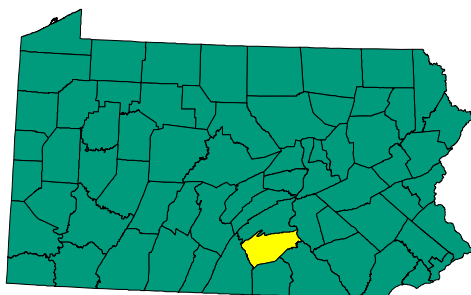
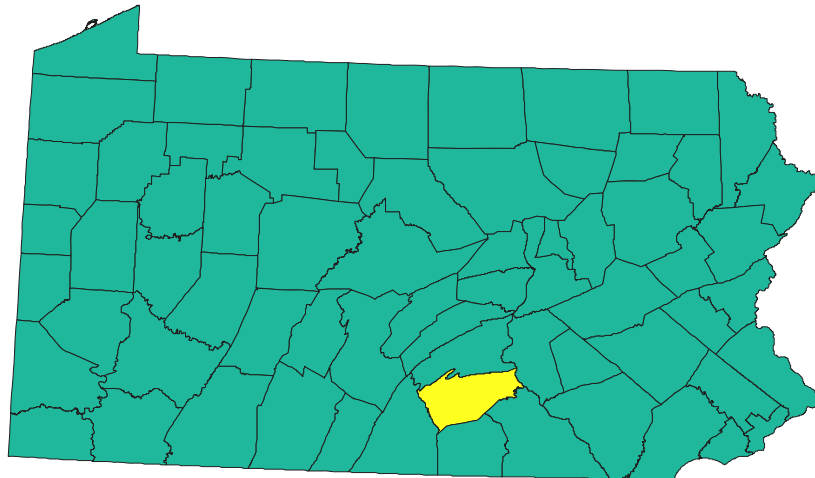


**A NATURAL AREAS INVENTORY
OF CUMBERLAND COUNTY, PENNSYLVANIA**
Update – 2005





**A NATURAL AREAS INVENTORY
OF CUMBERLAND COUNTY, PENNSYLVANIA**
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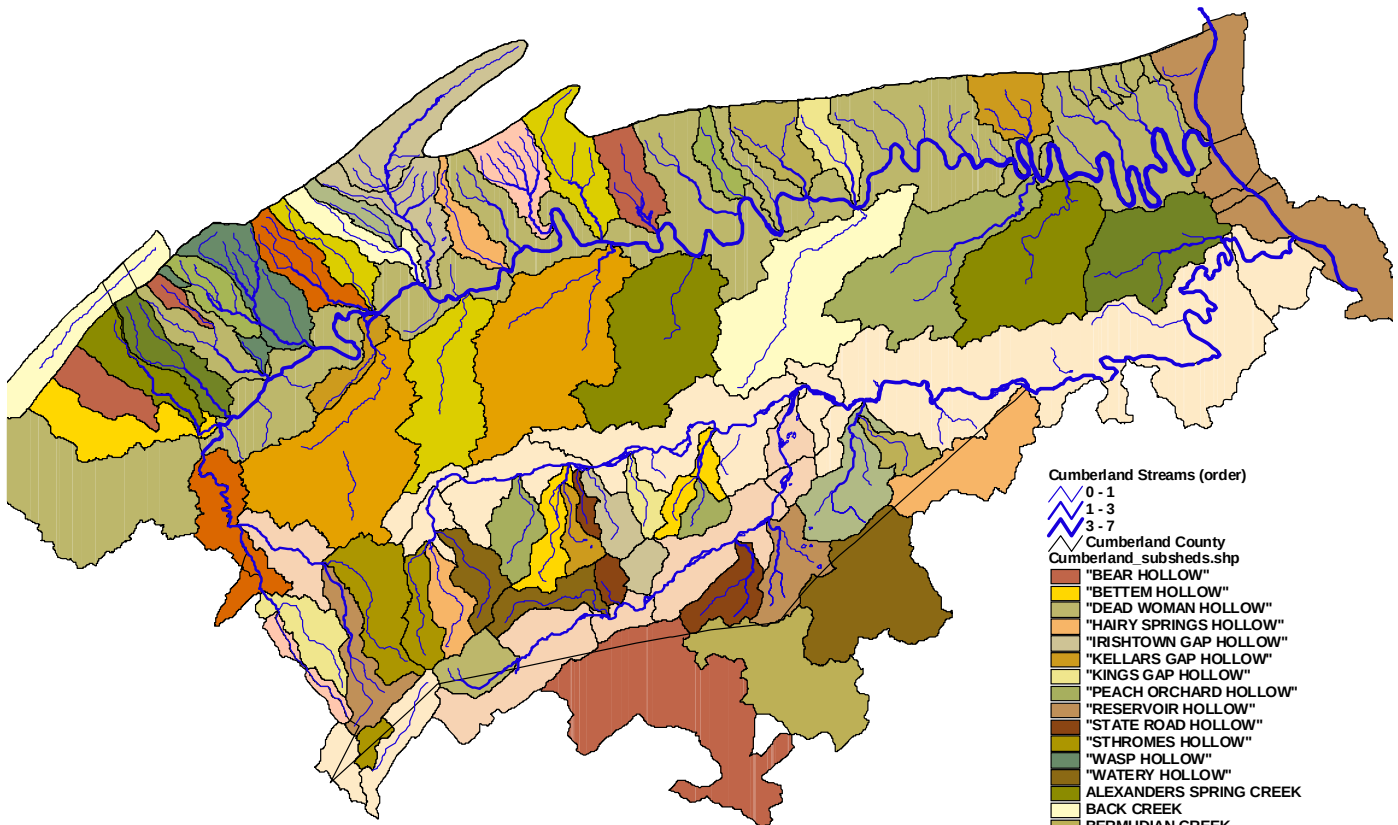


Prepared by:
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Submitted to:
**The Tri-County Regional Planning Commission
Dauphin County Veterans Memorial Office Building
112 Market Street, Seventh Floor
Harrisburg, PA 17101-2015
(717-234-2639)**

This project was financed in part by a grant from the Keystone Recreation, Park and Conservation Fund, under the administration of the PA Department of Conservation and Natural Resources, Bureau of Recreation and Conservation and a Community Development Block Grant, under the administration of the PA Department of Community and Economic development, Office of Community Development and Housing.

Subwatersheds of Cumberland County

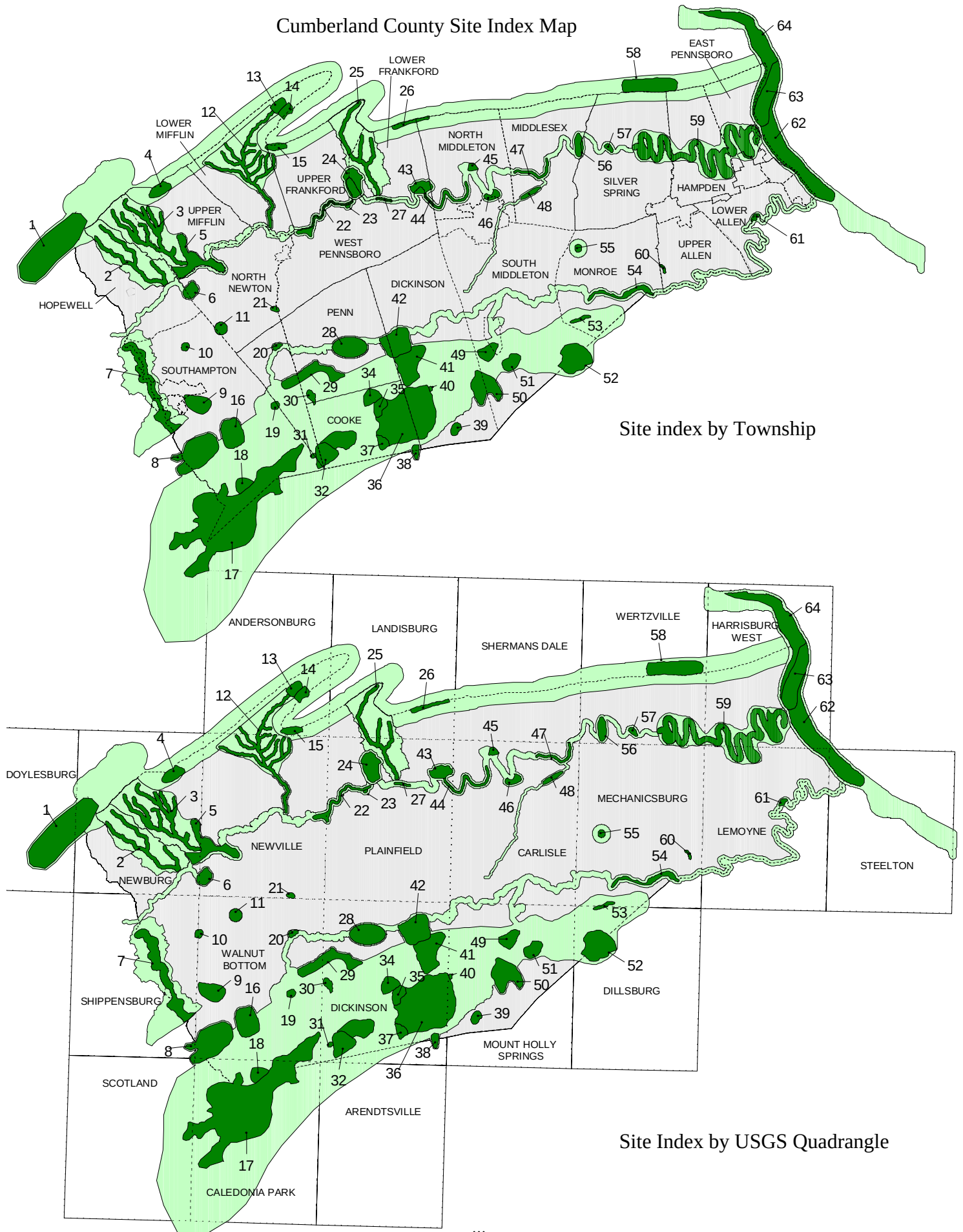


Forested buffers help protect streams and creeks from non-point sources of pollution and help maintain cool water temperatures for improved water quality and wildlife habitat.



Preservation and repair of forested stream corridors in even heavily urbanized areas can significantly increase protection for water quality and wildlife habitat within the region.

Cumberland County Site Index Map



Index to Cumberland County Sites—Listed by Site Number

- Note that natural areas with species of special concern are in capital letters while locally significant sites are in lower case letters throughout the document.
- Sites numbered from West to East, North to South

Site #	Site Name	Changes Since 2000	Municipality	USGS Quadrangle(s)	Pg #
1	GUNTER VALLEY AND RIDGES	NEW	Hopewell Twp. & Franklin & Perry Cos.	Doylesburg, Newburg	68
2	Peebles Run	UPDATED	Hopewell Twp.	Newburg	68
3	THREE SQUARE HOLLOW RUN	UPDATED	Hopewell, Upper Mifflin Twps.	Newburg	68, 122
4	THREE SQUARE HOLLOW EAST	NEW	Upper Mifflin Twp.	Newburg	122
5	STATE GAME LANDS #169	UPDATED	Upper Mifflin Twp.	Newburg, Newville	122
6	RUNNING PUMP ROAD WOODS		North Newton Twp.	Newville	90
7	MIDDLE SPRING CREEK WATERSHED	UPDATED	Hopewell and Southampton Twps., Shippensburg Boro., Franklin Co.	Shippensburg	68, 101
8	MAINS RUN & GUM RUN PONDS	UPDATED	Southampton Twp. & Franklin Co.	Caledonia Park, Shippensburg, Walnut Bottom	101
9	BURD RUN CAVES		Southampton Twp.	Walnut Bottom	100
10	MUDLEVEL ROAD SITE		Southampton Twp.	Shippensburg, Walnut Bottom	101
11	SPRING HILL SCHOOL GRASSLANDS	NEW	North Newton, Southampton Twps.	Walnut Bottom	90, 102
12	Doubling Gap Creek	UPDATED	Lower Mifflin Twp.	Andersonburg, Newville	78
13	Colonel Denning State Park		Lower Mifflin Twp.	Andersonburg	78
14	TUSCARORA TRAIL SITE		Lower Mifflin, Tyrone Twps. & Perry Co.	Andersonburg	78
15	FLAT ROCK SITE		Lower Mifflin, Upper Frankford Twps. & Perry Co.	Andersonburg	78, 118
16	THOMSON HOLLOW PONDS		Southampton Twp.	Walnut Bottom	102
17	BIG PINE FLAT	UPDATED	Southampton Twp. & Franklin & Adams Cos.	Caledonia Park, Walnut Bottom	100
18	OLD BALTIMORE ROAD SITE		Southampton Twp.	Caledonia Park	101

Site #	Site Name	Changes Since 2000	Municipality	USGS Quadrangle(s)	Pg #
19	C.C.C. DAM SITE	UPDATED	South Newton, Southampton Twps.	Walnut Bottom	101, 112
20	WALNUT RIDGE CAVE		South Newton Twp.	Walnut Bottom	112
21	BIG SPRING	NEW	North Newton, West Pennsboro Twps.	Newville	90, 125
22	CONODOGUINET CREEK EAST OF NEWVILLE	NEW	Upper Frankford & West Pennsboro Twps.	Newville, Plainfield	118, 126
23	LOGAN SCHOOL FOSSIL SITE	NEW	West Pennsboro Twp.	Plainfield	126
24	BLOSERVILLE HILL	UPDATED	Lower Frankford & West Pennsboro Twps.	Plainfield	74, 118, 125
25	Locust Creek	UPDATED	Lower Frankford & Upper Frankford Twps.	Landisburg , Plainfield	74
26	WAGGONERS GAP	UPDATED	Lower Frankford, North Middleton Twps. & Perry Co.	Landisburg	74, 86
27	CONODOGUINET CREEK AT MT. ROCK SPRING CREEK		Lower Frankford & West Pennsboro Twps.	Plainfield	126
28	HUNTSDALE GRASSLANDS	NEW	Penn Twp.	Dickinson	92
29	PEACH ORCHARD HOLLOW PONDS	UPDATED	Penn, South Newton Twps.	Dickinson, Walnut Bottom	92, 112
30	CHIMNEY ROCKS	NEW	Penn Twp.	Dickinson	92
31	LEWIS ROCKS	NEW	South Newton, Southampton Twps.	Dickinson	101, 112
32	DEAD WOMAN HOLLOW		Cooke, South Newton, Southampton Twps.	Dickinson	45, 101, 112
33	MICHAUX ROAD SITE	UPDATED	Cooke Twp.	Dickinson	45
34	BLACK SWAMP		Cooke Twp.	Dickinson	45
35	IRON RUN		Cooke Twp.	Dickinson	45
36	MOUNTAIN CREEK SEEPS / SAGE RUN	UPDATED	Cooke, Dickinson Twp.	Dickinson, Mount Holly Springs	46, 52
37	PINEY MOUNTAIN SEEPS		Cooke Twp.	Dickinson	45
38	Laurel Road Swamp	NEW	Cooke Twp. & Adams Co.	Dickinson	46

Site #	Site Name	Changes Since 2000	Municipality	USGS Quadrangle(s)	Pg #
39	TAGG RUN		Dickinson Twp.	Mount Holly Springs	52
40	HAMMONDS ROCKS	NEW	Dickinson Twp.	Mount Holly Springs	51
41	KINGS GAP HOLLOW		Dickinson Twp.	Dickinson	51
42	HUNTSDALE FLOODPLAIN / KINGS GAP PONDS		Dickinson, Penn Twp.	Dickinson	51, 92
43	CONODOGUINET CREEK AT MT. ZION SCHOOL ROAD	NEW	Lower Frankford & West Pennsboro Twps.	Plainfield	74, 125
44	CONODOGUINET CREEK AT CARLISLE		North Middleton, West Pennsboro Twp.	Carlisle, Plainfield	86, 125
45	CACTUS HILL SITE		North Middleton Twp.	Carlisle	86
46	CAVE HILL NATURE CENTER		North Middleton Twp.	Carlisle	86
47	CONODOGUINET CREEK AT WOLF BRIDGE		Middlesex Twp.	Carlisle	80
48	Letort Spring Run		Middlesex Twp.	Carlisle	80
49	MOUNT HOLLY MARSH	UPDATED	South Middleton Twp.	Mount Holly Springs	108
50	HUNTERS RUN SITE	UPDATED	Dickinson, South Middleton Twps.	Mount Holly Springs	51, 108
51	Upper Mill Woods	UPDATED	South Middleton Twp.	Mount Holly Springs	108
52	CAMP TUCKAHOE		South Middleton Twp. & York Co.	Dillsburg	108
53	WHITE ROCKS	NEW	Monroe Twp.	Mechanicsburg, Dillsburg	84
54	YELLOW BREECHES CREEK - LEIDIGHS TO WILLIAMS GROVE		Monroe Twp. & York Co.	Mechanicsburg	84
55	LISBURN ROAD FARM		Monroe Twp.	Mechanicsburg	84
56	CONODOGUINET CREEK AT BERNHEISEL BRIDGE		Middlesex, Silver Spring Twps.	Wertzville	80, 95
57	CONODOGUINET CREEK AT RICH VALLEY ROAD	UPDATED	Silver Spring Twp.	Wertzville	95
58	LAMBS GAP/TROUT RUN HEADWATERS	NEW	Hampden, Silver Spring Twps. & Perry Co.	Wertzville	64, 96
59	CONODOGUINET MACROSITE	UPDATED	East Pennsboro, Hampden, Silver Spring Twps. and West Fairview, Camp Hill, and Wormleysburg Boros.	Harrisburg West, Wertzville, Lemoyne	57, 64, 95

Site #	Site Name	Changes Since 2000	Municipality	USGS Quadrangle(s)	Pg #
60	TROUT RUN NATURE PRESERVE/UPPER ALLEN MARSH		Upper Allen Twp.	Mechanicsburg	116
61	YELLOW BREECHES/RABOLD SITE	NEW	Lower Allen Twp. & York Co.	Lemoyne	72
62	SUSQUEHANNA RIVER AT HARRISBURG	UPDATED	City of Harrisburg, Swatara Twp., Cumberland & York Cos.	Harrisburg West, Harrisburg East, Steelton, Lemoyne	58
63	SUSQUEHANNA RIVER ISLANDS—MCCORMICKS ISLAND ARCHIPELAGO	UPDATED	East Pennsboro Twp. & Dauphin Co.	Harrisburg West	58
64	SUSQUEHANNA RIVER AT FORT HUNTER/ROCKVILLE	UPDATED	East Pennsboro Twp. & Dauphin & Perry Cos.	Harrisburg West	57



The **BOG TURTLE** (*Clemmys muhlenbergii*) is a Federally-threatened and PA-endangered species found in Cumberland County. Photo: PA Science Office of The Nature Conservancy.

Index to Cumberland County Sites—Listed Alphabetically by Site Name

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- Sites numbered from West to East, North to South

Site #	Site Name	Changes Since 2000	Municipality	USGS Quadrangle(s)	Pg #
17	BIG PINE FLAT	UPDATED	Southampton Twp. & Franklin & Adams Cos.	Caledonia Park, Walnut Bottom	100
21	BIG SPRING	NEW	North Newton, West Pennsboro Twps.	Newville	90, 125
34	BLACK SWAMP		Cooke Twp.	Dickinson	45
24	BLOSERVILLE HILL	UPDATED	Lower Frankford & West Pennsboro Twps.	Plainfield	74, 118, 125
	BRIDGE ROAD SITE	(combined into CONODOGUINET CREEK EAST OF NEWVILLE)			
9	BURD RUN CAVES		Southampton Twp.	Walnut Bottom	100
19	C.C.C. DAM SITE	UPDATED	South Newton, Southampton Twps.	Walnut Bottom	101, 112
45	CACTUS HILL SITE		North Middleton Twp.	Carlisle	86
52	CAMP TUCKAHOE		South Middleton Twp. & York Co.	Dillsburg	108
46	CAVE HILL NATURE CENTER		North Middleton Twp.	Carlisle	86
30	CHIMNEY ROCKS	NEW	Penn Twp.	Dickinson	92
13	Colonel Denning State Park		Lower Mifflin Twp.	Andersonburg	78
56	CONODOGUINET CREEK AT BERNHEISEL BRIDGE		Middlesex, Silver Spring Twps.	Wertzville	80, 95
44	CONODOGUINET CREEK AT CARLISLE		North Middleton, West Pennsboro Twp.	Carlisle, Plainfield	86, 125
27	CONODOGUINET CREEK AT MT. ROCK SPRING CREEK		Lower Frankford & West Pennsboro Twps.	Plainfield	126
	CONODOGUINET CREEK AT ROUTE 4021 BRIDGE	(combined into CONODOGUINET CREEK EAST OF NEWVILLE)			
43	CONODOGUINET CREEK AT MT. ZION SCHOOL ROAD	NEW	Lower Frankford & West Pennsboro Twps.	Plainfield	74, 125
57	CONODOGUINET CREEK AT RICH VALLEY ROAD	UPDATED	Silver Spring Twp.	Wertzville	95
47	CONODOGUINET CREEK AT WOLF BRIDGE		Middlesex Twp.	Carlisle	80

Site #	Site Name	Changes Since 2000	Municipality	USGS Quadrangle(s)	Pg #
22	CONODOGUINET CREEK EAST OF NEWVILLE	NEW	Upper Frankford & West Pennsboro Twps.	Newville, Plainfield	118, 126
59	CONODOGUINET MACROSITE	UPDATED	East Pennsboro, Hampden, Silver Spring Twps. and West Fairview, Camp Hill, and Wormleysburg Boros.	Harrisburg West, Wertzville, Lemoyne	57, 64, 95
32	DEAD WOMAN HOLLOW		Cooke, South Newton, Southampton Twps.	Dickinson	45, 101, 112
12	Doubling Gap Creek	UPDATED	Lower Mifflin Twp.	Andersonburg, Newville	78
15	FLAT ROCK SITE		Lower Mifflin, Upper Frankford Twps. & Perry Co.	Andersonburg	78, 118
1	GUNTER VALLEY AND RIDGES	NEW	Hopewell Twp. & Franklin & Perry Cos.	Doylesburg, Newburg	68
40	HAMMONDS ROCKS	NEW	Dickinson Twp.	Mount Holly Springs	51
	Hampden Slopes	(combined into CONODOGUINET MACROSITE)			
50	HUNTERS RUN SITE	UPDATED	Dickinson, South Middleton Twps.	Mount Holly Springs	51, 108
42	HUNTSDALE FLOODPLAIN / KINGS GAP PONDS		Dickinson, Penn Twp.	Dickinson	51, 92
28	HUNTSDALE GRASSLANDS	NEW	Penn Twp.	Dickinson	92
35	IRON RUN		Cooke Twp.	Dickinson	45
41	KINGS GAP HOLLOW		Dickinson Twp.	Dickinson	51
58	LAMBS GAP/TROUT RUN HEADWATERS	NEW	Hampden, Silver Spring Twps. & Perry Co.	Wertzville	64, 96
38	Laurel Road Swamp	NEW	Cooke Twp. & Adams Co.	Dickinson	46
48	Letort Spring Run		Middlesex Twp.	Carlisle	80
31	LEWIS ROCKS	NEW	South Newton, Southampton Twps.	Dickinson	101, 112
55	LISBURN ROAD FARM		Monroe Twp.	Mechanicsburg	84
25	Locust Creek	UPDATED	Lower Frankford & Upper Frankford Twps.	Landisburg , Plainfield	74
23	LOGAN SCHOOL FOSSIL SITE	NEW	West Pennsboro Twp.	Plainfield	126

Site #	Site Name	Changes Since 2000	Municipality	USGS Quadrangle(s)	Pg #
8	MAINS RUN & GUM RUN PONDS	UPDATED	Southampton Twp. & Franklin Co.	Caledonia Park, Shippensburg, Walnut Bottom	101
33	MICHAUX ROAD SITE	UPDATED	Cooke Twp.	Dickinson	45
7	MIDDLE SPRING CREEK WATERSHED	UPDATED	Hopewell and Southampton Twps., Shippensburg Boro., Franklin Co.	Shippensburg	68, 101
49	MOUNT HOLLY MARSH	UPDATED	South Middleton Twp.	Mount Holly Springs	108
36	MOUNTAIN CREEK SEEPS / SAGE RUN	UPDATED	Cooke, Dickinson Twp.	Dickinson, Mount Holly Springs	46, 52
	MT TABOR WOODS	(see THREE SQUARE HOLLOW RUN)			
10	MUDLEVEL ROAD SITE		Southampton Twp.	Shippensburg, Walnut Bottom	101
18	OLD BALTIMORE ROAD SITE		Southampton Twp.	Caledonia Park	101
29	PEACH ORCHARD HOLLOW PONDS	UPDATED	Penn, South Newton Twps.	Dickinson, Walnut Bottom	92, 112
2	Peebles Run	UPDATED	Hopewell Twp.	Newburg	68
	Pine Hill Arboretum	(combined into CONODOGUINET MACROSITE)			
37	PINEY MOUNTAIN SEEPS		Cooke Twp.	Dickinson	45
6	RUNNING PUMP ROAD WOODS		North Newton Twp.	Newville	90
11	SPRING HILL SCHOOL GRASSLANDS	NEW	North Newton, Southampton Twps.	Walnut Bottom	90, 102
5	STATE GAME LANDS #169	UPDATED	Upper Mifflin Twp.	Newburg, Newville	122
64	SUSQUEHANNA RIVER AT FORT HUNTER/ROCKVILLE	UPDATED	East Pennsboro Twp. & Dauphin & Perry Cos.	Harrisburg West	57
62	SUSQUEHANNA RIVER AT HARRISBURG	UPDATED	City of Harrisburg, Swatara Twp., Cumberland & York Cos.	Harrisburg West, Harrisburg East, Steelton, Lemoyne	58
	SUSQUEHANNA RIVER AT INDEPENDENCE ISLAND	UPDATED-Combined Susquehanna River at Independence Island and Susquehanna River at Steelton into "SUSQUEHANNA RIVER AT HARRISBURG"			
63	SUSQUEHANNA RIVER ISLANDS—MCCORMICKS ISLAND ARCHIPELAGO	UPDATED	East Pennsboro Twp. & Dauphin Co.	Harrisburg West	58
39	TAGG RUN		Dickinson Twp.	Mount Holly Springs	52
16	THOMSON HOLLOW PONDS		Southampton Twp.	Walnut Bottom	102

Site #	Site Name	Changes Since 2000	Municipality	USGS Quadrangle(s)	Pg #
4	THREE SQUARE HOLLOW EAST	NEW	Upper Mifflin Twp.	Newburg	122
3	THREE SQUARE HOLLOW RUN	UPDATED	Hopewell, Upper Mifflin Twps.	Newburg	68, 122
60	TROUT RUN NATURE PRESERVE/UPPER ALLEN MARSH		Upper Allen Twp.	Mechanicsburg	116
14	TUSCARORA TRAIL SITE		Lower Mifflin, Tyrone Twps. & Perry Co.	Andersonburg	78
51	Upper Mill Woods	UPDATED	South Middleton Twp.	Mount Holly Springs	108
26	WAGGONERS GAP	UPDATED	Lower Frankford, North Middleton Twps. & Perry Co.	Landisburg	74, 86
20	WALNUT RIDGE CAVE		South Newton Twp.	Walnut Bottom	112
53	WHITE ROCKS	NEW	Monroe Twp.	Mechanicsburg, Dillsburg	84
54	YELLOW BREECHES CREEK - LEIDIGHS TO WILLIAMS GROVE		Monroe Twp. & York Co.	Mechanicsburg	84
61	YELLOW BREECHES/RABOLD SITE	NEW	Lower Allen Twp. & York Co.	Lemoyne	72

A NATURAL AREAS INVENTORY
OF CUMBERLAND COUNTY, PENNSYLVANIA
UPDATE 2005

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2005 UPDATE SUMMARY

The original Tri-County Natural Areas Inventory (NAI), which was completed in 2000, included descriptions, maps, and rankings of sites of ecological significance in the county. The emphasis of the report was upon locations of species listed as rare, threatened, or endangered Federally, or in Pennsylvania, and exemplary natural communities. This NAI update is a thorough revision to the original report. It includes new information based on fieldwork that was completed since the original NAI was written. Many of the new sites have resulted from inventories of neighboring counties. Additionally, several sites of geologic importance were included in order to be consistent with newer methodology adopted by the authors. The sites that were not visited since completion of the original NAI were not reevaluated. Even with additional fieldwork completed since the original Tri-County NAI report was written, the top sites listed as top priorities in the original report are still considered the most important sites for conservation in the counties. Based upon the results of new field visits, the update includes changes in the rankings of sites listed in the original report, as well as any new sites discovered since the original inventories. The rankings are based on the same criteria used in the original report.

There is also updated information about elements reported in the original document. In some cases the state rarity rank (S rank), global rank (G rank), state and federal legal status, and/or the quality for an element has changed. Appendix 1 contains descriptions of state and global rank codes, and Appendix 2 contains descriptions of population quality ranks.

The results presented in the update have been reorganized from the original Tri-County NAI. There are tables for each township in the counties rather than for each USGS quadrangle map. Additionally, the tables have been organized by natural area and the species occurring within each site rather than comprehensively for the quad. Each table provides global and state rarity ranks, state legal status, site quality, date last observed for each element, and the status of each element occurrence (i.e. delisted, new, rank change). Following the table is a brief narrative for each site, noting whether it is a NEW natural area or an UPDATED site description.

All original natural communities and species of concern are described in the tables and text. Species codes used in the original report have been replaced by the species name in most cases. Sensitive species are not identified in order to prevent unauthorized collection and possible extirpation of the species at the site. Where the original report did not name any element occurrences, the update names all plants and natural communities, as well as most animals.

Maps of each township accompany the text, showing the location of each site identified. The area outlined on a map represents the general location of a species as well as the watershed or subwatershed area where the elements are located. Additional information about how this report was designed and how it can be used is detailed in the Introduction and Natural Areas Inventory Methods in the body of the report.

(Title Page of First Edition)

A NATURAL AREAS INVENTORY
OF CUMBERLAND, DAUPHIN, AND PERRY COUNTIES, PENNSYLVANIA
2000

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All of Cumberland County drains into the Susquehanna River. Activities within the County have a significant impact on the river and ultimately, the Chesapeake Bay.
Photo: PA Science Office of The Nature Conservancy

PREFACE

The Cumberland, Dauphin, and Perry Counties Natural Areas Inventory is a document compiled and written by the Pennsylvania Science Office of The Nature Conservancy. It contains information on the locations of rare, threatened, and endangered species and of the highest quality natural areas in the three counties; it is not an inventory of all open space. It is intended as a conservation tool and should in no way be treated or used as a field guide. Accompanying each site description are general management recommendations that would help to ensure the protection and continued existence of these rare plants, animals and natural communities. The recommendations are based on the biological needs of these elements (species and communities). The recommendations are strictly those of The Nature Conservancy and do not necessarily reflect the policies of the state or the policies of the three counties or townships for which the report was prepared.

Managed areas such as federal, state, county and township lands, private preserves and conservation easements are also provided on the maps where that information was available to us. This information is useful in determining where gaps occur in the protection of land with rare species, natural communities and locally significant habitats. The mapped boundaries are approximate and our list of managed areas may be incomplete, as new sites are always being added.

Implementation of the recommendations is up to the discretion of the landowners. However, cooperative efforts to protect the highest quality natural features through the development of site-specific management plans are greatly encouraged. Landowners working on management of or site plans for specific areas described in this document are encouraged to contact the Pennsylvania Science Office of The Nature Conservancy for further information.

Although an attempt was made through advertising, public meetings, research, and informal communications to locate the sites most important to the conservation of biodiversity within the three counties, it is possible that something was missed. Anyone with information on sites that may have been overlooked should contact the Tri-County Regional Planning Commission (see address on following page). This Natural Areas Inventory will be updated within five years, and additional sites may be included at that time.

ACKNOWLEDGMENTS

This project was financed in part by a grant from the Keystone Recreation, Park and Conservation Fund, under the administration of the PA Department of Conservation and Natural Resources, Bureau of Recreation and Conservation and a Community Development Block Grant, under the administration of the PA Department of Community and Economic development, Office of Community Development and Housing. Additional funding came from Cumberland, Dauphin, and Perry Counties, and from contributions by Gregory H. Knight, Esq., and from anonymous donors.

The species information utilized in the inventory came from many sources as well as our own field surveys. We wish to acknowledge the work of all of those who have carried out botanical and zoological survey work over the years. Without their contributions, this survey would have been far less complete. Biologists from institutions and agencies such as the Academy of Natural Sciences in Philadelphia, the Morris Arboretum of the University of Pennsylvania, the Department of Conservation and Natural Resources (formerly DER), the Pennsylvania Game Commission, the Pennsylvania Fish and Boat Commission, Shippensburg University, and Dickinson College were among the contributors for plant and animal records. Rob Criswell conducted surveys for rare fish species and Larry Klotz conducted surveys for rare plant species under contract for this report. Valuable information on vernal pond communities of South Mountain was provided by Gene Wingert and Randy Cassell of Cumberland Valley High School, Dr. Eric Lindquist of Messiah College, Dr. Tim Maret and Dr. Larry Klotz of Shippensburg University. The foresters of Tuscarora State Forest provided information and maps of areas of interest in Tuscarora State Forest and elsewhere in Perry County. Dan Brauning of the PA Game Commission DCNR provided information on sites for rare bird species. Steve Spangler provided information and assistance on surveys State Game Lands in Cumberland County. Many thanks go to those who reviewed the draft of this report. Finally, we especially wish to thank the many landowners who granted us permission to conduct inventories on their lands. The task of inventorying the natural heritage of Cumberland, Dauphin, and Perry Counties would have been far more difficult without this tremendous pool of information gathered by many people over many years.

Donald Cameron was the Coordinator of County Natural Areas Inventories at the start of this project. He planned the inventory, performed background research, and conducted much of the fieldwork. He deserves credit for his contributions to this Inventory.

Copies of this document may be obtained from:

The Tri-County Regional Planning Commission
Dauphin County Veterans Memorial Office Building
112 Market Street, Seventh Floor
Harrisburg, PA 17101-2015
(717)-234-2639

TABLE OF CONTENTS

Index to Cumberland County Sites—Listed by Site Number.....	iv
Index to Cumberland County Sites—Listed Alphabetically by Site Name.....	viii
2005 UPDATE SUMMARY	xiii
PREFACE.....	xvi
ACKNOWLEDGMENTS	xvii
INTRODUCTION.....	1
NATURAL HISTORY OVERVIEW OF THE COUNTIES.....	3
Physiography and Geology	3
Soils.....	4
Vegetation.....	5
Wetlands	7
Disturbance	10
PENNSYLVANIA NATURAL HERITAGE PROGRAM DATA SYSTEM	12
NATURAL AREAS INVENTORY METHODS	13
Information Gathering	13
Map and Air Photo Interpretation.....	13
Field Work	14
Data Analysis.....	14
Data Analysis.....	15
Landscape Analysis	16
CONSERVATION RECOMMENDATIONS	18
RESULTS	21
Top Priority Natural Areas in Cumberland County:.....	24
Natural Areas of Cumberland County by Township	43
COOKE TOWNSHIP	45
DICKINSON TOWNSHIP	51
EAST PENNSBORO TOWNSHIP, West Fairview, Wormleysburg, Lemoyne, Camp Hill & New Cumberland Boroughs.....	57
HAMPDEN TOWNSHIP	64
HOPEWELL TOWNSHIP, Newburg Borough	68
LOWER ALLEN TOWNSHIP, Shermanstown Borough.....	72
LOWER FRANKFORD TOWNSHIP	74
LOWER MIFFLIN TOWNSHIP	78
MIDDLESEX TOWNSHIP.....	80
MONROE TOWNSHIP.....	84
NORTH MIDDLETON TOWNSHIP, Carlisle Borough.....	86
NORTH NEWTON TOWNSHIP, Newville Borough	90
PENN TOWNSHIP	92
SILVER SPRING TOWNSHIP	95
SOUTHAMPTON TOWNSHIP, SHIPPENSBURG TOWNSHIP, Shippensburg Borough ...	100
SOUTH MIDDLETON TOWNSHIP, Mount Holly Springs Borough.....	108
SOUTH NEWTON TOWNSHIP	112
UPPER ALLEN TOWNSHIP, Mechanicsburg Borough.....	116
UPPER FRANKFORD TOWNSHIP	118
UPPER MIFFLIN TOWNSHIP	122
WEST PENNSBORO TOWNSHIP	125

GLOSSARY	132
References And Literature Cited	135
Appendix I: Natural Area Survey Form.....	137
Appendix II: Community Classification.....	138
Appendix III: Field Survey Form	141
Appendix IV: PNHP Ranks, Federal and State Status.....	142
Appendix V: Pennsylvania Element Occurrence Quality Ranks.....	147
Appendix VII: Plants and Animals of Special Concern in Cumberland County.....	148
Appendix VIII: Associated Species of Plants and Animals.....	150
Fact Sheets for Selected Species of Cumberland County	154

INTRODUCTION

The Tri-County Region of Cumberland, Dauphin, and Perry counties is located in south-central Pennsylvania, centered about the Susquehanna River. Together, the three counties area is approximately 1,625 square miles (Tri-County Regional Planning Commission). The region encompasses a mix of forest, agriculture, small towns, suburbs, and urban areas. From 1990 to 2000, the combined population of the three counties increased more than seven percent, to 509,074 people (U.S. Bureau of Census), a continuation of the trend illustrated in the 1980's. In 2004, the population of each county was estimated at 221,397 people in Cumberland County, 253,282 people living in Dauphin County, and 44,652 people living in Perry County. Dauphin County illustrated the lowest percentage of growth among the three counties from 2000 to 2004.

Development patterns in the three counties have been greatly influenced by the dominant features of the landscape itself. The Great Valley, incorporating central Cumberland and Lower Dauphin counties, contains the majority of the urban and intensely agricultural areas, while the more rugged topography of Perry and northern Dauphin counties has a more sparsely settled mixture of forests and small farms. Each of the three counties still contain a patchwork of natural and human-dominated habitats, including cropland, pasture, young and old forests, ponds, streams, and rivers. These areas are used for hunting, fishing, hiking, birdwatching, and other activities that make the region an attractive place to live. The same pieces of the landscape that provide scenic and recreational opportunities also function as habitat for a great diversity of plants and animals, including some which are rare, threatened and endangered species. Cumberland, Dauphin, and Perry County each contain intact examples of natural communities and sites for species rare in the state or even globally rare.

Much of the recent population growth in the region has occurred through new developments and the expansion of small towns and suburbs into previously rural areas. Recent changes such as the expansion of Route 322 and the growth of suburbs in the Cumberland Valley have affected the entire region. As growth continues, the natural areas that comprise the Tri-County Region's native natural heritage can be easily lost without careful planning of growth and development. Protecting the integrity of these natural systems provides benefits to humans as well as providing for the survival of wildlife, rare and otherwise. The danger of losing rare species and habitats is more intense in a region experiencing growth as rapidly as the Tri-County area. Wise planning can maintain open space, including natural environments and the plants and animals associated with them. A balance between growth and the conservation of scenic and natural resources can be achieved by guiding development away from the most environmentally sensitive areas.

In order to achieve such a balance and ensure protection of critical natural areas, county and municipal governments, the public, and developers must know the location and importance of these sites. This knowledge can help prevent conflicts over land use as well as help to direct protection efforts and limited conservation dollars to the most vulnerable areas. The Pennsylvania Science Office of The Nature Conservancy, under contract to the Tri-County Planning Commission, has undertaken this project to provide a document and maps that will aid in the identification of these important areas.

The Natural Areas Inventory report presents these three counties' known outstanding natural features—floral, faunal and geologic. The Inventory provides maps of the best natural communities

(habitats) and all the known locations of animal and plant species of special concern (endangered, threatened, or rare) in Cumberland, Dauphin, and Perry Counties. A written description and a summary table of the sites, including quality, degree of rarity, and last-observed date, accompany each map. Potential threats and some suggestions for protection of the rare plants or animals at the site are included in many of the individual site descriptions. Selected geologic features of statewide significance are also noted. In addition, the inventory describes locations of areas that are significant on a county-wide scale but cannot be deemed exemplary natural communities because no species of concern were documented at these sites. These "locally significant" sites represent good examples of habitats that are relatively rare in the county, support an uncommon diversity of plant species, and/or provide valuable wildlife habitat on a local level. Locally significant sites are referenced in lowercase lettering throughout this report, whereas natural area sites are referenced in uppercase lettering.

Particular species names, common and scientific, are provided in coordination with the state agency with jurisdiction over those species. Plants are under the jurisdiction of the PA Department of Conservation and Natural Resources (DCNR). Mammals and birds are under the jurisdiction of the PA Game Commission (PGC). Fish, aquatic invertebrates, reptiles, and amphibians are under the jurisdiction of the PA Fish and Boat Commission (PFBC) and are considered vulnerable to unauthorized collection. They are therefore not identified in the text of this report, at the request of the PFBC, in order to provide some measure of protection for the species. Terrestrial invertebrates are currently not regulated by a jurisdictional agency in Pennsylvania, though the Natural Heritage Program keeps track of many taxa that are considered rare in the state. Scientific names of associated species referenced in the site descriptions are provided in an appendix (Appendix VIII) in order to simplify the site descriptions.

The information and maps presented in this report provide a useful guide for planning development and parks, for conserving natural areas, and for setting priorities for the preservation of the most vulnerable natural areas. An overall summary identifies the highest quality sites in each county. All of the sites in this report were evaluated for their importance in protecting biological diversity on a state and local level, but many also have scenic value, provide water quality protection, and are potential sites for low-impact passive recreation, nature observation and/or environmental education.

The Natural Areas Inventory will be provided to each municipality through the Tri-County Planning Commission. The inventory is one tool that will aid in the implementation of county and municipal comprehensive plans. The counties, municipalities, land trusts, and other organizations can use the Natural Areas Inventory to identify potential protection projects that may be eligible for funding through state or community grant programs. Landowners will also find this inventory useful in managing and planning for the use of their land; it gives them the opportunity to explore alternatives that will provide for their needs and still protect the species and habitats that occur on their land. In addition, land managers may wish to consult this report in an effort to avoid potential conflicts in areas with species of special concern and/or identify ways of enhancing or protecting this resource. Users of this document are encouraged to contact the Pennsylvania Science Office of The Nature Conservancy for additional information.

Questions regarding potential conflicts between proposed projects (developments, culverts, pipelines, etc.) and species of concern mentioned in this report should be directed to the Environmental Review Specialist at the PNHP Office in Harrisburg (717) 772-0258.

NATURAL HISTORY OVERVIEW OF THE COUNTIES

The climate, geology, topography, and soils have been important in the development of the plant communities (forests, wetlands, etc.) as well as other natural features (e.g., streams and geologic features) in the three counties. Both natural and human disturbances have played an important role in the development and alteration of those plant communities and have caused the extirpation of some species and the introduction of others. These combined factors provide the framework for locating and identifying exemplary natural communities and species of special concern within the region. A brief overview of the physiography, geology, soils, and vegetation of Cumberland, Dauphin, and Perry Counties provides the background for the natural areas inventory methodology and findings presented in this report.

Physiography and Geology

Physiographic Provinces are classified by the characteristic landscapes and distinctive geologic formations that comprise each province. Physiography relates in part to a region's topography and climate, two factors that significantly influence soil development, hydrology, and land use patterns of an area. Bedrock type also influences soil formation and hydrology. Therefore, both physiography and geology are important to the patterns of plant community distribution, which is in turn important to animal distribution (see Vegetation). Certain plant communities and species might be expected to occur within some provinces and not in others, due to differences in climate, soils, and moisture regime. Physiographic and geologic information has come from a variety of sources, including Geyer and Bolles (1979 and 1987), Berg et al. (1981), *The Atlas of Pennsylvania* (Cuff et al. 1989), the *Geologic Map of Pennsylvania* (Socolow 1980), *Glacial Deposits of Pennsylvania* (Socolow 1981), and *Physiographic Provinces of Pennsylvania* (Berg et al. 1989).

The Tri-County region is situated within parts of three Physiographic Provinces: the Ridge and Valley Province, the Blue Ridge Province, and the Piedmont Province (Berg *et al* 1989). Each of these provinces has characteristic rock formations and topography (Geyer and Bolles 1979). The Ridge and Valley Province, underlain by wrinkled layers of sedimentary rock, contains most of the land in the three counties. This Province is divided into two Sections: the Appalachian Mountain Section and the Great Valley Section. The northwest-to-southeast running ridges of northern Perry and northern Dauphin Counties are part of the Appalachian Mountain section. These sandstone ridges typically range from 800 to 1200 feet in elevation and are fairly uniform. The valleys between these ridges may be more different from each other, reflecting differences in the underlying bedrock. South of the Appalachian Mountain Section is the Great Valley Section. This section occurs in a broad band across most of Cumberland County and the central part of Dauphin County. The Great Valley Section has a flat to rolling topography underlain by limestone and shale.

The Blue Ridge Physiographic Province (South Mountain Section) is represented by the portion of South Mountain that is located in southwestern Cumberland County. This portion of South Mountain represents the northern most tip of the Blue Ridge Physiographic Province, which continues south into Maryland and Virginia. The topography consists of steep ridges and narrow valleys, and the underlying rocks are erosion-resistant granite, sandstones, quartzite, and diabase.

The Piedmont Physiographic Province, Gettysburg-Trenton Section, extends into the south end of Dauphin County and into a very small part of Cumberland County near the town of Lisburn.

This Section has steep-sided diabase ridges and rolling hills underlain by conglomerates, sandstones, and shales.

Soils

The distribution of soils in these three counties reflects both local topography and bedrock geology. The physiographic regions outlined above tend to have similar soils, which in turn influence land use patterns. The Great Valley Section is mostly in agriculture, while the Appalachian Mountain and South Mountain Sections contain many woodlands and reservoirs, with small farms in the valleys.

The following brief descriptions of soil characteristics are taken from USDA soil surveys of each county, cited below, and the reader is referred to those documents for more detailed information. Additional information on associated vegetation is provided based on image interpretation and field surveys conducted for this Natural Areas Inventory. Soil types are important in the inventory process, as some natural communities and rare plant species are closely associated with specific soil types or characteristics.

The soil associations of the three counties have been described in two soil surveys: one for Cumberland and Perry Counties (Zarichansky 1983), and one for Dauphin County (Kunkle *et al* 1972). These are described below, grouped by physiographic section. An association is a group of soils with a distinctive, proportional pattern of occurrence in the landscape (Carey and Yaworksi 1963). Eight soil associations have been described for Cumberland County, eight for Dauphin county, and seven for Perry County. Each soil association contains one or more major soils and minor soils. The soils of the three counties are described together, arranged by physiographic section. Additional information on associated vegetation types is provided based on field surveys conducted for this Natural Areas Inventory.

Appalachian Mountain Section--The ridges of this section have soils derived from resistant quartzite, sandstone, siltstone, and shale. The **Hazleton-Laidig-Buchanan** association in Perry Co. and the **Dekalb-Lehew** association in Dauphin Co. are deep soils of stony sandy loam, on level to very steep upper slopes and ridgetops. This land is almost all in woodland. The valleys of this section are more variable, depending on their parent material. The **Weikert-Calvin-Berks** association, which covers the most area in Perry Co., and the **Cavin-Leck Kill-Klinesville** association in Dauphin Co., are shallow to deep soils derived from shales and sandstone. They are found in coves and on lower hills and ridges. These soils are used for a mixture of cropland, pasture, and woodland.

The **Elliber-Kreamer** association in Perry Co. consists of deep, gently sloping to steep soils on low ridges and valleys, derived from cherty limestone. These soils are suited to use as cropland. The **Murrill-Laidig-Buchanan** association in Perry Co. and the **Laidig-Buchanan-Andover** association in Dauphin Co. are deep soils of lower mountain slopes, formed from colluvium. These soils have fragipans from accumulated clay, and are well-drained to poorly drained. They are used for agriculture where not too stony or poorly drained. The valleys of the *Appalachian Mountain Section* also contains small areas of soil associations found in the *Great Valley Section*, as described below.

Great Valley Section--The northern portion of this section is underlain by shale, siltstone, and sandstone, from which the **Berks-Weikert-Bedington** (Cumberland Co.) and **Berks-Bedington-Weikert** (Dauphin Co.) are derived. These soils, which extend in a band across both

counties, are used mainly for agriculture. Immediately to the south is the **Hagerstown-Duffield** association, derived from weathered limestone. These soils are mostly on level to sloping terrain, and are very fertile. Few natural areas remain. Sinkholes and limestone outcrops may occur in these areas.

South Mountain Section--Three soil associations are found in this Section, south of the Great Valley in southwestern Cumberland County. The **Highfield-Glenville** association, formed in weathered schist and rhyolite, occurs on the tops and upper slopes of mountains and ridges. These are deep soils used for croplands, orchards, and pasture where not too steep or stony. The **Hazleton-Clymer** association occurs on ridgetops and sideslopes of sandstone and quartzite. They are deep, well-drained soils, nearly entirely forested because of their slope and stoniness. Downslope of South Mountain to the north is the **Murrill-Laidig-Buchanan** association. This is the same association, formed in colluvium, discussed in the Appalachian Mountain Section.

Gettysburg-Newark Section--This section, occurring in southern Dauphin and a small portion of southern Cumberland Counties, contains three soil associations. The **Athol-Neshaminy** association contains deep soils on undulating terrain, formed from conglomerate, breccias, and diabase. These soils are suitable for crops and pasture. Stony Ridge, which runs north-south across the *Great Valley*, is an extension of this association. The **Lewisberry-Penn-Athol** association in Dauphin Co. contains deep and moderately deep soils on undulating terrain, formed from red sandstone and shale. Most of this area has been cleared for farm crops. The **Brecknock-Neshaminy Association** is associated with ridges formed from intrusive diabase dikes; Neshaminy soils are derived from diabase, and Brecknock soils from adjacent, metamorphosed sandstones and shales. Most of the Brecknock areas have been cleared for croplands, while most of the Neshaminy soils are still wooded.

Two soil associations related to river valleys are found in the Tri-Counties. The **Monongahela-Atkins-Middlebury** association is formed from alluvium along the Susquehanna River and major tributaries in Perry and Cumberland Counties, and the **Duncannon-Chavies-Tioga** association is made up of sandy or silty loams along Susquehanna River terraces and floodplains in Dauphin Co.

Vegetation

The vegetation of Cumberland, Dauphin, and Perry Counties reflects the environmental conditions (geology, topography, soils, climate) and disturbance history, both natural and anthropogenic that occur within the counties. The three counties are located in the original Oak-Chestnut Forest Region (Braun 1950). The American chestnut (*Castanea dentata*) was once a dominant feature of the Oak-Chestnut Forest, but was virtually eliminated with the introduction to North America of the chestnut blight fungus (*Endothia parasitica*) in 1904. Today the forest of this region is more aptly classified as Appalachian Oak Forest (Bailey 1980) or Mixed Oak Forest (Monk et al. 1990), dominated by white, red, scarlet, and black oaks (*Quercus alba*, *Q. rubra*, *Q. coccinea*, and *Q. velutina*), often mixed with tulip poplar (*Liriodendron tulipifera*), red maple (*Acer rubrum*), and/or beech (*Fagus grandifolia*). This forest type occurs on the slopes and tops of all the mountain ridges within the counties as well as in some of the narrower valleys of central Dauphin and western Perry Counties, and throughout the more convoluted mountain ridges of South Mountain. At some of the higher elevation, cooler north-facing slopes in western Perry County, Tulip Tree (beech) maple forest may predominate, with tulip tree, red and sugar maple (*Acer*

saccharum), hickories, and sweet birch (*Betula lenta*) mixing with or replacing most of the oaks and heaths.

Several notable variations in the typical "Mixed Oak Forest" composition (Monk et al. 1990) occur with relationship to soil, soil moisture, and topography. Drier ridge tops with shallow nutrient poor soils are characterized by chestnut oak (*Quercus montana*) and black gum (*Nyssa sylvatica*) with red maple and other oaks as associates, and an understory of ericaceous shrubs including blueberries (*Vaccinium* spp.), huckleberries (*Gaylussacia* spp.), and mountain laurel (*Kalmia latifolia*). Some of these ridgetop woodlands also contain a significant component of pitch pine (*Pinus rigida*) and scrub oak (*Quercus ilicifolia*); these areas are known as Pitch pine-scrub oak barrens (Smith 1983). "Big Flat Barrens" is an example of this community type. Another distinct variant is the Mesic Central Forest community type, which occurs on slopes and in ravines adjacent to the Susquehanna River. Examples of this community type occur at Mahantango Mountain and along Shermans Creek at Cove Mountain. This broadly defined community type is characterized by some combination of the following species: sugar maple, red oak, basswood (*Tilia americana*), sweet birch, hemlock (*Tsuga canadensis*), tulip poplar, maple-leaved viburnum (*Viburnum acerifolium*), and witch hazel (*Hamamelis virginiana*), and has many additional woody and herbaceous associates. Yet another variant occurs along some of the small stream corridors and adjacent north-facing slopes of the region, and is dominated by hemlock with a minor component of yellow birch (*Betula alleghaniensis*) and an understory of ericads and witch hazel. Because of the dense shade and acidic litter, these hemlock-dominated forests typically have a depauperate herbaceous layer, often limited to several species of fern and sedges.

Only a small fraction of the forest cover of the Piedmont section remains, most having been cleared for agriculture and development, or repeatedly logged for lumber and fuel (Keever 1973). On the Piedmont Section tulip poplar often becomes the dominant tree after logging, seeding in on the openings and then growing more quickly than other trees. As the forest matures, however, shade-tolerant species (such as red oak) replace tulip poplar because it does not regenerate under a closed canopy (Tryon 1980). Currently forested lands of the piedmont such as State Game Lands 246 exist on areas such as rocky slopes and wetlands that are poorly suited to other uses. Some of the unforested Piedmont lands, particularly areas that were seldom or never plowed, support native vegetation similar to sites in Virginia as described by Braun (1950). These contain native grasses such as little blue stem (*Schizachyrium scoparium*), big blue stem (*Andropogon* spp.), and Indian grass (*Sorghastrum nutans*), and scattered small trees such as sassafras (*Sassafras albidum*) and/or red cedar (*Juniperus virginiana*).

The majority of the forests in the three counties have past histories of logging and are currently in some stage of regrowth. The largest stands of older regrowth observed during the inventory were located in Tuscarora State Forest in western Perry County. The oldest forest known in the three-county area is thought to be the virgin stand growing in Hemlocks Natural Area of Tuscarora S. F. Some areas historically cleared for agriculture have been succeeding back to forest. On drier soils in Perry County and northern Cumberland County, these successional forests are characterized by significant stands of Virginia pine (*Pinus virginiana*).

Wetlands

Wetlands include vegetation types important for the area, providing essential habitat for many plant and animal species. The type of wetland depends on soil type, disturbance, and length and duration of flooding. In Cumberland, Dauphin, and Perry Counties many of the wetlands are associated with streams or rivers and include floodplain forests, forested swamps, shrub swamps, and graminoid marshes. Two other wetlands types known from the region are seepage swamps and vernal pools.

Ephemeral or vernal pools are wetlands that fill with water on an intermittent basis due to annual precipitation, rising groundwater, or surface water runoff (Kenney and Burne, 2000). These pools become almost completely dry in most years, losing water through transpiration and evaporation. These pools, due to being ephemeral and virtually free of breeding fish, attract many species of breeding salamanders, turtles, frogs and toads. Some species, like the Spotted Salamander (*Ambystoma maculatum*), are obligate vernal pool species. This species and other *Ambystoma* species lay eggs only in vernal pools. In Cumberland County, this habitat occurs frequently at the toe slope of South Mountain in Dickinson, Penn, South Newton and Southampton Townships, and less frequently along North Mountain.

Floodplain forests occur along rivers and streams in low-lying areas. These locations are periodically inundated by floodwaters of spring runoff or runoff from intense storm events. In south-central Pennsylvania these forests are characterized by a canopy containing some combination of silver maple, sycamore, river birch, black willow, green ash, American elm, or box-elder. Shrubs and vines common to these forests include spicebush, ninebark, silky dogwood, Virginia creeper, and poison ivy. Floodplain forest communities, especially along the Susquehanna River, receive severe disturbances from floodwaters including erosion and scouring by water, ice, and debris and/or deposition of massive quantities of sediments and debris. Only species with adaptations or tolerance for these kinds of conditions can survive here.

Floodplains on smaller waterways receive less intense disturbances but are still periodically flooded which limits the kinds of vegetation that can occur on them. Pin oak, swamp white oak, silver maple, red maple, ash, sycamore, and black walnut are frequent on wetter bottomland soils associated with smaller creeks. Understory species include spicebush, violets, nettles, cut-leaved coneflower, golden alexanders and many other wildflowers. Several species of special concern are found in these habitats. In addition, floodplain forests also serve as a protective buffer against erosion and flood damage along many of the area's creeks.

Graminoid marshes are wetlands dominated by grasslike plants such as cattails, sedges, and grasses. These wetlands may be found in association with streams or in areas with ground water seepages. Graminoid marshes are uncommon in the Tri-county region, except as successional communities following beaver dams or other impoundments.

Seepage swamps are relatively small forested or shrub-dominated wetlands found on lower slopes where water emerges at the surface in a diffuse flow. They may be dominated by red maple with hemlock and yellow birch as associates, and an understory of rhododendron, swamp azalea, spicebush, and/or highbush blueberry. Common herbs in these seepage wetlands include skunk cabbage, violets, manna grass, sedges, and ferns, including cinnamon fern, royal fern, and sensitive fern, and sphagnum moss.

Because wetlands are relatively rare in south-central Pennsylvania, they are important refugia for plants as well as important habitat for nesting and migrating birds. Many other animals groups such as amphibians, reptiles, odonates, and lepidopterans also depend on specific wetland habitats for all or a portion of their life cycles.

Ephemeral/Fluctuating Natural Pools

Pennsylvania Natural Community Type

State Rank: S3 Global Rank: GNR

General Description

Ephemeral/fluctuating natural pools, more commonly referred to as vernal pools, are shallow natural depressions within the forest that seasonally fill with water during spring and fall rains, and dry during the summer months. Vernal pools rely on rainfall for their sole source of water input. These pools are void of fish species because of the cyclic pattern of alternating wet/dry periods. For this reason, vernal pools support a wide array of organisms that are specially adapted to the varying hydroperiod. The life histories of several insect species and amphibian species are tied to the fluctuating conditions of vernal pools for breeding and development of young. Many other species are known to use these pools as foraging grounds and for hibernation.

No other group of organisms has their life history tied to vernal pools more than the Ambystomatid salamanders. These species are considered vernal pool obligates, meaning their life histories are directly linked to the alternating wet/dry cycle of vernal pools. Pennsylvania's three species of Ambystomatid salamanders, commonly known as mole salamanders, spend the majority of their lives underground, sometimes up to several meters below the surface! Because of their secretive lifestyles, the mole salamanders are rarely seen by most people. In fact, the only reliable way to see these creatures is to be at a vernal pool, at night, while it's raining, during the breeding season!



photograph courtesy of the Pennsylvania Science Office

a spring season view of a vernal pool

The Cycle of Vernal Pools

Beginning in late February through March, the first warm rains of the year cause the ice that has covered the vernal pools to melt, initiating the mole salamander breeding migrations. The first species to enter the pools is the Jefferson Salamander, *Ambystoma jeffersonianum*. The Jefferson salamander is gray with blue flecking on the sides. The extremely long toes of the Jefferson salamander distinguish it from all other species of salamander in Pennsylvania. Jeffersons arrive at the pools, often crawling over snow, and slip into the water through small gaps and openings in the ice. For the next several days, the male Jefferson salamanders will court the females. Eggs are then deposited in jelly-like masses, usually attached to vegetation or sticks and limbs that have fallen into the pool. After the eggs are laid, Jeffersons will migrate out of the pools and back onto land where they will spend the rest of the year in subterranean retreats.

The migration of the Jefferson salamander usually overlaps with the breeding migrations of the Spotted salamander, *Ambystoma maculatum*. This robust salamander can grow to be nearly 8 inches long! The spotted salamander is brown to black with brilliant yellow or orange spots on the head and back. These salamanders have been known to form aggregations, known as breeding balls, where dozens of males will cluster around one or two females. Once spotted salamanders have laid their eggs on submerged vegetation and twigs, like the Jeffersons, they will migrate back into the surrounding forest.



photograph courtesy of Charlie Eichelberger

a gray treefrog calling at a vernal pool

Wood frogs (*Rana sylvatica*), spring peepers, (*Pseudacris crucifer*), and gray treefrogs (*Hyla versicolor*), extensively use vernal pools for breeding as well. The calls of these species can sometimes be used to locate vernal pools. The wood frog, which produces a call that sounds similar to squabbling ducks, are vernal pool obligates. Wood frogs are pinkish-brown, moderately sized frogs reaching lengths of about three to four inches and have dark brown masks under the eyes. The spring peeper is a small tree frog, which will rarely exceed an inch in length. Spring peepers are light brown with a brown "X" across their backs. The call is a high-pitched "peep!" and large deafening choruses are a sure sign that spring is on the way. The gray treefrog is greenish gray with bright yellow patches beneath the legs. Their call is a fluttering musical chirp. Vernal pools can also support many other frogs and toads, including the green frog (*Rana clamitans*), the bullfrog (*Rana catesbeiana*), the American toad (*Bufo americanus*), and the Eastern spadefoot toad (*Scaphiopus holbrookii*).

The vernal pools, now laden with amphibian eggs, are converged upon by a host of other species, which feed on the egg masses, larvae and tadpoles. The spotted turtle (*Clemmys guttata*) and red spotted newts (*Notophthalmus viridescens*) are frequent visitors of vernal pools. These species gorge themselves on the nutrient rich salamander and frog egg masses. Eastern garter snakes (*Thamnophis sirtalis*), and Eastern hognosed snakes (*Heterodon platyrhinos*) can be found hunting for salamanders and toads along the pool margins, and northern water snakes (*Nerodia sipedon*) will feed on the larvae and tadpoles within the pools.

As the spring rains end and summer begins, the water level in the pools drops considerably, often drying up completely. This decrease in water level coincides with the metamorphosis of the larval salamanders and tadpoles into adult salamanders, frogs and toads. These young salamanders and froglets begin their terrestrial lives, returning to the pools to breed once they attain sexual maturity.

During the summer, drying vernal pool basins provide a unique habitat for an array of plants, some of which are specially adapted to the same cyclic wet/dry pattern upon which the amphibians rely. Vernal pools provide habitat for several rare plant species, including the federally listed Northeastern Bulrush, (*Scirpus ancistrochaetus*).



photograph courtesy of the Pennsylvania Science Office

vernal pool salamander egg masses and tadpoles



photograph courtesy of Charlie Eichelberger

a marbled salamander migrating to a vernal pool

The onset of fall rains begins to refill the dried pool basins. It is during these rain episodes that the third species of mole salamander in Pennsylvania, the marbled salamander (*Ambystoma opacum*) breeds. The marbled salamander is a stout species, with a jet-black body patterned with unmistakable dazzling white bands. This species breeds in the shallows of the pools with the females laying their eggs under leaf litter and wood within the pool basin. As fall rains fill the pools and inundate the eggs, the marbled salamander eggs will hatch and the larvae spend the winter months beneath the ice, feeding on the aquatic vernal pool insects. For this reason, the marbled salamander larvae are much larger than the larvae of the Jefferson and spotted salamanders in the spring.

Status and Threats

Currently, Pennsylvania tracks Ephemeral/Fluctuating Natural Pools as important natural communities within the forest. Besides providing critical habitat for unique plants, per square inch, vernal pools provide the largest biomass production of vertebrates of any other community in the northeast!

Only within the last few decades have we begun to understand the importance of vernal pools to the ecology of Pennsylvania's forests. Temporary pools have historically been viewed as mosquito breeding pools, of little importance to forest ecology. As a result, a long history of vernal pool destruction exists. Many people have treated vernal pools with pesticides to control mosquitoes. Although mosquitoes will use vernal pools to breed, the animals specially adapted to vernal pools use the mosquito larvae as a food source. Most mosquito eggs laid in vernal pools don't survive to metamorphosis because the vernal pool species feed on the mosquito larvae. Unfortunately, pesticide application to vernal pools can be detrimental to the vernal pool obligates that rely on this unique natural community. Amphibians as a whole are highly sensitive to poisons and the application of chemicals can destroy the intricate food webs in vernal pool communities.

Despite the recent awareness of the importance of vernal pools to forest ecology, vernal pools are not protected from modification or destruction. Vernal pools provide critical habitat for a number of species of plants and animals that are specially adapted to the cyclic patterns exhibited by ephemeral/fluctuating natural pools. It is important to protect these ecological gems to conserve the rich biodiversity of the community.

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Disturbance

The nature, scale and frequency of disturbance are influential in the evolution and appearance of natural communities and associated rare species. Disturbance can be beneficial or destructive to the development and persistence of natural communities.

Some examples of natural disturbances are flooding, fire, and deer browsing. While often regarded as a detrimental impact, both fire and small-scale flooding can be beneficial to certain communities or rare species. Floodplain forests benefit from the periodic scouring and deposition of sediments as streams overtop their banks. At the same time, streamside wetland communities hold excess water, thus reducing the scale of flooding downstream. In contrast, deer have been blamed for a number of negative impacts on Pennsylvania flora and fauna (Rhoads et al. 1992): a reduction in the amount of understory, poor regeneration of some species, decreased songbird diversity, and direct loss of rare plants.

In many cases, human disturbance has been clearly destructive to natural habitats and species associated with them. Although necessary, farming, mining and development are disturbances that have completely eradicated some natural communities and habitats. For example, old-growth forests are all but non-existent although occasional old trees may be encountered; many wetland habitats have been filled or altered, resulting in the loss of some of the native plants and animals of these sites. Although some species, including several rare species, are aided by on-site disturbance (e.g. clearing or mowing), human disturbance is detrimental to most species. With wide-ranging human disturbance, some plant and animal species may be completely eradicated from an area because they cannot compete or survive under newly created conditions.

An increasing threat to these communities and natural habitats is the introduction and spread of exotic (i.e., non-native), invasive species across the landscape. These include, among others, the chestnut blight fungus that dramatically changed the composition of our forests; the grass carp that can disrupt native aquatic life; and a long list of plants that out-compete native species. An introduced pest of hemlock trees [Hemlock Woolly Adelgid](#) has had a dramatic negative impact on hemlocks in the county. [Invasive species of plants](#) such as Japanese honeysuckle (*Lonicera japonica*), tree-of-heaven (*Ailanthus altissima*), Oriental bittersweet (*Celastrus orbiculatus*), and garlic mustard (*Alliaria officinalis*) have become commonplace in disturbed woodlands, often to the point of excluding some of the native plants. In wetlands and along streams, purple loosestrife (*Lythrum salicaria*), Japanese knotweed (*Polygonum cuspidatum*), and mile-a-minute weed (*Polygonum perfoliatum*) are aggressive, weedy species that follow in the wake of disturbance and crowd out native species. The natural disturbances of flooding and scouring that occur along the Juniata and Susquehanna river corridors have helped to facilitate the invasion and colonization of many exotic species. There are few if any plant communities along the two major river corridors that do not have significant components of exotic species. The species with the greatest impact in these communities tend to be robust herbs such as purple loosestrife and Japanese knotweed, although vines such as Japanese hops are also serious problems. Aquatic habitats of the rivers, streams, and lakes are also vulnerable to invasion by exotics. Curly pondweed (*Potamogeton crispus*), a native of Europe, has become the dominant plant species in some of the regions waterways, and Asiatic clam (*Corbicula fluminea*) has become the most common mussel in some of the regions' streams.

Control of these problematic, non-native species is necessary for the long-term maintenance of high quality natural systems. Discouraging the use of these and other potentially weedy exotics in and around natural areas can help to prevent further encroachment. Some nurseries now carry a selection of tree, shrub and herbaceous species that are native to Pennsylvania, and these are recommended where plantings are necessary in, or adjacent to, natural areas. *The Vascular Flora of Pennsylvania* (1993) is a helpful reference for determining whether a plant species is native to the state or not.

Invasive Plant Species

Among the most aggressive introduced plant species in Pennsylvania include the following four top offenders of natural areas. These species are not kept in check by natural predators, and out-compete native species. Once established, they can be very difficult and time consuming to remove. Natural Areas should be monitored regularly for pioneer populations of these species. Small populations, once encountered, should be eradicated to help ensure the continued viability of natural areas. Photos: PA Department of Agriculture



Japanese Knotweed (*Polygonum cuspidatum*)



Tree of Heaven (*Ailanthus altissima*)



Purple loosestrife (*Lythrum salicaria*)



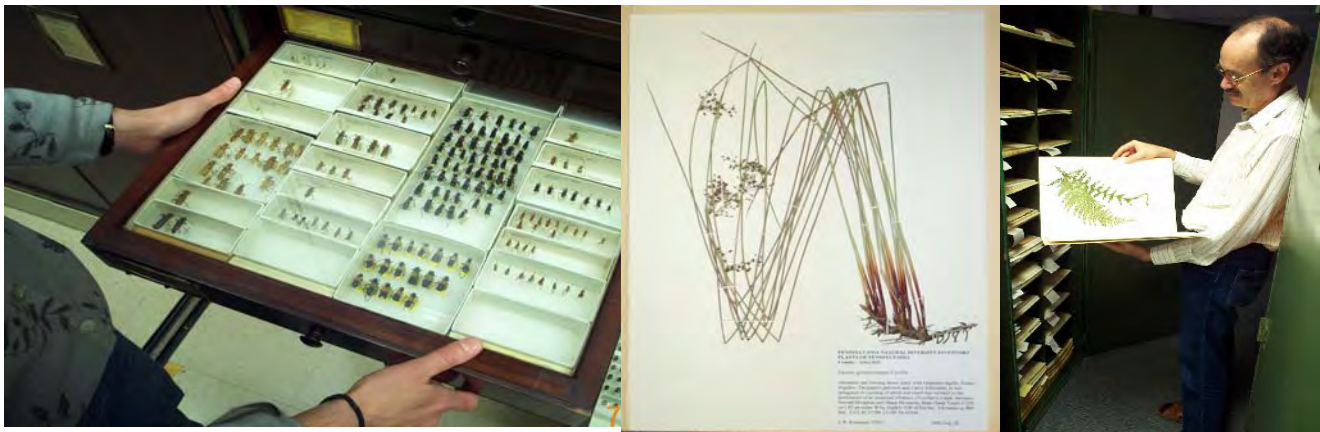
Multiflora rose (*Rosa multiflora*)

PENNSYLVANIA NATURAL HERITAGE PROGRAM DATA SYSTEM

In order to plan for the protection and stewardship of Cumberland, Dauphin, and Perry Counties' natural features, the Pennsylvania Science Office (PSO) of The Nature Conservancy (TNC) was contracted by the Tri-County Regional Planning Commission to provide an inventory of significant flora, fauna and natural communities in the three counties. Critical to this effort is the Pennsylvania Natural Heritage Program (PNHP) database. PNHP was established in 1982 as a joint venture of The Pennsylvania Science Office (PSO) of The Nature Conservancy, the Pennsylvania Department of Conservation of Natural Resources (DCNR), and the Western Pennsylvania Conservancy. In its 14 years of operation, the PNHP database has become Pennsylvania's chief storehouse of information on outstanding natural habitat types (called natural communities in PNHP terminology), sensitive plant and animal species (species of special concern), and heron rookeries. Several other noteworthy natural features are also mapped including DEP designated Exceptional Value streams (Shertzer 1992) and outstanding geologic features (based on recommendations from Geyer and Bolles 1979). Over 10,000 detailed occurrence records, largely the result of field surveys, are stored in computer files and denoted on topographic maps. Additional data are stored in extensive manual files set up for over 150 natural community types, over 800 plant and animal species, and about 650 managed areas, and are organized according to each of Pennsylvania's 881 7½' USGS topographic quadrangle maps.

Beginning in 1982, PSO has collected existing data on occurrences of elements of concern, drawing from publications, herbarium and museum specimens, and the knowledge of expert botanists, zoologists, ecologists, and naturalists. From this foundation, PSO has focused its efforts on, and conducted systematic inventories for, the best occurrences of the priority elements.

The PA Science Office has used this systematic inventory approach to identify the areas of highest natural integrity in Cumberland, Dauphin, and Perry Counties. These areas, comprised of natural communities with their characteristic species, represent an estimated 85-90 percent of the biological diversity of an area (The Nature Conservancy, 1988); the other 10-15 percent consists of sensitive plant and animal species, which occur both within and outside these natural communities. The full range of biological diversity in the three counties can be conserved by protecting both sites with the best occurrences of the counties' natural communities and good populations of their sensitive plants and animal species. The natural community and sensitive species data are the basis for judging the biological values of sites within the county.



The Pennsylvania Natural Diversity Inventory database has collected existing data on occurrences of species and communities (elements) of special concern, drawing from publications, herbarium and museum specimens, and the knowledge of expert botanists, zoologists, ecologists, and naturalists.

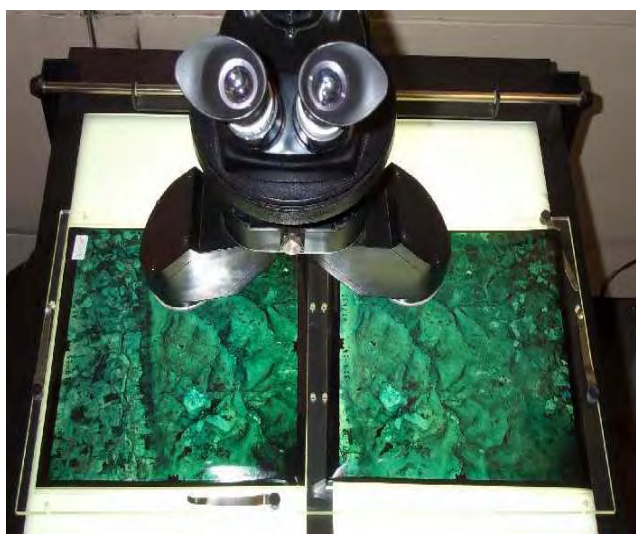
NATURAL AREAS INVENTORY METHODS

Methods used in the Tri-County Natural Areas Inventory followed PNHP procedures, and those developed in Illinois (White 1978) and Indiana (Anonymous 1985). The inventory proceeds in three stages: 1) information is gathered from the PNHP database files, local experts, and map and air photo interpretation; 2) ground survey and reconnaissance by aircraft is conducted; and 3) data are analyzed and mapped.

Information Gathering

A list of natural features found in each county was prepared from the PNHP database and supplemented with information volunteered by local individuals and organizations familiar with the three counties. In the spring of 1996 a public meeting was held and Recommended Natural Area Survey Forms (Appendix III) were distributed to facilitate public input. PSO staff solicited information about potential natural communities, plant species of special concern and important wildlife breeding areas from knowledgeable individuals and local conservation groups. A number of potential natural areas were identified.

Map and Air Photo Interpretation



PSO ecologists familiarized themselves with the air photo characteristics of high quality natural communities already documented (Appendix VI). Additional data from vegetation maps, soil-survey maps, field survey records and other sources were consulted to gain familiarity with the three counties' natural systems. This information, along with references on physiography, geology, and soils, was used to interpret photos and designate probable vegetation types and potential locations for exemplary communities and rare species. In many instances, vegetation was classified at an ecosystem level, and it was therefore critical that an ecologist or person with similar training interpret the maps and aerial photos.

Work progressed systematically within the area encompassed by each USGS topographic map. The natural area potential of all parcels of land was assessed using aerial photographs. Areas continuing into adjacent counties were examined in their entirety. Topographic maps for use during field surveys were marked to indicate locations and types of potential natural areas based on characteristics observed on the photos. For example, an uneven canopy with tall canopy trees could indicate an older forest; a forest opening, combined with information from geology and soils maps, could indicate a seepage swamp community with potential for several rare plant species. Baseline information on sites appearing to have good quality communities or potential for rare species was compiled on Potential Natural Area Survey Forms (Appendix III) to help prioritize field work.

After an initial round of photo interpretation, field surveys were conducted to determine what was actually on the ground. Locations with minimally disturbed natural communities or with species of special concern were outlined on topographic quadrangle maps. The photo signatures (characteristic patterns, texture, tone of vegetation, and other features on the photos) of these sites were then used as a guide for continued photo interpretation and future field surveys. Photo signatures which led to poor quality sites enabled the elimination of further field work on other sites with similar signatures.

Field Work

Experienced PSO biologists and contractors conducted numerous field surveys throughout the three counties from winter 1997 to spring 1999. Biologists evaluated the degree of naturalness of habitats (including assessment of percent of native vs. non-native plant species, degree of human disturbance, age of trees, etc.) and searched for plant and animal species of special concern. Workers categorized the vegetation by natural community type for each potential natural area visited. An evaluation of quality was made for each natural community, care being taken to give reasons for the quality rank. Boundaries of the community types were redrawn, if needed, based on new field information. The Potential Natural Area Survey Form (Appendix III) was completed for each community with a quality-rank of "C" and above. Community information recorded included the dominant, common, and other species, as well as disturbances to the community. Field forms were completed for all occurrences of sensitive plant and animal species, and natural communities (see sample Plant Survey Form, Appendix V), the quality of each population or community was assessed, and locations were marked on USGS topographic quadrangle maps.

On May 5, and Dec. 16, 1997, and in April 1998, low altitude reconnaissance flights were taken over the counties to provide a more accurate overview of the current condition and extent of known natural areas and to assess the potential of any additional areas.



Small Mammal Surveys



Invertebrate Surveys

Data Analysis

To organize the natural features data and set conservation priorities, each natural community or species (element) is ranked using factors of rarity and threat on a state-wide (state element ranking) and range-wide (global element ranking) basis (see Appendix I). Each location of a species element (an element occurrence) is ranked according to naturalness, its potential for future survival or recovery, its extent or population size, and any threats to it. An explanation of the five element occurrence quality ranks is given in Appendix II. The element-ranking and element occurrence-ranking systems help PSO personnel to simultaneously gauge the singular importance of each occurrence of, for example, a pitch pine-scrub oak barren community, rough-leaved aster, or giant swallowtail in the three counties, as well as the state-wide or world-wide importance of these natural features. Obviously, sites with a greater number of highly-ranked elements merit more immediate attention than sites with a smaller number of lower ranked elements.

Field data for natural communities of C-rank or better, and for all plant and animal species of concern found were combined with existing data and summarized on PNHP Element Occurrence Records for mapping and computerization. Mapped locations of natural features, including approximate watershed or subwatershed boundaries, were then transcribed on to acetate map overlays for County use and distribution.

Information on the needs of the rare species in this report has come from a variety of sources, including field guides and research publications. For reptiles and amphibians, the major source is DeGraaf and Rudis (1981); for birds, Brauning (1992); for moths, Covell (1984); for butterflies, Opler and Krizek (1984) and Opler and Malikul (1992); Schweitzer (1981) provided much of the information on moth and butterfly species rarity in Pennsylvania. A list of species of special concern currently known in the three counties is provided in Appendix VII. The scientific (Latin) names of non-listed species referred to in the report are given the first time they are mentioned in the body of the report.



Landscape Analysis

Background: Fragmentation of the landscape by roads, utility lines, and other human disturbances can impact the surrounding landscape significantly. A road or utility line cut through a forested block cleaves the large block into two smaller blocks and significantly increases the amount of edge habitat within the forest. When a forest with a closed canopy is disturbed by road building activities, the newly disturbed soil and open canopy favor the establishment of invasive species of plants and animals. Many of these will out-compete and displace native species in this disturbed habitat. These smaller forest fragments will have significantly more edge habitat and less forest interior than the original forest block. Furthermore, fragmentation of large forest blocks decreases the ability of many species to migrate across manmade barriers such as roads. Migration corridors, once severed, isolate populations of species one from another, limit the gene flow between populations and create islands of suitable habitat surrounded by human activity. Much of the native biological diversity of an area can be preserved by avoiding further fragmentation of these large forested areas.

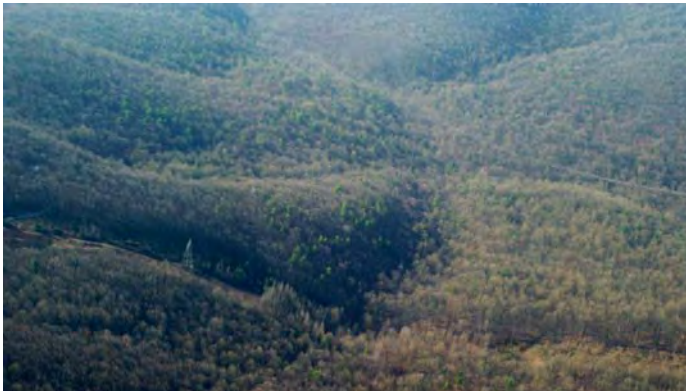
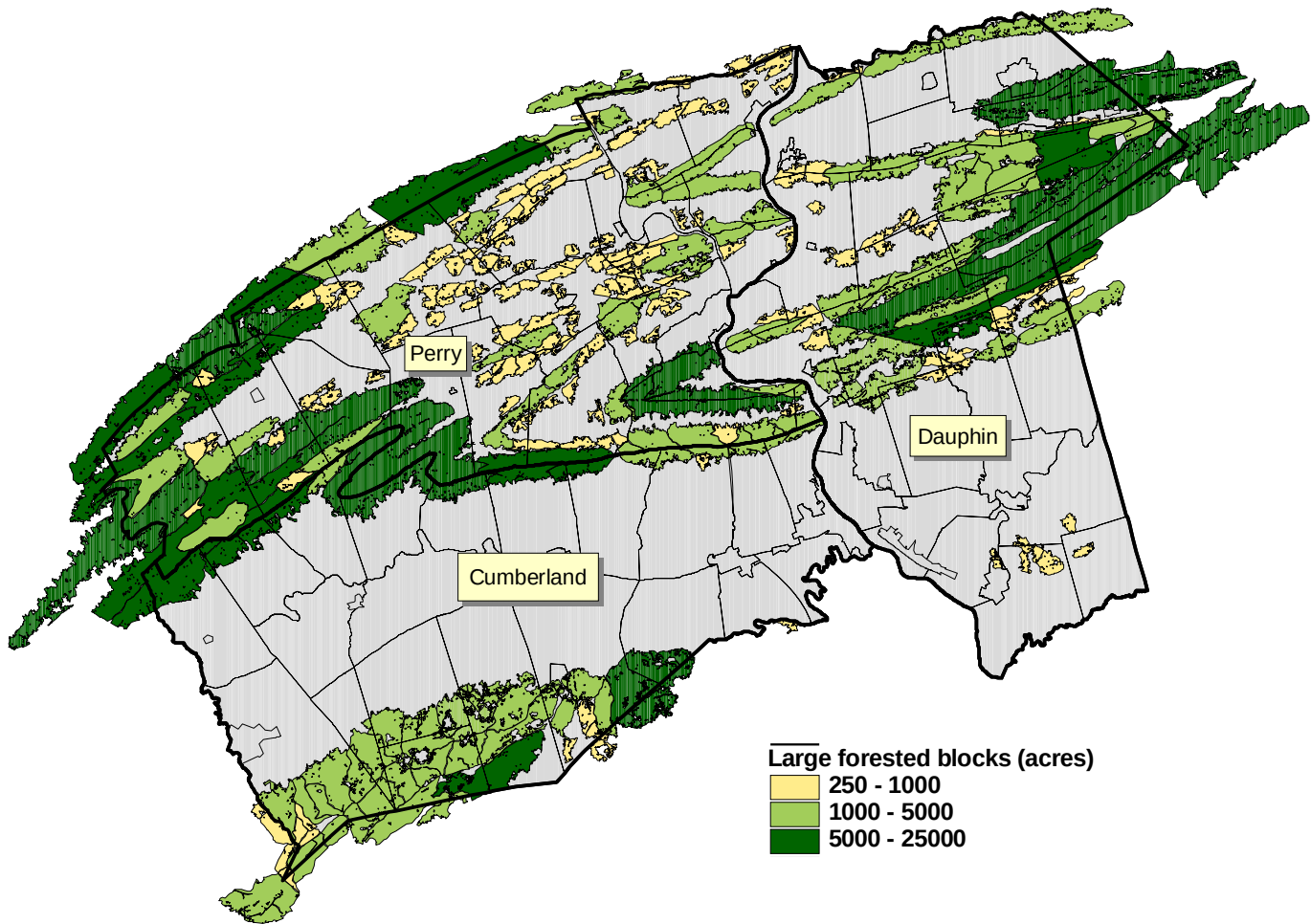
The larger forested blocks in the County (those of at least one acre in area) have been highlighted in an effort to draw attention to the significance of contiguous forested blocks within the County. Besides being habitat suitable for many native species, unfragmented forest blocks in close proximity to each other become natural corridors for species movement within and through the county. In many cases, by highlighting the larger forested blocks, the most natural landscape corridors become evident.

GIS Methodology: Creating NAI Forest Block Layers

The Pennsylvania portion of the National Land Cover Dataset (NLCD) was created as part of land cover mapping activities for Federal Region III that includes the states of Maryland, Delaware, Pennsylvania, Virginia, West Virginia, and the District of Columbia. The NLCD classification contains 21 different land cover categories with a spatial resolution of 30 meters. The NLCD was produced as a cooperative effort between the U.S. Geological Survey (USGS) and the U.S. Environmental Protection Agency (US EPA) to produce a consistent, land cover data layer for the conterminous U.S. using early 1990s Landsat thematic mapper (TM) data. The analysis and interpretation of the satellite imagery was conducted using very large, sometimes multi-state image mosaics (i.e. up to 18 Landsat scenes). Using a relatively small number of aerial photographs for 'ground truth', the thematic interpretations were necessarily conducted from a spatially-broad perspective. **This evaluation must be made remembering that the NLCD represents conditions in the early 1990s** (The Nature Conservancy 1999).

Deciduous, evergreen and mixed forest land cover types were grouped to provide a single "forested" cover type. This forest block layer was overlain by the Penn DOT road layer to identify forest blocks fragmented by roads. The Penn DOT right-of-way (ROW) distance was applied as a buffer to roads: Interstates have a 500-foot ROW, PA and US designated roads have a 150-foot ROW, local roads have a 100-foot ROW. Forest blocks with an area of greater than one acre were selected from the forest land cover type. This process highlights interior forest blocks greater than one acre in area as presented below.

Large Unfragmented Forest Blocks of Cumberland, Dauphin and Perry Counties



Large, relatively unfragmented forested areas cross the Tri-county area, providing valuable habitat for many species of plants and animals. The connected forest blocks also act as important migration corridors for dispersal throughout the region.

Fragmenting features, such as roads, powerlines and buildings, greatly diminish the long-term viability of these areas. A concerted effort should be made to guide such projects away from these remaining large forested areas.



CONSERVATION RECOMMENDATIONS

The following are general recommendations for protection of natural areas within a county. Approaches to protecting a natural area are wide-ranging and factors such as land ownership, time constraints, and tools/resources available should be considered when prioritizing protection of these sites. Prioritization works best within a planning situation, however, opportunities may arise that do not conform to a plan and the decision on how to manage or protect a natural heritage area may be made on a site-by-site basis. Keep in mind that personnel in our program or staff from state natural resource agencies are available to discuss more specific options as needed.

1. Consider conservation initiatives for natural areas on private land.

Conservation easements protect land while leaving it in private ownership. A conservation easement is a legal agreement between a landowner and a conservation or government agency that permanently limits a property's use in order to protect its conservation values. It can be tailored to the needs of both landowner and conservation organization. Tax incentives apply to conservation easements.

Leases, management agreements, and mutual covenants also allow the landowner to retain ownership and ensure permanent protection of land, though in a much more limited way. There are no tax deductions for these conservation methods. A lease to a land trust or government agency can protect land temporarily and ensure that its conservation values will be maintained. This can be a first step to help a landowner decide if they want to pursue more permanent protection methods. Management agreements require landowner and land trust to work together to develop a plan for managing resources such as plant or animal habitat, or protecting a watershed. Mutual covenants can be appropriate where land protection is important to several landowners but not of sufficient benefit to the general public to warrant a conservation easement.

Land acquisition can be at fair market value, as a last resort by conservation organization, or as a bargain sale in which a sale is negotiated for a purchase price below fair market value with tax benefits that reduce or eliminate the disparity. The NAI will help to pinpoint areas that may be excellent locations for new county or township parks. Sites that can serve more than one purpose such as wildlife habitat, flood and sediment control, water supply, recreation, and environmental education would be particularly ideal. Private lands adjacent to public should be examined for acquisition when a priority site is present on either property and there is a need of additional land to complete protection of the associated natural features.

Fee simple acquisition gives landowner maximum control over the use and management of the property and its resources. This conservation initiative is appropriate when the property's resources are highly sensitive and protection cannot be guaranteed using other conservation approaches.

Local zoning ordinances are one of the best-known regulatory tools available to municipalities. Examples of zoning ordinances a municipality can adopt include: overlay districts where the boundary is tied to a specific resource or interest such as riverfront protection and floodplains, and zoning to protect stream corridors and other drainage areas using buffer zones.

2. Prepare management plans that address species of special concern and natural communities.

Many of the already-protected natural areas are in need of additional management recommendations to ensure the continued existence of the associated natural elements. We hope that managers will incorporate specific recommendations into existing plans or prepare new plans. These may include: removal of exotic plant species; leaving the area alone to mature and recover from previous disturbance; creating natural areas within existing parks; limiting land-use practices such as mineral extraction, residential or industrial development, agriculture and certain forestry practices.

Existing parks and conservation lands provide important habitat for plants and animals at both the county level and on a regional scale. For example, these lands may serve as nesting or wintering areas for birds or as stopover areas during migration. Management plans for these areas should emphasize a reduction in activities that fragment habitat. Adjoining landowners should be educated about the importance of their land as it relates to species of special concern and their habitat needs and agreements should be worked out to minimize encroachments that may threaten native flora and fauna.

3. Protect bodies of water.

Protection of reservoirs, wetlands, rivers, and creeks is vital; especially those that protect biodiversity, supply drinking water, and are attractive recreational resources. Many sites that include rare species, unique natural communities or locally significant habitats are associated with water. Protection of high quality watersheds is the only way to ensure the viability of natural habitats and water quality. Land managers and township officials should scrutinize development proposals for their impact on entire watersheds not just the immediate project area. Cooperative efforts in land use planning among municipal, county, state, and federal agencies, developers, and residents can lessen the impact of development on watersheds.

4. Provide for buffers around natural areas.

Development plans should provide for natural buffers between disturbances and natural areas, be it a barrens community, wetland, water body, or forest. Disturbances may include construction of new roads and utility corridors, non-conservation timber harvesting, and disruption of large pieces of land. County and township officials can encourage landowners to maintain vegetated buffer zones within riparian zones. Vegetated buffers (preferably of PA-native plant species) help reduce erosion and sedimentation and shade/cool the water. This benefits aquatic animal life, provides habitat for other wildlife species, and creates a diversity of habitats along the creek or stream.

Watersheds or subwatersheds where natural communities and species of special concern occur (outlined on the Township maps in this report) should be viewed as areas of sensitivity, although all portions of the watershed may not be zones of potential impact. As an example, conserving natural areas around municipal water supply watersheds provides an additional protective buffer around the water supply, habitat for wildlife, and may also provide low-impact recreation opportunities.

5. Reduce fragmentation of surrounding landscape.

Residents and township officials should encourage development in sites that have already seen past disturbances. Care should be taken to ensure that protected natural areas do not become "islands" surrounded by development. In these situations, the site is effectively isolated and its value for wildlife is reduced. Careful planning can maintain natural environments and the

plants and animals associated with them. A balance between growth and the conservation of natural and scenic resources can be achieved by guiding development away from the most environmentally sensitive areas.

The reclamation of previously disturbed areas, or brownfields development, for commercial and industrial projects presents one way to encourage economic growth while allowing ecologically sensitive areas to remain undisturbed. Cluster development could be used to allow the same amount of development on much less land and leave much of the remaining land intact for wildlife and native plants. By compressing development into already disturbed areas with existing infrastructure (villages, roads, existing ROW's), large pieces of the landscape can be maintained intact. If possible, networks or corridors of woodlands or greenspace should be preserved linking sensitive natural areas to each other.

6. Encourage the formation of grassroots organizations.

County and municipal governments can do much of the work necessary to plan for the protection and management of natural areas identified in this report. However, grassroots organizations are needed to assist with obtaining funding, identifying landowners who wish to protect their land, providing information about easements, land acquisition, and management and stewardship of protected sites. Increasingly, local watershed organizations and land trusts are taking proactive steps to accomplish conservation at the local level. When activities threaten to impact ecological features, the responsible agency should be contacted. If no agency exists, private groups such as conservancies, land trusts and watershed associations should be sought for ecological consultation and specific protection recommendations.

7. Manage for invasive species.

Invasive species threaten native diversity by dominating habitat used by native species and disrupting the integrity of the ecosystems they occupy. Management for invasives depends upon the extent of establishment of the species. Small infestations may be easily controlled or eliminated but more well established populations might present difficult management challenges. Below is a list sources for invasive species information.

The *Mid-Atlantic Exotic Plant Pest Council* (MA-EPPC) is a non-profit organization (501c3) dedicated to addressing the problem of invasive exotic plants and their threat to the Mid-Atlantic region's economy, environment, and human health by: providing leadership; representing the mid-Atlantic region at national meetings and conferences; monitoring and disseminating research on impacts and controls; facilitating information development and exchange; and coordinating on-the-ground removal and training. A membership brochure is available as a pdf file at <http://www.ma-eppc.org>.

Several excellent web sites exist to provide information about invasive exotic species. The following sources provide individual species profiles for the most troublesome invaders, with information such as the species' country of origin, ecological impact, geographic distribution, as well as an evaluation of possible control techniques. The Nature Conservancy's Weeds on the Web at <http://tncweeds.ucdavis.edu/>. The Virginia Natural Heritage Program's invasive plant page at <http://www.dcr.state.va.us/dnh/invinfos.htm>. The Missouri Department of Conservation's Missouri Vegetation Management Manual at <http://www.conservation.state.mo.us/nathis/exotic/vegman/>. The following site is a national invasive species information clearinghouse listing numerous other resources on a variety of related topics: <http://www.invasivespecies.gov/>.

RESULTS

Each year biologists meet to discuss and rank the most important sites for the protection of biodiversity in Pennsylvania. This meeting consists of a review and ranking of all sites within the state, in terms of the rarity and quality of the species or habitats of concern, potential threats, and protection needs. The results of these meetings provide a baseline for evaluating the statewide significance of the sites recognized in the Natural Areas Inventory.

Priorities for Protection

The Natural Areas Inventory recognizes sites at two primary levels of significance for the protection of biological diversity: 1) sites of statewide importance and 2) sites of local significance.

Table 1 in this section lists all sites identified within the county with natural communities and species of concern by order of priority for protection. These sites are displayed in UPPER CASE LETTERS throughout the report. This table ranks sites from the most important and threatened to the least. Ranks are based on rarity, quality, and threats or management needs of the elements at the site. Sites in this category that are ranked 1 or 2 may contain some of the best natural areas in the state. Table 1 lists the site name, local jurisdiction(s), and pertinent information about the site's significance. A more detailed description of each site is included in the text for each Township in which it occurs.

Locally significant sites are indicated in Title Case Letters throughout the document, and are briefly discussed in the text accompanying each map. These are sites at which species of special concern or high-quality natural communities could not be documented during the survey period. These areas are not exemplary at the state level, but may be important at the county level. Examples would include relatively intact forested areas, large wetlands, and other areas significant for maintaining local biodiversity. Additionally, sites from the 2000 NAI report that supported species of plants or animals that have since been removed from the species of concern list due to a reevaluation of their state status are retained as locally significant sites in this update. These secondary sites are listed in Table 2 accompanied by qualitative ranks (high, medium, or low) according to size, level of disturbance, proximity to other open-space lands, and potential for sustaining a diversity of plant and animal life. These secondary site ranks must be viewed as very approximate.

Each of the primary sites identified in this report has associated with it areas described as **Core Habitat** and **Supporting Landscape**. Core Habitat areas are intended to identify the essential habitat of the species of concern or natural community that can absorb very little activity or disturbance without substantial impact to the natural features. The Supporting Landscape identifies areas surrounding or adjacent to core habitat that are not considered the primary habitat of the species of concern or natural community, but may serve as secondary habitat. These areas also provide support by maintaining vital ecological processes as well as isolation from potential environmental degradation. Supporting Landscape areas may be able to accommodate some types of activities without detriment to natural resources of concern. Each should be considered on a site by site and species by species basis.

Exceptional Natural Feature: The Susquehanna River

In considering the value of specific sites for the preservation of biological diversity it is important to note that these sites are dependent on the integrity of larger scale systems such as the Susquehanna River and its tributary watersheds. The Susquehanna River and its adjacent forested watersheds comprise one of the major corridors for the movement of biota in central Pennsylvania. This includes the habitat for resident species, habitat required for migrating birds on a biannual basis, habitat for resident and migratory aquatic animals, habitat needed for the long-term survival of plant species, and more. Conserving the best sites as highlighted in this report must be considered as part of the effort to conserve the greater natural functional value of the river corridor. In reviewing the report it is evident that many of the best natural sites within the three counties are along the Susquehanna River and its major tributaries. Along with these sites are many areas that were beyond the scope of this project to fully investigate. Any intact natural area in or adjacent to these waterways should be considered potential important habitat. The development of a comprehensive conservation plan for the portions of the three counties adjacent to the river and its major tributaries, conducted in conjunction with other counties in the lower Susquehanna River Basin, may be the best tool for conserving this important natural resource. Nearly all of the region is in the Susquehanna watershed, and soil and groundwater conservation and protection throughout the three counties will benefit biological diversity in the counties as well as downstream.



Susquehanna River near Harrisburg



Kittatinny Ridge at Blue Mountain

Exceptional Natural Feature: The Kittatinny Ridge

The northern border of Cumberland County follows the ridgeline of Blue Mountain, or North Mountain, part of the Kittatinny Ridge. This mountain range stretches southwesterly from southern New York and northwestern New Jersey, continuing through southeastern Pennsylvania and terminating near the Maryland border. This ridge is world-renowned as a transportation corridor for migrating raptors and songbirds as well as for the movement of other biota in the northeastern United States. The ridge functions as an interstate greenway, linking many of southeastern Pennsylvania's most biologically important areas with each other. Without this resulting

connectivity, these biologically rich areas would become functional islands in a sea of farmland, suburban development and other lands modified by human activity, effectively severing modes of reproductive mingling and dispersal for many species of plants and animals. The Kittatinny Ridge Project, led by Audubon Pennsylvania, is a collaborative effort of local, regional, and state organizations and agencies to focus public attention on the importance of the Ridge through Pennsylvania and to promote conservation activities to protect the Ridge from further habitat loss, fragmentation, and inappropriate land use.

Exceptional Natural Feature: South Mountain

The southwestern portion of Cumberland County includes the northern end of the South Mountain, which is the northern terminus of the Blue Ridge Mountains of Maryland and Virginia. Several globally rare plant and animal species as well as rare natural communities and an abundance of high quality vernal pools are found here. Many of the highest priority natural areas identified in the county fall within the South Mountain region. The mountain also supports several outstanding geologic features, such as Chimney Rocks, Hammond Rocks, Lewis Rocks, and White Rocks. Like the Kittatinny, this parallel ridge functions as an interstate greenway, linking Pennsylvania with southern natural areas. Although most of the mountain lies within public lands, the development pressures on the valleys surrounding South Mountain threaten to further isolate, fragment, and encroach on the natural resources found here.

Species of Concern: Timber Rattlesnake

The ridges and boulder fields of South Mountain and North Mountain have historically provided extensive habitat for the PA-candidate G4, S3S4 timber rattlesnake (*Crotalus horridus*). The Pennsylvania Fish and Boat Commission (PFBC) has been gathering information regarding the status of the timber rattlesnake in the state, in particular the South Mountain region, for several years. Past land use practices appear to have isolated the South Mountain populations of timber rattlesnakes from the rest of the state and most of Maryland; ongoing genetic research is being conducted to confirm this isolation. Furthermore, habitat destruction, wanton killing, and collecting are leading to severe population declines in the South Mountain region in particular. In response, the PFBC has recently recommended full protection for the South Mountain populations of timber rattlesnakes, declaring them off-limits from hunting (final rulemaking to be effective January 1, 2007). In order to enhance this protection, the locations of known den and breeding sites are not identified in this report. However, important habitats for the timber rattlesnake occur the length of the South Mountain in southwestern Cumberland County. Some of these habitats are included in the sites identified in this report for other species or communities, but persistence of this species in the county and region will depend on maintaining connectivity of the rocky forested ridges that provide habitat for den and breeding sites.

Timber rattlesnakes primarily occur on south or southwest-facing slopes, on rocky slopes where they can find refuge in spaces between the boulders as well as thermoregulate in the sunny openings. Hibernacula, or dens, often are found under canopy cover but are usually located within several hundred meters of an open basking site. Persistence of these sites relies on forestry practices that maintain a diversity of open areas adjacent to forested foraging habitat. Additionally, these habitats should be buffered and protected from development to reduce human-snake encounters.

The following sections contain brief descriptions outlining the top priority sites for each county, and tables listing all sites in the county. Complete descriptions for all sites, arranged by township in alphabetical order, are presented in the Results.

Top Priority Natural Areas in Cumberland County:

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All of the natural areas in the county are important to maintaining biodiversity in the region and the state. However, the following eleven sites from Table 1 are the most critical at present for maintaining Cumberland County's biological diversity into the future (see Figure 1 for approximate locations of these sites). More detailed descriptions and mapped locations of all sites are included in the Results section that follows.

BIG PINE FLAT—UPDATED—(Southampton Township and Franklin and Adams Counties) This site supports a fair to good quality Ridgetop Dwarf-Tree Forest Natural Community, more commonly known as a "Pitch pine-Scrub oak barren," as well as a good quality Ephemeral/Fluctuating Natural Pool Community. Many rare plant and animal species are associated with pitch pine-scrub oak barrens communities. To date eight animal and two plant species of special concern have been discovered at in the barrens as well as in similar habitats nearby. An additional two rare plants are associated with the vernal pool habitats. The animal species here are dependent upon the unusual, fire-maintained vegetative community. However, with the advent of fire suppression efforts, this community type tends to succeed to a more common oak forest community. Prescribed burning could help to maintain the Big Pine Flat community and reduce the fuel load and the subsequent risk of uncontrolled fires in this area. Most of the site is within Michaux State Forest.

BURD RUN CAVES (Southampton Twp.) Three caves located near Burd Run are home to two state rare aquatic invertebrate animal species of concern restricted to caves and groundwater systems in south-central Pennsylvania. Both of these species have very specific habitat requirements, and like other species that have adapted to life in caves, they have no eyes or pigmentation. These caves occur in an agricultural area and thus are vulnerable to leaching of pesticides or fertilizer through the soil into the groundwater. Excessive drawdown of the water table and contamination of the ground water flowing through the cave are threats to the rare species.

CONODOGUINET CREEK AT MT. ZION SCHOOL—NEW—(Lower Frankford & West Pennsboro Twps.) This site includes the Conodoguinet Creek floodplain and banks, as well as the forested hills and ravines flanking both sides of the creek. Five plant species of concern, including **two S1 species, one S2 species and two S3 species** were identified at this site in 2000. Many of these plants of special concern were found among the shale cliffs and rock outcrops within a red cedar-mixed hardwood, rich shale woodland. The forested floodplain along the creek, the forested slopes and ravines to the north of the creek, and the dry shale outcrops provide valuable habitat for the species of concern in this area. Deer browsing, logging operations and road maintenance are additional threats that may degrade the habitat at this site for these species. Maintaining this site in its present condition with an intact forested buffer will best provide protection of the habitat for these species.

CONODOGUINET MACROSITE—UPDATED—(East Pennsboro, Hampden, and Silver Spring Townships; and West Fairview, Camp Hill and Wormleysburg Boroughs) The Conodoguinet Creek drains most of Cumberland County, running west to east through an agricultural and residential landscape. The Great Valley it bisects is mostly limestone and dolomite, and the Creek receives many

inputs from springs and from groundwater flow. As a result, the Creek's waters have a fairly high pH, and a relatively constant temperature and flow. The Creek itself provides habitats for both aquatic plant and animal species of concern. Forested slopes and floodplains along the river, often with rich, limestone-influenced soils, are home to several listed plant species. Sites with species of concern were identified along the Conodoguinet throughout its length; the lower portion, a series of looping meanders from Huston's Mill to the confluence with the Susquehanna, has **multiple occurrences of listed plant and animal species** at several sites in close proximity. For mapping purposes, this area was combined into the Conodoguinet Macrosite.

Abundant aquatic habitat remains in the Conodoguinet for the three animal and four plant species of concern. The persistence of these species, however, depends upon maintaining the water quality of the Conodoguinet Creek ecosystem as a whole, which in turn depends on management of the entire watershed. Agricultural and commercial runoff, logging of stream and river corridors, and pollutants are all real and current threats in the watershed. As growth and associated demands for groundwater continue in the Cumberland Valley, these species of concern may serve as indicators of the health of both the Creek and the Valley's groundwater. Most of the remaining forested slopes and floodplains along this stretch of the Conodoguinet are restricted to narrow strips of relatively inaccessible or undevelopable land. Disturbances include cottages and residential development, old roads, jeep trails, and sewer lines, and runoff and trash dumping onto the slopes from the largely residential and commercial areas above. Despite these disturbances, good quality populations of four plant species of concern persist at the known sites, and any intact floodplain forest along this portion of the Conodoguinet should be considered potential rare plant habitat.

HUNTERS RUN SITE—UPDATED—(Dickinson, South Middleton Twps) This site located along Hunters Run and adjacent Mountain Creek includes a mosaic of wetland cover types including acidic to Circumneutral swamp and several acidic seepage areas as well as the streams themselves. The site supports populations of three plant species of special concern including **G3, S1 PA-Endangered glade spurge (*Euphorbia purpurea*)**. This species occurs in several different subsets, occupying forested wetland pools and small streamside swamps. Associated plant species include red maple, black ash, spicebush, winterberry, skunk cabbage, and jewelweed. A nice diversity of sedges and other wetland herbs are also found here. The **G5, S2 rough-leaved aster (*Eurybia radula*)** occurs in the same streamside habitat, and the **G5T5?, S? showy goldenrod (*Solidago speciosa* var. *speciosa*)** occupies openings in the dry oak-pine forest along the Appalachian Trail adjacent to Mountain Creek. A portion of this site is on the Appalachian Trail National Corridor. Leaving a forested buffer along Hunters Run and its tributaries and avoiding soil disturbances at this site will help these species to persist here.

IRON RUN (Cooke Twp.) This site consists of a corridor of mesic acidic central forest adjacent to Iron Run. It supports a good quality population of the **G3, S2 PA-endangered Variable sedge (*Carex polymorpha*)**. Associated species include cinnamon and hay-scented ferns, fly poison, Indian cucumber, and bellwort. Several jeep lanes bisect the area and exotic species are abundant in some areas. Preventing further encroachment of jeep lanes and avoiding soil disturbances should help this species to continue to persist here. This site is located in Michaux State Forest.

LAMBS GAP/TROUT RUN HEADWATERS—NEW—(Hampden and Silver Spring Townships and Perry County) This site supports a fair quality example of a **S2S3 Circumneutral Broadleaf Swamp Natural Community**. It is comprised of a series of broad seeps, which occur in

the bottom of a valley between Little Mountain and Blue Mountain. The swamp is dominated by American beech, black birch, and tulip poplar with an understory of smooth alder and spicebush. The substrate of the seeps is relatively deep muck. Moss-covered hummocks support shrub copses, trees, and several species of fern. A wide diversity of herbs, sedges, and grasses grows within the swamp as well as along its margins. Skunk cabbage and jewelweed are dominant herbs. The site supports a good quality population of **G3, S1 PA-endangered glade spurge (*Euphorbia purpurea*)**. During recent surveys, three animal species of concern were found. The relative isolation of the site, tucked between the mountains, makes it good habitat for a number of common birds, reptiles, and amphibians. A few species that have been observed here during our field surveys include wood and green frogs, dusky and red-backed salamanders, northern water snakes, and 26 species of birds. The swamp is undisturbed except for some nearby mountain bike trails. Adjacent slopes on the two mountains were both clear cut over ten years ago but the clear cutting does not appear to have impacted the hydrology of the site. Opportunistic exotic species that frequently colonize disturbed areas may invade the clear cuts and potentially threaten the quality of the site. Limiting disturbances in this watershed, particularly by re-routing the existing bike trails, will help to maintain the quality of this site and allow the globally rare species to persist here. This site is located in State Game Lands 170.

MOUNTAIN CREEK SEEPS/SAGE RUN—UPDATED—(Cooke and Dickinson Townships) This is a complex of several sites in the area of Sage Run and Mountain Creek on South Mountain. Small seeps, areas where groundwater comes to the surface of a slope, are extensive along the lower part of the main branch of the Sage Run and along Mountain Creek. The acidic, often Sphagnum-dominated seeps are habitat for seven plant species rare in PA and one, which is rare globally. The populations of these species vary in size and quality, and are scattered throughout this watershed. This site is located in Michaux State Forest. Maintaining adequate buffers around seepage areas and along stream corridors, and avoiding soil disturbances will help protect the seep habitats and the rare plant species they contain.

MOUNT HOLLY MARSH—UPDATED—(South Middleton Twp.) This site is a fifty-plus acre wetland along Mountain Creek. The site contains two notable plant habitats - a circumneutral seepage swamp, characterized by red maple and black ash, and a wet to seepy meadow (formerly the location of mill ponds) dominated by various graminoids, cattail, and buttonbush. The swamp forest supports a fair-quality population of **G3, S1 PA-endangered glade spurge (*Euphorbia purpurea*)**. In 2001 several individuals of a rare invertebrate were observed in the marsh. The large wet meadow also contains a PA-endangered animal species, which occupies the wettest portions. The population, though small, appears to be reproducing successfully. The site is owned by The Nature Conservancy and has been designated as a nature preserve. The primary threat to the site is the maintenance of water quality and quantity. Maintaining good water quality throughout the length of Mountain Creek upstream is therefore a priority.

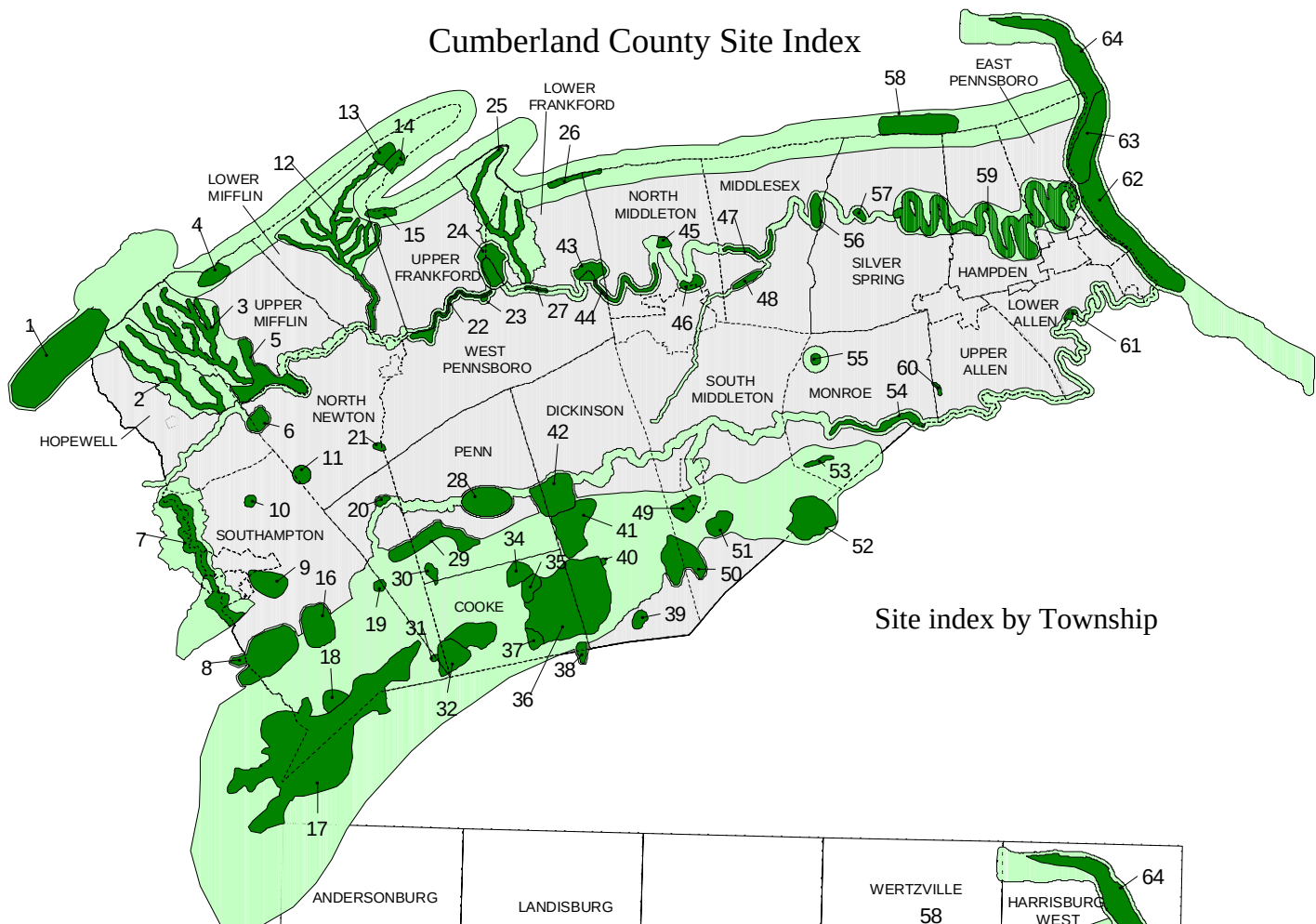
SUSQUEHANNA RIVER ISLANDS—MCCORMICKS ISLAND ARCHIPELAGO — UPDATED—(East Pennsboro Township and Dauphin County) This site encompasses a series of islands in the Susquehanna River on the north side of Harrisburg. McCormick's Island, the largest of the series, is characterized by a rare **floodplain forest natural community**. This silver maple and tulip poplar-dominated forest is relatively mature and contains many canopy gaps with scattered subcanopy trees and shrubs. The largest gaps are dominated by a dense mix of native and exotic herbs including

the native jewel-weed, ostrich fern, and poison ivy, and the non-native garlic mustard and mile-a-minute weed, and Japanese knotweed. Spicebush is the most common shrub. The site supports a fair-to-poor population of the PA-threatened **umbrella magnolia (*Magnolia tripetala*, G5, S2)**. This site has been disturbed by logging and campfires in the past but has recovered well. Its quality as a natural community should continue to improve over time.

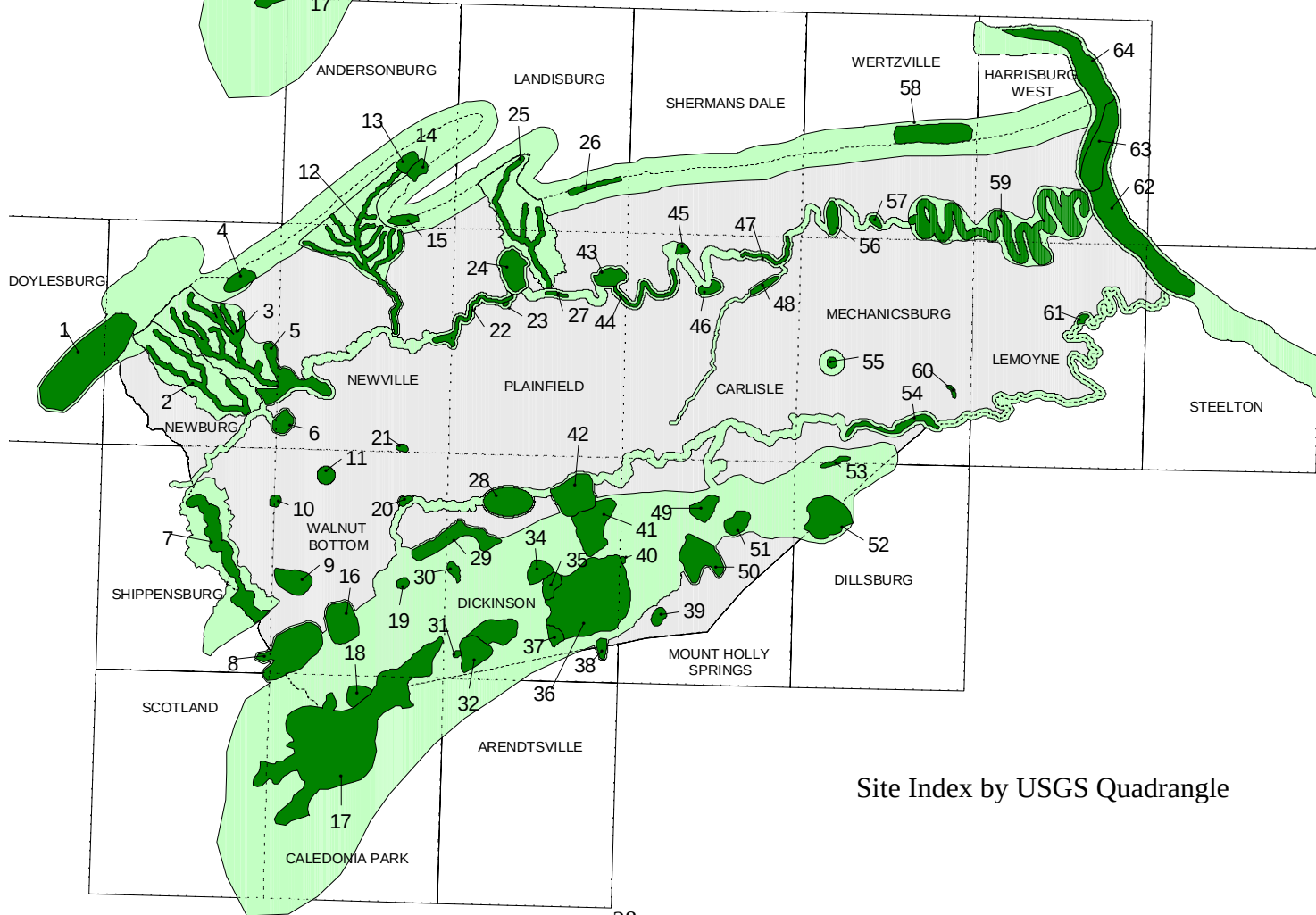
This island is one of a series of islands occurring along this stretch of the river, which together make up a greater system of habitats including riparian forest, sloughs and shrub swamps, a littoral zone, and several types of aquatic habitats such as riffles, sand bars, and pools. Several listed bird species are found here, including the **G5, S1B PA-endangered yellow-crowned night heron (*Nyctanassa violacea*)**, the **G5, S1B PA-endangered great egret (*Casmerodius albus*)**, and the **G5, S2S3B black-crowned night heron (*Nyctanassa nyctanassa*)**. The birds are colonial nesters and their rookeries may contain hundreds of nests in small areas of floodplain forest. Rookeries are known from McCormick's Island as well as from several smaller nearby islands with mature floodplain forests. These rookeries are critical to the continued well-being of these species in PA. Both the nesting trees and the surrounding mosaic of feeding habitats are required to protect the bird colonies. This site has been identified by the PA Audubon Society as one of the most important areas in the state for supporting bird diversity. This rookery and all of the habitat associated with the McCormicks Island Archipelago would be threatened by an increase of the water level along this stretch of the river through the construction of the Dock Street Dam. Increased water levels would kill trees on the islands, destroying their utility for nesting, and likely drown entirely many of the smaller islands and sand bars used for feeding. In addition, increased recreational use of the river in this area may disturb the birds' breeding and roosting activities. The abundant diversity that helps retain the wild character of the river in this urban area exists primarily due to these islands.

THOMSON HOLLOW PONDS (Southampton Twp.) This site includes a group of vernal pools occurring in a forested landscape. The seasonal ponds in this **Ephemeral-fluctuating Pool Natural Community** are variously vegetated with grasses, sedges, and rushes. Shrubs such as highbush blueberry and buttonbush are also common. These pools support populations of three plant species of special concern, including two good quality sub-populations of the **federal endangered northeastern bulrush (*Scirpus ancistrochaetus*)**. Additionally, the pools support a fair to good quality population of the **lance-leaf loosestrife (*Lysimachia hybrida*, G5, S1)**. Along with supporting rare plants vernal pools can play an important role in helping to maintain the diversity of species in forest ecosystems. Vernal pools frequently only hold water from winter until mid-summer and are not capable of supporting fish species. The lack of fish makes them excellent breeding habitat for amphibians. These pools are often swarming with tadpoles or salamander larvae early in the growing season. The quality of the pools and the adjacent woods at this site has been degraded by logging. The quality of this site will improve by allowing the woods to regenerate without further disturbance. If logging is to continue in this area adequate buffers should be maintained around the pools and clear cutting should be avoided. The vernal ponds at this location are but a few of the many ponds that line the toe slopes of South Mountain in Cumberland and Franklin Counties. All of the vernal ponds along the lower slopes of South Mountain should be considered points of high biological importance as part of the larger continuous landscape of South Mountain. Additional vernal ponds are currently being mapped and described in the county by several organizations including The Nature Conservancy, Messiah College and Shippensburg University.

Cumberland County Site Index



Site index by Township



Site Index by USGS Quadrangle

Table 1. The sites of statewide significance for the protection of biological diversity in Cumberland County in approximate order of priority from the most important (rank = 1) to the least (rank = 5). The presence of species of special concern and/or exemplary natural communities has been documented at these sites. More in-depth information on each site including detailed site descriptions and management recommendations where appropriate can be found in the text of the report following the maps for each municipality. Quality ranks, legal status, and last observation dates for species of special concern and natural communities are located in the table that precedes each map page.

County Rank ¹	Site Name, Site #	Municipality	PA Heritage Ranks ² and Site Importance	Pg. #
1	BIG PINE FLAT #17 UPDATED	Southampton Twp. & Franklin & Adams County	This site supports a fair to good quality Ridgetop Dwarf-Tree Forest Natural Community, more commonly known as a "Pitch pine-Scrub oak barren". Several rare plant and animal species are associated with the pitch pine-scrub oak barrens community, including G5, S1 PA-endangered dwarf iris (<i>Iris verna</i>) ; the Footpath Sallow Moth (<i>Metaxaglaea semitaria</i>, G5, S2) , two Noctuid moths (<i>Platyperigea meralis</i>, G4, S1; <i>Apharetra purpurea</i>, G4, S2) , the southern variable dart moth (<i>Xestia elimata</i>, G5, S2S3) , the pine woods underwing (<i>Catocala</i> sp. 1 nr. <i>jair</i>, G5, S1) , a Zale moth (<i>Zale submediana</i>, G4, S2) , and the southern pine looper moth (<i>Caripeta aretaria</i>, G4, S1) . A good quality population of G3, S2 PA-endangered variable sedge (<i>Carex polymorpha</i>) is found in the upper reaches of Birch Run, which flows out of the south side of Big Flat Barrens. The Adams and Franklin County portions of this site contain a small population of Northeastern Bulrush (<i>Scirpus ancistrochaetus</i>) , a G3, S3 Federally Endangered plant species, a fair population of netted chainfern (<i>Woodwardia areolata</i>, G5, S2) , and a good quality Ephemeral/fluctuating Pool Natural Community .	100
1	MOUNTAIN CREEK SEEPS \ SAGE RUN #36 UPDATED	Cooke, Dickinson Twps.	This is a complex of several sites in the area of Sage Run and Mountain Creek on South Mountain. Seeps are extensive along the lower part of the main branch of the Sage Run and along Mountain Creek. Eight plant species of special concern, including the G3, S2 PA-endangered variable sedge (<i>Carex polymorpha</i>) , G5, S2 PA-threatened sweet bay magnolia (<i>Magnolia virginiana</i>) ; G5T5?, S? showy goldenrod (<i>Solidago speciosa</i> var. <i>speciosa</i>) ; G5, S2 rough-leaved aster (<i>Eurybia radula</i>) ; G5, S3 lupine (<i>Lupinus perennis</i>) ; G5, SU Virginia bunchflower (<i>Melanthium virginicum</i>) ; G5, S2 yellow-fringed orchid (<i>Platanthera ciliaris</i>) ; and G4, SU quillwort (<i>Isoetes valida</i>) , are found in the various seeps. The populations of these species vary in size and quality, and are scattered throughout this watershed.	45, 51

County Rank ¹	Site Name, Site #	Municipality	PA Heritage Ranks ² and Site Importance	Pg. #
2	BURD RUN CAVES #9	Southampton Twp.	Three caves located near Burd Run are home to two state rare aquatic invertebrate animal species of concern restricted to caves and groundwater systems in south-central Pennsylvania.	100
2	CONODOGUINET CREEK AT MT. ZION SCHOOL #43 NEW	Lower Frankford, West Pensboro Twps.	This site includes the Conodoguinet Creek floodplain and banks, as well as the forested hills and ravines flanking both sides of the creek. A good-quality population of G4, S3 beard-tongue (<i>Penstemon canescens</i>) ; a good-quality population G5, S1 PA-Endangered slender goldenrod (<i>Solidago speciosa</i> var. <i>erecta</i>) ; and a small population of G5, S1 stalked wild petunia (<i>Ruellia pedunculata</i>) , the first and only record of this plant species occurring in Pennsylvania, were found among the shale cliffs and rock outcrops within a red cedar-mixed hardwood, rich shale woodland. A small population of G4G5, S2 PA-Threatened limestone petunia (<i>Ruellia strepens</i>) was found along the forested floodplain of the Conodoguinet Creek. The sedge <i>Carex shortiana</i>, G5, S3 , was found in a small marsh in a forest opening within a wooded shale ravine.	74, 125
2	CONODOGUINET MACROSITE #59 UPDATED	East Penssboro, Hampden, Silver Spring Twps.; West Fairview, Camp Hill, Wormleysburg Boros.	This site is a combination of several adjacent locations for aquatic and terrestrial plant and animal species of concern along the lower reaches of the Conodoguinet. The G5, S1 PA-Endangered Yellow-crowned Night Heron (<i>Nyctanassa violacea</i>) was observed using habitat along the edge of the creek in 1994. Good quality populations of two aquatic animal species of concern were found at several locations in the Macrosite, in habitat consisting of riffles and shallow areas of still water. A fair to good quality population of the aquatic plant G5, S3 white-water crowfoot (<i>Ranunculus aquatilis</i> var. <i>diffusus</i>) was also found in several locations in this portion of the Conodoguinet. Three terrestrial plant species of concern are also known from the Macrosite, including several fair quality populations of G4G5, S2 PA-threatened Limestone petunia (<i>Ruellia strepens</i>) ; G5, S3 white trout-lily (<i>Erythronium albidum</i>) ; and G5, S3 sedge species <i>Carex shortiana</i>.	57, 64, 95

County Rank ¹	Site Name, Site #	Municipality	PA Heritage Ranks ² and Site Importance	Pg. #
2	HUNTERS RUN #50 UPDATED	Dickinson, South Middleton Twps.	This site located along Hunters Run and nearby Mountain Creek includes a mosaic of wetland cover types including acidic to circumneutral swamp and several acidic seepage areas as well as the streams themselves. The site supports populations of three plant species of special concern including G3, S1 PA-Endangered glade spurge (<i>Euphorbia purpurea</i>) . The G5, S2 rough-leaved aster (<i>Eurybia radula</i>) occurs in the same streamside habitat, and the G5T5?, S? showy goldenrod (<i>Solidago speciosa</i> var. <i>speciosa</i>) occupies openings in the dry oak-pine forest along the Appalachian Trail adjacent to Mountain Creek.	51, 108
2	IRON RUN #35	Cooke Twp.	This site consists of a corridor of mesic acidic central forest adjacent to Iron Run. It supports a good quality population of the G3, S2 PA-endangered Variable sedge (<i>Carex polymorpha</i>) .	45
2	LAMBS GAP/TROUT RUN HEADWATERS #58 NEW	Hampden, Silver Spring Twps. & Perry Co.	This site supports a fair quality example of a S2S3 Circumneutral Broadleaf Swamp Natural Community . The site supports a good quality population of G3, S1 PA-endangered glade spurge (<i>Euphorbia purpurea</i>) . Three animal species of concern were also located during surveys in 2001 and 2002.	64, 95
2	MOUNT HOLLY MARSH #49 UPDATED	South Middleton Twp.	This site is a fifty-plus acre wetland situated in the Mountain Creek drainage. The swamp forest supports The wetland supports a fair-quality population of G3, S1 PA-endangered glade spurge (<i>Euphorbia purpurea</i>) , an invertebrate animal species of concern, and a state endangered animal. The site is owned by The Nature Conservancy and has been designated as a nature preserve.	108
2	SUSQUEHANNA RIVER ISLANDS -- McCORMICKS ISLAND ARCHIPELAGO #63 NEW	East Pennsboro Twp. & Dauphin Co.	This site encompasses a series of islands in the Susquehanna River on the north side of Harrisburg. McCormick's Island, the largest of the series, is characterized by a rare floodplain forest natural community . The site supports a fair-to-poor population of the PA-threatened umbrella magnolia (<i>Magnolia tripetala</i>, G5, S2) . Several listed bird species are found here, including the G5, S1B PA-endangered yellow-crowned night heron (<i>Nyctanassa violacea</i>) , the G5, S1B PA-endangered great egret (<i>Casmerodius albus</i>) , and the G5, S2S3B black-crowned night heron (<i>Nyctanassa nyctanassa</i>) .	57

County Rank ¹	Site Name, Site #	Municipality	PA Heritage Ranks ² and Site Importance	Pg. #
2	THOMSON HOLLOW PONDS #16	Southampton Twp.	This site includes a group of seasonal ponds that make up an Ephemeral-fluctuating Pool Natural Community . These pools support populations of two plant species of special concern, including two good quality sub-populations of the federal endangered northeastern bulrush (<i>Scirpus ancistrochaetus</i>) and a fair to good quality population of the lance-leaf loosestrife (<i>Lysimachia hybrida</i>, G5, S1) . Along with supporting rare plants vernal pools can play an important role in helping to maintain the diversity of species in forest ecosystems.	102
3	BLACK SWAMP #34	Cooke Twp.	This site supports a fair-to-poor quality example of a G5, S3 Acidic Broadleaf Swamp Natural Community . The forested portion is dominated by the G5, S2 PA-Threatened sweet bay magnolia (<i>Magnolia virginiana</i>) shrub species, which co-occurs with red maple, black gum, pitch pine, white oak, and witch hazel. This site is unique in supporting species that are typical of both more southerly and northerly habitats.	45
3	BLOSERVILLE HILL #24 UPDATED	Lower Frankford, West Pennsboro Twps.	This site is a forested woodlot on a shale ridge. It supports a good quality population of a PA-Endangered shrub species, G5, S1 Missouri gooseberry (<i>Ribes missouriense</i>) . A fair-quality population of limestone petunia (<i>Ruellia strepens</i>) , a G4G5, S2 PA-Threatened plant species of concern, and a good-quality population of G4, S3 beard-tongue (<i>Penstemon canescens</i>) were documented in survey in 2000. These findings elevate the importance of this site from a rank of 4 to a rank of 3.	74, 118, 125
3	CONODOGUINET CREEK AT BERNHEISEL BRIDGE #56	Middlesex, Silver Spring Twps.	This site supports populations of two animal and two plant species of special concern in the Creek and on the adjacent floodplain. The G5, S3 sedge <i>Carex shortiana</i> and the G4G5, S2 PA-threatened limestone petunia (<i>Ruellia strepens</i>) occur on the floodplain of Conodoguinet Creek. The animal species of concern occurs in the Conodoguinet Creek.	80, 95
3	CONODOGUINET CREEK AT RICH VALLEY ROAD #57 UPDATED	Silver Spring Twp.	There are good quality populations of two plant species of concern, the G5, S3 sedge <i>Carex shortiana</i> and the G5, S3 white trout lily (<i>Erythronium albidum</i>) , at this forested floodplain along the Conodoguinet Creek.	95

County Rank ¹	Site Name, Site #	Municipality	PA Heritage Ranks ² and Site Importance	Pg. #
3	DEAD WOMAN HOLLOW #32	Cooke, South Newton, Southampton Twps.	This site includes several areas of acidic seeps near the headwaters of Mountain Creek. Four plant species of concern— G5, SU Virginia bunchflower (<i>Melanthium virginicum</i>); G4, SU Quillwort (<i>Isoetes valida</i>); G5, S2 Yellow-fringed orchid (<i>Platanthera ciliaris</i>); and G5, S1 Twisted yellow-eyed grass (<i>Xyris torta</i>) --occur here in seepy lower slopes and ravines.	45, 100, 112
3	HUNTSDALE FLOODPLAIN / KINGS GAP PONDS #42	Dickinson, Penn Twp.	An Ephemeral/Fluctuating Natural Pool Natural Community exists at the base of south Mountain below Kings Gap Hollow. A nest with young of the G5, S2 long-eared owl (<i>Asio otis</i>) was observed in this area in 1985. A good-quality population of G5, S2 netted chainfern (<i>Woodwardia areolata</i>) was found growing in a wet depression on the floodplain of the Yellow Breeches Creek, as was an animal species of concern.	51, 92
3	HUNTSDALE GRASSLANDS #28 NEW	Penn Twp.	The G5, S2B PA-Threatened dickcissel (<i>Spiza americana</i>) has been observed at this site in 1997 and again in 2000 inhabiting agricultural fields planted in hay mixtures.	92
3	KINGS GAP HOLLOW #41	Dickinson Twp.	This site is a forested watershed of South Mountain, bisected by the north-flowing Kings Gap Hollow Run. The G5, S1S2 short-leaf pine (<i>Pinus echinata</i>) is a tree species widely scattered in the dry upland forest. The G5, S2 rough-leaved aster (<i>Eurybia radula</i>) species found along upper Kings Gap Hollow Run and in its small headwater swamp. An individual of the G5, S2 yellow-fringed orchid (<i>Platanthera ciliaris</i>) was found in the hardwood-white pine-heath woods along a small stream. The G5, S2 Footpath sallow moth (<i>Metaxaglaea semitaria</i>); G4, S3 Broad sallow moth (<i>Xylotype capax</i>); and G5, S2S3 Southern variable dart moth (<i>Xestia elimata</i>) are moth species found for the first time in a 1998 survey.	51
3	PEACH ORCHARD HOLLOW PONDS #29 UPDATED	Penn, South Newton Twps.	This site consists of numerous small woodland ponds surrounded by oak-heath forest. This Ephemeral-fluctuating Pool Natural Community supports a fair to poor quality population of northeastern bulrush (<i>Scirpus ancistrochaetus</i>) , a PA-endangered plant species.	92, 112

County Rank ¹	Site Name, Site #	Municipality	PA Heritage Ranks ² and Site Importance	Pg. #
3	PINEY MOUNTAIN SEEPS #37	Cooke Twp.	This site supports an S3 Northern Appalachian Acidic Seep Natural Community . Found at the base of the slopes above the seepages is a healthy population of the G5, S3 <i>Trillium cernuum</i> .	45
3	STATE GAME LANDS No.169 #5 UPDATED	Upper Mifflin Twp.	Two plant and one animal species of concern occur in different habitats within this game lands. This site supports three separate locations for a fair to good quality population of prickly-pear cactus (<i>Opuntia humifusa</i>, G5, S3) . A poor-quality population of PA-threatened limestone petunia (<i>Ruellia stepens</i>) is associated with wetlands and floodplain along the north side of the Conodoguinet Creek. In 1998 a fair-to-good quality population of PA-Endangered black-crowned night heron (<i>Nycticorax nycticorax</i>) was discovered to be nesting along the edges of a large, impounded lagoon between the Creek and the agricultural fields to the North.	122
3	SUSQUEHANNA RIVER AT FORT HUNTER-ROCKVILLE #64 UPDATED	East Pennsboro Twp. & Dauphin & Perry Cos.	This site is located in the Susquehanna River and is characterized by a bedrock bottom covered with gravel and cobbles with boulders. It supports four species of rare aquatic animals.	57
3	WAGGONERS GAP #26 UPDATED	Lower Frankford , North Middleton Twps.	This site is located on the crest of Blue Mountain in the vicinity of Waggoners Gap. This site supports two species of concern, the G5, S3 Prickly-pear cactus (<i>Opuntia humifusa</i>) and the G3G4, S3 PA-Threatened Allegheny woodrat (<i>Neotoma magister</i>) .	74, 86
4	CAMP TUCKAHOE #52	South Middleton Twp. & York Co.	This site consists of an area of acidic seeps near the headwaters of Dogwood Run along the Cumberland/York county line. In 1995, a very small population of G5, S2 rough-leaved aster (<i>Eurybia radula</i>) was observed flowering in a small floodplain meadow. During 1998 surveys, a fair-to-good population of G5, S2 netted chainfern (<i>Woodwardia areolata</i>) was located.	108
4	CAVE HILL NATURE CENTER #46	North Middleton Twp.	This site is an area of limestone bluffs facing the Conodoguinet Creek. A G5, S2S3 rare invertebrate species is found in rimstone pools inside a cave. The G4G5, S2 limestone petunia (<i>Ruellia strepens</i>) was discovered at the site in 1998; whereas G5, S2 tall gramma (<i>Bouteloua curtipendula</i>) been known to occur at this site since 1925.	86

County Rank ¹	Site Name, Site #	Municipality	PA Heritage Ranks ² and Site Importance	Pg. #
4	CONODOGUINET CREEK AT CARLISLE #44	North Middleton, West Pennsboro Twps.	This site extends along a several mile stretch of the Conodoguinet Creek and supports three plant species of special concern. Two of these, the white-water crowfoot (<i>Ranunculus aquaticus</i> var. <i>diffusus</i>, G5T5, S3) and the Illinois pondweed (<i>Potamogeton illinoensis</i>, G5, S3S4) , are aquatic, growing submerged in the Conodoguinet. The floodplain adjacent to the Creek supports a poor-quality population of PA-threatened limestone petunia (<i>Ruellia strepens</i>, G4G5, S2) .	86, 125
4	CONODOGUINET CREEK EAST OF NEWVILLE #22 NEW	Upper Frankford, West Pennsboro Twps.	This site supports a fair quality population of G4G5, S2 PA-Threatened limestone petunia (<i>Ruellia strepens</i>) . Surveys in 2000 revealed the continued presence of a historically-recorded population of G4, S3 beard-tongue (<i>Penstemon canescens</i>) on the shale slopes above the creek. Evidence of a G3 animal species of concern was found at this in the creek 1994. This species is sensitive to pollution and sedimentation.	118, 126
4	FLAT ROCK SITE #15	Upper Frankford Twp.	This southeast facing forested mountain slope supports the presence of the G3G4, S3 PA-Threatened Allegheny woodrat (<i>Neotoma magister</i>) .	78, 118
4	GUNTER VALLEY AND RIDGES #1 NEW	Hopewell Twp., Franklin, Perry Cos.	This site is the watershed for a High Gradient Clearwater Creek natural community, designated as an Exceptional Value Stream by the PA Department of Environmental Protection. One individual of Northern Myotis (<i>Myotis septentrionalis</i>) , a G4 S3B, S3N animal species of concern, was captured above a small stream (Trout Run) habitat feeding a large reservoir. Also at this site, an individual of a G4, S3S4 animal species of concern was found in 2002.	68
4	MICHAUX ROAD SITE #33 UPDATED	Cooke Twp	This site is located in one of the forested tributary drainages of Mountain Creek. A plant species of special concern, G5, S2 proposed-threatened rough-leaved aster (<i>Eurybia radula</i>) has been observed here growing along the margins of small stream channels and in acidic seepage areas.	45

County Rank ¹	Site Name, Site #	Municipality	PA Heritage Ranks ² and Site Importance	Pg. #
4	MIDDLE SPRING CREEK WATERSHED #7 UPDATED	Hopewell, Southampton Twps., Shippensburg Boro., Franklin Co.	During surveys in 2000, a PA-Endangered animal was discovered in a small wetland along the creek. Within this site, a calcareous wetland contains a population of Grass-leaved Rush (<i>Juncus biflorus</i>) , an S2 plant. Also included at this site is a fair to good population of Short-fruited Rush (<i>Juncus brachycarpus</i>) , a G4G5, S1 Pennsylvania-Endangered plant species of concern.	68, 100
4	SPRING HILL SCHOOL GRASSLANDS #11 NEW	North Newton, Southampton Twps.	A breeding population of G5, S1S2B PA-Threatened upland sandpiper (<i>Bartramia longicauda</i>) was observed at this site in 1984 and again in 1988. This species will utilize the open, grassy habitat of pastures, fallow fields, golf courses and airports.	90, 102
4	SUSQUEHANNA RIVER AT HARRISBURG #62	New Cumberland & Wormleysburg Boroughs & Dauphin Co.	This site is a portion of the Susquehanna River within the city of Harrisburg. Three rare animal species are found here in shallow quickwater and riffles. Independence Island and other forested islands in the vicinity are also potential habitat for wading bird colonies; in 1989 nests of the G5, S1B PA-endangered yellow-crowned night heron (<i>Nyctanassa violacea</i>) were documented at this site, but a survey of the site in 1997 failed to find any active nests of this species.	57
4	THREE SQUARE HOLLOW EAST #4 NEW	Upper Mifflin Twp.	This site consists of the forested crest and steep upper slope of a southeast facing mountain ridge. It supports a fair quality population of the PA-Threatened Allegheny woodrat (<i>Neotoma magister</i>) .	122
5	BIG SPRING #21 NEW	North Newton, West Pennsboro Twps.	This site is considered an outstanding geologic feature of Pennsylvania. The spring is the starting point for the Big Spring Creek, and it is the fifth largest spring in the state, having a flow of 12,500 gallons per minute (Geyer and Bolles 1979).	90, 125
5	C.C.C. DAM SITE #19 UPDATED	South Newton, Southampton Twps.	This site is a former shallow dam in Hairy Springs Hollow near the base of South Mountain. The resulting artificial wetland habitat supports the G5, S2 PA-threatened southern bog clubmoss (<i>Lycopodiella appressa</i>) and the formerly-listed bladderwort (<i>Utricularia geminiscapa</i>) .	100, 112
5	CACTUS HILL #45	North Middleton Twp.	This is a xeric site with a shaly soil supporting a forest of chestnut oak, pignut hickory, Scot's pine and Virginia pine. A good population of G5, S3 prickly-pear cactus (<i>Opuntia humifusa</i>) species is found on a powerline R.O.W. that cuts through the site.	86

County Rank ¹	Site Name, Site #	Municipality	PA Heritage Ranks ² and Site Importance	Pg. #
5	CHIMNEY ROCKS #30 NEW	Penn Twp.	This site is considered an outstanding geologic feature of Pennsylvania. A spire of quartzite in shape of a chimney rises above the surrounding ridgeline. It is part of the Antietam Formation dating from the Cambrian (540-490 million years ago). (Geyer and Bolles 1979) Old signs of occupation by the PA-threatened Allegheny woodrat (<i>Neotoma magister</i>) were observed at this site in 1992; follow-up surveys should be conducted to determine if the site is presently occupied by this species.	92
5	CONODOGUINET CREEK AT WOLF BRIDGE #47	Middlesex Twp.	A population of two G4, S3S4 rare aquatic animal species was found in this stretch of the Conodoguinet Creek, upstream of the Creek's confluence with Letort Spring Run.	80
5	CONODOGUINET CREEK AT MT. ROCK SPRING CREEK #27	Lower Frankford, West Pennsboro Twps.	This site includes a portion of the Conodoguinet Creek. It supports a small population of an aquatic plant species, G5T5, S3 white-water crowfoot (<i>Ranunculus aquaticus</i> var. <i>diffusus</i>) . It is likely more of this species occurs in the creek along this stretch.	74, 126
5	HAMMONDS ROCKS #40 NEW	Dickinson Twp.	This site is considered an outstanding geologic feature of Pennsylvania. Hammonds Rocks is an outcrop of Weverton conglomerate dating from the Cambrian (540-490 million years ago) at the crest of South Mountain, with a good view of the South Mountain physiographic section to the south (Geyer and Bolles 1979).	51
5	LEWIS ROCKS #31 NEW	South Newton, Southampton Twps.	This site is considered an outstanding geologic feature of Pennsylvania. It is characterized by a group of hard, tough weather-resistant spires of quartzite, from the Weverton formation dating from the Cambrian (Geyer and Bolles 1979).	100, 112
5	LISBURN ROAD FARM #55	Monroe Twp.	A barn owl (<i>Tyto alba</i>, G5, S3B S3N) was observed using a silo at this farm in 1996.	84
5	LOGAN SCHOOL FOSSIL SITE #23 NEW	West Pennsboro Twp.	This site is considered an outstanding geologic feature of Pennsylvania. It contains abundant fossil species preserved in limestone of the Chambersburg Formation from the Middle Ordovician Age. The site is on private property and is not open to the public (Geyer and Bolles 1979).	126

County Rank ¹	Site Name, Site #	Municipality	PA Heritage Ranks ² and Site Importance	Pg. #
5	MAINS RUN & GUM RUN PONDS #8 UPDATED	Southampton Twp., Franklin County	This site consists of an aggregation of vernal pools at the base of South Mountain along the Franklin County border. A fair population of Small Beggar's-Ticks (<i>Bidens discoidea</i>) , a G5, S3 Pennsylvania plant species of concern, was found in a Buttonbush shrub swamp.	100
5	MUDLEVEL ROAD SITE #10	Southampton Twp.	The site consists of an agricultural field, and the species of concern, the Dickcissel (<i>Spiza americana</i>, G5, S1B) , is a grassland species that occupies agricultural settings if the disturbance regime and other habitat requirements are suitable.	100
5	OLD BALTIMORE ROAD SITE #18	Southampton Twp	This site supports a poor-quality occurrence of the G5, S2, PA-threatened yellow-fringed orchid (<i>Platanthera ciliaris</i>) . A very small population of this species occurs in an acidic seepage area along with sedges, New York fern, and sphagnum moss.	100
5	RUNNING PUMP ROAD WOODS #6	North Newton Twp.	A small poor-quality population of G5, S3 puttyroot (<i>Aplectrum hyemale</i>) occurs in an oak-hickory forest at this site. Surveys in 1987, 1997, and 1998 indicate that the population may be expanding and the habitat remains good.	90
5	TAGG RUN #39	Dickinson Twp.	A fair to good quality population of G5, S2 rough-leaved aster (<i>Eurybia radula</i>) occurs along the southern tributaries of Tagg Run.	51
5	THREE SQUARE HOLLOW RUN #3 UPDATED	Hopewell, Upper Mifflin Twp.	A good-sized population of G5, S3 prickly-pear cactus (<i>Opuntia humifusa</i>) was found growing in artificial habitat along a shale outcrop roadbank within this site. The habitat here is an open upper slope with many exotic plant species and dry soil. Additionally, a single occurrence of the G4G5, S3 crane fly orchid (<i>Tipularia discolor</i>) was located within a shaly, moist oak-hickory forest stand.	68, 122
5	TROUT RUN PRESERVE-UPPER ALLEN MARSH #60	Upper Allen Twp.	This site consists of a streamside wetland formerly used as a cow pasture. The site has been used by various bird species, including Least Bittern, Great Blue Heron, and Great Egret, and in 1988 was noted to harbor a small population of G5, S1B, PA-threatened Sedge Wrens (<i>Cistothorus platensis</i>) .	116

County Rank ¹	Site Name, Site #	Municipality	PA Heritage Ranks ² and Site Importance	Pg. #
5	TUSCARORA TRAIL SITE #14	Lower Mifflin, Tyrone Twps., Perry Co.	This site is a rocky forested ridgetop along the border of Cumberland and Perry Counties, dominated by oak. Evidence of the G3G4, S3 PA-Threatened Allegheny woodrat (<i>Neotoma magister</i>) was found here in 1990.	78
5	WALNUT RIDGE CAVE #20	South Newton Twp.	The G4, S3BS3N northern Myotis bat (<i>Myotis septentrionalis</i>) was last observed hibernating in this cave in 1989.	112
5	WHITE ROCKS #53 NEW	Monroe Twp.	This site is considered an outstanding geologic feature of Pennsylvania. White Rocks is a quartzite outcrop of the Antietam Formation dating from the Cambrian (540-490 million years ago) on South Mountain south of Boiling Springs. From the top, at Center Point Knob, there is a good view across the Great Valley to the north (Geyer and Bolles 1979).	84
5	YELLOW BREECHES CREEKS-LEIDIGHS TO WILLIAMS GROVE #54	Monroe Twp., York Co.	This site extends along several miles of the Yellow Breeches Creek. . It supports populations of two rare aquatic plant species: G5, S3 PA-threatened red-head pondweed (<i>Potamogeton richardsonii</i>) and G5T5, S3 white-water crowfoot (<i>Ranunculus aquatilis</i> var. <i>diffusus</i>) .	84
5	YELLOW BREECHES-RABOLD SITE #61 NEW	Lower Allen Twp., York Co.	A small poor-quality population of tooth-cup (<i>Rotala ramosior</i>) , G5, S3 , falls on the margin of an agricultural field on the floodplain of the Yellow Breeches Creek.	72

¹Ranks are very approximate and are based primarily on the quality of the habitat. Sites with more intact natural communities (on a counties-wide scale) are given highest priority. Other sites represent areas with locally significant woodlands or wetlands or sites that support a particularly rich or unusual flora or fauna. Areas that are already protected as park land or open space may be assigned lower rank to reflect lower urgency for protection action. Sites of similar rank are listed alphabetically by site name.

²See Appendix I for an explanation of global (G) and state (S) ranks.

Table 2. Areas of local significance in Cumberland County based on size, diversity of wildlife and plant life, water quality protection, and recreation potential. (These sites do not include high quality natural communities and no species of special concern have been documented at the sites, although several of the areas have potential for rare species to occur.)

County Rank ¹	Site Name	Municipality	Natural Feature and Importance	Page #
High	Colonel Denning State Park #13	Lower Mifflin Twp.	This site occupies a narrow valley formed by Doubling Gap, a bend in the Blue Ridge. There are historical records from the Park for both plant and animal species of concern. The site remains potential habitat for rare species as it recovers from these disturbances.	78
	Hampden Slopes UPDATED	Hampden Twp.	This site has been incorporated into the larger Conodoguinet Macrosite. This site consists of steep north and west-facing forested slopes and narrow strip of floodplain along Conodoguinet Creek. The site has a fairly mature forest and a diverse spring ephemeral flora.	64
Med	Doubling Gap Creek #12 UPDATED	Lower Mifflin Twp.	The creek downstream of the state park supports a good quality population of Potomac Sculpin (<i>Cottus girardii</i>), which has been removed from the species of concern list since the 2000 report. Though there are currently no listed species of concern at this site, the site supports a variety of aquatic species and warrants attention to its water quality.	78
Med	Laurel Road Swamp #38 NEW	Cooke Twp., Adams Co.	This site is a locally significant natural community, characterized by a seep derived hardwood swamp dominated by red maple, white pine, and white oak with an understory of swamp azalea, witch hazel, spicebush, and winterberry. The swamp contains a diversity of herbs, sedges, and grasses and provides good habitat for amphibians as well.	45
Med	Letort Spring Run #48	Middlesex Twp.	This locally significant area consists of marshy floodplain habitat along this spring-fed tributary to the Conodoguinet Creek. It is habitat for a variety of bird, reptile, and amphibian species.	40
Med	Locust Creek #25 UPDATED	Lower Frankford, Upper Frankford Twp.	The well-shaded creek at this site supports a good quality population of Potomac Sculpin (<i>Cottus girardii</i>), which has been removed from the species of concern list since the 2000 report. Though there are currently no listed species of concern at this site, the site supports a variety of aquatic species and warrants attention to its water quality.	74, 118

County Rank ¹	Site Name	Municipality	Natural Feature and Importance	Page #
Med	Peebles Run #2 UPDATED	Hopewell Twp.	A small creek at this site supports a small fair quality population of Potomac Sculpin (<i>Cottus girardii</i>), which has been removed from the species of concern list since the 2000 report. Though there are currently no listed species of concern at this site, the site supports a variety of aquatic species and warrants attention to its water quality.	68
	Pine Hill Arboretum UPDATED	East Pennsboro Twp.	This site has been incorporated into the larger Conodoguinet Macrosite. This site is a narrow forested stream ravine on the north side of Conodoguinet Creek. The moist northeast-facing slopes and narrow floodplain support an abundance of spring wildflowers including wild leeks, trout lily, Dutchman's breeches, spring beauty, sweet cicely, bluebells and others.	58
Med	Upper Mill Woods #51 UPDATED	South Middleton Twp.	This site supports a fair to good quality population of the plant species golden club (<i>Orontium aquaticum</i>), which has been removed from the species of concern list since the 2000 report. With the delisting of this species, this site has been downgraded to a locally significant site.	108

¹Ranks are very approximate and are based primarily on the quality of the habitat. Sites with more intact natural communities (on a counties-wide scale) are given highest priority. Other sites represent areas with locally significant woodlands or wetlands or sites that support a particularly rich or unusual flora or fauna. Areas that are already protected as park land or open space may be assigned lower rank to reflect lower urgency for protection action. Sites of similar rank are listed alphabetically by site name

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Natural Areas of Cumberland County by Township



The Virginia bluebell is a common spring wildflower that occurs in great quantities along the Conodoguinet Creek and many other areas in the county. Photo: PA Science Office of The Nature Conservancy

THE NORTHEASTERN BULRUSH (*Scirpus ancistrochaetus*) is a Federally-Endangered plant species that is specially adapted to the fluctuating water levels of temporary pools. Photo: Julie Lundgren



VERNAL PONDS such as these near the base of South Mountain are important breeding habitats for amphibians, and may harbor rare plant or animal species as well. Photo: PA Science Office of The Nature Conservancy.

COOKE TOWNSHIP

Site Name (County Rank)	Special Species / Community Type	PNHP Ranks*		State Status	Last Seen (m-d-y)	Quality**
		Global	State			
Black Swamp (3)	Natural Community: Acidic Broadleaf Swamp	G5	S3	N	06-04-97	BC
	Plant: Sweet Bay Magnolia <i>Magnolia virginiana</i>	G5	S2	PT	06-04-97	B
Dead Woman Hollow (3)	Plant: Virginia Bunchflower <i>Melanthium virginicum</i>	G5	SU	N	07-25-98	C
	Plant: Quillwort <i>Isoetes valida</i>	G4?	SU	N	07-25-98	B
	Plant: Yellow-fringed Orchid <i>Platanthera ciliaris</i>	G5	S2	TU	07-25-98	CD
	Plant: Twisted Yellow-eyed Grass <i>Xyris torta</i>	G5	S1	N	09-01-97	B
Iron Run (2)	Plant: Variable Sedge <i>Carex polymorpha</i>	G3	S2	PE	07-11-97	B
Michaux Road Site (4)	Plant: Rough-leaved Aster <i>Eurybia radula</i>	G5	S2	N	09-07-95	D
	Plant: Golden Club <i>Orontium aquaticum</i>	G5	S4	DL	07-15-97	BC
Piney Mountain Seeps (3)	Natural Community: Northern. Appalachian Acidic Seep	G?	S3?	N	06-10-99	C
	Plant: <i>Trillium cernuum</i>	G5	S3	N	5-17-98	BC

Site Name (County Rank)	Special Species / Community Type	PNHP Ranks*		State Status	Last Seen (m-d-y)	Quality**
		Global	State			
Mountain Creek Seeps / Sage Run (1)	Plant: Showy Goldenrod <i>Solidago speciosa</i> var. <i>speciosa</i>	G5T5?	S?	N	10-18-97	BC
	Plant: Rough-leaved Aster <i>Eurybia radula</i>	G5	S2	N	10-18-97	B
	Plant: Variable Sedge <i>Carex polymorpha</i>	G3	S2	PE	07-29-97	B
	Plant: Lupine <i>Lupinus perennis</i>	G5	S3	N	05-16-97	BC
	Plant: Virginia Bunchflower <i>Melanthium virginicum</i>	G5	SU	N	07-22-98	B
	Plant: Yellow-fringed Orchid <i>Platanthera ciliaris</i>	G5	S2	TU	08-23-97	D
	Plant: Quillwort <i>Isoetes valida</i>	G4?	SU	N	07-25-98	B
	Plant: Golden Club <i>Orontium aquaticum</i>	G5	S4	DL	07-22-98	B
	Plant: Sweet Bay Magnolia <i>Magnolia virginiana</i>	G5	S2	PT	07-29-97	D

* Please refer to Appendix I for an explanation of PNHP Ranks and State Status.

**Please refer to Appendix II for an explanation of Quality Ranks.

Locally Significant: Laurel Road Swamp

Managed Lands: Michaux State Forest

Pine Grove Furnace State Park

Kings Gap Environmental Education Center



Other: High Quality Cold Water Fisheries—Mountain Creek, Bettem Hollow, Opossum Creek, Peach Orchard Hollow

[COOKE TOWNSHIP MAP](#)

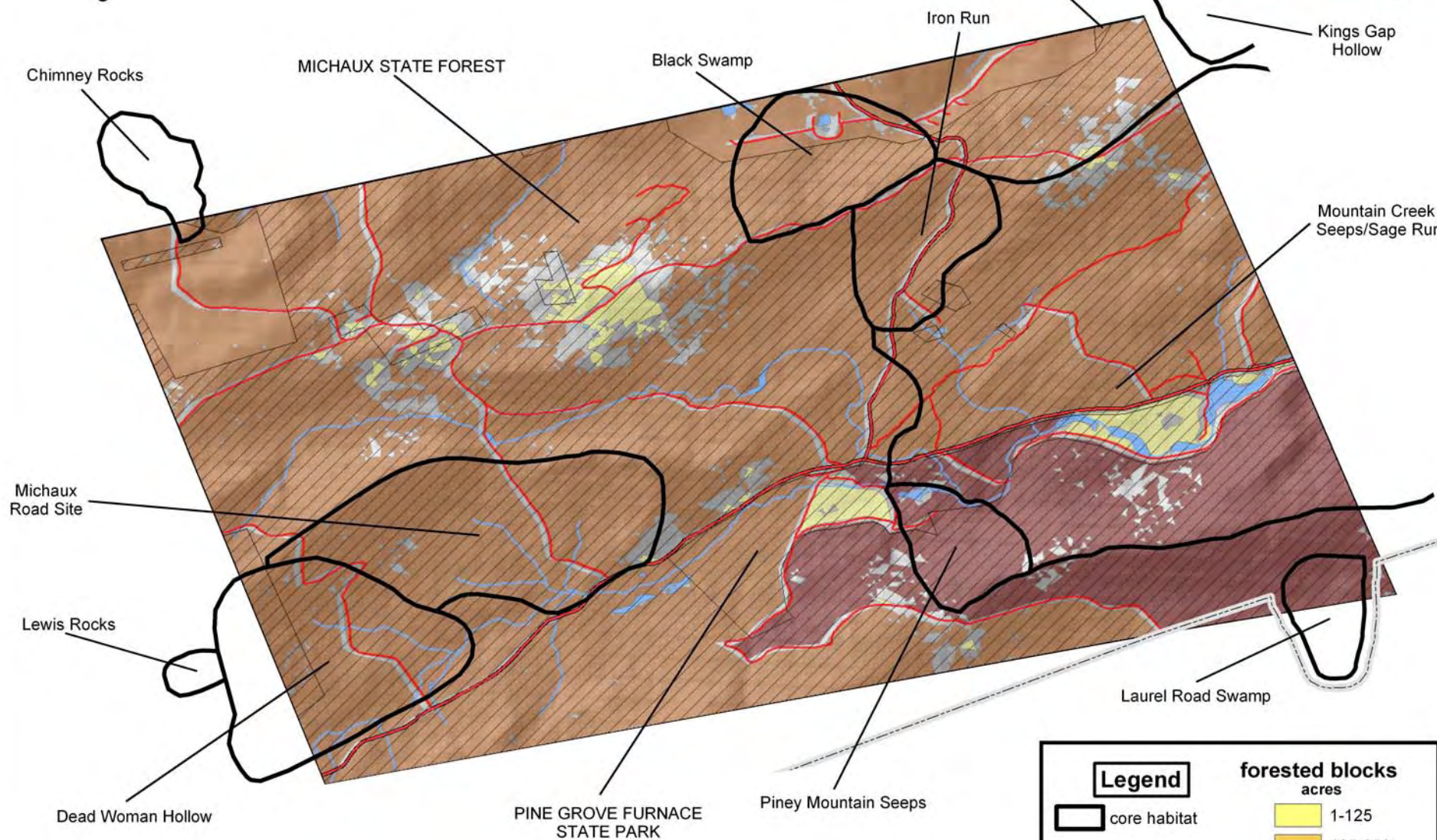


Cooke Township

KINGS GAP ENVIRONMENTAL
EDUCATION CENTER
STATE PARK

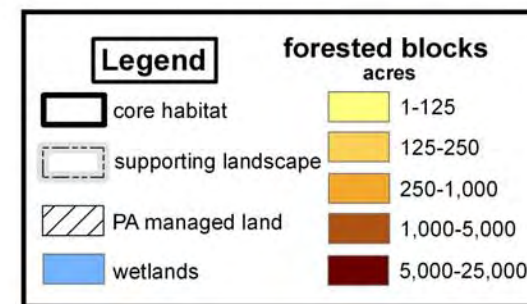


Pennsylvania Natural Heritage Program



Scale: 1:60,000

0 0.5 1 2 Miles



COOKE TOWNSHIP

Cooke Township is in the heart of the South Mountain in Cumberland County. Most of the township is within the Michaux State Forest and is managed by the Department of Conservation and Natural Resources. The headwaters of Mountain Creek, a High Quality Cold Water Fishery, flow through the center of the township, which is also host to several other high quality headwater streams. The South Mountain contains the largest expanse of unbroken forested land in the county and provides an important natural greenway extending south into Maryland. The natural areas in the township are dotted with large and small wetlands or pools, seeps, and swamps. Much of the township's native biodiversity and scenery can be preserved by avoiding unnecessary fragmentation of landscape features by steering construction of new roads and buildings away from large forest blocks and wetlands, particularly in the northern portions of the township that are outside the state forest boundary.

BLACK SWAMP (Cooke Township)

This site supports a fair-to-poor quality example of a **G5, S3 Acidic Broadleaf Swamp Natural Community**. This three-acre swamp consists of open seepage areas mixed in with closed canopy forest. Open areas contain sphagnum hummocks and support an unusual diversity of shrubs and herbs including beak rush, cinnamon fern, cranberry, highbush blueberry, sundew, cottongrass, spikerush, and bladderwort. The forested portion is dominated by the **G5, S2 PA-Threatened sweet bay magnolia (*Magnolia virginiana*)** shrub species, which co-occurs with red maple, black gum, pitch pine, white oak, and witch hazel. This site is unique in supporting species that are typical of both more southerly and northerly habitats. This site is partially in Michaux State Forest.

Threats and Disturbances:

The site is bisected by a small road, which appears to have little impact on the plants occurring here. This site and the rare species it contains will benefit from being left in its current state.

Conservation Recommendations:

To help maintain and improve the quality of the site an adequate buffer should be left around the site if logging or further development is to take place in the vicinity.

DEAD WOMAN HOLLOW (Cooke, South Newton, and Southampton Townships)

This site includes several areas of acidic seeps near the headwaters of Mountain Creek. Four plant species of concern—**G5, SU Virginia bunchflower (*Melanthium virginicum*)**; **G4, SU Quillwort (*Isoetes valida*)**; **G5, S2 Yellow-fringed orchid (*Platanthera ciliaris*)**; and **G5, S1 Twisted yellow-eyed grass (*Xyris torta*)**—occur here in seepy lower slopes and ravines. The surrounding upland forests are dominated by oaks, pine, black gum and mountain laurel; the seeps themselves may be open or partially shaded by black gum, black birch, tulip tree, white pine, or hemlock. Skunk cabbage, Sphagnum moss, manna grass, and sedges are prevalent groundcover species in the wetter portions of the seeps themselves. The site is within Michaux State Forest.

Threats and Disturbances:

Stilt grass and barberry are invasive species present in the seeps. Other potential threats include trampling or runoff from nearby bike trails and roads. Deer browsing is also a threat to one of the plant species of concern.

IRON RUN (Cooke Township)

This site consists of a corridor of mesic acidic central forest adjacent to Iron Run. It supports a good quality population of the **G3, S2 PA-endangered Variable sedge (*Carex polymorpha*)**. Associated species include cinnamon and hay-scented ferns, fly poison, Indian cucumber, and bellwort. This site is located in Michaux State Forest.

Threats and Disturbances:

Several jeep lanes bisect the area and exotic species are abundant in some areas.

Conservation Recommendations:

Preventing further encroachment of jeep lanes and avoiding soil disturbances should help this species to continue to persist here.

MICHAUX ROAD SITE—UPDATED—(Cooke Township)

This site is located in one of the forested tributary drainages of Mountain Creek. A plant species of special concern, **G5, S2 proposed-threatened rough-leaved aster (*Eurybia radula*)** has been observed here growing along the margins of small stream channels and in acidic seepage areas. Associated species include sphagnum moss, skunk cabbage, jewelweed, cardinal flower, fowl meadow grass, and numerous ferns and sedges. Additional habitat for this species occurs elsewhere in this subwatershed. Further surveys are recommended to discover the size and extent of these occurrences. The G5, S4 golden club (*Orontium aquaticum*), also found associated with the rough-leaved aster, has been delisted since the 2000 report. This site is located in Michaux State Forest.

Conservation Recommendations:

Maintaining adequate buffers around seepage areas and along stream corridors, and avoiding soil disturbances is recommended to help these species continue to persist at this site.

MOUNTAIN CREEK SEEPS/SAGE RUN—UPDATED—(Cooke and Dickinson Townships)

This site is a complex of several sites in the area of Sage Run and Mountain Creek on South Mountain. This portion of South Mountain is dominated by a dry-mesic central forest composed of chestnut oak, black gum, sassafras, pitch pine, and red maple, with mountain laurel, blueberry, and huckleberry the most common shrubs. Seeps are extensive along the lower part of the main branch of the Sage Run and along Mountain Creek. Eight plant species of special concern, including the **G3, S2 PA-endangered variable sedge (*Carex polymorpha*)**, **G5, S2 PA-threatened sweet bay magnolia (*Magnolia virginiana*)**; **G5T5?, S? showy goldenrod (*Solidago speciosa* var. *speciosa*)**; **G5, S2 rough-leaved aster (*Eurybia radula*)**; **G5, S3 lupine (*Lupinus perennis*)**; **G5, SU Virginia bunchflower (*Melanthium virginicum*)**; **G5, S2 yellow-fringed orchid (*Platanthera ciliaris*)**; and **G4, SU quillwort (*Isoetes valida*)**, are found in the various seeps. The populations of these species vary in size and quality, and are scattered throughout this watershed. Other plant species common to the seepage areas include cinnamon, royal, and New York ferns; fly poison, Indian cucumber, bellwort, sedges, and sphagnum mosses. The G5, S4 golden club (*Orontium aquaticum*), also found associated with the seep communities, has been removed from the species of concern list since the 2000 report. This site is located in Michaux State Forest.

Threats and Disturbances:

Threats at this site include competition from exotic, invasive plants, including stilt grass and barberry, and overbrowsing by deer.

Conservation Recommendations:

Maintaining adequate buffers around seepage areas and along stream corridors, and avoiding soil disturbances will help protect the seep habitats and the rare plant species they contain.

PINEY MOUNTAIN SEEPS (Cooke Township)

This site supports an **S3 Northern Appalachian Acidic Seep Natural Community**. The seeps occur between Piney Mountain and Mountain Creek, as groundwater comes to the surface where Mountain Creek's floodplain meets the base of the north-facing slope. Most of the seeps are forested, with some large hemlock and white pine trees present along with occasional black ash and tulip tree. Skunk cabbage, cinnamon fern, marsh marigold, turtlehead and sedge species are common in the groundcover. The seeps are potential habitat for several rare plant species, although none have been found to date. Found at the base of the slopes above the seepages is a healthy population of the **G5, S3 *Trillium cernuum***.

Threats and Disturbances:

Disturbances to the site include an old railroad bed now used as a hiking trail, which interrupts the flow of the seeps towards Mountain Creek and has created some open-water pools. There are also some exotic plant species (barberry, stilt-grass) in the seeps, although they have not yet come to dominate much area. The site is part of Pine Grove Furnace State Park and adjacent trails are used for biking and hiking. Deer browse, potential trampling, and competition from invasive plants are potential threats to the trillium.

Conservation Recommendations:

Management concerns include protecting water quality and minimizing foot-traffic through the seeps.

Locally Significant Site:

Laurel Road Swamp—NEW—(Cooke Township, Adams County)

This site is a locally significant natural community, characterized by a seep derived hardwood swamp dominated by red maple, white pine, and white oak with an understory of swamp azalea, witch hazel, spicebush, and winterberry. The swamp is comprised of a dense network of braided seeps and streams, which meander through moss-covered hummocks at the base of trees, shrubs, and ferns. The swamp contains a diversity of herbs, sedges, and grasses and provides good habitat for amphibians as well. The site was identified during the Adams County Natural Area Inventory and is a new addition to this report.



The **variable sedge** (*Carex polymorpha*) is a PA-threatened and globally rare plant species that can be found in woodlands near streams. The leaves are often the most visible portion of the plant and resemble large blades of grass (right). Without the fruiting stem (left) the variable sedge can be very difficult to identify. In Pennsylvania, this species has been found in the Pocono region and on South Mountain in Cumberland County. Photo: PA Science Office of The Nature Conservancy

DICKINSON TOWNSHIP

Site Name (County Rank)	Special Species / Community Type	PNHP Ranks*		State Status	Last Seen (m-d-y)	Quality**
		Global	State			
Hammonds Rocks (5)	Geologic Feature: Erosional remnant	G?	S?	N	1979	E
Hunters Run (2)	Plant: Showy Goldenrod <i>Solidago speciosa</i> var. <i>speciosa</i>	G5T5?	S?	N	10-19-97	BC
	Plant: Rough-leaved Aster <i>Eurybia radula</i>	G5	S2	N	10-19-97	C
	Plant: Glade Spurge <i>Euphorbia purpurea</i>	G3	S1	PE	07-27-98	C
	Plant: Golden Club <i>Orontium aquaticum</i>	G5	S4	DL	10-19-97	C
Huntsdale Floodplain / Kings Gap Ponds (3)	Natural Community: Ephemeral/Fluctuating Natural Pool	G?	S3	N	07-20-98	BC
	Plant: Netted Chainfern <i>Woodwardia areolata</i>	G5	S2	N	06-04-98	B
	Animal: Long-eared Owl <i>Asio otis</i>	G5	S2B,S2S3N	CU	06-02-1985	E
Kings Gap Hollow (3)	Plant: Rough-leaved Aster <i>Eurybia radula</i>	G5	S2	N	10-17-97	B
	Plant: Yellow-fringed Orchid <i>Platanthera ciliaris</i>	G5	S2	TU	08-14-98	D
	Plant: Short-leaf Pine <i>Pinus echinata</i>	G5	S1S2	N	04-21-97	CD
	Animal: Footpath Sallow Moth <i>Metaxaglaea semitaria</i>	G5	S2	N	9-29-98	B
	Animal: Broad Sallow Moth <i>Xylotype capax</i>	G4	S3	N	9-29-98	B
	Animal: Southern Variable Dart Moth <i>Xestia elimata</i>	G5	S2S3	N	9-29-98	BC

Site Name (County Rank)	Special Species / Community Type	PNHP Ranks*		State Status	Last Seen (m-d-y)	Quality**
		Global	State			
Mountain Creek Seeps / Sage Run (1)	Plant: Showy Goldenrod <i>Solidago speciosa</i> var. <i>speciosa</i>	G5T5?	S?	N	10-18-97	BC
	Plant: Rough-leaved Aster <i>Eurybia radula</i>	G5	S2	N	09-26-97	B
	Plant: Variable Sedge <i>Carex polymorpha</i>	G3	S2	PE	07-29-97	B
	Plant: Lupine <i>Lupinus perennis</i>	G5	S3	N	05-16-97	BC
	Plant: Virginia Bunchflower <i>Melanthium virginicum</i>	G5	SU	N	07-22-98	B
	Plant: Yellow-fringed Orchid <i>Platanthera ciliaris</i>	G5	S2	TU	08-23-97	D
	Plant: Quillwort <i>Isoetes valida</i>	G4?	SU	N	07-25-98	B
	Plant: Golden Club <i>Orontium aquaticum</i>	G5	S4	DL	07-22-98	B
	Plant: Sweet Bay Magnolia <i>Magnolia virginiana</i>	G5	S2	PT	07-29-97	D
Tagg Run (5)	Plant: Rough-leaved Aster <i>Eurybia radula</i>	G5	S2	N	10-24-97	BC

* Please refer to Appendix I for an explanation of PNHP Ranks and State Status.

**Please refer to Appendix II for an explanation of Quality Ranks.

Locally Significant: None

Managed Lands: Michaux State Forest

Pine Grove Furnace State Park

Kings Gap Environmental Education Center



Other: High-Quality Cold Water Fisheries—Mountain Creek to Toland, Spruce Run, Kings Gap Hollow, Yellow Breeches Creek

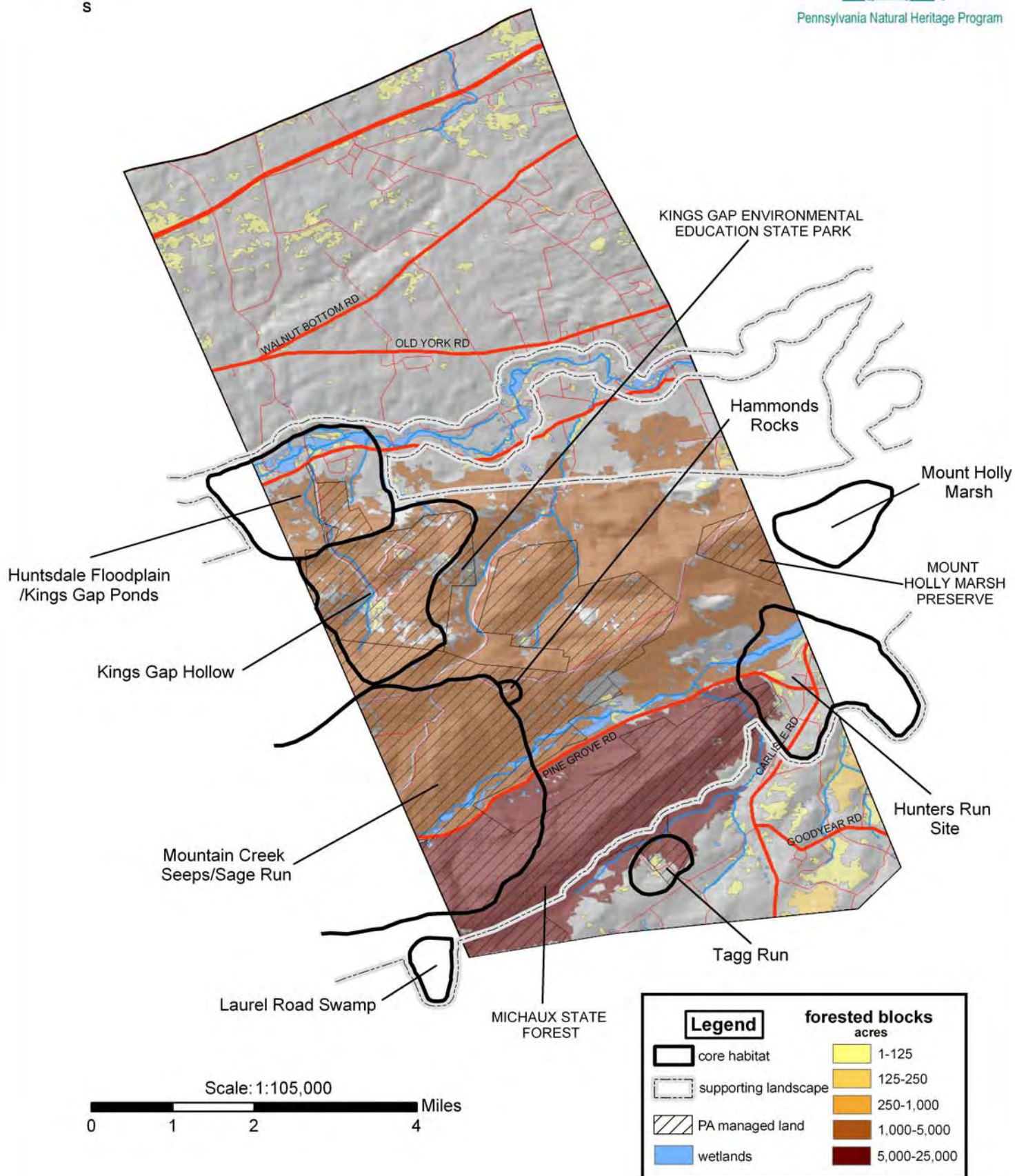
[DICKINSON TOWNSHIP MAP](#)



Dickinson Township



Pennsylvania Natural Heritage Program



DICKINSON TOWNSHIP

Dickinson Township is divided physiographically by the Great Valley Section in the north and the South Mountain Section in the south. Much of the South Mountain portion is within the Michaux State Forest and is managed by the Department of Conservation and Natural Resources. The South Mountain contains the largest expanse of unbroken forested land in the county and provides an important natural greenway extending south into Maryland. The natural areas in the township are dotted with large and small wetlands or pools, seeps, and swamps. Many temporary vernal pools occur on the lower slopes of the north face of South Mountain. These ponds are extremely important as amphibian breeding habitat, many of which will only breed in temporary pools such as these. The vernal ponds at this location are but a few of the many ponds that line the toe slopes of South Mountain in Cumberland and Franklin Counties. All of the vernal ponds along the lower slopes of South Mountain should be considered points of high biological importance as part of the larger continuous landscape of South Mountain. Additional vernal ponds are currently being mapped and described in the county by several organizations including The Nature Conservancy, Messiah College and Shippensburg University. Proposed building projects in the Township should be scrutinized to assess their impact on vernal pools in the vicinity. Much of the township's native biodiversity and scenery can be preserved by avoiding unnecessary fragmentation of landscape features by steering construction of new roads and buildings away from large forest blocks and wetlands, particularly in the southern portions of the township that are outside the state forest boundary. North of Yellow Breeches Creek the township is dominated by agriculture, though some moderate-sized forest blocks remain to the north. Maintenance and restoration of connectivity between these woodlots would benefit wildlife by forming natural movement corridors. Stream-side buffers should be preserved where they occur and restored where they are missing, particularly along the Yellow Breeches Creek and Cold Spring Run, the Township's two main tributaries to the Susquehanna River. Care should be taken in restoration efforts to use only native species of trees and shrubs, preferably of local sources.

HAMMONDS ROCKS—NEW—(Dickinson Township)

This site is considered an outstanding geologic feature of Pennsylvania. Hammonds Rocks is an outcrop of Weverton conglomerate dating from the Cambrian (540-490 million years ago) at the crest of South Mountain, with a good view of the South Mountain physiographic section to the south (Geyer and Bolles 1979).

HUNTERS RUN—UPDATED—(Dickinson, South Middleton Townships)

This site located along Hunters Run and adjacent Mountain Creek includes a mosaic of wetland cover types including acidic to Circumneutral swamp and several acidic seepage areas as well as the streams themselves. The site supports populations of three plant species of special concern including **G3, S1 PA-Endangered glade spurge (*Euphorbia purpurea*)**. This species occurs in several different subsets, occupying forested wetland pools and small streamside swamps. Associated plant species include red maple, black ash, spicebush, winterberry, skunk cabbage, and jewelweed. A nice diversity of sedges and other wetland herbs are also found here. The **G5, S2 rough-leaved aster (*Eurybia radula*)** occurs in the same streamside habitat, and the **G5T5?, S? showy goldenrod (*Solidago speciosa* var. *speciosa*)** occupies openings in the dry oak-pine forest along the Appalachian Trail adjacent to Mountain Creek. A portion of this site is on the Appalachian Trail National Corridor. The plant species golden club (*Orontium aquaticum*), also reported here, has been removed from the species of concern list.

Conservation Recommendations:

Leaving a forested buffer along Hunters Run and its tributaries and avoiding soil disturbances at this site will help these species to persist here.

HUNTSDALE FLOODPLAIN/KINGS GAP PONDS (Dickinson and Penn Townships)

A large assemblage of vernal pools make up an **Ephemeral/Fluctuating Natural Pool Natural Community** at the base of South Mountain below Kings Gap Hollow. Along with supporting rare plants vernal pools can play an important role in helping to maintain the diversity of species in forest ecosystems. Vernal pools frequently only hold water from winter until mid-summer and are not capable of supporting fish species. They are breeding sites for odonates, amphibians, and diverse macro-invertebrate communities. Over a dozen such pools are found at this site. Some of these are small and forested with shallow water and little vegetation, while others are up to 40 meters in radius, have up to a meter of water in early spring, and are treeless with a mixture of shrubs such as highbush blueberry, buttonbush, winterberry, and emergent herbaceous vegetation including manna grass, spike-rush, and smartweeds. Spotted turtles, spotted salamanders, and green darners and other odonate species were among the animal species observed during surveys. Although no listed species were identified during our surveys, the health of the natural community appears good and additional inventories of these pools are recommended.

The surrounding forest matrix is dominated by various oak species, white pine, sassafras, black gum, and red maple, as well as some silvicultural plantations. A nest with young of the **G5, S2 long-eared owl (*Asio otis*)** was observed in this area in 1985. Some portions of this site are within Kings Gap Environmental Education Center and Huntsdale Fish Hatchery.

A good-quality population of **G5, S2 netted chainfern (*Woodwardia areolata*)** was found growing in a wet depression on the floodplain of the Yellow Breeches Creek. Associated species include sensitive fern, cinnamon fern, swamp raspberry, and spicebush. The surrounding floodplain forest is relatively undisturbed. A PA-Endangered animal species was observed at a road crossing nearby on the floodplain in 1988. Marginal habitat for these species is still present; further surveys are recommended

Threats and Disturbances:

Aerial application of gypsy moth control or other pesticides could affect the health of the vernal ponds. Browsing and trampling by deer is evident in the area and is a threat.

KINGS GAP HOLLOW (Dickinson Township)

This site is a forested watershed of South Mountain, bisected by the north-flowing Kings Gap Hollow Run. Several elements of concern occur here in different habitats within the watershed. A second-growth forest dominated by white, chestnut, and scarlet oaks, and white and pitch pines. White pine and white oak are the dominant understory trees, with blueberries and other heaths in the shrub layer. Three different rare plant species occur at this site. The **G5, S1S2 short-leaf pine (*Pinus echinata*)** is a tree species widely scattered in the dry upland forest. The pine is associated with fire and likely became established following fires 75 or 80 years ago. Further surveys are recommended to determine the size of this population and whether it is reproducing.

The **G5, S2 rough-leaved aster (*Eurybia radula*)** species found along upper Kings Gap Hollow Run and in its small headwater swamp. Associated plant species include sphagnum moss, cinnamon fern (*Osmunda cinnamomea*), skunk cabbage, and dewberry. This element reproduces best in wet, sunlit conditions. An individual of the **G5, S2 yellow-fringed orchid (*Platanthera ciliaris*)** was found in the hardwood-white pine-heath woods along a small stream. This species is found in filtered light in dry-mesic soil. Associated species include cinnamon fern, mountain laurel, dangleberry and highbush blueberry.

DICKINSON TOWNSHIP

The G5, S2 Footpath sawfly moth (*Metaxaglaea semitaria*); G4, S3 Broad sawfly moth (*Xylotype capax*); and G5, S2S3 Southern variable dart moth (*Xestia elimata*) are moth species found for the first time in a 1998 survey. These are species associated with southern pine and oak forests, found in an area of open pine-oak-heath woods.

Threats and Disturbances:

Spraying for gypsy moth control could negatively impact the rare moth species.

Conservation Recommendations:

Several hiking trails are in close proximity to the two plant species of concern. These trails may aid the species of concern by increasing available light, so long as they do not disturb the stream or the wetlands themselves. Additional surveys are recommended to determine the size of these populations and to determine whether other plant or invertebrate species of concern occur at the site. A large part of this site occurs within the Kings Gap Environmental Education Center, managed by DCNR. The occurrence of these elements at the Center affords an opportunity to combine environmental education with conservation of species of concern in Pennsylvania.

MOUNTAIN CREEK SEEPS/SAGE RUN—UPDATED—(Cooke and Dickinson Townships)

This site is a complex of several sites in the area of Sage Run and Mountain Creek on South Mountain. This portion of South Mountain is dominated by a dry-mesic central forest composed of chestnut oak, black gum, sassafras, pitch pine, and red maple, with mountain laurel, blueberry, and huckleberry the most common shrubs. Seeps are extensive along the lower part of the main branch of the Sage Run and along Mountain Creek. Eight plant species of special concern, including the **G3, S2 PA-endangered variable sedge (*Carex polymorpha*)**, **G5, S2 PA-threatened sweet bay magnolia (*Magnolia virginiana*)**; **G5T5?, S? showy goldenrod (*Solidago speciosa* var. *speciosa*)**; **G5, S2 rough-leaved aster (*Eurybia radula*)**; **G5, S3 lupine (*Lupinus perennis*)**; **G5, SU Virginia bunchflower (*Melanthium virginicum*)**; **G5, S2 yellow-fringed orchid (*Platanthera ciliaris*)**; and **G4, SU quillwort (*Isoetes valida*)**, are found in the various seeps. The populations of these species vary in size and quality, and are scattered throughout this watershed. Other plant species common to the seepage areas include cinnamon, royal, and New York ferns; fly poison, Indian cucumber, bellwort, sedges, and sphagnum mosses. The G5, S4 golden club (*Orontium aquaticum*), also found associated with the seep communities, has been removed from the species of concern list since the 2000 report. This site is located in Michaux State Forest.

Threats and Disturbances:

Threats at this site include competition from exotic, invasive plants, including stilt grass and barberry, and overbrowsing by deer.

Conservation Recommendations:

Maintaining adequate buffers around seepage areas and along stream corridors, and avoiding soil disturbances will help protect the seep habitats and the rare plant species they contain.

TAGG RUN (Dickinson Township)

A fair to good quality population of **G5, S2 rough-leaved aster (*Eurybia radula*)** occurs along the southern tributaries of Tagg Run. The species prefers openings and treefalls in acidic seep or swamp habitats, and at this site is found growing with cinnamon fern and sphagnum mosses under an open canopy of tulip tree, black gum, red maple, sweet birch, and red and pitch pines. The site occurs within Michaux State Forest.

Threats and Disturbances:

Deer browse or clearcutting are potential threats to this species.

Colonial Nesting Bird Rookeries



Jeannine Tardiff

Several types of Herons typically form roosting colonies in the tops of trees on islands in the Susquehanna River and woodlands along its tributaries. Disturbance of woodland rookeries by recreational water activities or their destruction from logging operations pose the greatest current threats to these nesting sites.
Photo: Jeannine Tardiff

EAST PENNSBORO TOWNSHIP, West Fairview, Wormleysburg, Lemoyne, Camp Hill & New Cumberland Boroughs

Site Name (County Rank)	Special Species / Community Type	PNHP Ranks*		State Status	Last Seen (m-d-y)	Quality**
		Global	State			
Conodoguinet Macrosite (2)	Plant: White Trout-lily <i>Erythronium albidum</i>	G5	S3	N	04-23-01	BC
	Plant: Limestone Petunia <i>Ruellia strepens</i>	G4G5	S2	PT	09-08-98	C
	Plant: Sedge <i>Carex shortiana</i>	G5	S3	N	06-20-97	B
	Plant: White-water Crowfoot <i>Ranunculus aquatilis</i> var. <i>diffusus</i>	G5T5	S3	N	09-07-98	BC
	Plant: Shellbark Hickory <i>Carya laciniosa</i>	G5	S3	DL	09-19-95	C
	Animal: Yellow-crowned Night Heron <i>Nyctanassa violacea</i>	G5	S1B	PE	04-18-00	E
	Animal Species of Concern	G4	S3S4	N	9-17-98	E
	Animal Species of Concern	G3G4	S3S4	N	09-18-98	C
Susquehanna River at Fort Hunter/Rockville (3)	Animal Species of Concern	G3G4	S3S4	N	08-09-95	E
	Animal Species of Concern	G4	S3S4	N	08-09-95	E
	Animal Species of Concern	G5	S1	N	08-09-95	E
	Animal Species of Concern	G3G4	S1S2	N	05-19-01	E

Site Name (County Rank)	Special Species / Community Type	PNHP Ranks*		State Status	Last Seen (m-d-y)	Quality**
		Global	State			
Susquehanna River at Harrisburg (4)	Animal: Yellow-crowned Night-heron <i>Nyctanassa violacea</i>	G5	S1B	PE	05-02-89	B
	Animal Species of Concern	G3G4	S3S4	N	08-20-98	D
	Animal Species of Concern	G4	S3S4	N	08-20-98	E
	Animal Species of Concern	G4	S4	N	08-20-98	E
Susquehanna River Islands— McCormicks Island Archipelago (2)	Natural Community: Floodplain Forest	G?	S2	N	06-09-97	CD
	Plant: Umbrella Magnolia <i>Magnolia tripetala</i>	G5	S2	PT	06-09-97	CD
	Animal: Great Egret <i>Casmerodius albus</i>	G5	S1B	PE	06-09-97	AB
	Animal: Black-crowned Night-heron <i>Nycticorax nycticorax</i>	G5	S2S3B	CA	04-18-00	A
	Animal: Yellow-crowned Night-heron <i>Nyctanassa violacea</i>	G5	S1B	PE	06-09-97	B

* Please refer to Appendix I for an explanation of PNHP Ranks and State Status.

**Please refer to Appendix II for an explanation of Quality Ranks.

Locally Significant: Pine Hill Arboretum (**UPDATED**)

Managed Lands: None

East Pennsboro Township supports important aquatic resources in the Conodoguinet Creek and Susquehanna Rivers, under the influence of increasingly developed areas and shrinking agricultural and natural landscapes. Forested riparian corridors should be maintained where they remain and restored where possible, particularly along the Conodoguinet and Holtz Run. Care should be taken in restoration efforts to use only native species of trees and shrubs, preferably of local sources. Forested buffers help filter surface water runoff, preventing many non-point sources of pollution from entering waterways, protecting water quality in the township and the Susquehanna River basin. In addition, reforestation of creek and stream banks can help link larger forested blocks together, contributing to their utility as a natural wildlife corridor. Protection of the continuous forested ridge along Blue Mountain in the north is critical to maintaining this area as a wildlife corridor and to protecting the water quality of the downstream watersheds.



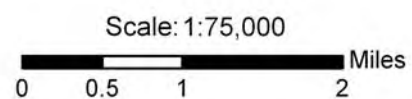
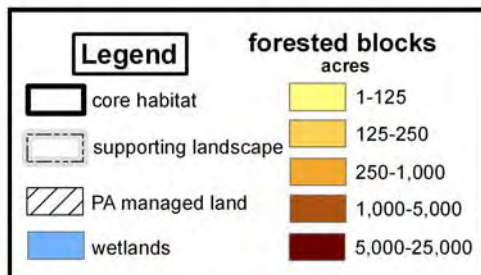
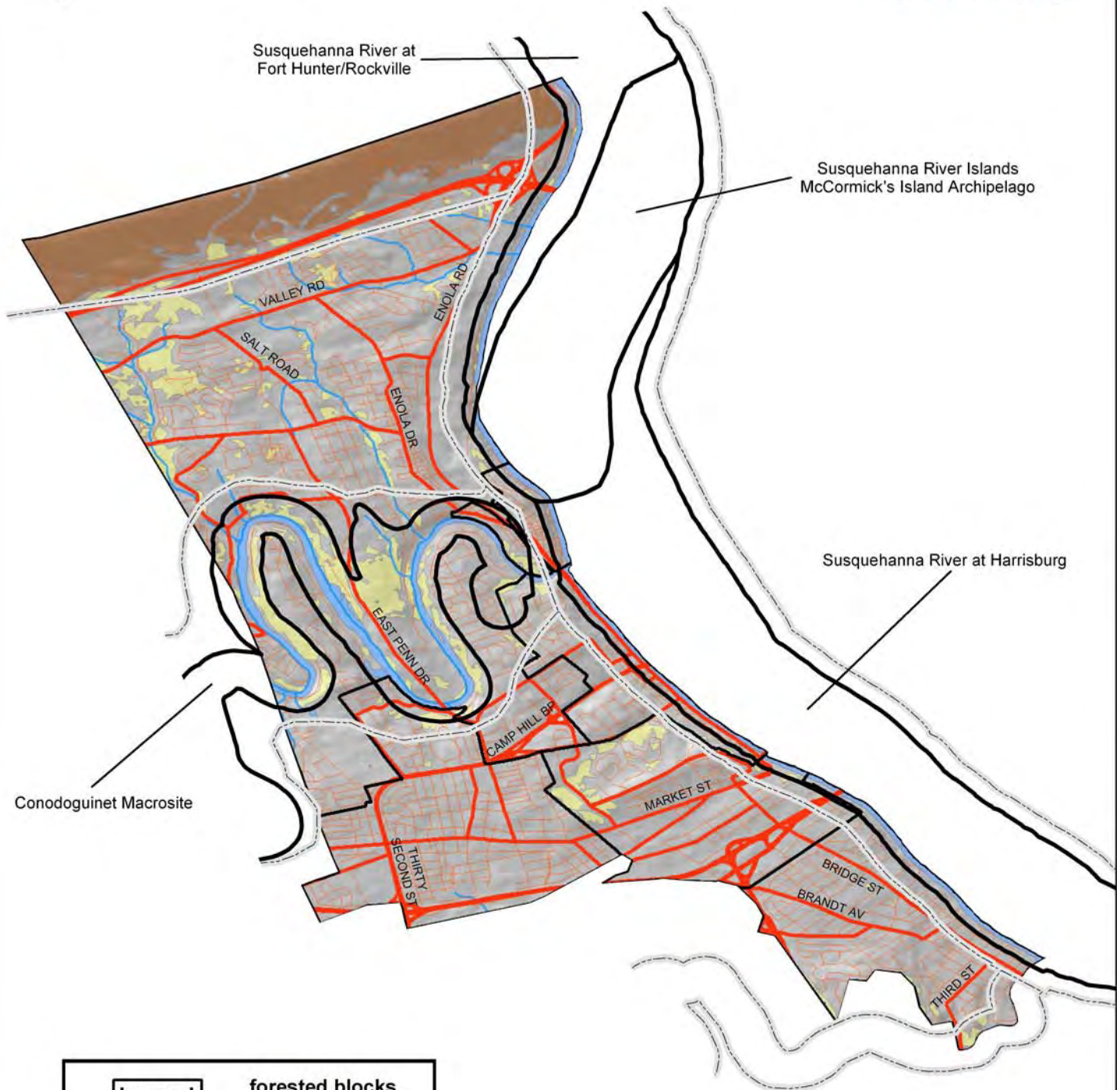
[EAST PENNSBORO TOWNSHIP MAP](#)



East Pennsboro Township



Pennsylvania Natural Heritage Program



CONODOGUINET MACROSITE—UPDATED—(East Pennsboro, Hampden, and Silver Spring Townships; and West Fairview, Camp Hill and Wormleysburg Boroughs)

The Conodoguinet Creek drains most of Cumberland County, running west to east through an agricultural and residential landscape. The Great Valley it bisects is mostly limestone and dolomite, and the Creek receives many inputs from springs and from groundwater flow. As a result, the Creek's waters have a fairly high pH, and a relatively constant temperature and flow. The Creek itself provides habitats for both aquatic plant and animal species of concern. Forested slopes and floodplains along the river, often with rich, limestone-influenced soils, are home to several listed plant species. Sites with species of concern were identified along the Conodoguinet throughout its length; the lower portion, a series of looping meanders from Huston's Mill to the confluence with the Susquehanna, has multiple occurrences of listed plant and animal species at several sites in close proximity. For mapping purposes, this area was combined into the Conodoguinet Macrosite.

The G5, S1 PA-Endangered Yellow-crowned Night-heron (*Nyctanassa violacea*) was observed using habitat along the edge of the creek in 1994 and 2000. Development along the water's edge would pose a threat to this species, and water quality issues also apply because the animal relies mostly on aquatic species for food. Good quality populations of two aquatic animal species of concern were found at several locations in the Macrosite, in habitat consisting of riffles and shallow areas of still water. A fair to good quality population of the aquatic plant **G5, S3 white-water crowfoot (*Ranunculus aquatilis* var. *diffusus*)** was also found in several locations in this portion of the Conodoguinet. It was found associated with watercress, waterweed, water-stargrass, and Eurasian water-milfoil.

Three terrestrial plant species of concern are also known from the Macrosite, including several fair quality populations of **G4G5, S2 PA-threatened Limestone petunia (*Ruellia strepens*)**; **G5, S3 white trout-lily (*Erythronium albidum*)**; and **G5, S3 sedge species *Carex shortiana***.. These species co-occur in rich floodplain woods that have not been recently disturbed. Common overstory trees at these sites include silver maple, box elder, sycamore, shagbark hickory, honey locust, hackberry and basswood. The groundcover at these sites is a diverse, particularly the spring ephemeral flora. Associates of the listed plant species include moneywort, bluebells, spring beauty, may apple, water-leaf, dame's rocket and various sedge species. Also associated with these plant species is the shellbark hickory, which has been removed from the species of concern list since the 2000 report.

Threats and Disturbances:

Most of the remaining forested slopes and floodplains along this stretch of the Conodoguinet are restricted to narrow strips of relatively inaccessible or undevelopable land. Disturbances include cottages and residential development, old roads, jeep trails, and sewer lines, and runoff and trash dumping onto the slopes from the largely residential and commercial areas above. Such disturbances provide opportunities for the colonization of habitat by exotic plants; garlic mustard, in particular, is widespread in disturbed areas of these floodplain habitats. Despite these disturbances, good quality populations of the plant species of concern persist at the known sites, and any intact floodplain forest along this portion of the Conodoguinet should be considered potential rare plant habitat.

Conservation Recommendations:

Abundant aquatic habitat remains in the Conodoguinet for both the animal and plant species of concern. The persistence of these species, however, depends upon maintaining the water quality of the Conodoguinet Creek ecosystem as a whole, which in turn depends on management of the entire watershed. Agricultural and commercial runoff, logging of stream and river corridors, and pollutants are all real and current threats in the watershed. As growth and associated demands for groundwater continue in the Cumberland Valley, these species of concern may serve as indicators of the health of both the Creek and the Valley's groundwater.

SUSQUEHANNA RIVER AT FORT HUNTER/ROCKVILLE—UPDATED—(Middle Paxton and Susquehanna Townships; and Cumberland and Perry Counties)

Two adjacent sites from the original NAI were combined because of the contiguous habitat that occurs for these species of concern. This site is located in the Susquehanna River and is characterized by a bedrock bottom covered with gravel and cobbles with boulders. It supports four species of rare aquatic animals. During a survey in 2001 a population of a rare invertebrate animal was found in the Susquehanna River near Lions Park.

Threats and Disturbances:

Threats to these populations as well as to other common species that occupy this stretch of the river include thermal and chemical pollution, impoundment, and excessive sedimentation.

Conservation Recommendations:

Maintaining the free-flowing character of the river and the best quality water possible will help these species persist and even flourish at this site into the future.

SUSQUEHANNA RIVER AT HARRISBURG—UPDATED—(New Cumberland and Wormleysburg Boroughs and Dauphin County)

This site combines two sites from the original NAI due to the contiguous suitable habitat between the two. This site is a portion of the Susquehanna River adjacent to the city of Harrisburg, Steelton and Cumberland County. Three species of rare aquatic animals are found here in shallow quickwater and riffles. The substrate consists of pebbles with some bedrock ledges, sand and larger cobbles.

Independence Island and other forested islands in the vicinity are also potential habitat for wading bird colonies; in 1989 nests of the **G5, S1B PA-endangered Yellow-crowned Night Heron (*Nyctanassa violacea*)** were documented at this site, but a survey of the site in 1997 failed to find any active nests of this species.

Threats and Disturbances:

This site is near the upstream limit of the impounded area from the Dock Street Dam. Brief surveys in the impounded areas downstream of the site found increased sedimentation, and no live native mussels. Increasing the height of the dam, as has been proposed, would expand the impounded area and probably eliminate the species of concern at this site. Pollution or other changes in water quality are also threats to the species of concern.

Conservation Recommendations:

Maintaining the free-flowing character of the river and the best quality water possible will help these species persist and even flourish at this site into the future.

SUSQUEHANNA RIVER ISLANDS—MCCORMICKS ISLAND ARCHIPELAGO—NEW—(East Pennsboro Township and Dauphin County)

This site encompasses a series of islands in the Susquehanna River on the north side of Harrisburg. McCormick's Island, the largest of the series, is characterized by a rare **floodplain forest natural community**. This silver maple and tulip poplar-dominated forest is relatively mature and contains many canopy gaps with scattered subcanopy trees and shrubs. The largest gaps are dominated by a dense mix of native and exotic herbs including the native jewel-weed, ostrich fern, and poison ivy, and the non-native garlic mustard and mile-a-minute weed, and Japanese knotweed. Spicebush is the most common shrub. The site supports a fair-to-poor population of the PA-threatened **umbrella magnolia** (***Magnolia tripetala***, G5, S2). This site has been disturbed by logging and campfires in the past but has recovered well. Its quality as a natural community should continue to improve over time.

This island is one of a series of islands occurring along this stretch of the river, which together make up a greater system of habitats including riparian forest, sloughs and shrub swamps, a littoral zone, and several types of aquatic habitats such as riffles, sand bars, and pools. Several listed bird species are found here, including the G5, S1B PA-endangered **Yellow-crowned Night-heron** (***Nyctanassa violacea***), the G5, S1B PA-endangered **Great Egret** (***Casmerodius albus***), and the G5, S2S3B **Black-crowned Night-heron** (***Nyctanassa nyctanassa***). The birds are colonial nesters and their rookeries may contain hundreds of nests in small areas of floodplain forest. Rookeries are known from McCormick's Island as well as from several smaller nearby islands with mature floodplain forests. These rookeries are critical to the continued well-being of these species in PA. Both the nesting trees and the surrounding mosaic of feeding habitats are required to protect the bird colonies. This site has been identified by the PA Audubon Society as one of the most important areas in the state for supporting bird diversity.

Threats and Disturbances:

This rookery and all of the habitat associated with the McCormicks Island Archipelago would be threatened by an increase of the water level along this stretch of the river through the construction of the Dock Street Dam. Increased water levels would kill trees on the islands, destroying their utility for nesting, and likely drown entirely many of the smaller islands and sand bars used for feeding. In addition, increased recreational use of the river in this area may disturb the birds' breeding and roosting activities. The abundant diversity that helps retain the wild character of the river in this urban area exists primarily due to these islands.

Locally Significant Site:

Pine Hill Arboretum-UPDATED-(East Pennsboro Township)

This site has been incorporated into the larger Conodoguinet Macrosite. This site is a narrow forested stream ravine on the north side of Conodoguinet Creek. Despite disturbances from a sewer line and a fairly high abundance of exotic species, a diverse spring ephemeral flora persists here. The second-growth forest includes Tulip tree, red oak, beech, hackberry, hickories, and hemlock. The moist northeast-facing slopes and narrow floodplain support an abundance of spring wildflowers including wild leeks, trout lily, Dutchman's breeches, spring beauty, sweet cicely, bluebells and others. The drier, steep west-facing slopes have a canopy of oaks and hemlock, blueberries in the shrub layer, and groundcover more adapted to dry conditions, including wild

columbine, rattlesnake-weed, and wild pink. The ravine ends at a road, across which lies an approximately 100-m long, 75-m wide strip of intact floodplain forest, with some large silver maple, and sycamore trees. The upper portion of the ravine is dominated by weedy, non-native shrub and tree species, including Asian honeysuckles, multiflora rose, and Norway maple, and some of these species, as well as an abundance of garlic mustard, are common in the lower ravine and floodplain. This site is small enough and has enough remaining native vegetation to be a good location for restoration efforts aimed at removing the invasive species and preserving the diverse native flora in the ravine as well as on the floodplain.



The Susquehanna River is habitat for the **YELLOW LAMPMUSSEL** (*Lampsilis cariosa*), center, a globally rare species, as well as other mussel species.
Photo: PA Science Office of The Nature Conservancy.



CONODOGUINET CREEK flows the length of Cumberland County. The Creek itself and the adjacent forests are habitat for several rare plant and animal species, although development is increasing along much of its length. Photo: PA Science Office of The Nature Conservancy.

HAMPDEN TOWNSHIP

Site Name (County Rank)	Special Species / Community Type	PNHP Ranks*		State Status	Last Seen (m-d-y)	Quality**
		Global	State			
Conodoguinet Macrosite (2)	Plant: White Trout-lily <i>Erythronium albidum</i>	G5	S3	N	04-23-01	BC
	Plant: Limestone Petunia <i>Ruellia strepens</i>	G4G5	S2	PT	09-08-98	C
	Plant: Sedge <i>Carex shortiana</i>	G5	S3	N	06-20-97	B
	Plant: White-water Crowfoot <i>Ranunculus aquatilis</i> var. <i>diffusus</i>	G5T5	S3	N	09-07-98	BC
	Plant: Shellbark Hickory <i>Carya laciniosa</i>	G5	S3	DL	09-19-95	C
	Animal: Yellow-crowned Night Heron <i>Nyctanassa violacea</i>	G5	S1B	PE	04-18-00	E
	Animal Species of Concern	G4	S3S4	N	9-17-98	E
	Animal Species of Concern	G3G4	S3S4	N	09-18-98	C
Lambs Gap / Trout Run Headwaters (2)	Natural Community: Circumneutral Broadleaf Swamp	G?	S2S3	N	06-07-97	C
	Plant: Glade Spurge <i>Euphorbia purpurea</i>	G3	S1	PE	06-00-98	B
	Animal Species of Concern	G4	S1	N	06-26-02	AB
	Animal Species of Concern	G5	S1	N	08-26-01	E
	Animal Species of Concern	G4	S3	N	07-21-01	E

* Please refer to Appendix I for an explanation of PNHP Ranks and State Status.

**Please refer to Appendix II for an explanation of Quality Ranks.

Managed Lands: State Game Lands #170

Locally Significant: None

[HAMPDEN TOWNSHIP MAP](#)





Hampden Township



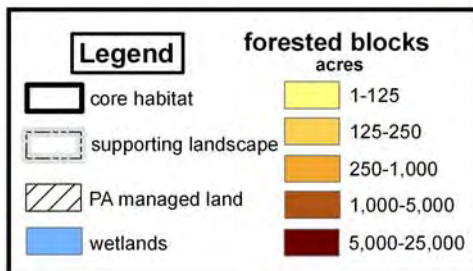
Pennsylvania Natural Heritage Program

STATE GAME LAND 170

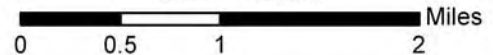
Lambs Gap/Trout
Run Headwaters

Conodoguinet
Macrosite

Conodoguinet
Macrosite



Scale: 1:60,000



Hampden Township supports important aquatic resources in the Conodoguinet Creek, under the influence of ever-expanding developed areas and shrinking agricultural lands. Forested riparian corridors should be maintained where they remain, particularly along the Conodoguinet and Sears and Pine Runs. Care should be taken in restoration efforts to use only native species of trees and shrubs, preferably of local sources. Forested buffers help filter surface water runoff, preventing many non-point sources of pollution from entering waterways, protecting water quality in the township and the Susquehanna River basin. In addition, reforestation of creek and stream banks can help link larger forested blocks together, contributing to their utility as a natural wildlife corridor. Protection of the continuous forested ridge along Blue Mountain in the north is critical to maintaining this area as a wildlife corridor and to protecting the water quality of the downstream watersheds.

CONODOGUINET MACROSITE—UPDATED—(East Pennsboro, Hampden, and Silver Spring Townships; and West Fairview, Camp Hill and Wormleysburg Boroughs)

The Conodoguinet Creek drains most of Cumberland County, running west to east through an agricultural and residential landscape. The Great Valley it bisects is mostly limestone and dolomite, and the Creek receives many inputs from springs and from groundwater flow. As a result, the Creek's waters have a fairly high pH, and a relatively constant temperature and flow. The Creek itself provides habitats for both aquatic plant and animal species of concern. Forested slopes and floodplains along the river, often with rich, limestone-influenced soils, are home to several listed plant species. Sites with species of concern were identified along the Conodoguinet throughout its length; the lower portion, a series of looping meanders from Huston's Mill to the confluence with the Susquehanna, has multiple occurrences of listed plant and animal species at several sites in close proximity. For mapping purposes, this area was combined into the Conodoguinet Macrosite.

The G5, S1 PA-Endangered Yellow-crowned Night Heron (*Nyctanassa violacea*) was observed using habitat along the edge of the creek in 1994. Development along the water's edge would pose a threat to this species and water quality issues also apply because the animal relies mostly on aquatic species for food. Good quality populations of two aquatic animal species of concern were found at several locations in the Macrosite, in habitat consisting of riffles and shallow areas of still water. A fair to good quality population of the aquatic plant **G5, S3 white-water crowfoot (*Ranunculus aquatilis* var. *diffusus*)** was also found in several locations in this portion of the Conodoguinet. It was found associated with watercress, waterweed, water-stargrass, and Eurasian water-milfoil.

Three terrestrial plant species of concern are also known from the Macrosite, including several fair quality populations of **G4G5, S2 PA-threatened Limestone petunia (*Ruellia strepens*)**; **G5, S3 white trout-lily (*Erythronium albidum*)**; and **G5, S3 sedge species *Carex shortiana***. These species co-occur in rich floodplain woods that have not been recently disturbed. Common overstory trees at these sites include silver maple, box elder, sycamore, shagbark hickory, honey locust, hackberry and basswood. The groundcover at these sites is a diverse, particularly the spring ephemeral flora. Associates of the listed plant species include moneywort, bluebells, spring beauty, may apple, water-leaf, dame's rocket and various sedge species. Also associated with these plant species is the shellbark hickory, which has been removed from the species of concern list since the 2000 report.

Threats and Disturbances:

Most of the remaining forested slopes and floodplains along this stretch of the Conodoguinet are restricted to narrow strips of relatively inaccessible or undevelopable land. Disturbances include cottages and residential development, old roads, jeep trails, and sewer lines, and runoff and trash dumping onto the slopes from the largely residential and commercial areas above. Such disturbances provide opportunities for the colonization of habitat by exotic plants; garlic mustard, in particular, is widespread in disturbed areas of these floodplain habitats. Despite these disturbances, good quality populations of the plant species of concern persist at the known sites, and any intact floodplain forest along this portion of the Conodoguinet should be considered potential rare plant habitat.

Conservation Recommendations:

Abundant aquatic habitat remains in the Conodoguinet for both the animal and plant species of concern. The persistence of these species, however, depends upon maintaining the water quality of the Conodoguinet Creek ecosystem as a whole, which in turn depends on management of the entire watershed. Agricultural and commercial runoff, logging of stream and river corridors, and pollutants are all real and current threats in the watershed. As growth and associated demands for groundwater continue in the Cumberland Valley, these species of concern may serve as indicators of the health of both the Creek and the Valley's groundwater.

Hampden Slopes—UPDATED-(Hampden Township)

This site has been incorporated into the larger Conodoguinet Macrosite.

LAMBS GAP/TROUT RUN HEADWATERS—NEW—(Hampden and Silver Spring Townships and Perry County)

This site supports a fair quality example of a **S2S3 Circumneutral Broadleaf Swamp Natural Community**. It is comprised of a series of broad seeps, which occur in the bottom of a valley between Little Mountain and Blue Mountain. The swamp is dominated by American beech, black birch, and tulip poplar with an understory of smooth alder and spicebush. The substrate of the seeps is relatively deep muck. Moss-covered hummocks support shrub copses, trees, and several species of fern. A wide diversity of herbs, sedges, and grasses grows within the swamp as well as along its margins. Skunk cabbage and jewelweed are dominant herbs. The site supports a good quality population of **G3, S1 PA-endangered glade spurge (*Euphorbia purpurea*)**. During recent surveys, three invertebrate animal species of concern were found. The relative isolation of the site, tucked between the mountains, makes it good habitat for a number of common birds, reptiles, and amphibians. A few species that have been observed here during our field surveys include wood and green frogs, dusky and red-backed salamanders, northern water snakes, and 26 species of birds.

Threats and Disturbances

The swamp is undisturbed except for some nearby mountain bike trails. Adjacent slopes on the two mountains were both clear cut over ten years ago but the clear cutting does not appear to have impacted the hydrology of the site. Opportunistic exotic species that frequently colonize disturbed areas may invade the clear cuts and potentially threaten the quality of the site.

Conservation Recommendations

Limiting disturbances in this watershed, particularly by re-routing the existing bike trails, will help to maintain the quality of this site and allow the globally rare species to persist here. This site is located in State Game Lands 170.



Two species of rushes uncommon in Pennsylvania occur in a wet meadow in Cumberland County. Top: Grass-leaved rush (*Juncus biflorus*) a G5, S2 species, and bottom: the short-fruited rush (*Juncus brachycarpus*) a G4G5, S1 species. Photos: PA Science Office of The Nature Conservancy.



HOPEWELL TOWNSHIP, Newburg Borough

Site Name (County Rank)	Special Species / Community Type	PNHP Ranks*		State Status	Last Seen (m-d-y)	Quality**
		Global	State			
Gunter Valley and Ridges (4)	Natural Community: High Gradient Cleawater Creek	G?	S3	N		E
	Animal Species of Concern	G4	S3S4	PC	6/26/2002	E
	Animal: Northern Myotis <i>Myotis septentrionalis</i>	G4	S3B, S3N	N	6/27/2000	E
Middle Spring Creek Watershed (4)	Plant: Grass-leaved Rush <i>Juncus biflorus</i>	G5	S2	N	7/28/2001	BC
	Plant: Short-fruited Rush <i>Juncus brachycarpus</i>	G4G5	S1	PE	7/28/2001	BC
	Animal: Potomac Sculpin <i>Cottus girardii</i>	G4	S3S4	DL	06-07-97	B
Three Square Hollow Run (5)	Plant: Prickly-pear Cactus <i>Opuntia humifusa</i>	G5	S3	PR	02-22-98	C
	Plant: Crane-fly Orchid <i>Tipularia discolor</i>	G4G5	S3	N	05-25-88	D
	Animal: Potomac Sculpin <i>Cottus girardii</i>	G4	S3S4	DL	06-07-97	B

* Please refer to Appendix I for an explanation of PNHP Ranks and State Status.

**Please refer to Appendix II for an explanation of Quality Ranks.

Locally Significant: Peebles Run

Managed Lands: Tuscarora State Forest
State Game Lands #169

Other: Trout Run—Exceptional Value

[HOPEWELL TOWNSHIP MAP](#)





Hopewell Township



Pennsylvania Natural Heritage Program

TUSCARORA STATE FOREST

Gunter Valley & Ridges

Three Square Hollow Run

State Game
Lands #169

Peebles Run

PA TURNPIKE

ENOLA RD

TURNPIKE RD

HIGH ST

NEWBURG RD

LOVERS LN

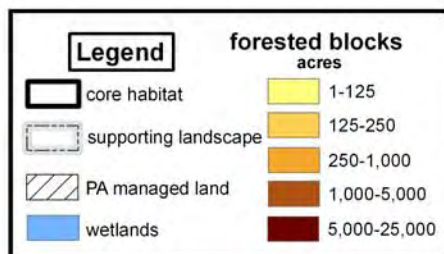
SHIPPENSBURG RD

RIDGE RD

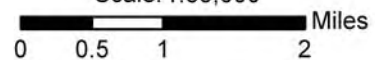
BOOZ RD

Running Pump
Road Woods

Middle Spring
Creek Watershed



Scale: 1:85,000



HOPEWELL TOWNSHIP

Hopewell Township supports several important aquatic resources, from headwater streams to the Conodoguinet Creek. South of the Blue Mountain ridge corridor, the majority of the township is in agriculture. Forested riparian corridors should be maintained where they remain, and restored where needed, particularly along the stream resources identified in this report. Care should be taken in restoration efforts to use only native species of trees and shrubs, preferably of local sources. Forested buffers help filter surface water runoff, preventing many non-point sources of pollution from entering waterways, protecting water quality in the township and the Susquehanna River basin. In addition, reforestation of creek and stream banks can help link larger forested blocks together, contributing to their utility as a natural wildlife corridor. The forested blocks of the valley portion of the township appear to be clustered in a few areas, lending themselves to protection and connectivity. Protection of the continuous forested ridge along Blue Mountain in the north is critical to maintaining this area as a wildlife corridor and to protecting the water quality of the headwater streams flowing into the valley below.

GUNTER VALLEY AND RIDGES—NEW—(Hopewell Township and Franklin and Perry Counties)

This site is the watershed for a High Gradient Clearwater Creek natural community, designated as an Exceptional Value Stream by the PA Department of Environmental Protection. The PA Bureau of Forestry recently purchased much of this land from the Shippensburg Water Authority. This large tract of land has potential for species of concern and deserves a more thorough biological survey. One individual of a **Northern Myotis (*Myotis septentrionalis*)**, a **G4 S3B, S3N** animal species of concern, was captured in a net above a small stream that leads to a large reservoir. Associated species include Little Brown Bat and Big Brown Bat. Dominant vegetation in this area includes eastern hemlock, black birch, american beech, black gum, and tuliptree. The herbaceous layer includes stiltgrass, hay-scented fern, and cinnamon fern. Also at this site, an individual of a **G4, S3S4 animal species of concern** was found in 2002. This site was identified during the Franklin County Natural Area Inventory and is newly added to this report.

Threats and Disturbances

If roosting habitat for the Northern Myotis is nearby, one potential threat would be periodic logging along the mountains. No other disturbances or threats are noted.

Conservation Recommendations

Additional surveys of these bats are needed to better assess the population. Undisturbed forested buffers should be maintained along all waterways. For the other animal species of concern, logging should be avoided along rocky ridgetop outcrops except in the winter months to avoid impacting this species of concern.

MIDDLE SPRING CREEK WATERSHED—UPDATED—(Hopewell and Southampton Townships, Shippensburg Borough and Franklin County)

During surveys in 2000, a PA-Endangered animal was discovered in a small wetland along the creek. The wetland is fed by groundwater and has standing water in some areas. This site also supports a good population of Potomac sculpin (*Cottus girardii*), a recently delisted fish species. Several dozen individuals including juveniles were observed at four separate observation points along a section of Middle Spring Creek. Associated species include creek chub, blacknose dace, longnose dace, flathead minnow, bluegill, pearl dace, and juvenile brown trout.

HOPEWELL TOWNSHIP

Within this site, a calcareous wetland contains a population of **Grass-leaved Rush (*Juncus biflorus*)**, an **S2 plant**. Also included at this site is a fair to good population of **Short-fruited Rush (*Juncus brachycarpus*)**, a **G4G5, S1 Pennsylvania-Endangered plant species of concern**. The area is partly described as a “wet meadow” with a small section of “cattail marsh”, and some adjacent upland area with scattered small trees and shrub thickets.

Threats and Disturbances:

The animal population and the quality of habitat in Middle Spring Creek are threatened by excessive siltation from agricultural runoff and by industrial pollution. Some of the wet areas have been filled and the ground has been disturbed. Threats to this animal include invasive species of plants and further development.

Conservation Recommendations

Maintaining and restoring undisturbed-forested buffers along the creek and avoiding disturbances to the stream and its banks will help the animal species of concern, as well as many others to continue to persist at this site. More surveys are needed at the wetland to determine the status of the PA endangered species. Management plans could include provisions for the control and removal of invasive species of plants.

THREE SQUARE HOLLOW RUN—UPDATED—(Hopewell and Upper Mifflin Townships)

This site includes Mount Tabor Woods site from the 2000 report. A good-sized population of **G5, S3 prickly-pear cactus (*Opuntia humifusa*)** was found growing in artificial habitat along a shale outcrop roadbank within this site. The habitat here is an open upper slope with many exotic plant species and dry soil. Associated species include orchard grass, brome grasses and multiflora rose. Additionally, a single occurrence of the **G4G5, S3 cranefly orchid (*Tipularia discolor*)** was located within a shaly, moist oak-hickory forest stand, associated with may apple, false Solomon’s seal, showy orchis, and wild comfrey. Surveys in 1998 failed to find a small population of G5, S3 puttyroot (*Aplectrum hyemale*), which was reported from Mount Tabor Woods in 1988. Follow-up surveys should be conducted to determine if this plant still occurs at the site.

The creek at this site supports a fair quality population of Potomac sculpin (*Cottus girardii*), which has been removed from the species of concern list since the 2000 report. The site consists of a moderate gradient clearwater creek with riffles, runs and a few pools flowing through a landscape of forest and old fields. Associated species include creek chub, common shiner, blacknose dace, longnose dace, fantail darter and tessellated darter.

Threats and Disturbances

The prickly pear cactus could be threatened by alteration of the roadside habitat as well as encroachment by exotic species. The cranefly orchid occurrence is very vulnerable to deer browse and trampling. Surveys should be done to determine if it has a greater extent than was found.

Locally Significant Site:

Peebles Run—UPDATED—(Hopewell Township)

HOPEWELL TOWNSHIP

A small creek at this site supports a small fair quality population of Potomac sculpin (*Cottus girardii*), which has been removed from the species of concern list since the 2000 report. Though there are currently no listed species of concern at this site, the site supports a variety of aquatic species and warrants attention to its water quality. The site consists of a small creek with riffles, runs and pools with a substrate of silt, sand, and gravel. Associated species include creek chub, blacknose dace, longnose dace, bluegill, rockbass, and tessellated darter.

Threats and Disturbances

This site has been degraded by siltation from agriculture field runoff. Persistence of this species at this site is threatened by continued agricultural pollution.



Forested floodplains provide habitat for numerous species of breeding and migratory birds, invertebrates, mammals, reptiles and amphibians. These linear habitats provide natural travel corridors for animal species up and down stream. This is particularly important in areas where the only remaining intact closed canopy forest is on the active floodplain, due to farming or development of the adjacent uplands (Podnieszinski & Wagner 2002).

Photo: PA Science Office of The Nature Conservancy

LOWER ALLEN TOWNSHIP

LOWER ALLEN TOWNSHIP, Shermanstown Borough

Site Name (County Rank)	Special Species / Community Type	PNHP Ranks*		State Status	Last Seen (m-d-y)	Quality**
		Global	State			
Yellow Breeches/Rabold Site (5)	Plant: Tooth-cup <i>Rotala ramosior</i>	G5	S3	PR	8/29/95	D

* Please refer to Appendix I for an explanation of PNHP Ranks and State Status.

**Please refer to Appendix II for an explanation of Quality Ranks.

Locally Significant: None

Managed Lands: None



Lower Allen Township is primarily covered by urban development, but some natural areas remain along the Yellow Breeches Creek, along the southern border of the township. Much of this land is undeveloped due to the presence of the State Correctional Institution at Camp Hill. Significant forested blocks can be found along the riparian corridor of Yellow Breeches Creek and should be maintained and restored. Reforestation of creek and stream banks can help link larger forested blocks together, contributing to their utility as a natural wildlife corridor. Care should be taken in restoration efforts to use only native species of trees and shrubs, preferably of local sources.

YELLOW BREECHES/RABOLD SITE—NEW—(Lower Allen Township and York County)

A small poor-quality population of tooth-cup (*Rotala ramosior*), G5, S3, falls on the margin of an agricultural field on the floodplain of the Yellow Breeches Creek. It occurs in an open wet depression with smooth panic-grass, lovegrass, spikerush, amaranth, and corn. This site was identified from the York County Natural Area Inventory and is being added to this report.

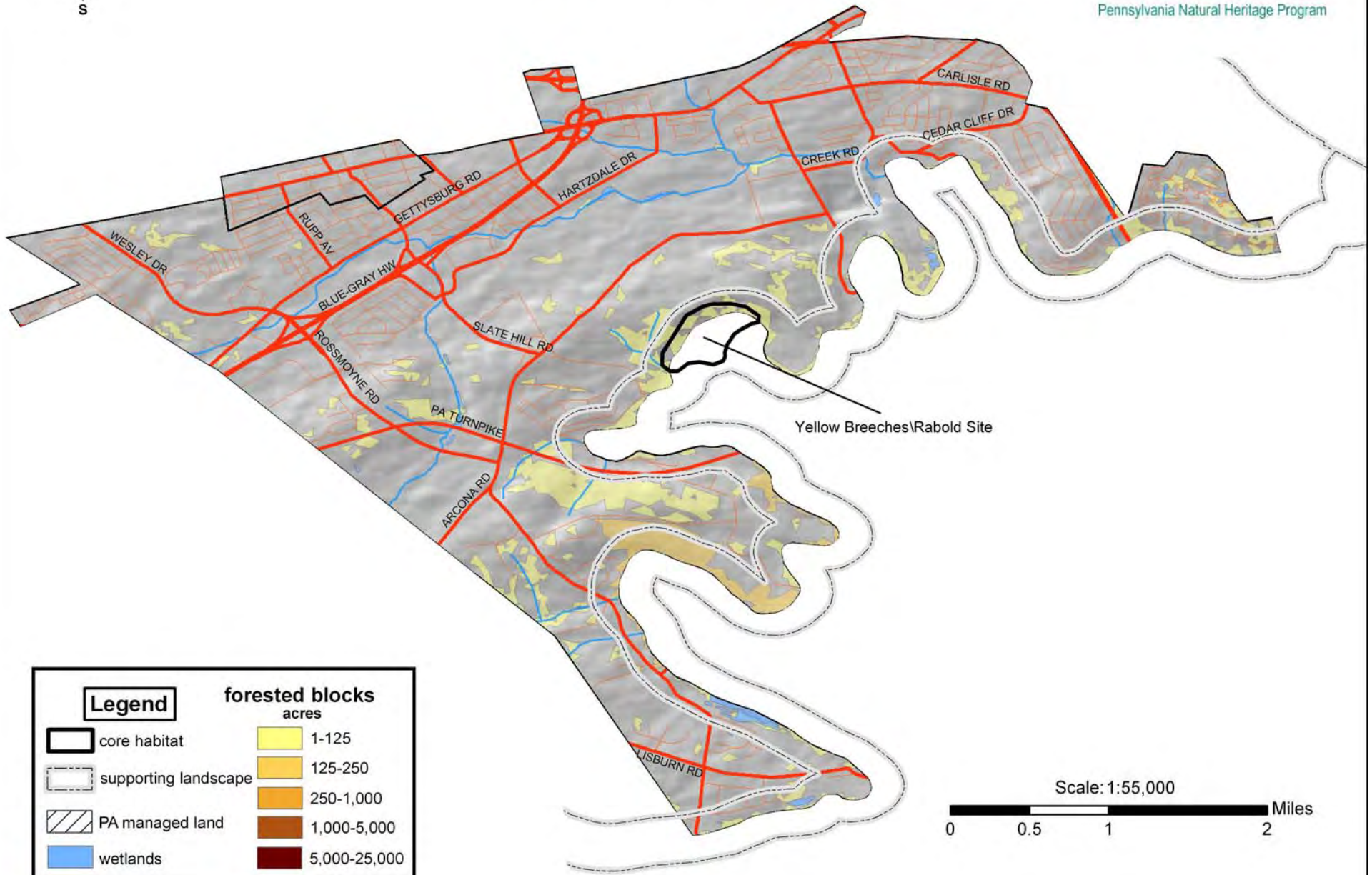
[LOWER ALLEN TOWNSHIP MAP](#)



Lower Allen Township



Pennsylvania Natural Heritage Program





OXBOWS like the one pictured above along the Conodoguinet Creek form when rivers change channels in the floodplain. Few areas of undisturbed floodplain forest like this remain along the Conodoguinet.
Photo: PA Science Office of The Nature Conservancy.

LOWER FRANKFORD TOWNSHIP

Site Name (County Rank)	Special Species / Community Type	PNHP Ranks*		State Status	Last Seen (m-d-y)	Quality**
		Global	State			
Bloserville Hill (3)	Plant: Missouri Gooseberry <i>Ribes missouriense</i>	G5	S1	PE	09-01-98	A
	Plant: Limestone Petunia <i>Ruellia strepens</i>	G4G5	S2	PT	07-10-00	CD
	Plant: Beard-tongue <i>Penstemon canescens</i>	G4	S3	N	07-10-00	B
Conodoguinet Creek at Mt. Rock Spring Creek (5)	Plant: White-water Crowfoot <i>Ranunculus aquatilis</i> var. <i>diffusus</i>	G5T5	S3	N	06-08-97	E
Conodoguinet Creek at Mt. Zion School Road (2)	Plant: Beard-tongue <i>Penstemon canescens</i>	G4	S3	N	07-07-00	BC
	Plant: Slender Goldenrod <i>Solidago speciosa</i> var. <i>erecta</i>	G5	S1	PE	07-05-00	B
	Plant: Stalked Wild Petunia <i>Ruellia pedunculata</i>	G5	S1	N	07-30-00	D
	Plant: Limestone Petunia <i>Ruellia strepens</i>	G4G5	S2	PT	07-30-00	D
	Plant: Sedge <i>Carex shortiana</i>	G5	S3	N	05-31-00	D
Waggoners Gap (3)	Plant: Prickly-pear Cactus <i>Opuntia humifusa</i>	G5	S3	PR	11-29-00	C
	Animal: Allegheny Woodrat <i>Neotoma magister</i>	G3G4	S3	PT	05-11-02	E

*Please refer to Appendix I for an explanation of PNHP Ranks and State Status.

**Please refer to Appendix II for an explanation of Quality Ranks.

Locally Significant: Locust Creek

Managed Lands: None

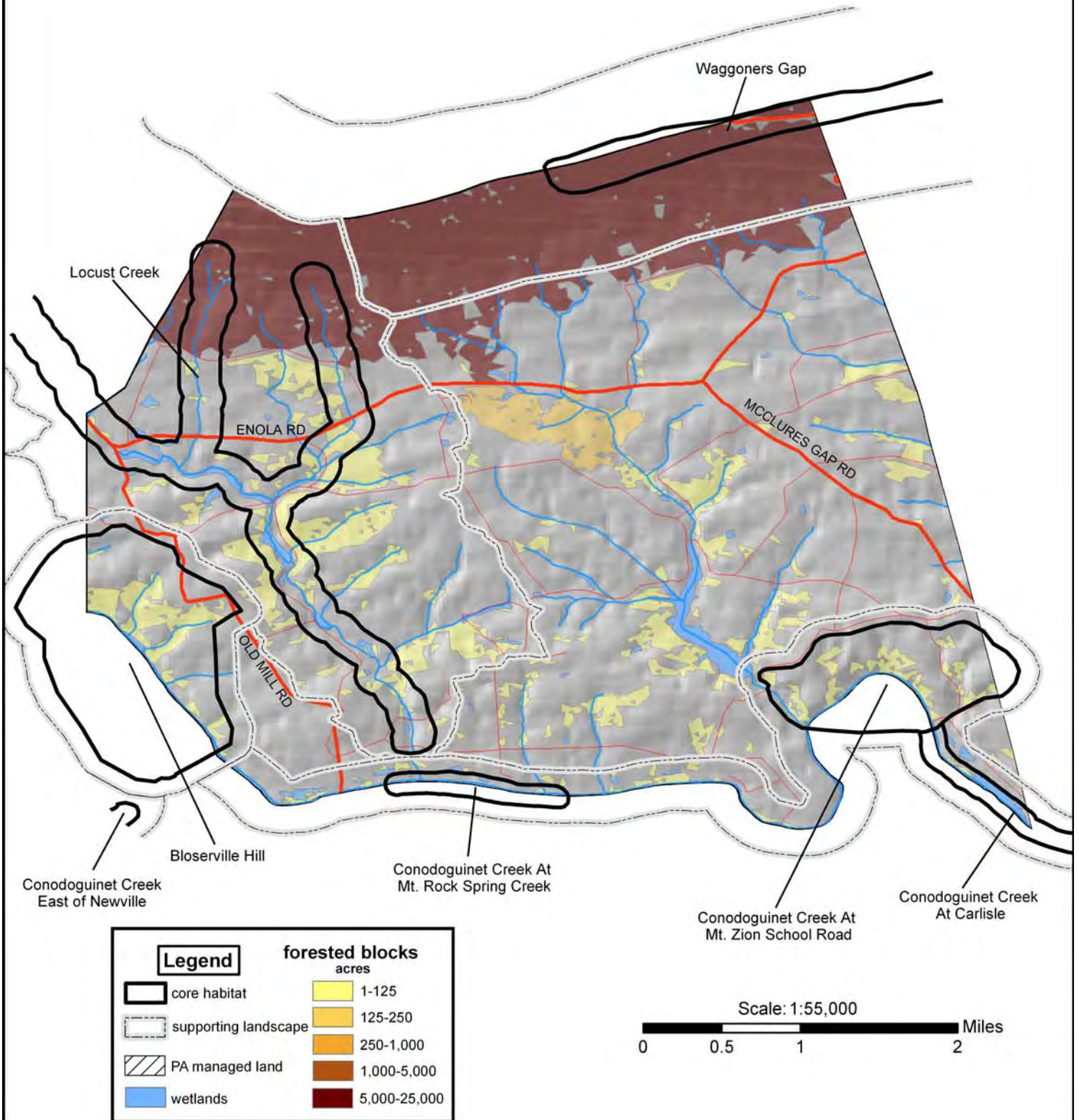
Other: Opossum Creek—High Quality Stream to PFBC dam



[LOWER FRANKFORD TOWNSHIP MAP](#)



Lower Frankford Township



LOWER FRANKFORD TOWNSHIP

Lower Frankford Township supports several important aquatic resources, from headwater streams to the Conodoguinet Creek. South of the Blue Mountain ridge corridor, the majority of the township is in agriculture. Several large blocks of forest remain along stream corridors and maintain connectivity of natural habitats from the ridge to the Conodoguinet. Forested stream-side corridors should be preserved where they remain and restored where they are missing. Care should be taken in restoration efforts to use only native species of trees and shrubs, preferably of local sources. Forested buffers help filter surface water runoff, preventing many non-point sources of pollution from entering waterways, protecting water quality in the township and the Susquehanna River basin. In addition, reforestation of creek and stream banks can help link larger forested blocks together, contributing to their utility as a natural wildlife corridor. The forested blocks of the valley portion of the township appear to be clustered in a few areas, lending themselves to protection and connectivity. Protection of the continuous forested ridge along Blue Mountain in the north is critical to maintaining this area as a wildlife corridor and to protecting the water quality of the headwater streams flowing into the valley below.

BLOSERVILLE HILL—UPDATED—(Lower Frankford and West Pennsboro Townships)

This site is a forested woodlot on a shale ridge. It supports a good quality population of a **PA-Endangered shrub species, G5, S1 Missouri gooseberry (*Ribes missouriense*)**. The gooseberry is the dominant shrub in portions of the forest at this site. It is reproducing well and should persist at the site indefinitely if it is not disturbed.

During a survey to this site in 2000, two additional plant species of concern were found in the floodplain and surrounding hills in this area. A fair-quality population of **limestone petunia (*Ruellia strepens*)**, a **G4G5, S2 PA-Threatened** plant species of concern, and a good-quality population of **G4, S3 beard-tongue (*Penstemon canescens*)** were documented in this survey.

Threats and Disturbances

Clearcutting of the woods would be detrimental to these species.

Conservation Recommendations

The discovery of these two additional plant species of concern at this site increases the importance of maintaining undisturbed forested buffers along the Conodoguinet Creek and hillsides in this area.

CONODOGUINET CREEK AT MT. ROCK SPRING CREEK (Lower Frankford and West Pennsboro Township)

This site includes a portion of the Conodoguinet Creek. The creek is wide and relatively shallow along this stretch with a bottom of gravel. It supports a small population of an aquatic plant species, **G5T5, S3 white-water crowfoot (*Ranunculus aquaticus* var. *diffusus*)**. It is likely more of this species occurs in the creek along this stretch. Further surveys are recommended to determine the quality and extent of this population.

Threats and Disturbances

The south side of the creek is poorly buffered at this site with no trees along the bank.

Conservation Recommendations

Forest buffer along the creek provides valuable habitat for both rare and common species as well as helping to prevent erosion and to maintain the quality of the water.

CONODOGUINET CREEK AT MT. ZION SCHOOL—NEW—(Lower Frankford & West Pennsboro Townships)

This site includes the Conodoguinet Creek floodplain and banks, as well as the forested hills and ravines flanking both sides of the creek. Five plant species of concern, including two S1 species, one S2 species and two S3 species were identified at this site in 2000. A good-quality population of **G4, S3 beard-tongue (*Penstemon canescens*)**; a good-quality population **G5, S1 PA-Endangered slender goldenrod (*Solidago speciosa* var. *erecta*)**; and a small population of **G5, S1 stalked wild petunia (*Ruellia pedunculata*)**, the first and only record of this plant species occurring in Pennsylvania, were found among the shale cliffs and rock outcrops within a red cedar-mixed hardwood, rich shale woodland. A small population of **G4G5, S2 PA-Threatened limestone petunia (*Ruellia strepens*)** was found along the forested floodplain of the Conodoguinet Creek. **The sedge *Carex shortiana*, G5, S3**, was found in a small marsh in a forest opening within a wooded shale ravine. The forested floodplain along the creek, the forested slopes and ravines to the north of the creek, and the dry shale outcrops provide valuable habitat for the species of concern in this area.

Threats and Disturbances

Exotic species of plants including garlic mustard and Japanese honeysuckle present the greatest threat to these species. Deer browsing, logging operations and road maintenance are additional threats that may degrade the habitat at this site for these species.

Conservation Recommendations

Maintaining this site in its present condition with an intact forested buffer will best provide protection of the habitat for these species.

WAGGONERS GAP—UPDATED—(Lower Frankford and North Middleton Townships)

This site is located on the crest of Blue Mountain in the vicinity of Waggoners Gap. The area consists of three main habitat types including patches of exposed talus outcrops, patches of pine-oak-heath woodland, and more extensive xeric mixed oak forest. The talus outcrops occur on the ridgetop and on south-facing slopes and consist of large rock boulders, which form many small cave-like crevices and support no vegetation. These areas are fringed primarily with chestnut oak and black birch. The pine-oak-heath woodland occurs on a large expanse of exposed bedrock that flanks a section of the mountain ridge on the south side. This area is characterized by scattered pines and chestnut oaks with patches of mountain laurel and lowbush blueberry and a few scattered herbs. It can be seen on the upslope side of Route 74 when driving on the south side of the gap. This site supports two species of concern, the **G5, S3 Prickly-pear cactus (*Opuntia humifusa*)** and the **G3G4, S3 PA-Threatened Allegheny woodrat (*Neotoma magister*)**.

Threats and Disturbances

This site has been disturbed by the construction of Route 74 and radio transmission towers. Its close proximity to the road and the panoramic view makes it a desirable party spot and therefore vulnerable to degradation from trash and vandalism.

Locally Significant Site:

Locust Creek—UPDATED—(Lower Frankford and Upper Frankford Townships)

The well-shaded creek at this site supports a good quality population of Potomac sculpin (*Cottus girardii*), which has been removed from the species of concern list since the 2000 report. Though there are currently no listed species of concern at this site, the site supports a variety of aquatic species and warrants attention to its water quality. The site consists of a narrow hard-bottomed stream with a cobble substrate with scattered areas of silt and bedrock. Associated species include creek chub, blacknose dace, longnose dace, and fantail darter.



Rocky ridgetops and boulder fields like this one on Blue Mountain can be suitable habitat for Allegheny Woodrats as well as timber rattlesnakes.
Photo: PA Science Office of The Nature Conservancy.

LOWER MIFFLIN TOWNSHIP

Site Name (County Rank)	Special Species / Community Type	PNHP Ranks*		State Status	Last Seen (m-d-y)	Quality**
		Global	State			
Flat Rock Site (4)	Animal: Allegheny Woodrat <i>Neotoma magister</i>	G3G4	S3	PT	07-19-96	E
Tuscarora Trail Site (5)	Animal: Allegheny Woodrat <i>Neotoma magister</i>	G3G4	S3	PT	11-27-90	E

* Please refer to Appendix I for an explanation of PNHP Ranks and State Status.

**Please refer to Appendix II for an explanation of Quality Ranks.

Locally Significant: Colonel Denning State Park
Doubling Gap Creek

Managed Lands: Tuscarora State Forest
Colonel Denning State Park

Other: Doubling Gap Creek—High Quality Cold Water
Fishery from source to PA 944



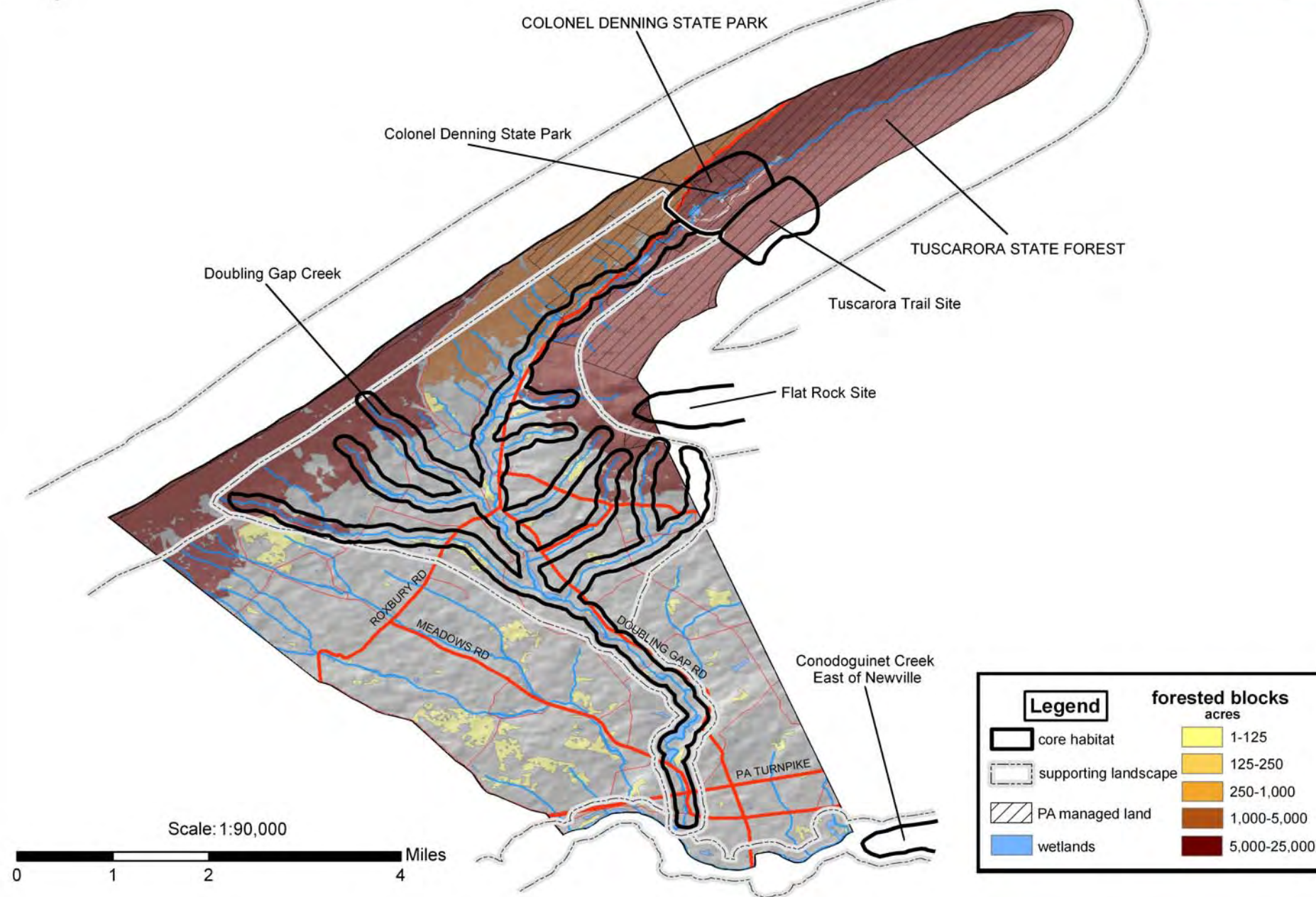
Lower Mifflin Township supports several aquatic resources, from headwater streams to the Conodoguinet Creek. South of the Blue Mountain ridge corridor, the majority of the township is in agriculture. Several large blocks of forest remain along stream corridors and maintain connectivity of natural habitats from the ridge to the Conodoguinet. Forested riparian corridors should be preserved where they remain and restored where they are missing. Care should be taken in restoration efforts to use only native species of trees and shrubs, preferably of local sources. Forested buffers help filter surface water runoff, preventing many non-point sources of pollution from entering waterways, protecting water quality in the township and the Susquehanna River basin. In addition, reforestation of creek and stream banks can help link larger forested blocks together, contributing to their utility as a natural wildlife corridor. Protection of the continuous forested ridge along Blue Mountain in the north is critical to maintaining this area as a wildlife corridor and to protecting the water quality of the headwater streams flowing into the valley below.

[LOWER MIFFLIN TOWNSHIP MAP](#)



Pennsylvania Natural Heritage Program

Lower Mifflin Township



FLAT ROCK SITE (Lower Mifflin and Upper Frankford Townships and Perry County)

This southeast-facing forested mountain slope supports a population of the **G3G4, S3 PA-Threatened Allegheny woodrat (*Neotoma magister*)**. The canopy vegetation includes black oak and chestnut oak. The subcanopy includes witch hazel, mountain laurel, blackberry, and grape. Evidence of this population was last observed in 1996. This site is located within Tuscarora State Forest.

TUSCARORA TRAIL SITE (Lower Mifflin Township and Perry County)

This site is a rocky forested ridgetop along the border of Cumberland and Perry Counties, dominated by oak. Evidence of the **G3G4, S3 PA-Threatened Allegheny woodrat (*Neotoma magister*)** was found here in 1990; further surveys to determine the extent and condition of the population are recommended. This site is located within Tuscarora State Forest.

Locally Significant Sites:

Colonel Denning State Park (Lower Mifflin Township)

This park occupies a narrow valley formed by Doubling Gap, a bend in the Blue Ridge. There are historical records from the Park for both plant and animal species of concern. Doubling Gap Creek, a High-Quality Cold Water Fishery, bisects the park. The plant species of concern were known from a small seepage swamp adjacent to Doubling Gap Run. Although searches in recent years have not identified any species of concern, the swamp is in fairly good condition, with a diverse, mostly native flora. Scattered trees, including black ash, yellow birch, and northern hemlock and eastern white pine mix with a shrub layer dominated by spicebush, winterberry, and highbush blueberry. The groundcover includes numerous sedge species, manna-grasses, skunk-cabbage, cinnamon fern, sensitive fern and other fern species. In the past the swamp has been disturbed by flooding from dams on Doubling Gap Creek, and by fill from construction of nearby hiking trails. Despite these disturbances, a diverse native flora has persisted and the site remains potential habitat for rare species. The Park is also used for recreation, with nature trails and impounded areas for swimming along the Creek, and a network of hiking trails ascending the second-growth forests on the steep sides of the valley.

Doubling Gap Creek—UPDATED—(Lower Mifflin Township)

The creek downstream of the state park supports a good quality population of Potomac sculpin (*Cottus girardii*), which has been removed from the species of concern list since the 2000 report. Though there are currently no listed species of concern at this site, the site supports a variety of aquatic species and warrants attention to its water quality. The site is characterized by a shaded hard-bottomed stream with slow-moderate runs & a few small riffles. Associated species include creek chub, fantail darter, blacknose dace and longnose dace.

MIDDLESEX TOWNSHIP

Site Name (County Rank)	Special Species / Community Type	PNHP Ranks*		State Status	Last Seen (m-d-y)	Quality**
		Global	State			
Conodoguinet Creek at Bernheisel Bridge (3)	Plant: Sedge <i>Carex shortiana</i>	G5	S3	N	06-19-97	E
	Plant: Limestone Petunia <i>Ruellia strepens</i>	G4G5	S2	PT	09-20-98	BC
	Animal Species of Concern	G3G4	S3S4	N	08-15-95	E
Conodoguinet Creek at Wolf Bridge (5)	Animal Species of Concern	G4	S3S4	N	09-19-98	B

* Please refer to Appendix I for an explanation of PNHP Ranks and State Status.

**Please refer to Appendix II for an explanation of Quality Ranks.



Locally Significant: Letort Spring Run

Managed Lands: State Game Lands #230

Middlesex Township supports several important aquatic resources, from headwater streams to the Conodoguinet Creek. South of the Blue Mountain ridge corridor, the majority of the township is in agriculture. Several large blocks of forest remain along stream corridors and maintain connectivity of natural habitats from the ridge to the Conodoguinet. Forested stream-side corridors should be preserved where they remain and restored where they are missing, Particularly along the length of Spring Run and the Conodoguinet Creek. Care should be taken in restoration efforts to use only native species of trees and shrubs, preferably of local sources. Forested buffers help filter surface water runoff, preventing many non-point sources of pollution from entering waterways, protecting water quality in the township and the Susquehanna River basin. In addition, reforestation of creek and stream banks can help link larger forested blocks together, contributing to their utility as a natural wildlife corridor. The forested blocks of the valley portion of the township appear to be clustered in a few areas, lending themselves to protection and connectivity. Protection of the continuous forested ridge along Blue Mountain in the north is critical to maintaining this area as a wildlife corridor and to protecting the water quality of the headwater streams flowing into the valley below.

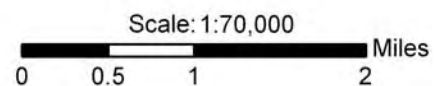
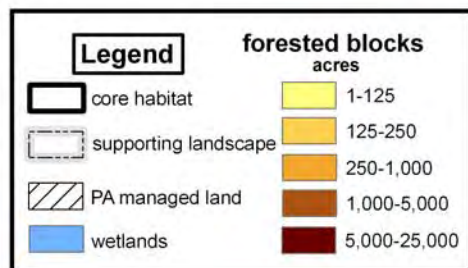
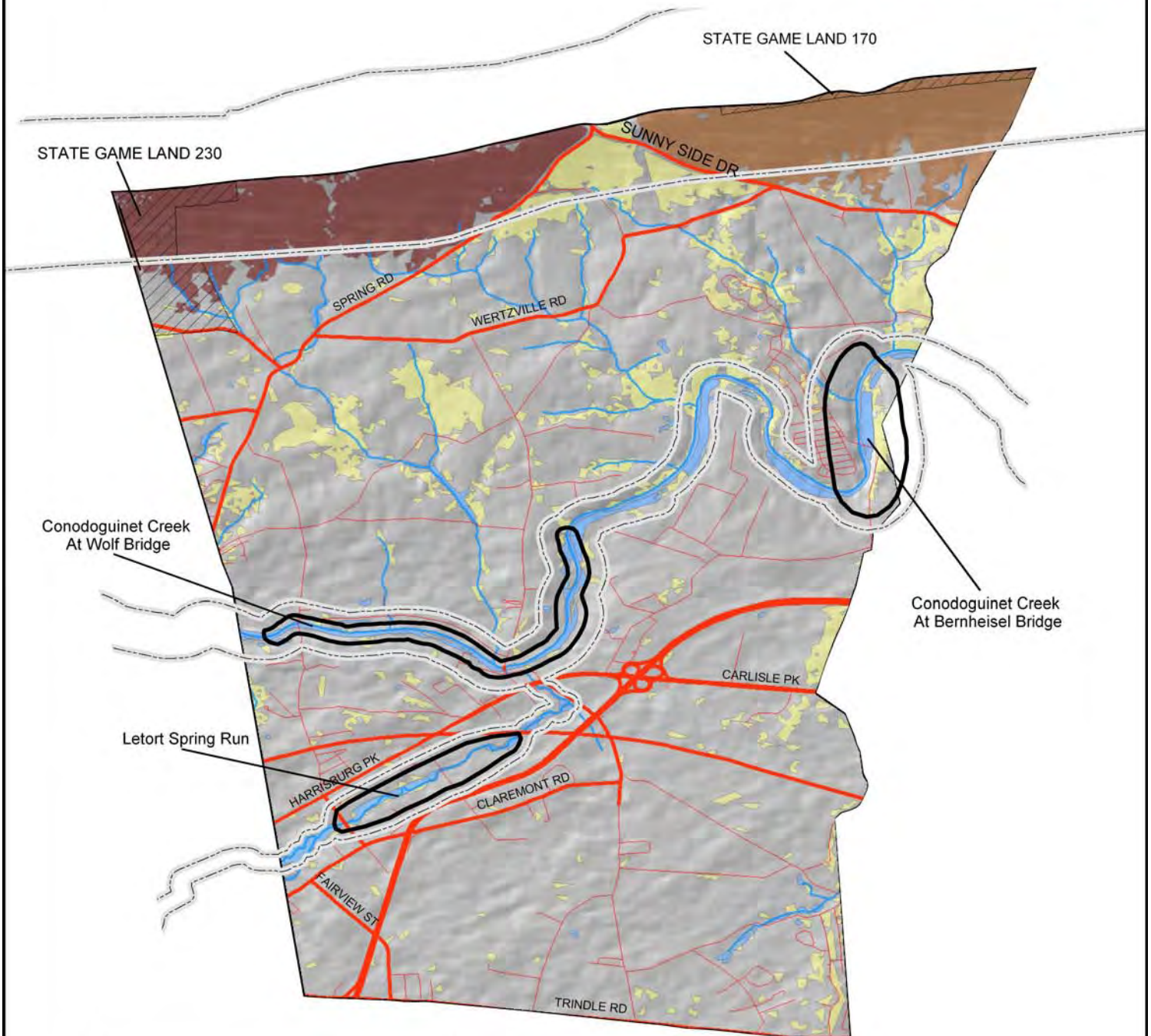
[MIDDLESEX TOWNSHIP MAP](#)



Middlesex Township



Pennsylvania Natural Heritage Program



CONODOGUINET CREEK AT BERNHEISEL BRIDGE (Middlesex and Silver Spring Townships)

This site supports two plant species of concern and an animal species of concern. The **G5, S3 sedge *Carex shortiana* and the G4G5, S2 PA-threatened limestone petunia (*Ruellia strepens*)** occur on the floodplain of Conodoguinet Creek. The floodplain is made up primarily of old fields with some patches of successional forest in-between. Older trees and remnants of native floodplain plant herb associations occur in a narrow band along the creek bank. The trees include silver maple, hackberry, box elder, and slippery elm. This site is partly on the Appalachian Trail National Historic Corridor. The animal species of concern occurs in the Conodoguinet Creek.

Conservation Recommendations:

Maintaining water quality in the Conodoguinet will benefit these species, which also occur downstream at several locations along the Creek. The plants species of concern will benefit from minimizing disturbance on the floodplain and by allowing a wider forested buffer to grow in along the creek.

CONODOGUINET CREEK AT WOLF BRIDGE (Middlesex Township)

A population of two G4, S3S4 rare aquatic animal species was found in this stretch of the Conodoguinet Creek, upstream of the Creek's confluence with Letort Spring Run. The substrate is fine gravel, sand and silt, with some submerged aquatic vegetation.

Conservation Recommendations

These species also occur at several sites further downstream, and further surveys may uncover additional sites in the Conodoguinet. Maintaining water quality upstream is the most important requirement for conserving these populations.

Locally Significant Site:

Letort Spring Run (Middlesex Township)

This locally significant area consists of marshy floodplain habitat along this spring-fed tributary to the Conodoguinet Creek. Letort Spring Run itself has abundant aquatic vegetation, including broad waterweed, Eurasian water-milfoil, pondweed, and watercress. The surrounding marshes have patches of cattail, reed-canary grass, jewelweed, tussock sedge, blue vervain, and joe-pye weed, as well as a few willow trees and patches of dogwood and buttonbush. The site presents a variety of habitats for birds -- Great Blue Heron and Mallards were observed during one survey. Letort Spring Run is also listed as a **HQ-CWF** from its source to Letort Park.

Conservation Recommendations

All existing forested buffers along the Letort Creek should be preserved. In addition, restoration of forested buffers where they are missing should entail the planting of native trees and shrubs to help the maintenance and recovery of this watershed.

Hemlock Woolly Adelgid



The state tree of Pennsylvania, the Eastern Hemlock (*Tsuga canadensis*), has been under attack by an accidentally introduced insect species, the Hemlock Woolly Adelgid (*Adelges tsugae*). Many of these trees may succumb due to defoliation by these insect pests. The character of these hemlock-dominated habitats will likely change dramatically if continued defoliation occurs. The removal of the hemlock canopy would likely result in a marked decrease in these shade-adapted species and an increase in shade intolerant species, including many species considered invasive. It is difficult to predict the future consequences of the loss of mature stands of hemlock in these habitats.

Top: The woolly adelgid appears as a cottony mass on the undersides of hemlock branches.

Center: The insect devours the evergreen needles of even the largest trees.

Bottom: Hemlock cannot withstand defoliation, and will die shortly after being stripped of its needles.



Barn Owls (*Tyto alba*) require open meadows for feeding and tree cavities or human made structures for nesting. A shift in agricultural practices, loss of suitable nesting structures and a general change in land use patterns pose threats to the continued success of this species in Pennsylvania.

Photos by Jim Malone

MONROE TOWNSHIP

Site Name (County Rank)	Special Species / Community Type	PNHP Ranks*		State Status	Last Seen (m-d-y)	Quality**
		Global	State			
Lisburn Road Farm (5)	Animal: Barn Owl <i>Tyto alba</i>	G5	S3BS3N	CA	11-13-96	E
White Rocks (5)	Geologic Feature: Erosional Remnant	G?	S?	N	N/A	E
Yellow Breeches Creek Leidighs to Williams Grove (5)	Plant: Red-head Pondweed <i>Potamogeton richardsonii</i>	G5	S3	PT	07-15-97	CD
	Plant: White-water Crowfoot <i>Ranunculus aquatilis</i> var. <i>diffusus</i>	G5T5	S3	N	07-15-97	B

* Please refer to Appendix I for an explanation of PNHP Ranks and State Status.

**Please refer to Appendix II for an explanation of Quality Ranks.

Locally Significant: None

Managed Lands: State Game Lands #305

Other: Yellow Breeches Creek—High Quality Cold
Water Fishery to SR 1007



Monroe Township is primarily in the Great Valley Section but includes the northern terminus of the South Mountain Section. The South Mountain contains the largest expanse of unbroken forested land in the county and provides an important natural greenway extending south into Maryland. This portion of the mountain is primarily privately owned. Much of the township's native biodiversity and scenery can be preserved by avoiding unnecessary fragmentation of landscape features by steering construction of new roads and buildings away from these large forest blocks. North of Yellow Breeches Creek the township is dominated by agriculture, though some moderate-sized forest blocks remain to the north. Maintenance and restoration of connectivity between these woodlots would benefit wildlife by forming natural movement corridors. Agricultural land in the Township also plays an important role in maintaining habitat for species of concern, particularly Barn Owls and other grassland-dependent bird species.

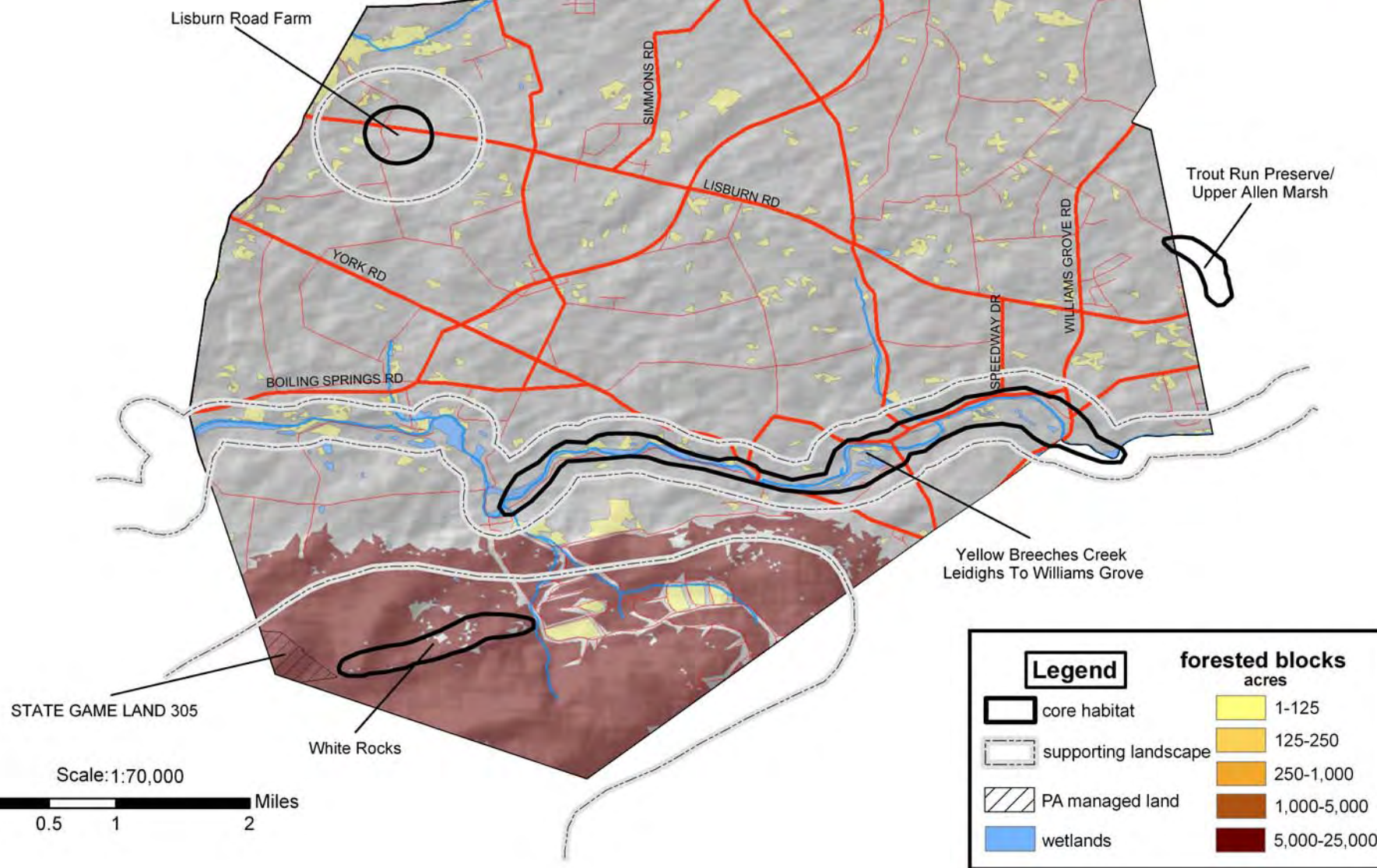
[MONROE TOWNSHIP MAP](#)



Monroe Township



Pennsylvania Natural Heritage Program



LISBURN ROAD FARM (Monroe Township)

A **barn owl** (*Tyto alba*, G5, S3B S3N) was observed using a silo at this farm in 1996. More surveys are needed to determine whether the species is still present or breeding at this site.

WHITE ROCKS—NEW—(Monroe Township)

This site is considered an outstanding geologic feature of Pennsylvania. White Rocks is a quartzite outcrop of the Antietam Formation dating from the Cambrian (540-490 million years ago) on South Mountain south of Boiling Springs. From the top, at Center Point Knob, there is a good view across the Great Valley to the north (Geyer and Bolles 1979).

YELLOW BREECHES CREEK - LEIDIGHS TO WILLIAMS GROVE (Monroe Township and York County)

This site extends along several miles of the Yellow Breeches Creek. It supports populations of two rare aquatic plant species: **G5, S3 PA-threatened red-head pondweed (*Potamogeton richardsonii*) and G5T5, S3 white-water crowfoot (*Ranunculus aquatilis* var. *diffusus*)**. Streambed habitat varies considerably over this segment of the creek and includes both weak and strong riffles, deeper pools, and deeper water associated with dams. Both species of concern found here prefer fast flowing clear water habitat and are threatened by impoundment or excessive sedimentation. These populations are relatively small and are widely scattered through this length of creek.

Threats and Disturbances

Availability of habitat is partially responsible for this distribution. Crowding out by the exotic species curly pondweed may also be a factor. Buffers along the creek vary from little or no buffer to well-established forest.

Conservation Recommendations

Forest buffer along the creek provides valuable habitat for both rare and common species as well as helping to prevent erosion and to maintain the quality of the water. Allowing wide buffers along the banks of the creek to mature and avoiding further streamside development will benefit this exceptional resource. Care should be taken in restoration efforts to use only native species of trees and shrubs, preferably of local sources.

NORTH MIDDLETON TOWNSHIP, Carlisle Borough

Site Name (County Rank)	Special Species / Community Type	PNHP Ranks*		State Status	Last Seen (m-d-y)	Quality**
		Global	State			
Cactus Hill Site (5)	Plant: Prickly-pear Cactus <i>Opuntia humifusa</i>	G5	S3	PR	03-24-98	BC
Cave Hill Nature Center (4)	Plant: Tall Gramma <i>Bouteloua curtipendula</i>	G5	S2	PT	06-31-01	D
	Plant: Limestone Petunia <i>Ruellia strepens</i>	G4G5	S2	PT	10-17-98	C
	Animal Species of Concern	G5	S2S3	N	03-24-98	E
Conodoguinet Creek at Carlisle (4)	Plant: Limestone Petunia <i>Ruellia strepens</i>	G4G5	S2	PT	07-21-87	D
	Plant: White-Water Crowfoot <i>Ranunculus aquatilis</i> var. <i>diffusus</i>	G5T5	S3	N	06-24-97	BC
	Plant: Illinois Pondweed <i>Potamogeton illinoensis</i>	G5	S3S4	TU	06-24-97	E
Waggoners Gap (3)	Plant: Prickly-pear Cactus <i>Opuntia humifusa</i>	G5	S3	PR	11-29-00	C
	Animal: Allegheny Woodrat <i>Neotoma magister</i>	G3G4	S3	PT	05-11-02	E

* Please refer to Appendix I for an explanation of PNHP Ranks and State Status.

**Please refer to Appendix II for an explanation of Quality Ranks.

Locally Significant: None

Managed Lands: State Game Lands #230

[NORTH MIDDLETON TOWNSHIP MAP](#)





North Middleton Township



Pennsylvania Natural Heritage Program

STATE GAME LAND 230

Waggoners Gap

Cactus Hill Site

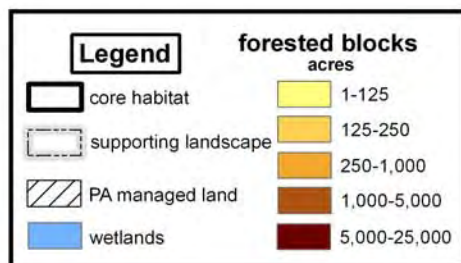
Conodoguinet Creek
At Wolf Bridge

Cave Hill
Nature Center

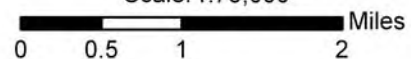
Letort Spring
Run

Conodoguinet Creek At
Mt. Zion School Road

Conodoguinet Creek
At Carlisle



Scale: 1:75,000



NORTH MIDDLETON TOWNSHIP

North Middleton Township supports several important aquatic resources, from headwater streams to the Conodoguinet Creek. South of the Blue Mountain ridge corridor, the majority of the township is in agriculture or development associated with Carlisle. Several large blocks of forest remain north of the Conodoguinet and maintain connectivity of natural habitats from the ridge to the Conodoguinet. Forested riparian corridors should be restored and maintained where they remain. Forested buffers help filter surface water runoff, preventing many non-point sources of pollution from entering waterways, protecting water quality in the township and the Susquehanna River basin. In addition, reforestation of creek and stream banks can help link larger forested blocks together, contributing to their utility as a natural wildlife corridor. Care should be taken in restoration efforts to use only native species of trees and shrubs, preferably of local sources. Protection of the continuous forested ridge along Blue Mountain in the north is critical to maintaining this area as a wildlife corridor and to protecting the water quality of the headwater streams flowing into the valley below.

CACTUS HILL SITE (North Middleton Township)

This is a xeric site with a shaly soil supporting a forest of chestnut oak, pignut hickory, Scot's pine and Virginia pine. A good population of **G5, S3 prickly-pear cactus (*Opuntia humifusa*)** is found on a powerline R.O.W. that cuts through the site. The plant is associated with beard-tongue, moss-pink, and rattlesnake-weed. The species of concern requires open conditions.

Threats and Disturbances

Increased growth of blackberry thickets and tree species could shade out the plant.

Conservation Recommendations

The powerline R.O.W. should be kept open by annual mowing or other methods that will not harm the species of concern.

CAVE HILL NATURE CENTER (North Middleton Township)

This site is an area of limestone bluffs facing the Conodoguinet Creek. Three different species of concern occur here. A **G5, S2S3 rare invertebrate species** is found in rimstone pools inside a cave. Portions of the cave flood in high water, and the cave has been damaged by graffiti and vandalism. The species of concern was found in an elevated side-passage of the cave, and further surveys are encouraged to determine the extent of the population. Two PA-Threatened plant species are also found at this site. The **G4G5, S2 limestone petunia (*Ruellia strepens*)** was discovered at the site in 1998; whereas **G5, S2 tall gramma (*Bouteloua curtipendula*)** been known to occur at this site since 1925.

Threats and Disturbances

Both plant species of concern may soon be lost due to site degradation. Road construction, trash dumping, and colonization of exotic species have all impacted the site. Much of the previously available habitat has been overrun by black swallow-wort. This small vine of the milkweed family is a native of southern Europe. It grows in dense colonies climbing over and crowding out our native species. It grows with vigor in exposed limestone areas such as that found at the Cave Hill site. The tall gramma occurs on the road shoulder, where mowing appears to have kept the black swallow-wort and other exotics in check.

Conservation Recommendations

Appropriate management at this site would include gating the cave, to protect the element as well as several species of bats, which use the cave as a hibernaculum, and continued mowing of the area along the road.

CONODOGUINET CREEK AT CARLISLE (North Middleton and West Pennsboro Townships)

This site extends along a several-mile stretch of the Conodoguinet Creek and supports three plant species of special concern. Two of these, the **white-water crowfoot (*Ranunculus aquaticus* var. *diffusus*, G5T5, S3)** and the **Illinois pondweed (*Potamogeton illinoensis*, G5, S3S4)**, are aquatic, growing submerged in the Conodoguinet. Populations for these species are small and thinly scattered in the creek. They occur with curly pondweed, broad waterweed, and horned pondweed. These two rare species found in this section of the creek likely occur at other locations up and downstream, and further surveys are recommended. The floodplain adjacent to the Creek supports a poor-quality population of **PA-threatened limestone petunia (*Ruellia strepens*, G4G5, S2)**. It is found growing in a thicket of red elm, honey-locust, box elder, sycamore, black raspberry, and Japanese honeysuckle. Last observed in 1987, this occurrence may have since been overrun by exotic species. This species, which prefers rich floodplain soils, is known from several locations along the Conodoguinet Creek and probably occurs at additional sites on the creek that have yet to be surveyed.

Threats and Disturbances

Curly pondweed is an exotic species that grows thickly in parts of the Conodoguinet. It and other exotic plant species are likely out-competing native aquatic species and is a threat to the persistence of the rare species at this site.

Conservation Recommendations

Maintaining forest buffers along the banks of the Conodoguinet and its tributaries will provide habitat for the rare floodplain plant species as well as help to limit sediment loads in the creek and benefit the aquatic fauna and flora.

WAGGONERS GAP—UPDATED—(Lower Frankford and North Middleton Townships and Perry County)

This site is located on the crest of Blue Mountain in the vicinity of Waggoners Gap. The area consists of three main habitat types including patches of exposed talus outcrops, patches of pine-oak-heath woodland, and more extensive xeric mixed oak forest. The talus outcrops occur on the ridgetop and on south-facing slopes and consist of large rock boulders, which form many small cave-like crevices and support no vegetation. These areas are fringed primarily with chestnut oak and black birch. The pine-oak-heath woodland occurs on a large expanse of exposed bedrock that flanks a section of the mountain ridge on the south side. This area is characterized by scattered pines and chestnut oaks with patches of mountain laurel and lowbush blueberry and a few scattered herbs. It can be seen on the upslope side of Route 74 when driving on the south side of the gap. This site supports two species of concern, the **G5, S3 Prickly-pear cactus (*Opuntia humifusa*)** and the **G3G4, S3 PA-Threatened Allegheny woodrat (*Neotoma magister*)**.

Threats and Disturbances

This site has been disturbed by the construction of Route 74 and radio transmission towers. Its close proximity to the road and the panoramic view makes it a desirable party spot and therefore vulnerable to degradation from trash and vandalism.



Forested buffers along waterways serve many purposes. They provide ground and surface water purification, provide shade for trout and other cold-water species, and help to control erosion. They are reservoirs of biological diversity and sanctuaries for common, sensitive and declining species. Enrolment in the Conservation Reserve Enhancement Program (CREP) can provide financial incentive to repair and protect streamside buffers.

NORTH NEWTON TOWNSHIP, Newville Borough

Site Name (County Rank)	Special Species / Community Type	PNHP Ranks*		State Status	Last Seen (m-d-y)	Quality**
		Global	State			
Big Spring (5)	Geologic Feature: Springs	G?	S?	N	1979	E
Running Pump Road Woods (5)	Plant: Puttyroot <i>Aplectrum hyemale</i>	G5	S3	N	03-07-98	CD
Spring Hill School Grasslands (4)	Animal: Upland Sandpiper <i>Bartramia longicauda</i>	G5	S1S2B	PT	07-31-88	E

* Please refer to Appendix I for an explanation of PNHP Ranks and State Status.

**Please refer to Appendix II for an explanation of Quality Ranks.

Locally Significant: None

Managed Lands: None

Other: Big Spring Creek—Exceptional Value to SR 3007/T333



North Newton Township lies entirely in the Great Valley Section and is primarily an agricultural township. Several streams run through the township and into the Conodoguinet Creek, including the Exceptional Value Big Spring Creek. The largest blocks of forest remaining in the township are found along the Big Spring drainage. Forested riparian corridors should be restored and maintained where they remain. Forested buffers help filter surface water runoff, preventing many non-point sources of pollution from entering waterways, protecting water quality in the township and the Susquehanna River basin. In addition, reforestation of creek and stream banks can help link larger forested blocks together, contributing to their utility as a natural wildlife corridor. Care should be taken in restoration efforts to use only native species of trees and shrubs, preferably of local sources. The forested blocks of Big Spring, Green Spring and along the Conodoguinet appear to be clustered in a few areas, lending themselves to protection and connectivity.

[NORTH NEWTON TOWNSHIP MAP](#)



North Middleton Township



Pennsylvania Natural Heritage Program

STATE GAME LAND 230

Waggoners Gap

ENOLA RD

WAGNER DR

Cactus Hill Site

Conodoguinet Creek
At Wolf Bridge

Cave Hill
Nature Center

Letort Spring
Run

Conodoguinet Creek At
Mt. Zion School Road

Conodoguinet Creek
At Carlisle

WAGGONERS GAP RD

MCCLURES GAP RD

PA TURNPIKE

NEWVILLE RD

RITNER HW

ALLEN RD

Legend

core habitat

supporting landscape

PA managed land

wetlands

forested blocks acres

1-125

125-250

250-1,000

1,000-5,000

5,000-25,000

Scale: 1:75,000

0 0.5 1 2 Miles

BIG SPRING—NEW—(North Newton and West Pennsboro Townships)

This site is considered an outstanding geologic feature of Pennsylvania. The spring is the starting point for the Big Spring Creek, and it is the fifth largest spring in the state, having a flow of 12,500 gallons per minute (Geyer and Bolles 1979).

RUNNING PUMP ROAD WOODS (North Newton Township)

A small poor-quality population of **G5, S3 puttyroot (*Aplectrum hyemale*)** occurs in an oak-hickory forest at this site. Surveys in 1987, 1997, and 1998 indicate that the population may be expanding and the habitat remains good.

SPRING HILL SCHOOL GRASSLANDS—NEW—(North Newton and Southampton Townships)

A breeding population of **G5, S1S2B PA-Threatened upland sandpiper (*Bartramia longicauda*)** was observed at this site in 1984 and again in 1988. These sightings did not make it into the original NAI report. This species is common in the mid-western prairies, and with the clearing of the Pennsylvania forests for agriculture in the 18th and 19th centuries, had spread across the state (Brauning 1992). With the abandonment and conversion of much farmland in the later half of the 20th century, suitable habitat for this species is on the decline. The upland sandpiper will utilize the open, grassy habitat of pastures, fallow fields, golf courses and airports.

Conservation Recommendations

Agricultural easements in this area would help to continue to provide suitable habitat for this species.



An S3 plant species of concern, Puttyroot (*Aplectrum hyemale*), occurs in few hardwood forests in the county.
(Photo by Mark Laroque).

PENN TOWNSHIP

Site Name (County Rank)	Special Species / Community Type	PNHP Ranks*		State Status	Last Seen (m-d-y)	Quality**
		Global	State			
Chimney Rocks (5)	Geologic Feature: Erosional Remnant	G?	S?	N	1979	E
	Animal: Allegheny Woodrat <i>Neotoma magister</i>	G3G4	S3	PT	4-21-92	E
Huntsdale Floodplain / Kings Gap Ponds (3)	Natural Community: Ephemeral/Fluctuating Natural Pool	G?	S3	N	07-20-98	BC
	Plant: Netted Chainfern <i>Woodwardia areolata</i>	G5	S2	N	07-20-98	B
	Animal: Long-eared Owl <i>Asio otis</i>	G5	S2B,S2S3N	CU	06-02-1985	E
Huntsdale Grasslands (3)	Animal: Dickcissel <i>Spiza americana</i>	G5	S2B	PT	06-11-00	E
Peach Orchard Hollow Ponds (3)	Plant: Northeastern bulrush <i>Scirpus ancistrochaetus</i>	G3	S3	PE	08-21-97	BC

* Please refer to Appendix I for an explanation of PNHP Ranks and State Status.

**Please refer to Appendix II for an explanation of Quality Ranks.

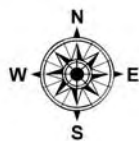
Locally Significant: None

Managed Lands: Michaux State Forest
Kings Gap Environmental Education Center

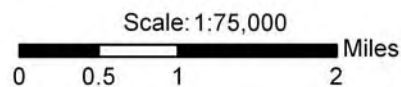
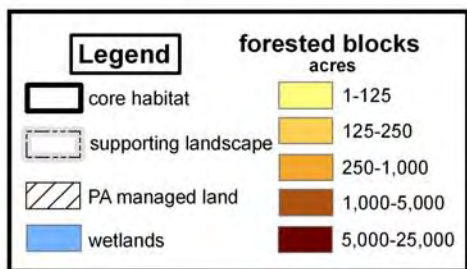
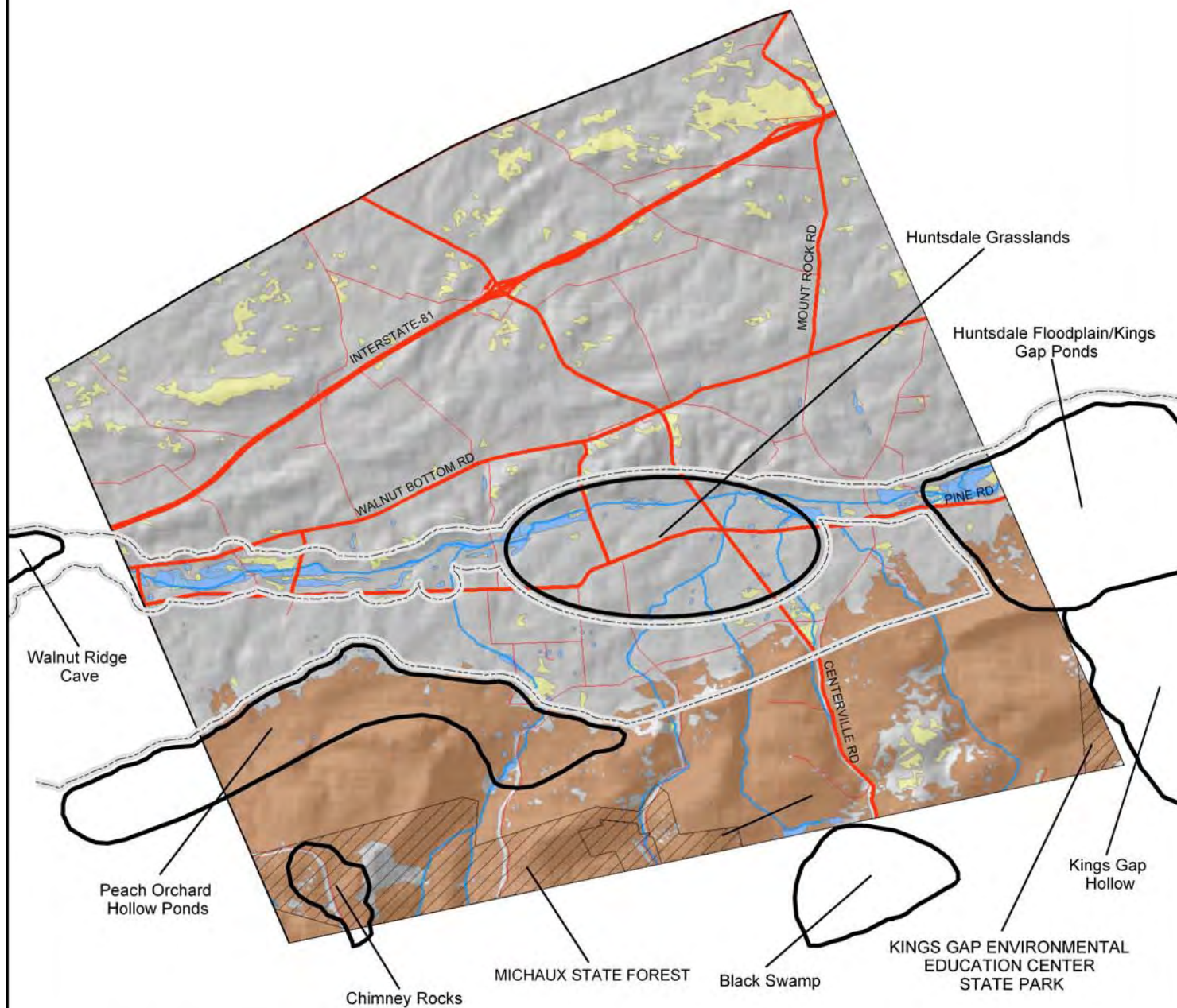
Other: High Quality Cold Water Fisheries—Peach Orchard Hollow, Bettem Hollow, Irishtown Gap Hollow, State Road Hollow, Yellow Breeches Creek



[PENN TOWNSHIP MAP](#)



Penn Township



PENN TOWNSHIP

Penn Township is divided physiographically by the Great Valley Section in the north and the South Mountain Section in the south. Much of the South Mountain portion is within the Michaux State Forest and is managed by the Department of Conservation and Natural Resources. The South Mountain contains the largest expanse of unbroken forested land in the county and provides an important natural greenway extending south into Maryland. The natural areas in the township are dotted with large and small wetlands or pools, seeps, and swamps. Many temporary vernal pools occur on the lower slopes of the north face of South Mountain. These ponds are extremely important as breeding habitat for amphibians, many of which will only breed in temporary pools such as these. The vernal ponds at this location are but a few of the many ponds that line the toe slopes of South Mountain in Cumberland and Franklin Counties. All of the vernal ponds along the lower slopes of South Mountain should be considered points of high biological importance as part of the larger continuous landscape of South Mountain. Additional vernal ponds are currently being mapped and described in the county by several organizations including The Nature Conservancy, Messiah College and Shippensburg University. Proposed building projects in the Township should be scrutinized to assess their impact on vernal pools in the vicinity. Much of the township's native biodiversity and scenery can be preserved by avoiding unnecessary fragmentation of landscape features by steering construction of new roads and buildings away from large forest blocks and wetlands, particularly in the southern portions of the township that are outside the state forest boundary. North of Yellow Breeches Creek the township is dominated by agriculture, though some moderate-sized forest blocks remain to the north. Maintenance and restoration of connectivity between these woodlots would benefit wildlife by forming natural movement corridors.

CHIMNEY ROCKS—NEW—(Penn Township)

This site is considered an outstanding geologic feature of Pennsylvania. A spire of quartzite in shape of a chimney rises above the surrounding ridgeline. It is part of the Antietam Formation dating from the Cambrian (540-490 million years ago). (Geyer and Bolles 1979) Old signs of occupation by the **PA-threatened Allegheny woodrat (*Neotoma magister*)** were observed at this site in 1992; follow-up surveys should be conducted to determine if the site is presently occupied by this species.

HUNTSDALE FLOODPLAIN/KINGS GAP PONDS (Dickinson and Penn Townships)

A large assemblage of vernal pools make up an **Ephemeral/Fluctuating Natural Pool Natural Community** at the base of South Mountain below Kings Gap Hollow. Along with supporting rare plants vernal pools can play an important role in helping to maintain the diversity of species in forest ecosystems. Vernal pools frequently only hold water from winter until mid-summer and are not capable of supporting fish species. They are breeding sites for odonates, amphibians, and diverse macro-invertebrate communities. Over a dozen such pools are found at this site. Some of these are small and forested with shallow water and little vegetation, while others are up to 40 meters in radius, have up to a meter of water in early spring, and are treeless with a mixture of shrubs such as highbush blueberry, buttonbush, winterberry, and emergent herbaceous vegetation, including manna grass, spike-rush, and smartweeds. Spotted turtles, spotted salamanders, and green darners and other odonate species were among the animal species observed during surveys. Although no listed species were identified during our surveys, the health of the natural community appears good and additional inventories of these pools are recommended.

The surrounding forest matrix is dominated by various oak species, white pine, sassafras, black gum, and red maple, as well as some silvicultural plantations. A nest with young of the **G5, S2**

long-eared owl (*Asio otis*) was observed in this area in 1985. Some portions of this site are within Kings Gap Environmental Education Center and Huntsdale Fish Hatchery.

A good-quality population of **G5, S2 netted chainfern (*Woodwardia areolata*)** was found growing in a wet depression on the floodplain of the Yellow Breeches Creek. Associated species include sensitive fern, cinnamon fern, swamp raspberry, and spicebush. The surrounding floodplain forest is relatively undisturbed. A PA-Endangered animal species was observed at a road crossing nearby on the floodplain in 1988. Marginal habitat for these species is still present; further surveys are recommended

Threats and Disturbances:

Aerial application of gypsy moth control or other pesticides could affect the health of the vernal ponds. Browsing and trampling by deer is evident in the area and is a threat.

HUNTSDALE GRASSLANDS—NEW—(Penn Township)

The **G5, S2B PA-Threatened dickcissel (*Spiza americana*)** has been observed at this site in 1997 and again in 2000. This species is more common in the prairie regions of the mid-western United States, but has been found inhabiting agricultural fields planted in hay mixtures in Franklin and Cumberland Counties in Pennsylvania (Brauning 1992).

Conservation Recommendations

The establishment of agricultural easements in this area will help provide continued habitat protection for this species in Pennsylvania.

PEACH ORCHARD HOLLOW PONDS—UPDATED—(Penn and South Newton Townships)

This site consists of numerous small woodland ponds (vernal pools) surrounded by oak-heath forest. Several of the ponds are lush with aquatic plant species including three-way sedge, pale meadow grass, and buttonbush. Shrubs including highbush blueberry, winterberry, and huckleberry grow on the pond margins along with red maple and black gum trees. This **Ephemeral-fluctuating Pool Natural Community** supports a fair to poor quality population of **northeastern bulrush (*Scirpus ancistrochaetus*)**, a **PA-endangered** plant species. This population is of moderate size compared to other populations known from the state. The site boundary was updated to more accurately encompass the extent of vernal pool habitats based on aerial photography.

Threats and Disturbances

The quality of the habitat has been somewhat compromised by houses built among the ponds. The current hydrologic regime of the site appears to be adequately supporting the rare species.

Conservation Recommendations

Several other vernal pools are located nearby in this watershed. Along with supporting rare plants vernal pools can play an important role in helping to maintain the diversity of species in forest ecosystems. Vernal pools frequently only hold water from winter until mid-summer and are not capable of supporting fish species. The lack of fish makes them excellent breeding habitat for amphibians. These pools are often swarming with tadpoles or salamander larvae early in the growing season. Leaving this site in its current condition will help the rare and common species continue to persist here. Proposed building projects in the Township should be scrutinized to assess their impact on vernal pools in the vicinity.

SILVER SPRING TOWNSHIP

Site Name (County Rank)	Special Species / Community Type	PNHP Ranks*		State Status	Last Seen (m-d-y)	Quality**
		Global	State			
Conodoguinet Creek at Bernheisel Bridge (3)	Plant: Sedge <i>Carex shortiana</i>	G5	S3	N	06-19-97	E
	Plant: Limestone Petunia <i>Ruellia strepens</i>	G4G5	S2	PT	09-20-98	BC
	Animal Species of Concern	G3G4	S3S4	N	08-15-95	E
Conodoguinet Creek at Rich Valley Road (3)	Plant: Sedge <i>Carex shortiana</i>	G5	S3	N	06-21-97	B
	Plant: White Trout-lily <i>Erythronium albidum</i>	G5	S3	N	04-27-97	B
	Plant: Shellbark Hickory <i>Carya laciniosa</i>	G5	S3	DL	09-27-97	B
Conodoguinet Macrosite (2)	Plant: White Trout-lily <i>Erythronium albidum</i>	G5	S3	N	04-23-01	BC
	Plant: Limestone Petunia <i>Ruellia strepens</i>	G4G5	S2	PT	09-08-98	C
	Plant: Sedge <i>Carex shortiana</i>	G5	S3	N	06-20-97	B
	Plant: White-water Crowfoot <i>Ranunculus aquatilis</i> var. <i>diffusus</i>	G5T5	S3	N	09-07-98	BC
	Plant: Shellbark Hickory <i>Carya laciniosa</i>	G5	S3	DL	09-19-95	C
	Animal: Yellow-crowned Night Heron <i>Nyctanassa violacea</i>	G5	S1B	PE	04-18-00	E
	Animal Species of Concern	G4	S3S4	N	9-17-98	E
	Animal Species of Concern	G3G4	S3S4	N	09-18-98	C

Site Name (County Rank)	Special Species / Community Type	PNHP Ranks*		State Status	Last Seen (m-d-y)	Quality**
		Global	State			
Lambs Gap / Trout Run Headwaters (2)	Natural Community: Circumneutral Broadleaf Swamp	G?	S2S3	N	06-07-97	C
	Plant: Glade Spurge <i>Euphorbia purpurea</i>	G3	S1	PE	06-00-98	B
	Animal Species of Concern	G4	S1	N	06-26-02	AB
	Animal Species of Concern	G5	S1	N	08-26-01	E
	Animal Species of Concern	G4	S3	N	07-21-01	E

* Please refer to Appendix I for an explanation of PNHP Ranks and State Status.

**Please refer to Appendix II for an explanation of Quality Ranks.

Locally Significant: None

Managed Lands: State Game Lands #170

Other: Trindle Spring Run—High Quality Cold
Water Fishery from Silver Spring Meeting House to mouth



Silver Spring Township contains a diversity of land covers, from intact interior forest along Blue Mountain to the Conodoguinet floodplain with a mixture of agriculture and developed areas. Several large blocks of forest remain along stream corridors north of the Conodoguinet and maintain connectivity of natural habitats from the ridge to the Conodoguinet. Forested riparian corridors should be restored and maintained where they remain, particularly along the Conodoguinet, but also along the lengths of Hogestown Run and Trindle Spring Run. Forested buffers in these areas can help filter surface water runoff, preventing many non-point sources of pollution from entering waterways, protecting water quality in the township and the Susquehanna River basin. In addition, reforestation of creek and stream banks can help link larger forested blocks together, contributing to their utility as a natural wildlife corridor. Care should be taken in restoration efforts to use only native species of trees and shrubs, preferably of local sources. Protection of the continuous forested ridge along Blue Mountain in the north is critical to maintaining this area as a wildlife corridor and to protecting the water quality of the headwater streams flowing into the valley below.

[SILVER SPRING TOWNSHIP MAP](#)



Silver Spring Township



Pennsylvania Natural Heritage Program

Lambs Gap/Trout Run Headwaters

STATE GAME LAND 170

Conodoguinet Creek
At Bernhisel Bridge

Conodoguinet
Macrosite

WERTZVILLE RD

RICH VALLEY RD

CARLISLE PK

Conodoguinet Creek
At Rich Valley Road

LOCUST POINT RD

TEXACO RD

HOGESTOWN RD

STATE RD

OLD STONE HOUSE RD

Scale: 1:75,000

0 0.5 1 2 Miles

Legend

- core habitat
- supporting landscape
- PA managed land
- wetlands

forested blocks acres

- 1-125
- 125-250
- 250-1,000
- 1,000-5,000
- 5,000-25,000

CONODOGUINET CREEK AT BERNHEISEL BRIDGE (Middlesex and Silver Spring Townships)

This site supports two plant species of concern and an animal species of concern. The **G5, S3 sedge *Carex shortiana*** and the **G4G5, S2 PA-threatened limestone petunia (*Ruellia strepens*)** occur on the floodplain of Conodoguinet Creek. The floodplain is made up primarily of old fields with some patches of successional forest in-between. Older trees and remnants of native floodplain plant herb associations occur in a narrow band along the creek bank. The trees include silver maple, hackberry, box elder, and slippery elm. This site is partly on the Appalachian Trail National Historic Corridor. The animal species of concern occurs in the Conodoguinet Creek.

Conservation Recommendations:

Maintaining water quality in the Conodoguinet will benefit these species, which also occur downstream at several locations along the Creek. The plants species of concern will benefit from minimizing disturbance on the floodplain and by allowing a wider forested buffer to grow in along the creek.

CONODOGUINET CREEK AT RICH VALLEY ROAD—UPDATED—(Silver Spring Township)

There are good quality populations of two plant species of concern, the **G5, S3 sedge *Carex shortiana*** and the **G5, S3 white trout lily (*Erythronium albidum*)**, at this forested floodplain along the Conodoguinet Creek. Past clearing and agriculture have disturbed the site and introduced exotic species (garlic mustard, dame's rocket [*Hesperis matronalis*] and multiflora rose are common), but a diverse native flora persists in some areas. The species of concern are found in a forest whose canopy includes silver maple, box elder, hackberry, and shagbark hickory, with a diverse flora including bluebells, spring beauty, may apple, and jack-in-the-pulpit. Also associated with these plant species is the shellbark hickory, which has been removed from the species of concern list since the 2000 report.

Conservation Recommendations

Protecting this site and other remaining floodplain forest fragments along the Conodoguinet will benefit the species of concern.

CONODOGUINET MACROSITE—UPDATED—(East Pennsboro, Hampden, and Silver Spring Townships; and West Fairview, Camp Hill and Wormleysburg Boroughs)

The Conodoguinet Creek drains most of Cumberland County, running west to east through an agricultural and residential landscape. The Great Valley it bisects is mostly limestone and dolomite, and the Creek receives many inputs from springs and from groundwater flow. As a result, the Creek's waters have a fairly high pH, and a relatively constant temperature and flow. The Creek itself provides habitats for both aquatic plant and animal species of concern. Forested slopes and floodplains along the river, often with rich, limestone-influenced soils, are home to several listed plant species. Sites with species of concern were identified along the Conodoguinet throughout its length; the lower portion, a series of looping meanders from Huston's Mill to the confluence with the Susquehanna, has multiple occurrences of listed plant and animal species at several sites in close proximity. For mapping purposes, this area was combined into the Conodoguinet Macrosite.

The G5, S1 PA-Endangered Yellow-crowned Night Heron (*Nyctanassa violacea*) was observed using habitat along the edge of the creek in 1994 and 2000. Development along the water's edge would pose a threat to this species and water quality issues also apply because the animal relies mostly on aquatic species for food. Good quality populations of two aquatic animal species of concern were found at several locations in the Macrosite, in habitat consisting of riffles and shallow areas of still water. A fair to good quality population of the aquatic plant **G5, S3 white-water crowfoot (*Ranunculus aquatilis* var. *diffusus*)** was also found in several locations in this portion of the Conodoguinet. It was found associated with watercress, waterweed, water-stargrass, and Eurasian water-milfoil.

Three terrestrial plant species of concern are also known from the Macrosite, including several fair quality populations of **G4G5, S2 PA-Threatened Limestone petunia (*Ruellia strepens*); G5, S3 white trout-lily (*Erythronium albidum*); and G5, S3 sedge species *Carex shortiana*..** These species co-occur in rich floodplain woods that have not been recently disturbed. Common overstory trees at these sites include silver maple, box elder, sycamore, shagbark hickory, honey locust, hackberry and basswood. The groundcover at these sites is a diverse, particularly the spring ephemeral flora. Associates of the listed plant species include moneywort, bluebells, spring beauty, may apple, water-leaf, dame's rocket and various sedge species. Also associated with these plant species is the shellbark hickory (*Carya laciniosa*), which has been removed from the species of concern list since the 2000 report.

Threats and Disturbances:

Most of the remaining forested slopes and floodplains along this stretch of the Conodoguinet are restricted to narrow strips of relatively inaccessible or undevelopable land. Disturbances include cottages and residential development, old roads, jeep trails, and sewer lines, and runoff and trash dumping onto the slopes from the largely residential and commercial areas above. Such disturbances provide opportunities for the colonization of habitat by exotic plants; garlic mustard, in particular, is widespread in disturbed areas of these floodplain habitats. Despite these disturbances, good quality populations of the plant species of concern persist at the known sites, and any intact floodplain forest along this portion of the Conodoguinet should be considered potential rare plant habitat.

Conservation Recommendations:

Abundant aquatic habitat remains in the Conodoguinet for both the animal and plant species of concern. The persistence of these species, however, depends upon maintaining the water quality of the Conodoguinet Creek ecosystem as a whole, which in turn depends on management of the entire watershed. Agricultural and commercial runoff, logging of stream and river corridors, and pollutants are all real and current threats in the watershed. As growth and associated demands for groundwater continue in the Cumberland Valley, these species of concern may serve as indicators of the health of both the Creek and the Valley's groundwater.

LAMBS GAP/TROUT RUN HEADWATERS—NEW—(Hampden and Silver Spring Townships and Perry County)

This site supports a fair quality example of a **S2S3 Circumneutral Broadleaf Swamp Natural Community**. It is comprised of a series of broad seeps, which occur in the bottom of a valley between Little Mountain and Blue Mountain. The swamp is dominated by American beech, black birch, and

SILVER SPRING TOWNSHIP

tulip poplar with an understory of smooth alder and spicebush. The substrate of the seeps is relatively deep muck. Moss-covered hummocks support shrub copses, trees, and several species of fern. A wide diversity of herbs, sedges, and grasses grows within the swamp as well as along its margins. Skunk cabbage and jewelweed are dominant herbs. The site supports a good quality population of **G3, S1 PA-endangered glade spurge (*Euphorbia purpurea*)**. During recent surveys, three invertebrate animal species of concern were found at this site. The relative isolation of the site, tucked between the mountains, makes it good habitat for a number of common birds, reptiles, and amphibians. A few species that have been observed here during our field surveys include wood and green frogs, dusky and red-backed salamanders, northern water snakes, and 26 species of birds.

Threats and Disturbances

The swamp is undisturbed except for some nearby mountain bike trails. Adjacent slopes on the two mountains were both clear cut over ten years ago but the clear cutting does not appear to have impacted the hydrology of the site. Opportunistic exotic species that frequently colonize disturbed areas may invade the clear cuts and potentially threaten the quality of the site.

Conservation Recommendations

Limiting disturbances in this watershed, particularly by re-routing the existing bike trails, will help to maintain the quality of this site and allow the globally rare species to persist here. This site is located in State Game Lands 170.



The white trout-lily (*Erythronium albidum*) is much less common than yellow trout lily (*Erythronium americanum*), but can be found along floodplains and rich wooded slopes in the county. Photo: PA Science Office of The Nature Conservancy.

SOUTHAMPTON TOWNSHIP, SHIPPENSBURG TOWNSHIP, Shippensburg
Borough

Site Name (County Rank)	Special Species / Community Type	PNHP Ranks*		State Status	Last Seen (m-d-y)	Quality**
		Global	State			
Big Pine Flat (formerly Big Flat Barrens) (1)	Natural Community: Ridgetop/Dwarf Tree Forest	G4	S3	N	06-08-95	BC
	Natural Community: Ephemeral/Fluctuating Natural Pool Community	G?	S3	N	1/14/1998	B
	Plant: Variable Sedge <i>Carex polymorpha</i>	G3	S2	PE	06-30-97	B
	Plant: Dwarf Iris <i>Iris verna</i>	G5	S1	PE	06-21-97	BC
	Plant: Netted Chainfern <i>Woodwardia areolata</i>	G5	S2	N	9/26/1995	C
	Plant: Northeastern Bulrush <i>Scirpus ancistrochaetus</i>	G3	S3	PE	8/2/1995	D
	Animal Species of Concern	G4	S3S4	PC	7/31/2002	E
	Animal: Footpath sallow Moth <i>Metaxaglaea semitaria</i>	G5	S2	N	10/01/2003	E
	Animal: A Noctuid Moth <i>Platyperigea meralis</i>	G4	S1	N	09-26-87	B
	Animal: Southern Variable Dart Moth <i>Xestia elimata</i>	G5	S2S3	N	08-24-98	BC
	Animal: Pine Woods Underwing <i>Catocala</i> sp. 1 nr. <i>jair</i>	G5	S1	N	08-24-98	C
	Animal: A Noctuid Moth <i>Apharetra purpurea</i>	G4	S2	N	07-30-87	B
	Animal: A Zale Moth <i>Zale submediana</i>	G4	S2	N	05-07-87	B
	Animal: Southern Pine Looper Moth <i>Caripeta aretaria</i>	G4	S1	N	08-24-98	C
Burd Run Caves (2)	Animal Species of Concern	G2G4	S1	N	10-26-94	E
	Animal Species of Concern	G5	S2S3	N	09-15-95	B

Site Name (County Rank)	Special Species / Community Type	PNHP Ranks*		State Status	Last Seen (m-d-y)	Quality**
		Global	State			
C.C.C. Dam Site (5)	Plant: Southern Bog Clubmoss <i>Lycopodiella appressa</i>	G5	S2	PT	9-12-97	B
	Plant: Bladderwort <i>Utricularia geminiscapa</i>	G5G4	S4	DL	09-13-97	B
Dead Woman Hollow (3)	Plant: Virginia Bunchflower <i>Melanthium virginicum</i>	G5	SU	N	07-25-98	C
	Plant: Quillwort <i>Isoetes valida</i>	G4?	SU	N	07-25-98	B
	Plant: Yellow-fringed Orchid <i>Platanthera ciliaris</i>	G5	S2	TU	07-25-98	CD
	Plant: Twisted Yellow-eyed Grass <i>Xyris torta</i>	G5	S1	N	09-01-97	B
Lewis Rocks (5)	Geologic Feature: Erosional Remnant	G?	S?	N	1979	E
Mains Run & Gum Run Ponds (5)	Plant: Small Beggar-ticks <i>Bidens discoidea</i>	G5	S3	PR	11-01-98	C
Middle Spring Creek Watershed (4)	Plant: Grass-leaved Rush <i>Juncus biflorus</i>	G5	S2	N	7/28/2001	BC
	Plant: Short-fruited Rush <i>Juncus brachycarpus</i>	G4G5	S1	PE	7/28/2001	BC
	Animal: Potomac Sculpin <i>Cottus girardii</i>	G4	S3S4	DL	07-06-97	B
Mudlevel Road Site (5)	Animal: Dickcissel <i>Spiza americana</i>	G5	SIB	N	07-16-92	E
Old Baltimore Road Site (5)	Plant: Yellow-fringed Orchid <i>Platanthera ciliaris</i>	G5	S2	N	07-29-95	D

Site Name (County Rank)	Special Species / Community Type	PNHP Ranks*		State Status	Last Seen (m-d-y)	Quality**
		Global	State			
Spring Hill School Grasslands (4)	Animal: Upland Sandpiper <i>Bartramia longicauda</i>	G5	S1S2B	PT	07-31-88	E
Thomson Hollow Ponds (2)	Plant: Lance-leaf Loosestrife <i>Lysimachia hybrida</i>	G5	S1	N	09-08-97	C
	Plant: Golden club <i>Orontium aquaticum</i>	G5	S4	DL	05-16-97	CD
	Plant: Northeastern bulrush <i>Scirpus ancistrochaetus</i>	G3	S3	PE	08-18-92	B

* Please refer to Appendix I for an explanation of PNHP Ranks and State Status.

**Please refer to Appendix II for an explanation of Quality Ranks.

Locally Significant: None

Managed Lands: Michaux State Forest

Other: High Quality Cold Water Fishery—Yellow Breeches Creek, Sthromes Hollow, Hairy Springs Hollow



Southampton Township is divided physiographically by the Great Valley Section in the north and the South Mountain Section in the south. Much of the South Mountain portion is within the Michaux State Forest and is managed by the Department of Conservation and Natural Resources. The South Mountain contains the largest expanse of unbroken forested land in the county and provides an important natural greenway extending south into Maryland. The natural areas in the township are dotted with large and small wetlands or pools, seeps, and swamps. Many temporary vernal pools dot the lower slopes of the north face of South Mountain. These ponds are extremely important as breeding habitat for amphibians, many of which will only breed in temporary pools such as these. The vernal ponds at this location are but a few of the many ponds that line the toe slopes of South Mountain in Cumberland and Franklin Counties. All of the vernal ponds along the lower slopes of South Mountain should be considered points of high biological importance as part of the larger continuous landscape of South Mountain. Additional vernal ponds are currently being mapped and described in the county by several organizations including The Nature Conservancy, Messiah College and Shippensburg University. Proposed building projects in the Township should be scrutinized to assess their impact on vernal pools in the vicinity. Much of the township's native biodiversity and scenery can be preserved by avoiding unnecessary fragmentation of landscape features by steering construction of new roads and buildings away from large forest blocks and wetlands, particularly in the southern portions of the township that are outside the state forest boundary. North of the South Mountain area the township is dominated by agriculture, though some moderate-sized forest blocks remain scattered throughout. Maintenance and restoration of connectivity between these woodlots would benefit wildlife by forming natural movement corridors.

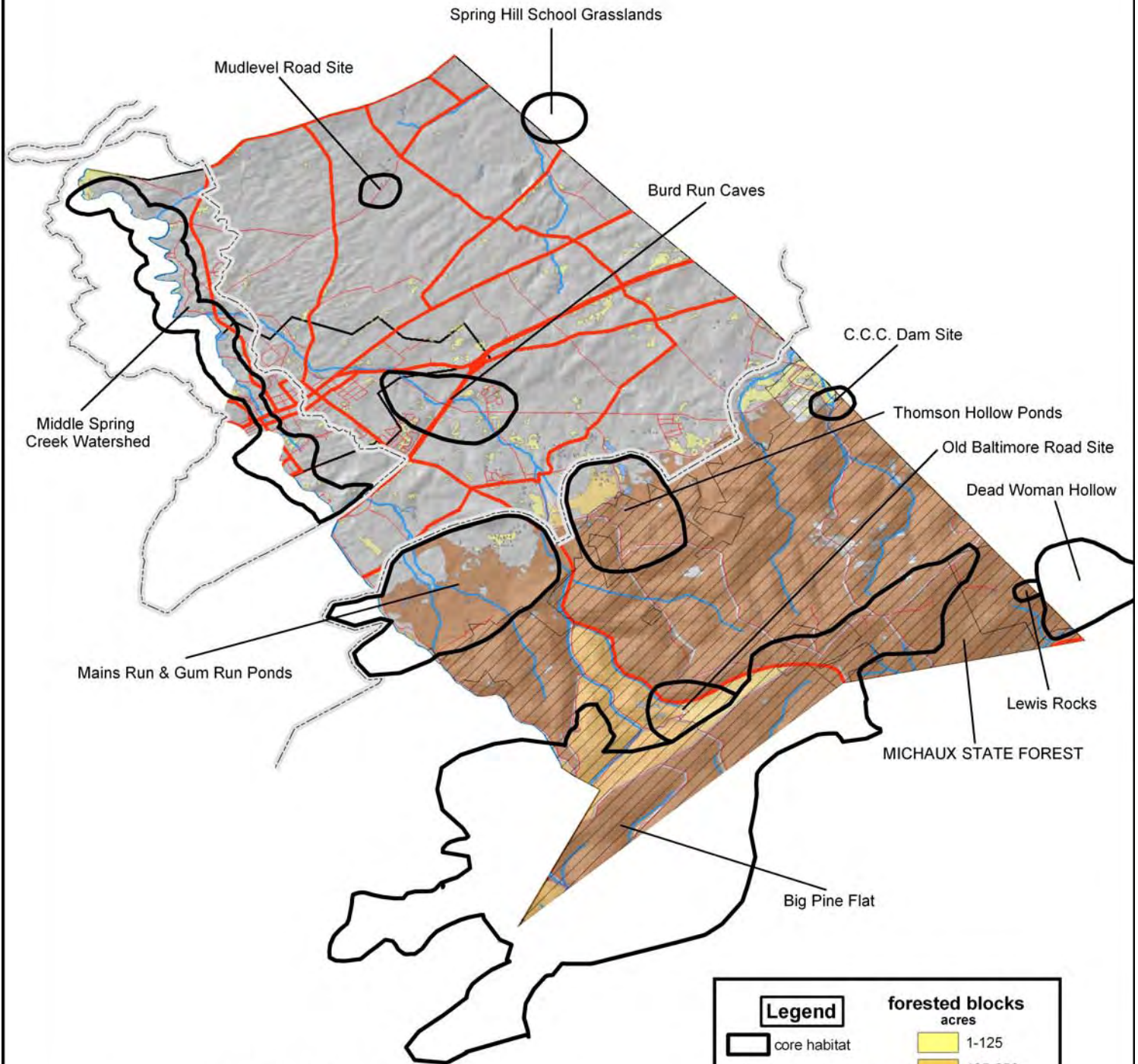
[SOUTHAMPTON TOWNSHIP MAP](#)



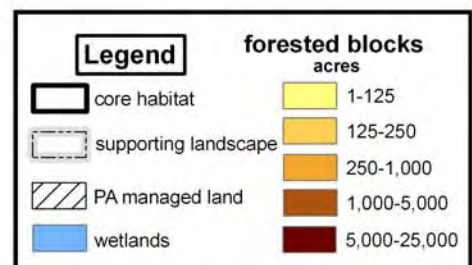
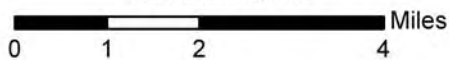
Southampton Township



Pennsylvania Natural Heritage Program



Scale: 1:130,000



BIG PINE FLAT—UPDATED—(Southampton Township and Franklin and Adams Counties)

Formerly BIG FLAT BARRENS. This site contains a large example of a **Ridgetop Dwarf-Tree Forest Natural Community**. This natural community complex is a mosaic of more narrowly defined community types including the “Pitch Pine – Scrub Oak Woodland”, “Pitch Pine - Mixed Hardwood Woodland”, “Pitch Pine - Heath Woodland”, “Scrub Oak Shrubland”, and “Low Heath Shrubland” (Fike 1999). This community complex is typically found between elevations of 1200 to 2100 feet where thin, dry soils, high winds, repeated cutting and frequent fires limit the growth of trees. The community occurs in several locations across Big Flat Ridge in Cumberland County. Most of the site is within Michaux State Forest.

Though covering many ridgetop plateaus in the state, this habitat type is considered rare on a global scale. The species found on these sites are specially adapted to the conditions of these acidic, droughty, nutrient poor soils, where other species cannot survive. The ridgetops in these areas are identified by pronounced dwarf-stature trees of pitch pine, scrub oak, chestnut oak, scarlet oak, white oak, black gum & sassafras. The dwarfed trees are usually accompanied by a thick undergrowth of blueberries, huckleberries, mountain laurel and black chokeberry. There usually exists a sparse herbaceous cover of bracken fern, teaberry, wintergreen, and wild sarsaparilla (Fike 1999). The extent of this Natural Community was delineated from aerial photography.

Many of the plant species of the pitch pine-scrub oak barrens are fire tolerant (e.g., with thick protective bark and the capability to resprout and to germinate after fires) and under natural conditions fire has likely helped to maintain the pitch pine-scrub oak community. The pine barren community supports a fair population of **G5, S1 PA-endangered dwarf iris (*Iris verna*)**. This plant is benefited by openings in the canopy artificially provided by existing trails, in addition to those that naturally occur in a barrens community when a fire regime is allowed to maintain the natural vegetative cover.

Plant diversity is typically low in pitch pine barrens, but these specialized habitats frequently harbor a high diversity of rare butterflies and moths. Some species of rare moths that occur in Pennsylvania are found solely in these environments. To date nine species of rare moths have been discovered at Big Flat Barrens. These include the **Footpath Sallow Moth (*Metaxaglaea semitaria*, G5, S2)**, **two Noctuid moths (*Platyperigea meralis*, G4, S1; *Apharetra purpurea*, G4, S2)**, **the southern variable dart moth (*Xestia elimata*, G5, S2S3)**, **the pine woods underwing (*Catocala* sp. 1 nr. *jair*, G5, S1)**, **a Zale moth (*Zale submediana*, G4, S2)**, **and the southern pine looper moth (*Caripeta aretaria*, G4, S1)**. The moth species here are dependent upon the unusual, fire-maintained vegetative community. Prescribed burning could help to maintain the Big Pine Flat community and reduce the fuel load and the subsequent risk of uncontrolled fires in this area.

A good quality population of **G3, S2 PA-endangered variable sedge (*Carex polymorpha*)** is found in the upper reaches of Birch Run, which flows out of the south side of Big Flat Barrens. It is found growing under a relatively open canopy of red maple and chestnut oak with lowbush blueberry, huckleberry, teaberry, and bracken fern. It is possible that it occurs elsewhere in this locality and further surveys are recommended.

The Adams and Franklin County portions of this site contain a small population of **Northeastern Bulrush (*Scirpus ancistrochaetus*)**, a **G3, S3 Federally Endangered** plant species, a fair

SOUTHAMPTON TOWNSHIP

population of **netted chainfern** (*Woodwardia areolata*, G5, S2), and a good quality **Ephemeral/fluctuating Pool Natural Community**. This **Ephemeral-fluctuating Pool Natural Community** contains vernal ponds on a moderate to gentle slope at the base of a very steep southeast-facing ridge. This site received a salvage cut in 1993 though an attempt was made to leave shelterbelts around the ponds. The majority of the site is now a combination of bare ground and blueberry scrub. The ponds are widely scattered over approximately 100 acres.

Threats and Disturbances

Disturbances include heavy trail use from hikers, All Terrain Vehicles and cars. There are no immediate threats to the area.

Conservation Recommendations

More surveys are needed to assess the population size of the animal species of concern and the breeding sites of these species. Without periodic fires, the scrub habitat would succeed to other hardwood species. Other hardwood species may represent greater potential income as harvestable timber, but these trees would not likely become economically large enough due to the harsh conditions of these sites. The periodic fire regime that has helped create and maintain the quality of this unique natural community type is likely incompatible with residential and commercial development. These Ridgetop Dwarf-Tree Natural Communities may be passed intact into the future if careful planning for their survival is undertaken now. The development and implementation of a prescribed burn management program would help maintain the quality of this naturally-occurring community.

BURD RUN CAVES (Southampton Township)

Three caves located near Burd Run are home to two state rare aquatic invertebrate animal species of concern restricted to caves and groundwater systems in south-central Pennsylvania. Both of these species have very specific habitat requirements, and like other species that have adapted to life in caves, they have no eyes or pigmentation. These caves occur in an agricultural area and thus are vulnerable to leaching of pesticides or fertilizer through the soil into the groundwater. Excessive drawdown of the water table and contamination of the ground water flowing through the cave are threats to the rare species.

C.C.C. DAM SITE—UPDATED—(South Newton and Southampton Townships)

This site is a former shallow dam in Hairy Springs Hollow near the base of South Mountain. The resulting artificial wetland habitat supports the **G5, S2 PA-threatened southern bog clubmoss** (*Lycopodiella appressa*) and the **formerly-listed bladderwort** (*Utricularia geminiscapa*). Associated plant species at the site include sphagnum mosses, beak rush, sundews, and rushes.

Threats and Disturbances:

Although artificial in origin and disturbed by ATV trails and trash dumping from the adjacent road, native species predominate at the site and the open character is favorable to the species of concern.

Conservation Recommendations:

No special management is recommended. The site is part of the Michaux State Forest.

DEAD WOMAN HOLLOW (Cooke, South Newton, and Southampton Townships)

This site includes several areas of acidic seeps near the headwaters of Mountain Creek. Four plant species of concern—**G5, SU Virginia bunchflower (*Melanthium virginicum*)**; **G4, SU Quillwort (*Isoetes valida*)**; **G5, S2 Yellow-fringed orchid (*Platanthera ciliaris*)**; and **G5, S1 Twisted yellow-eyed grass (*Xyris torta*)**—occur here in seepy lower slopes and ravines. The surrounding upland forests are dominated by oaks, pine, black gum and mountain laurel; the seeps themselves may be open or partially shaded by black gum, black birch, tulip tree, white pine, or hemlock. Skunk cabbage, sphagnum moss, manna grass, and sedges are prevalent groundcover species in the wetter portions of the seeps themselves. The site is within Michaux State Forest.

Threats and Disturbances:

Stilt grass and barberry are invasive species present in the seeps. Other potential threats include trampling or runoff from nearby bike trails and roads. Deer browsing is also a threat to one of the plant species of concern.

LEWIS ROCKS—NEW—(South Newton and Southampton Townships)

This site is considered an outstanding geologic feature of Pennsylvania. It is characterized by a group of hard, tough weather-resistant spires of quartzite, from the Weverton formation dating from the Cambrian (Geyer and Bolles 1979).

MAINS RUN & GUM RUN PONDS—UPDATED—(Southampton Township and Franklin County)

This site consists of an aggregation of vernal pools at the base of South Mountain along the Franklin County border. The area is highly disturbed, with some of the ponds having been filled with trash or with slash from logging operations. Some intact pools still exist; however, and are potential habitat both for breeding amphibians and for plant species of concern. A fair population of **Small Beggar's-Ticks (*Bidens discoidea*)**, a **G5, S3** Pennsylvania plant species of concern, was found in a buttonbush shrub swamp. Associated species include buttonbush and duckweed. The ponds are bordered by a swamp forest of red maple, pin oak, black gum, highbush blueberry, and winterberry, with manna grass, mosses, rushes, spike-rush, and buttonbush in their centers.

Threats and Disturbances

Threats and disturbances include dumping, clearing, and deer over-browsing. Road and home building has destroyed some ponds, but there is potential for some of the ponds to recover if protected from further disturbance.

Conservation Recommendations

As always for wetlands, it is recommended that a forested buffer be maintained around the shrub swamp to fully protect it from hydrology changes and surrounding land use changes.

MIDDLE SPRING CREEK WATERSHED—UPDATED—(Hopewell and Southampton Townships, Shippensburg Borough and Franklin County)

During surveys in 2000, a PA-Endangered animal was discovered in a small wetland along the creek. The wetland is fed by groundwater and has standing water in some areas. This site also supports a good population of Potomac sculpin (*Cottus girardii*), a recently delisted species. Several dozen individuals including juveniles were observed at four separate observation points along a section of

SOUTHAMPTON TOWNSHIP

Middle Spring Creek. Associated species include creek chub, blacknose dace, longnose dace, flathead minnow, bluegill, pearl dace, and juvenile brown trout.

Within this site, a calcareous wetland contains a population of **Grass-leaved Rush (*Juncus biflorus*)**, an S2 plant. Also included at this site is a fair to good population of **Short-fruited Rush (*Juncus brachycarpus*)**, a **G4G5, S1 PA-Endangered plant species of concern**. The area is partly described as a “wet meadow” with a small section of “cattail marsh”, and some adjacent upland area with scattered small trees and shrub thickets.

Threats and Disturbances:

The animal population and the quality of habitat in Middle Spring Creek are threatened by excessive siltation from agricultural runoff and by industrial pollution. Some of the wet areas have been filled and the ground has been disturbed. Threats to this animal include invasive species of plants and further development.

Conservation Recommendations

Maintaining and restoring undisturbed-forested buffers along the creek and avoiding disturbances to the stream and its banks will help the animal species of concern, as well as many others to continue to persist at this site. More surveys are needed at the wetland to determine the status of the PA endangered species. Management plans could include provisions for the control and removal of invasive species of plants.

MUDLEVEL ROAD SITE (Southampton Township)

An animal species of concern was last observed at this site in 1992. The site consists of an agricultural field, and the species of concern, the **Dickcissel (*Spiza americana*, G5, S1B)**, is a grassland species that occupies agricultural settings if the disturbance regime and other habitat requirements are suitable.

Conservation Recommendations

Although this species was not seen in 1998 surveys, a large area of similar habitat exists in the area, and maintaining the present condition of the agricultural landscape will favor the dickcissel and other grassland birds. Agricultural easements in this area would help to continue to provide suitable habitat for this species.

OLD BALTIMORE ROAD SITE (Southampton Township)

This site supports a poor-quality occurrence of the **G5, S2, PA-threatened yellow-fringed orchid (*Platanthera ciliaris*)**. A very small population of this species occurs in an acidic seepage area along with sedges, New York fern, and sphagnum moss. No special management is recommended for this occurrence.

SPRING HILL SCHOOL GRASSLANDS—NEW—(North Newton & Southampton Townships)

A breeding population of **G5, S1S2B PA-Threatened upland sandpiper (*Bartramia longicauda*)** was observed at this site in 1984 and again in 1988. These sightings did not make it into the original NAI report. This species is common in the mid-western prairies, and with the clearing of the Pennsylvania forests for agriculture in the 18th and 19th centuries, had spread across the state (Brauning 1992). With the abandonment and conversion of much farmland in the later half of the 20th century,

SOUTHAMPTON TOWNSHIP

suitable habitat for this species is on the decline. The upland sandpiper will utilize the open, grassy habitat of pastures, fallow fields, golf courses and airports.

Conservation Recommendations

Agricultural easements in this area would help to continue to provide suitable habitat for this species.

THOMSON HOLLOW PONDS (Southampton Township)

This site includes a group of vernal pools occurring in a forested landscape. The pools in this **Ephemeral-fluctuating Pool Natural Community** are variously vegetated with grasses, sedges, and rushes. Shrubs such as highbush blueberry and buttonbush are also common. These pools support populations of two plant species of special concern, including two good quality sub-populations of the **federal endangered northeastern bulrush (*Scirpus ancistrochaetus*)**. Additionally, the pools support a fair to good quality population of the **lance-leaf loosestrife (*Lysimachia hybrida*, G5, S1)**. Also present at this site is golden club (*Orontium aquaticum*), which has been removed from the species of concern list since the 2000 report. Along with supporting rare plants vernal pools can play an important role in helping to maintain the diversity of species in forest ecosystems. Vernal pools frequently only hold water from winter until mid-summer and are not capable of supporting fish species. The lack of fish makes them excellent breeding habitat for amphibians. These pools are often swarming with tadpoles or salamander larvae early in the growing season.

Threats and Disturbances:

The quality of the pools and the adjacent woods at this site has been degraded by logging.

Conservation Recommendations:

The quality of this site will improve by allowing the woods to regenerate without further disturbance. If logging is to continue in this area adequate buffers should be maintained around the pools and clear cutting should be avoided.



GOLDEN CLUB
(*Orontium aquaticum*) has recently been removed from the plant species of concern list due to updated state-wide population estimates. This conspicuous wetland plant is known from several locations in Cumberland and Dauphin Counties. Photo: PA Science Office of The Nature Conservancy.

SOUTH MIDDLETON TOWNSHIP, Mount Holly Springs Borough

Site Name (County Rank)	Special Species / Community Type	PNHP Ranks*		State Status	Last Seen (m-d-y)	Quality**
		Global	State			
Camp Tuckahoe (4)	Plant: Netted Chainfern <i>Woodwardia areolata</i>	G5	S2	N	07-20-98	BC
	Plant: Rough-leaved Aster <i>Eurybia radula</i>	G5	S2	N	07-20-98	BC
Hunters Run (2)	Plant: Showy Goldenrod <i>Solidago speciosa</i> var. <i>speciosa</i>	G5T5?	S?	N	10-19-97	BC
	Plant: Rough-leaved Aster <i>Eurybia radula</i>	G5	S2	N	10-19-97	C
	Plant: Glade Spurge <i>Euphorbia purpurea</i>	G3	S1	PE	07-27-98	C
	Plant: Golden Club <i>Orontium aquaticum</i>	G5	S4	DL	10-19-97	C
Mount Holly Marsh (2)	Plant: Glade Spurge <i>Euphorbia purpurea</i>	G3	S1	PE	1998	C
	Plant: Golden Club <i>Orontium aquaticum</i>	G5	S4	DL	06-25-92	C
	Animal Species of Concern	G5	S2	N	07-05-01	E

* Please refer to Appendix I for an explanation of PNHP Ranks and State Status.

**Please refer to Appendix II for an explanation of Quality Ranks.

Locally Significant: Upper Mill Woods

Managed Lands: Michaux State Forest
State Game Lands #305

Other: High Quality Cold Water Fisheries—Yellow Breeches Creek,
Letort Spring Run to T710, Old Town Run



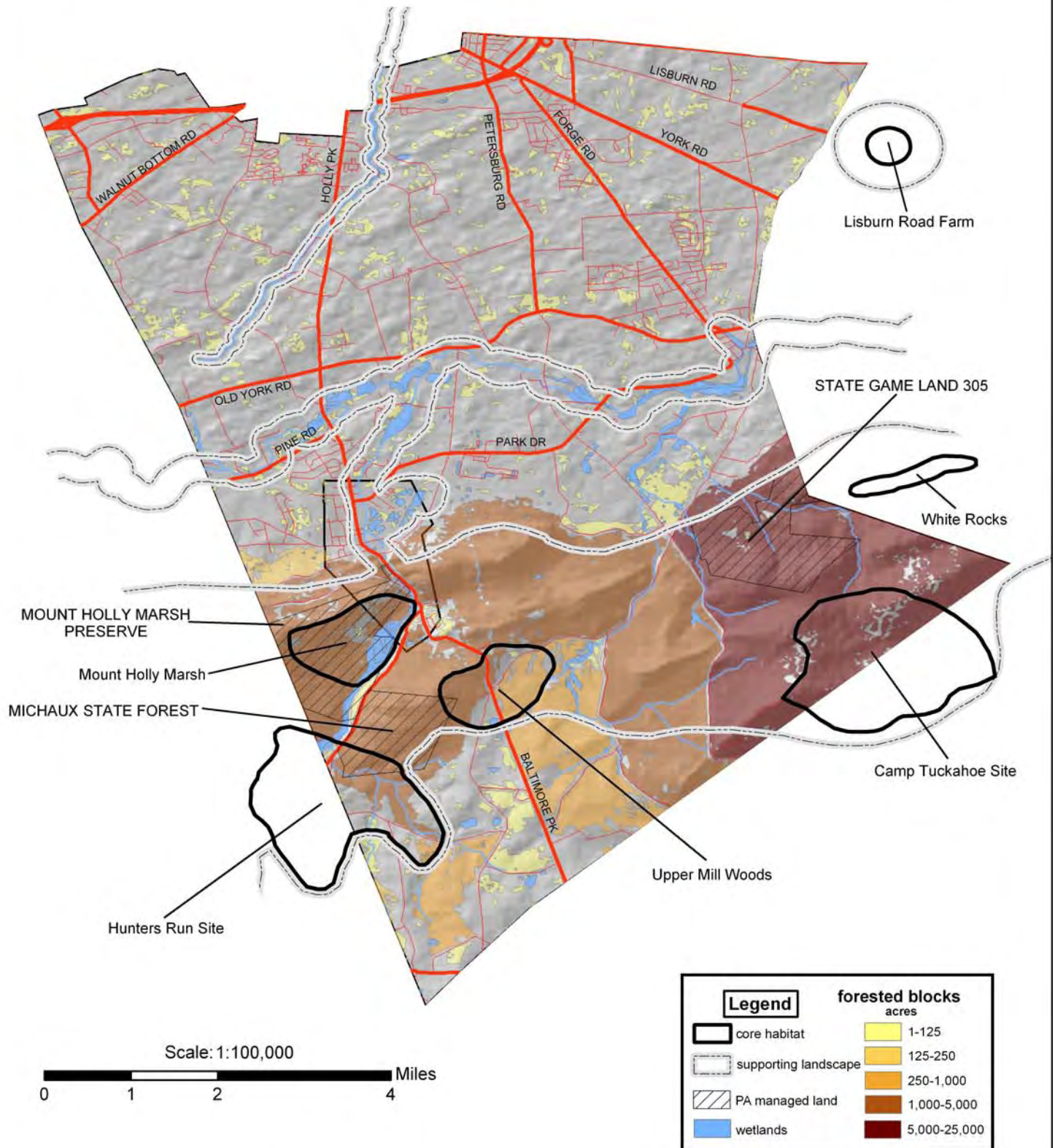
[SOUTH MIDDLETON TOWNSHIP MAP](#)



South Middleton Township



Pennsylvania Natural Heritage Program



SOUTH MIDDLETON TOWNSHIP

South Middleton Township is divided physiographically by the Great Valley Section in the north and the South Mountain Section in the south. Much of the South Mountain portion is already fragmented more than the rest of the ridgeline. The South Mountain contains the largest expanse of unbroken forested land in the county and provides an important natural greenway extending south into Maryland. The natural areas in the township are dotted with large and small wetlands or pools, seeps, and swamps. Several large blocks of forest remain along the Yellow Breeches Creek and maintain connectivity of natural habitats from South Mountain to the creek valley. Forested riparian corridors should be restored and maintained where they remain, particularly along the Yellow Breeches, but also along the length of Mountain Creek, which runs through the town of Mount Holly Springs. Forested buffers in these areas can help filter surface water runoff, preventing many non-point sources of pollution from entering waterways, protecting water quality in the township and the Susquehanna River basin. In addition, reforestation of creek and stream banks can help link larger forested blocks together, contributing to their utility as a natural wildlife corridor. Care should be taken in restoration efforts to use only native species of trees and shrubs, preferably of local sources. Much of the township's native biodiversity and scenery can be preserved by avoiding further fragmentation of landscape features by steering construction of new roads and buildings away from large forest blocks and wetlands, particularly in the southern portions of the township that are outside the state forest boundary. North of Yellow Breeches Creek the township is dominated by agriculture, though some moderate-sized forest blocks remain to the north. Maintenance and restoration of connectivity between these woodlots would benefit wildlife by forming natural movement corridors.

CAMP TUCKAHOE (South Middleton Township and York County)

In 1995, a very small population of **G5, S2 rough-leaved aster (*Eurybia radula*)** was observed flowering in a small floodplain meadow along the upper reaches of Dogwood Run at Camp Tuckahoe. Moist soils, such as those found in swamps and bogs, are needed for the persistence of this species. Also the partial light provided by canopy gaps may be a necessity for this species to flower. Several additional patches and clumps of the rough-leaved aster were located along acidic seeps in Cumberland County during visits to the site in 1996 and 1998. Also during the 1998 surveys, a fair-to-good population of **G5, S2 netted chainfern (*Woodwardia areolata*)** was located growing on a slope in filtered light and saturated stony loam soils. Associated species included red maple, black gum, highbush blueberry, cinnamon fern, mountain laurel, and marsh fern.

Threats and Disturbances:

The area has recently undergone extensive logging. Additionally, deer browse poses a regular threat to flowering plants such as the species of concern.

Conservation Recommendations

More searching of the upper reaches of Dogwood Run in both Cumberland and York Counties is necessary to establish the full extent of these occurrences.

HUNTERS RUN—UPDATED—(Dickinson, South Middleton Townships)

This site located along Hunters Run and adjacent Mountain Creek includes a mosaic of wetland cover types including acidic to Circumneutral swamp and several acidic seepage areas as well as the streams themselves. The site supports populations of three plant species of special concern including **G3, S1 PA-Endangered glade spurge (*Euphorbia purpurea*)**. This species occurs in

SOUTH MIDDLETON TOWNSHIP

several different subsets, occupying forested wetland pools and small streamside swamps. Associated plant species include red maple, black ash, spicebush, winterberry, skunk cabbage, and jewelweed. A nice diversity of sedges and other wetland herbs are also found here. The **G5, S2 rough-leaved aster (*Eurybia radula*)** occurs in the same streamside habitat, and the **G5T5?, S? showy goldenrod (*Solidago speciosa* var. *speciosa*)** occupies openings in the dry oak-pine forest along the Appalachian Trail adjacent to Mountain Creek. A portion of this site is on the Appalachian Trail National Corridor. The plant species golden club (*Orontium aquaticum*), noted to occur here, has been removed from the species of concern list.

Conservation Recommendations:

Leaving a forested buffer along Hunters Run and its tributaries and avoiding soil disturbances at this site will help these species to persist here.

MOUNT HOLLY MARSH—UPDATED—(South Middleton Township)

This site encompasses a fifty-plus acre wetland along Mountain Creek. The site contains two notable plant habitats--a circumneutral seepage swamp, characterized by red maple and black ash, and a wet to seepy meadow (formerly the location of mill ponds) dominated by various graminoids, cattail, and buttonbush. The swamp forest supports a fair-quality population of **G3, S1 PA-endangered glade spurge (*Euphorbia purpurea*)**. In 2001 several individuals of a rare invertebrate were observed in the marsh. The large wet meadow also contains a PA-endangered animal species, which occupies the wettest portions. The population, though small, appears to be reproducing successfully. Also present in the swamp forest is golden club (*Orontium aquaticum*), which has been removed from the species of concern list since the 2000 report.

Threats and Disturbances:

Deer herbivory is a threat to the plant species of concern. The primary threat to the site overall is the potential degradation of water quality and quantity.

Conservation Recommendations:

The site is owned by The Nature Conservancy and has been designated as a nature preserve. Protection of the water quality and quantity flowing into the site through forested riparian buffers and runoff control will maintain the characteristics of the wetland.

Locally Significant Site:

Upper Mill Woods—UPDATED—(South Middleton Township)

This site supports a fair to good quality population of the plant species golden club (*Orontium aquaticum*), which has been removed from the species of concern list since the 2000 report. With the delisting of this species, this site has been downgraded to a locally significant site. The population occurs on a seepy forested slope in sandy acidic soil. Associates include American burnet, cinnamon fern, marsh fern, sphagnum moss and a variety of other common herbs.

Conservation Recommendations:

The rare species at this site will benefit from rerouting an ATV trail that has been impacting the site and by leaving this seepy forested tract undisturbed.



Pitch pine (*Pinus rigida*) is a fire dependent species that has the unusual tendency to produce growth from lateral branch buds in response to a fire event, giving the trees a “bearded” appearance. Pitch pine is a common component of the Big Pine Flat Ridgetop Dwarf-tree Forest Natural Community. Residential development within this fire prone natural community should be discouraged.

Top photo: PA Science Office of The Nature Conservancy

Bottom photo: Roger Latham



SOUTH NEWTON TOWNSHIP

Site Name (County Rank)	Special Species / Community Type	PNHP Ranks*		State Status	Last Seen (m-d-y)	Quality**
		Global	State			
C.C.C. Dam Site (5)	Plant: Southern Bog Clubmoss <i>Lycopodiella appressa</i>	G5	S2	PT	9-12-97	B
	Plant: Bladderwort <i>Utricularia geminiscapa</i>	G5G4	S4	DL	09-13-97	B
Dead Woman Hollow (3)	Plant: Virginia Bunchflower <i>Melanthium virginicum</i>	G5	SU	N	07-25-98	C
	Plant: Quillwort <i>Isoetes valida</i>	G4?	SU	N	07-25-98	B
	Plant: Yellow-fringed Orchid <i>Platanthera ciliaris</i>	G5	S2	TU	07-25-98	CD
	Plant: Twisted Yellow-eyed Grass <i>Xyris torta</i>	G5	S1	N	09-01-97	B
Lewis Rocks (5)	Geologic Feature: Erosional Remnant	G?	S?	N	1979	E
Peach Orchard Hollow Ponds (3)	Plant: Northeastern bulrush <i>Scirpus ancistrochaetus</i>	G3	S3	PE	08-21-97	BC
Walnut Ridge Cave (5)	Animal: Northern Myotis <i>Myotis septentrionalis</i>	G4	S3B,S3N	CR	02-01-89	E

* Please refer to Appendix I for an explanation of PNHP Ranks and State Status.

**Please refer to Appendix II for an explanation of Quality Ranks.

Locally Significant: None

Managed Lands: Michaux State Forest

Other: High Quality Cold Water Fishery—Yellow Breeches
Creek, Watery Hollow Run

[SOUTH NEWTON TOWNSHIP MAP](#)

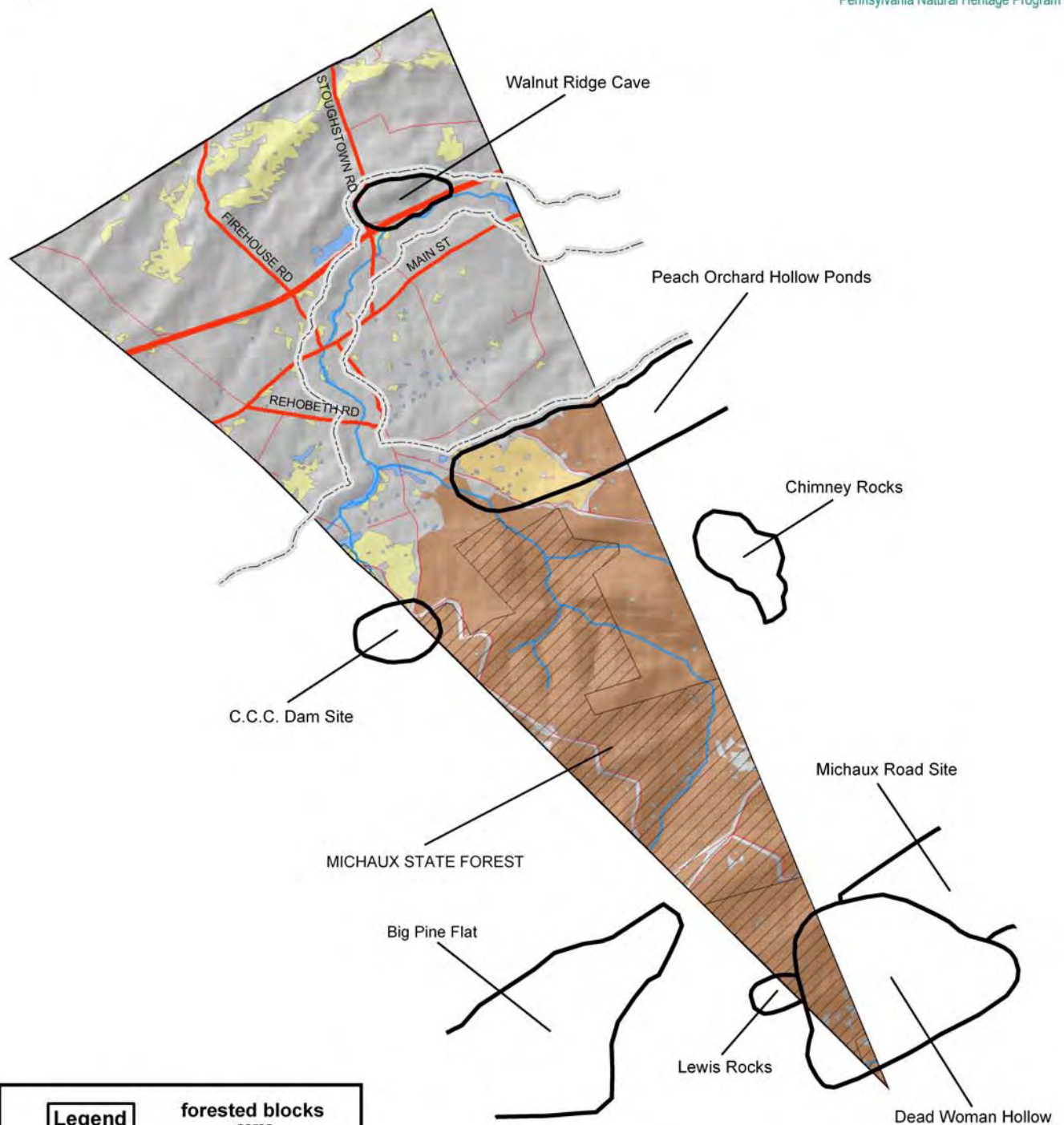




South Newton Township



Pennsylvania Natural Heritage Program



Legend

	core habitat		forested blocks acres
	supporting landscape		1-125
	PA managed land		125-250
	wetlands		250-1,000
			1,000-5,000
			5,000-25,000

Scale: 1:70,000

0 0.5 1 2 Miles

SOUTH NEWTON TOWNSHIP

South Newton Township is divided physiographically by the Great Valley Section in the north and the South Mountain Section in the south. Much of the South Mountain portion is within the Michaux State Forest and is managed by the Department of Conservation and Natural Resources. The South Mountain contains the largest expanse of unbroken forested land in the county and provides an important natural greenway extending south into Maryland. The natural areas in the township are dotted with large and small wetlands or pools, seeps, and swamps. Many temporary vernal pools dot the lower slopes of the north face of South Mountain. These ponds are extremely important as breeding habitat for amphibians, many of which will only breed in temporary pools such as these. The vernal ponds at this location are but a few of the many ponds that line the toe slopes of South Mountain in Cumberland and Franklin Counties. All of the vernal ponds along the lower slopes of South Mountain should be considered points of high biological importance as part of the larger continuous landscape of South Mountain. Additional vernal ponds are currently being mapped and described in the county by several organizations including The Nature Conservancy, Messiah College and Shippensburg University. Proposed building projects in the Township should be scrutinized to assess their impact on vernal pools in the vicinity. Much of the township's native biodiversity and scenery can be preserved by avoiding unnecessary fragmentation of landscape features by steering construction of new roads and buildings away from large forest blocks and wetlands, particularly in the southern portions of the township that are outside the state forest boundary. North of Yellow Breeches Creek the township is dominated by agriculture, though some moderate-sized forest blocks remain to the north. Maintenance and restoration of connectivity between these woodlots would benefit wildlife by forming natural movement corridors.

C.C.C. DAM SITE—UPDATED—(South Newton and Southampton Townships)

This site is a former shallow dam in Hairy Springs Hollow near the base of South Mountain. The resulting artificial wetland habitat supports the **G5, S2 PA-threatened southern bog clubmoss (*Lycopodiella appressa*) and the formerly-listed bladderwort (*Utricularia geminiscapa*)**. Associated plant species at the site include Sphagnum mosses, beak rush, sundews, and rushes.

Threats and Disturbances:

Although artificial in origin and disturbed by ATV trails and trash dumping from the adjacent road, native species predominate at the site and the open character is favorable to the species of concern.

Conservation Recommendations:

No special management is recommended. The site is part of Michaux State Forest.

DEAD WOMAN HOLLOW (Cooke, South Newton, and Southampton Townships)

This site includes several areas of acidic seeps near the headwaters of Mountain Creek. Four plant species of concern—G5, SU Virginia bunchflower (*Melanthium virginicum*); G4, SU Quillwort (*Isoetes valida*); G5, S2 Yellow-fringed orchid (*Platanthera ciliaris*); and G5, S1 Twisted yellow-eyed grass (*Xyris torta*)—occur here in seepy lower slopes and ravines. The surrounding upland forests are dominated by oaks, pine, black gum and mountain laurel; the seeps themselves may be open or partially shaded by black gum, black birch, tulip tree, white pine, or hemlock. Skunk cabbage, sphagnum moss, manna grass, and sedges are prevalent groundcover species in the wetter portions of the seeps themselves. The site is within Michaux State Forest.

Threats and Disturbances:

Stilt grass and barberry are invasive species present in the seeps. Other potential threats include trampling or runoff from nearby bike trails and roads. Deer browsing is also a threat to one of the plant species of concern.

LEWIS ROCKS—NEW—(South Newton and Southampton Townships)

This site is considered an outstanding geologic feature of Pennsylvania. It is characterized by a group of hard, tough weather-resistant spires of quartzite, from the Weverton formation dating from the Cambrian (Geyer and Bolles 1979).

PEACH ORCHARD HOLLOW PONDS—UPDATED—(Penn and South Newton Townships)

This site consists of numerous small woodland ponds (vernal pools) surrounded by oak-heath forest. Several of the ponds are lush with aquatic plant species including three-way sedge, pale meadow grass, and buttonbush. Shrubs including highbush blueberry, winterberry, and huckleberry grow on the pond margins along with red maple and black gum trees. This **Ephemeral-fluctuating Pool Natural Community** supports a fair to poor quality population of northeastern bulrush (*Scirpus ancistrochaetus*), a PA-endangered plant species. This population is of moderate size compared to other populations known from the state. The site boundary was updated to more accurately encompass the extent of vernal pool habitats based on aerial photography.

Threats and Disturbances

The quality of the habitat has been somewhat compromised by houses built among the ponds. The current hydrologic regime of the site appears to be adequately supporting the rare species.

Conservation Recommendations

Several other vernal pools are located nearby in this watershed. Along with supporting rare plants vernal pools can play an important role in helping to maintain the diversity of species in forest ecosystems. Vernal pools frequently only hold water from winter until mid-summer and are not capable of supporting fish species. The lack of fish makes them excellent breeding habitat for amphibians. These pools are often swarming with tadpoles or salamander larvae early in the growing season. Leaving this site in its current condition will help the rare species continue to persist here.

WALNUT RIDGE CAVE (South Newton Township)

The **G4, S3BS3N northern Myotis bat (*Myotis septentrionalis*)** was last observed hibernating in this cave in 1989. The status of this population is unknown, and additional surveys for this species or other animal species of concern in the cave are recommended.



The yellow-fringed orchid (*Platanthera ciliaris*) occurs in several open wetlands in Cumberland County. Removal from its natural habitat by uninformed gardeners may pose the greatest risk to this species.

Photo: PA Science Office of The Nature Conservancy.



Northern long-eared bats (*Myotis septentrionalis*) use caves and mine openings during the winter for hibernation.

Photo: PA Science Office of The Nature Conservancy

UPPER ALLEN TOWNSHIP, Mechanicsburg Borough

Site Name (County Rank)	Special Species / Community Type	PNHP Ranks*		State Status	Last Seen (m-d-y)	Quality**
		Global	State			
Trout Run Preserve / Upper Allen Marsh (5)	Animal: Sedge Wren <i>Cistothorus platensis</i>	G5	S1B	PT	08-31-88	D

* Please refer to Appendix I for an explanation of PNHP Ranks and State Status.

**Please refer to Appendix II for an explanation of Quality Ranks.

Locally Significant: None

Managed Lands: None

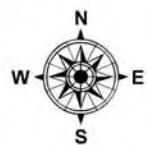


Upper Allen Township is composed of a mixture of urban development and agriculture, with some natural landscapes remain along the Yellow Breeches Creek along the southern border of the township. Significant forested blocks can be found along the riparian corridor of Yellow Breeches Creek and its tributaries, and should be maintained and restored. Forested buffers in these areas can help filter surface water runoff, preventing many non-point sources of pollution from entering waterways, protecting water quality in the township and the Susquehanna River basin. . In addition, reforestation of creek and stream banks can help link larger forested blocks together, contributing to their utility as a natural wildlife corridor. Care should be taken in restoration efforts to use only native species of trees and shrubs, preferably of local sources.

TROUT RUN NATURE PRESERVE/UPPER ALLEN MARSH (Upper Allen Township)

This site consists of a streamside wetland formerly used as a cow pasture. The vegetation is a mixture of mostly graminoid vegetation, including cattails, sedges, and grasses in the wettest portions and a mixture of native and exotic old field species in drier areas. The invasive species reed-canary grass is a dominant in some areas. The site has been used by various bird species, including Least Bittern, Great Blue Heron, and Great Egret, and in 1988 was noted to harbor a small population of **G5, S1B, PA-Threatened Sedge Wrens (*Cistothorus platensis*)**. Follow-up surveys should be conducted to determine if the wrens are still breeding at the site. The site is currently protected as part of Appalachian Audubon's Trout Run Nature Preserve.

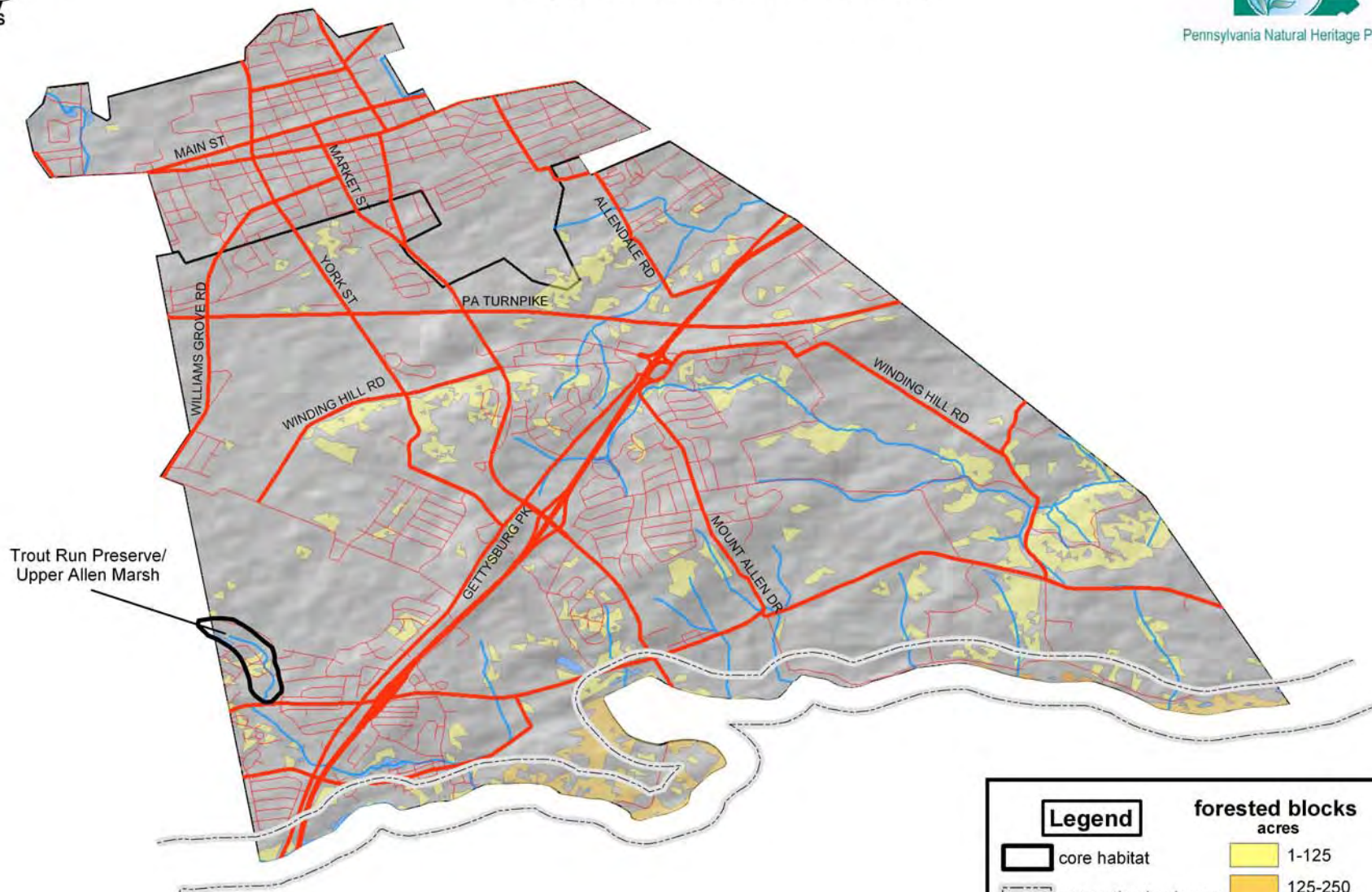
[UPPER ALLEN TOWNSHIP MAP](#)



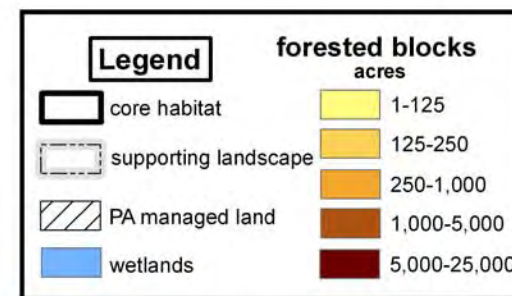
Upper Allen Township



Pennsylvania Natural Heritage Program



Scale: 1:60,000
0 0.5 1 2 Miles





Above: The Allegheny woodrat (*Neotoma magister*), which was once a common resident in Pennsylvania, is found in several locations in Cumberland County. The woodrat is a Pennsylvania-Threatened species.
Photo: Fred Habegger

Below: The Timber Rattlesnake (*Crotalus horridus*), a PA-Candidate species of concern, has been found on mountain ridges in Cumberland County. These misunderstood snakes are relatively mild-mannered, and will seek escape before defending themselves. This species is endangered in Pennsylvania primarily due to exploitation by snake hunters (Hulse 2001).
Photo: the PA Science Office of The Nature Conservancy



UPPER FRANKFORD TOWNSHIP

Site Name (County Rank)	Special Species / Community Type	PNHP Ranks*		State Status	Last Seen (m-d-y)	Quality**
		Global	State			
Bloserville Hill (3)	Plant: Missouri Gooseberry <i>Ribes missouriense</i>	G5	S1	PE	09-01-98	A
	Plant: Limestone Petunia <i>Ruellia strepens</i>	G4G5	S2	PT	07-10-00	CD
	Plant: Beard-tongue <i>Penstemon canescens</i>	G4	S3	N	07-10-00	B
Conodoguinet Creek East of Newville (4)	Plant: Beard-tongue <i>Penstemon canescens</i>	G4	S3	N	05-25-00	BC
	Plant: Limestone Petunia <i>Ruellia strepens</i>	G4G5	S2	PT	06-11-90	C
	Animal Species of Concern	G3	S2	N	08-02-94	E
Flat Rock Site (4)	Animal: Allegheny Woodrat <i>Neotoma magister</i>	G3G4	S3	PT	07-19-96	E

* Please refer to Appendix I for an explanation of PNHP Ranks and State Status.

**Please refer to Appendix II for an explanation of Quality Ranks.

Locally Significant: Locust Creek

Managed Lands: Tuscarora State Forest



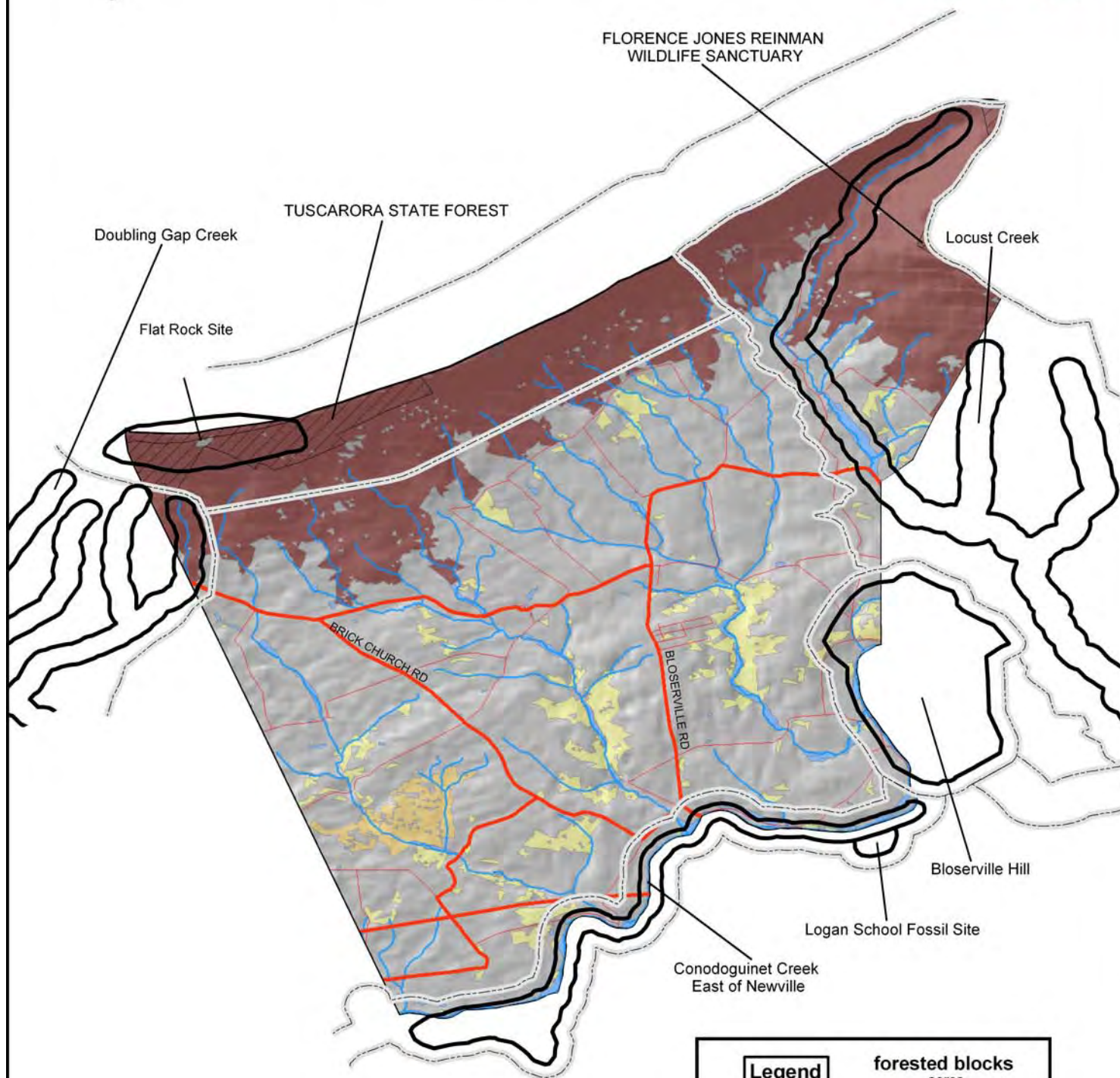
[UPPER FRANKFORD TOWNSHIP MAP](#)



Upper Frankford Township

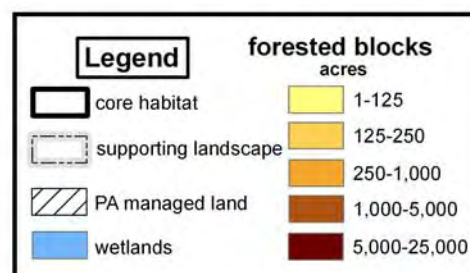


Pennsylvania Natural Heritage Program



Scale: 1:70,000

0 0.5 1 2 Miles



Upper Frankford Township supports several aquatic resources, from headwater streams to the Conodoguinet Creek. South of the Blue Mountain ridge corridor, the majority of the township is in agriculture. Several large blocks of forest remain along stream corridors but do not offer connectivity of natural habitats from the ridge to the Conodoguinet. Forested riparian corridors should be restored and maintained where they remain. Forested buffers help filter surface water runoff, preventing many non-point sources of pollution from entering waterways, protecting water quality in the township and the Susquehanna River basin. In addition, reforestation of creek and stream banks can help link larger forested blocks together, contributing to their utility as a natural wildlife corridor. The forested blocks of the valley portion of the township appear to be clustered in a few areas, lending themselves to protection and connectivity. Protection of the continuous forested ridge along Blue Mountain in the north is critical to maintaining this area as a wildlife corridor and to protecting the water quality of the headwater streams flowing into the valley below.

BLOSERVILLE HILL—UPDATED—(Upper Frankford and West Pennsboro Townships)

This site is a forested woodlot on a shale ridge. It supports a good quality population of a **PA-Endangered shrub species, Missouri gooseberry (*Ribes missouriense*)**. This species is the dominant shrub in portions of the forest at this site. It is reproducing well and should persist at the site indefinitely if it is not disturbed. Clearcutting of the woods would be detrimental to this species.

During a survey to this site in 2000, two additional plant species of concern were found in the floodplain and surrounding hills in this area. A fair-quality population of **G4G5, S2 PA-Threatened limestone petunia (*Ruellia strepens*)** and a good-quality population of **G4, S3 beard-tongue (*Penstemon canescens*)** were found associated with the shale slopes, associated with sycamore, osage orange, silver maple, box elder, American elm, shagbark hickory, bladdernut, wingstem, poverty grass, Virginia pine, and chestnut oak. The discovery of these two additional plant species of concern at this site increases the importance of maintaining undisturbed forested buffers along the Conodoguinet Creek and hillsides in this area.

CONODOGUINET CREEK EAST OF NEWVILLE—NEW—(Upper Frankford and West Pennsboro Townships)

Formerly BRIDGE ROAD SITE and CONODOGUINET CREEK AT ROUTE 4021 BRIDGE (These sites have been combined). This site supports a fair quality population of **G4G5, S2 PA-Threatened limestone petunia (*Ruellia strepens*)**. This plant is found growing along the creek with jewelweed, goldenrod, wingstem, and the exotic species dames rocket in a floodplain forest dominated by hackberry, silver maple, box elder, and slippery elm. Surveys in 2000 revealed the continued presence of a historically-recorded population of **G4, S3 beard-tongue (*Penstemon canescens*)** on the shale slopes above the creek.

Evidence of a G3 animal species was found at this site in the creek 1994. Further surveys are suggested to determine the extent and size of this population. This species is sensitive to water pollution and excessive sedimentation.

Threats and Disturbances:

Crowding by exotic species such as dames rocket, Japanese honeysuckle, and common privet which all occur at the site is a threat to both plant populations.

Conservation Recommendations:

Maintaining the forested buffer along the creek should benefit the limestone petunia as well as many other species that use floodplain forests.

FLAT ROCK SITE (Upper Frankford Township)

This southeast facing forested mountain slope supports the presence of the **G3G4, S3 PA-Threatened Allegheny woodrat (*Neotoma magister*)**. The canopy vegetation includes black oak and chestnut oak. The subcanopy includes witch hazel, mountain laurel, blackberry, and grape. Evidence of this population was last observed in 1996. This site is located within Tuscarora State Forest.

Locally Significant Site:

Locust Creek—UPDATED— (Lower Frankford and Upper Frankford Townships)

The well-shaded creek at this site supports a good quality population of Potomac sculpin (*Cottus girardii*), which has been removed from the species of concern list since the 2000 report. Though there are currently no listed species of concern at this site, the site supports a variety of aquatic species and warrants attention to its water quality. The site consists of a narrow hard-bottomed stream with a cobble substrate with scattered areas of silt and bedrock. Associated species include creek chub, blacknose dace, longnose dace, and fantail darter.

The Nodding Trillium, a G5, S3 plant species of concern, gets its name from the drooping way the flower is suspended below the leaves.

Photo: Sally Ray.





Good quality populations of prickly-pear cactus (*Opuntia humifusa*), a PA-Rare plant species of concern, are found in several locations in Cumberland County. Photo: PA Science Office of The Nature Conservancy

UPPER MIFFLIN TOWNSHIP

Site Name (County Rank)	Special Species / Community Type	PNHP Ranks*		State Status	Last Seen (m-d-y)	Quality**
		Global	State			
State Game Lands #169 (3)	Plant: Prickly-pear Cactus <i>Opuntia humifusa</i>	G5	S3	PR	05-14-98	BC
	Plant: Limestone Petunia <i>Ruellia strepens</i>	G4G5	S2	PT	09-21-88	D
	Animal: Black-crowned Night-heron <i>Nycticorax nycticorax</i>	G5	S2S3B	CA	05-14-98	BC
	Animal: Potomac Sculpin <i>Cottus girardii</i>	G4	S3S4	DL	06-07-97	B
Three Square Hollow East (4)	Animal: Allegheny Woodrat <i>Neotoma magister</i>	G3G4	S3	PT	10-02-86	C
Three Square Hollow Run (5)	Plant: Prickly-pear Cactus <i>Opuntia humifusa</i>	G5	S3	PR	02-22-98	C
	Plant: Crane-fly Orchid <i>Tipularia discolor</i>	G4G5	S3	N	05-25-88	D
	Animal: Potomac Sculpin <i>Cottus girardii</i>	G4	S3S4	DL	06-07-97	B

* Please refer to Appendix I for an explanation of PNHP Ranks and State Status.

**Please refer to Appendix II for an explanation of Quality Ranks.

Locally Significant: None

Managed Lands: Tuscarora State Forest
State Game Lands #169



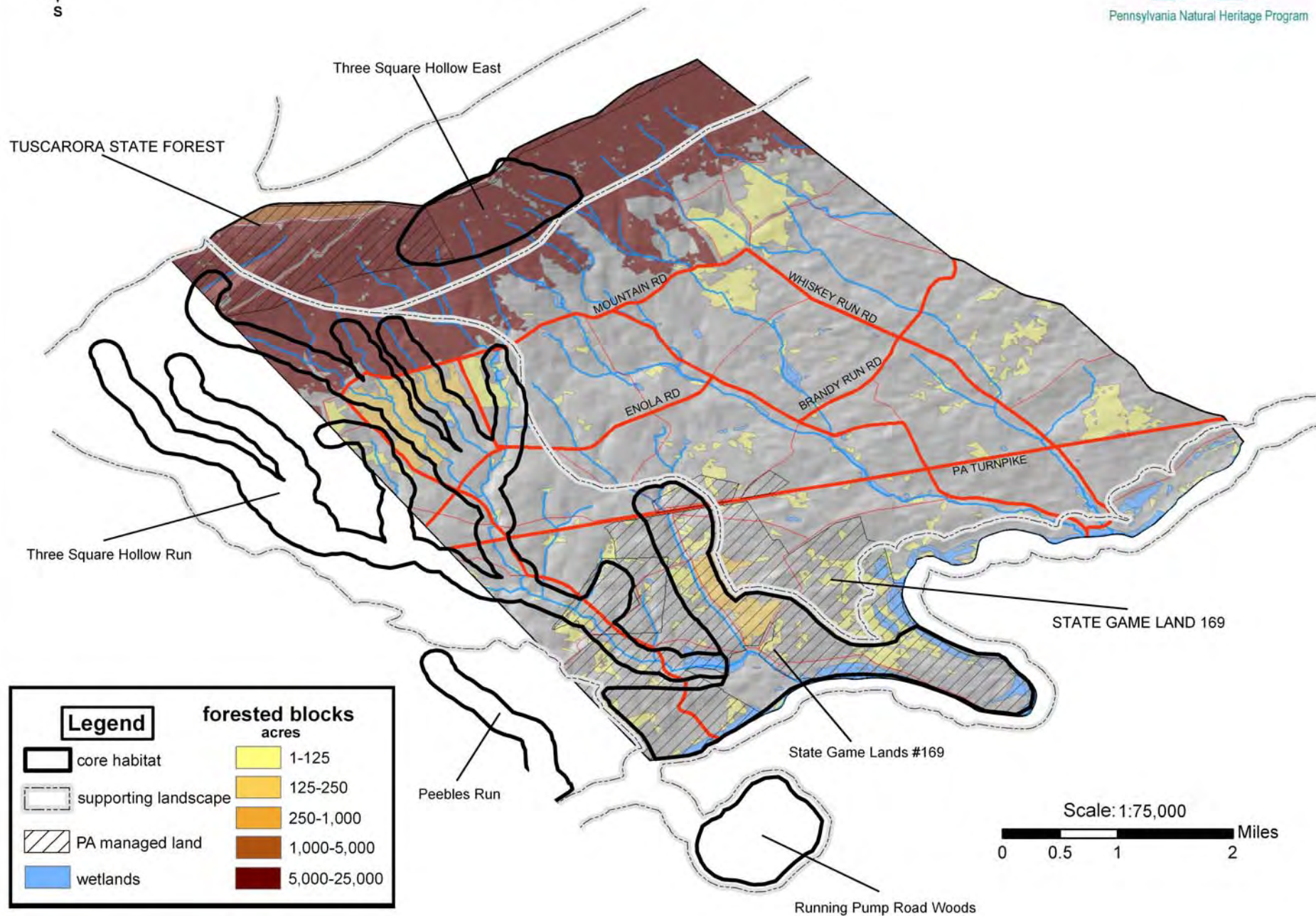
[UPPER MIFFLIN TOWNSHIP MAP](#)



Upper Mifflin Township



Pennsylvania Natural Heritage Program



Upper Mifflin Township supports several aquatic resources, from headwater streams to the Conodoguinet Creek. South of the Blue Mountain ridge corridor, the majority of the township is in agriculture. Several large blocks of forest remain close to the Blue Mountain and within the State Game Lands. Forested riparian corridors should be restored and maintained where they remain. Forested buffers help filter surface water runoff, preventing many non-point sources of pollution from entering waterways, protecting water quality in the township and the Susquehanna River basin. In addition, reforestation of creek and stream banks can help link larger forested blocks together, contributing to their utility as a natural wildlife corridor. Protection of the continuous forested ridge along Blue Mountain in the north is critical to maintaining this area as a wildlife corridor and to protecting the water quality of the headwater streams flowing into the valley below.

STATE GAME LANDS #169—UPDATED—(Upper Mifflin Township)

Two plant and two animal species of concern occur in different habitat within this game lands. This site supports three separate locations for a fair to good quality population of **prickly-pear cactus (*Opuntia humifusa*, G5, S3)**. The species occurs on dry, open barrens-like southwest-facing slopes. It may have been more extensive in the past but large sections of the site are succeeding to forest and shrubland and the cactus is being outcompeted. The best remaining areas are those that remain most open. Management of the State Game Lands, which has included plowing and planting of various grasses, has impacted the upper edges of the site. Knapweed and shrub honeysuckle are two non-native species that have also have been competing with the rare species. Keeping woody species from invading these small barrens openings will help this species persist at this site.

A poor-quality population of **PA-threatened limestone petunia (*Ruellia strepens*)** is associated with wetlands and floodplain along the north side of the Conodoguinet Creek. Disturbance of the forest canopy and competition from exotics are threats to this species, which also occurs at several locations downstream along the Creek. In 1998 a fair-to-good quality population of **PA-Endangered Black-crowned Night Heron (*Nycticorax nycticorax*)** was discovered to be nesting along the edges of a large, impounded lagoon between the Creek and the agricultural fields to the North. Preventing human disturbance to the lagoon and adjacent treelines will benefit this species at the site. Finally, the creek at this site supports a good quality population of Potomac sculpin (*Cottus girardii*), which has been removed from the species of concern list since the 2000 report.

THREE SQUARE HOLLOW EAST—NEW—(Upper Mifflin Township)

This site consists of the forested crest and steep upper slope of a southeast facing mountain ridge. It is dominated by mixed oak species growing from a talus substrate. It supports a fair quality population of the **PA-Threatened Allegheny woodrat (*Neotoma magister*)**. A small portion of this site is located in Tuscarora State Forest.

THREE SQUARE HOLLOW RUN—UPDATED—(Hopewell and Upper Mifflin Townships)

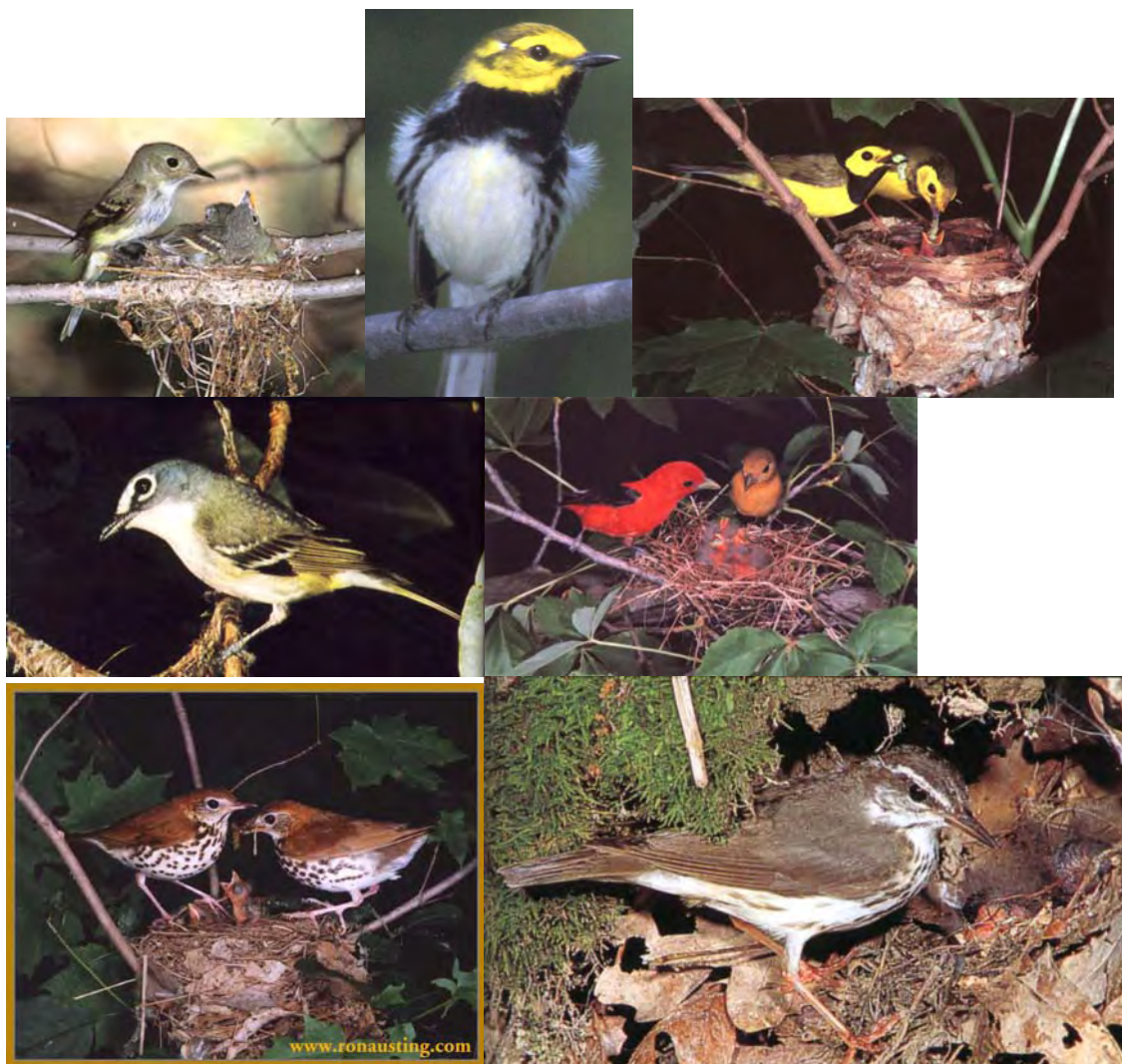
This site includes Mount Tabor Woods site from the 2000 report. A good-sized population of **G5, S3 prickly-pear cactus (*Opuntia humifusa*)** was found growing in artificial habitat along a shale outcrop roadbank within this site. The habitat here is an open upper slope with many exotic plant species and dry soil. Associated species include orchard grass, brome grasses and multiflora rose. Additionally, a single occurrence of the **G4G5, S3 crane fly orchid (*Tipularia discolor*)** was located within a shaly, moist oak-hickory forest stand, associated with may apple, false Solomon's seal, showy orchis, and wild comfrey. Surveys in 1998 failed to find a small population of G5, S3 puttyroot (*Aplectrum hyemale*), which was reported from Mount Tabor Woods in 1988. Follow-up surveys should be conducted to determine if this plant still occurs at the site.

UPPER MIFFLIN TOWNSHIP

The creek at this site supports a fair quality population of Potomac sculpin (*Cottus girardii*), which has been removed from the species of concern list since the 2000 report. The site consists of a moderate gradient clearwater creek with riffles, runs and a few pools flowing through a landscape of forest and old fields. Associated species include creek chub, common shiner, blacknose dace, longnose dace, fantail darter and tessellated darter.

Threats and Disturbances

The prickly pear cactus could be threatened by alteration of the roadside habitat as well as encroachment by exotic species. The crane fly orchid occurrence is very vulnerable to deer browse and trampling. Surveys should be done to determine if it has a greater extent than was found.



From left to right and top to bottom: Songbirds such as 1) **Acadian Flycatcher** (*Empidonax virens*), 2) **Black-throated Green Warbler** (*Dendroica virens*), 3) **Hooded Warbler** (*Wilsonia citrina*), 4) **Blue-headed Vireo** (*Vireo solitarius*), 5) **Scarlet Tanager** (*Piranga olivacea*), 6) **Wood Thrush** (*Hylocichla mustelina*), and 7) **Louisiana Waterthrush** (*Seiurus motacilla*) all depend on large blocks of interior forest for successful breeding. Nest parasitism specialists such as Brown-headed Cowbirds and predators such as house cats, raccoons and Blue Jays are not as plentiful in the forest interior as on the forest edge. Several large contiguous forests in Cumberland County have large diverse forest songbird populations. Protecting large blocks of forest is important to the continued nesting of these neo-tropical migrant landbirds in Cumberland County and Pennsylvania. (Photos by Ron Austing).

WEST PENNSBORO TOWNSHIP

Site Name (County Rank)	Special Species / Community Type	PNHP Ranks*		State Status	Last Seen (m-d-y)	Quality**
		Global	State			
Big Spring (5)	Geologic Feature: Springs	G?	S?	N	1979	E
Bloserville Hill (3)	Plant: Missouri Gooseberry <i>Ribes missouriense</i>	G5	S1	PE	09-01-98	A
	Plant: Limestone Petunia <i>Ruellia strepens</i>	G4G5	S2	PT	07-10-00	CD
	Plant: Beard-tongue <i>Penstemon canescens</i>	G4	S3	N	07-10-00	B
Conodoguinet Creek at Carlisle (4)	Plant: Limestone Petunia <i>Ruellia strepens</i>	G4G5	S2	PT	07-21-87	D
	Plant: White-Water Crowfoot <i>Ranunculus aquatilis</i> var. <i>diffusus</i>	G5T5	S3	N	06-24-97	BC
	Plant: Illinois Pondweed <i>Potamogeton illinoensis</i>	G5	S3S4	TU	06-24-97	E
Conodoguinet Creek at Mt. Zion School Road (2)	Plant: Beard-tongue <i>Penstemon canescens</i>	G4	S3	N	07-07-00	BC
	Plant: Slender Goldenrod <i>Solidago speciosa</i> var. <i>erecta</i>	G5	S1	PE	07-05-00	B
	Plant: Stalked Wild Petunia <i>Ruellia pedunculata</i>	G5	S1	N	07-30-00	D
	Plant: Limestone Petunia <i>Ruellia strepens</i>	G4G5	S2	PT	07-30-00	D
	Plant: Sedge <i>Carex shortiana</i>	G5	S3	N	05-31-00	D

Site Name (County Rank)	Special Species / Community Type	PNHP Ranks*		State Status	Last Seen (m-d-y)	Quality**
		Global	State			
Conodoguinet Creek at Mt. Rock Spring Creek (5)	Plant: White-water Crowfoot <i>Ranunculus aquatilis</i> var. <i>diffusus</i>	G5T5	S3	N	06-08-97	E
Conodoguinet Creek East of Newville (4)	Plant: Beard-tongue <i>Penstemon canescens</i>	G4	S3	N	05-25-00	BC
	Plant: Limestone Petunia <i>Ruellia strepens</i>	G4G5	S2	PT	06-11-90	C
	Animal Species of Concern	G3	S2	N	08-02-94	E
Logan School Fossil Site (5)	Geologic Feature: Invertebrate Fossil Animals	G?	S?	N	1979	E

* Please refer to Appendix I for an explanation of PNHP Ranks and State Status.

**Please refer to Appendix II for an explanation of Quality Ranks.

Locally Significant: None

Managed Lands: None

Other: Big Spring Creek—Exceptional Value to SR 3007/T333



West Pennsboro Township lies entirely in the Great Valley Section of the Ridge and Valley Physiographic Province and is primarily an agricultural township. Several streams run through the township and into the Conodoguinet Creek, including the Exceptional Value Big Spring Creek. The largest blocks of forest remaining in the township are found along the Big Spring drainage. Forested riparian corridors should be restored and maintained where they remain, not only along Big Spring and the Conodoguinet Creek, but also along Alexanders Spring Creek and Mount Rock Spring Creek. Forested buffers help filter surface water runoff, preventing many non-point sources of pollution from entering waterways, protecting water quality in the township and the Susquehanna River basin. In addition, reforestation of creek and stream banks can help link larger forested blocks together, contributing to their utility as a natural wildlife corridor. Care should be taken in restoration efforts to use only native species of trees and shrubs, preferably of local sources. Several other forested blocks are scattered through the agricultural valley; maintenance and restoration of connectivity between these woodlots would benefit wildlife by forming natural movement corridors.

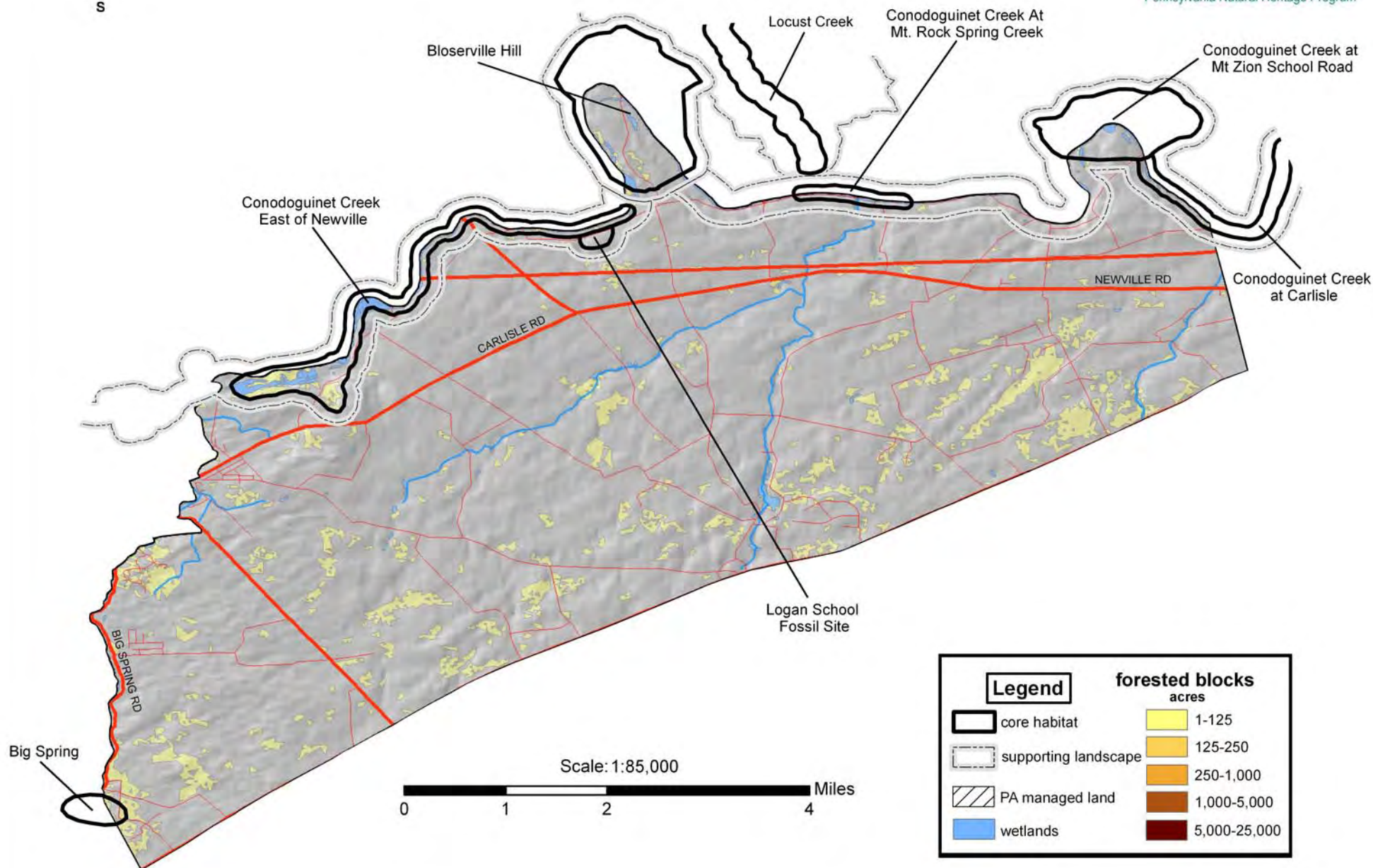
[WEST PENNSBORO TOWNSHIP MAP](#)



West Pennsboro Township



Pennsylvania Natural Heritage Program



BIG SPRING—NEW—(North Newton and West Pennsboro Townships)

This site is considered an outstanding geologic feature of Pennsylvania. The spring is the starting point for the Big Spring Creek, and it is the fifth largest spring in the state, having a flow of 12,500 gallons per minute (Geyer and Bolles 1979).

BLOSERVILLE HILL—UPDATED—(Lower Frankford and West Pennsboro Townships)

This site is a forested woodlot on a shale ridge. It supports a good quality population of a **PA-Endangered shrub species, G5, S1 Missouri gooseberry (*Ribes missouriense*)**. The gooseberry is the dominant shrub in portions of the forest at this site. It is reproducing well and should persist at the site indefinitely if it is not disturbed.

During a survey to this site in 2000, two additional plant species of concern were found in the floodplain and surrounding hills in this area. A fair-quality population of **limestone petunia (*Ruellia strepens*)**, a **G4G5, S2 PA-Threatened** plant species of concern, and a good-quality population of **G4, S3 beard-tongue (*Penstemon canescens*)** were documented in this survey.

Threats and Disturbances

Clearcutting of the woods would be detrimental to these species.

Conservation Recommendations

The discovery of these two additional plant species of concern at this site increases the importance of maintaining undisturbed forested buffers along the Conodoguinet Creek and hillsides in this area.

CONODOGUINET CREEK AT CARLISLE (North Middleton and West Pennsboro Townships)

This site extends along a several-mile stretch of the Conodoguinet Creek and supports three plant species of special concern. Two of these, the **white-water crowfoot (*Ranunculus aquaticus* var. *diffusus*, G5T5, S3)** and the **Illinois pondweed (*Potamogeton illinoensis*, G5, S3S4)**, are aquatic, growing submerged in the Conodoguinet. Populations for these species are small and thinly scattered in the creek. They occur with curly pondweed, broad waterweed, and horned pondweed. These two rare species found in this section of the creek likely occur at other locations up and downstream, and further surveys are recommended. The floodplain adjacent to the Creek supports a poor-quality population of **PA-threatened limestone petunia (*Ruellia strepens*, G4G5, S2)**. It is found growing in a thicket of red elm, honey-locust, box elder, sycamore, black raspberry, and Japanese honeysuckle. Last observed in 1987, this occurrence may have since been overrun by exotic species. This species, which prefers rich floodplain soils, is known from several locations along the Conodoguinet Creek and probably occurs at additional sites on the creek that have yet to be surveyed.

Threats and Disturbances

Curly pondweed is an exotic species that grows thickly in parts of the Conodoguinet. It and other exotic plant species are likely out-competing native aquatic species and is a threat to the persistence of the rare species at this site.

Conservation Recommendations

Maintaining forest buffers along the banks of the Conodoguinet and its tributaries will provide habitat for the rare floodplain plant species as well as help to limit sediment loads in the creek and benefit the aquatic fauna and flora.

CONODOGUINET CREEK AT MT. ROCK SPRING CREEK (Lower Frankford and West Pennsboro Township)

This site includes a portion of the Conodoguinet Creek. The creek is wide and relatively shallow along this stretch with a bottom of gravel. It supports a small population of an aquatic plant species, **G5T5, S3 white-water crowfoot (*Ranunculus aquaticus* var. *diffusus*)**. It is likely more of this species occurs in the creek along this stretch. Further surveys are recommended to determine the quality and extent of this population.

Threats and Disturbances

The south side of the creek is poorly buffered at this site with no trees along the bank.

Conservation Recommendations

Forest buffer along the creek provides valuable habitat for both rare and common species as well as helping to prevent erosion and to maintain the quality of the water.

CONODOGUINET CREEK AT MT. ZION SCHOOL ROAD—NEW—(Lower Frankford & West Pennsboro Townships)

This site includes the Conodoguinet Creek floodplain and banks, as well as the forested hills and ravines flanking both sides of the creek. Five plant species of concern, including two S1 species, one S2 species and two S3 species were identified at this site in 2000. A good-quality population of **G4, S3 beard-tongue (*Penstemon canescens*)**; a good-quality population **G5, S1 PA-Endangered slender goldenrod (*Solidago speciosa* var. *erecta*)**; and a small population of **G5, S1 stalked wild petunia (*Ruellia pedunculata*)**, the first and only record of this plant species occurring in Pennsylvania, were found among the shale cliffs and rock outcrops within a red cedar-mixed hardwood, rich shale woodland. A small population of **G4G5, S2 PA-Threatened limestone petunia (*Ruellia strepens*)** was found along the forested floodplain of the Conodoguinet Creek. **The sedge *Carex shortiana*, G5, S3**, was found in a small marsh in a forest opening within a wooded shale ravine. The forested floodplain along the creek, the forested slopes and ravines to the north of the creek, and the dry shale outcrops provide valuable habitat for the species of concern in this area.

Threats and Disturbances

Exotic species of plants including garlic mustard and Japanese honeysuckle present the greatest threat to these species. Deer browsing, logging operations and road maintenance are additional threats that may degrade the habitat at this site for these species.

Conservation Recommendations

Maintaining this site in its present condition with an intact forested buffer will best provide protection of the habitat for these species.

CONODOGUINET CREEK EAST OF NEWVILLE—NEW—(Upper Frankford and West Pennsboro Townships)

Formerly BRIDGE ROAD SITE and CONODOGUINET CREEK AT ROUTE 4021 BRIDGE (These sites have been combined). This site supports a fair quality population of **G4G5, S2 PA-Threatened limestone petunia (*Ruellia strepera*)**. This plant is found growing along the creek with jewelweed, goldenrod, wingstem, and the exotic species dames rocket in a floodplain forest dominated by hackberry, silver maple, box elder, and slippery elm. Surveys in 2000 revealed the continued presence of a historically-recorded population of **G4, S3 beard-tongue (*Penstemon canescens*)** on the shale slopes above the creek.

Evidence of a G3 animal species was found at this site in the creek 1994. Further surveys are suggested to determine the extent and size of this population. This species is sensitive to pollution and excessive sedimentation.

Threats and Disturbances:

Crowding by exotic species such as dames rocket, Japanese honeysuckle, and common privet which all occur at the site is a threat to both plant populations.

Conservation Recommendations:

Maintaining the forested buffer along the creek should benefit the limestone petunia as well as many other species that use floodplain forests.

LOGAN SCHOOL FOSSIL SITE—NEW—(West Pennsboro Township)

This site is considered an outstanding geologic feature of Pennsylvania. It contains abundant fossil species preserved in limestone of the Chambersburg Formation from the Middle Ordovician Age. The site is on private property and is not open to the public (Geyer and Bolles 1979).

Appendices

GLOSSARY

anthropogenic - human caused.

ATV - all-terrain-vehicle.

barrens - areas that are naturally infertile as a consequence of nutrient-poor soils; often form on resistant rock such as quartz, sandstone or highly weathered and leached glacial material.

canopy - the layer formed by the tallest vegetation.

circumneutral - pH between 5.5 and 7.

co-dominant - where several species together comprise the dominant layer (see "dominant" below).

community – an assemblage of plant or animal populations sharing a common environment and interacting with each other and the physical environment.

DCNR - Pennsylvania Department of Conservation and Natural Resources.

DEP - Pennsylvania Department of Environmental Protection.

diabase - a dark gray igneous rock. The chemical composition of diabase may support unusual plant communities.

dominant - the species (usually plant) exerting the greatest influence on a given community either by numerical dominance or influence on microclimate, soils and other species.

element - all-inclusive term for species of special concern and exemplary natural communities.

ericaceous - members of the heath family including blueberries, huckleberries, rhododendrons, and azaleas; these plants are adapted to living in acidic soils.

Exceptional Value Waters (EV) - DEP designation for a stream or watershed which constitutes an outstanding national, state, regional or local resource, such as waters of national, State or county parks or forests; or waters which are used as a source of unfiltered potable water supply, or waters of wildlife refuges or State Game Lands, and other waters of substantial recreational or ecological significance. For more detailed information about EV stream designations, the reader is referred to the Special Protection Waters Implementation Handbook (Shertzer 1992).

exotic - non-native; used to describe plant or animal species that were introduced by humans; examples include Japanese honeysuckle, purple loosestrife and grass carp; exotics present a problem because they may out-compete native species.

extant - currently in existence.

floodplain - low-lying land generally along streams or rivers that receives periodic flooding.

forb - non-grass herbaceous plant such as goldenrod.

graminoid - grass or grass-like plant such as a sedge or a rush.

ground cover - low shrubs, herbs and mosses that are found at or close to the ground surface.

hibernacula – a location where animals hibernate.

High-Quality Coldwater Fisheries (HQ-CWF) - DEP designation for a stream or watershed which has excellent quality waters and environmental or other features that require special water quality protection. For more detailed information about HQ-CWF stream designations, the reader is referred to the Special Protection Waters Implementation Handbook (Shertzer 1992).

hydrology - water system of an area including both surface water and ground water.

lepidoptera - moths and butterflies.

littoral - the area where water meets land, the shoreline.

mesic - moist, not saturated.

native – describes species that occurred in Pennsylvania or in the area in which they are found prior to European settlement; not introduced by human activities.

natural area - As used in this study, a site with either an exemplary natural community or species of special concern; not to be confused with the State Forest Natural Areas which are specific management units designated by DCNR Bureau of Forestry.

non-point - refers to diffuse sources of pollution such as storm water runoff contaminated with oil or pesticides.

POSCIP - Plant of Special Concern in Pennsylvania

Potential Natural Area - used by The Nature Conservancy to denote an area that may have desirable environmental characteristics to support rare species or exemplary natural communities, but which needs a field survey to confirm; a preliminary category given to sites prior to field survey (see METHODS section).

prescribed burning - burning under controlled conditions; needed to maintain communities such as limestone glades and pitch pine barrens.

riparian - streamside

rookery – the breeding ground of certain birds or animals, such as herons, penguins, and seals.

ROW - right-of-way, usually referring to powerlines or pipelines.

seeps - where water flows from the ground in a diffuse pattern and saturates the soil; lush herbaceous vegetation often grows in these wet areas.

soil association - a group of soils that are geographically associated in a characteristic repeating pattern and defined and delineated as a single unit.

soil series - groups of soils that have vertical profiles that are almost the same, that is, with horizons (layers) that are similar in composition, thickness, and arrangement.

succession - natural process of vegetation change through time; over time, the plant species of a site will change in composition and structure as light and soil conditions change (e.g., a field that is left alone may, over time, be taken over by shrubs, then small trees and eventually a woodland).

talus - slope formed of loose rock and gravel that accumulates at the base of mountains or cliffs.

TNC – The Nature Conservancy

understory - layer of shrubs and small trees between the herbaceous layer and the canopy.

upland – sites with well-drained dry to mesic soils.

wetland – are intermediate between aquatic and terrestrial habitats; characterized by a predominance of hydrophytes, where conditions are at least periodically wet enough, during the growing season, to produce anaerobic soil conditions and thereby influence plant growth.

vernal – occurring in the spring.

xeric - extremely dry or droughty.

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Appendix I: Natural Area Survey Form

Surveyor: _____ Address & Phone: _____

Date of Observation _____ Site Name: _____

Quadrangle Name _____ Exact Location of
Site (please be specific & include a map or sketch)

Owner: _____
Owners Attitude Toward Conservation: _____

Site Elevation: _____ Size of Site (acres): _____

Source of Lead: _____

Current Land Use: _____

Type of Area: ☐ Old Growth Forest; ☐ Marsh; ☐ Shrub Swamp;
☐ Forested Swamp; ☐ Bog; ☐ Natural Pond.

Written Description: Try to convey a mental image of the site features (including vegetation, significant animals & plants, aquatic features, land forms, geologic substrata, scenic qualities, etc.):

Evidence of Disturbance: _____

Site Condition Compared to Your Last Visit: _____

Please attach any additional information, species list, etc.
Please send completed report forms to Pennsylvania Science Office
of The Nature Conservancy, 208 Airport Drive, Middletown, PA 17057
(717) 948-3962. Additional forms may be obtained from this
office. Thank you for your contribution.

Appendix II: Community Classification

CLASSIFICATION OF NATURAL COMMUNITIES IN PENNSYLVANIA (Fike 1999)

Community Name	State Rank
Terrestrial Forests	
CONIFEROUS TERRESTRIAL FORESTS:	
Hemlock (white pine) forest	S4
CONIFER – BROADLEAF TERRESTRIAL FORESTS	
Serpentine pitch pine - oak forest	S1
Serpentine Virginia pine - oak forest	S1
Pitch pine - mixed oak forest	S4
Virginia pine - mixed hardwood forest	S5
Dry white pine (hemlock) - oak forest	S4
Hemlock (white pine) - northern hardwood forest	S5
Hemlock (white pine) - red oak - mixed hardwood forest	S4
Hemlock - tuliptree - birch forest	S4
Rich hemlock - mesic hardwood forest	S2S3
BROADLEAF TERRESTRIAL FORESTS	
Dry oak - heath forest	S4S5
Dry oak - mixed hardwood forest	S3
Red oak - mixed hardwood forest	S5
Northern hardwood forest	S4
Black cherry - northern hardwood forest	S4
Tuliptree - beech -maple forest	S4
Sugar maple - basswood	S4
Mixed mesophytic forest	S1S2
Sweet gum - oak coastal plain forest	S1
Red maple (terrestrial) forest	S5
Black-gum Ridgetop forest	S3
Aspen/gray (paper) birch forest	S3 NOT TRACKED
Palustrine Forests	
CONIFEROUS PALUSTRINE FORESTS	
Black spruce - tamarack peatland forest	S3
Red spruce palustrine forest	S3
Hemlock palustrine forest	S3
CONIFER – BROADLEAF PALUSTRINE FORESTS	
Hemlock - mixed hardwood palustrine forest	S3S4
Red spruce - mixed hardwood palustrine forest	S3
BROADLEAF PALUSTRINE FORESTS	
Bottomland oak - hardwood palustrine forest	S2
Red maple - black-gum palustrine forest	S3S4
Red maple - black ash palustrine forest	S2S3
Red maple - magnolia Coastal Plain palustrine forest	S1
Great Lakes Region lakeplain palustrine forest	S1
Sycamore - (river birch) - box-elder floodplain forest	S3
Silver maple floodplain forest	S3

Red maple - elm - willow floodplain swamp	S2
Terrestrial Woodlands	
CONIFEROUS WOODLANDS	
Pitch pine - heath woodland	S2
Pitch pine - scrub oak woodland	S2S3
Red spruce rocky summit	S1
Pitch pine - rhodora - scrub oak woodland	S1
CONIFER – BROADLEAF TERRESTRIAL WOODLANDS	
Pitch pine - mixed hardwood woodland	S2S3
Virginia pine - mixed hardwood shale woodland	S2
Red-cedar - mixed hardwood rich shale woodland	S1S2
BROADLEAF – TERRESTRIAL WOODLANDS	
Dry oak - heath woodland	S3
Birch (black-gum) rocky slope woodland	S2
Yellow oak - redbud woodland	S2
Great Lakes Region scarp woodland	S1S2
Great Lakes Region bayberry - cottonwood community	S1
Palustrine Woodlands	
CONIFEROUS PALUSTRINE WOODLANDS	
Pitch pine - leatherleaf palustrine woodland	S1
Black spruce - tamarack palustrine woodland	S2
Red spruce palustrine woodland	S2S3
BROADLEAF PALUSTRINE WOODLANDS	
Red maple - highbush blueberry palustrine woodland	S4
Red maple - sedge palustrine woodland	S4
Red maple - mixed shrub palustrine woodland	S4
Terrestrial Shrublands	
CONIFEROUS TERRESTRIAL SHRUBLANDS	
Red-cedar - prickly pear shale shrubland	S2
Red-cedar - pine serpentine shrubland	S1
CONIFER – BROADLEAF TERRESTRIAL SHRUBLANDS	
Red-cedar - redbud shrubland	S2
BROADLEAF TERRESTRIAL SHRUBLANDS	
Low heath shrubland	S1
Low heath - mountain ash shrubland	S2
Scrub oak shrubland	S3
Rhodora - mixed heath - scrub oak shrubland	S1
Palustrine Shrublands	
BROADLEAF PALUSTRINE SHRUBLANDS	
Buttonbush wetland	S4
Alder - ninebark wetland	S3
Alder - sphagnum wetland	S4
Highbush blueberry - meadow-sweet wetland	S5
Highbush blueberry - sphagnum wetland	S5
Leatherleaf - sedge wetland	S3
Leatherleaf - bog rosemary peatland	S2
Leatherleaf - cranberry peatland	S2S3
Water-willow (Decodon verticillatus) shrub wetland	S3

River birch - sycamore floodplain scrub	S4
Black willow scrub/shrub wetland	S4
Poison sumac - red-cedar - bayberry fen	S1
Buckthorn - sedge (Carex interior) - golden ragwort fen	S1
Great Lakes Region scarp seep	S1
Great Lakes Region bayberry - mixed shrub palustrine shrubland	S1
Terrestrial Herbaceous Openings	
Little bluestem - Pennsylvania sedge opening	S2
Side-oats gramma calcareous grassland	S1
Calcareous opening/cliff	S2
Serpentine grassland	S1
Serpentine gravel forb community	S1
Great Lakes Region dry sandplain	S1
Great Lakes Region sparsely vegetated beach	S1
Herbaceous Wetlands	
PERSISTENT EMERGENT WETLANDS	
Bluejoint - reed canary grass marsh	S5
Cattail marsh	S5
Tussock sedge marsh	S3
Mixed forb marsh	S3
Herbaceous vernal pond	S3S4
Wet meadow	S5 NOT TRACKED
Bulrush marsh	S3
Great Lakes Region palustrine sandplain	S1
Prairie sedge - spotted joe-pye-weed marsh	S1S2
Open sedge (Carex stricta, C. prairea, C. lacustris) fen	S1
Golden saxifrage - sedge rich seep	S2
Skunk cabbage - golden saxifrage forest seep	S4S5
Serpentine seepage wetland	S1
Golden saxifrage - Pennsylvania bitter-cress spring run	S3S4
Sphagnum - beaked rush peatland	S3
Many fruited sedge - bladderwort peatland	S2
Water-willow (Justicia americana) - smartweed riverbed community	S4
Riverside ice scour community	S1S2
Big bluestem - Indian grass river grassland	S3
NON-PERSISTENT EMERGENT WETLANDS	
Pickereel-weed - arrow-arum - arrowhead wetland	S4
Spatterdock - water lily wetland	S4
Community Complexes	
ACIDIC GLACIAL PEATLAND COMPLEX	
GREAT LAKES REGION SCARP COMPLEX	
ERIE LAKESHORE BEACH - DUNE - SANDPLAIN COMPLEX	
MESIC TILL BARRENS COMPLEX	
SERPENTINE BARRENS COMPLEX	
RIDGETOP ACIDIC BARRENS COMPLEX	
RIVER BED - BANK - FLOODPLAIN COMPLEX	

* Not all natural communities have been assigned a global or state rank; disturbed or artificial communities are not assigned ranks.

Appendix III: Field Survey Form

**PENNSYLVANIA NATURAL DIVERSITY INVENTORY EAST:
SPECIES OF SPECIAL CONCERN FIELD REPORT**

SNAME:

EOCODE:

SITENAME:

SURVEYDATE:

SURVEYSITE:

SOURCECODE

SURVEYOR:

SPECIMEN REPOSITORY:

Locational Information

QUADCODE

DOTNUM

TEN,TEN COUNTYCODE

TOWNSHIP

LAT:

LONG:

DIRECTIONS:

Global

PA EORANK:

EORANK

COMMENTS:

DATA:

HABITAT

DESCRIPTION:

MISCELLANEOUS:

DATA SENSITIVITY:

OWNERCODE

REASON FOR DATA

OWNER

SENSITIVITY:

HABITAT SKETCH:

Appendix IV: PNHP Ranks, Federal and State Status

FEDERAL AND STATE STATUS AND THE PENNSYLVANIA NATURAL HERITAGE PROGRAM RANKS

FEDERAL STATUS

U.S. FISH AND WILDLIFE SERVICE CATEGORIES OF ENDANGERED AND THREATENED PLANTS AND ANIMALS

The following definitions are extracted from the September 27, 1985 U.S. Fish and Wildlife Service notice in the Federal Register:

- LE** - Listed Endangered - Taxa in danger of extinction throughout all or a significant portion of their ranges.
- LT** - Listed Threatened - Taxa that are likely to become endangered within the foreseeable future through all or a significant portion of their ranges.
- PE** - Proposed Endangered - Taxa proposed to be formally listed as endangered.
- PT** - Proposed Threatened - Taxa proposed to be formally listed as threatened.
- C1** - Taxa for which the Service currently has on file substantial information on biological vulnerability and threat(s) to support the appropriateness of proposing to list them as endangered or threatened species.
- C2** - Taxa for which information now in possession of the Service indicates that proposing to list them as endangered or threatened species is possibly appropriate, but for which substantial data on biological vulnerability and threats are not currently known or on file to support the immediate preparation of rules.
- C3** - Taxa that are no longer being considered for listing as threatened or endangered species. Such taxa are further coded to indicate three categories, depending on the reason(s) for removal from consideration.
- 3A--Taxa for which the Service has persuasive evidence of extinction.
- 3B--Names that, on the basis of current taxonomic understanding, usually as represented in published revisions and monographs, do not represent taxa meeting the Act's definition of "species".
- 3C--Taxa that have proven to be more abundant or widespread than was previously believed and/or those that are not subject to any identifiable threat.
- N** - Taxa not currently listed by the U.S. Fish and Wildlife Service

APPENDIX IV (continued)

STATE STATUS - NATIVE PLANT SPECIES

Legislative Authority: Title 25, Chapter 82, Conservation of Native Wild Plants, amended June 18, 1993, Pennsylvania Department of Environmental Resources.

- PE -** Pennsylvania Endangered - Plant species which are in danger of extinction throughout most or all of their natural range within this Commonwealth, if critical habitat is not maintained or if the species is greatly exploited by man. This classification shall also include any populations of plant species that have been classified as Pennsylvania Extirpated, but which subsequently are found to exist in this Commonwealth.
- PT -** Pennsylvania Threatened - Plant species which may become endangered throughout most or all of their natural range within this Commonwealth, if critical habitat is not maintained to prevent further decline in this Commonwealth, or if the species is greatly exploited by man.
- PR -** Pennsylvania Rare - Plant species which are uncommon within this Commonwealth. All species of native wild plants classified as Disjunct, Endemic, Limit of Range and Restricted are included within the Pennsylvania Rare classification.
- PX -** Pennsylvania Extirpated - Plant species believed by the Department to be extinct within this Commonwealth. These plant species may or may not be in existence outside this Commonwealth. If plant species classified as Pennsylvania Extirpated are found to exist, the species automatically will be considered to be classified as Pennsylvania Endangered.
- PV -** Pennsylvania Vulnerable - Plant species which are in danger of population decline within Pennsylvania because of their beauty, economic value, use as a cultivar, or other factors which indicate that persons may seek to remove these species from their native habitats.
- TU -** Tentatively Undetermined - Plant species which are believed to be in danger of population decline, but which cannot presently be included within another classification due to taxonomic uncertainties, limited evidence within historical records, or insufficient data.
- N -** None - Plant species which are believed to be endangered, rare, or threatened, but which are being considered by the required regulatory review processes for future listing

APPENDIX IV (continued)

STATE STATUS - ANIMALS

The following state statuses are used by the Pennsylvania Game Commission for (1990, Title 34, Chapter 133 pertaining to wild birds and mammals) and by the Pennsylvania Fish and Boat Commission (1991, Title 30, Chapter 75 pertaining to fish, amphibians, reptiles and aquatic organisms):

PE - Pennsylvania Endangered

Game Commission - Species in imminent danger of extinction or extirpation throughout their range in Pennsylvania if the deleterious factors affecting them continue to operate. These are:

- 1) species whose numbers have already been reduced to a critically low level or whose habitat has been so drastically reduced or degraded that immediate action is required to prevent their extirpation from the Commonwealth; or
- 2) species whose extreme rarity or peripherality places them in potential danger of precipitous declines or sudden extirpation throughout their range in Pennsylvania; or
- 3) species that have been classified as "Pennsylvania Extirpated", but which are subsequently found to exist in Pennsylvania as long as the above conditions 1 or 2 are met; or
- 4) species determined to be "Endangered" pursuant to the Endangered Species Act of 1973, Public law 93-205 (87 Stat. 884), as amended.

Fish and Boat Commission - Endangered Species are all species and subspecies:

- 1) declared by the Secretary of the United States Department of the Interior to be threatened with extinction and appear on the Endangered Species List or the Native Endangered Species list published in the Federal Register; or,
- 2) declared by the Executive Director (PaFC) to be threatened with extinction and appear on the Pennsylvania Endangered Species List published in the Pennsylvania Bulletin.

PT - Pennsylvania Threatened

Game Commission - Species that may become endangered within the foreseeable future throughout their range in Pennsylvania unless the causal factors affecting the organism are abated. These are:

- 1) species whose populations within the Commonwealth are decreasing or have been heavily depleted by adverse factors and while not actually endangered, are still in critical condition; or
- 2) species whose populations may be relatively abundant in the Commonwealth but are under severe threat from serious adverse factors that have been identified and documented; or
- 3) species whose populations are rare or peripheral and in possible danger of severe decline throughout their range in Pennsylvania; or
- 4) species determined to be "Threatened" pursuant to the Endangered Species Act of 1973, Public law 93-205 (87-Stat. 884), as amended, that are not listed as "Pennsylvania Endangered".

Fish and Boat Commission - Threatened Species are all species and subspecies:

- 1) declared by the Secretary of the United States Department of the Interior to be in such small numbers throughout their range that they may become endangered if their environment worsens and appear on a Threatened Species List published in the Federal Register; or,
- 2) have been declared by the Executive Director (PaFC) to be in such small numbers throughout their range that they may become endangered if their environment worsens and appear on the Pennsylvania Threatened Species List published in the Pennsylvania Bulletin.

APPENDIX IV (continued)

PNHP GLOBAL ELEMENT RANKS

- G1** = Critically imperiled globally because of extreme rarity (5 or fewer occurrences or very few remaining individuals or acres) or because of some factor(s) making it especially vulnerable to extinction.
- G2** = Imperiled globally because of rarity (6 to 20 occurrences or few remaining individuals or acres) or because of some factor(s) making it very vulnerable to extinction throughout its range.
- G3** = Either very rare and local throughout its range or found locally (even abundantly at some of its locations) in a restricted range or because of other factors making it vulnerable to extinction throughout its range; in terms of occurrences, in the range of 21 to 100.
- G4** = Apparently secure globally, though it may be quite rare in parts of its range, especially at the periphery.
- G5** = Demonstrably secure globally, though it may be quite rare in parts of its range, especially at the periphery.
- GH** = Of historical occurrence throughout its range, i.e., formerly part of the established biota, with the expectation that it may be rediscovered (e.g., Bachman's Warbler).
- GU** = Possibly in peril range wide but status uncertain; need more information.
- GX** = Believed to be extinct throughout its range (e.g., Passenger Pigeon) with virtually no likelihood that it will be rediscovered.

PNHP STATE ELEMENT RANKS

- S1** = Critically imperiled in state because of extreme rarity (5 or fewer occurrences or very few remaining individuals or acres) or because of some factor(s) making it especially vulnerable to extirpation from the state.
- S2** = Imperiled in state because of rarity (6 to 20 occurrences or few remaining individuals or acres) or because of some factor(s) making it very vulnerable to extirpation from the state.
- S3** = Rare or uncommon in state (on the order of 21 to 100 occurrences).
- S4** = Apparently secure in state, with many occurrences.
- S5** = Demonstrably secure in state and essentially ineradicable under present conditions.

APPENDIX IV (continued)

SA = Accidental in state, including species which only sporadically breed in the state.

SE = An exotic established in state; may be native elsewhere in North America (e.g., house finch).

SH = Of historical occurrence in the state with the expectation that it may be rediscovered.

SN = Regularly occurring, usually migratory and typically non-breeding species for which no significant or effective habitat conservation measures can be taken in the state.

SR = Reported from the state, but without persuasive documentation which would provide a basis for either accepting or rejecting (e.g., misidentified specimen) the report.

SRF = Reported falsely (in error) from the state but this error persisting in the literature.

SU = Possibly in peril in state but status uncertain; need more information.

SX = Apparently extirpated from the state.

Note: A "T" appearing in either the G Rank or S Rank indicates that the intraspecific taxa is being ranked differently than the species. A "Q" in the rank indicates that there is taxonomic uncertainty about a taxa being ranked (i.e., taxa is being accepted as a full species or natural community in this list but may be treated as a variety or form by others). A "?" after a "G" or "S" indicates that the rank is uncertain at this time.

Appendix V: Pennsylvania Element Occurrence Quality Ranks

Quality Rank*	Explanation
A	Excellent occurrence: all A-rank occurrences of an element merit quick, strong protection. An A-rank community is nearly undisturbed by humans or has nearly recovered from early human disturbance; further distinguished by being an extensive, well-buffered occurrence. An A-rank population of a sensitive species is large in area and number of individuals, stable, if not growing, shows good reproduction, and exists in natural habitat.
B	Good occurrence: protection of the occurrence is important to the survival of the element in Pennsylvania, especially if very few or no A-rank occurrences exist. A B-rank community is still recovering from early disturbance or recent light disturbance, or is nearly undisturbed but is less than A-rank because of significantly smaller size, poorer buffer, etc. A B-rank population of a sensitive species is at least stable, in a minimally disturbed habitat, and of moderate size and number.
C	Fair occurrence: protection of the occurrence helps conserve the diversity of a region's or county's biota and is important to statewide conservation if no higher-ranked occurrences exist. A C-rank community is in an early stage of recovery from disturbance, or its structure and composition have been altered such that the original vegetation of the site will never rejuvenate, yet with management and time partial restoration of the community is possible. A C-rank population of a sensitive species is in a clearly disturbed habitat, small in size and/or number, and possibly declining.
D	Small occurrence: protection of the occurrence may be worthwhile for historical reasons or only if no higher ranked occurrences exist. A D-rank community is severely disturbed, its structure and composition been greatly altered, and recovery to original conditions, despite management and time, essentially will not take place. A D-rank population of a sensitive species is very small with a high likelihood of dying out or being destroyed, and exists in a highly disturbed and vulnerable habitat.
E	Verified as extant, but has not been given a rank; additional information needed to evaluate quality.

*Intermediate ranks may also be assigned.

Appendix VII: Plants and Animals of Special Concern in Cumberland County

PLANTS:

<u>SCIENTIFIC NAME</u>	<u>COMMON NAME</u>
<i>Aplectrum hyemale</i>	puttyroot
<i>Bidens discoidea</i>	small beggar-ticks
<i>Bouteloua curtipendula</i>	tall gramma
<i>Carex polymorpha</i>	variable sedge
<i>Carex shortiana</i>	a sedge
<i>Carya laciniosa</i>	shellbark hickory
<i>Erythronium albidum</i>	white trout-lily
<i>Euphorbia purpurea</i>	glade spurge
<i>Eurybia radula</i>	rough aster
<i>Iris verna</i>	dwarf iris
<i>Isoetes valida</i>	a quillwort
<i>Lupinus perennis</i>	a lupine
<i>Lycopodiella appressa</i>	southern bog clubmoss
<i>Lysimachia hybrida</i>	lance-leaved loosestrife
<i>Magnolia virginiana</i>	sweetbay magnolia
<i>Melanthium virginicum</i>	bunch-flower
<i>Opuntia humifusa</i>	prickly-pear
<i>Orontium aquaticum</i>	golden club
<i>Penstemon canescens</i>	beard-tongue
<i>Pinus echinata</i>	short-leaf pine
<i>Platanthera ciliaris</i>	yellow-fringed orchid
<i>Potamogeton illinoiensis</i>	Illinois pondweed
<i>Potamogeton richardsonii</i>	red-head pondweed
<i>Ranunculus aquaticus</i> var. <i>diffuses</i>	white-water crowfoot
<i>Ribes missouriense</i>	Missouri gooseberry
<i>Rotala ramosior</i>	tooth-cup
<i>Ruellia pedunculata</i>	stalked wild petunia
<i>Ruellia strepens</i>	limestone petunia
<i>Scirpus ancistrochaetus</i>	northeastern bulrush
<i>Solidago speciosa</i> var. <i>erecta</i>	slender goldenrod
<i>Solidago speciosa</i> var. <i>speciosa</i>	showy goldenrod
<i>Tipularia discolor</i>	crane-fly orchid
<i>Trillium cernuum</i>	a trillium
<i>Utricularia geminiscapa</i>	bladderwort
<i>Woodwardia areolata</i>	netted chainfern
<i>Xyris torta</i>	twisted yellow-eyed grass

ANIMALS:

<u>SCIENTIFIC NAME</u>	<u>COMMON NAME</u>
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<i>Alasmidonta marginata</i>	elktoe mussel
<i>Alasmidonta undulata</i>	triangle floater mussel
<i>Apharetra purpurea</i>	A Noctuid moth
<i>Asio otus</i>	Long-eared Owl
<i>Bartramia longicauda</i>	Upland Sandpiper
<i>Caecidotea pricei</i>	a cave amphipod
<i>Caripeta aretaria</i>	Southern pine looper moth
<i>Catocala sp. 1 nr. jair</i>	Pine woods <i>underwing</i> moth
<i>Cistothorus platensis</i>	Sedge Wren
<i>Clemmys muhlenbergii</i>	bog turtle
<i>Cottus girardii</i>	Potomac sculpin
<i>Crotalus horridus</i>	timber rattlesnake
<i>Lampsilis cariosa</i>	yellow lampmussel
<i>Lasmigona subviridis</i>	green floater mussel
<i>Metaxaglaea semitaria</i>	footpath sallow moth
<i>Myotis septentrionalis</i>	Northern myotis
<i>Neotoma magister</i>	Allegheny woodrat
<i>Nyctanassa violacea</i>	Yellow-crowned Night-heron
<i>Nycticorax nycticorax</i>	Black -crowned Night-heron
<i>Platyperigea meralis</i>	A Noctuid moth
<i>Spiza americana</i>	Dickcissel
<i>Somatochlora elongata</i>	ski-tailed emerald dragonfly
<i>Stygobromus biggersii</i>	A cave isopod
<i>Tyto alba</i>	Barn Owl
<i>Xestia elimata</i>	Southern variable dart moth
<i>Xylotype capax</i>	Broad sallow moth
<i>Zale submediana</i>	A Zale moth

NATURAL COMMUNITIES:

Acidic broadleaf swamp
Ephemeral/fluctuating natural pool
Northern Appalachian acidic seep
Ridgetop dwarf-tree forest

**Appendix VIII: Associated Species of Plants and Animals
Referenced in Site Descriptions for Cumberland County**

Common Name	Scientific Name
Amaranth	<i>Amaranthus spp.</i>
American Burnet	<i>Sanguisorba canadensis</i>
American Elm	<i>Ulmus americana</i>
Barberry	<i>Berberis thunbergii</i>
Basswood	<i>Tilia americana</i>
Beak Rush	<i>Rhycosphora spp.</i>
Beech	<i>Fagus grandifolia</i>
Bellwort	<i>Uvularia spp.</i>
Big Blue Stem	<i>Andropogon spp.</i>
Big Brown Bat	<i>Eptesicus fuscus</i>
Black Ash	<i>Fraxinus nigra</i>
Black Birch	<i>Betula lenta</i>
Black Chokeberry	<i>Aronia melanocarpa</i>
Black Gum	<i>Nyssa sylvatica</i>
Black Oak	<i>Quercus velutina</i>
Black Raspberry	<i>Rubus occidentalis</i>
Black Swallow-Wort	<i>Vincetoxicum nigrum</i>
Black Walnut	<i>Juglans nigra</i>
Black Willow	<i>Salix nigra</i>
Blacknose Dace	<i>Rhinichthys atratalus</i>
Bladdernut	<i>Staphylea trifolia</i>
Bladderwort	<i>Utricularia spp.</i>
Bloodroot	<i>Sanguinaria canadensis</i>
Blue Vervain	<i>Verbena hastata</i>
Bluebells	<i>Mertensia virginiana</i>
Bluegill	<i>Lepomis macrochirus</i>
Box Elder	<i>Acer negundo</i>
Broad Waterweed	<i>Elodea canadensis</i>
Brome Grasses	<i>Bromus spp.</i>
Brown Trout	<i>Salmo trutta</i>
Buttonbush	<i>Cephalanthus occidentalis</i>
Cardinal Flower	<i>Lobelia cardinalis</i>
Cattail	<i>Typha latifolia</i>
Chestnut Oak	<i>Quercus montana</i>
Cinnamon Fern	<i>Osmunda cinnamomea</i>
Common Shiner	<i>Luxilus cornutus</i>
Corn	<i>Zea mays</i>
Cottongrass	<i>Eriophorum spp.</i>
Cranberry	<i>Vaccinium macrocarpon</i>
Creek Chub	<i>Semolitus atromaculatus</i>
Curly Pondweed	<i>Potamogeton crispus</i>
Cut-Leaved Coneflower	<i>Rudbeckia laciniata</i>
Dame's Rocket	<i>Hesperis matronalis</i>

Common Name	Scientific Name
Dangleberry	<i>Gaylussacia frondosa</i>
Dewberry	<i>Rubus hispidus</i>
Duckweed	<i>Lemna minor</i>
Dutchman's Breeches	<i>Dicentra cucullaria</i>
Eastern Red Cedar	<i>Juniperus virginiana</i>
Eurasian Water-Milfoil	<i>Myriophyllum spicatum</i>
False Solomon's Seal	<i>Smilacina racemosa</i>
Fantail Darter	<i>Etheostoma flabellare</i>
Flathead Minnow	<i>Pimephales promelas</i>
Fly Poison	<i>Amianthium muscaetoxicum</i>
Fowl Meadow Grass	<i>Glyceria striata</i>
Garlic Mustard	<i>Alliaria officinalis</i>
Golden Alexander	<i>Zizia aurea</i>
Grape	<i>Vitis</i> spp.
Great Blue Heron	<i>Ardea herodias</i>
Great Egret	<i>Casmerodius albus</i>
Green Ash	<i>Fraxinus pennsylvanica</i>
Green Darners	<i>Anax junius</i>
Hackberry	<i>Celtis occidentalis</i>
Hay-Scented Ferns	<i>Dennstaedtia punctilobula</i>
Hemlock	<i>Tsuga canadensis</i>
Highbush Blueberry	<i>Vaccinium corymbosum</i>
Honey Locust	<i>Gleditsia tricanthos</i>
Honeysuckle	<i>Lonicera</i> spp.
Horned Pondweed	<i>Zannichellia palustris</i>
Indian Cucumber-Root	<i>Medeola virginiana</i>
Indian Grass	<i>Sorghastrum nutans</i>
Jack-In-The-Pulpit	<i>Arisaema triphyllum</i>
Japanese Honeysuckle	<i>Lonicera japonica</i>
Jewelweed	<i>Impatiens capensis</i>
Joe-Pye Weed	<i>Eupatorium fistulosum</i>
Kingfisher	<i>Ceryle alcyon</i>
Knapweed	<i>Centaurea nigrescens</i>
Least Bittern	<i>Ixobrychus exilis</i>
Little Blue Stem	<i>Schizachyrium scoparium</i>
Little Brown Bat	<i>Myotis lucifugus</i>
Longnose Dace	<i>Rhinichthys cataractae</i>
Lovegrass	<i>Eragrostis</i> spp.
Lowbush Blueberry	<i>Vaccinium angustifolium</i>
Mallards	<i>Anas platyrhynchos</i>
Manna Grass	<i>Glyceria acutiflora</i>
Map Turtles	<i>Graptemys geographica</i>
Maple-Leaved Viburnum	<i>Viburnum acerifolium</i>
Marsh Fern	<i>Thelypteris noveboracensis</i>
Marsh Marigold	<i>Caltha palustris</i>
May Apple	<i>Podophyllum peltatum</i>

Common Name	Scientific Name
Moneywort	<i>Lysimachia nummularia</i>
Mountain Laurel	<i>Kalmia latifolia</i>
Multiflora Rose	<i>Rosa multiflora</i>
Myrtle	<i>Vinca minor</i>
Nettle	<i>Urtica dioica</i>
New York Fern	<i>Thelypteris noveboracensis</i>
Ninebark	<i>Physocarpus opulifolius</i>
Norway Maple	<i>Acer platanoides</i>
Orchard Grass	<i>Dactylis glomerata</i>
Osage Orange	<i>Maclura pomifera</i>
Osprey	<i>Pandion haliaeetus</i>
Pale Meadow Grass	<i>Torreyochloa pallida</i>
Pearl Dace	<i>Semolitus margarita</i>
Pin Oak	<i>Quercus palustris</i>
Pitch Pine	<i>Pinus rigida</i>
Poison Ivy	<i>Toxicodendron radicans</i>
Pondweed	<i>Potamogeton pectinatus</i>
Poverty Grass	<i>Danthonia spicata</i>
Purple Loosestrife	<i>Lythrum salicaria</i>
Puttyroot	<i>Aplectrum hyemale</i>
Rattlesnake-Weed	<i>Hieracium venosum</i>
Red Elm	<i>Ulmus rubra</i>
Red Maple	<i>Acer rubrum</i>
Red Oak	<i>Quercus rubra</i>
Reed-Canary Grass	<i>Phalaris arundinacea</i>
River Birch	<i>Betula nigra</i>
Rock Bass	<i>Ambloplites rupestris</i>
Royal Fern	<i>Osmunda regalis</i>
Rushes	<i>Juncus caudatus</i>
Sassafras	<i>Sassafras albidum</i>
Scarlet Oaks	<i>Quercus coccinea</i>
Scrub Oak	<i>Quercus ilicifolia</i>
Sedge	<i>Carex folliculata</i>
Sedge	<i>Carex pennsylvanica</i>
Sensitive Fern	<i>Onoclea sensibilis</i>
Shagbark Hickory	<i>Carya ovata</i>
Showy Orchis	<i>Orchis spectabilis</i>
Silky Dogwood	<i>Cornus amomum</i>
Silver Maple	<i>Acer saccharinum</i>
Skunk Cabbage	<i>Symplocarpus foetidus</i>
Smartweeds	<i>Polygonum spp.</i>
Smooth Panic-Grass	<i>Panicum dichotorniflorum</i>
Sphagnum Moss .	<i>Sphagnum spp</i>
Spicebush	<i>Lindera benzoin</i>
Spike-Rush	<i>Eleocharis acicularis</i>
Spotted Salamanders	<i>Ambystoma maculatum</i>

Common Name	Scientific Name
Spotted Sandpiper	<i>Actitis macularia</i>
Spotted Turtles	<i>Clemmys guttata</i>
Spring Beauty	<i>Claytonia virginiana</i>
Stilt Grass	<i>Microstegium vimineum</i>
Sugar Maple	<i>Acer saccharum</i>
Sundews	<i>Drosera spp.</i>
Swamp Azalea	<i>Rhododendron viscosum</i>
Swamp Raspberry	<i>Rubus pubescens</i>
Swamp White Oak	<i>Quercus bicolor</i>
Sweet Cicely	<i>Osmorhiza claytonii</i>
Sycamore	<i>Platanus occidentalis</i>
Tesselated Darter	<i>Etheostoma olmstedii</i>
Three-Way Sedge	<i>Dulichium arundinaceum</i>
Trout Lily	<i>Erythronium americanum</i>
Tulip Tree	<i>Liriodendron tulipifera</i>
Turtlehead	<i>Chelone glabra</i>
Tussock Sedge	<i>Carex stricta</i>
Virginia Creeper	<i>Parthenocissus quinquefolia</i>
Virginia Pine	<i>Pinus virginiana</i>
Watercress	<i>Nasturtium officinalis</i>
Water-Leaf	<i>Hydrophyllum virginianum</i>
Water-Stargrass	<i>Zosterella dubia</i>
Waterweed	<i>Elodea nuttallii</i>
White Oak	<i>Quercus alba</i>
White Pine	<i>Pinus strobus</i>
Wild Columbine	<i>Aquilegia canadensis</i>
Wild Comfrey	<i>Cynoglossum virginianum</i>
Wild Leeks	<i>Allium tricoccum</i>
Wild Pink	<i>Silene caroliana</i>
Wild Sarsaparilla	<i>Aralia nudicaulis</i>
Wingstem	<i>Actinomeris altnernifolia</i>
Wingstem	<i>Verbesina alternifolia</i>
Winterberry	<i>Ilex verticillata</i>
Witch Hazel	<i>Hamamelis virginiana</i>
Yellow Birch	<i>Betula alleghaniensis</i>

Fact Sheets for Selected Species of Cumberland County

[Allegheny Woodrat](#)

[Northern Myotis](#)

[Barn Owl](#)

[Forest Interior birds](#)

[Grassland-dependent birds](#)

[Timber Rattlesnake](#)

[Bog Turtle](#)

[Vernal Pools](#)

[Checkered Sculpin](#)

[Cave Invertebrates](#)

[The Barrens Moths](#)

[Yellow Lampmussel](#)

[Carex polymorpha](#)