yes**	No	**Yes**	**Yes**	**Yes**	No	**Yes**	No
Lower Mt. Bethel Township	No	No	**Yes**	No	**Yes**	No	**Yes**	No	**Yes**	No
Lower Nazareth Township	**Yes**	**Yes**	**Yes**	No	**Yes**	**Yes**	**Yes**	**Yes**	No	No
Lower Saucon Township	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**
Moore Township	No	No	**Yes**	No	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	No
Nazareth Borough	No	No	**Yes**	No	No	No	No	No	No	No
North Catasauqua Borough	No	No	**Yes**	No	No	No	No	No	No	No
Northampton Borough	No	No	**Yes**	No	No	No	No	No	No	No
Palmer Township	**Yes**	**Yes**	**Yes**	**Yes**	No	No	**Yes**	**Yes**	No	No
Pen Argyl Borough	No	No	**Yes**	**Yes**	**Yes**	**Yes**	No	**Yes**	No	No
Plainfield Township	No	No	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	No
Portland Borough	No	No	**Yes**	No	No	No	No	No	No	No
Roseto Borough	No	No	**Yes**	No	**Yes**	No	No	No	No	No
Stockertown Borough	**Yes**	No	**Yes**	**Yes**	No	No	No	**Yes**	No	No
Tatamy Borough	**Yes**	No	**Yes**	**Yes**	No	No	**Yes**	No	No	No
Upper Mt. Bethel Township	No	No	**Yes**	**Yes**	**Yes**	**Yes**	No	No	**Yes**	No
Upper Nazareth Township	**Yes**	**Yes**	**Yes**	No	No	No	No	No	No	No
Walnutport Borough	No	No	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	No	No
Washington Township	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	No	**Yes**	No
West Easton Borough	No	No	**Yes**	No	No	No	No	No	No	No
Williams Township	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	No
Wilson Borough	No	No	**Yes**	No	No	No	No	No	No	No
Wind Gap Borough	No	No	**Yes**	No	No	No	No	No	**Yes**	**Yes**

*It is possible that the table and the ordinances might not reflect more recent amendments. As such, the accuracy of the information displayed cannot be guaranteed.
[1]Important Natural Areas include those areas identified in *A Natural Areas Inventory of Lehigh and Northampton Counties, Pennsylvania* , 2005. The Pennsylvania Science Office of the Nature Conservancy.

The following is a list of outstanding sample natural resource protection ordinances chosen from among municipalities on the list above. The full text of the ordinances can be found at the LVPC offices and is available upon request.

1. Comprehensive Natural Features Protection Ordinance

   As a regulatory method to protect a variety of natural features, this approach is the most comprehensive and easiest to administer. Instead of several stand alone ordinances, it is a concise set of regulations, packaged as a section in a zoning ordinance, or as one stand alone ordinance. The examples listed below protect a host of the natural features highlighted previously in this chapter.

   Lower Saucon Township, Northampton County
   Heidelberg Township, Lehigh County
   Upper Mount Bethel Township, Northampton County

Specialized environmental features ordinances that are not generally covered in a natural features omnibus ordinance include:

2. Sinkhole Prevention

   Lehigh Valley Planning Commission (LVPC) Model Regulations
   Williams Township, Northampton County

3. Forestry

   Lower Saucon Township, Northampton County
   Upper Macungie Township, Lehigh County
   Upper Milford Township, Lehigh County
   Penn State University Cooperative Extension Model Ordinance

4. Wellhead Protection

   LVPC Model Wellhead Protection Ordinance

Zoning Techniques

The *Pennsylvania Municipalities Planning Code* (MPC) designates zoning as a tool for regulating land uses, including open space and recreational facilities. The primary function of zoning should be to implement the municipality's comprehensive plan. It regulates the use of private property in the public interest and may be used to protect natural resources.

Overlay districts

An overlay district directs development away from sensitive or environmentally important lands. It is a set of regulations that are in addition to the base zoning district and is usually applied to specific locations within the municipality. Techniques such as conservation subdivisions, buffer strips and numerous performance standards are usually included in overlay regulations.

Performance Standards

"Performance zoning" is a flexible alternative to traditional land use zoning. Where traditional zoning specifies land uses within districts, performance zoning specifies the intensity of land use that is acceptable in consideration of the surrounding environment. With performance standards municipalities can steer development away from natural features, limit the intensity of development, and limit negative effects of development on public infrastructure. This option allows developers more flexibility in design since the use of a property is not restricted as long as the impacts to the surrounding land are not negative.

Sliding Scales

Sliding scale zoning limits the number of times a parcel can be subdivided to a maximum number established by the zoning ordinance. This method prevents the complete residential subdivision of large parcels, because of the diminishing returns as tract size increases. Conventional zoning would permit a fixed number of lots per acre regardless of tract size. Sliding scale zoning allows some residential development without using the entirety of the land. For example, a sliding scale would permit one building lot for every 10–20 acres, two lots for every 20–40 acres, three lots for every 40–80 acres and only four lots for parcels over 80 acres.

Conservation Subdivision Design

A conservation subdivision is a land development of common open space and clustered compact lots. The purpose of a conservation subdivision is to protect natural resources while allowing for the maximum number of residences under current municipal zoning and subdivision regulations. Conservation subdivision ordinances generally require permanent dedication of 40% or more of the total development parcel as open space. Open space design requirements often include contiguity and connection to other open space or conservation areas.

Planned Residential Development (PRD)

Planned residential development is a form of mixed use development that includes open space. They may consist of single-family dwellings, duplexes, multifamily dwellings, or a mixture of housing types. PRD encourages well-planned developments. The planned residential development option is intended to give landowners greater flexibility in developing tracts of land on a project basis by relaxing the various lot area, lot width, setback, yard and other regulations. PRD regulations can also mandate open space, similar to conservation design.

Lot Averaging

Lot averaging is a method that allows flexibility in lot size. This technique permits one or more lots in a subdivision to be undersized, as long as the same numbers of lots in the subdivision are oversized by an equal or greater area than what the zoning district permits. This allows a developer to work around existing natural features, such as wetlands, by making adjacent lots smaller, and locating them in protected open space.

Transfer of Development Rights (TDR)

The transfer of development rights "transfers" development to another part of the municipality where development and infrastructure may already exist. The goal of a TDR is to direct growth to an already developed, or developing, area. Landowners of these properties, usually in farmland or rural areas (senders) sell development rights to developers in areas designated for higher density development (receivers). The municipality or a nonprofit agency can act proactively, by purchasing the development rights and "retire" them, making them unavailable for future use, or "bank" them, making them available to interested developers for their use in receiving areas. An excellent resource on the TDR option is *Transfer of Development Rights* by the Environmental Management Center of Brandywine Conservancy.

Protecting Environmental Features through Zoning

Outside of creative methods to shape or otherwise limit development, significant natural features can be protected by specific stand alone ordinances or sections of the zoning ordinance. In practice, across the Lehigh Valley, it is the most proactive and successful approach a municipality can undertake in protecting natural features.

Floodplains

Floodplain areas absorb and store large amounts of water, which is a source of aquifer recharge. The floodplain is defined by the 100-year or base flood which has a 1 percent chance of being equaled or exceeded in a given year. The floodplain includes floodways and flood fringes. The majority of communities have floodplain regulations of varying regulatory restrictiveness. Natural vegetation supported by floodplains helps trap sediment from upland surface runoff, stabilizes stream banks and reduces soil erosion. Floodplains also provide shelter for wildlife and proper stream conditions for aquatic life. Many of the most scenic areas in Lehigh and Northampton counties are found within the floodplain of the Delaware River, Lehigh River, and larger streams such as the Little Lehigh Creek, Jordan Creek and Bushkill Creek.

Water quality is also affected by the action of water in a floodplain. When soil particles are scoured from the surface of the earth by water erosion, they can travel into fish habitats and human drinking sources. Reduced sedimentation in streams and rivers can aid in protecting an area from serious flooding by not clogging stream channels and drainage ditches. The intent of regulating development in floodplain areas is to eliminate loss of life, health hazards and property damages which may be caused by floods; to preserve the capacity of stream channels and adjacent floodplain areas to carry flood waters; and to encourage the use of flood prone land for open space uses.

Riparian buffers

A riparian buffer is an area of trees and other vegetation adjacent to a watercourse that forms a transition area between land and the watercourse. A riparian buffer ordinance establishes riparian buffers and regulates the size and permitted disturbances of the buffer. The riparian buffer is designed to intercept runoff from upland sources for the purpose of neutralizing the effects of nutrients, sediment, organic matter, pesticides or other pollutants before they enter the watercourse.

To be most effective, buffers should be considered along all streams, including intermittent and ephemeral channels. The effectiveness of a riparian buffer can be improved by limiting impervious surfaces and strictly enforced on-site sediment controls. Both grassed and forested buffers are effective at trapping sediment, although forested buffers provide other benefits as well, such as providing wildlife habitat.

Steep slopes

Steep slope regulations limit or prohibit development on areas of steep slope. The definition of steep varies from municipality to municipality, with 15% typically the minimum gradient classified as steep. Steep slopes are vulnerable to damage resulting from site disruption, primarily related to soil erosion. Such damage is likely to spread to areas that were not originally disturbed. Such erosion reduces the productivity of the soil, and results in increased sedimentation in drainage ways, wetlands and streams. Development of steep slopes, especially adjacent to stream corridors, can increase erosion of stream banks, resulting in pollution and decreased water quality.

Increased sedimentation also increases flood hazards by reducing the floodwater storage capacity and elevating the flood level of the drainage system in low-lying areas. Beyond these threats to the public safety, disruption of steep slopes also increases the likelihood of slippage and slumping — unstable soil movements, which may threaten adjacent properties, buildings, and public facilities such as roads and utilities.

Woodlands and Trees

Woodland and tree preservation regulations control and regulate the excessive removal, cutting, and destruction of trees. Woodlands stabilize the soil, control water pollution and provide a natural habitat for wildlife. Development can lead to tree loss and remaining trees lose vigor because of damage sustained during construction. Municipalities can limit both tree loss and tree damage with well conceived tree preservation ordinances or policies.

The goals of tree preservation are twofold. First, it seeks to protect designated trees. Secondly, it attempts to minimize impact to those trees during construction. The protection of native, non-invasive species of vegetation and older specimens of trees is accomplished by designing standards that regulate the type of vegetation to be removed and the circumstances under which it can be removed.

Wetlands

Wetlands are all lands regulated as wetlands by the Pennsylvania Department of Environmental Protection and/or the United States Army Corps of Engineers. Such areas are inundated or saturated by surface water or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions, including swamps, marshes, bogs and similar areas.

Many of these wetlands are seasonal (they are dry one or more seasons every year). The quantity of water present and the timing of its presence in part determine the functions of a wetland and its role in the environment. Even wetlands that appear dry at times for significant parts of the year (vernal pools) can provide habitats for wildlife. A wetland must have “hydrophytic vegetation,” defined as plants adapted to tolerate oxygen-poor, wet conditions. A wetland also must have “hydric soil,” which is soil that formed when oxygen was lacking because of prolonged inundation or saturation.

Wetlands have important filtering capabilities for collecting runoff from higher dry land before the runoff reaches streams and rivers, maintain stream flow during periods of drought, and can assist in replenishing groundwater. They also serve an important role in flood management since the holding capacity of a wetland can lessen the effects of a flooding event.

Wellhead protection

A wellhead protection ordinance regulates land use activities within defined critical recharge areas surrounding public water supply wells. The ordinance is structured to prohibit certain land use types, which could contaminate the water supply, from locating within the defined critical recharge areas. It can be a stand alone ordinance or be part of a zoning or subdivision and land development ordinance.

Sinkholes

The majority of the Lehigh Valley is underlain by soluble carbonate rock. When areas within a municipality are underlain with carbonate bedrock, these areas are often unstable and susceptible to collapse and the formation of closed depressions and sinkholes. This process can threaten the local groundwater supply by leaving the water vulnerable to contamination that moves through the rock's fractures and openings. The goal of this type of regulation is to protect groundwater resources and reduce the frequency of property damage due to sinkhole collapse.

The "Net Out" of features

The net out of resources refers to the technique of deducting environmentally constrained lands from development density calculations. Netting out is intended to protect and preserve environmentally constrained areas by reducing or eliminating the credit given for these lands toward the amount of development permitted on a given site.

Financial Implementation

The conservation of land for open space and/or greenways can create costs (lost tax revenue) and benefits (increased values for nearby properties, recreational and other amenities) for municipalities. There are several options for acquiring open space, ranging from or a combination of pay-as-you-go using tax revenue; borrowing funds via traditional loans or general obligation bonds; or federal, state and local grant programs.

With pay-as-you-go approaches, the government spends revenues from general appropriations or from a dedicated funding source such as property taxes, earned income taxes, real estate transfer taxes, dedicated open space tax or budget surpluses with no borrowing costs. This approach is an incremental approach, with a focus on acquisition of small parcels or completion of projects in stages. The cost of the open space is essentially borne by the present residents of the municipality.

Utilizing a borrowing approach, municipalities issue bonds or borrow from commercial lenders. It allows the municipality to expeditiously fund significant acquisitions or complete major projects. Borrowing spreads the cost of the open space over present and future residents of the municipality. Municipalities can combine the two approaches, borrowing funds for acquisition debt and implement a dedicated tax for open space acquisition. Revenues from the dedicated tax pay off the debt.

Another less commonly known method is the Installment Purchase Agreement (IPA). An IPA puts the purchase price into a tax-free annuity instead of giving the money directly to the landowner. The landowner receives tax-free interest from the annuity for a fixed number of years and then at the end of the period the full amount of the principal is transferred to the owner. In this way the landowner postpones the taxation of the principal amount, and in the interim, receives tax-free payments semiannually. The municipality typically purchases bonds to cover the payments. Deferral of payment of the purchase price for up to thirty years allows the municipality to make additional purchases or complete projects than could otherwise be made over the short term.

Since the municipality will own the easements forever, spreading the payments over time means that the cost is evenly distributed between present and future residents. The implementation of a municipal open space program is based on many variables and all options should be carefully considered to fit local natural resources protection goals and political needs.

Three excellent resources on financing options published by Heritage Conservancy are:

Public Finance for Open Space: A Guide for Pennsylvania's Municipalities, by Gary Gordon, PhD., 2003.
Using Conservation Easements to Preserve Open Space: A Guide for Pennsylvania's Municipalities by Debra Wolf Goldstein, Esq., 2002.
Implementing a Municipal Open Space Program: A Guide for Pennsylvania's Municipalities, by Michael Frank, 2003.

County Implementation Measures

Lehigh County Green Future Fund

Adopted in 2004, the Lehigh County Green Future Fund was developed:

1. To expedite the distribution of funds and project execution.
2. To support the recommendations of *Lehigh County Parks 2005* and the *Comprehensive Plan The Lehigh Valley … 2030*.
3. To leverage additional funds.
4. To encourage park planning with multi-municipal and private partnerships.
5. To help municipalities meet National Recreation and Park Association suggested guidelines.
6. To improve public parks, both county and municipally owned.

Funding is available for the County and its municipalities for real property purchases and the creation and/or improvement of physical assets that preserve open space or increase recreation opportunities. The program funding goal is $30,000,000 over a 10 year period or $3,000,000 a year. The funds are allocated as follows: 1/3 for the preservation of parks and open space, 1/3 for park improvements and 1/3 for the purchase of agricultural conservation easements.

Northampton County 21st Century Open Space Initiative

Also adopted in 2004, the Northampton County 21st Century Open Space Initiative was developed:

1. To preserve and enhance the natural environment.
2. To protect the county's important natural features by assisting municipalities and nonprofit organizations acquire and permanently preserve land where these resources are found.
3. To assist municipalities acquire land for park and recreation purposes and to improve existing parks.

4. To provide county funds that can be used to match state funds for the purchase of agricultural conservation easements.

Funding is available to acquire the interests in open space and natural areas real estate and for municipal park acquisition and development. In 2002, Northampton County voters authorized the borrowing of $37,000,000 to fund this initiative. The funding was organized as follows: $14,000,000 for open space and natural areas, $11,000,000 for municipal park acquisition and development and $12,000,000 for farmland preservation.

The LVPC has assisted Lehigh and Northampton counties in developing the recommendations and guidelines for both programs. Additionally, the LVPC staff provides the governing bodies and advisory committees with technical support as needed to further implement each program.

Municipal Implementation Measures

Many municipalities in the Lehigh Valley have developed recreation and open space master plans and update them periodically. These plans address the funding, acquisition, development and improvement of parks and open space. The adoption of such plans is an important step in the protection of municipal lands that are naturally, historically and culturally important. The following municipalities have existing park and recreation plans (current as of January 2006):

Lehigh County

Alburtis Borough
Allentown City
Emmaus Borough
Fountain Hill Borough
Hanover Township
Heidelberg Township
Lower Macungie Township
Lower Milford Township
Lowhill Township
Lynn Township
North Whitehall Township
Salisbury Township
Slatington Borough
South Whitehall Township
Upper Macungie Township
Upper Milford Township
Upper Saucon Township
Washington Township
Weisenberg Township
Whitehall Township

Northampton County

Allen Township
Bath Borough
Bethlehem Township
Bushkill Township
Chapman Borough
East Allen Township
Easton City
Forks Township
Glendon Borough
Hanover Township
Lehigh Township
Lower Nazareth Township
Upper Saucon Township
Lower Saucon Township
Moore Township
Nazareth Township
North Catasauqua Borough
Palmer Township
Tatamy Borough
Upper Nazareth Township
Williams Township

It is the implementation of these plans that has been a challenge. Methods of acquiring public open space require initiative and a dedicated funding source. Funding for open space can come from various resources, both public and private. However these funds need to be leveraged with local dollars. Municipalities can decide to pay for these programs year by year through finance mechanisms that include property taxes, earned income taxes, real estate transfer taxes, budget surpluses and/or general appropriations. Few Lehigh Valley municipalities have taken the additional steps necessary to fund a successful open space program. However, those that have taken the initiative have discovered overwhelming support from the voters.

State Support for Municipal Implementation

The state of Pennsylvania has shown incredible initiative in funding land conservation efforts throughout the Commonwealth. These programs are highlighted below:

Pennsylvania State Funding Programs

Pennsylvania Department of Conservation and Natural Resources Community Conservation Partnerships Program. Pennsylvania's funding source for local parks, recreation, land conservation, trails and river conservation. The department provides matching grants for land acquisition and transaction costs, as well as for planning and studies. Contact: 717-783-4734 or www.dcnr.state.pa.us/grants.htm.

Pennsylvania Agricultural Conservation Easement Purchase Program. The Pennsylvania Department of Agriculture provides funds to counties for the purchase of easements on agricultural land by municipalities and the counties themselves. To be eligible a property must be part of a voluntarily formed Agricultural Security Area and apply to the county agricultural preservation board. Contact: your county Agricultural Preservation Board.

Pennsylvania Department of Agriculture Land Trust Agricultural Easement Program. Provides up to $5,000 per transaction to reimburse non-profit land trusts for transaction costs such as appraisals and surveys. Municipalities working with a land trust on their open space acquisitions can access this funding source through the land trust. Contact: your local land trust, or call the Department of Agriculture's Bureau of Farmland Preservation at 717-783-3167.

Pennsylvania Department of Environmental Protection Growing Greener Grant Program. Provides funds to municipalities for open space planning and implementation. Contact: 717-705-5400 or 877-PAGREEN or www.dep.state.pa.us/growgreen/defaultdep.htm.

Federal conservation funds are available to state governments through several programs including: the Land and Water Conservation Fund (LWCF); Forest Legacy; the North American Wetlands Conservation Act; and the Cooperative Endangered Species Conservation Fund. Local governments do not have direct access to these funding sources.

Source: *Public Finance for Open Space: A Guide for Pennsylvania's Municipalitie*s, Gary Gordon, Ph.D.

Ballot Measures to Raise Public Funds for Land Acquisition

PENNSYLVANIA
Growing Greener II, Environmental bond for watershed protection, expansion of open space and farmland, and maintenance
5-17-2005 61% YES/39% NO Total funds approved by voters - $625,000,000; $297,500,000 acquisition funds

LEHIGH COUNTY
Bond to finance purchase of agricultural easements, parks, and open space
5-21-2002 71% YES/29% NO Total funds approved by voters - $30,000,000

NORTHAMPTON COUNTY
Bond for watersheds, wetlands, farmland and parks
11-05-2002 65% NO/35% YES Total funds approved by voters - $37,000,000

Bushkill Township, Northampton County
0.25% earned income tax increase to purchase development rights on open space and farmland
11-28-2005 66% YES/34% NO Total funds approved by voters - $3,140,000

Lower Mount Bethel Township, Northampton County
0.25% earned income tax increase to fund open space preservation
5-16-2006 76% YES/24% NO Total funds approved by voters - $3,000,000

Lower Saucon Township, Northampton County
5-year, 0.25% earned income tax increase for the preservation of open space, farmland and recreational lands
11-07-2006 60% YES/40% NO Total funds approved by voters - $3,500,000

Moore Township, Northampton County
0.25% earned income tax increase to fund farmland and open space preservation
5-17-2005 55% YES/45% NO Total funds approved by voters - $10,000,000

Williams Township, Northampton County
0.25% earned income tax increase to acquire open space and property development rights on farmland and open space
11-02-2004 70% YES/30% NO Total funds approved by voters - $4,500,000

Source: *The Trust for Public Land, LandVote® Database*

Arendt, Randall G. (1997). *Growing Greener*. Natural Lands Trust, Inc.

Audubon Pennsylvania (2006). *Conservation Plan for the Kittatinny Ridge*.

EDAW, Inc. (2003). *Open Space, Greenways, and Outdoor Recreation Master Plan*. Lackawanna County Regional Planning Commission and Luzerne County Planning Commission.

Flink, Charles A. and Searns, Robert M. (1993). *Greenways A Guide to Planning, Design, and Development*. The Conservation Fund.

Frank, Michael (2003). *Implementing a Municipal Open Space Program: A Guide for Pennsylvania's Municipalities*. Heritage Conservancy.

Frank, Michael (2003). *Opportunity Knocks –Open Space is a Community Investment*. Heritage Conservancy.

Goldstein, Debra W. (2002). *Using Conservation Easements to Preserve Open Space: A Guide for Pennsylvania's Municipalities*. Heritage Conservancy.

Gordon, Gary (2003). *Public Finance for Open Space: A Guide for Pennsylvania's Municipalities*. Heritage Conservancy.

Horner, Wesley, et. al. (2003). *Transfer of Development Rights: A Flexible Option for Redirecting Growth in Pennsylvania*. Brandywine Conservancy, Environmental Management Center.

Hunter, Malcolm L. Jr. (1990). *Wildlife, Forests, and Forestry: Principles of Managing Forests for Biological Diversity*.

Johnson, Russ (1998). *Creating Connections, The Pennsylvania Greenways and Trails How-To Manua*l. Pennsylvania Greenways Partnership.

Joint Planning Commission, Lehigh-Northampton Counties (1994). *Bike Rides The Lehigh Valley*.

Labaree, Jonathan M. (1992). *How Greenways Work: A Handbook on Ecology*. 2nd Edition. National Park Service and Atlantic Center for the Environment.

Lehigh Valley Convention and Visitors Bureau (2006). *Lehigh Valley Map & Guide, 2006*.

Lehigh Valley Planning Commission (1997). *Lehigh County Parks — 2005*.

Lehigh Valley Planning Commission (2002). *Northampton County Parks — 2010*.

Lehigh Valley Planning Commission (2005). *Comprehensive Plan The Lehigh Valley … 2030*.

Mertes, J.D. and Hall, J.R. (1996). *Park Recreation, Open Space and Greenway Guidelines*. National Recreation and Park Association.

Montgomery County Planning Commission (2005). *Shaping Our Future — A Comprehensive Plan for Montgomery County*.

Pennsylvania Greenways Partnership Commission, Greenways Partnership Advisory Committee (2001). *Pennsylvania Greenways An Action Plan for Creating Connections*.

Pennsylvania Science Office of the Nature Conservancy (1999). *A Natural Areas Inventory of Lehigh and Northampton Counties, Pennsylvania*.

Urban Research and Development Corporation (2005). *Two Rivers Area Greenway Plan*. Two Rivers Area Council of Governments.

Wildlands Conservancy (2006). *South Mountain Preserve Conservation, Greenways, and Trails Plan*.

Williamson, Karen S. (2003). *Growing with Green Infrastructure*. Heritage Conservancy.

Internet References

Pennsylvania Department of Conservation and Natural Resources, Bureau of Topographic and Geologic Survey. Geology of Pennsylvania.
Information retrieved from http://www.dcnr.state.pa.us/topogeo/field/index.aspx

Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Greenways. Pennsylvania Greenways Clearinghouse
Information retrieved from http://www.pagreenways.org/

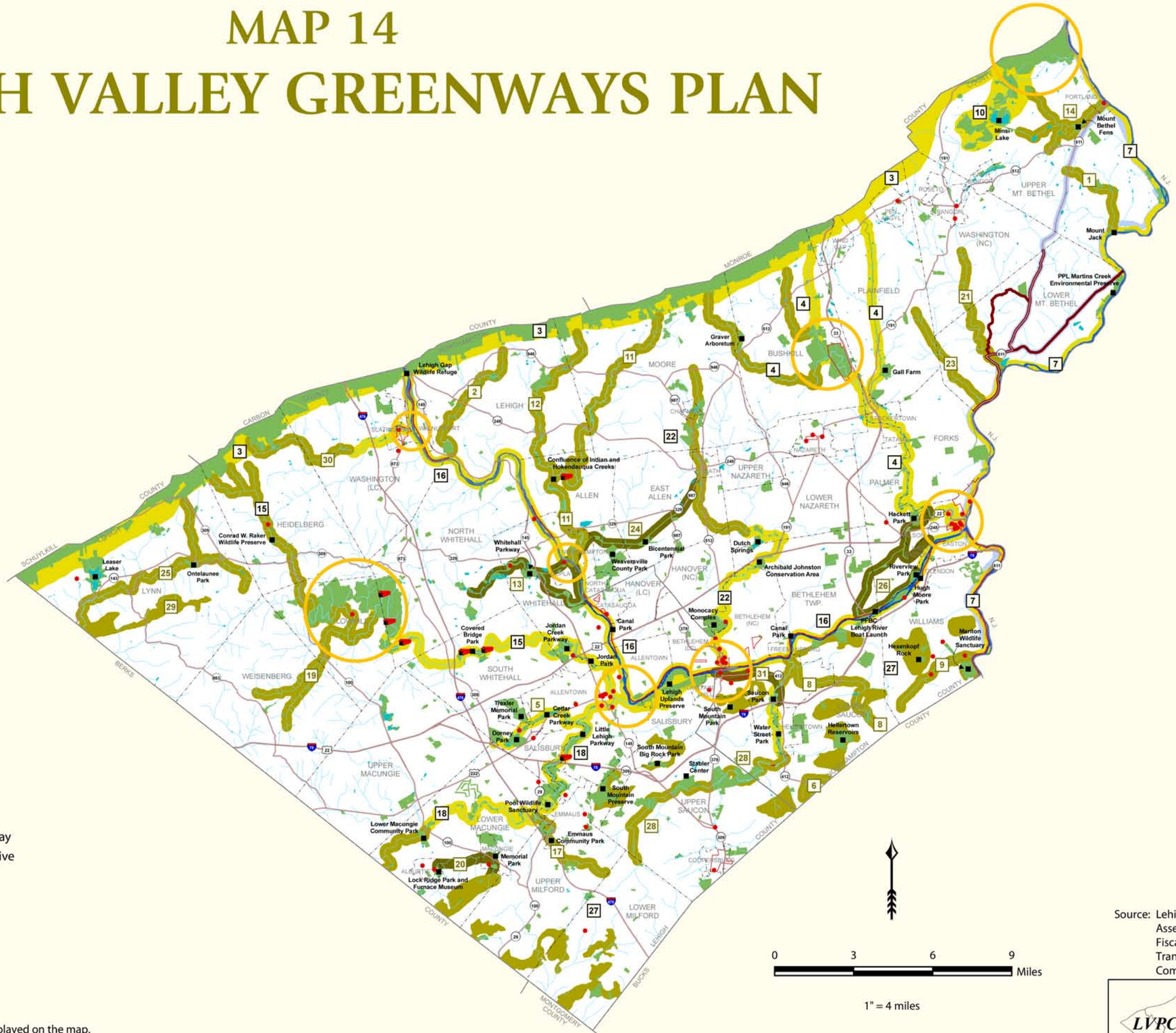
Pennsylvania Historical Museum Commission, Bureau for Historic Preservation. National Register Listed, Eligible, and NHL properties.
Information retrieved from http://www.phmc.state.pa.us/bhp/Inventories/NR_Reports/overview.asp?secid=25

The Trust for Public Land. TPL LandVote Database.
Information retrieved from http://www.tpl.org/tier3_cd.cfm?content_item_id=12010&folder_id=2386

USDA Forest Service. The Highlands of Connecticut, New Jersey, New York, and Pennsylvania.
Information retrieved from http://www.na.fs.fed.us/highlands/regional/index.shtm

MAP 14

LEHIGH VALLEY GREENWAYS PLAN



Greenway Types

- Cultural/Recreational
- Conservation
- Multi-Use
- Scenic
- Hub
- Node*
- Park (> 5 acres)

Historic Sites

- Structure
- Covered Bridge
- Canal
- District

- Pennsylvania Scenic Byway
- Delaware River Scenic Drive
- Major Road
- Municipal Boundary
- County Boundary
- Stream
- River
- Lake or Pond

*Nodes located within a hub are not displayed on the map.

1 Allegheny Creek
2 Bertsch Creek
3 Blue Mountain/Kittatinny Ridge
4 Bushkill Creek Corridor
5 Cedar Creek
6 Cooks Creek
7 Delaware River
8 East Branch Saucon Creek
9 Fry's Run
10 Greater Minsi Lake Corridor
11 Hokendauqua Creek
12 Indian Creek
13 Ironton Rail Trail
14 Jacoby Creek
15 Jordan Creek
16 Lehigh River
17 Leibert Creek
18 Little Lehigh Creek
19 Lyon Creek
20 Macungie-Alburtis Trail
21 Martins Creek
22 Monocacy Creek
23 Mud Run
24 Nor-Bath Trail
25 Ontelaunee Creek
26 Palmer-Bethlehem Bikeway
27 Pennsylvania Highlands
28 Saucon Creek
29 Shochary Ridge
30 Slate Heritage Trail/Trout Creek
31 South Bethlehem Greenway

Notes:
1) Priority greenways are indicated by black typeface.
2) No. 27 on the map also refers to the many isolated conservation/multi-use greenway areas within the Pennsylvania Highlands scenic greenway boundary.

Source: Lehigh Valley Planning Commission, 2007; Lehigh County, Tax Assessment Office, 2004 and 2006; Northampton County, Dept. of Fiscal Affairs, GIS Division, 2004 and 2005; Pennsylvania Dept. of Transportation, 1997 and 2006; Pennsylvania Historical Museum Commission, Bureau of Historic Preservation, 2006

LVPC
LEHIGH VALLEY PLANNING COMMISSION
961 Marcon Boulevard, Suite 310
Allentown, PA 18109-9368
(610) 264-4544