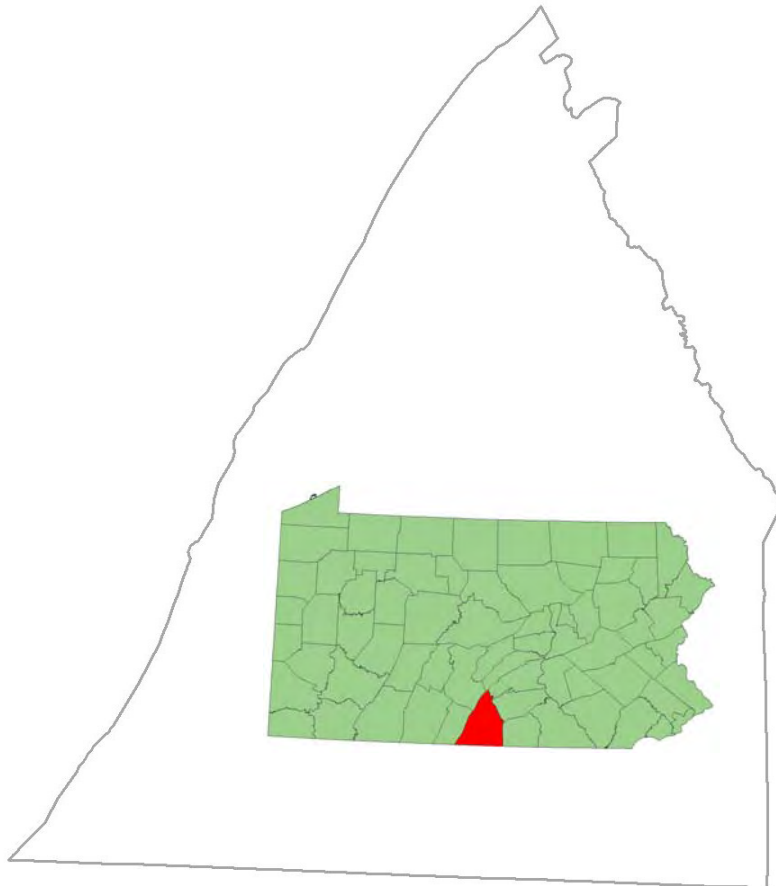


A NATURAL AREAS INVENTORY OF FRANKLIN COUNTY, PENNSYLVANIA 2004



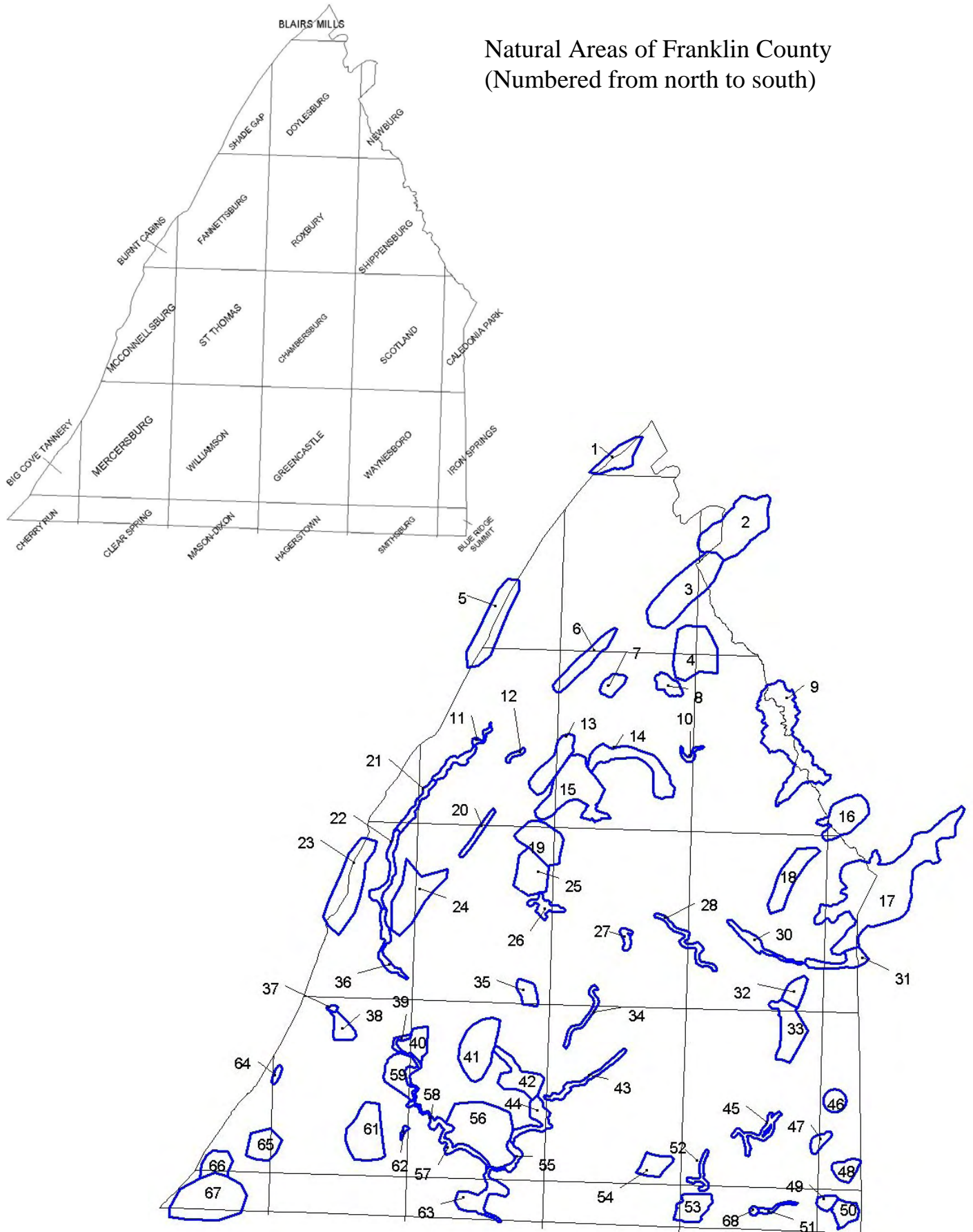
Submitted to:
The Franklin County Planning Commission
Administrative Annex
218 North Second Street
Chambersburg, PA 17201-1642

Prepared by:
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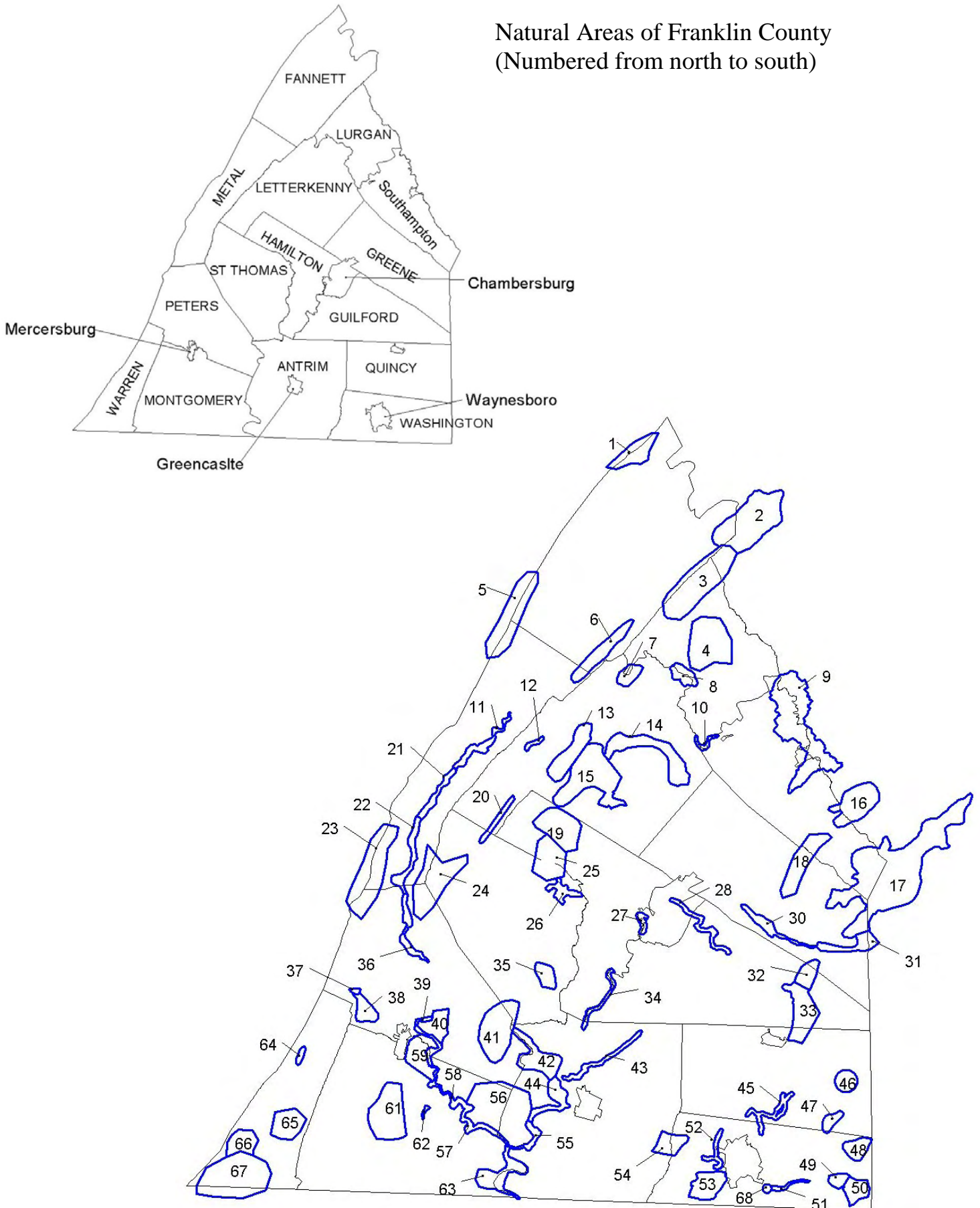
Franklin County USGS Quadrangle Index

Natural Areas of Franklin County (Numbered from north to south)



Franklin County Township Index

Natural Areas of Franklin County
(Numbered from north to south)



Site Index: (Sites numbered from north to south)

Site #	Site Name	Municipality(ies)	Map(s)	Page(s)
1	Concord Narrows	Fannett Twp., and Huntingdon Co.	41b	41
2	Second Narrows Slopes	Fannett Twp.	41b	41
3	Gunter Valley & Ridges	Fannett Twp., Lurgan Twp. and Cumberland Co.	41b, 66b	41, 66
4	Rt-997 North of Roxbury	Lurgan Twp.	66b	66
5	Neeleyton Ridgetop	Fannett Twp., Metal Twp. and Huntingdon Co.	41b, 66b	41, 66
6	Pine Run Ponds	Fannett Twp., Metal Twp.	41b, 66b	41, 66
7	Letterkenny Reservoir	Letterkenny Twp., Lurgan Twp.	60b, 66b	60, 66
8	Roxbury Floodplain	Letterkenny Twp., Lurgan Twp.	60b, 66b	60, 66
9	Middle Spring Creek Watershed	Southampton Twp. and Cumberland County	102b	102
10	Conodoguinet Creek at Orrstown	Letterkenny Twp., Southampton Twp., Lurgan Twp.	60b, 66b, 102b	60, 66, 102
11	Mountain Lake	Metal Twp.	72b	72
12	Conodoguinet Creek in Upper Horse Valley	Letterkenny Twp.	60b	60
13	Clarks Knob	Letterkenny Twp.	60b	60
14	Keasey Run Wetlands	Letterkenny Twp.	60b	60
15	Letterkenny Army Depot	Letterkenny Twp.	60b	60
16	Mains Run Ponds	Southampton Twp. and Cumberland Co.	102b	102
17	Big Pine Flat	Green Twp. , Southampton Twp. and Cumberland Co.	44b, 102b	43, 102
18	Mountain Run Ponds	Greene Twp., Southampton Twp	44b, 102b	44, 102
19	Dunn's Creek Meadow	Hamilton Twp.	56b	56
20	Bear Valley	Letterkenny Twp., St. Thomas Twp.	60b, 108b	60, 108
21	Metal Church Spring	Metal Twp.	72b	72
22	Upper West Branch Conococheague Creek	Metal Twp., Peters Twp.	72b, 87b	72, 87
23	Tuscarora Ridgetop	Metal Twp., Peters Twp. and Fulton Co.	72b, 87b	72, 87
24	Upper Horse Valley	Metal Twp., Peters Twp., St. Thomas Twp.	72b, 87b, 108b	72, 87, 108
25	Edenville Meadows	St. Thomas Twp., Hamilton Twp.	56b, 108b	56, 108
26	Wilson Run	St. Thomas Twp.	108b	108
27	Siberia	Guilford Twp., Hamilton Twp.	50b, 56b	50, 56
28	Falling Spring	Guilford Twp.	50b	50
30	Muskrat Fen	Greene Twp.	44b	44
31	Conodoguinet Creek at Caledonia Park	Greene Twp., and Adams County	44b	43
32	Mount Cydonia	Guilford Twp., Greene Twp.	44b, 50b	43, 50
33	Mont Alto Mountain	Guilford Twp., Quincy Twp.	50b, 98b	50, 98
34	Conococheague Creek Near Marion	Hamilton, Guilford and Antrim Townships	30b, 50b, 56b	28, 50, 56

Site Index: (Sites listed from north to south)

Site #	Site Name	Municipality(ies)	Map(s)	Page(s)
35	St. Thomas Barren	St. Thomas Twp.	108b	108
36	Fort Loudon Floodplain	Peters Twp.	88b	86
37	Rattlesnake Ridge	Peters Twp.	88b	86
38	Charlestown Ponds	Peters Twp.	88b	86
39	Mercersburg Woods	Montgomery Twp., Peters Twp.	78b, 88b	78, 86
40	Church Hill Marsh	Peters Twp.	88b	86
41	Williamson Shrubland	Antrim Twp., Peters Twp., St. Thomas Twp.	88b, 108b	87, 108
42	Sportsman's Road Shale Bank	Antrim Twp., Peters Twp.	30b, 87	29, 87
43	Muddy Run Spring	Antrim Twp.	30b	29
44	Conococheague Creek at Rt-16	Antrim Twp.	30b	28
45	Nunnery Spring	Quincy Twp, Washington Twp.	98b, 122b	98,122
46	Erosional Remnant	Quincy Twp.	98b	98
47	Glen Forney Vernalis	Quincy Twp., Washington Twp.	98b, 122b	98,122
48	Makey Run Ponds	Washington Twp.	122b	122
49	Beartown Woods	Washington Twp.	122b	122
50	Happel's Meadow	Washington Twp.	122b	122
51	Hoover Spring	Washington Twp.	122b	122
52	Zullinger Spring	Washington Twp.	122b	122
53	Antietam West Branch	Washington Twp.	122b	122
54	Wayneastle Old Field Habitat	Antrim Twp., Washington Twp.	30b, 122b	29, 122
55	Martin's Mill Bridge	Antrim Twp.	30b	29
56	Highland School Fields	Antrim Twp., Montgomery Twp., Peters Twp.	30b, 78b, 86b	28, 77, 86
57	Conococheague Creek at Highland School	Montgomery Twp.	30b, 78b	28, 77
58	West Branch Conococheague	Montgomery Twp.	78b	78
59	Mercersburg Meadow	Montgomery and Peters Twp.	78b, 86b	77, 86
61	Shimpstown Meadows	Montgomery Twp.	78b	78
62	Concrete Bottom at Licking Creek	Montgomery Twp.	78b	77
63	Lower Conococheague Creek	Antrim Twp., Montgomery Twp.	30b, 78b	29, 78
64	Tuscarora Trail	Warren Twp.	116b	116
65	Little Cove Creek Cliff	Warren Twp.	116b	116
66	SGL#124-Tuscarora Trail	Warren Twp.	116b	116
67	Licking Creek Woods	Warren Twp. and Maryland	116b	115
68	Needy Cave	Washington Twp.	122b	122

Site Index: (Sites listed alphabetically)

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38	Charlestown Ponds	Peters Twp.	88b	86
40	Church Hill Marsh	Peters Twp.	88b	86
13	Clarks Knob	Letterkenny Twp.	60b	60
1	Concord Narrows	Fannett Twp., and Huntingdon Co.	41b	41
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PREFACE

The Franklin County 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 county; 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 county 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 county, it is likely that something was missed. Anyone with information on sites that may have been overlooked should contact the Franklin County 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.

ACKNOWLEDGEMENTS

This project was funded in part by a state grant from the Pennsylvania Department of Conservation and Natural Resources, Bureau of Recreation and Conservation, Wild Resource Conservation Program. The Alexander Stewart, M.D. Foundation, and the Franklin County Planning Commission provided additional financial support.

Thanks to the Franklin County Commissioners, Franklin County Planning Commission and the Pennsylvania Department of Community & Economic Development for their support of this project.

Thanks to everyone who provided financial and administrative support for the inventory. Without your help, this study would not have been possible.

The species information utilized in the inventory came from many sources as well as our own field surveys. We wish to acknowledge all of those who carried out botanical and zoological survey work over the years. Without their contributions, this survey would have been far less complete.

The report benefited from the help of local naturalists and conservationists who gave generously of their time. Thanks to all the help and support given by Dr. Larry Klotz for botanical surveys, Rob Criswell for fish surveys, Jason Ambler for herpetological surveys, Phil Wolgemuth of the Franklin County Planning Commission, Marge Mau for help with tax maps, Carol Loeffler for aerial reconnaissance, Doris Goldman, Terry Snyder, Jim Malone and many others for their assistance in identifying areas of interest.

Thanks to the Pennsylvania Game Commission, the PA Fish and Boat Commission, and the Buchanan, Michaux and Tuscarora State Forest Managers for suggestions and access to lands under their jurisdiction.

Thanks to the many other private citizens who contacted our office and the Franklin County Planning Commission office with information on natural areas.

Many thanks to everyone who participated in the Technical Advisory Committee by reviewing the draft Natural Areas Inventory report.

Finally, we especially wish to thank the many landowners that granted us permission to conduct inventories on their lands. The task of inventorying the natural heritage of Franklin County would have been far more difficult without this tremendous pool of information gathered by many people over many years.

Copies of this document may be obtained from:

Franklin County Planning Commission
Administrative Annex
218 North Second Street
Chambersburg, PA 17201-1642

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INTRODUCTION

Franklin County, named in honor of Benjamin Franklin, was organized in September 1784 (USDA , 1975). It extends from southwest of Cumberland County to the present Pennsylvania state line. Before European settlement, the Cumberland Valley was a prized hunting ground of the Native Americans. The county has played an important part in the historic development of the Central Mid-Atlantic. Much of Franklin County is part of an expansive and beautiful valley that sweeps along the entire eastern coast of the United States, extending under different names, from the southern extremity of the Connecticut River Valley of Vermont and Massachusetts, the Hudson at Newburgh, the Delaware at Easton, the Susquehanna at Harrisburg, the Potomac at Harper's Ferry, the James at Lynchburg, and so on south to Alabama (History of Franklin County, 1887). This large valley system has been broken down into fertile agricultural sections by the beautiful streams, and has supplied its occupants with a very strong foundation for civilization. The "Cumberland" Valley of Franklin County is bounded on either side by a chain of the great Appalachian Mountain System, running from northeast to the southwest, and is of nearly uniform width, from twelve to twenty miles---the whole distance. Cumberland Valley lies between the Susquehanna and the Potomac Rivers in South Central Pennsylvania. The fertile valley is due mainly to the limestone and slate soils that occur in Franklin County. Limestone soils are very productive, and the entire belt of land in the valley is subject to the highest cultivation, with the only agriculturally uncultivated parts lying on the sides of the mountains (History of Franklin County, 1887). Much of the area is now paved and/or otherwise modified by human activity.

The northwestern boundary of the valley is known as North Mountain, Blue Mountain, and Kittatinny Mountain, and the southeastern boundary is South Mountain, parallel with the Kittatinny Ridge. From the Susquehanna to the Potomac, the Kittatinny maintains an almost uniform summit line, ranging from 700 to 1,200 feet above the valley beneath. Many picturesque projections, known as Clark's, Parnell's, Jordan's and Casey's Knobs, are standouts in scenery along the mountain, where Parnell's and Casey's Knobs were used during the Civil War as Union signal stations. Several productive and beautiful valleys such as Amberson Valley, Path Valley, Horse Valley, and Cove Gap lie between the Kittatinny and the Tuscarora Mountains. South Mountain, like the Kittatinny range, contains valuable timber used for the fuel supplies they furnish to the inhabitants of the valley, as well as for the diversified scenery they afford to the passers-by (History of Franklin County, 1887).

The drainage of Franklin County consists of two systems, the Susquehanna and the Potomac Rivers. Mountain-fed streams drain into these two major rivers, and provide sparkling cold water for people and animals, and provide quality habitat for a good variety of fishes. Many Scotch-Irish and German settlers were attracted to this very fertile valley, which has been heavily relying on agriculture as the main industry for a long time (History of Franklin County, 1887). Hence, agriculture has heavily influenced many of the natural areas in the county. There are only small amounts of forested lands in the valleys of Franklin County, but many of the creek floodplains provide very interesting habitats for uncommon plant species. Despite the heavy influence of agriculture in the county, the area still harbors large tracts of relatively unbroken forested land. Michaux State Forest, Caledonia State Park, Tuscarora State Forest, Buchanan State Forest, Bear Mountain, Gunter Valley, along with State Game Lands #76, #235, and #124 all contain large, relatively intact contiguous forests, special natural communities and species of concern.

These public natural areas of Franklin County are used for boating, hunting, fishing, hiking, biking, 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 rare, threatened and endangered species. This Natural Areas Inventory documented many examples of intact natural communities and sites for species rarely found in the state or the world.

Franklin County's population has risen slightly from 121,082 in 1990 to 128,812 in 1999 to an estimate of 130,506 in 2001. With this increase in population comes increased development pressure on some of the sensitive natural areas of the county. With this rise in population, economically unsustainable farms are in danger of being sold to developers for residential and commercial uses. Farms represent many generations of cultural heritage and some farms contain a natural component or are adjacent to a natural area. The natural areas that comprise the natural heritage of Franklin County can be easily lost without careful planning of growth and development. Ironically the scenic and remote nature of these areas may make them prime targets for residential developments. Protecting the integrity of these natural systems provides benefits to humans as well as providing for the survival of all flora and fauna, rare and otherwise. Planning for long-term sustainability can maintain open space, including natural environments and the plants and animals associated with them. Using a Natural Areas Inventory as a conservation tool can steer development away from environmentally sensitive areas, creating a needed balance between growth and the conservation of scenic and natural resources.

It is important that county and municipal government, the public, developers and planners know the location of such environmentally sensitive areas in order to maintain a balance and protection of these areas. Knowing where these areas are located can help prevent potential land-use conflicts, and help focus conservation efforts and limited funds to the most vulnerable areas. The Pennsylvania Science Office of The Nature Conservancy, under contract with the Franklin 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 (NAI) report presents the known outstanding natural features, floral, faunal and geologic in Franklin County. The Inventory provides maps of the best natural communities (habitats) and the locations of animal and plant species of special concern (endangered, threatened, or rare) in Franklin County. Due to budget and time constraints, some sites in the county may have been missed. The maps do not pinpoint the site of the species of concern but rather represent a zone of potential impacts within the site's watershed. A written description and a summary table of the sites, including quality, degree of rarity, and last-observed date, accompany each map.

Particular species names, common and scientific, are provided in coordination with the appropriate jurisdictional agency. Plants and terrestrial invertebrates 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). Aquatic animals, reptiles and amphibians are under the jurisdiction of the PA Fish and Boat Commission (PFBC), and are often subject to unauthorized collection. They are therefore not identified in the text of this report, at the request of the agency, in order to provide some measure of protection for the species.

Site descriptions frequently include other dominant species noted at the site. Associated plant and bird species are listed by common name in this report, and are referenced in [Appendix VII](#) to the corresponding scientific name. Common names for plants are drawn from [“The Vascular Flora of Pennsylvania: Annotated Checklist and Atlas”](#) by Rhoads and Klein (1993). Bird names are derived from “Atlas

of Breeding Birds in Pennsylvania” by Daniel Brauning, Editor (1992). Amphibian and Reptile names are consistent with “Amphibians and Reptiles of Pennsylvania nad the Northeast” by Arthur Hulse et. al. (2001). Natural community names and descriptions are intended to be consistent with [“Terrestrial & Palustrine Plant Communities of Pennsylvania”](#) by Jean Fike (1999).

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 of past disturbances. 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.

The information and maps presented in this report provide a useful guide for planning commercial and residential developments, recreational 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 the 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 Franklin County Planning Commission. The Inventory is a conservation tool that will aid in the creation of municipal, county and comprehensive plans, and the emphasis on biological diversity should inform county and regional open space plans already underway. Franklin County, its municipalities, land trusts, and other organizations can also use the Natural Areas Inventory to identify potential protection projects that may be eligible for funding through state or community grant programs such as the Growing Greener Fund. 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. For example, the Forest Stewardship program, coordinated by PA Department of Conservation and Natural Resources, Bureau of Forestry, assists landowners in creating management plans. This plan is developed based on landowner objectives (e.g., wildlife or timber management). Land managers may wish to consult this report and the Pennsylvania Natural Diversity Inventory (PNDI) 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 (717-948-3962) of The Nature Conservancy for additional information.

NATURAL HISTORY OVERVIEW OF THE COUNTY

The climate, topography, geology, and soils have been particularly important in development of ecosystems (forests, fields, wetlands) and physical features (streams, rivers, mountains) that occur in Franklin County. Many disturbances, both natural and human, have been influential in forming and altering many of Franklin Counties' ecosystems, causing extinction 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 in the county. The following sections provide a brief overview of the physiography, geology, soils, surface water, and vegetation of Franklin County.

Physiography and Geology

The characteristic landscapes and distinctive geological formations classify Physiographic Provinces. Physiography relates in part to a region's topography and climate. These two factors, along with bedrock type, significantly influence soil development, hydrology, and land use patterns of an area. Additionally, both physiography and geology are important to the patterns of plant community distribution, which in turn influences animal distribution. Because of the differences in climate, soils, and moisture regime, certain plant communities would be expected to occur within some provinces and not in others. Physiographic and geologic information was obtained from many sources including Ground Water in Northeastern Pennsylvania (Lohman 1957), The Geology of Pennsylvania (PA Geological Survey and Pittsburgh Geological Survey 1999), and Physiographic Provinces of Pennsylvania (Sevan 2000).

Franklin County lies entirely within the Ridge and Valley Physiographic province (The Pennsylvania Atlas, 1982). The Ridge and Valley province is a distinguished belt of long, narrow wooded ridges and broad agricultural valleys that sweep diagonally through central Pennsylvania. The ridges of this province are similar in structure and elevation, typically rising between 800-1200 feet above sea level, but occasionally to 2000 feet. Meanwhile, the valleys that dominate in this region are variable depending on the type of rock that underlies them. Franklin County valleys typically have limestone bedrock, which are the flattest and the most fertile of valley types. Shale soils are also present in Franklin County, which are characteristic of a more hilly land and relatively poor soil (The Pennsylvania Atlas, 1982).

Soils

Table 1. Soil Associations

A soil association is a group of soils with a distinctive, proportional pattern of occurrence in the landscape (USDA 1981). The soils of Franklin County have been described in *The Soil Survey of Franklin County* (USDA, 1981). There have been six mapped soil associations for Franklin County. They include: 1) Laidig-Very stony land-Buchanan association, 2) Hagerstown-Duffield association, 3) Murrill-Laidig association, 4) Highfield-Glenfield association, 5) Weikert-Berks-Bedington association, and 6) Dekalb-Laidig-Very stony land association.

Soil Association	Description	Percentage of County	Land Use
Laidig-Very stony land-Buchanan association	Deep, well drained to somewhat poorly drained, nearly level to very steep soils formed in colluvium from sandstone, and very stony land; on tops and sides of mountains	20	Nearly all of this soil association is wooded. Most of it is too stony for cultivation, with the exception of a few areas used for crops, pasture, hay and orchards.
Hagerstown-Duffield association	Deep, well-drained, nearly level to steep soils formed in materials weathered from limestone; in valleys	32	Nearly all of this association has been cleared and is used for crops, orchards, hay, and pasture with some urban and industrial developments. The soils are among the best for farming, but contain sinkholes as limitations.
Murrill-Laidig association	Deep, well-drained, gently sloping to moderately steep soils formed in colluvium; on mountain foot slopes	9	Nearly all of this association has been cleared and are among the best soils in the county used for crops, hay, pastures, and orchards. A few areas, mostly the steep or stony ones, are wooded.
Highfield-Glenville association	Deep, well-drained to somewhat poorly drained, gently sloping to very steep soils formed in materials weathered from metabasalt, rocks containing mica, and metarhyolite; on tops and sides of mountains	2	Much of this association is wooded but some areas have been cleared and used for crops, hay, pasture, orchards, and development. Some are too stony and steep for cultivation and these are the main limitations for most development.

Weikert-Berks-Bedington association	Shallow to deep, well-drained, nearly level to very steep soils formed in materials weathered from shale and interbedded shale, siltstone, and sandstone; in valleys	31	Much of this association has been cleared and used for crops but some areas are wooded, particularly areas with steep soils. Few areas are used for development, but depth to bedrock, slope and shale fragments are limitations.
Dekalb-Laidig-Very stony land association	Moderately deep and deep, well-drained, nearly level to very steep soils formed in colluvium and in materials weathered from sandstone and quartzite, and Very stony land; on tops and sides of mountains	6	Most of this association is too stony for cultivation and is wooded. A few areas have been cleared or have been used for orchards, crops, hay, or pasture

Vegetation

Upland Forest Communities

The American Chestnut (*Castanea dentata*) once dominated many of the Eastern North American Hardwood Forests from Maine to Michigan to Alabama (Treadwell, 1996). However, around 1904, a Chestnut Blight (*Cryphonectria parasitica*) was introduced to North America from Asia. The blight spread from the Bronx Zoo northward and southward, and by 1960, there were few mature Chestnuts left standing (Treadwell, 1996). Today, many young sprouts and shoots still remain, but rarely will reach maturity due to the blight. The loss of the Chestnut from the forest left huge canopy breaks all across the eastern United States. These canopy gaps have since filled with many of the Chestnut's associate species, including species of Oak. These oak species comprise the Appalachian Oak Forest, which is the dominant vegetation type in the uplands of Franklin County (The Pennsylvania Atlas, 1982). White Oak, Northern Red Oak and Chestnut Oak dominate the upland forest communities along with an array of other hardwood species. Hardwood associates such as Scarlet Oak, Black Birch, Red Maple, Black Gum, Hickories, American Beech and Tuliptree are the major associates within an Appalachian Oak Forest (The Pennsylvania Atlas, 1982). The understory of Appalachian Oak Forests typically consists of Mountain Laurel, Low Sweet Blueberry, Lowbush Blueberry, Black Huckleberry, Witch-hazel, and other species (The Pennsylvania Atlas, 1982). A good example of an Appalachian Oak Forest occurs throughout most of Michaux State Forest.

A small part of Franklin County also contains the Oak/Hickory/Pine Forest as the major vegetation type. This forest type typically consists of a medium-tall to tall forest of broadleaf deciduous and needleleaf evergreen trees. Hickory, Virginia Pine, Pitch Pine, White Oak, Scarlet Oak, Chestnut Oak and Black Oak are common species of this forest type. This southeastern forest type reaches its northern limit in Pennsylvania (The Pennsylvania Atlas, 1982).

Wetlands

Even though wetlands account for only two percent total of Pennsylvania's area, they are home to a diverse array of rare plants and animals and are an extremely productive part of the landscape as a whole (The Pennsylvania Atlas, 1982). Wetlands differ in size, structure and species diversity. Wetlands also differ according to their placement on the landscape – at stream headwaters, dips in valleys, adjacent to tidal rivers, or on slopes where ground water discharges and whether the water contained is flowing or stagnant. These different scenarios result in bogs and fens, marshes, swamps, floodplain forests, forested wetlands, wet meadows, and seeps. Wetlands differ also in vegetative species cover. Tree species such as Red Maple, Yellow Birch, Eastern Hemlock and Ash usually dominate forested swamps. The understory consists of shrub species such as Spicebush, Rhododendron and Azaleas (*Rhododendron spp.*), Winterberry Holly, Alders, Swamp Rose, Sedges (*Carex spp.*), and many others.

Graminoid marshes are wetlands dominated by grasslike plants such as cattails, sedges (*Carex spp.*), Rushes (*Juncus spp.*), and grasses (*Glyceria spp.*, *Poa spp.*, *Panicum spp.*, etc.). This type of wetland may be found in association with slow streams or in areas with ground water seepages. Graminoid marshes in the county are usually formed as successional communities following beaver dams or other impoundments.

Seeps and wet meadows are small wetlands that are generally fed by ground water coming to the surface in a diffuse flow (The Pennsylvania Atlas, 1982). These wetlands are a relatively uncommon sight in Franklin County. These areas consist of vegetation species such as Skunk Cabbage, Cinnamon Fern, Sensitive Fern, Jewelweed, Sedges (*Carex spp.*), Grasses (*Poa spp.*), Manna Grass (*Glyceria spp.*), Reed Canary Grass and Red Maple. Some wet meadows or pastures provide valuable habitat for the endangered Bog Turtle (*Clemmys muhlenbergii*) in Franklin County. A good example of a seep in Franklin County occurs at Bear Valley in Buchanan State Forest. An example of a wet meadow is Muskrat Fen east of Chambersburg.

Shrub Swamps are wetlands occurring on mineral soils with water near or above the surface most of the year (The Pennsylvania Atlas, 1982). Shrubs under 20 feet tall dominate the wetland. Frequent species of shrub swamps include Buttonbush, Swamp Rose, Meadowsweet and Steeplebush, Silky Dogwood, Willows, Ninebark, Sedges (*Carex spp.*), Smooth Alder, and Highbush Blueberry. A fine example of this habitat in Franklin County is Happel's Meadow in Washington Township.

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 often become 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. Plants typically associated with vernal ponds include Woolgrass, Three-way Sedge, Pin Oak, Highbush Blueberry, Red Maple, St. John's Wort, and the federally endangered Northeastern Bulrush (*Scirpus ancistrochaetus*). In Franklin County, this habitat can be seen in Michaux State Forest at Mt. Cydonia and Glen Forney.

Due to the rarity of wetlands in Franklin County and central Pennsylvania, all good examples of these habitats should be preserved whenever possible. Wetlands provide valuable habitat for breeding and migrating birds, mammals, reptiles, amphibians, dragonflies and damselflies, and many other insects. Wetlands also provide a refuge for many species of wetland dependent rare plants.

Disturbance

Disturbances, whether natural or man-made, have played a key role in shaping many of the natural communities and the associated species. The frequency and scale of these disturbances have played a key role in the appearance of natural communities today.

Natural disturbances such as fire and flooding can actually benefit certain natural communities and species. Periodic fires are needed to maintain Pitch Pine and Scrub Oak barren areas in order to sprout new growth of these species and keep out other successional 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.

Another natural disturbance, excessive understory browsing by deer, can have detrimental effects on natural communities and species (Rhoads and Klein, 1993). Excessive deer browse can decrease the understory of some forests, and decrease regeneration of new growth of the canopy and understory. Deer overbrowse has been known to have negative impacts on understory dependent forest songbirds, which have noticeably decreased with increased deer browse (PA Audubon, 2000). Deer browse can also have a direct effect on rare plants. Private landowners can be encouraged to control deer population by allowing hunting on their respective lands.

In many cases, human disturbances have directly affected natural communities and animal and plant species in certain areas. In Franklin County, farming and urbanization have created biological “islands” where small natural areas are surrounded by agriculture or development. This isolates gene pools of wildlife and/or plant species, inhibiting gene flow between populations. In addition, logging and mining can affect forest age and natural community structure. For example, the amount of old-growth forests has virtually disappeared despite the fact that some scattered old trees remain. As farming remains an important industry in Franklin County, some farm practices and abandoned farmland make conditions favorable for some grassland birds. Birds such as Dickcissel, Eastern Meadowlark, Bobolink, Upland Sandpiper, Henslow’s Sparrow and Vesper Sparrow have benefited from human managed and created early successional areas.

Additionally, many wetlands have been filled resulting in loss of biodiversity at a given site. Human and natural disturbances create different habitats in different scenarios, but it is human disturbances that usually leave the most lasting effect on the environment. Many human disturbances are quite beneficial, especially to early successional species. However, what may be beneficial to a few species, may be detrimental to other species. Many rare species have become rare because they just can’t cope with disturbance to their particular habitat, which is sometimes a specialized niche. Consequently, many species have declined due to human alteration of the landscape. Human disturbances are a permanent part of landscape, but decisions about the type, timing, and extent of future disturbances are important to the natural ecological diversity that remains.

Probably the most detrimental indirect effect that human disturbance has had on natural communities and associated species is the spread of non-native (i.e. exotic) invasive species in natural areas. Many of these

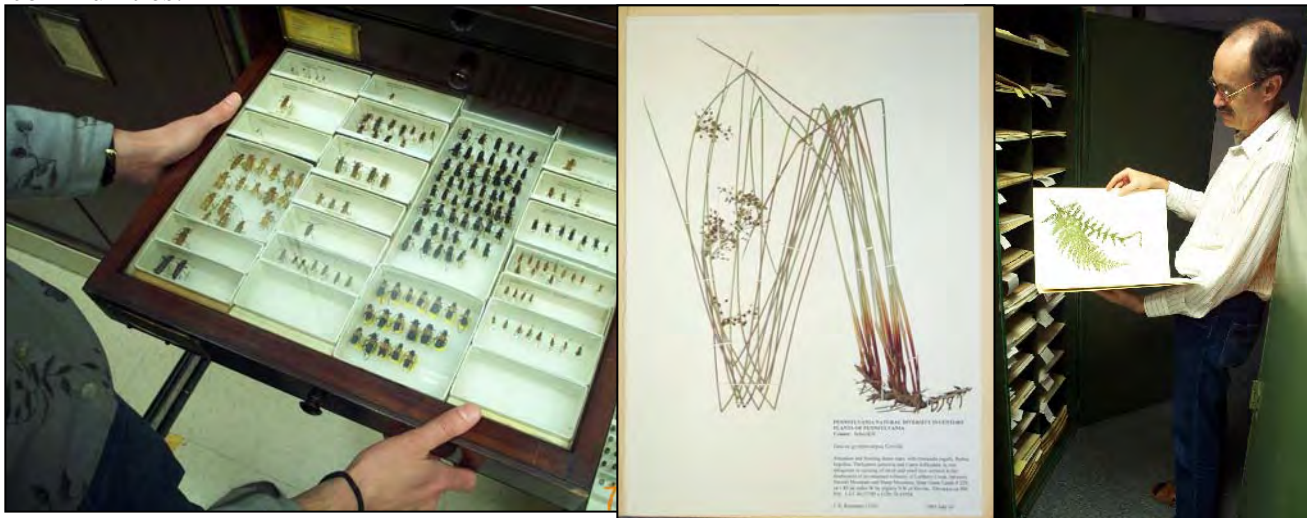
invasive species, including the chestnut blight that changed the composition of eastern forests, have caused such widespread problems that they are now out-competing native species and decreasing overall quality of natural areas. Non-native plants such as Japanese Barberry, Multiflora Rose, Japanese Honeysuckle, Tree-of-heaven, Garlic Mustard, Mile-a-minute and Autumn Olive have become commonplace in disturbed woodlands, often to the point of excluding some of the native plants. In wetlands and along streams, Mile-a-minute Weed are aggressive, weedy species that follow in the wake of disturbance and crowd out native species.

Some of these non-native invasive plants have become serious threats to ecosystems in Franklin and in all counties in Pennsylvania. Control of these invasive plants is needed, especially in or adjacent to areas that have been categorized as high quality natural areas to help control further encroachment. Some nurseries in Pennsylvania 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* (Rhoads and Klein 1993) is a helpful reference for determining whether a plant species is native to the state or not. Additional references include two PA Department of Conservation and Natural Resources publications: *Invasive Plants in Pennsylvania* and *Landscaping with Native Plants in Pennsylvania*.

PENNSYLVANIA NATURAL DIVERSITY INVENTORY DATA SYSTEM

In order to conduct an inventory of significant flora, fauna, and natural communities in the county, scientists from PA Science Office of the The Nature Conservancy first consulted the Pennsylvania Natural Diversity Inventory (PNDI) database. PNDI was established in 1982 as a joint venture of The Pennsylvania Science Office (PSO), and the Western Pennsylvania Conservancy (WPC). In its 20 years of operation, the PNDI database has become Pennsylvania's chief storehouse of information on outstanding natural habitat types (natural communities), significant plants and animals (species of special concern). Several other noteworthy natural features are also mapped including Department of Environmental Protection designated Exceptional Value Streams (Shertzer 1992) and outstanding geologic features (based on recommendations from Geyer and Bolles (1979 and 1987).

PNDI 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. From this foundation, PNDI has focused its efforts on, and conducts systematic inventories for, the best occurrences of the priority species and natural communities.



Sources of Data

PNDI has recorded over 15,000-detailed occurrences of species and communities of special concern, largely the result of field surveys. These are stored in computer and manual files and denoted on topographic maps. Additional data are stored in extensive manual and digital files set up for over 200 natural community types, 1400 animals, and 3500 plants. These files are organized by each of Pennsylvania's 881 7½ USGS topographic quadrangle maps using a geographic information system (GIS).

The PA Science Office has used this systematic inventory approach to identify the areas of highest natural integrity in Franklin County. The natural community and sensitive species data are the basis for judging the biological values of sites within the County. Protecting the sites with the best occurrences of the County's natural communities, and good populations of sensitive plant and animal species can help to insure that a full range of biological diversity in Franklin County is preserved for the future.

NATURAL AREAS INVENTORY METHODS

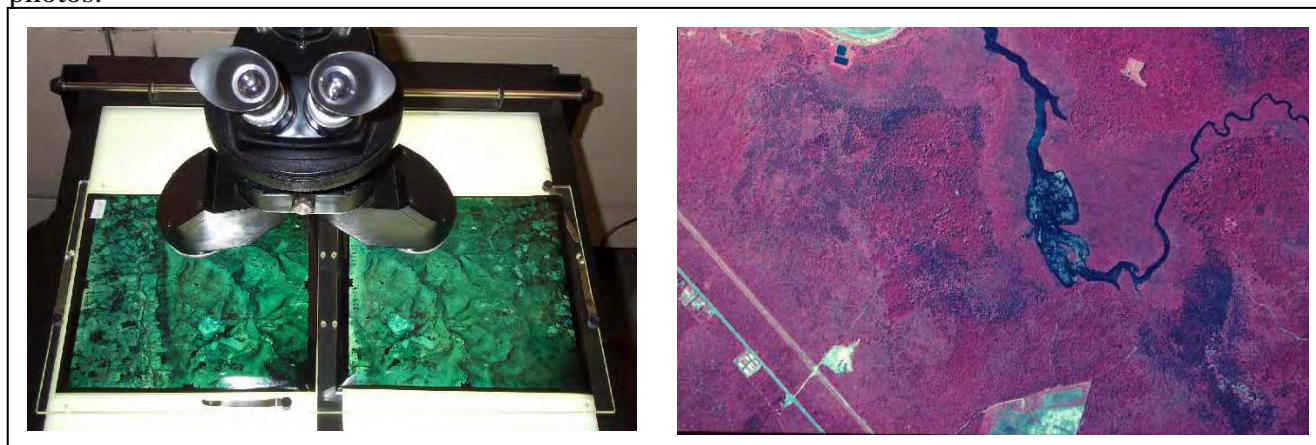
Methods used in the Franklin County Natural Areas Inventory followed PNDI procedures, and those developed in Illinois (White 1978) and Indiana (Anonymous 1985). The inventory proceeds in three stages: 1) information is gathered from the PNDI data-base files, local experts, and map and air photo interpretation;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

Information Gathering

A list of natural features found in Franklin County was prepared from the PNDI database and supplemented with information volunteered by local individuals and organizations familiar with Franklin County. In January of 2002 a public meeting was held and Natural Area Survey Forms (Appendix I) 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 by audience members and scheduled for field surveys.

Map and Air Photo Interpretation

PSO ecologists familiarized themselves with the air photo characteristics of high quality natural communities already documented (Appendix II). Additional data from vegetation maps, soil survey maps, field survey records and other sources were consulted to gain familiarity with Franklin County's 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 interpreted the maps and aerial photos.



Aerial Photo Interpretation

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 used 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 to help prioritize fieldwork.

After an initial round of photo interpretation, field surveys were conducted to evaluate the potential natural areas that were 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 with poor quality sites led to the elimination of further field work on other sites with similar signatures.

Field Work

Experienced PSO biologists and contractors conducted numerous field surveys throughout Franklin County during 2002 and 2003. 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 also categorized the vegetation of each potential natural area visited. An evaluation of quality was made for each potential natural community element, care being taken to give reasons for the quality rank. Boundaries of the community types were redrawn, if needed, based on new field information. 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 & Animal Survey Form, Appendix III), the quality of each population or community was assessed, and locations were marked on USGS topographic quadrangle maps.

In April and May of 2002, two low altitude reconnaissance flights were flown over the county 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.

Data Analysis

To organize the natural features data and set conservation priorities, each natural community or species (element) was ranked using factors of rarity and threat on a state-wide (state element ranking) and range-wide (global element ranking) basis (see Appendix IV). Each location of a species (an element occurrence) was 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 V. The element-ranking and element occurrence-ranking systems help PSO personnel to simultaneously gauge the singular importance of each occurrence of, for example, an Ephemeral/Fluctuating Pool Natural Community or yellow-fringed orchid occurrence in Franklin County, 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 PNDI Element Occurrence Records for mapping and computerization. Mapped locations of natural features, including approximate watershed

or subwatershed boundaries, were then created and added electronically to PNDI's Geographical Information System (GIS) layer.

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 sources are Hulse et al. (2001) and 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 rare moth and butterfly species in Pennsylvania. A list of Plant and Animals of Special Concern in Franklin County is provided in Appendix VI.

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 2 presented in the Results section prioritizes sites with natural communities and rare species in Franklin County. 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. Table 2 lists the site name, local jurisdiction, and pertinent information about the site. A more detailed description for each of the sites is included in the text of the report.

“Locally Significant” sites are listed in Table 3 of the Results section, are also indicated on the maps, and are briefly discussed in the text accompanying each map. These are sites that do not have species of special concern or high-quality natural communities 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. They have been given 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. These areas provide locally significant habitat and may be suitable for environmental education, parks or preserves. No species of special concern or exemplary communities have been identified at the sites during this survey, but future surveys are recommended.

RECOMMENDATIONS AND SUMMARY

Franklin County has a number of groups pursuing the protection of natural areas within the county. The following are general recommendations for protecting biological diversity within the county.

1. **All sites that are ranked 1 or 2 (Table 2) should be targeted immediately for protection and/or management of the site and the surrounding lands.** Privately owned lands at these sites may be protected through a combination of conservation easements and acquisition to encourage current land use or make improvements in land use where needed.
2. **Management plans on public and private lands should address species of special concern and natural communities and assess the need for additional acres to complete protection.** Each species of concern located within a given site will need to be addressed in new management plans for that area. Many of the already-protected sites are in need of additional land to complete protection and/or are in need of management to ensure the continued existence of the associated natural elements. Efforts are already underway to refine management plans for some of the high quality natural areas on public lands in the counties.
3. **Conservation easements or other low cost protection can be pursued on lower-ranked sites.** All sites of lower rank but with good to excellent populations of species of special concern or good natural communities on private land should receive protection too, but conservation easement or some type of tax incentive may be more appropriate. Conservation easements are designed to allow landowners the current use of their land while protecting the owner and the resource from outside development pressure. Management plans will be needed to ensure that these sites remain high-quality natural areas. Where easements are not possible, any proposals for significant land use changes should be scrutinized carefully by county and municipal planners.
4. **Low quality sites (e.g., with marginal or poor populations of listed species in marginal areas) should be carefully assessed before pursuing protection or management efforts.** The rare elements may be important for the maintenance of biological diversity at the local level, but costs and efforts for protecting these sites need to be weighed against other sites that will be left unprotected which truly have the potential for long-term viability of elements. However, these sites may have other qualities, such as scenic or recreation value, that make them worth protecting.
5. **Locally Significant sites (Table 3) may be protected as higher priority sites are completed or as new information emerges.** These are sites in the counties that do not have exemplary natural communities or known occurrences of rare species, but that could be excellent sites for counties or township parks or as natural areas within existing parks (sites within existing managed areas will need to be included in management plans). Those that can serve more than one purpose such as recreation, environmental education, wildlife habitat, flood and sediment control, water supply, are ideal. Species of special concern that may be found in some of these areas in future surveys can fit into county park or preserve plans.
6. **Protection of the reservoirs, wetlands, rivers, and creeks of Franklin County is vital, especially those that protect biodiversity, supply drinking water, and are attractive recreational resources.** Many of the sites containing rare species, natural communities or locally significant habitats in Franklin County are associated with water. Protection of these watersheds is the only way to ensure the viability

of natural habitats and water quality. Cooperative efforts on land use among municipal, county, state, and federal agencies, developers, and residents can lessen the impact of development on the watersheds and plant communities of Franklin County. Protecting 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.

7. **Minimize encroachment on the parks and conservation lands throughout Franklin County.** Existing parks and conservation lands provide habitat for a number of plant and animal species and may be important not only on a county-wide level, but also on a regional scale. For example, they may serve as nesting or wintering areas for birds or as stopover areas during migration. Where appropriate, more land should be added or agreements worked out with abutting landowners to minimize encroachments that may threaten native flora and fauna.
8. **County and township officials can encourage landowners whose land includes waterways to maintain vegetated buffer zones along shorelines.** Vegetated buffers (preferably of PA-native plant species) help reduce erosion and sedimentation and help to shade and cool the water. This in turn benefits aquatic animal life, including the fisheries. These buffers also provide habitat for other wildlife species and help to create a diversity of habitats along the creek or stream.
9. **Scrutinize development proposals for their impact on entire watersheds not just the immediate impact area.** Certainly, new housing and commercial development can be given close scrutiny before it is allowed in the areas outlined in this report and careful review can be required within any watershed in the county. Townships can also require minimum setbacks from all water bodies to help protect water quality. Landowners within any particular watershed can act on their own to protect water by forming watershed associations to voluntarily monitor and screen proposals in their localities.
10. **Development plans should provide for creating natural buffers between the development and the core preserve area, be it a barrens community, wetland, water body, or forest.** Care should be taken to ensure that protected natural areas do not become "islands" surrounded by development. When a wetland or woodland is completely surrounded by development, even if there are no direct impacts, the site is effectively isolated and its value for wildlife is reduced. If possible, networks or corridors of woodlands or greenspace should be preserved linking sensitive natural areas to each other. Cluster development could be used to allow the same amount of development on much less land in such areas, but most importantly, leave much of the land intact as corridors for wildlife and native plants.
11. **Grassroots organizations are needed.** County and municipal governments can do much of the work necessary to plan for the protection and management of the natural areas identified in this report. However, grassroots organizations are needed to assist with identifying landowners who wish to protect their land, providing information about easements to landowners, 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. This report is intended as a tool to help these organizations as well as other local watershed associations and land trusts in their efforts.
12. **Encourage development in sites that have already seen past disturbances.** Careful 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. The reclamation of previously

disturbed areas for residential, commercial and industrial development presents a logical way to accommodate economic growth while allowing ecologically sensitive areas to remain undisturbed.

On the municipality maps in this report, we have outlined the watersheds or subwatersheds where the natural communities and species of special concern occur. These areas should be viewed as zones of potential impact; consideration of the entire area may not be necessary. Smaller buffer areas have been designated for locally significant sites. The core areas where the communities and species occur need to be given the most attention and fee title acquisition may be appropriate. Land uses that do not impact these important sites should be encouraged for the buffer zones.

We wish to emphasize that this Natural Areas Inventory is only a beginning. New sites with good natural communities and species of special concern wait to be discovered. Plant communities and plant and animal populations are dynamic, constantly changing with time and conditions. As this information is received and updated in the Pennsylvania Natural Diversity Inventory database, so too will the Natural Areas Inventories. If there are any questions about the impact of a proposed development or other activity, we suggest that our office, the Pennsylvania Science Office of The Nature Conservancy, be consulted at (717) 948-3962. Questions regarding protection methods and tools for planning should be directed to the Franklin County Planning Commission at (717) 389-9146.

RESULTS

Exceptional Natural Feature

The Kittatinny Ridge stretches southwesterly from southern New York and northwestern New Jersey, continuing through southeastern Pennsylvania and terminating near the Maryland border. The 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.

Top Priority Natural Areas in Franklin County

LICKING CREEK WOODS (Warren Township and northern Maryland)

The vegetation at this site in the southwestern-most portion of Franklin County has been significantly influenced by the limestone substrate of the forested hills, creek banks and rocky outcrops in this area. Though aerial observations seem to indicate nothing out of the ordinary in this corner of the county, the rich herbaceous vegetation found at this site makes it one of the top sites for the conservation of biological diversity in the County. **This site contains one animal species of concern and multiple populations of 18 plant species of concern.** These species inhabit a variety of habitats types such as the forested floodplain of Licking Creek, moist calcareous shale woods, limestone bedrock outcrops and mixed deciduous upland forests.

In addition to the plant species of special concern, this site also supports a number of species that are more typical of the Ohio River watershed in Pennsylvania and are therefore noteworthy for their occurrence in Franklin County. These species include Short's aster (*Aster shortii*), Dwarf Larkspur (*Delphinium tricornis*), Twinleaf (*Jeffersonia diphylla*), Miami-mist (*Phacelia purshii*), and Toadshade (*Trillium sessile*). In a study of plant diversity, a total of 253 plant species in 69 families was found within an area of about four hectares at this site. This entire area constitutes one of the most diverse plant areas in the state (Klotz and Walck, 1993).

CONOCOCHUEGUE CREEK AT HIGHLAND SCHOOL (Antrim and Montgomery Townships)

This site is considered one of the top priority areas for the conservation of biological diversity within Franklin County based on the multiple populations of a large number of plant species of concern, the rarity of the species (G & S-ranks), and the intactness of the surrounding natural community. This dry-mesic calcareous forest supports a very rich herbaceous layer including multiple populations of seven plant species of concern, which occur scattered along the forested, limestone-bedrock bluffs and outcrops lining the West Branch of the Conococheague Creek. The species of concern documented at this site include **Black-stemmed Spleenwort (*Asplenium resiliens*)**, **Jeweled Shooting-star (*Dodecatheon meadia*)**, **Spreading Rockcress (*Arabis patens*)**, **Leather Flower (*Clematis viorna*)**, **Lance-leaved Buckthorn (*Rhamnus lanceolata*)**, **Green and Gold (*Chrysogonum virginianum*)** and **Limestone Petunia (*Ruellia strepens*)**. The natural community at this site is the result of limestone bedrock outcrops, which create frequent openings in the tree and shrub canopy. The high pH of the soil weathered from the limestone parent material in these woods and openings create ideal conditions for the calcium-loving species encountered here. Many such habitats statewide have been impacted by

quarrying and other disturbances. The preservation of the forested buffers along the Conococheague Creek and overlooking bluffs is an essential step in the long-term conservation of the biological diversity at this site.

BIG PINE FLAT (Southampton and Greene Townships, and Cumberland County)

This site contains a good-quality 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. 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.

Plant diversity is typically low in pitch pine barrens, but these specialized habitats frequently harbor a high diversity of rare butterflies and moths. The pitch pine barrens are disturbance dependent ecosystems. The development and implementation of a prescribed burn management program would help maintain the quality of this naturally occurring community. 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 extent of this Natural Community was delineated from aerial photography.

WILLIAMSON-RED CEDAR-REDBUD SHRUBLAND (Antrim, Peters and St. Thomas Townships)

This site represents one of the most important areas for the conservation of biological diversity in Franklin County. Multiple populations of nine plant species of concern and two animal species of concern have been documented at this site. The successional shrubland habitat found on this site consists of a mosaic of habitat types, with a **Red-cedar – Redbud Shrubland Natural Community**, an S2 tracked natural community type, occurring in some areas. This natural community type is the result of repeated disturbance of the relatively thin and dry soil over limestone bedrock outcrops, which create frequent openings in the tree and shrub canopy. The high pH of the soil weathered from the limestone parent material in these woods and openings creates ideal conditions for the calcium-loving species encountered here. The limestone bedrock is perforated with openings leading into an extensive cave system that was once open to the public as a tourist attraction called Baker’s Caverns. Past disturbances such as farming, grazing animals and fire, as well as the thin soils and dryness of the site have kept much of this area in an early successional stage. In the absence of disturbance such as fire, much of this site will succeed to a hardwood forest.

Table 2. Site Summary

Summary of the sites of statewide significance for the protection of biological diversity in Franklin 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.

County Rank ¹	Site Name	Municipality	PA Heritage Ranks ² and Site Importance
1	BIG FLAT PINE BARRENS	Southampton Twp., Green Twp., and Cumberland Co.	This site contains a large example of a “ Ridgetop Dwarf-Tree Forest Natural Community ”, and unknown quality populations of two animal species of concern . It is the large, relatively unfragmented character of this natural community and rarity of this community type at the global level that makes this one of the tops sites for the protection of biodiversity in Franklin County. Additional fragmenting features such as roads and structures will decrease the quality of this habitat. This site is primarily within Michaux State Forest.
1	CONOCOCHIEAGUE CREEK AT HIGHLAND SCHOOL	Montgomery Twp.	This site contains multiple populations of seven plant species of concern and two animal species of concern in a calcareous mixed deciduous forest with a very rich herbaceous layer. Additional fragmenting features such as roads and structures will decrease the quality of this habitat. Conservation easements, tax incentives, or fee title acquisition of sensitive parcels of land for the purpose of conserving the biological diversity found in this area is highly recommended. This area is private property.
1	LICKING CREEK WOODS	Warren Twp. and Maryland	This site contains multiple populations of 18 species of concern such as Jeweled Shooting-star (<i>Dodecatheon meadia</i>) , Blunt-leaved Spurge (<i>Euphorbia obtusata</i>) , Allegheny Stonecrop (<i>Sedum telephioides</i>) , and Green and Gold (<i>Chrysogonum virginianum</i>) . Threats to the populations of the plant species above and the overall area include trampling, collection of plants, invasive species of plants, overbrowsing by deer, logging, and herbicide spraying. This entire site harbors the most plant species of concern in the county, and should be considered a top priority area for the conservation of biodiversity in the state as well.
1	WILLIAMSON RED CEDAR-REDBUD SHRUBLAND	Antrim Twp. Peters Twp. St. Thomas Twp.	This site contains multiple populations of eight plant species of concern and two animal species of concern . Plant species found in the Williamson area include Lance-leaved Buckthorn (<i>Rhamnus lanceolata</i>) , Limestone Petunia (<i>Ruellia strepens</i>) , Prickly-Pear Cactus (<i>Opuntia humifusa</i>) , Fringed-leaved Petunia (<i>Ruellia humilis</i>) , and this site also includes the states only known population of Limestone Adder’s-Tongue (<i>Ophioglossum engelmannii</i>) . . Conservation easements, tax incentives, or fee title acquisition of sensitive parcels of land for the purpose of conserving the biological diversity found in this area is highly recommended. This area is private property.

County Rank ¹	Site Name	Municipality	PA Heritage Ranks ² and Site Importance
2	CONCORD NARROWS	Fannett Twp., and Huntingdon Co.	This site contains a good population of the globally rare Virginia Mallow (<i>Sida hermaphrodita</i>), a G2, S2 plant species of concern. This population is situated on a roadside bank/woods border at the foot of Tuscarora Mountain, and could be severely impacted by roadside maintenance activities. Also included in this site on a talus slope is a fair population of Allegheny Woodrat (<i>Neotoma magister</i>), an S3 Pennsylvania animal species of concern.
2	MOUNT CYDONIA	Guilford Twp. Greene Twp.	This site contains a fair quality “Ephemeral/Fluctuating Pool” Natural Community and several species of concern. The Federally–Endangered Northeastern Bulrush (<i>Scirpus ancistrochaetus</i>), a Federally–Endangered G3, S3 plant species of concern. In addition, populations of the rare plant species Lupine (<i>Lupinus perennis</i>), Short-leaf Pine (<i>Pinus echinata</i>), Small Milkweed (<i>Asclepias variegata</i>) and an undetermined quality population of an S3S4 animal species of concern were found at this site. Threats and disturbances include logging, exotic plant species, overbrowsing by deer, and ATV trails through the area. It is strongly recommended that logging be avoided throughout the area containing the ponds. Additional buffer between the ponds and nearby residences should be acquired if the opportunity arises.
2	MUSKRAT FEN	Greene Twp.	This wetland contains populations of Prairie Sedge (<i>Carex prairea</i>), an S2 plant species of concern, Baltic Rush (<i>Juncus arcticus var littoralis</i>), an S2 plant species of concern, Vetchling (<i>Lathyrus palustris</i>), an S1 plant species of concern, and Broad-leaved Willow (<i>Salix myricoides</i>), an S2 plant species of concern. Some areas adjacent to the wetland require additional forested buffers to minimize the impact of non-point sources of pollution.
2	NEEDY CAVE	Washington Twp.	This site contains three globally rare animal species of concern. Specimens of a G3G4 animal species of concern , and two separate G2G4 animal species of concern were found in a complex cave system. The establishment of forested buffers around the cave openings can help protect the site from non-point sources of pollution.
3	BEAR VALLEY	Letterkenny Twp. St. Thomas Twp.	This area contains at least 22 temporary ponds that together make up an Ephemeral/Fluctuating Pool Natural Community . Surrounding land use is passive and active recreation. This site is within State Game Lands #235 and Buchanan State Forest.
3	CONOCOCHIEAGUE CREEK FLOODPLAIN AT CALEDONIA PARK	Greene Twp., and Adams County	An unknown quality population of an S1 animal species of concern was found at this site in Caledonia State Park. Several specimens were collected here in 1979 and again in 1991 in an area shaded by Eastern Hemlock. In addition, a good population of Kidney-leaved Twayblade (<i>Listera smallii</i>), an S1 plant species of concern, was found along a stream.

County Rank ¹	Site Name	Municipality	PA Heritage Ranks ² and Site Importance
3	FORT LOUDON FLOODPLAIN	Peters Twp.	This site contains Limestone Petunia (<i>Ruellia strepens</i>) , an S2 plant species of concern, and Water-plantain spearwort (<i>Ranunculus ambigens</i>) , an S3 plant species of concern. In addition, an undetermined quality population of a G4, S3 animal species of concern was documented at this site. All species were found in a floodplain forest with braided overflow channels that includes some exotic plant species, and some surrounding agricultural land use. Exotic plant species pose the greatest long-term risk to the species of concern on this site. Undisturbed forested buffers should be conserved along the floodplain, and additional fragmenting features such as roads and structures discouraged along the creek.
3	GLENN FORNEY VERNALS	Quincy Twp., Washington Twp.	This site contains a series of approximately 30 vernal ponds that make up an Ephemeral / Fluctuating Pool Natural Community . Several good-quality populations of an S1 plant species of concern, the Lance-leaved Loosestrife (<i>Lysimachia hybrida</i>) occur in many of these ponds. Logging within this portion of the forest should be avoided due to the numerous ponds scattered over this 200-acre area. An undisturbed forested buffer between nearby residences and the ponds should to be established, and additional buffers should be acquired if the opportunity becomes available.
3	LETTERKENNY RESERVOIR	Letterkenny Twp. Lurgan Twp.	This area consists of an unknown quality Ephemeral/Fluctuating Pool Natural Community . This area also contains an older hemlock ravine, a Sugar Maple dominated floodplain, and an open wet meadow along the Conodoguinet Creek south of Letterkenny Reservoir. It is recommended that logging in this older-growth area be restricted. It is also recommended that an undisturbed forested buffer surround the Ephemeral/Fluctuating Pool Natural Community and that logging in that area be left to a minimum.
3	LITTLE COVE CREEK CLIFF	Warren Twp.	This site contains a fair to good population of Black-stemmed Spleenwort (<i>Asplenium resiliens</i>) , an S1 plant species of concern. This species was found on a northeast facing calcareous cliff. No disturbances or threats were identified at this site.. Exotic plant species invasion could cause shading and competition for the plant species of concern.
3	LOWER CONOCOCHEAGUE CREEK	Antrim Twp. Montgomery Twp.	This site contains a good population of Allegheny Stonecrop (<i>Sedum telephioides</i>) , an S3 plant species of concern, and a fair to good population of Limestone Petunia (<i>Ruellia strepens</i>) , an S2 plant species of concern. Two other rare plant species occur in small populations at this site, Wild Senna (<i>Senna marilandica</i>) , and Mistflower (<i>Eupatorium coelestinum</i>) . Maintaining an intact, forested floodplain along the creek can preserve much of the area's important biodiversity.
3	MAKEY RUN PONDS	Washington Twp.	This site contains a fair to good quality population of Northeastern Bulrush (<i>Scirpus ancistrochaetus</i>) , a Federally-Endangered G3, S3 plant species of concern. This area has been logged but the main disturbance here is overbrowsing by deer. This area contains an Ephemeral / fluctuating Pool Natural Community that provides very important habitat for dragonflies, damselflies, and amphibians.

County Rank ¹	Site Name	Municipality	PA Heritage Ranks ² and Site Importance
3	MARTIN'S MILL BRIDGE	Antrim Twp.	This site contains a population of Beard-Tongue (<i>Penstemon canescens</i>), an S3 plant species of concern, a fair population of Limestone Petunia (<i>Ruellia strepens</i>), an S2 plant species of concern, and Slender Goldenrod (<i>Solidago speciosa var. erecta</i>), an S1 plant species of concern. Threats and disturbances include road maintenance (spraying, widening), erosion, and invasive species, such as Japanese Honeysuckle.
3	MERCERSBURG WOODS	Montgomery Twp. Peters Twp.	This site contains several Pennsylvania plant species of concern found in a small floodplain forest and marsh next to the Conococheague Creek and Johnston Run. A fair to good population of Cattail Sedge (<i>Carex typhina</i>), an S2 plant species of concern, was found in a narrow zone of marsh. Several species were found in the floodplain area, including a good population of a recently delisted plant species, American Beakgrain (<i>Diarrhena obovata</i>); a fair population of an S2 plant species, Limestone Petunia (<i>Ruellia strepens</i>); and a small population of an S1 plant species, Shumard's Oak (<i>Quercus shumardii</i>). All these species were found in a floodplain forest on an alluvial terrace. Surrounding land use includes rural residential areas and agricultural fields. One recommendation is that timber harvesting be avoided in the floodplain forest.
3	MOUNTAIN RUN/STILLHOUSE HOLLOW PONDS	Greene Twp. Southampton Twp.	This site contains several populations of Northeastern Bulrush (<i>Scirpus ancistrochaetus</i>), a Federally-Endangered G3, S3 plant species of concern. Clear-cutting is a threat to this population. A fair population of Oakes' Pondweed (<i>Potamogeton oakesianus</i>), an S1S2 plant species of concern was also documented at this location. In addition, a good to excellent quality "Ephemeral/fluctuating Natural Pool" was found on this site. Disturbances include jeep lanes, deer paths, selective cutting, and bulldozing brush by owners near pond. Threats include increasing residences in forest. There is very little disturbance in the main pond.
3	NEELEYTON RIDGETOP	Fannett Twp. Metal Twp.	This site contains a fair to good population of Allegheny Woodrat (<i>Neotoma magister</i>), an S3 animal species of concern. This is a typical site that occurs along a roadside in an acidic rock outcrop.
3	PINE RUN PONDS	Fannett Twp.	This site contains a fair to good population of Northeastern Bulrush (<i>Scirpus ancistrochaetus</i>), a Federally-Endangered G3, S3 plant species of concern, and an "Ephemeral/Fluctuating Pool Natural Community" . Disturbances include previous logging and exotics.
3	SECOND NARROWS SLOPES	Fannett Twp. Perry County	This site contains a fair to good quality population of Northeastern Bulrush (<i>Scirpus ancistrochaetus</i>), a Federally-Endangered G3, S3 plant species of concern. This species is an obligate species to vernal ponds and was found in a few ponds in the area. This site also contains fair to good quality "Ephemeral/Fluctuating Pool Natural Communities" in a dry forest in Tuscarora State Forest. This site is home to an exceptional population of a salamander (<i>Ambystoma spp.</i>). Potential logging and other changes could be a threat or disturbance to these ponds.

County Rank ¹	Site Name	Municipality	PA Heritage Ranks ² and Site Importance
3	SPORTSMAN'S ROAD SHALE BANK	Antrim Twp. Peters Twp.	This site contains several species of concern including Prickly-Pear Cactus (<i>Opuntia humifusa</i>), an S3 plant species of concern, and White Water-Crowfoot (<i>Ranunculus aquatilis var diffusus</i>), an S3 plant species of concern. Also included in this site is a fair to good population of Cat's-paw Ragwort (<i>Senecio antennariifolius</i>), an S1 plant species of concern, and a small population of Kate's Mountain Clover (<i>Trifolium virginicum</i>), a S1 plant species of concern. Disturbances include mowing and invasive plant species such as Japanese Honeysuckle.
3	TUSCARORA RIDGETOP	Metal Twp. Peters Twp.	This site contains an unknown quality population of Allegheny Woodrat (<i>Neotoma magister</i>), a G3G4, S3 animal species of concern. No immediate threats or disturbances were noted at the site. More surveys are encouraged to better assess the population. This site extends into Fulton County but mostly straddles the county line along the Tuscarora ridgetop area.
4	ANTIETAM WEST BRANCH	Washington Twp.	This site contains an unknown quality population of Loggerhead Shrike (<i>Lanius ludovicianus</i>), a G4T3Q Pennsylvania animal species of concern. Direct threats to this species include conversion of land use from farm/open grasslands to development or rowcrop agriculture. It is important if this species is still breeding at this site that monitoring, management, and intensive research be conducted to better assess the shrike's life history and habitat needs.
4	CHURCH HILL MARSH	Peters Twp.	This site contains a small population of Lance-leaved Buckthorn (<i>Rhamnus lanceolata</i>), an S1 Pennsylvania-Endangered plant species of concern. This site also supports a pair of Barn Owls (<i>Tyto alba</i>), a G5, S3B S3N Pennsylvania animal species of concern.. The main threat to the Barn Owl site include land use changes to the surrounding grasslands and upland forested areas.
4	CLARKS KNOB	etterkennyTwp.	This area contains an undetermined quality population of Allegheny Woodrat (<i>Neotoma magister</i>), an S3 Pennsylvania animal species of concern. Potential threats to den sites at ridgetop include logging operations. An undisturbed forested buffer should be maintained around all ridgetop rock outcrops.
4	CONCRETE BOTTOM AT LICKING CREEK	Montgomery Twp.	This site contains a fair population of Limestone Petunia (<i>Ruellia strepens</i>), an S2 Pennsylvania plant species of concern. This species occurs along a road adjacent to a creek. Roadside mowing is a threat to the population.
4	CONOCOCHIEGUE CREEK AT ROUTE 16	Antrim Twp.	This site contains an unranked population of Spreading Rock-cress (<i>Arabis patens</i>), a G3, S2 PA-Threatened plant species of concern. This species of concern was found on a steep shale slope becoming a shear rock outcrop as the Conococheague Creek bends. Threats to the population include invasive species such as English Ivy. Additional surveys for this species in this area are recommended.
4	CONODOGUINET CREEK IN UPPER HORSE VALLEY	Letterkenny Twp	This site contains an unknown quality population of Northern Myotis (<i>Myotis septentrionalis</i>), an S3B, S3N animal species of concern . Additional surveys of these bats are needed to better assess the population.

County Rank ¹	Site Name	Municipality	PA Heritage Ranks ² and Site Importance
4	DUNN'S CREEK MEADOW	Hamilton Twp.	This site supports a pair of Barn Owls (<i>Tyto alba</i>), an S3B, S3N Pennsylvania animal species of concern. The main threat to this site is land use changes to the surrounding grasslands and upland forested areas.
4	FALLING SPRING	Guilford Twp., Chambersburg Borough	This site contains an unknown quality population of a G4Q Pennsylvania animal species of concern . Threats to this species include additional stream warming and water pollution. Direct disturbances to this species include runoff from surrounding businesses and roadways. It is recommended that this spring be protected from pollution by the maintenance of undisturbed forested buffers.
4	GUNTER VALLEY AND RIDGES	Lurgan Twp.	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.
4	HIGHLAND SCHOOL FIELDS	Montgomery Twp.	This site contains an unknown quality population of Loggerhead Shrike (<i>Lanius ludovicianus</i>), a G4T3Q Pennsylvania animal species of concern. Direct threats to this species include conversion of land use from farm/open grasslands to development or rowcrop agriculture. It is important if this species is still breeding at this site that monitoring, management, and intensive research be conducted to better assess the shrike's life history and habitat needs.
4	HOOVER SPRING	Washington Twp.	This site contains an unknown quality population of a G4Q Pennsylvania animal species of concern . Direct threats to the population of the species would be changes in hydrology, water pollution such as lawn runoff and chemicals, and agricultural runoff. It is recommended that further surveys of this species be conducted in nearby springs to determine the extent of the population.
4	LETTERKENNY ARMY DEPOT	Letterkenny Twp.	This site contains an unknown quality "Ephemeral/Fluctuating Pool" Natural Community. This area also contains good grassland bird habitat that may support the delisted but still carefully monitored Henslow's Sparrow (<i>Ammodramus henslowii</i>).
4	MAINS RUN PONDS	Southampton Twp., and Cumberland Co.	A fair population of Small Beggar's-Ticks (<i>Bidens discoidea</i>), an S3 plant species of concern , was documented in a Buttonbush shrub swamp. Threats and disturbances include dumping, clearing, deer over-browsing; the southwest part of this pond has been filled in as a dump.
4	MERCERSBURG MEADOW	Montgomery and Peters Twp.	This site contains an unknown quality population of Barn Owl (<i>Tyto alba</i>), an S3B, S3N Pennsylvania animal species of concern. Threats and disturbances include land use changes to the surrounding grasslands and upland forested areas

County Rank ¹	Site Name	Municipality	PA Heritage Ranks ² and Site Importance
4	MIDDLE CREEK SPRING WATERSHED	Southampton Twp., and Cumberland County	During surveys in 2000, a PA-Endangered animal was discovered in a small wetland along the creek. The animal population and the quality of habitat in Middle Spring Creek are threatened by excessive siltation from agricultural runoff and by industrial pollution. Also at this site is a population of Grass-leaved Rush (<i>Juncus biflorus</i>) , a G5, S2 Pennsylvania plant species of concern, and Short-fruited Rush (<i>Juncus brachycarpus</i>) , a G4G5, S1 Pennsylvania Endangered plant species of concern. Changing hydrology due to the road and development is a possible long-term threat.
4	MONT ALTO MOUNTAIN	Guilford Twp. Quincy Twp.	This area contains fair to good populations of Short-leaf Pine (<i>Pinus echinata</i>) found in a “mixed hardwood-pine forest” in well-drained sandy soil in a multiple usage area. Succession is a threat to this area. This area may require management in order to regenerate some of the pine species that grow there. Succession is a continued threat.
4	MUDDY RUN SPRING	Antrim Twp.	This site contains an unknown quality population of a G4 SQ animal species of concern . A population of this species was found in a spring-fed run with gravel/cobble/rubble substrate with extensive silted areas and high turbidity.
4	NUNNERY SPRING	Quincy Twp, Washington Twp.	This site contains an unknown quality population of a G4Q Pennsylvania animal species of concern . Direct threats to the population of the species would be changes in hydrology, water pollution such as lawn runoff and chemicals, and agricultural runoff. Disturbances include lack of forested buffer, mowing right up to edge of the stream, and nearby agriculture. It is recommended that further surveys of this species be conducted in nearby springs to determine the extent of the population.
4	QUARRY GAP	Greene Twp., and Adams County	This site contains a small population of Northeastern Bulrush (<i>Scirpus ancistrochaetus</i>) , a Federally-Endangered G3 S3 plant species of concern, and a small to fair quality “Ephemeral/fluctuating Natural Pool” natural community. No major threats or disturbances are noted at this site but a shelter cut in the past has left some deforested areas.
4	ROUTE 997 NORTH OF ROXBURY	Lurgan Twp.	This site contains two unknown quality occurrences of Upland Sandpiper (<i>Bartramia longicauda</i>) , an S1 Pennsylvania threatened animal species of concern. Also occurring here is an unknown quality population of Loggerhead Shrike (<i>Lanius ludovicianus</i>) , a G4T3Q Pennsylvania animal species of concern. Direct threats to this species include conversion of land use from farm/open grasslands to development or rowcrop agriculture.
4	SHIMPSTOWN MEADOWS	Montgomery Twp.	This area contains an unknown quality population of Barn Owl (<i>Tyto alba</i>) , an S3B, S3N Pennsylvania animal species of concern. Threats and disturbances include land use changes to the surrounding grasslands and upland forested areas

County Rank ¹	Site Name	Municipality	PA Heritage Ranks ² and Site Importance
4	ST. THOMAS BARREN	St. Thomas Twp.	This site contains several populations of Prickly-Pear Cactus (<i>Opuntia humifusa</i>) found in dry grassy areas, road embankments and one area of woods. Threats and disturbances include invasive plant species, succession, roadside mowing, and maintenance and spraying activities.
4	WAYNECASTLE OLD FIELD HABITAT	Antrim Twp. Washington Twp.	This site contains a fair to good population of Lance-leaved Buckthorn (<i>Rhamnus lanceolata</i>) , a G5, S1 Pennsylvania plant species of concern. Threats and disturbances include continued succession and development pressure.
4	ZULLINGER SPRING	Washington Twp.	This site contains an unknown quality population of a G4Q Pennsylvania animal species of concern . Direct threats to the population of the species would be changes in hydrology, water pollution such as lawn runoff and chemicals, and agricultural runoff. Disturbances include lack of forested buffer, mowing right up to edge of the stream, and nearby agriculture. It is recommended that further surveys of this species be conducted in nearby springs to determine the extent of the population.
5	BEARTOWN WOODS	Washington Twp.	This site contains an unknown quality of a “ Mesic Central Forest ”, an S2 Natural Community. This community occupies most of the valley bottom along Red Run. Surrounding land use is Michaux State Forest, and single home residential units.
5	CHARLESTOWN PONDS	Peters Twp.	This site contains approximately eight small to fair quality “ Ephemeral/Fluctuating Pool Natural Communities ”, which provide critical breeding habitat for amphibians. It is recommended that undisturbed forested buffers be maintained around this pond community. Further surveys of this area could identify additional vernal pools.
5	CONOCOCHIEAGUE CREEK NEAR MARION	Hamilton, Guilford and Antrim Townships	This site contains a small population of Limestone Petunia (<i>Ruellia strepens</i>) , a G5, S2 plant species of concern.
5	CONODOGUINET CREEK AT ORRSTOWN	Letterkenny Twp. Southampton Twp. Lurgan Twp.	This forested but disturbed floodplain area contains an undetermined quality population of Pineland Pimpernel (<i>Samolus parviflorus</i>) , an S2 Pennsylvania plant species of concern. Threats to this area include draining, conversion to agricultural fields and invasive plant species.
5	EDENVILLE MEADOWS	St. Thomas Twp. Hamilton Twp.	This site has supported an unknown quality population of Dickcissel (<i>Spiza americana</i>) , an S2B animal species of concern, in the past. This site may or may not presently support this species due to changing land use management. Lack of data and site revisits are needed to determine if this species still utilizes this site.
5	EROSIONAL REMNANT	Quincy Twp.	This site contains a geologic feature that is an outstanding view from spectacular pinnacles of Weverton quartzite (Cambrian age). Stretched pebbles and crossbedding may be seen on the rocks. Chimney Rock and Buzzard Peak can be seen in the distance.

County Rank ¹	Site Name	Municipality	PA Heritage Ranks ² and Site Importance
5	KEASEY RUN WETLANDS	Letterkenny Twp.	A fair population of Brown Sedge (<i>Carex buxbaumii</i>), an S3 Pennsylvania plant species of concern, was found in a marshy area in a bottomland along a creek in a saturated shale substrate. This area has little disturbance with the exception of the presence of Rough Bluegrass (<i>Poa trivialis</i>), an exotic species.
5	METAL CHURCH SPRING	Metal Twp.	This site contains a population of White Water-Crowfoot (<i>Ranunculus aquatilis var. diffusus</i>), an S3 Pennsylvania plant species of concern. Also included in this site is an undetermined quality population of an animal species of concern .
5	MOUNTAIN LAKE	Metal Twp.	Mountain Lake was formed by damming the West Branch Conococheague Creek and has become suitable habitat for a Pennsylvania threatened animal species of concern . There has been some discussion in the past of removing the dam and draining the lake. This would eliminate the habitat for the species of concern and is not recommended. Further monitoring is necessary to determine the health of this population.
5	RATTLESNAKE RIDGE	Peters Twp.	A good population of Slender Goldenrod (<i>Solidago speciosa var. erecta</i>) was found on a south facing rocky roadbank on a dry shale and chunky sandstone substrate. The population of this species is vulnerable to roadside spraying, or maintenance.
5	SIBERIA	Guilford Twp. Hamilton Twp. Chambersburg Boro.	This site contains a good population of Limestone Petunia (<i>Ruellia strepens</i>), an S2 plant species of concern. Surrounding land includes the borough of Chambersburg and suburbs, farms, fields, and pastures. Exotic plant species in the floodplain are a threat.
5	STATE GAME LANDS #124-TUSCARORA TRAIL	Warren Twp.	This site contains a good population of Purple Bedstraw (<i>Galium latifolium</i>), a G5, S3 plant species of concern. Disturbances to this site include exotic plant species, gypsy moth defoliation, and deer overbrowsing. It is recommended that this site be monitored for invasive plant species and for excessive overbrowsing by deer.
5	TUSCARORA TRAIL	Warren Twp.	This site contains a good population of Purple Bedstraw (<i>Galium latifolium</i>), an S3 plant species of concern. Disturbances to this site include exotics, gypsy moth defoliation, and excessive deer browse.
5	UPPER HORSE VALLEY	Metal Twp. Peters Twp. St. Thomas Twp.	This area contains an unknown quality population of a S3S4 animal species of concern . More surveys are needed in the area to determine the extent of the population.
5	UPPER WEST BRANCH CONOCOCHIEAGUE CREEK	Metal Twp. Peters Twp.	This site contains a population of Purple Bedstraw (<i>Galium latifolium</i>), an S3 Pennsylvania plant species of concern. Also included in this site is a population of American Beakgrain (<i>Diarrhena obovata</i>), a recently delisted plant species.
5	WEST BRANCH CONOCOCHIEAGUE	Montgomery Twp.	An unknown population of an S2 animal species of concern was found in this area. More surveys are needed to better assess the population of this species at this site.

Table 3. Locally Significant Sites

Areas of Local Significance in Franklin 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
High	Roxbury Floodplain	Letterkenny Twp., Lurgan Twp.	This site contains an extensive floodplain community. This site has potential for many plant species of concern in the floodplain area and in a shale outcrop near Lurgan School. Despite the invasive species spread, this area, along with many floodplain and shale cliff areas along the Conodoguinet and Conococheague Creeks, remain an important part of the Franklin County landscape and the potential for finding further species of concern are high.
Medium	Happel's Meadow	Washington Twp.	This locally significant site consists of a good-sized shrub swamp, dry and wet meadow along Route 16 in Washington Township. Even though no plant species of concern were found at this site during the visit, the potential exists. This site is deemed locally significant mainly due to the very good plant diversity, good bird diversity, and for being one of the few remaining good quality shrub swamps in Franklin County.
Low	Wilson Run	St. Thomas Twp.	This locally significant site contains potential habitat for species of concern. Site surveys are recommended to determine the quality of the habitat for species of concern.

Franklin County Natural Areas by Township



A limestone glade within the Williamson Redbud – Red Cedar Shrubland Natural Community, one of Franklin County's top priority natural areas. This site is home to two species of rare animals and nine species of rare plants.

Photo: PA Science Office of The Nature Conservancy

ANTRIM TOWNSHIP & Greencastle Borough

Site Name	Special Species / Community Type	PNHP Ranks*		State Status	Last Seen	Quality**
		Global	State			
Conococheague Creek at Route 16	Spreading Rockcress (<i>Arabis patens</i>)	G3	S2	N	5/14/2002	E
	Limestone Petunia (<i>Ruellia strepens</i>)	G4G5	S2	PT	2003	E
Conococheague Creek at Highland School	Animal	BC	S2S3	N	6/25/1993	BC
	Animal: Giant Swallowtail (<i>Papilo cressphontes</i>)	G5	S2	N	7/15/1987	F
	Spreading Rockcress (<i>Arabis patens</i>)	G3	S2	N	5/18/2002	AB, B
	Black-stemmed Spleenwort (<i>Asplenium resiliens</i>)	G5	S1	PE	5/18/2002	C
	Limestone Petunia (<i>Ruellia strepens</i>)	G4G5	S2	PT	5/18/2002	B
	Jeweled Shooting-star (<i>Dodecatheon meadia</i>)	G?	S2	PT	5/10/1995	A
	Green-and-Gold (<i>Chrysogonum virginianum</i>)	G5	S1	PE	5/18/2002	B, B
	Lance-leaved Buckthorn (<i>Rhamnus lanceolata</i>)	G5	S1	PE	5/18/2002	C, CD
Leather Flower (<i>Clematis viorna</i>)	G5	S1	PE	5/18/2002	B, D	
Conococheague Creek near Marion	Limestone Petunia (<i>Ruellia strepens</i>)	G4G5	S2	PT	2003	D
Highland School Fields	Animal: Loggerhead Shrike (<i>Lanius ludovicianus</i>)	G4	S?	PE	1994	E

Site Name	Special Species / Community Type	PNHP Ranks*		State Status	Last Seen	Quality**
		Global	State			
Lower Conococheague Creek	Limestone Petunia (<i>Ruellia strepens</i>)	G4G5	S2	PT	8/23/2003	BC
	Allegheny Stonecrop (<i>Sedum telephioides</i>)	G4	S3	PR	8/23/2003	B
	Animal: Loggerhead Shrike (<i>Lanius ludovicianus</i>)	G4	S?	PE	1994	E
	Wild Senna (<i>Senna marilandica</i>)	G5	S1	TU	8/23/2003	D
	Mistflower (<i>Eupatorium coelestinum</i>)	G5	S3	N	8/23/2003	D
Martin's Mill Bridge	Beard-tongue (<i>Penstemon canescens</i>)	G4	S3	N	5/23/2002	B
	Limestone Petunia (<i>Ruellia strepens</i>)	G4G5	S2	PT	7/5/1987	C
	Slender Goldenrod (<i>Solidago speciosa</i> var. <i>erecta</i>)	G5	S1	PE	9/06/2003	B
Muddy Run Spring	Animal	G4Q	S?	N	8/9/2002	E
Sportsman's Road Shale Bank	Prickly Pear-Cactus (<i>Opuntia humifusa</i>)	G5	S3	PR	5/22/1987	C
	Kate's Mountain Clover (<i>Trifolium virginicum</i>)	G3	S1	PE	5/5/1990	D
	Cat's-Paw Ragwort (<i>Senecio antennariifolius</i>)	G4	S1	PE	5/1/1995	BC
	Shumard's Oak (<i>Quercus shumardii</i>)	G5	S1	PE	11/15/2003	E
	White Water-Crowfoot (<i>Ranunculus aquatilis</i> var <i>diffusus</i>)	G5T5	S3	N	9/14/2002	B
Waynecastle Old Field Habitat	Lance-leaved Buckthorn (<i>Rhamnus lanceolata</i>)	G5	S1	N	7/25/2002	BC
	Sedge (<i>Carex shortiana</i>)	G5	S3	N	2003	?

Site Name	Special Species / Community Type	PNHP Ranks*		State Status	Last Seen	Quality**
		Global	State			
Williamson Red Cedar-Redbud Shrubland	Tufted Buttercup (<i>Ranunculus fascicularis</i>)	G5	S1S2	PE	5/24/1994	CD
	Fringed-leaved Petunia (<i>Ruellia humilis</i>)	G5	S1	PE	7/9/2002	AB
	Lance-leaved Buckthorn (<i>Rhamnus lanceolata</i>)	G5	S1	PE	7/9/2002	BC
	Limestone Petunia (<i>Ruellia strepens</i>)	G4G5	S1	PT	8/31/1990	C
	Spreading Rockcress (<i>Arabis patens</i>)	G3	S2	N	5/24/1994	CD
	Oblique Milkvine (<i>Matelea obliqua</i>)	G4?	S1	PE	8/31/1990	CD
	Prickly Pear Cactus (<i>Opuntia humifusa</i>)	G5	S3	PR	6/26/1996	D
	Tall Grama (<i>Bouteloua curtipendula</i>)	G5	S2	PT	7/9/2002	C
	Animal	G2G3	S1	N	6/25/1993	B
	Animal	G3G4	S2S3	N	6/25/1993	B
Limestone Adder-tongue (<i>Ophioglossum engelmannii</i>)	G5	S1	N	5/24/1994	B	

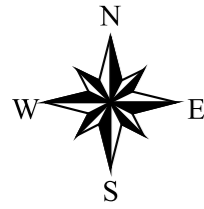
Managed Lands: None

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

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

[Antrim Township Map](#)

Antrim Township and Greencastle Borough

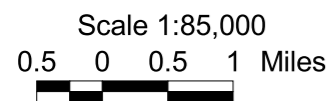
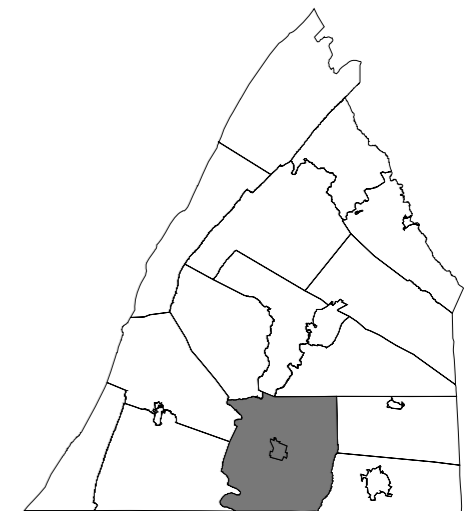
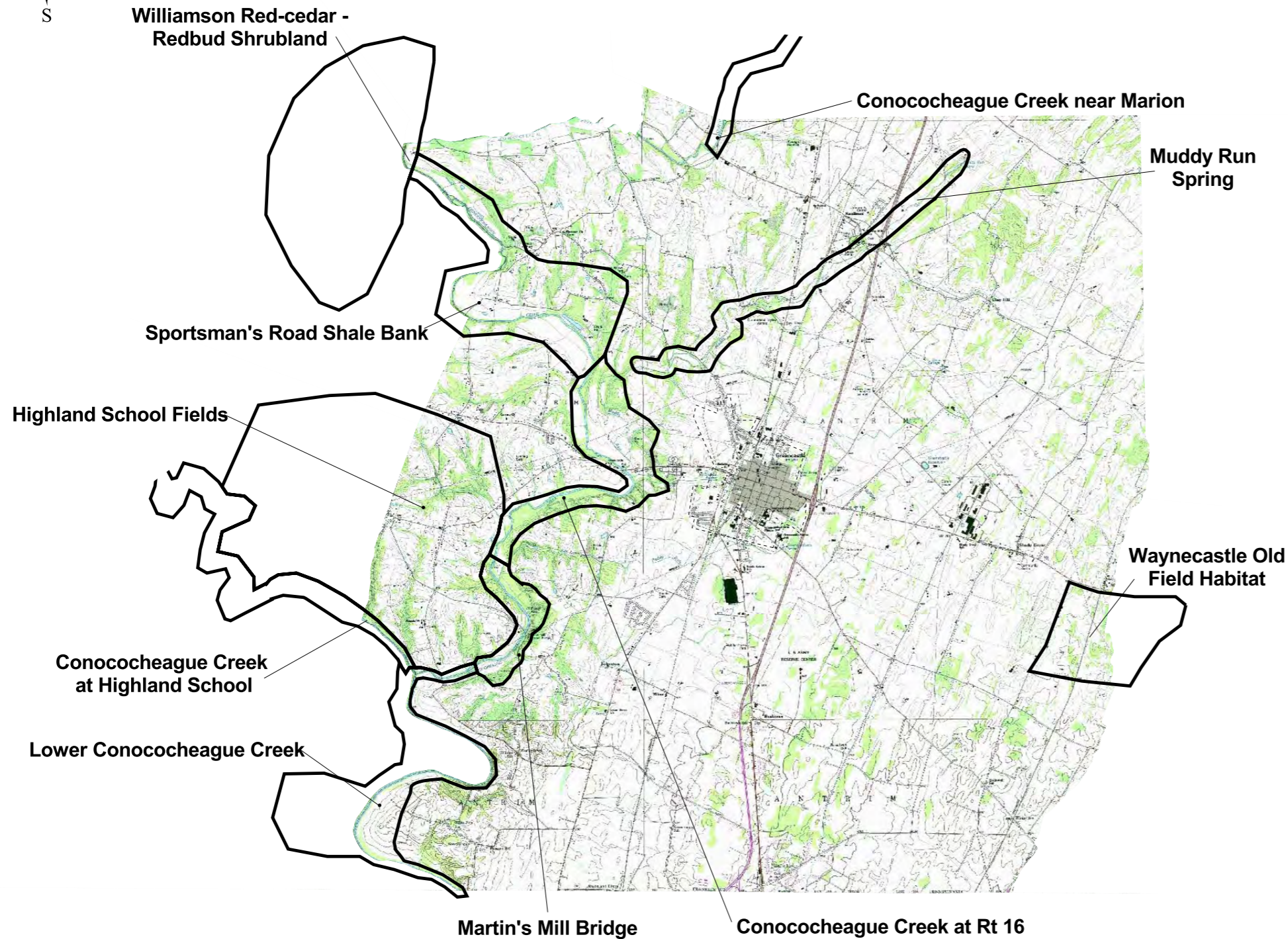


Antrim Township and Greencastle Borough



Franklin County Natural Areas Inventory

Natural Areas:

- Conococheague Creek at Highland School
- Conococheague Creek at Rt 16
- Conococheague Creek near Marion
- Highland School Fields
- Lower Conococheague Creek
- Martin's Mill Bridge
- Muddy Run Spring
- Sportsman's Road Shale Bank
- Waynecastle Old Field Habitat
- Williamson Red-cedar-Redbud Shrubland



Legend

-  Natural Area or Locally Significant Site
-  Municipal Boundary

CONOCOCHEAGUE CREEK AT ROUTE 16 (Antrim Township)

This site contains a small population of **Spreading Rock-cress** (*Arabis patens*), a G3, S2 Pennsylvania plant species of concern, and a fair-quality population of **Limestone Petunia** (*Ruellia strepens*), a G5, S2 PA-Threatened plant species of concern. The Spreading Rock-cress was found on a steep shale slope that grades into a shear rock outcrop as the Conococheague Creek bends. The slopes in this area are composed of a loose-shale substrate, and support a mixed oak-hardwood canopy. There is sparse vegetation cover beneath the canopy on the upper slopes, but the herbaceous layer becomes more pronounced as the hillside approaches the creek banks. Plants found in association with the species of concern at this site include Wild Columbine, Orpine, Marginal Shield Fern, Rock-cap Fern, Solomon's Seal, Alum-root, Crowfoot, Maidenhair Spleenwort, Black Birch, White Pine, Wild Hydrangea, English Ivy, Osage-Orange, Red Oak, Chestnut Oak, Witch-hazel, Mountain Laurel, Box-elder, Silky Dogwood, and Slippery Elm. The surrounding land is mostly forested along the steep slopes, with agricultural fields and rural residences scattered on level areas.

Threats and Disturbances

The greatest threat to this site is the introduced plant species English Ivy, which is a highly aggressive invasive plant that has the potential to overrun the habitat of these species of concern. Logging of the slopes adjacent to the creek would also be detrimental to this habitat. Creation of lawn-like environments right up to the creek edge also destroys the habitat of these species.

Conservation Recommendations

Control of English Ivy, preferably by hand pulling, or other mechanical means may be required to preserve the habitat of these species. Forested buffers should be established and preserved along the creek banks and slopes.

CONOCOCHEAGUE CREEK AT HIGHLAND SCHOOL (Antrim and Montgomery Townships)

This site is considered one of the top priority areas for the conservation of biological diversity within Franklin County based on the multiple populations of a large number of plant species of concern, the rarity of the species (G & S-ranks), and the intactness of the surrounding natural community. This dry-mesic calcareous forest supports a very rich herbaceous layer including multiple populations of seven plant species of concern, which occur scattered along the forested, limestone-bedrock bluffs and outcrops lining the West Branch of the Conococheague Creek. The species of concern documented at this site include **Black-stemmed Spleenwort** (*Asplenium resiliens*), **Jeweled Shooting-star** (*Dodecatheon meadia*), **Spreading Rock-cress** (*Arabis patens*), **Leather Flower** (*Clematis viorna*), **Lance-leaved Buckthorn** (*Rhamnus lanceolata*), **Green and Gold** (*Chrysogonum virginianum*) and **Limestone Petunia** (*Ruellia strepens*).

The natural community at this site is the result of limestone bedrock outcrops, which create frequent openings in the tree and shrub canopy. The high pH of the soil weathered from the limestone parent material in these woods and openings create ideal conditions for the calcium-loving species encountered here. The forest along the creek and upper slopes is characterized by the dominance of Sugar Maple, and Basswood with additional tree species including Yellow Oak, Shagbark Hickory, White Ash, and Redbud. The population of the G5, S2 PA-Threatened plant species of concern **Jeweled Shooting-star** at this site is considered one of the best in the state. The population occurs on creek-side outcrops and throughout the bluff-top deciduous woodland in multiple large patches over several acres, occasionally dominating the herbaceous layer. The limited active pasturing of cattle on

portions of this site may help keep the invasive species Japanese Honeysuckle from overtaking the habitat.

Several good-to-excellent populations of **Spreading Rock-cress** a G3, S2 plant species of concern occur scattered among the exposed limestone bedrock. This species has a relatively limited range in North America, hence the G3 rank, with the best-known populations occurring in Pennsylvania and Maryland (NatureServe 2003). The degradation of any local population of Spreading Rock-cress could significantly impact the global range of this species. Two fair-quality populations of the G5, S1 PA-Endangered plant species of concern, **Leather Flower**, and several fair-quality populations of **Lance-leaved Buckthorn**, a G5, S1 PA-Endangered plant species of concern, were documented occurring among the rich shrub layer of the forest community. Associated shrubs in these rich woods include Redbud, Hop-Hornbeam, Slippery Elm, Bladdernut, Virginia Pine, Red Cedar, Black-haw, Burning-bush, Fox Grape, Poison Ivy and the invasive species Japanese Honeysuckle.

A fair-quality population of **Black-stemmed Spleenwort**, a G5, S1 Pennsylvania-Endangered plant species of concern, was found at the base of a north facing limestone cliff. Though wide-ranging in North America, this is one of only a few occurrences of this species in Pennsylvania, the northern limit of its range, all of which are in Franklin County. The forest canopy needs to be left intact along these cliffs to maintain the cool, moist conditions necessary for this species. Aggressive exotic plant species such as Multiflora Rose and Japanese Honeysuckle are very abundant in the vicinity of this species. Several populations of **Green and Gold**, an S1 PA-Endangered plant, were also found in these rich wooded slopes. The known range of this species in Pennsylvania is limited to rich, limestone woods in southern Franklin and Fulton Counties. A good-quality population of **Limestone Petunia** was found along a fisherman's path on the banks of the creek. Herbaceous species found in association along these rich woods include False Solomon's Seal, Bloodroot, Wild Ginger, Trout-lily, Early Meadow-rue, Wild Columbine, Dutchman's-Breeches and Liverleaf .

Finally, two animal species of concern were also documented from this site. **Giant Swallowtail (*Papilio cresphontes*)**, an S2 Pennsylvania-animal species of concern, was found on exposed and wooded cliffs along a creek in 1987, but was not found again in subsequent visits. The larvae of this species of butterfly feed primarily on Prickly Ash (Opler & Malikul 1992). Additional surveys are recommended to determine the status of this species at this site. A fair to good population of an **S2/S3 animal species of concern** was also found in a cave located in a limestone rock outcrop in the middle of a forested pasture.

Threats and Disturbances

Threats and disturbances to this site include invasion from exotic plant species, especially Japanese Honeysuckle. Other disturbances include off-road vehicle trails, vulnerability to logging, cattle grazing, trampling, selective cutting of mature trees, and impact from log removing equipment. Trash dumping down the slope to the creek was a disturbance in one location.

Conservation Recommendations:

The wooded limestone slopes along the creek in this area are particularly rich in several plant species of concern. Undisturbed forested buffers should be maintained along the creek, with logging and other landscape disturbances avoided. Forested buffers should remain intact for the length of the creek with logging operations refraining from cutting within 50 to 100 feet of the creek bank. The species at this site are vulnerable to habitat degradation from invasive species of plants, particularly

(Antrim Township continued)

Japanese Honeysuckle, which is prominent at this location, and Multiflora Rose, which is currently less of a problem at this site. A non-chemical control of Japanese Honeysuckle may be necessary to protect the habitat for these species. Limited cattle grazing may be beneficial in the control of this aggressive plant species. Off road vehicle trails are evident in portions of the site, and should be eliminated in the most sensitive areas. Housing construction should be strongly discouraged along the bluffs overlooking the creek. Narrow access paths to the creek can be created to replace large expanses of park-like lawns along the edge of the creek. In addition, the stream bank floodplain and corridor is usually an area of significantly higher biodiversity than the adjoining uplands. Much of the area's important biodiversity can be preserved by maintaining an intact, forested floodplain along the creek. The effectiveness of the forested creek as a habitat corridor would be diminished by fragmentation of the forest continuity by the construction of houses and additional roadways along the creek. Local planning should discourage construction of new residences and roadways along the creek and floodplain. Future land use considerations should include the possibility of the creation of a natural area on the most sensitive areas of this site.

CONOCOCHAGUE CREEK NEAR MARION (Antrim, Guilford and Hamilton Townships)

This site contains a fair quality population of **Limestone Petunia** (*Ruellia strepens*), a G4G5, S2 PA-Threatened plant species of concern. Though occurring frequently along the southern portion of the Conococheague Creek, this plant is only found in a few other counties in southern Pennsylvania, occurring more frequently in the mid-western United States. The plants at this site were found along the forested creek banks, its favored habitat, and also along a mowed roadside adjacent to the creek. The forest along the creek at this location is composed of characteristic floodplain species such as the trees Box-elder, Basswood, Ash, Black Walnut, the shrubs Bladdernut, Black-haw, Pawpaw, with the understory dominated by Wingstem, Wild Ginger, and Poison Ivy.

Threats & Disturbances

Introduced species of plants, some that are highly aggressive, inhabit much of this floodplain habitat, reducing the area available to habitat specialists like limestone petunia. The Limestone Petunia typically occurs along the levy or high water mark of the creek, and is much less commonly found in other habitats. Invasive species documented at this site include thick tangles of Multiflora Rose, Japanese honeysuckle, Asiatic Bittersweet, Dame's Rocket and Norway Maple. Roadside mowing maintenance appears to favor the Limestone Petunia at this location.

Conservation Recommendations

Control of invasive species of plants along the creek banks may become necessary to protect the habitat of Limestone Petunia in this area. Mechanical methods of weed control such as cutting and pulling could be augmented by a careful, selective application of herbicides registered for use along waterways. The creation and expansion of protective forested buffers along the creek would help reduce the edge effect that many invasive species of plants prefer.

HIGHLAND SCHOOL FIELDS (Antrim and Montgomery Townships)

This site contains an unknown quality population of **Loggerhead Shrike** (*Lanius ludovicianus*), a G4T3Q Pennsylvania animal species of concern. Shrikes prefer open countryside, inhabiting short-grass pastures, weedy fields, grasslands, agricultural areas, swampy thickets, orchards, and right-of-way corridors (Brauning, 1992). This species prefers areas containing hedgerows, scattered trees or shrubs such as Hawthorns, Osage-orange, and Multiflora Rose. There should be some trees containing thorns or at least barbed wire fence for impaling prey since the species has no sharp talons. No associated species

(Antrim Township continued)

were noted at this site. It should be noted that this species has not been documented at this site for at least four years.

Threats and Disturbances

Direct threats to this species include conversion of land use from farm/open grasslands to development or rowcrop agriculture. Bushwhacking of shrubs and small trees in this area would likely cause Shrikes to abandon their nesting site. Another direct threat is the use of pesticides on farm pests such as mice. Pesticides such as DDT may have contributed to the rapid decline of this species throughout the northeast (Michigan Natural Features Inventory, 2001). Succession into forest is another threat to the site itself. Disturbances include potential development, and encroaching roads and suburbanization.

Conservation Recommendations

It is important if this species is still breeding at this site that monitoring, management, and intensive research be conducted to better assess the shrike's life history and habitat needs. It is recommended that this site be managed for this species by keeping the area at an early successional stage but with scattered trees, adequate patch size, short grasses (4-18"), adequate hunting perches, adequate nest sites, sufficient prey supply, and impaling substrate (New Jersey Fish & Wildlife, 2002). If an active farm is nearby, it is recommended that limited pesticides be used. This species is in great peril in the northeast, and if this site still supports breeding pairs of migrant Loggerhead Shrikes, it is vital to protect the habitat on which it depends. A subspecies of the Loggerhead Shrike (*Lanius ludovicianus migrans*), which may occur in Pennsylvania, is a candidate for federal listing and is a Nongame Migratory Bird of Management Concern.

LOWER CONCOCHEAGUE CREEK (Antrim and Montgomery Townships)

This site contains a high-quality population of **Allegheny Stonecrop** (*Sedum telephioides*), a G4, S3 PA-Rare plant species of concern, and an excellent-quality population of **Limestone Petunia** (*Ruellia strepens*), a G4G5, S2 PA-Threatened plant species of concern. The site also contains a small occurrence of an S1 plant species of concern, **Wild Senna** (*Senna marilandica*) and a small population of an S3 plant species of concern, **Mistflower** (*Eupatorium coelestinum*). In addition, this site contains an unknown quality population of **Loggerhead Shrike** (*Lanius ludovicianus*), a G4T3Q animal species of concern.

The narrow, though mostly continuous forest canopy along the creek edge can be characterized as a "Silver Maple Floodplain Forest" (Fike 1999). Besides Silver Maple, the canopy along the narrow floodplain includes Sycamore, Box-elder, Basswood, Hackberry, American Elm, White & Red Ash, the recently delisted species, Shellbark Hickory, and the infrequently occurring Bur Oak.

The **Allegheny Stonecrop** occupies a calcareous-shale outcrop cliff undercut by a bend in the Conococheague Creek. This species occurs in several large bands from near the water's edge to high up on the cliff summit at this location. The known Pennsylvania distribution of this species is limited to the southern portions of Bedford, Fulton and Franklin Counties. Associated species on the rock outcrop include White Aster, Common Polypody, Wild Columbine, Marginal Shield Fern, Maidenhair Spleenwort, Ebony Spleenwort, Wild Hydrangea, Stinging Nettle, Wood Nettle and Poison Ivy. Canopy trees surrounding the outcrop include Silver Maple, Box Elder, Red Maple, Basswood, Hop Hornbeam and Hemlock.

The extensive population of **Limestone Petunia** found along the banks of this stretch of the Conococheague Creek represents perhaps the best quality population of this species in the state. This plant occurs scattered singly, in small clumps and in occasional dense patches in a narrow zone along the levy and portions of the floodplain of the creek. The small populations of **Wild Senna** and **Mistflower** also occur along the creek bank. Plant species associated with Limestone Petunia in this location typically include Poison-ivy, Wingstem, Calico Aster, Stiltgrass, Great Lobelia, Evening Primrose, White vervain, Eastern Figwort, Spotted St. John's-wort and Bottlebrush Grass.

The unknown quality population of **Loggerhead Shrikes** was also seen not far from the creek south of Welsh Run. It is unclear whether this site still supports this species since the last survey was conducted in 1994.

Threats and Disturbances

Observed disturbances and potential threats to these creek-side species occurrences include crowding by invasive plant species, road maintenance activities where the road encounters the creek, pathway trampling, and the removal of creek bank vegetation for lawns. Logging to the creek edge was observed in some areas. New houses built on the banks of the creek fragment the continuity of the habitat, interrupting its effect as a wildlife corridor, and could potentially introduce invasive species of plants into the habitat.

Direct threats to the shrike habitat include conversion of land use from farm/open grasslands to development or rowcrop agriculture. Bushwhacking of shrubs and small trees in this area would likely cause Shrikes to abandon their nesting site. Another direct threat is the use of pesticides on farm pests such as mice. Pesticides such as DDT may have contributed to the rapid decline of this species throughout the northeast. Succession into forest is another threat to the site itself. Disturbances include potential development, and encroaching roads and suburbanization.

Conservation Recommendations

The population of Limestone Petunia appears to be thriving despite creek-side clearing disturbances, but would not survive the creation of lawn-like conditions to the creek edge. The isolated, inaccessible nature of the rock outcrop where the Allegheny Stonecrop occurs will likely protect it from disturbances, but should be monitored for invasive species. The forested canopy above the rock outcrop should be maintained as a buffer from human impacts to the site. Forested buffers should remain intact for the length of the creek with logging operations refraining from cutting within 50 to 100 feet of the creek bank. Stream bank forests help buffer the watershed from the effects of non-point sources of pollution including runoff from agricultural, residential and roadway settings. In addition, the stream bank floodplain and corridor is usually an area of significantly higher biodiversity than the adjoining uplands. Much of the area's important biodiversity can be preserved by maintaining an intact, forested floodplain along the creek. The effectiveness of the forested creek as a habitat corridor would be diminished by fragmentation of the forest continuity by the construction of houses and additional roadways along the creek. Local planning should discourage construction of new residences and roadways along the creek and floodplain. Additional surveys for species of concern in this area are encouraged.

For loggerhead shrike habitat, it is important if the species is still breeding at this site that monitoring, management, and intensive research be conducted to better assess the shrike's life history and habitat needs. It is recommended that this site be managed for this species by keeping the area at an early

(Antrim Township continued)

successional stage but with scattered trees, adequate patch size, short grasses (4-18"), adequate hunting perches, adequate nest sites, sufficient prey supply, and impaling substrate (New Jersey Fish & Wildlife 2002). If an active farm is nearby, it is recommended that limited pesticides be used. This species is in great peril in the northeast, and if this site still supports breeding pairs of migrant Loggerhead Shrikes, it is vital to protect the habitat that it depends on. A subspecies of the Loggerhead Shrike (*Lanius ludovicianus migrans*), which may occur in Pennsylvania, is a candidate for federal listing and is a Nongame Migratory Bird of Management Concern.

MARTIN'S MILL BRIDGE (Antrim Township)

This site contains a fair quality population of **Limestone Petunia** (*Ruellia strepens*), a G4G5, S2 PA-Threatened plant species of concern, along the banks of the Conococheague Creek. In addition, a good quality population of **Beard-Tongue** (*Penstemon canescens*), a G4, S3 plant species of concern, and a good quality population of **Slender Goldenrod** (*Solidago speciosa var. erecta*), an S1 PA-Endangered plant species of concern, were found scattered over a wide area of west/northwest facing shale slope. The best populations of these species were found on the steep slopes in loose shale under a canopy of pines and mixed oaks with sparse herbaceous understory. Dominant species included White Pine, Virginia Pine, Chestnut Oak, Red Oak, White Oak, Serviceberry, Hickories, Choke Cherry, Black Tupelo, Hop-Hornbeam, Ninebark, Maple-leaved Viburnum, Black Huckleberry, Pasture Rose, Common Dittany, Pussytoes, Marginal Shield Fern, Rattlesnake-Weed, Golden-alexanders, and Ebony spleenwort. The surrounding landscape includes a seasonal camp at the base of the slope along the creek, a township park, agricultural fields and rural residences.

Threats and disturbances

Road maintenance (spraying, widening), Antrim Township Park construction activities, erosion control along the creek banks (rip-rap), and invasive plant species present the greatest potential disturbances to these species.

Conservation Recommendations

Logging should be left to a minimum along the slopes and floodplain in this area. Control of invasive species of plants, especially Japanese Honeysuckle and Multiflora Rose, may become necessary to keep the plant species of concern from being choked out of the available habitat. The creation / expansion of the Antrim Township Park on the upper, level portion of the site should present no threat to the species of concern; however, caution is urged for any landscape modifications planned near the crest of the hill overlooking the creek, and the adjacent slopes and creek bank. Any trails created in the Antrim Township Park should be monitored for disturbances from unauthorized motorized vehicles. Additional surveys for species of concern in this area are encouraged.

MUDDY RUN SPRING (Antrim Township)

This site contains an unknown quality population of a **G4Q SQ animal species of concern**. A population of this species was found in a spring-fed run with gravel/cobble/rubble substrate with extensive silted areas and high turbidity. This area also had a dense canopy closure and coarse woody debris. Associated species include Satinfin Shiner (*Cyprinella analostana*), Spotfin Shiner (*Cyprinella spiloptera*), Pearl Dace (*Margariscus margarita*), Blacknose Dace (*Rhinichthys atratulus*), Creek Chub (*Semotilus atromaculatus*), White Sucker (*Catostomus commersoni*), Pumpkinseed (*Lepomis gibbosus*), and Green Sunfish (*Lepomis cyanellus*).

Threats and Disturbances

Threats to the species population include development, removal of trees from the riparian corridor that would change the water temperature, and water pollution. Disturbances to the population include sediment entering the stream through a manmade channel. The channel could be an attempt to drain a wet field.

Conservation Recommendations

It is recommended that further surveys of this species be conducted in nearby springs to determine the extent of the population. Also, this spring should be protected from pollution to protect the population.

SPORTSMAN'S ROAD SHALE BANK (Antrim and Peters Townships)

A small population of **Kate's Mountain Clover** (*Trifolium virginianum*), a G3 S1 Pennsylvania plant species of concern, a fair to good population of **Cat's Paw Ragwort** (*Senecio antennariifolius*), a G4 S1 Pennsylvania plant species of concern, and a fair population of **Prickly-Pear Cactus** (*Opuntia humifusa*), a G5 S3 Pennsylvania plant species of concern, were found in a nearly bare shale area with mixed deciduous forest on the north side and surrounding lawn and a manmade lake. This area is an old shale excavation area that simulates a shale barren and has very sparse vegetation cover. Japanese Honeysuckle (*Lonicera japonica*) occur in abundance in the surrounding deciduous forests. Also at this site, a good population of **White Water-Crowfoot** (*Ranunculus aquatilis var diffusus*), a G5T5 Pennsylvania plant species of concern, occurs in the creek. The stream banks in this area also support an unknown quality population of **Shumard's Oak** (*Quercus shumardii*) a G5, S1 PA-Endangered tree species of concern.

Threats and disturbances

Disturbances include mowing and invasive species. Residential development of the shale bank area can potentially eliminate the species of concern that occur here. Logging operations along the creek bank can potentially eliminate this occurrence of Shumard's Oak. Increased sedimentation and non-point sources of pollution can significantly decrease the water quality for the aquatic plant species. There were no immediate threats observed in this area.

Conservation Recommendations

Forested buffers should remain intact for the length of the creek with logging operations refraining from cutting within 50 to 100 feet of the creek bank. Stream bank forests help buffer the watershed from the effects of non-point sources of pollution including runoff from agricultural, residential and roadway settings. Periodic monitoring of the spread of invasive species such as Japanese Honeysuckle is recommended.

WAYNECASTLE OLD FIELD HABITAT (Antrim and Washington Townships)

This site contains a fair to good quality population of **Lance-leaved Buckthorn** (*Rhamnus lanceolata*), an S1 Pennsylvania plant species of concern, and a small population of a **Sedge** (*Carex shortiana*), an S3 plant species of concern. The **Lance-leaved Buckthorn** population is located in an old-field habitat on a gently undulating terrain with exposed limestone bedrock. The heaviest concentrations of this population are along a managed pipeline right-of-way and along the road edge. This species is thriving amid extensive competition from invasive species. The successional habitat

(Antrim Township continued)

maintained by the regimen of infrequent mowing at this site helps provide the habitat necessary for the continued success of this species.

The rare **sedge** species found at this site (*Carex shortiana*) was growing in a moist, graminoid dominated pasture with a limestone substrate. The dominant species are exotic grasses such as orchard grass, smooth brome grass and blue grasses pasture appears to have only occasional grazing.

The disturbance from infrequent mowing or grazing is likely beneficial for this species. Some of the land at this site is in the Conservation Reserve Enhancement Program (CREP). The agricultural practices encouraged under this program, such as agricultural filter strips and forested buffers help protect streams, lakes, and rivers from sedimentation and agricultural runoff, as well as provide valuable habitat for common and uncommon plants and animals. Associated species at this site include common hay field grasses and forbs such as Orchard Grass, Smooth Brome Grass, Fescue (*Festuca elatior*), Kentucky Bluegrass, Queen Anne's Lace, Oswego-tea, Wild Bergamot, and Horse-Nettle. Common young trees and shrubs include Black Cherry, Eastern Red Cedar, Black Walnut, Black Locust, Slippery Elm, Hackberry, Poison-Ivy, Common Blackberry, Staghorn Sumac, Smooth Sumac. Aggressive invasive plants include Multiflora Rose, Morrow's Honeysuckle, Japanese Barberry, Tree-of-heaven, Spotted Knapweed, and Japanese Honeysuckle.

Bird species recorded here include Northern Cardinal, Eastern Towhee, American, Common Yellowthroat, American Goldfinch, Gray Catbird, Willow Flycatcher and Field Sparrow.

Threats and Disturbances

The spread of exotic plant species, and expanding suburban development pressure are the greatest threats to the species of concern at this site. Continued succession from a young, old-field habitat to a more mature forest will also tend to decrease the amount of habitat suitable for these species.

Conservation Recommendations

The agricultural practices encouraged under the CREP program, such as the infrequent mowing and forested buffer strips, help provide the successional habitat necessary for these species. A carefully designed and executed prescribed burn regimen would also help reduce the invasive species present while rejuvenating the habitat of this site. Additional surveys for species of concern in this area are encouraged.

WILLIAMSON RED CEDAR-REDBUD SHRUBLAND (Antrim, Peters, and St. Thomas Townships)

Only a small portion of this biologically important site occurs in Antrim Township. Please refer to the site description in Peters Township.

(Antrim Township continued)

Conococheague Creek Near the Maryland Border



The Bends of the Conococheague Creek as it nears the Maryland border provide the necessary habitat requirements for excellent quality populations of several plant species of concern. Shown at left is Allegheny stonecrop (*Sedum telephioides*) a G4, S3 PA-Rare species of concern.



At left is, by Pennsylvania standards, an enormous population of limestone petunia (*Ruellia strepens*), a G4G5, S2 Pa-Threatened plant species of concern, which occurs frequently along the floodplain of the lower Conococheague Creek.

At right is Wild Senna (*Senna marilandica*). A small population of this species was also documented along the Lower



(Photos: PA Science Office of The Nature Conservancy)

FANNETT TOWNSHIP

Site Name	Special Species / Community Type	PNHP Ranks*		State Status	Last Seen	Quality**
		Global	State			
Concord Narrows	Animal: Allegheny Woodrat (<i>Neotoma magister</i>)	G3G4	S3	PT	8/11/1987	C
	Virginia Mallow (<i>Sida hermaphrodita</i>)	G2	S2	PE	8/7/2002	B
Gunter Valley and Ridges	Animal	G4	S3S4	PC	6/26/2002	E
	Animal: Northern Myotis (<i>Myotis septentrionalis</i>)	G4	S3B, S3N	N	6/27/2000	E
Neeleytown Ridgetop	Animal: Allegheny Woodrat (<i>Neotoma magister</i>)	G3G4	S3	PT	8/11/0987	BC
Pine Run Ponds	Northeastern Bulrush (<i>Scirpus ancistrochaetus</i>)	G3	S3	PE	8/03/2000	BC
	Ephemeral/Fluctuating Natural Pool Community	G?	S3	N	9/10/2002	BC
Second Narrows Slopes	Northeastern Bulrush (<i>Scirpus ancistrochaetus</i>)	G3	S3	PT	8/3/2003	BC
	Purple Bedstraw (<i>Galium latifolium</i>)	G5	S3	N	8/13/2003	D
	Ephemeral/Fluctuating Natural Pool Community	G?	S3	N	9/10/2002	BC

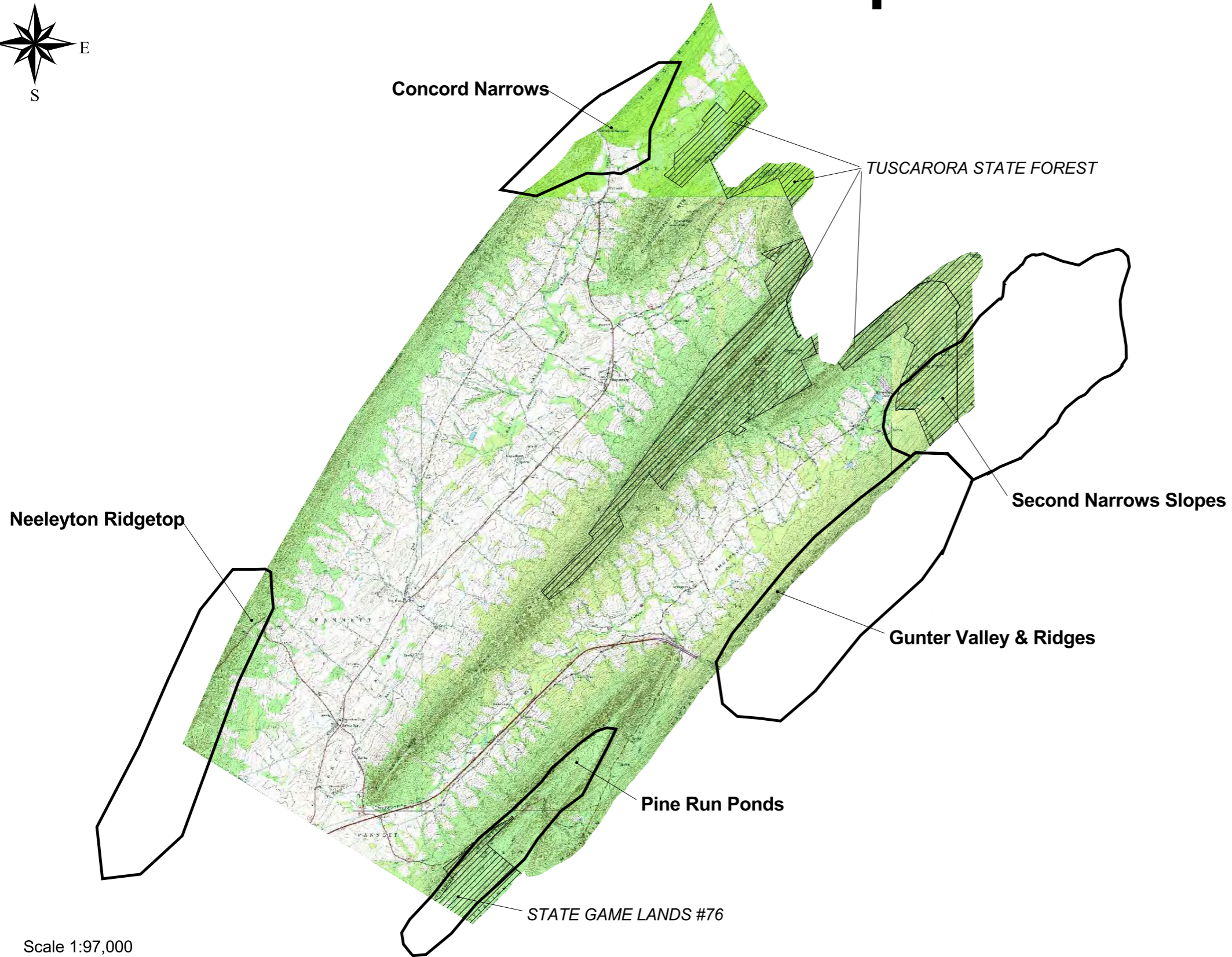
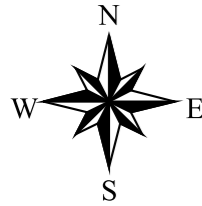
Managed Lands: State Game Lands #76
Tuscarora State Forest

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

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

[Fannett Township Map](#)

Fannett Township



Scale 1:97,000

0.5 0 0.5 1 Miles



Fannett Township

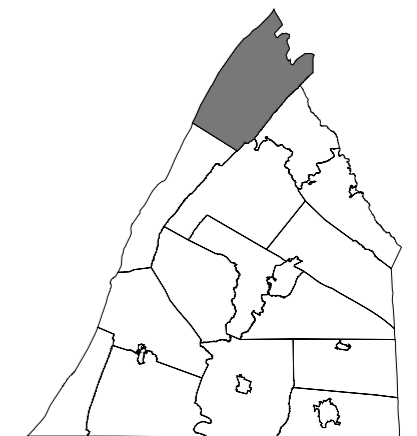
Franklin County Natural Areas Inventory

Natural Areas:

- Concord Narrows
- Gunter Valley & Ridges
- Neeleyton Ridgetop
- Pine Run Ponds
- Second Narrows Slope

Managed Areas:

- State Game Lands #76
- Tuscarora State Forest



Legend

- Natural Area or Locally Significant Site
- Municipal Boundary
- Managed Area

CONCORD NARROWS (Fannett Township and Huntingdon County)

This site contains a good population of **Virginia Mallow** (*Sida hermaphrodita*), a G2, S2 plant species of concern. This species has a very limited range, occurring more abundantly in Ohio, Kentucky and West Virginia, and is typically found in artificially altered habitats like along roadways and railroad beds (NatureServe, 2004). The natural habitat of this species is more typically sites that receive natural disturbances such as ice scouring along rivers and creeks. Despite its weedy character, populations are declining over much of its natural range, making the long-term outlook for this species precarious (NatureServe, 2004). This population is situated on a roadside meadow at the foot of Tuscarora Mountain. Associated species include Jewelweed, Asiatic Dayflower, Joe-pye-Weed, Common Milkweed, Coltsfoot, Sassafras, Black Walnut, Poison Ivy, Virginia Creeper, Black Raspberry, Blue Chicory and Thimbleflower. Invasive plant species found here include Multiflora Rose, Tree-of-heaven and Morrow's Honeysuckle. Also included in this site on a talus slope is a fair population of **Allegheny Woodrat** (*Neotoma magister*), a G3G4 S3 animal species of concern.

Threats and Disturbances

Threats to the roadside population of Virginia Mallow include mowing, invasive plant species, and roadside herbicides. For the Allegheny Woodrat site, disturbances include logging on top of ridges and potential development.

Conservation Recommendations

Since this is a roadside population, any herbicide application to invasive species should be very carefully administered due to the vulnerability of this population. Even though this is a roadside population, the G2 status of this species increases the importance of this population. For the Allegheny Woodrat site, it is recommended that an undisturbed forested buffer be maintained around ridgetop rocky outcrops where the woodrats occur.

GUNTER VALLEY AND RIDGES (Fannett and Lurgan Townships)

Much of this land was recently purchased by the PA Bureau of Forestry 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 (*Myotis lucifugus*) and Big Brown Bat (*Eptesicus fuscus*). 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.

Threats and Disturbances

If roosting by 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.

NEELEYTOWN RIDGETOP (Fannett and Metal Townships, and Huntingdon County)

Evidence of several populations of a G3G4, S3 PA-Threatened animal species, the **Allegheny woodrat** (*Neotoma magister*), was found at this site during a site survey in 1987. This species typically inhabits the deep crevices of rocky outcrops, boulder-strewn talus slopes and caves. Populations of this species throughout the state have experienced rapid decline in recent decades due for unknown reasons (Merritt 1987).

Threats and Disturbances

Potential disturbances include logging on top of ridges and development.

Conservation Recommendations

An undisturbed forested buffer should be maintained around ridgetop rocky outcrops where the woodrats occur. The population of this species at this site needs to be reassessed and updated. Additional surveys for this species at this site are recommended.

PINE RUN PONDS (Fannett and Metal Townships)

This site contains a fair to good quality population of **Northeastern Bulrush** (*Scirpus ancistrochaetus*), and a fair to good quality example of an “**Ephemeral/Fluctuating Natural Pool Community**”. The Federally endangered status of this plant indicates that the species is in danger of extinction throughout all or a significant portion of its range. The northeastern bulrush is primarily found in temporary ponds and other pools with fluctuating water levels. These ponds also typically provide important breeding habitat for forest dwelling amphibians such as the wood frog (*Rana sylvatica*), and the spotted salamander (*Ambystoma maculatum*). Associated species include Rattlesnake mannagrass, Woolgrass, Royal Fern, Three-way Sedge. Surrounding woods consists of Red Maple, Black Gum and Black Birch.

Threats and Disturbances

Disturbances include previous logging and exotics (mainly along road and in food plot field), although Multiflora Rose occurs on the border of some ponds. The increased use of All Terrain Vehicles (ATVs) in State Game Lands property poses a potential threat to the site. No obvious threats to the population were observed.

Conservation Recommendations

Logging within the portion of the forest where the ponds are located should be avoided. Former logging practices commonly included throwing the leftover tops of trees into ponds such as these. This is not a normal practice among today’s foresters, but the fact bears mentioning, that this is not an acceptable procedure in modern logging operations. The site should be monitored for ATV traffic, and trails blocked as they appear.

SECOND NARROWS SLOPES (Fannett Township and Perry County)

This site contains a fair to good quality “**Ephemeral/Fluctuating Natural Pool Community**” in State Game Lands 76. The ponds contain a fair to good quality population of **Northeastern Bulrush** (*Scirpus ancistrochaetus*), a federally endangered G3, S3 plant species of concern. The Federally endangered status of this plant indicates that the species is in danger of extinction throughout all or a significant portion of its range. The northeastern bulrush is primarily found in temporary ponds and

(Fannett Township continued)

other pools with fluctuating water levels. These ponds also typically provide important breeding habitat for forest dwelling amphibians such as the wood frog (*Rana sylvatica*), and the spotted salamander (*Ambystoma maculatum*). Associated species include Rattlesnake Mannagrass, Woolgrass, Royal Fern, and Three-way Sedge. The surrounding woods consisted of canopy trees such as Red Maple, Black Tupelo, Black Birch, Black Locust, and various Oak species. Multiflora Rose is present along the roadside but it and other exotics do not pose a direct threat to the population.

In addition, a small population of **Purple Bedstraw** (*Galium latifolium*) a G5, S3 plant species of concern was documented on the dry loose-shale slopes of Price Knob in Tuscarora State Forest.

Threats and Disturbances

Logging and other changes in the habitat adjacent to the ponds would decrease the quality of the habitat for the populations of Northeastern Bulrush at this location. The increased use of All Terrain Vehicles (ATVs) in public forest property poses a potential threat to the site.

Conservation Recommendations

Logging should be avoided near the ponds in this area, and an undisturbed forested buffer should be maintained around each vernal pond. The site should be monitored for ATV traffic, and trails near the ponds blocked as they appear.



Virginia Mallow (*Sida hermaphrodita*) is a G2 ranked species due to a very limited number of occurrences on a global scale. This species typically thrives in disturbed habitats such a scour areas of floodplains, but in this location in Fannett Township, the species occurs along a roadway. Maintenance of roadside vegetation in this area should not include the use of herbicides.

Photo: PA Science Office of The Nature Conservancy

Virginia Mallow



Above: The Allegheny woodrat (*Neotoma magister*), which was once a common resident in Pennsylvania, is found in several locations in Franklin 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 Franklin 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 by the PA Science Office of The Nature Conservancy)



Allegheny Woodrat and Timber Rattlesnake

GREENE TOWNSHIP

Site Name	Special Species / Community Type	PNHP Ranks*		State Status	Last Seen	Quality**
		Global	State			
Big Pine Flat	Animal	G4	S3S4	PC	7/31/2002	E
	Footpath sallow Moth (<i>Metaxaglaea semitaria</i>)	G5	S2	N	10/01/2003	E
	Ridgetop Dwarf-Tree Forest	G4	S3	N	6/08/1995	BC
	Northeastern Bulrush (<i>Scirpus ancistrochaetus</i>)	G3	S3	PE	8/2/1995	D
	Ephemeral/Fluctuating Natural Pool Community	G?	S3	N	1/14/1998	B
	Animal	G4	S3S4	PC	05/01/1997	E
Conococheague Creek Floodplain @ Caledonia Park	Animal	G5	S1	PE	8//1991	E
	Kidney-leaved Twayblade (<i>Listera smallii</i>)	G4	S1	PE	7/16/1995	B
Mount Cydonia	Northeastern Bulrush (<i>Scirpus ancistrochaetus</i>)	G3	S3	PE	6/27/1996	CD
	Lupine (<i>Lupinus perennis</i>)	G5	S3	PR	5/22/1989	B
	Animal	G5	S3S4	N	6/5/2002	E
	Ephemeral/Fluctuating Natural Pool Community	G?	S3	N	5/04/2003	C
	White Milkweed (<i>Asclepias variegata</i>)	G5	S1	TU	6/11/2001	C
	Lance-leaved Loosestrife (<i>Lysimachia hybrida</i>)	G5	S1	N	7/30/2001	BC

Site Name	Special Species / Community Type	PNHP Ranks*		State Status	Last Seen	Quality**
		Global	State			
Mountain Run/ Stillhouse Hollow Ponds	Northeastern Bulrush (<i>Scirpus ancistrochaetus</i>)	G3	S3	PE	9/3/1992	AB, D
	Ephemeral/Fluctuating Natural Pool Community	G?	S3	N	9/3/1992	AB
	Oakes' Pondweed (<i>Potamogeton oakesianus</i>)	G4	S1S2	N	7/11/1992	C
Muskrat Fen	Prairie Sedge (<i>Carex prairea</i>)	G5?	S2	PT	6/05/2002	BC
	Baltic Rush (<i>Juncus arcticus var. littoralis</i>)	G5T5	S2	PT	6/05/2002	AB
	Vetchling (<i>Lathyrus palustris</i>)	G5	S1	N	6/05/2002	B
	Broad-leaved Willow (<i>Salix myricoides</i>)	G4	S2	N	6/05/2002	B

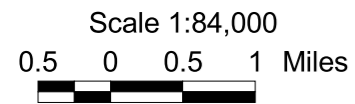
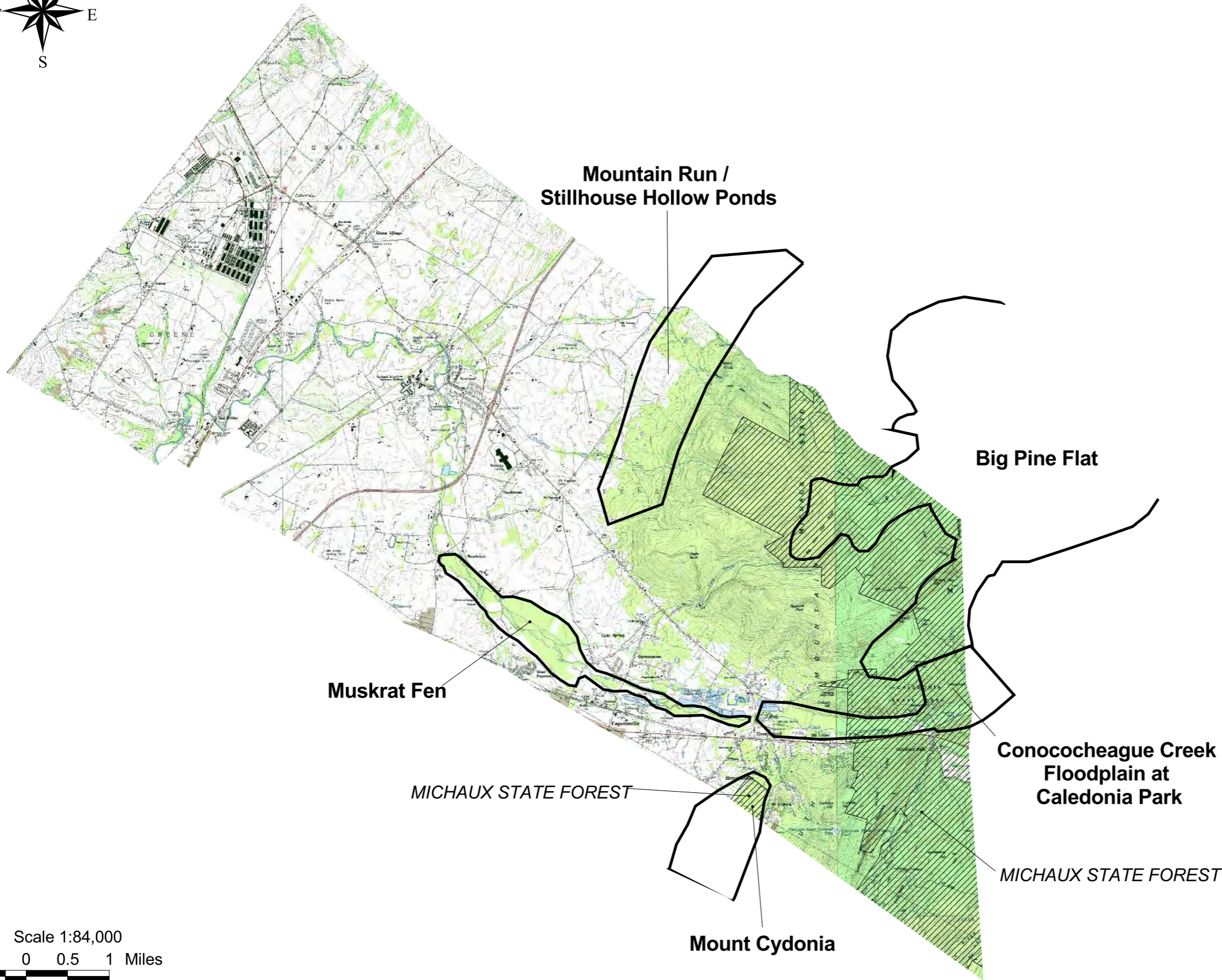
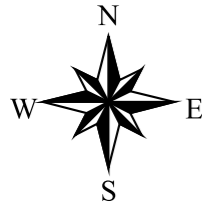
Managed Lands: Michaux State Forest

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

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

[Greene Township Map](#)

Greene Township



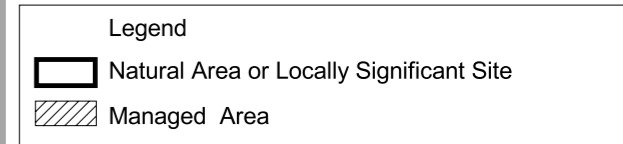
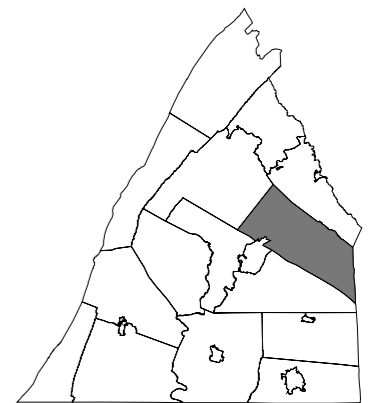
Greene Township Franklin County Natural Areas Inventory

Natural Areas:

- Big Pine Flat
- Conococheague Creek
Floodplain at
Caledonia Park
- Mount Cydonia
- Mountain Run /
Stillhouse Hollow Ponds
- Muskrat Fen

Managed Areas:

- Michaux State Forest



BIG PINE FLAT (Greene and Southampton Townships, and Cumberland County)

This site contains a small population of **Northeastern Bulrush** (*Scirpus ancistrochaetus*), a G3, S3 Federally Endangered plant species of concern, and a good quality **Ephemeral/fluctuating Pool Natural Community**. The site 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 shelter belts 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.

This site also 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.

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, wild sarsaparilla (Fike 1999).

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. The pitch pine barrens are disturbance dependent ecosystems. The development and implementation of a prescribed burn management program would help maintain the quality of this naturally occurring community. 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 extent of this Natural Community was delineated from aerial photography.

Two animal species of concern were also documented from this site. An unknown quality population of an **S3S4 animal species of concern** was observed along the Appalachian Trail. An unknown quality population of the **Footpath Sallow Moth** (*Metaxaglaea semitaria*) a G5, S2 animal species of concern was collected in a light trap in a utility line right-of-way adjacent to a scrub oak-pitch pine dominated forest. This species feeds on blueberry plants in its larval stage. Other, more common species documented from this site include Copper Underwing (*Amphipyra pyramidoides*), Bristly Cutworm (*Lacinipolia renigera*), Venerable Dart (*Agrotis venerabilis*), Swordsman Dart (*Agrotis gladiaria*), Gold-striped Leaf-tier Moth (*Machimia tentoriferella*), Celery Leaf-tier Moth (*Udea rubigalis*), Bent-Line Carpet (*Orthonama centrostrigaria*), The Wedgling (*Galgula partita*), Maple Spanworm (*Ennomos magnaria*), Green Cloverworm (*Plathypena scabra*), Lunate Zale (*Zale lunata*), Scalloped Sallow (*Eucirroedia pampina*), Corn Earworm Moth (*Heliothis zea*), a Dart (*Xestia*

(Greene Township continued)

dilucida), (*Agriphila vulgivagella*), Large Tolyte (*Tolyte vellada*) and Wandering Brocade (*Oligia illocata*)

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.

CONOCOCHEAGUE CREEK FLOODPLAIN AT CALEDONIA PARK (Greene Township and Adams County)

An unknown quality population of a **G5, S1 PA-Endangered animal species of concern** was found at this site in Caledonia Park. Several specimens were collected here in 1979 and again in 1991 in an area shaded by Eastern Hemlock and Rosebay. In addition, a good population of **Kidney-leaved Twayblade (*Listera smallii*)**, a G4, S1 PA-Endangered plant species of concern was documented at this site in 1995.

Threats and Disturbances

Disturbances at this site include earth moving by bulldozers, potential logging, and the spread of the hemlock woolly adelgid, a devastating introduced insect pest of hemlocks.

Conservation Recommendations

Logging should be avoided along the creek and seeps at this location to provide an undisturbed forested buffer for all waterways. Monitoring for the woolly adelgid on Eastern Hemlock is recommended and biological control measures for the woolly adelgid applied if practical.

MOUNT CYDONIA (Greene and Guilford Townships)

This site contains a fair-quality **Ephemeral/Fluctuating Natural Pool Community** and several species of concern. At least thirty pools in acidic sand or gravel colluvium were located along the base of South Mountain surrounded by Oak-Maple Woods. A portion of this site is a Natural Area within Michaux State Forest. Ephemeral/fluctuating or vernal pools are wetlands that fill annually from precipitation, surface water runoff, and rising groundwater to appear pond-like during the winter and spring months. These pools typically become completely dry through evaporation by late spring or summer. Since these ponds dry up during a portion of the year, they cannot support fish populations. During the brief time the pools contain water, and in the absence of fish, they become important breeding areas for a variety of amphibian species such as wood frogs and spotted salamanders, many of which breed solely in vernal pools.

Among the four plant species of concern identified at the site includes a small to fair population of **Northeastern Bulrush (*Scirpus ancistrochaetus*)**, a Federally Endangered G3, S3 plant species of concern. The Federally endangered status of this plant indicates that the species is in danger of extinction throughout all or a significant portion of its range. The northeastern bulrush is primarily found in temporary ponds and other pools with fluctuating water levels. Associated species at this site include a fair to good population of **Lance-leaved Loosestrife (*Lysimachia hybrida*)**, a G5, S1 Pennsylvania plant species of concern, which was found in the outer zone of one of the ponds.

(Greene Township continued)

Associated species include Three-way Sedge, a Sedge (*Carex vesicaria*), Buttonbush, Red Maple, Greenbrier, Black Tupelo, Pin Oak and Highbush Blueberry.

A good population of **Lupine** (*Lupinus perennis*) G5, S3 plant species of concern was found in a successional stand of saplings, shrubs & herbs between an orchard & a mature forest. A small population of **White Milkweed** (*Asclepias variegata*), a G5, S1 plant species of concern was also found on a roadside area within a Dry Oak-Heath forest. Associated species include Japanese Honeysuckle, Fox Grape and Stiltgrass. In addition, an undetermined quality population of a **G5, S3S4 animal species of concern** was found at this site within a twelve year old clear-cut with pole-sized mixed deciduous trees dominating.

Threats and Disturbances

Threats to the *Scirpus ancistrochaetus* population include development, drainage, dumping and any activities that could alter the hydrology of the site. The proximity of these ponds to residential development may lead to abuses such as dumping of household waste, lawn clippings and other debris. The ponds may also be perceived as mosquito breeding areas, with accompanying demands for pesticide application to reduce insect populations. Herbivory by deer poses a threat to the populations of Lance-leaved Loosestrife. The increased illegal or unauthorized use of All Terrain Vehicles (ATVs) in public forest property poses a potential threat to the site.

Conservation Recommendations

Logging within this portion of the forest should be avoided due to the numerous ponds scattered over this area. An undisturbed forested buffer between nearby residences and the ponds should be established, and additional buffer should be acquired if the opportunity becomes available. It is worth mentioning that pools exist to the south of the Natural Area and perhaps the boundary should be extended south by DCNR to include these additional ponds. The site should be monitored for ATV traffic, and trails near the ponds blocked as they appear. Aquatic pesticide applications for mosquito control should be avoided in these ponds, as this would disrupt the food cycle necessary to maintain amphibian populations. Deer hunting should be encouraged in the area to reduce herbivory pressure at this site. Additional surveys for species of concern in this area are encouraged.

MOUNTAIN RUN/STILLHOUSE HOLLOW PONDS (Greene and Southampton Townships)

This site contains a good-to-excellent quality example of an **Ephemeral/fluctuating Natural Pool Community**. This area contains five vernal/ephemeral ponds rimmed by swamp forest surrounded by mixed-oak forest matrix on the lower slopes of South Mountain. Vegetation includes shrub and graminoid zones around the ponds. This site contains a good to excellent quality population of **Northeastern Bulrush** (*Scirpus ancistrochaetus*), a G3, S3 plant species of concern. The Federally endangered status of this plant indicates that the species is in danger of extinction throughout all or a significant portion of its range. The northeastern bulrush is primarily found in temporary ponds and other pools with fluctuating water levels. In addition, a fair quality population of **Oakes' Pondweed** (*Potamogeton oakesianus*), a G4, S1S2 plant species of concern, was found in a few vernal ponds at this site. Associated species include a recently delisted plant species Golden-club, Buttonbush, Highbush Blueberry, Mannagrass, Pale Meadowgrass, Rattlesnake Mannagrass, and Three-way Sedge.

Threats and Disturbances

Disturbances at this site include jeep lanes, deer paths, selective cutting, and bulldozing brush by owners in and around the ponds. Threats include an increasing pressure from a residential area adjacent to the forest.

Conservation Recommendations

Logging within this portion of the forest should be avoided because of the ponds scattered over this area. An undisturbed forested buffer between nearby residences and the ponds should be established, and additional buffer should be acquired if the opportunity becomes available. The site should be monitored for ATV traffic, and trails near the ponds blocked as they appear. Aquatic pesticide applications for mosquito control should be avoided in these ponds, as this would disrupt the food cycle necessary to maintain amphibian populations. Deer hunting should be encouraged in the area to reduce herbivory pressure at this site. Additional surveys for species of concern in this area are encouraged.

MUSKRAT FEN (Greene Township)

This wetland, situated in the bottomland to the north of Conococheague Creek, was reputedly created many years ago during an unsuccessful venture to raise muskrats for the fur market. It was abandoned and has since “returned to nature.” The area today retains an overall open and marsh-like aspect, but with shrubs and small trees, particularly poison-sumac and red maple, becoming established on the perimeter and in portions of the interior. The wetland has been called a “fen” because it appears to be calcareous, which is a relatively uncommon habitat type in the state. Four plant species currently considered to be Endangered or Threatened in Pennsylvania – **Prairie Sedge (*Carex prairea*)**, **Baltic rush (*Juncus arcticus* var. *littoralis*)**, **Vetchling (*Lathyrus palustris*)**, and **Broad-leaved Willow (*Salix myricoides*)** – have been documented at this site. It is unclear if these species became established here through deliberate or accidental introduction or through natural means. If the latter situation is correct, then the site has greater conservation significance. In addition to the listed plants, the wetland also has importance in adding to the diversity of habitats available for local wildlife and wild plants. The tract is owned by a quarry company and may be subject to mining activity in the future.

Threats and Disturbances

The surrounding agricultural and residential landuse may not provide an adequate protective buffer to this important habitat. Runoff from residences, streets and agricultural fields could impair the water quality of the wetland. The spread of invasive plant species into the wetland could displace much of the native diversity within this habitat.

Conservation Recommendations

Some areas adjacent to the wetland require additional forested buffers to minimize the impact of non-point sources of pollution. Forested buffers provide critical protection to streams by reducing nutrient, sediment and toxic runoff from roads, residences and agricultural fields. Monitoring for invasive species of plants is also recommended. Populations of invasive species removed as they first appear are far more easily and effectively eliminated than established populations.

(Greene Township continued)



The Northeastern Bulrush (*Scirpus ancistrochaetus*) is a Federally Endangered plant species that has been documented in several locations in Franklin County.

GUILFORD TOWNSHIP & Chambersburg Borough

Site Name	Special Species / Community Type	PNHP Ranks*		State Status	Last Seen	Quality**
		Global	State			
Conococheague Creek near Marion	Limestone Petunia (<i>Ruellia strepens</i>)	G4G5	S2	PT	2003	D
Falling Spring	Animal	G4Q	S?	N	8/8/2002	E
Mont Alto Mountain	Short-leaf Pine (<i>Pinus echinata</i>)	G5	S1S2	N	11/5/1996	BC, C
Mt. Cydonia	Ephemeral/Fluctuating Natural Pool Community	G?	S3	N	5/04/2003	C
	White Milkweed (<i>Asclepias variegata</i>)	G5	S1	TU	6/23/1990	D
	Northeastern Bulrush (<i>Scirpus ancistrochaetus</i>)	G3	S3	PE	6/27/1996	CD
	Animal	G5	S3S4	N	6/5/2002	E
	Lance-leaved Loosestrife (<i>Lysimachia hybrida</i>)	G5	S1	N	7/30/2001	BC
	Lupine (<i>Lupinus perennis</i>)	G5	S3	PR	5/22/1989	B
Siberia	Limestone Petunia (<i>Ruellia strepens</i>)	G4G5	S2	PT	7/24/1993	B

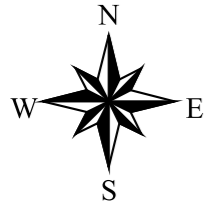
Managed Lands: Michaux State Forest

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

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

[Guilford Township Map](#)

Guilford Township and Chambersburg Borough



Guilford Township and Chambersburg Borough

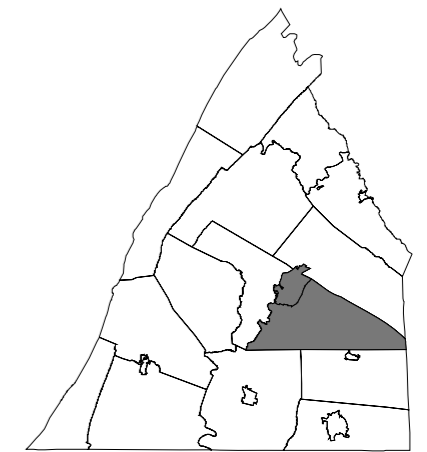
Franklin County Natural Areas Inventory

Natural Areas:

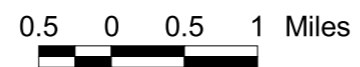
- Conococheague Creek near Marion
- Falling Spring
- Mont Alto Mountain
- Mount Cydonia
- Siberia

Managed Areas:

- Michaux State Forest



Scale 1:84,000



Legend

- Natural Area or Locally Significant Site
- Municipal Boundary
- Managed Area

CONOCOCHEAGUE CREEK NEAR MARION (Antrim, Guilford and Hamilton Townships)

This site contains a fair quality population of **Limestone Petunia** (*Ruellia strepens*), a G4G5, S2 PA-Threatened plant species of concern. Though occurring frequently along the southern portion of the Conococheague Creek, this plant is only found in a few other counties in southern Pennsylvania, occurring more frequently in the mid-western United States. The plants at this site were found along the forested creek banks, its favored habitat, and also along a mowed roadside adjacent to the creek. The forest along the creek at this location is composed of characteristic floodplain species such as the trees Box-elder, Basswood, Ash, Black Walnut, the shrubs Bladdernut, Black-haw, Pawpaw, with the understory dominated by Wingstem, Wild Ginger, and Poison Ivy.

Threats & Disturbances

Introduced species of plants, some that are highly aggressive, inhabit much of this floodplain habitat, reducing the area available to habitat specialists like limestone petunia. The Limestone Petunia typically occurs along the levy or high water mark of the creek, and is much less commonly found in other habitats. Invasive species documented at this site include thick tangles of Multiflora Rose, Japanese honeysuckle, Asiatic Bittersweet, Dame's Rocket and Norway Maple. Roadside mowing maintenance appears to favor the Limestone Petunia at this location.

Conservation Recommendations

Control of invasive species of plants along the creek banks may become necessary to protect the habitat of Limestone Petunia in this area. Mechanical methods of weed control such as cutting and pulling could be augmented by a careful, selective application of herbicides registered for use along waterways. The creation and expansion of protective forested buffers along the creek would help reduce the edge effect that many invasive species of plants prefer.

FALLING SPRING (Guilford Township and Chambersburg Borough)

This site contains an unknown quality population of a **G4Q Pennsylvania animal species of concern**. This species was found throughout this coldwater spring. Associated species included Satinfish Shiner (*Cyprinella analostana*), Spotfin Shiner (*Cyprinella spiloptera*), Pearl Dace (*Margariscus margarita*), Rainbow Trout (*Onchorhynchus mykiss*), Brown Trout (*Salmo trutta*), Blacknose Dace (*Rhinichthys atratulus*), and White Sucker (*Catostomus commersoni*). This area is described as a high volume spring-fed stream with a gravel/cobble/rubble substrate with sections of sand and small boulders, and a moderate amount of coarse woody debris in stream. The canopy closure was dense at the sampling station, but this is not typical of the entire stream corridor. Much of this spring runs through the Borough of Chambersburg. Approximately 190 individuals of this species were captured using a backpack electroshocker. This species probably occurs throughout this watershed; especially at the headwaters where many springs enter the stream.

Threats and Disturbances

Threats to this species include additional stream warming and water pollution. Direct disturbances to this species include runoff from surrounding businesses and roadways. The landuse may not provide an adequate protective buffer to this important habitat. Runoff from residences, streets and agricultural fields could impair the water quality of the spring-fed stream.

Conservation Recommendations

It is recommended that further surveys of this species be conducted in nearby springs to determine the extent of the population. Some areas adjacent to the wetland require additional forested buffers to minimize the impact of non-point sources of pollution. Forested buffers provide critical protection to streams by reducing nutrient, sediment and toxic runoff from roads, residences and agricultural fields.

MOUNT CYDONIA (Greene and Guilford Townships)

This site contains a fair-quality **Ephemeral/Fluctuating Natural Pool Community** and several species of concern. At least thirty pools in acidic sand or gravel colluvium were located along the base of South Mountain surrounded by Oak-Maple Woods. Ephemeral/fluctuating or vernal pools are wetlands that fill annually from precipitation, surface water runoff, and rising groundwater to appear pond-like during the winter and spring months. These pools typically become completely dry through evaporation by late spring or summer. Since these ponds dry up during a portion of the year, they cannot support fish populations. During the brief time the pools contain water, and in the absence of fish, they become important breeding areas for a variety of amphibian species such as wood frogs and spotted salamanders, many of which breed solely in vernal pools.

Among the four plant species of concern identified at the site includes a small to fair population of **Northeastern Bulrush** (*Scirpus ancistrochaetus*), a Federally Endangered G3, S3 plant species of concern. The Federally endangered status of this plant indicates that the species is in danger of extinction throughout all or a significant portion of its range. The northeastern bulrush is primarily found in temporary ponds and other pools with fluctuating water levels. Associated species at this site include a fair to good population of **Lance-leaved Loosestrife** (*Lysimachia hybrida*), a G5, S1 Pennsylvania plant species of concern, which was found in the outer zone of one of the ponds. Associated species include Three-way Sedge, a Sedge (*Carex vesicaria*), Buttonbush, Red Maple, Greenbrier, Black Tupelo, Pin Oak and Highbush Blueberry.

A good population of **Lupine** (*Lupinus perennis*) G5, S3 plant species of concern was found in a successional stand of saplings, shrubs & herbs between an orchard & a mature forest. A small population of **White Milkweed** (*Asclepias variegata*), a G5, S1 plant species of concern was also found on a roadside area within a Dry Oak-Heath forest. Associated species include Japanese Honeysuckle, Fox Grape and Stiltgrass. In addition, an undetermined quality population of a **G5, S3S4 animal species of concern** was found at this site within a twelve year old clear-cut with pole-sized mixed deciduous trees dominating.

Threats and Disturbances

Threats to the *Scirpus ancistrochaetus* population include development, drainage, dumping and any activities that could alter the hydrology of the site. The proximity of these ponds to residential development may lead to abuses such as dumping of household waste, lawn clippings and other debris. The ponds may also be perceived as mosquito breeding areas, with accompanying demands for pesticide application to reduce insect populations. Herbivory by deer poses a threat to the populations of Lance-leaved Loosestrife. The increased use of All Terrain Vehicles (ATVs) in public forest property poses a potential threat to the site.

Conservation Recommendations

Logging within this portion of the forest should be avoided due to the numerous ponds scattered over this area. An undisturbed forested buffer between nearby residences and the ponds should be

(Guilford Township continued)

established, and additional buffer should be acquired if the opportunity becomes available. The site should be monitored for ATV traffic, and trails near the ponds blocked as they appear. Aquatic pesticide applications for mosquito control should be avoided in these ponds, as this would disrupt the food cycle necessary to maintain amphibian populations. Deer hunting should be encouraged in the area to reduce herbivory pressure at this site. Additional surveys for species of concern in this area are encouraged.

MONT ALTO MOUNTAIN (Guilford and Quincy Townships)

This area contains several populations of **Short-leaf Pine (*Pinus echinata*)** in a “mixed hardwood-pine forest” with well-drained sandy soil. Associated species include Pitch Pine, White Pine, Red Oak, Scarlet Oak, Black Oak, Chestnut Oak, Black Tupelo and Red Maple.

Also included in this area is the **Meeting of the Pines Natural Area**, a remnant stand of a “Xeric Central Conifer Forest Natural Community”. This site once had the distinction of once having most native *Pinus* species that occur in Pennsylvania (Kunsmann, pers. comm.). The species of pine that have been found here include Table Mountain Pine, Shortleaf Pine, Virginia Pine, Pitch Pine, and White Pine. Historic fires enhanced this area by promoting new growth of pine saplings. However, in recent years, succession has allowed increasing amounts of Oaks to invade the area.

Threats and Disturbances

Threats include succession of pine forest into Dry-Oak Heath forest. One disturbance would be excessive amounts of recreation.

Conservation Recommendations

A prescribed burn of this area would significantly improve the quality of the natural community. A prescribed burn would also enhance the Short-leaf Pine growth in the area.

SIBERIA (Guilford and Hamilton Townships, and Chambersburg Borough)

This site contains a good quality population of **Limestone Petunia (*Ruellia strepens*)**, a G4G5, S2 PA-Threatened plant species of concern. Several natural communities occupy the site. Together these natural communities support a diverse, interesting flora. These natural communities include a floodplain forest along the Conococheague Creek, an oak-hickory forest that occupies most of the upland area and successional vegetation in powerline clearings. Associated species include Silver Maple, Box Elder, American Elm, Bitternut Hickory, and Virginia Creeper. Surrounding land includes the Borough of Chambersburg and suburbs, farms, fields, and pastures.

Threats and Disturbances

Disturbances to this site include powerline clearing, jeep lanes, clearing for development, and exotic plant species.

Conservation Recommendations

It is recommended that development and clearing/mowing be minimized in the floodplain areas of creeks and streams. Some areas adjacent to the wetland require additional forested buffers to minimize the impact of non-point sources of pollution. Forested buffers provide critical protection to streams by reducing nutrient, sediment and toxic runoff from roads, residences and agricultural fields. Monitoring for invasive species of plants is also recommended. Populations of invasive species removed as they first appear are far more easily and effectively eliminated than established populations.



Thorey's Grayback Dragonfly (*Tachopteryx thoreyi*), a G4, S3 animal species of concern, lands on the shoulder of a field biologist. It's not always this easy to locate rare species in Franklin County. (Photo: PA Science Office of The Nature Conservancy)

Ephemeral / Fluctuating Pool Natural Communities



Ephemeral/fluctuating or vernal pools are wetlands that fill annually from precipitation, surface water runoff, and rising groundwater, to appear pond-like during the winter and spring months.

These pools typically become completely dry through evaporation by late spring or summer. Since these ponds dry up during a portion of the year, they cannot support fish populations.



During the brief time the pools contain water, and in the absence of fish, they become important breeding areas for a variety of amphibian species such as wood frogs and spotted salamanders, many of which breed solely in vernal pools. (Photos by the PA Science Office of The Nature Conservancy)



HAMILTON TOWNSHIP

Site Name	Special Species / Community Type	PNHP Ranks*		State Status	Last Seen	Quality**
		Global	State			
Conococheague Creek near Marion	Limestone Petunia (<i>Ruellia strepens</i>)	G4G5	S2	PT	2003	D
Dunn's Creek Meadow	Animal: Barn Owl (<i>Tyto alba</i>)	G5	S3B, S3N	CR	4/23/2003	E
Edenville Meadows	Animal: Dickcissel (<i>Spiza americana</i>)	G5	S2B	PE	6/1/1986	E
Siberia	Limestone Petunia (<i>Ruellia strepens</i>)	G4G5	S2	PT	7/24/1993	B

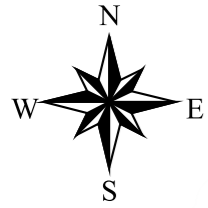
Managed Areas: Buchanan State Forest
State Game Lands #235

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

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

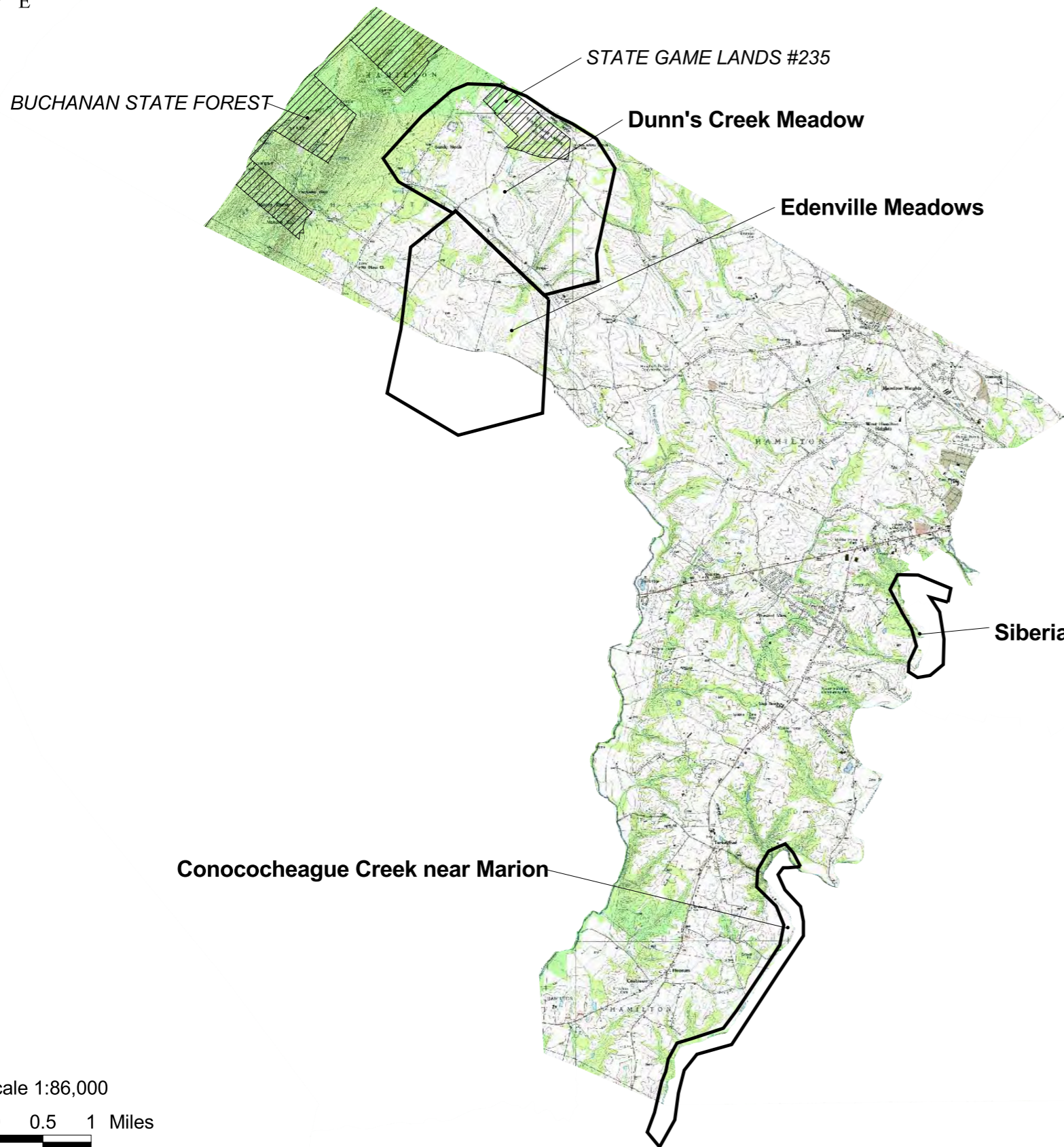
[Hamilton Township Map](#)

Hamilton Township



Hamilton Township

Franklin County Natural Areas Inventory

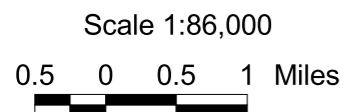
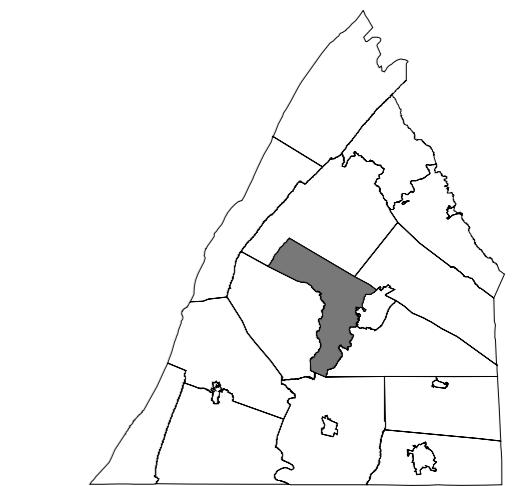


Natural Areas:

- Conococheague Creek near Marion
- Dunn's Creek Meadow
- Edenville Meadows
- Siberia

Managed Areas:

- Buchanan State Forest
- State Game Lands #235



Legend

- Natural Area or Locally Significant Site
- Municipal Boundary

CONOCOCHIEGUE CREEK NEAR MARION (Antrim, Guilford and Hamilton Townships)

This site contains a fair quality population of **Limestone Petunia** (*Ruellia strepens*), a G4G5, S2 PA-Threatened plant species of concern. Though occurring frequently along the southern portion of the Conococheague Creek, this plant is only found in a few other counties in southern Pennsylvania, occurring more frequently in the mid-western United States. The plants at this site were found along the forested creek banks, its favored habitat, and also along a mowed roadside adjacent to the creek. The forest along the creek at this location is composed of characteristic floodplain species such as the trees Box-elder, Basswood, Ash, Black Walnut, the shrubs Bladdernut, Black-haw, Pawpaw, with the understory dominated by Wingstem, Wild Ginger, and Poison Ivy.

Threats & Disturbances

Introduced species of plants, some that are highly aggressive, inhabit much of this floodplain habitat, reducing the area available to habitat specialists like limestone petunia. The Limestone Petunia typically occurs along the levy or high water mark of the creek, and is much less commonly found in other habitats. Invasive species documented at this site include thick tangles of Multiflora Rose, Japanese honeysuckle, Asiatic Bittersweet, Dame's Rocket and Norway Maple. Roadside mowing maintenance appears to favor the Limestone Petunia at this location.

Conservation Recommendations

Control of invasive species of plants along the creek banks may become necessary to protect the habitat of Limestone Petunia in this area. Mechanical methods of weed control such as cutting and pulling could be augmented by a careful, selective application of herbicides registered for use along waterways. The creation and expansion of protective forested buffers along the creek would help reduce the edge effect that many invasive species of plants prefer.

DUNN'S CREEK MEADOW (Hamilton Township)

This site supports a pair of **Barn Owls** (*Tyto alba*), a G5, S3B/S3N Pennsylvania animal species of concern. A nesting pair of this species was seen in a silo on a working farm near Dunn's Creek. Associated species include Chipping Sparrow, and Red-winged Blackbird. This site includes private farmland and a portion of State Game Lands #235.

Threats and Disturbances

The main threat to this site is land use changes to the surrounding grasslands and upland forested areas. Any change of the fields from grasslands to rowcrops would cause the owls to abandon the site as their main prey, Meadow Voles (*Microtus pennsylvanicus*) would likely decline. Another possible threat is conversion from farmland to suburban development. Due to the close proximity of the road to the nest site, another threat would be mortality by vehicle traffic.

Conservation Recommendations

If the working farm and the hayfields are maintained, then this species should continue to use the silos as nesting sites in the future. It is recommended that the hayfields not be converted to rowcrops that would lessen the Meadow Vole population. It is also recommended that pesticides that are used to control mice be limited to critical areas around the farm due to the possibility of destroying the main food prey, the Meadow Vole.

(Hamilton Township continued)

EDENVILLE MEADOWS (Hamilton Township)

This site has previously supported an unknown quality population of **Dickcissel** (*Spiza americana*), an S2B Pennsylvania-Endangered bird species of concern. This site may or may not presently support this species due to changing land use conditions. This site was resurveyed in June 2003. The target species Dickcissel was not found at this site, but other grassland bird species were observed such as Savannah Sparrow, Grasshopper Sparrow, Song Sparrow, and Eastern Meadowlark. However, this area still has potential for Dickcissels since the area is still a mixture of mixed grasses, row-crops and alfalfa fields. In Pennsylvania, Dickcissels nest in older reclaimed surface-mine sites planted with various grasses and legumes and grown up with scattered, taller, woody plants (Brauning, 1993). This species also nests in mixed hayfields containing grasses, alfalfa, and other forbs. It is thought that the only viable population of Dickcissel in Pennsylvania is in Franklin County. Further surveys and encouragement of Conservation Reserve Programs (CRP) is needed to secure the future of this species in Pennsylvania.

Threats and Disturbances

Potential nesting Dickcissels would not find suitable habitat in this area if much of the fields were converted to rowcrop agriculture. Changing land use would make the habitat unsuitable for this Pennsylvania-Endangered species. Any type of development would be a threat to the area. Disturbances include the road, farm machinery, and crop pesticides.

Conservation Recommendations

This species prefers mixed hayfields containing grasses, alfalfa, and other forbs and creating this type of field would make for optimum habitat. However, it is not known what condition this habitat was in when the first Dickcissels nested at the site. It is recommended that yearly surveys be conducted to determine if this species still occupies this site on a regular basis. Another recommendation is that any harvesting of hay be delayed until late July or August to give time for fledgling grassland birds to develop and leave the nest.

SIBERIA (Guilford and Hamilton Townships, and Chambersburg Borough)

This site contains a good quality population of **Limestone Petunia** (*Ruellia strepens*), a G4G5, S2 PA-Threatened plant species of concern. Several natural communities occupy the site. Together these natural communities support a diverse, interesting flora. These natural communities include a floodplain forest along the Conococheague Creek, an Oak-Hickory forest that occupies most of the upland area and successional vegetation in powerline clearings. Associated species include Silver Maple, Box Elder, American Elm, Bitternut Hickory, and Virginia Creeper. Surrounding land includes the Borough of Chambersburg and suburbs, farms, fields, and pastures.

Threats and Disturbances

Disturbances to this site include powerline clearing, jeep lanes, clearing for development, and exotic plant species.

Conservation Recommendations

It is recommended that development and clearing/mowing be minimized in the floodplain areas of creeks and streams. Some areas adjacent to the wetland require additional forested buffers to minimize the impact of non-point sources of pollution. Forested buffers provide critical protection to streams by reducing nutrient, sediment and toxic runoff from roads, residences and agricultural fields. Monitoring for invasive species of plants is also recommended. Populations of invasive species

(Hamilton Township continued)

removed as they first appear are far more easily and effectively eliminated than established populations.



Floodplain forests, like that pictured above along the Conococheague Creek, provide specialized habitat for a variety of plant and animal species from common to rare.

(Photo: PA Science of The Nature Conservancy)

LETTERKENNY TOWNSHIP

Site Name	Special Species / Community Type	PNHP Ranks*		State Status	Last Seen	Quality**
		Global	State			
Bear Valley	Ephemeral/fluctuating Natural Pool Community	G?	S3	N	3/2/2002	B
Clark's Knob	Animal: Allegheny Woodrat (<i>Neotoma magister</i>)	G3G4	S3	PT	11/12/1992	E
Conodoguinet Creek at Orrstown	Pineland pimpernel (<i>Samolus parviflorus</i>)	G5	S2	TU	8/7/2002	E
Conodoguinet Creek in Upper Horse Valley	Animal: Northern Myotis (<i>Myotis septentrionalis</i>)	G4	S3B, S3N	N	9/10/2002	E
Keasey Run Wetlands	Brown Sedge (<i>Carex buxbaumii</i>)	G5	S3	TU	6/23/1992	C
	Sedge (<i>Carex shortiana</i>)	G5	S3	TU	6/1/1992	E
Letterkenny Army Depot	"Ephemeral-fluctuating Natural Pool Community	G?	S3	N	04/2000	E
Letterkenny Reservoir	"Ephemeral-fluctuating Natural Pool Community	G?	S3	N	7/24/2003	E

Locally Significant: Roxbury Floodplain

Managed Lands: Buchanan State Forest
State Game Lands #76
State Game Lands #235

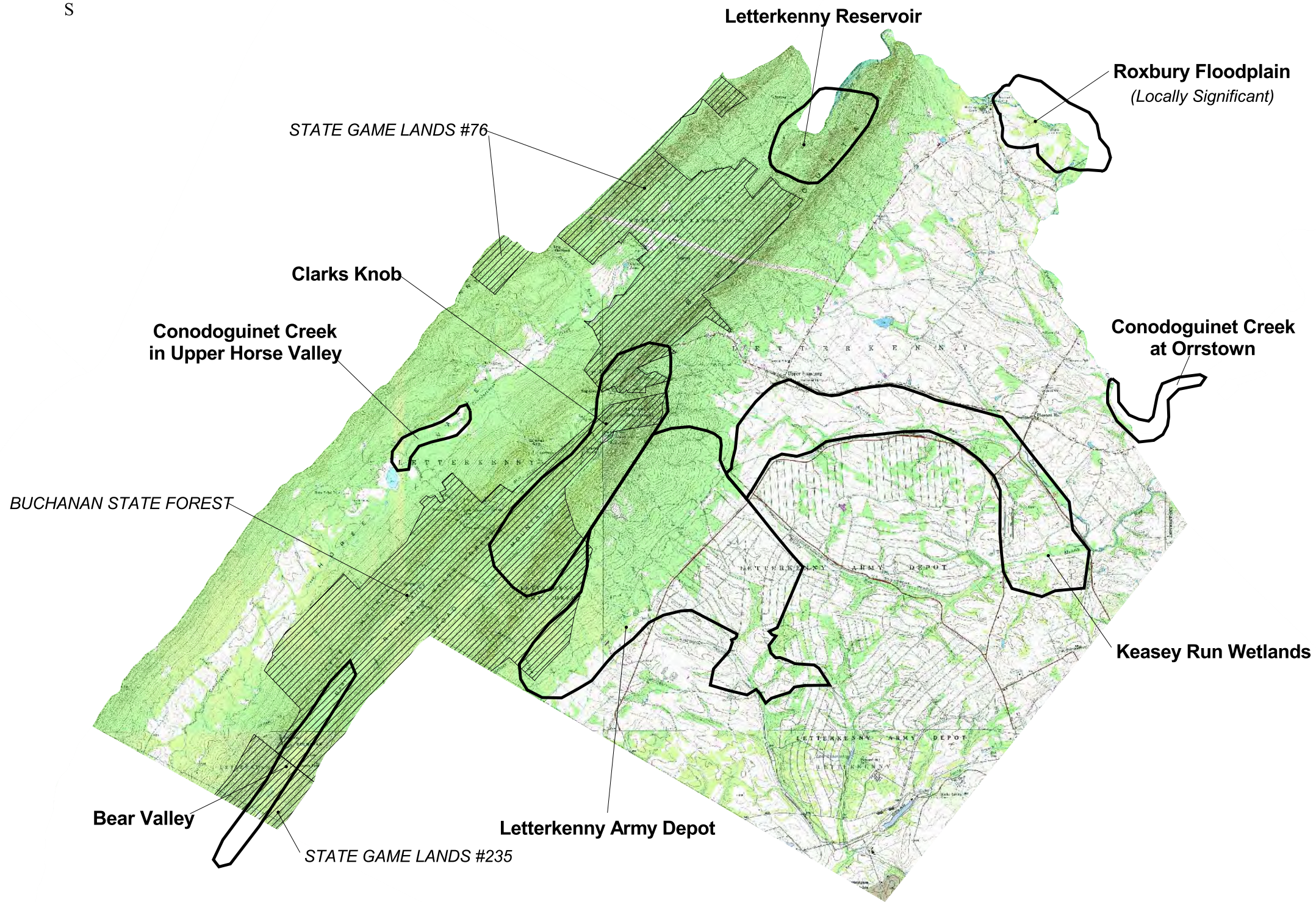
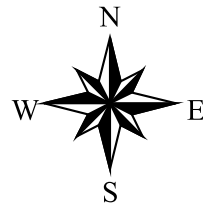
Other: Letterkenny Army Depot

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

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

[Letterkenny Township Map](#)

Letterkenny Township



Letterkenny Township

Franklin County Natural Areas Inventory

Natural Areas:

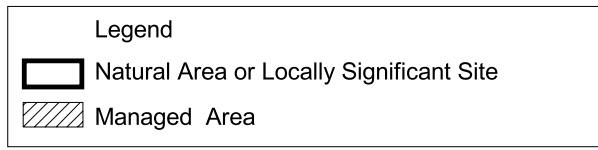
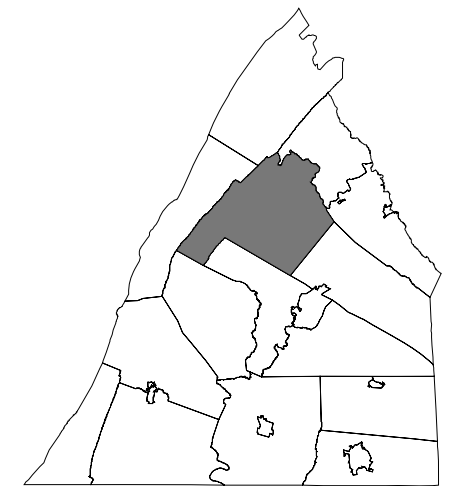
- Bear Valley
- Clarks Knob
- Conodoguinet Creek at Orrstown
- Conodoguinet Creek in Upper Horse Valley
- Keasey Run Wetlands
- Letterkenny Army Depot
- Letterkenny Reservoir

Locally Significant Sites:

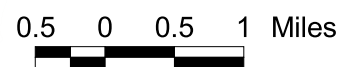
- Roxbury Floodplain

Managed Areas:

- Buchanan State Forest
- State Game Lands #76
- State Game Lands #235



Scale 1:84,000



BEAR VALLEY (Letterkenny and St. Thomas Townships)

Most of this valley is in public lands, containing portions of State Game Lands #235 and Buchanan State Forest. The forest is biologically diverse and very attractive. The surrounding forest canopy is primarily a Tuliptree-(American Beech)-Maple Forest (Fike 1999), with a strong component of Cucumber-tree. This area includes the headwaters of Broad Run, which grades into a “Hemlock-mixed hardwood Palustrine Forest” (Fike 1999). The palustrine forest area has extensive carpets of sphagnum moss-covered substrate under a Hemlock, Yellow Birch, and Cucumber-tree canopy. Occasional herbaceous openings dominated by ferns and sedges dot the bottomland of the valley. This area contains at least 22 good-quality temporary ponds that make up an **Ephemeral/Fluctuating Natural Pool Community**. These ponds occur in very stony soils at the headwaters of Broad Run. Ephemeral / fluctuating or vernal pools are wetlands that fill annually from precipitation, surface water runoff, and rising groundwater to appear pond-like during the winter and spring months. These pools typically become completely dry through evaporation by late spring or summer. Since these ponds dry up during a portion of the year, they cannot support fish populations. During the brief time the pools contain water, and in the absence of fish, they become important breeding areas for a variety of amphibian species such as wood frogs and spotted salamanders, many of which breed solely in vernal pools.

The ponds are within a richly diverse mixed coniferous-deciduous forest composed primarily of Hemlock, White Pine, Yellow Birch, Tuliptree, Pin, Red, Chestnut and White Oaks, Black Gum, Red and Sugar Maples, American Beech, Basswood, and a large population of Cucumber-tree. The ponds are frequently ringed by shrubs including Winterberry Holly, Pinxter-flower, Mountain Laurel, Huckleberries and Blueberries and Greenbriar. Several of the ponds contain wetland vegetation while many are unvegetated except for a thick ring of sphagnum moss at the waterline.

Animal species observed in association with these habitats include spotted salamanders (*Ambystoma maculatum*), wood frogs (*Rana sylvatica*), pickerel frogs (*Rana palustris*), eastern box turtles (*Terrapene carolina carolina*), wood turtles (*Clemmys insculpta*), black bear, white-tailed deer and porcupines.

Threats and Disturbances

Threats to this area include logging activities that do not include buffers around the ponds. Introduced species of plants are noticeably absent from the forest, but pioneer populations of Tree-of-heaven and Multiflora Rose are becoming established along the valley roadway. Heavy deer browse was noticed in portions of the forest. The increased use of All Terrain Vehicles (ATVs) in public forest property poses a potential threat to the site.

Conservation Recommendations

Logging within the portion of the forest where the ponds are located should be avoided. Undisturbed forest buffers need to be maintained around these ponds and other wetland habitats within the valley. The large size of the trees surrounding the pools suggests this practice has been exercised in logging operations at this site. The site should be monitored for ATV traffic, and trails blocked as they appear. Monitoring for invasive species of plants is also recommended. Populations of invasive species removed as they first appear are far more easily and effectively eliminated than established populations. Surveys for species of concern in this area are encouraged.

(Letterkenny Township continued)

CLARK'S KNOB (Letterkenny Township)

Evidence of several populations of a G3G4, S3 PA-Threatened animal species, the **Allegheny woodrat** (*Neotoma magister*), was found at this site during a site survey in 1992. This species typically inhabits the deep crevices of rocky outcrops, boulder-strewn talus slopes and caves. Populations of this species throughout the state have experienced rapid decline in recent decades due to unknown causes (Merritt 1987). This site includes portions of Buchanan State Forest.

Threats and Disturbances

Potential disturbances include logging on top of ridges and development.

Conservation Recommendations

An undisturbed forested buffer should be maintained around ridgetop rocky outcrops where the woodrats occur. The population of this species at this site needs to be reassessed and updated.

CONODOGUINET CREEK AT ORRSTOWN (Letterkenny, Lurgan and Southampton Townships)

This forested floodplain area contains an undetermined quality population of **Pineland Pimpernel** (*Samolus parviflorus*), a G5, S2 Pennsylvania plant species of concern. The floodplain area contains many invasive introduced species of plants, but a diverse native floodplain flora persists at this site.

Among the associated species of plants at this site include the trees Pin Oak Bitternut and Pignut Hickories, Red, Sugar and Silver Maples, American Sycamore, White Oak and American Basswood. Characteristic floodplain shrubs found at this site include Spicebush, Black-haw, Swamp Dogwood, Black Willow, Smooth Alder, Hornbeam, Slippery Elm, Greenbriar, Poison Ivy and the invasive introduced species Multiflora Rose. Herbaceous species found along the creek floodplain include Winged Monkey-flower, Orange Jewelweed, Seedbox, Cardinal flower, a Sedge (*Carex lupulina*), Arrow-leaved tearthumb, Cutgrass, Clearweed, White Avens, Bottlebrush Grass, Wingstem, New York Ironweed, Swamp Milkweed, and Sensitive Fern.

Bird species recorded at this site include Chestnut-sided Warbler, Northern Cardinal, White-breasted Nuthatch, Downy Woodpecker, Gray Catbird, Northern Flicker, and Belted Kingfisher.

Threats and Disturbances

Potential threats to this site include invasive plant species, conversion to agricultural fields, draining, pasturing, grazing, and invasive species.

Conservation Recommendations

The current minimal selective logging occurring on the site does not appear to significantly degrade this habitat. The area should be fenced from cattle to avoid increased invasion by non-native plants into the floodplain. Additional surveys for this and other species of concern are recommended along the floodplain at this location.

CONODOGUINET CREEK AT UPPER HORSE VALLEY (Letterkenny Township)

This site contains an unknown quality population of **Northern Myotis** (*Myotis septentrionalis*), a G4, S3B, S3N Pennsylvania animal species of concern. Associated species include Little Brown Bat

(Letterkenny Township continued)

(*Myotis lucifugus*), Big Brown Bat (*Eptesicus fuscus*), Eastern Pipistrelle (*Pipistrellus subflavus*), and Red Bat (*Lasiurus borealis*). The **Northern Myotis** was found along the Conodoguinet Creek in a primarily deciduous forest. Associated plant species include Red Oak, Eastern Hemlock, Red Maple, and other oaks. Greenbriar, Witch-hazel and Black Birch are also present in the understory. The occurrence of this species along the stream denotes the stream as either a foraging area or travel lane. This species may or may not be using this area as a roosting area.

Threats and Disturbances

If the **Northern Myotis** roosts nearby, one potential threat would be periodic logging along the mountains. No other disturbances or threats are noted.

Conservation Recommendations

Additional surveys of the **Northern Myotis** are needed to better assess the population. Undisturbed forested buffers should be maintained along all waterways.

KEASEY RUN WETLANDS (Letterkenny Township)

This site contains several fair quality populations of **Brown Sedge** (*Carex buxbaumii*), a G5, S3 Pennsylvania plant species of concern. This species was found in a marshy bottomland along a small creek with a saturated shale substrate. Associated species included Soft Rush, Fowl Mannagrass, Sedges (*Carex spp.*), Rough Bluegrass, Smooth Goldenrod, and Sensitive Fern. This area is generally surrounded by woods, but there is a fence and road to the south. This area has little disturbance with the exception of the presence of Rough Bluegrass, an exotic plant species. An undetermined quality population of a **Sedge** (*Carex shortiana*), a G5, S3 Pennsylvania plant species of concern, was found in a poorly drained area in an old field along a tributary of Keasey Run.

Threats and Disturbances

Threats and disturbances to these sites include invasive plant species in and around the edge of the marshy areas. The origin of the marsh could be a disturbance on its own. The marsh could be post-logging in origin. Other possible threats include succession and competition from the invasive Reed Canary Grass.

Conservation Recommendations

Some areas adjacent to the wetlands require additional forested buffers to minimize the impact of non-point sources of pollution. It is also recommended that a more thorough survey of Brown Sedge (*Carex buxbaumii*) be conducted along the creek to locate additional populations.

LETTERKENNY ARMY DEPOT (Letterkenny Township)

The Letterkenny Army Depot covers a large area in north central Franklin County. The depot contains a relatively intact area of forest that borders Buchanan State Forest. This area contains an **Ephemeral/Fluctuating Natural Pool Community**. These ponds are home to many species of amphibians including marbled salamanders (*Ambystoma opacum*), spotted salamanders (*Ambystoma maculatum*), Jefferson's salamanders (*Ambystoma jeffersonianum*), wood frogs (*Rana sylvatica*), spring peepers (*Pseudacris crucifer*), green frogs (*Rana clamitans*), pickerel frogs (*Rana palustris*), toads (*Bufo spp.*), and red-spotted newts (*Notophthalmus viridescens*). Most of the ponds are located in the forested areas on the depot. The pH of the ponds ranges from 4.7 to 7.95 and they vary in species composition.

(Letterkenny Township continued)

The depot also contains significant amounts of hay-dominated fields for grassland-dependent birds. A visit to one of the fields in June 2003 found uncommon grassland dependent species such as Grasshopper Sparrow, Field Sparrow, Bobolink, Common Yellowthroat, and Song Sparrow. There is a good possibility that Henslow's Sparrow, a former animal species of concern, nests in the area, but no confirmations could be found on that day. However, this species was documented at this exact site in the past. This area also may host a few grassland bird species of concern such as Upland Sandpiper, and Dickcissel. More bird surveys are encouraged to determine if these species exist on Letterkenny Army Depot property. This site includes portions of Letterkenny Army Depot, private property and a portion of Buchanan State Forest.

Threats and Disturbances

There are no immediate threats to the vernal pond community. Disturbances include activities on the depot, invasive species invasion and close proximity to roads. Any significant change from hay-dominated fields to another type of field is a threat to birds on this site. Any changes in the current management practices or additional development of the site poses a threat to bird species within the depot boundaries.

Conservation Recommendations

It is recommended that any habitat management activities around the vernal pond community be carefully reviewed. Undisturbed forested buffers should remain around each pond to minimize disturbance to the ponds and the species that depend on them. It is also recommended that further surveys be conducted to determine which grassland bird species utilize this area on a regular basis. There are additional grasslands that are present throughout Letterkenny Depot, and the area has potential to support populations of Dickcissel, Upland Sandpiper, Henslow's Sparrow and Barn Owl.

LETTERKENNY RESERVOIR (Letterkenny and Lurgan Townships)

This site contains several temporary ponds that make up an **Ephemeral/fluctuating Natural Pool Community** within a Sugar Maple dominated floodplain. Associated species with these ponds included Red Maple, White Oak, Eastern Hemlock, Yellow Birch, White Ash, Witch-hazel, Hornbeam, Hop-Hornbeam, Striped Maple, Stiltgrass, Smartweed, Hay-scented Fern, Partridgeberry, Mockernut Hickory and Orange Jewelweed. There was very little vegetation inside the pools, possibly because they were surveyed during an extremely dry year. Surrounding landscape included a stream, a reservoir, forest, and a park.

Threats and Disturbances

Potential threats and disturbances to this site include logging, park encroachment, development, hydrology changes, deer overbrowsing, and exotic plant species.

Conservation Recommendations

Logging within the portion of the forest where the ponds are located should be avoided. Undisturbed forest buffers need to be maintained around these ponds and other wetland habitats within the valley. Former logging practices commonly included throwing the leftover tops of trees into ponds such as these. This is not an acceptable procedure in modern logging operations. The site should be monitored for ATV traffic, and trails blocked as they appear. Monitoring for invasive species of plants is also recommended. Populations of invasive species removed as they first appear are far more easily and effectively eliminated than established populations. Surveys for species of concern in this area are encouraged.

Locally Significant Site:

Roxbury Floodplain (Letterkenny and Lurgan Twp.)

This **Locally Significant Site** consists of an expansive floodplain along a braided portion of the Conodoguinet Creek and a small shale outcrop in close proximity to Lurgan Elementary School. Atop the shale outcrop near the school is a Table Mountain Pine dominated shale outcrop. Other species in this area include Red Maple, Eastern Hemlock, Chestnut Oak, Scarlet Oak, Lowbush Blueberry, Black Cherry, Gypsyweed, Wild Columbine, Rusty Woodsia, Ebony Spleenwort and Mountain Laurel.

The floodplain forest was extensive and weedy at places. Species found here include characteristic floodplain tree species such as Silver Maple, Hornbeam, Sugar Maple, and American Sycamore. Other frequent plant species included Cardinal Flower, Winged Monkey-flower, Smartweeds, Joe-pye-weed, Buttonbush and Sensitive Fern. Unfortunately, invasive plant species were abundant in this area and decreased the overall quality of the site. Invasive plant species such as Multiflora Rose, Japanese Barberry, Stiltgrass, and Garlic Mustard have invaded parts of the understory in the floodplains. There were areas in this site that contained less amounts of invasive species, and these are the areas that have the greatest potential for containing Pennsylvania plant species of concern.

Threats and Disturbances

The main threat to this area is the spread of invasive plant species that decrease the overall quality of the area. Another long-term threat to the area is development.

Conservation Recommendations

More surveys of this site are recommended in the future to determine if any plant species of concern thrive there. Despite the invasive species spread, this area, along with many floodplain and shale cliff areas along the Conodoguinet and Conococheague Creeks, remain an important part of the Franklin County landscape and the potential for finding further plant species of concern are high.



Heavy siltation from agricultural runoff in many of the creeks of Franklin County impairs the habitat requirements of aquatic species including freshwater mussels. Many areas adjacent to the creeks in Franklin County require additional forested buffers to minimize the impact of non-point sources of pollution. Forested buffers provide critical protection to streams by reducing nutrient, sediment and toxic runoff from roads, residences and agricultural fields. Pictured above is a Plain Pocketbook mussel (*Lampsilis cardium*) in a Franklin County creek impacted by heavy siltation.

Photo: PA Science Office of The Nature Conservancy

LURGAN TOWNSHIP

Site Name	Special Species / Community Type	PNHP Ranks*		State Status	Last Seen	Quality**
		Global	State			
Conodoguinet Creek at Orrstown	Pineland pimpernel (<i>Samolus parviflorus</i>)	G5	S2	TU	8/7/2002	E
Gunter Valley and Ridges	Animal	G4	S3S4	PC	6/26/2002	E
	Animal: Northern Myotis (<i>Myotis septentrionalis</i>)	G4	S3B, S3N	N	6/27/2002	E
Letterkenny Reservoir	“Ephemeral-fluctuating Natural Pool Community	G?	S3	N	7/24/2003	E
Route 997 North of Roxbury	Animal: Upland Sandpiper (<i>Bartramia longicauda</i>)	G5	S1S2B	PT	1994	E
	Animal: Loggerhead Shrike (<i>Lanius ludovicianus</i>)	G4	S?	PE	1986	E

Locally Significant: Roxbury Floodplain

Managed Lands: Gunter Valley (State Forest), Letterkenny Reservoir

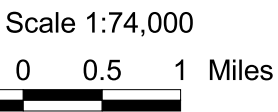
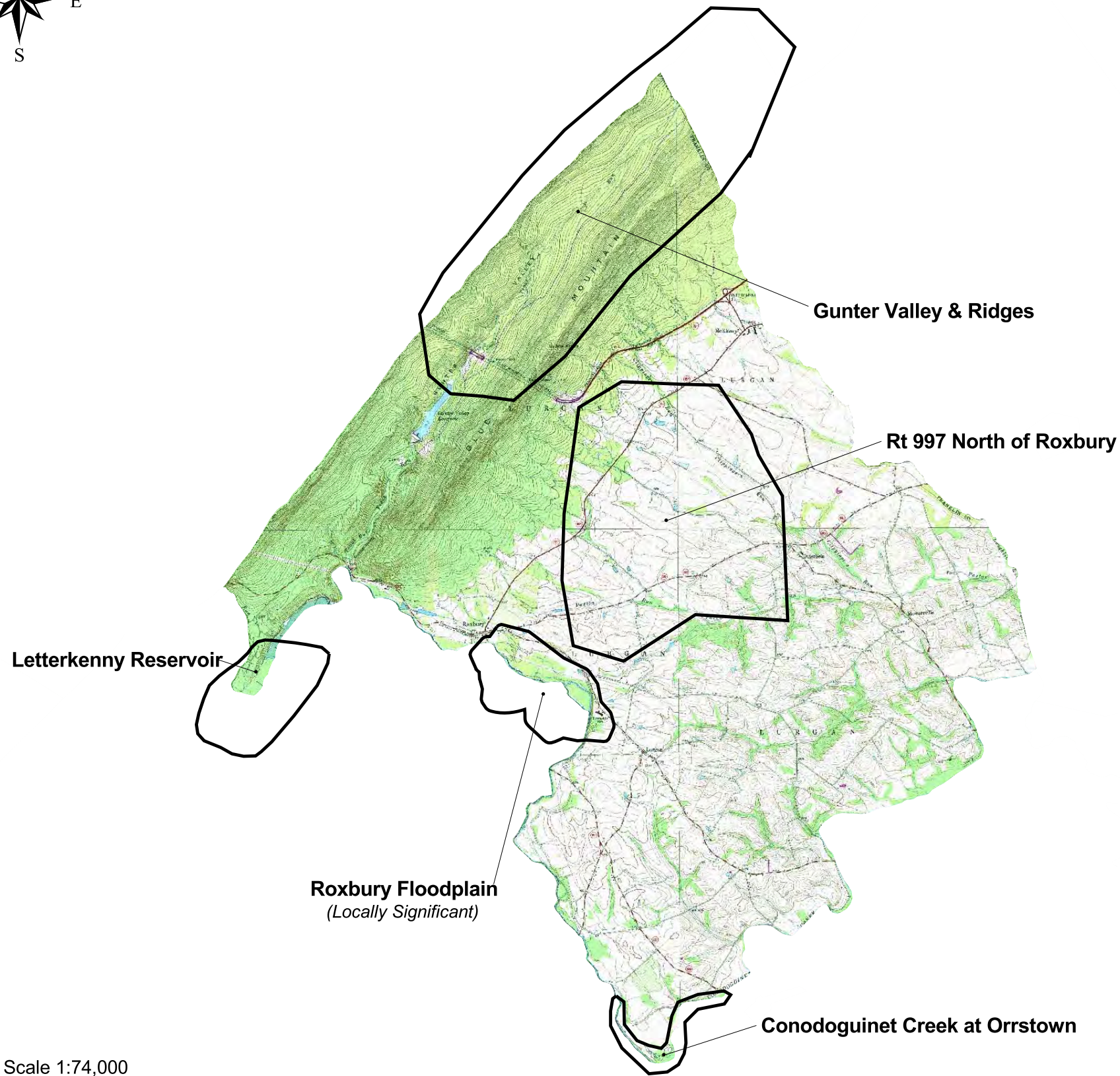
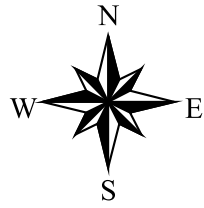
Other: Trout Run: Exceptional Value Stream

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

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

[Lurgan Township Map](#)

Lurgan Township



Lurgan Township

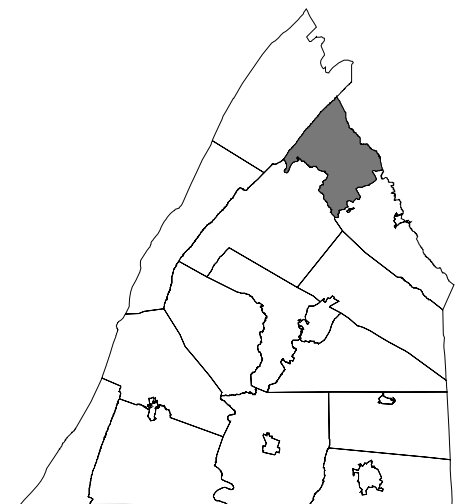
Franklin County Natural Areas Inventory

Natural Areas:

- Conodoguinet Creek at Orrstown
- Gunter Valley & Ridges
- Letterkenny Reservoir
- Rt 997 North of Roxbury

Locally Significant Sites:

- Roxbury Floodplain



(Lurgan Township continued)

CONODOGUINET CREEK AT ORRSTOWN (Letterkenny, Lurgan and Southampton Townships)

This forested floodplain area contains an undetermined quality population of **Pineland Pimpernel** (*Samolus parviflorus*), a G5, S2 Pennsylvania plant species of concern. The last recorded occurrence of this species in Franklin County was in 1850 near Mercersburg by Thomas Conrad Porter, an early influential Pennsylvania botanist who had been professor of natural sciences in Marshall College, Mercersburg in the mid 1800's. The floodplain area contains many invasive introduced species of plants, but a diverse native floodplain flora persists at this site.

Among the associated species of plants at this site include the trees Pin Oak Bitternut and Pignut Hickories, Red, Sugar and Silver Maples, American Sycamore, White Oak and American Basswood. Characteristic floodplain shrubs found at this site include Spicebush, Black-haw, Swamp Dogwood, Black Willow, Smooth Alder, Hornbeam, Slippery Elm, Greenbriar, Poison Ivy and the invasive introduced species Multiflora Rose. Herbaceous species found along the creek floodplain include Winged Monkey-flower, Orange Jewelweed, Seedbox, Cardinal flower, a Sedge (*Carex lupulina*), Arrow-leaved tearthumb, Cutgrass, Clearweed, White Avens, Bottlebrush Grass, Wingstem, New York Ironweed, Swamp Milkweed, and Sensitive Fern.

Bird species recorded at this site include Chestnut-sided Warbler, Northern Cardinal, White-breasted Nuthatch, Downy Woodpecker, Gray Catbird, Northern Flicker, and Belted Kingfisher.

Threats and Disturbances

Potential threats to this site include invasive plant species, conversion to agricultural fields, draining, pasturing, grazing, and invasive species.

Conservation Recommendations

The current minimal selective logging occurring on the site does not appear to significantly degrade this habitat. The area should be fenced from cattle to avoid increased invasion by non-native plants into the floodplain. Additional surveys for this and other species of concern are recommended along the floodplain at this location.

GUNTER VALLEY AND RIDGES (Fannett and Lurgan Townships)

Much of this land was recently purchased by the PA Bureau of Forestry from the Shippensburg Water Authority. This large tract of land has much 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 (*Myotis lucifugus*) and Big Brown Bat (*Eptesicus fuscus*). 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.

Threats and Disturbances

If roosting by 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.

LETTERKENNY RESERVOIR (Letterkenny and Lurgan Townships)

This site contains several temporary ponds that make up an **Ephemeral/fluctuating Natural Pool Community** within a Sugar Maple dominated floodplain. Associated species with these ponds included Red Maple, White Oak, Eastern Hemlock, Yellow Birch, White Ash, Witch-hazel, Hornbeam, Hop-Hornbeam, Striped Maple, Stiltgrass, Smartweed, Hay-scented Fern, Partridgeberry, Mockernut Hickory and Orange Jewelweed. There was very little vegetation inside the pools, possibly because they were surveyed during an extremely dry year. Surrounding landscape included a stream, a reservoir, forest, and a park.

Threats and Disturbances

Potential threats and disturbances to this site include logging, park encroachment, development, hydrology changes, deer overbrowsing, and exotic plant species.

Conservation Recommendations

Logging within the portion of the forest where the ponds are located should be avoided. Undisturbed forest buffers need to be maintained around these ponds and other wetland habitats within the valley. Former logging practices commonly included throwing the leftover tops of trees into ponds such as these. This is not an acceptable procedure in modern logging operations. The site should be monitored for ATV traffic, and trails blocked as they appear. Monitoring for invasive species of plants is also recommended. Populations of invasive species removed as they first appear are far more easily and effectively eliminated than established populations. Surveys for species of concern in this area are encouraged.

ROUTE 997 NORTH OF ROXBURY (Lurgan Township)

This site contains two unknown-quality populations of **Upland Sandpiper** (*Bartramia longicauda*), an S1S2B PA-Threatened animal species of concern. Four adults and four immature of this species were seen on a fence-post in an uncut grass pasture with a pond nearby. An updated survey to this site in June 2003 found species such as Red-winged Blackbird, Song Sparrow, Northern Flicker, Eastern Towhee, European Starling, Common Yellowthroat, American Robin, and Barn Swallow. The habitat at this site is now marginally suitable for the Upland Sandpiper. Cattle are present at this site as well. The initial plowing of land for crops adversely affects this grassland specialist even more than most other grassland species (Bowen and Houston, 2001). Another threat to this area is the possible conversion of old farms to development. It is recommended that these sites be surveyed for future activity for the Upland Sandpiper, and monitored for the threats mentioned above. It is also recommended that grasslands suitable for this species be of various heights with few shrubs (Bowen and Houston, 2001). This species requires short vegetation for foraging, taller vegetation for nesting, and short to medium vegetation for brood cover. Overall, grasslands should be preserved of at least 100 hectares in size (Bowen and Houston, 2001).

(Lurgan Township continued)

In addition, an unknown quality population of **Loggerhead Shrike** (*Lanius ludovicianus*), a G4, SQ PA-Endangered animal species of concern, was seen in the past near the site of the above species. This site has not been updated by TNC staff since 1986, and this species is not likely in this possible breeding site. In addition, Loggerhead Shrikes continue to contract from its former range in the northeast. However, this species may still be present in this habitat.

Threats and Disturbances

The main threat to these areas is the conversion of grassy fields to row crop fields that would provide unsuitable habitat for the Upland Sandpiper. Since no individuals of this species were found in a recent survey, one or both areas may already be unsuitable for this species.

Direct threats to the shrike habitat include conversion of land use from farm/open grasslands to development or rowcrop agriculture. Bushwhacking of shrubs and small trees in this area would likely cause Shrikes to abandon their nesting site. Another direct threat is the use of pesticides on farm pests such as mice. Pesticides such as DDT may have contributed to the rapid decline of this species throughout the northeast (Michigan Natural Features Inventory, 2001). Succession into forest is another threat to the site itself. Disturbances include potential development, and encroaching roads and suburbanization.

Conservation Recommendations

It is recommended that further surveys be conducted to determine if both above animal species of concern uses these two sites as breeding habitat. If the species is still breeding at this site, then it is important that monitoring, management, and intensive research be conducted to better assess the shrike's life history and habitat needs. It is recommended that this site be managed for this species by keeping the area at an early successional stage but with scattered trees, adequate patch size, short grasses (4-18"), adequate hunting perches, adequate nest sites, sufficient prey supply, and impaling substrate. Large landowners in this area should be encouraged to enroll a portion of their land in Conservation Reserve Programs (CRP) to provide financial incentive and habitat management recommendations for the requirements of these species. If an active farm is nearby, it is recommended that limited pesticides be used. This species is in great peril in the northeast, and if this site still supports breeding pairs of migrant Loggerhead Shrikes, it is vital to protect the habitat on which it depends. A subspecies of the Loggerhead Shrike (*Lanius ludovicianus migrans*), is a candidate for federal listing and is a Nongame Migratory Bird of Management Concern.

Locally Significant Site:

Roxbury Floodplain (Letterkenny and Lurgan Twp.)

This **Locally Significant Site** consists of an expansive floodplain along a braided portion of the Conodoguinet Creek and a small shale outcrop in close proximity to Lurgan Elementary School. Atop the shale outcrop near the school is a Table Mountain Pine dominated shale outcrop. Other species in this area include Red Maple, Eastern Hemlock, Chestnut Oak, Scarlet Oak, Lowbush Blueberry, Black Cherry, Gypsyweed, Wild Columbine, Rusty Woodsia, Ebony Spleenwort and Mountain Laurel.

The floodplain forest was extensive and weedy at places. Species found here include characteristic floodplain tree species such as Silver Maple, Hornbeam, Sugar Maple, and American Sycamore. Other frequent plant species included Cardinal Flower, Winged Monkey-flower, Smartweeds, Joe-pye-weed, Buttonbush and Sensitive Fern. Unfortunately, invasive plant species were abundant in this

(Lurgan Township continued)

area and decreased the overall quality of the site. Invasive plant species such as Multiflora Rose, Japanese Barberry, Stiltgrass, and Garlic Mustard have invaded parts of the understory in the floodplains. There were areas in this site that contained less amounts of invasive species, and these are the areas that have the greatest potential for containing Pennsylvania plant species of concern.

Threats and Disturbances

The main threat to this area is the spread of invasive plant species that decrease the overall quality of the area. Another long-term threat to the area is development.

Conservation Recommendations

More surveys of this site are recommended in the future to determine if any plant species of concern thrive there. Despite the invasive species spread, this area, along with many floodplain and shale cliff areas along the Conodoguinet and Conococheague Creeks, remain an important part of the Franklin County landscape and the potential for finding further plant species of concern are high.

Trout Run (Lurgan Township)

A stream in Pennsylvania is categorized as an “Exceptional Value Stream” due to an exceptional component of biology, chemistry, landscape, outstanding local water resource, or is designated as a wilderness trout stream. Trout Run is the only designated “Exceptional Value Stream” in the county. This stream is the largest tributary of the Conodoguinet Creek, and is considered an exceptional value stream from its source to the water supply dam. This stream serves as a water source for Shippensburg. Forested buffers should remain intact for the length of the creek with logging operations refraining from cutting within 50 to 100 feet of the creek bank. Stream bank forests help buffer the watershed from the effects of non-point sources of pollution including runoff from agricultural, residential and roadway settings. In addition, the stream bank floodplain and corridor is usually an area of significantly higher biodiversity than the adjoining uplands. Much of the area’s important biodiversity can be preserved by maintaining an intact, forested floodplain along the creek. The effectiveness of the forested creek as a habitat corridor would be diminished by fragmentation of the forest continuity by the construction of additional roadways along the creek.



A Northern long-eared bat (*Myotis septentrionalis*) a G4, S3 animal species of concern captured in a mist net along Trout Run in Franklin County.
Photo: PA Science Office of The Nature Conservancy



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

METAL TOWNSHIP

Site Name	Special Species / Community Type	PNHP Ranks*		State Status	Last Seen	Quality**
		Global	State			
Metal Church Spring	Animal	G4	S3S4	N	2003	E
	White water-Crowfoot (<i>Ranunculus aquatilis</i> var <i>diffusus</i>)	G5T5	S3	N	2003	E
Mountain Lake	Animal	G5	S2	PT	09/10/2003	E
Neeleytown Ridgetop	Animal: Allegheny Woodrat (<i>Neotoma magister</i>)	G3G4	S3	PT	8/11/1987	BC
Pine Run Ponds	Northeastern Bulrush (<i>Scirpus ancistrochaetus</i>)	G3	S3	PE	8/03/2000	BC
	Ephemeral/Fluctuating Natural Pool Community	G?	S3	N	9/10/2002	BC
Tuscarora Ridgetop	Animal: Allegheny Woodrat (<i>Neotoma magister</i>)	G3G4	S3	PT	1/1/1988	E
Upper Horse Valley	Animal	G4	S3S4	CA	7/16/2002	E
Upper West Branch Conococheague Creek	Purple Bedstraw (<i>Galium latifolium</i>)	G5	S3	N	9/01/2003	D
	American Beakgrain (<i>Diarrhena obovata</i>)	G5	S4	Delisted	9/01/2003	DL

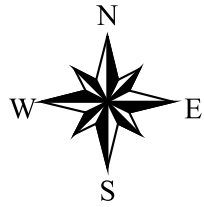
Managed Lands: Buchanan State Forest
Cowan's Gap State Park
State Game Lands #76

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

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

[Metal Township Map](#)

Metal Township



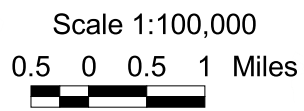
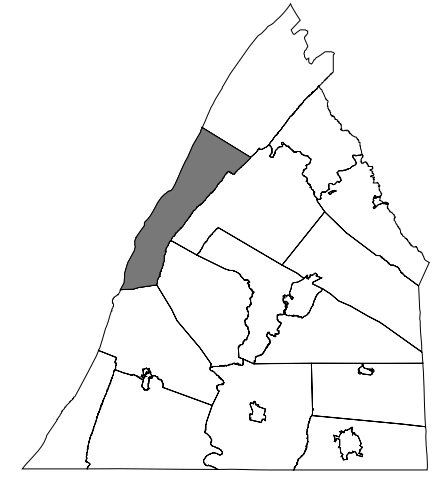
Metal Township Franklin County Natural Areas Inventory

Natural Areas:

- Metal Church Spring
- Mountain Lake
- Neeleyton Ridgetop
- Pine Run Ponds
- Tuscarora Ridgetop
- Upper Horse Valley
- Upper West Branch
- Conococheague Creek

Managed Areas:

- Buchanan State Forest
- Cowans Gap State Park
- State Game Lands #76



Legend

- Natural Area or Locally Significant Site
- Managed Area

Metal Church Spring (Metal Township)

This stretch of the West Branch of the Conococheague Creek contains old creek bed meanders called “oxbows” that create quality habitat for a rich variety of plants and animals. These oxbows are typically cut off from the main stem of the creek and flood during high water events. As the waters subside, they leave saturated soil conditions that persist throughout much of the growing season.

The creek is lined with floodplain tree species such as Sycamore, Silver Maple, Basswood, Box-elder, Black Walnut, Butternut and various Hickories. The thick shrub layer lining the banks is composed primarily of Spicebush, Redbud, Hop Hornbeam, Silky Dogwood, and includes the invasive species Multiflora Rose and Morrow’s Honeysuckle. The **White Water-crowfoot (*Ranunculus aquatilis var. diffusus*)** is an S3 plant species of concern that was found in a backwater eddy connected to the main creek. This aquatic plant species is typically entirely submerged in water except for the flowers, which float or protrude above the surface. Associated aquatic plant species include Waterweed, Hornwort, Bur-reed, Yellow Pond-lily and Duckweed. A small population of a **G4, S3 aquatic animal species of concern** was also located along this length of creek. Future surveys for this and other species of concern in this area are recommended.

Threats and Disturbances

Exotic species of plants are the only current disturbance observed along the creek in this location. The potential threats include filling of the oxbows, clearing the forested canopy along the creek and floodplain, the spread of aggressive introduced plant species, and development of the adjacent creek banks. Erosion and runoff from adjacent agriculture and other land altering activities threatens to impact the stream with increased siltation, and herbicide and pesticide runoff.

Conservation Recommendations

The establishment of undisturbed forested buffers along the length of the creek is the best means of protecting and improving the quality of the habitat found at this site. The expansion and preservation of existing forested creek buffers will help trap sediment and chemical runoff. Additionally, the shade from overhanging trees will help cool the creek, improving the water’s capacity to hold oxygen. The clearer, cooler water will improve its quality for the common and rare aquatic species that inhabit this creek.

MOUNTAIN LAKE (Metal Township)

Mountain Lake was formed by damming the West Branch Conococheague Creek and has become suitable habitat for a **Pennsylvania threatened animal species of concern**. This species was originally reported from the lake in 1968. At that time, one individual was captured and released. The site was revisited, yielding identification of one individual in June of 2003 and four individuals in September of the same year. Other animal species identified at the site include Belted Kingfisher, Red-winged Blackbird, Barn Swallow, Tree Swallow, Green-backed Heron, Canada Geese, Muskrats and Painted Turtles. Vegetation in and around the lake include Yellow Pond Lily, Cattail, Meadow-sweet, Willow, White Oak, Red Maple, Shagbark Hickory, Sycamore, Arrow-Wood, Greenbriar, Virginia Creeper, Nightshade, Poison Ivy, Honeysuckle, Black Locust, Pin Oak, and Ash.

(Metal Township continued)

Threats and Disturbances

The foundation that owns the lake is currently inactive and the future of Mountain Lake is uncertain. There has been some discussion in the past of removing the dam and draining the lake. This would eliminate the habitat for the species of concern and is not recommended. Homes and a mobile home park surround the lake. There is evidence of trash dumping and there is a thick layer of sediment on the lake bottom. There is little intact habitat surrounding the lake, however some areas would be suitable as upland habitat required by this species. Predators may thrive in the disturbed upland habitat around the lake and could be a threat to successful reproduction in this population.

Conservation Recommendations

It is recommended that the dam remain intact, assuming it passes required inspections for safety. Further monitoring is necessary to determine the health of this population. Further disturbance around the lake is discouraged. Removing trash from the lake would benefit all species inhabiting the area as well as residents who utilize the lake for recreation.

NEELEYTOWN RIDGETOP (Fannett and Metal Townships, and Huntingdon County)

Evidence of several populations of a G3G4, S3 PA-Threatened animal species, the **Allegheny woodrat** (*Neotoma magister*), was found at this site during a site survey in 1987. This species typically inhabits the deep crevices of rocky outcrops, boulder-strewn talus slopes and caves. Populations of this species throughout the state have experienced rapid decline in recent decades unknown causes (Merritt 1987). Additional surveys for this species at this site are recommended.

Threats and Disturbances

Potential disturbances include logging on top of ridges and development.

Conservation Recommendations

An undisturbed forested buffer should be maintained around ridgetop rocky outcrops where the woodrats occur. The population of this species at this site needs to be reassessed and updated.

PINE RUN PONDS (Fannett and Metal Townships)

This site contains a fair to good quality population of **Northeastern Bulrush** (*Scirpus ancistrochaetus*), and a fair to good quality example of an **Ephemeral/Fluctuating Natural Pool Community**. The Federally endangered status of the Northeastern Bulrush indicates that the species is in danger of extinction throughout all or a significant portion of its range. The northeastern bulrush is primarily found in temporary ponds and other pools with fluctuating water levels. These ponds also typically provide important breeding habitat for forest dwelling amphibians such as the wood frog (*Rana sylvatica*), and the spotted salamander (*Ambystoma maculatum*). Associated species include Rattlesnake mannagrass, Woolgrass, Royal Fern, Three-way Sedge. Surrounding woods consists of Red Maple, Black Gum and Black Birch.

Threats and Disturbances

Disturbances include previous logging and exotics (mainly along road and in food plot field), although Multiflora Rose occurs on the border of some ponds. The increased use of All Terrain Vehicles (ATVs) in public forest property poses a potential threat to the site. No obvious threats to the population were observed.

(Metal Township continued)

Conservation Recommendations

Logging within the portion of the forest where the ponds are located should be avoided. The site should be monitored for ATV traffic, and trails blocked as they appear.

TUSCARORA RIDGETOP (Metal and Peters Townships, and Fulton County)

This site contains an unknown quality population of **Allegheny Woodrat** (*Neotoma magister*), a G3G4, S3 PA-Threatened animal species of concern. Active signs of this species were seen on a survey of this site in 1988. This site extends into Fulton County but mostly straddles the county line along Tuscarora ridgetop area.

Threats and Disturbances

Disturbances to this site would be any logging occurring at the ridgetop and heavy trail use by hikers. No immediate threats were identified at this site.

Conservation Recommendations

An undisturbed forested buffer should be maintained around ridgetop rocky outcrops where the woodrats occur. The population of this species at this site needs to be reassessed and updated.

UPPER HORSE VALLEY (Metal, Peters and St. Thomas Townships)

This site contains an unknown quality population of **an S3S4 Pennsylvania animal species of concern**. One individual of this species was found in a "Tuliptree-American Beech-maple forest" (Fike, 1999). The forested areas consisted primarily of Tuliptree, Sassafras, Pignut Hickory, Butternut, Black Walnut, Slippery Elm, Chestnut Oak, Red Oak, Scarlet Oak, Yellow Birch, Black Birch, American Beech, Red Maple, and Eastern Hemlock.

Threats and Disturbances

Deer over browse is a serious problem in this area and is an overall disturbance to the area. A distinct "browse-line" is evident throughout the forest, with the understory dominated by Hay-scented Ferns and poor tree seedling regeneration. Recreational hiking and potential poaching are possible disturbances to the animal species of concern.

Conservation Recommendations

It is recommended that more surveys be conducted to determine the extent of this population. This area yielded no plant species of concern, but has some potential to be diverse in the spring for ephemeral wildflowers.

UPPER WEST BRANCH CONOCOCHIEGUE CREEK (Metal and Peters Townships)

The steep, dry, shale slopes and banks along the West Branch of the Conococheague Creek and Hogback Mountain in this area support several small populations of a G5, S3 plant species of concern, **Purple Bedstraw** (*Galium latifolium*). The underlying geology includes shale and sandstone and is well drained. The banks of the creek in this narrow valley are primarily undisturbed, and have many larger trees overhanging the relatively clear water. Expansive flat floodplains lie adjacent to the creek where the valley widens.

The creek banks are cloaked in a combination of upland and floodplain canopy tree species including American Beech, Hemlock, Sugar Maple, Silver Maple, Basswood, Shagbark Hickory, Black Gum, and White, Chestnut and Red Oaks. Characteristic shrub species include Spicebush, Witch-hazel, Bladdernut, Pinxter-flower, Maple-leaved Viburnum, Ninebark and Hop-hornbeam. Scattered in

(Metal Township continued)

many large patches along the creek banks and floodplain is an excellent-quality population of the American Beakrain, a plant species that has recently been removed from the species of concern list due to increased state-wide population estimates. The creek in this area also supports good populations of several submerged aquatic plant species including Longleaf Pondweed, Waterstargrass & Waterweed in a swift-water, shallow bend in the creek. This site includes a portion of Buchanan State Forest.

Threats and Disturbances

Virtually no disturbances were observed along the creek in this location. Moderate deer browsing was evident. Potential disturbances include logging and development of the riparian corridor. New houses built on the banks of the creek fragment the continuity of the habitat, interrupting its effect as a wildlife corridor, and potentially introducing invasive species of plants into the habitat.

Conservation Recommendations

The habitat appears to be very favorable for the species of concern located here and it should continue to thrive here. Conservation and expansion of the undisturbed forested canopy along the creek and floodplain will best preserve the habitat of this site. Forested buffers should remain intact for the length of the creek with logging operations refraining from cutting within 50 to 100 feet of the creek bank. Stream bank forests help buffer the watershed from the effects of non-point sources of pollution including runoff from agricultural, residential and roadway settings. In addition, the stream bank floodplain and corridor is usually an area of significantly higher biodiversity than the adjoining uplands. Much of the area's important biodiversity can be preserved by maintaining an intact, forested floodplain along the creek. The effectiveness of the forested creek as a habitat corridor would be diminished by fragmentation of the forest continuity by the construction of houses and additional roadways along the creek. Local planning should discourage construction of new residences and roadways along the creek and floodplain. Deer hunting should be encouraged to keep the deer population from increasing to unsustainable levels.



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.

MONTGOMERY TOWNSHIP & Mercersburg Borough

Site Name	Special Species / Community Type	PNHP Ranks*		State Status	Last Seen	Quality**
		Global	State			
Concrete Bottom at Licking Creek	Limestone Petunia (<i>Ruellia strepens</i>)	G4G5	S2	PT	8/9/1987	C
Conococheague Creek at Highland School	Animal	G3G4	S2S3	N	6/25/1993	BC
	Animal: Giant Swallowtail (<i>Papilio cresphontes</i>)	G5	S2	N	7/15/1987	F
	Spreading Rockcress (<i>Arabis patens</i>)	G3	S2	N	5/18/2002	AB, B
	Black-stemmed Spleenwort (<i>Asplenium resiliens</i>)	G5	S1	PE	5/18/2002	C
	Limestone Petunia (<i>Ruellia strepens</i>)	G4G5	S2	PT	5/18/2002	B
	Jeweled Shooting-star (<i>Dodecatheon meadia</i>)	G?	S2	PT	5/10/1995	A
	Green-and-Gold (<i>Chrysogonum virginianum</i>)	G5	S1	PE	5/18/2002	B, B
	Lance-leaved Buckthorn (<i>Rhamnus lanceolata</i>)	G5	S1	PE	5/18/2002	C, CD
Leather Flower (<i>Clematis viorna</i>)	G5	S1	PE	5/18/2002	B, D	
Highland School Fields	Loggerhead Shrike (<i>Lanius ludovicianus</i>)	G4	S?	PE	1994	E

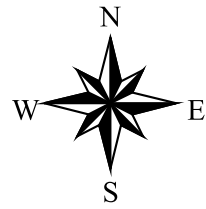
Site Name	Special Species / Community Type	PNHP Ranks*		State Status	Last Seen	Quality**
		Global	State			
Lower Conococheague Creek	Animal: Loggerhead Shrike (<i>Lanius ludovicianus</i>)	G4	S?	PE	1994	E
	Limestone Petunia (<i>Ruellia strepens</i>)	G4G5	S2	PT	9/06/2003	BC
	Allegheny Stonecrop (<i>Sedum telephioides</i>)	G4	S3	PR	9/06/2003	B
	Wild Senna (<i>Senna marilandica</i>)	G5	S1	TU	9/06/2003	D
	Mistflower (<i>Eupatorium coelestinum</i>)	G5	S3	N	9/06/2003	D
Mercersburg Meadow	Animal: Barn Owl (<i>Tyto alba</i>)	G5	S3B, S3N	CA	9/19/2002	E
Mercersburg Woods	Animal	G3	S2	N	10/17/1986	H
	Shumard's Oak (<i>Quercus shumardii</i>)	G5	S1	PE	9/10/1993	D
	Limestone Petunia (<i>Ruellia strepens</i>)	G4G5	S2	PT	9/10/1993	C
	Cattail Sedge (<i>Carex typhina</i>)	G5	S2	PE	5/27/1993	BC
Shimpstown Meadows	Animal: Barn Owl (<i>Tyto alba</i>)	G5	S3BS3N	CA	5/20/2002	E
West Branch Conococheague Creek	Animal	G3	S2	N	10/17/1986	H

Managed Lands: None

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

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

[Montgomery Township Map](#)



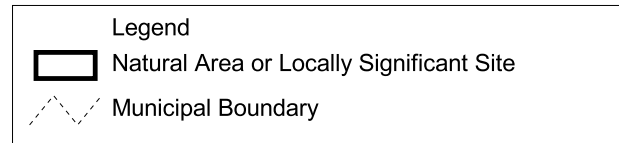
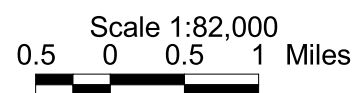
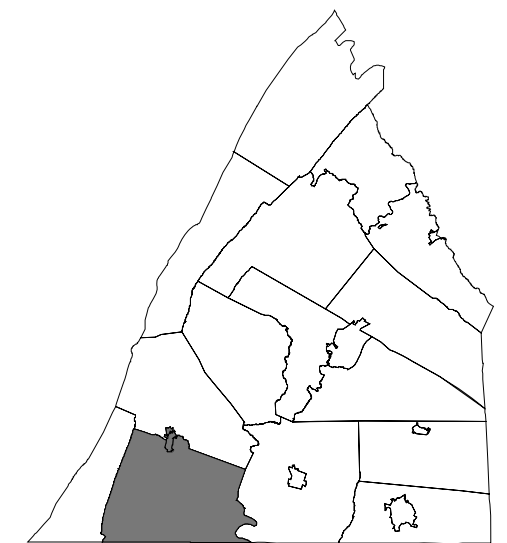
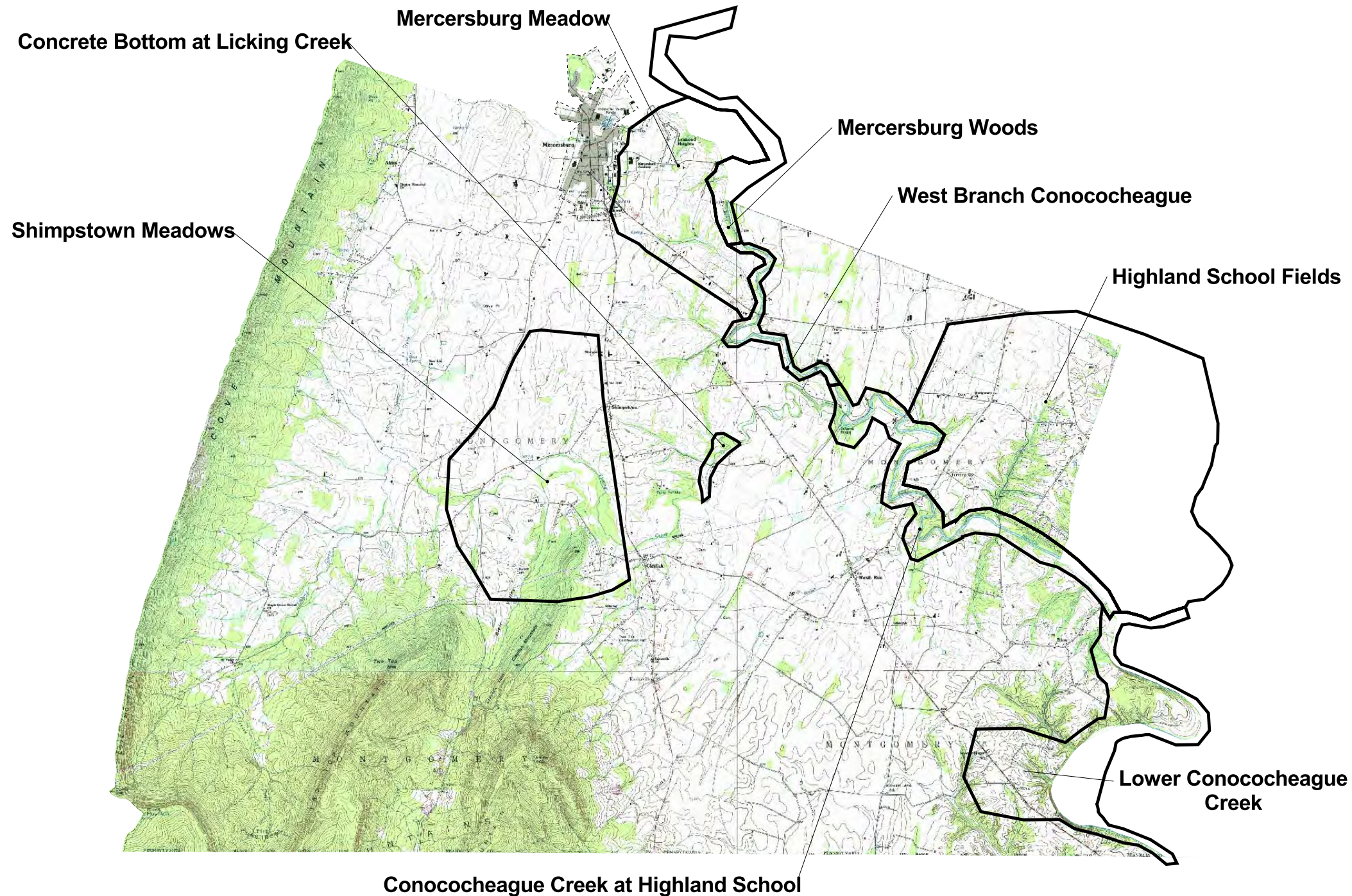
Montgomery Township and Mercersburg Borough

Montgomery Township and Mercersburg Borough

Franklin County Natural Areas Inventory

Natural Areas:

- Concrete Bottom at Licking Creek
- Mercersburg Meadow
- Mercersburg Woods
- West Branch Conococheague
- Highland School Fields
- Lower Conococheague Creek
- Shimpstown Meadows
- Conococheague Creek at Highland School



CONCRETE BOTTOM AT LICKING CREEK (Montgomery Township)

This site contains a fair population of **Limestone Petunia** (*Ruellia strepens*), a G4G5, S2 PA-Threatened plant species of concern. This species occurs along a road adjacent to a creek.

Threats and Disturbances

Roadside maintenance activities and introduced species of plants are the main threats to the plant species of concern at this location.

Conservation Recommendations

Roadside maintenance that favors mowing rather than herbicides is recommended for this location. Early seasonal mowing may help to reduce the density of invasive species of plants, offering the perennial Limestone Petunia a competitive advantage.

CONOCOCHEAGUE CREEK AT HIGHLAND SCHOOL (Antrim and Montgomery Townships)

This site is considered one of the top priority areas for the conservation of biological diversity within Franklin County based on the multiple populations of a large number of plant species of concern, the rarity of the species (G & S-ranks), and the intactness of the surrounding natural community. This dry-mesic calcareous forest supports a very rich herbaceous layer including multiple populations of seven plant species of concern, which occur scattered along the forested, limestone-bedrock bluffs and outcrops lining the West Branch of the Conococheague Creek. The species of concern documented at this site include **Black-stemmed Spleenwort** (*Asplenium resiliens*), **Jeweled Shooting-star** (*Dodecatheon meadia*), **Spreading Rockcress** (*Arabis patens*), **Leather Flower** (*Clematis viorna*), **Lance-leaved Buckthorn** (*Rhamnus lanceolata*), **Green and Gold** (*Chrysogonum virginianum*) and **Limestone Petunia** (*Ruellia strepens*).

The natural community at this site is the result of limestone bedrock outcrops, which create frequent openings in the tree and shrub canopy. The high pH of the soil weathered from the limestone parent material in these woods and openings create ideal conditions for the calcium-loving species encountered here. The forest along the creek and upper slopes is characterized by the dominance of Sugar Maple, and Basswood with additional tree species including Yellow Oak, Shagbark Hickory, White Ash, and Redbud. The population of the G5, S2 PA-Threatened plant species of concern **Jeweled Shooting-star** at this site is considered one of the best in the state. The population occurs on creek-side outcrops and throughout the bluff-top deciduous woodland in multiple large patches over several acres, occasionally dominating the herbaceous layer. The limited active pasturing of cattle on portions of this site may help keep the invasive species Japanese Honeysuckle from overtaking the habitat.

Several good-to-excellent populations of **Spreading Rockcress** a G3, S2 plant species of concern occur scattered among the exposed limestone bedrock. This species has a relatively limited range in North America, hence the G3 rank, with the best-known populations occurring in Pennsylvania and Maryland (NatureServe 2003). The degradation of any local population of Spreading Rockcress could significantly impact the global range of this species. Two fair-quality populations of the G5, S1 PA-Endangered plant species of concern, **Leather Flower**, and several fair-quality populations of **Lance-**

leaved Buckthorn, a G5, S1 PA-Endangered plant species of concern, were documented occurring among the rich shrub layer of the forest community.

A fair-quality population of **Black-stemmed Spleenwort**, a G5, S1 Pennsylvania-Endangered plant species of concern, was found at the base of a north facing limestone cliff. Though wide-ranging in North America, this is one of only a few occurrences of this species in Pennsylvania, the northern limit of its range, all of which are in Franklin County. The forest canopy needs to be left intact along these cliffs to maintain the cool, moist conditions necessary for this species. Aggressive exotic plant species such as Multiflora Rose and Japanese Honeysuckle are very abundant in the vicinity of this species. Several populations of **Green and Gold**, an S1 PA-Endangered plant, were also found in these rich wooded slopes. The known range of this species in Pennsylvania is limited to rich, limestone woods in southern Franklin and Fulton Counties. A good-quality population of **Limestone Petunia** was found along a fisherman's path on the banks of the creek. Herbaceous species found in association along these rich woods include False Solomon's Seal, Bloodroot, Wild Ginger, Trout-lily, Early Meadow-rue, Wild Columbine, Dutchman's-Breeches and Liverleaf.

Finally, two animal species of concern were also documented from this site. **Giant Swallowtail (*Papilio cresphontes*)**, an S2 Pennsylvania-animal species of concern, was found on exposed and wooded cliffs along a creek in 1987, but was not found again in subsequent visits. The larvae of this species of butterfly feed primarily on Prickly Ash (Opler & Malikul 1992). Additional surveys are recommended to determine the status of this species at this site. A fair to good population of an **S2/S3 animal species of concern** was also found in a cave located in a limestone rock outcrop in the middle of a forested pasture.

Threats and Disturbances

Threats and disturbances to this site include invasion from exotic plant species, especially Japanese Honeysuckle. Other disturbances include off-road vehicle trails, vulnerability to logging, cattle grazing, trampling, selective cutting of mature trees, and impact from log removing equipment. Trash dumping down the slope to the creek was a disturbance in one location.

Conservation Recommendations:

The wooded limestone slopes along the creek in this area are particularly rich in several plant species of concern. Undisturbed forested buffers should be maintained along the creek, with logging and other landscape disturbances avoided. Forested buffers should remain intact for the length of the creek with logging operations refraining from cutting within 50 to 100 feet of the creek bank. The species at this site are vulnerable to habitat degradation from invasive species of plants, particularly Japanese Honeysuckle, which is prominent at this location, and Multiflora Rose, which is currently less of a problem at this site. A non-chemical control of Japanese Honeysuckle may be necessary to protect the habitat for these species. Limited cattle grazing may be beneficial in the control of this aggressive plant species. Off road vehicle trails are evident in portions of the site, and should be eliminated in the most sensitive areas. Housing construction should be strongly discouraged along the bluffs overlooking the creek. Narrow access paths to the creek can be created to replace large expanses of park-like lawns along the edge of the creek. In addition, the stream bank floodplain and corridor is usually an area of significantly higher biodiversity than the adjoining uplands. Much of the area's important biodiversity can be preserved by maintaining an intact, forested floodplain along the creek. The effectiveness of the forested creek as a habitat corridor would be diminished by

(Montgomery Township continued)

fragmentation of the forest continuity by the construction of houses and additional roadways along the creek. Local planning should discourage construction of new residences and roadways along the creek and floodplain. Future land use considerations should include the possibility of the creation of a natural area on the most sensitive areas of this site.

HIGHLAND SCHOOL FIELDS (Antrim and Montgomery Townships)

This site contains an unknown quality population of **Loggerhead Shrike** (*Lanius ludovicianus*), a G4T3Q Pennsylvania animal species of concern. Shrikes prefer open countryside, inhabiting short-grass pastures, weedy fields, grasslands, agricultural areas, swampy thickets, orchards, and right-of-way corridors (Brauning, 1992). This species prefers areas containing hedgerows, scattered trees or shrubs such as Hawthorns, Osage-orange, and Multiflora Rose. There should be some trees containing thorns or at least barbed wire fence for impaling prey since the species has no sharp talons. No associated species were noted at this site. It should be noted that this species has not been documented at this site for at least four years.

Threats and Disturbances

Direct threats to this species include conversion of land use from farm/open grasslands to development or rowcrop agriculture. Bushwhacking of shrubs and small trees in this area would likely cause Shrikes to abandon their nesting site. Another direct threat is the use of pesticides on farm pests such as mice. Pesticides such as DDT may have contributed to the rapid decline of this species throughout the northeast (Michigan Natural Features Inventory, 2001). Succession into forest is another threat to the site itself. Disturbances include potential development, and encroaching roads and suburbanization.

Conservation Recommendations

It is important if this species is still breeding at this site that monitoring, management, and intensive research be conducted to better assess the shrike's life history and habitat needs. It is recommended that this site be managed for this species by keeping the area at an early successional stage but with scattered trees, adequate patch size, short grasses (4-18"), adequate hunting perches, adequate nest sites, sufficient prey supply, and impaling substrate (New Jersey Fish & Wildlife, 2002). If an active farm is nearby, it is recommended that limited pesticides be used. This species is in great peril in the northeast, and if this site still supports breeding pairs of migrant Loggerhead Shrikes, it is vital to protect the habitat on which it depends. A subspecies of the Loggerhead Shrike (*Lanius ludovicianus migrans*), which may occur in Pennsylvania, is a candidate for federal listing and is a Nongame Migratory Bird of Management Concern.

LOWER CONCOCHEAGUE CREEK (Antrim and Montgomery Townships)

This site contains a high-quality population of **Allegheny Stonecrop** (*Sedum telephioides*), a G4, S3 PA-Rare plant species of concern, and an excellent-quality population of **Limestone Petunia** (*Ruellia strepens*), a G4G5, S2 PA-Threatened plant species of concern. The site also contains a small occurrence of an S1 plant species of concern, **Wild Senna** (*Senna marilandica*) and a small population of an S3 plant species of concern, **Mistflower** (*Eupatorium coelestinum*). In addition, this site contains an unknown quality population of **Loggerhead Shrike** (*Lanius ludovicianus*), a G4T3Q animal species of concern.

The narrow, though mostly continuous forest canopy along the creek edge can be characterized as a "Silver Maple Floodplain Forest" (Fike 1999). Besides Silver Maple, the canopy along the narrow

(Montgomery Township continued)

floodplain includes Sycamore, Box-elder, Basswood, Hackberry, American Elm, White & Red Ash, the recently delisted species, Shellbark Hickory, and the infrequently occurring Bur Oak.

The **Allegheny Stonecrop** occupies a calcareous-shale outcrop cliff undercut by a bend in the Conococheague Creek. This species occurs in several large bands from near the water's edge to high up on the cliff summit at this location. The known Pennsylvania distribution of this species is limited to the southern portions of Bedford, Fulton and Franklin Counties.

The extensive population of **Limestone Petunia** found along the banks of this stretch of the Conococheague Creek represents perhaps the best quality population of this species in the state. This plant occurs scattered singly, in small clumps and in occasional dense patches in a narrow zone along the levy and portions of the floodplain of the creek. The small populations of **Wild Senna** and **Mistflower** also occur along the creek bank.

The unknown quality population of **Loggerhead Shrikes** was also seen not far from the creek south of Welsh Run. It is unclear whether this site still supports this species since the last survey was conducted in 1994.

Threats and Disturbances

Observed disturbances and potential threats to these creek-side species occurrences include crowding by invasive plant species, road maintenance activities where the road encounters the creek, pathway trampling, and the removal of creek bank vegetation for lawns. Logging to the creek edge was observed in some areas. New houses built on the banks of the creek fragment the continuity of the habitat, interrupting its effect as a wildlife corridor, and could potentially introduce invasive species of plants into the habitat.

Direct threats to the shrike habitat include conversion of land use from farm/open grasslands to development or rowcrop agriculture. Bushwhacking of shrubs and small trees in this area would likely cause Shrikes to abandon their nesting site. Another direct threat is the use of pesticides on farm pests such as mice. Pesticides such as DDT may have contributed to the rapid decline of this species throughout the northeast. Succession into forest is another threat to the site itself. Disturbances include potential development, and encroaching roads and suburbanization.

Conservation Recommendations

The population of Limestone Petunia appears to be thriving despite creek-side clearing disturbances, but would not survive the creation of lawn-like conditions to the creek edge. The isolated, inaccessible nature of the rock outcrop where the Allegheny Stonecrop occurs will likely protect it from disturbances, but should be monitored for invasive species. The forested canopy above the rock outcrop should be maintained as a buffer from human impacts to the site. Forested buffers should remain intact for the length of the creek with logging operations refraining from cutting within 50 to 100 feet of the creek bank. Stream bank forests help buffer the watershed from the effects of non-point sources of pollution including runoff from agricultural, residential and roadway settings. In addition, the stream bank floodplain and corridor is usually an area of significantly higher biodiversity than the adjoining uplands. Much of the area's important biodiversity can be preserved by maintaining an intact, forested floodplain along the creek. The effectiveness of the forested creek as a habitat corridor would be diminished by fragmentation of the forest continuity by the construction of houses and additional roadways along the creek. Local planning should discourage construction of new residences and

(Montgomery Township continued)

roadways along the creek and floodplain. Additional surveys for species of concern in this area are encouraged.

For loggerhead shrike habitat, it is important if the species is still breeding at this site that monitoring, management, and intensive research be conducted to better assess the shrike's life history and habitat needs. It is recommended that this site be managed for this species by keeping the area at an early successional stage but with scattered trees, adequate patch size, short grasses (4-18"), adequate hunting perches, adequate nest sites, sufficient prey supply, and impaling substrate (New Jersey Fish & Wildlife 2002). If an active farm is nearby, it is recommended that limited pesticides be used. This species is in great peril in the northeast, and if this site still supports breeding pairs of migrant Loggerhead Shrikes, it is vital to protect the habitat that it depends on. A subspecies of the Loggerhead Shrike (*Lanius ludovicianus migrans*), which may occur in Pennsylvania, is a candidate for federal listing and is a Nongame Migratory Bird of Management Concern.

MERCERSBURG MEADOW (Montgomery and Peters Townships)

This site contains an unknown quality population of **Barn Owl** (*Tyto alba*), an S3B, S3N Pennsylvania animal species of concern. This species has been documented to nest on the site for two years, and has fledged yearlings successfully each year. Associated species include Great Horned Owl, Red-tailed Hawk, American Kestrel, and Meadow Vole (*Mycrotis pennsylvanicus*). Surrounding land use include open agricultural and grassy fields, conifer forested uplands, major road, and a private school's grounds.

Threats and disturbances

The main threat to this site is land use changes to the surrounding grasslands and upland forested areas. Any change of the fields from grasslands to rowcrops would cause the owls to abandon the site if their main prey, the Meadow Vole, was to disappear. Another possible threat is conversion from farmland to suburban development. Due to the close proximity of the road to the nest site, another threat would be mortality by vehicle traffic. Great-Horned Owl predation is yet another threat to the species of concern at this site.

Conservation Recommendations

The nesting of this species is already monitored closely by Mercersburg Academy. It is recommended that this program continue to educate the public about the nesting behavior and ecology of Barn Owls. It is also recommended that pesticides that are used to control mice be limited due to the possibility of destroying the main food prey, the Meadow Vole.

MERCERSBURG WOODS (Montgomery and Peters Townships)

This site contains several Pennsylvania plant species of concern found in a small floodplain forest and marsh next to the Conococheague Creek and Johnston Run. A fair to good population of **Cattail Sedge** (*Carex typhina*), a G5, S2 plant species of concern, was found in a narrow zone of marsh. Several species were found in the floodplain area, including a fair-quality population of a G4G5, S2 PA-Threatened plant species, **Limestone Petunia** (*Ruellia strepens*), and a small population of a G5, S1 plant species, **Shumard's Oak** (*Quercus shumardii*). A good population of a G4G5, S3 plant species, **American Beakgrain** (*Diarrhena obovata*) was also documented at this site. This species was recently removed from the plant species of concern list based on updated statewide population estimates. Recent documentation of several excellent quality populations of American Beakgrain in Franklin County may suggest this species is truly on the rebound. All these species were found in the

(Montgomery Township continued)

creekside floodplain forest on an alluvial terrace. Associated species include Silver Maple, Sycamore, Sugar Maple, Box-elder, American Elm, Slippery Elm, Pin Oak, Swamp White Oak, Shagbark Hickory, and Black Walnut. Surrounding land use includes rural residential areas and agricultural fields.

Threats and Disturbances

Threats and disturbances include invasion from exotic plant species, especially near the rural residential and agricultural areas. Another disturbance would be timber harvesting in the floodplain areas. New houses built on the banks of the creek fragment the continuity of the habitat, interrupting its effect as a wildlife corridor, and potentially introducing invasive species of plants into the habitat.

Conservation Recommendations

Forested buffers should remain intact for the length of the creek with logging operations refraining from cutting within 50 to 100 feet of the creek bank. Stream bank forests help buffer the watershed from the effects of non-point sources of pollution including runoff from agricultural, residential and roadway settings. In addition, the stream bank floodplain and corridor is usually an area of significantly higher biodiversity than the adjoining uplands. Much of the area's important biodiversity can be preserved by maintaining an intact, forested floodplain along the creek. The effectiveness of the forested creek as a habitat corridor would be diminished by fragmentation of the forest continuity by the construction of houses and additional roadways along the creek. Local planning should discourage construction of new residences and roadways along the creek and floodplain.

SHIMPSTOWN MEADOWS (Montgomery Township)

This area contains an unknown quality population of **Barn Owl** (*Tyto alba*), an S3B, S3N Pennsylvania animal species of concern. Associated species in the grassland areas include Red-winged Blackbird, Song Sparrow, American Goldfinch, Mourning Dove and Savannah Sparrow. Nesting evidence of this species was present on the site, and the landowner has seen the birds on several occasions. However, more surveys are needed to access the breeding success and population of this species. A large barn is located on property very near to where grassland conservation reserve (CRP) program habitat begins. The surrounding land consists of agriculture and residential areas. Threats include discontinued Conservation Reserve Enhancement Program (CREP) or habitat is not managed to remain grassland and adjacent forested uplands.

Threats and Disturbances

The main threat to this site is land use changes to the surrounding grasslands and upland forested areas. Any change of the fields from grasslands to rowcrops would cause the owls to abandon the site if their main prey, the Meadow Voles (*Microtus pennsylvanicus*), was to disappear. Another possible threat is conversion from farmland to suburban development.

Conservation Recommendations

It is recommended that pesticides that are used to control mice be limited due to the possibility of impacting the main food prey, the Meadow Vole. It is also recommended that yearly surveys be conducted to determine the utilization of this site by this species.

(Montgomery Township continued)

WEST BRANCH CONOCOCHEAGUE (Montgomery Township)

An unknown population of a **G3 S2 Pennsylvania-Endangered animal species of concern** was found in this area during a survey in 1986. More surveys are needed to better assess the population of this species at this site.

Threats and Disturbances

Threats to this species include additional stream warming and water pollution. Direct disturbances to this species include runoff from surrounding businesses and roadways. The landuse may not provide an adequate protective buffer to this important habitat. Runoff from residences, streets and agricultural fields could impair the water quality of the spring-fed stream.

Conservation Recommendations

Additional surveys for this species are recommended in this area to determine the extent and current status of this population. Some areas adjacent to the creek require additional forested buffers to minimize the impact of non-point sources of pollution. Forested buffers provide critical protection to streams by reducing nutrient, sediment and toxic runoff from roads, residences and agricultural fields.



Though occurring more frequently in the southeastern US, the currently known PA populations of Green-and-gold (*Chrysogonum virginianum*), all occur in Franklin and neighboring Fulton Counties.
Photo: PA Science Office of The Nature Conservancy

PETERS TOWNSHIP

Site Name	Special Species / Community Type	PNHP Ranks*		State Status	Last Seen	Quality**
		Global	State			
Charlestown Ponds	Ephemeral/Fluctuating Natural Pool Community	G?	S3	N	10/02/2002	CD
Church Hill	Animal: Barn Owl (<i>Tyto alba</i>)	G5	S3B, S3N	CA	9/19/2002	E
	Lance-leaved Buckthorn (<i>Rhamnus lanceolata</i>)	G5	S1	PE	7/13/1992	D
Fort Loudon Floodplain	Animal	G4	S3	N	7/31/2002	E
	Limestone Petunia (<i>Ruellia strepens</i>)	G4G5	S2	PT	8/01/1993	C
	Water-plantain spearwort (<i>Ranunculus ambigens</i>)	G4	S3	N	7/30/2002	C
	American Beakgrain (<i>Diarrhena obovata</i>)	G4G5	S3	DL	8/1/1993	B
Highland School Fields	Animal: Loggerhead Shrike (<i>Lanius ludovicianus</i>)	G4	S?	PE	1994	E
Mercersburg Meadow	Animal: Barn Owl (<i>Tyto alba</i>)	G5	S3B, S3N	CA	9/19/2002	E
Mercersburg Woods	American Beakgrain (<i>Diarrhena obovata</i>)	G4G5	S3	DL	9/10/1993	D
	Shumard's Oak (<i>Quercus shumardii</i>)	G5	S1	PE	9/10/1993	D
	Limestone Petunia (<i>Ruellia strepens</i>)	G4G5	S2	PT	9/10/1993	C
	Cattail Sedge (<i>Carex typhina</i>)	G5	S2	PE	5/27/1993	BC
Rattlesnake Ridge	Slender Goldenrod (<i>Solidago speciosa</i> var. <i>erecta</i>)	G5	S1	N	2003	B

Site Name	Special Species / Community Type	PNHP Ranks*		State Status	Last Seen	Quality**
		Global	State			
Sportsman's Road Shale Bank	Prickly Pear-Cactus (<i>Opuntia humifusa</i>)	G5	S3	PR	5/22/1987	C
	Kate's Mountain Clover (<i>Trifolium virginicum</i>)	G3	S1	PE	5/5/1990	D
	Cat's-Paw Ragwort (<i>Senecio antennariifolius</i>)	G4	S1	PE	5/1/1995	BC
	Shumard's Oak (<i>Quercus shumardii</i>)	G5	S1	PE	11/15/2003	E
	White Water-Crowfoot (<i>Ranunculus aquatilis</i> var <i>diffusus</i>)	G5T5	S3	N	9/14/2002	B
Tuscarora Ridgetop	Animal: Allegheny Woodrat (<i>Neotoma magister</i>)	G3G4	S3	PT	1/1/1988	E
Upper Horse Valley	Animal	G4	S3S4	CA	7/16/02	E
Upper West Branch Conococheague Creek	Purple Bedstraw (<i>Galium latifolium</i>)	G5	S3	N	2003	D
	American Beakgrain (<i>Diarrhena obovata</i>)	G4G5	S3	DL	2003	B
Williamson-Red Cedar -Redbud Shrubland	Animal	G2G3	S1	N	6/25/1993	B
	Animal	G3G4	S2S3	N	6/25/1993	B
	Fringed-leaved Petunia (<i>Ruellia humilis</i>)	G5	S1	PE	7/9/2002	AB, C, BC
	Limestone Petunia (<i>Ruellia strepens</i>)	G4G5	S1	PT	8/22/1994	C, D, D
	Lance-leaved Buckthorn (<i>Rhamnus lanceolata</i>)	G5	S1	PE	7/9/2002	BC, C, D
	Spreading Rockcress (<i>Arabis patens</i>)	G3	S2	N	5/24/1994	CD

Site Name	Special Species / Community Type	PNHP Ranks*		State Status	Last Seen	Quality**
		Global	State			
	Oblique Milkvine (<i>Matelea obliqua</i>)	G4?	S1	PE	8/31/1990	CD
	Prickly Pear Cactus (<i>Opuntia humifusa</i>)	G5	S3	PR	6/26/1996	C, D
	Side-oats Grama (<i>Bouteloua curtipendula</i>)	G5	S2	PT	7/9/2002	C
	Limestone Adder-tongue (<i>Ophioglossum engelmannii</i>)	G5	S1	N	5/24/1994	B
	Tufted Buttercup (<i>Ranunculus fascicularis</i>)	G5	S1S2	PE	5/24/1994	CD

Managed Lands: Buchanan Birthplace State Park

Buchanan State Forest
State Game Lands #124
State Game Lands #235

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

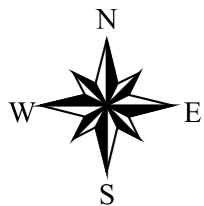
**Please refer to Appendix V for an explanation of Quality Ranks.

[Peters Township Map](#)

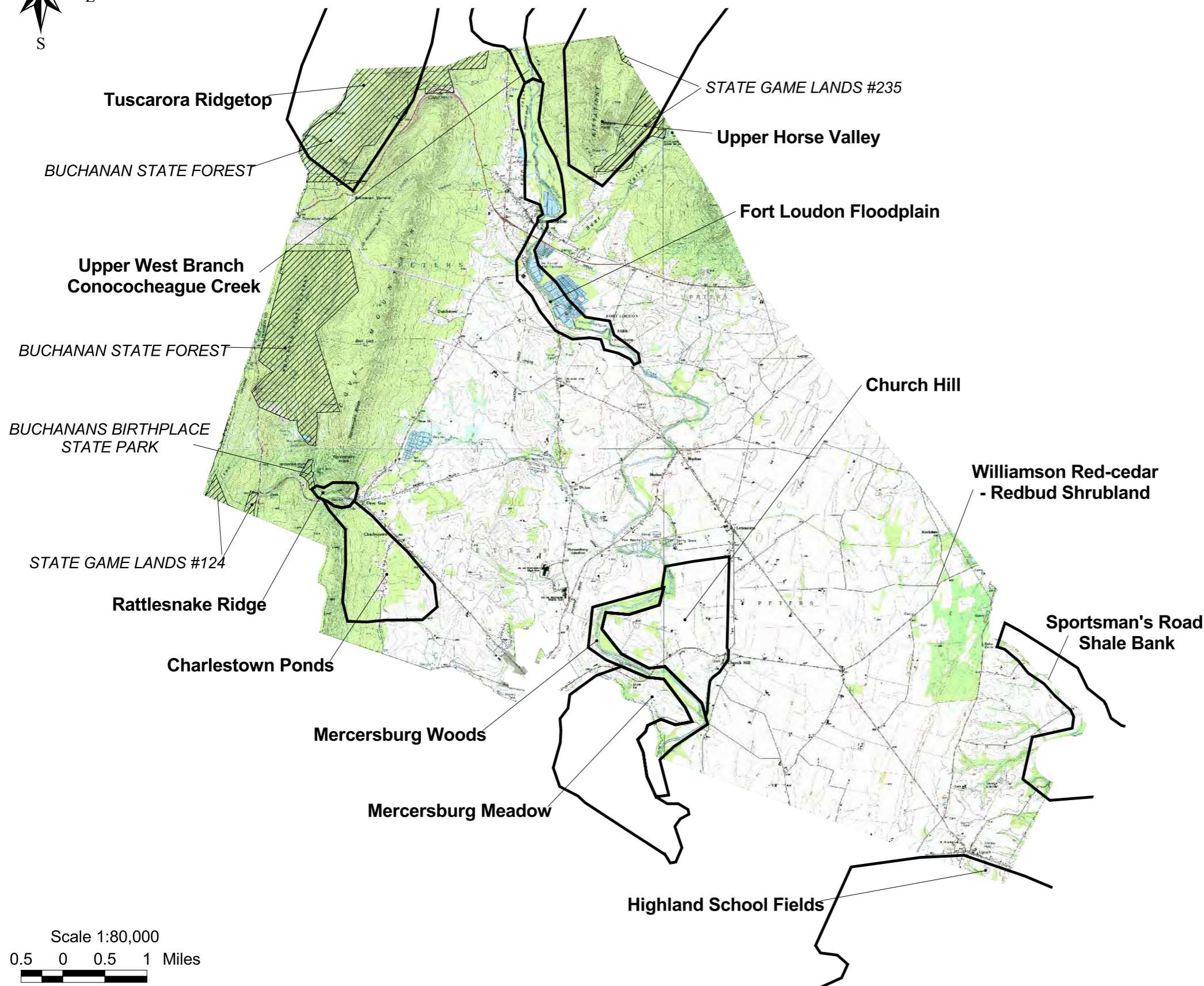


The fringed-leaved petunia (*Ruellia humilis*) is one of two species at the Williamson Redbud-Red Cedar Shrubland site that occurs in no other currently known locations in Pennsylvania. Both species occur more frequently in other states, and are considered to be at the edge of their range.

(Photo: PA Science Office of The Nature Conservancy)



Peters Township



Peters Township

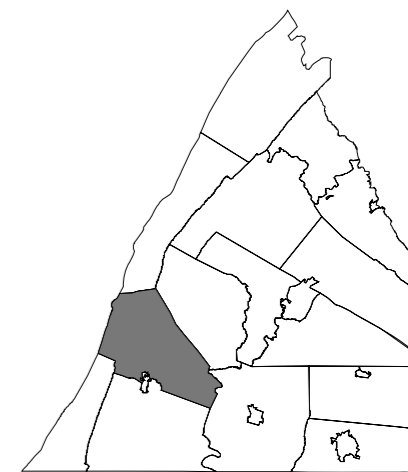
Franklin County Natural Areas Inventory

Natural Areas:

- Charlestown Ponds
- Church Hill
- Fort Loudon Floodplain
- Highland School Fields
- Mercersburg Meadow
- Mercersburg Woods
- Rattlesnake Ridge
- Sportsman's Road
- Shale Bank
- Tuscarora Ridgetop
- Upper Horse Valley
- Upper West Branch
- Conococheague Creek
- Williamson Red-cedar-Redbud Shrubland

Managed Areas:

- Buchanan Birthplace State Park
- Buchanan State Forest
- State Game Lands #124
- State Game Lands #235



Legend

- Natural Area or Locally Significant Site
- Managed Area

Scale 1:80,000

0.5 0 0.5 1 Miles



CHARLESTOWN PONDS (Peters Township)

This site contains approximately eight temporary ponds, which make up an **Ephemeral/Fluctuating Natural Pool Community**, which provide critical breeding habitat for amphibians. Vegetation found in the vernal pools include Woolgrass, Tickseed, Highbush Blueberry and Smartweed. Vegetation found surrounding the pools included Chestnut Oak, Black Tupelo, a Sedge (*Carex lupulina*), False Nettle, Greenbriar, Red Maple, Eastern Hemlock, Catalpa, Winterberry Holly, Pin Oak, Pokeweed, Japanese Barberry, Persimmon, Black Cherry and Black Birch. Surrounding land use includes farms and suburban/rural housing.

Threats and Disturbances

Logging and the residual slash thrown into the vernal pools are the main threat to the viability of the ponds. Other threats and disturbances include invasive plant species, hydrology changes, development, change in land use, and runoff from nearby farms.

Conservation Recommendations

It is recommended that undisturbed-forested buffers be maintained around each vernal pool. It is also recommended that minimal logging be conducted in this area for best viability of the vernal pools. Further surveys of this area could identify additional vernal pools.

CHURCH HILL (Peters Township)

This site contains a small population of **Lance-leaved Buckthorn** (*Rhamnus lanceolata*), an S1 Pennsylvania-Endangered plant species of concern. This species was found in a site that is a narrow tributary to the West Branch of the Conococheague Creek containing calcium carbonate accretions called marl. Associated species include Multiflora Rose, Black Raspberry, Autumn Olive, Virginia Creeper, Poison Ivy, American Elder, Pokeweed, Bouncing-Bet, White Champion and Lady's-thumb.

This site also supports a pair of **Barn Owls** (*Tyto alba*), a G5, S3B/S3N Pennsylvania animal species of concern. This species nests in an abandoned silo on a non-working farm. Grassy pastures with some scattered trees dominate the area. The species probably roosts in the bottomland forests down at the West Branch of the Conococheague Creek. Associated species include Red-tailed Hawk and Blue Jay.

Threats and Disturbances

For the plant population, disturbances to this site include exotic plant species, grazing, cultivation, and selective cutting. A narrow ditch crossing the marsh serves a disturbance to hydrology of the marsh. It is recommended that this site be monitored for hydrology changes and exotic plant species invasion. The main threats to the Barn Owl site include land use changes to the surrounding grasslands and upland forested areas. Any change of the fields from grasslands to rowcrops would cause the owls to abandon the site if their main prey, the Meadow Voles (*Microtus pennsylvanicus*), was to disappear. A major threat to this area is the conversion from farmland to suburban development. At the time of the survey, the farm was being sold to an undisclosed party. Any change in land use could jeopardize the breeding site and the surrounding grasslands where Barn Owls hunt for Meadow Voles.

Conservation Recommendations

It is recommended that this site be monitored for hydrology changes and exotic plant species invasion. For the Barn Owl site, it is recommended that the new buyer of the property manage it in the way that supports Barn Owl breeding. More surveys and a visit to the site in a few years would be

(Peters Township continued)

beneficial to determine if the area is still applicable for breeding Barn Owls. It is also recommended that pesticides that are used to control mice be limited due to the possibility of destroying the main food prey, the Meadow Vole.

FORT LOUDON FLOODPLAIN (Peters Township)

This site contains several plant species of concern and one animal species of concern. Included in this site is a fair-quality population of **Limestone Petunia (*Ruellia strepens*)**, a G4G5, S2 PA-Threatened plant species of concern. An undetermined quality population of **Water-plantain spearwort (*Ranunculus ambigens*)**, a G4, S3 plant species of concern, was found in a forested floodplain with braided overflow channels.

Associated species include Yellow-Pond Lily, Marsh-purslane, Waterweed, Marsh Bellflower, a Sedge (*Carex lurida*), Bur-reed and Soft Rush. Dominant tree species at this site include Pin Oak, White Oak, Black Walnut, Pignut Hickory, Shagbark Hickory, Shellbark Hickory, Slippery Elm, Sycamore and Silver Maple. Frequent shrub species encountered in this area include Spicebush, Redbud, Hornbeam, Hop-hornbeam, Pawpaw and Black Haw. Characteristic floodplain herbaceous species encountered include Wingstem, Fowl Mannagrass, White-snakeroot, Sedges (*Carex gynandra* & *C. lupulina*), Winged Monkey-flower, Arrow-leaved Tearthumb, Halberd-leaved Tearthumb, Bottlebrush Grass and the invasive plants Stiltgrass, Japanese Barberry, Multiflora Rose Japanese Honeysuckle and Garlic-Mustard.

Bird species recorded here include White-breasted Nuthatch, American Goldfinch, Red-eyed Vireo, Eastern Wood-Pewee, Eastern Tufted Titmouse, and Great-crested Flycatcher. A good quality population of **American Beakgrain (*Diarrhena obovata*)**, a recently delisted species, was found in this area as well. In addition, an undetermined quality population of a **G4, S3 animal species of concern** was found on this site. All species were found in a floodplain forest with braided overflow channels containing some exotic plant species, and some surrounding agricultural land use. Exotic plant species pose the greatest long-term risk to the species of concern on this site.

Threats and Disturbances

Exotic plant species pose the greatest long-term risk to the species of concern on this site. No other disturbances were noted, and current land uses appear to favor the long-term viability of these species. Potential changes in land use such as residential development would severely degrade the floodplain habitat of this site. New houses built on the banks of the creek fragment the continuity of the habitat, interrupting its effect as a wildlife corridor, and can potentially introduce invasive species of plants into the habitat.

Conservation Recommendations

Forested buffers should remain intact for the length of the creek with logging operations refraining from cutting within 50 to 100 feet of the creek bank. Stream bank forests help buffer the watershed from the effects of non-point sources of pollution including runoff from agricultural, residential and roadway settings. In addition, the stream bank floodplain and corridor is usually an area of significantly higher biodiversity than the adjoining uplands. Much of the area's important biodiversity can be preserved by maintaining an intact, forested floodplain along the creek. The effectiveness of the forested creek as a habitat corridor would be diminished by fragmentation of the forest continuity by the construction of houses and additional roadways along the creek. Local planning should discourage construction of new residences and roadways along the creek and floodplain.

HIGHLAND SCHOOL FIELDS (Antrim, Montgomery and Peters Townships)

This site contains an unknown quality population of **Loggerhead Shrike** (*Lanius ludovicianus*), a G4T3Q Pennsylvania animal species of concern. Shrikes prefer open countryside, inhabiting short-grass pastures, weedy fields, grasslands, agricultural areas, swampy thickets, orchards, and right-of-way corridors (Dechant et al., 2003). This species prefers areas containing hedgerows, scattered trees or shrubs such as Hawthorns, Osage-orange and Multiflora Rose. There should be some trees containing thorns or at least barbed wire fence for impaling prey since the species has no sharp talons. No associated species were noted at this site. It should be noted that this species has not been documented at this site for at least four years.

Threats and Disturbances

Direct threats to this species include conversion of land use from farm/open grasslands to development or rowcrop agriculture. Bushwhacking of shrubs and small trees in this area would likely cause Shrikes to abandon their nesting site. Another direct threat is the use of pesticides on farm pests such as mice. Pesticides such as DDT may have contributed to the rapid decline of the Shrikes throughout the northeast. Succession into forest is another threat to the site itself. Disturbances include potential development, and encroaching roads and suburbanization.

(<http://www.nj.gov/dep/fgw/ensp/pdf/end-thrtened/loggerhdshrike.pdf>).

Conservation Recommendations

It is important if this species is still breeding at this site that monitoring, management, and intensive research be conducted to better assess the Shrike's life history and habitat needs. It is recommended that this site be managed for this species by keeping the area at an early successional stage but with scattered trees, adequate patch size, short grasses (4-18"), adequate hunting perches, adequate nest sites, sufficient prey supply, and impaling substrate. If an active farm is nearby, it is recommended that limited pesticides be used. This species is in great peril in the northeast, and if this site still supports breeding pairs of migrant Loggerhead Shrikes, it is vital to protect the habitat that it depends. One subspecies of the Loggerhead Shrike (*Lanius ludovicianus migrans*), is a candidate for federal listing and is a Nongame Migratory Bird of Management Concern.

(<http://www.nj.gov/dep/fgw/ensp/pdf/end-thrtened/loggerhdshrike.pdf>).

MERCERSBURG MEADOW (Montgomery and Peters Townships)

This site contains an unknown quality population of **Barn Owl** (*Tyto alba*), an S3B, S3N Pennsylvania animal species of concern. This species has been documented to nest on the site for two years, and has fledged yearlings successfully each year. Associated species include Great Horned Owl, Red-tailed Hawk, American Kestrel, and Meadow Vole (*Mycrotis pennsylvanicus*). Surrounding land use include open agricultural and grassy fields, conifer forested uplands, major road, and a private school's grounds.

Threats and disturbances

The main threat to this site is land use changes to the surrounding grasslands and upland forested areas. Any change of the fields from grasslands to rowcrops would cause the owls to abandon the site if their main prey, the Meadow Vole, was to disappear. Another possible threat is conversion from

(Peters Township continued)

farmland to suburban development. Due to the close proximity of the road to the nest site, another threat would be mortality by vehicle traffic. Great-Horned Owl predation is yet another threat to the species of concern at this site.

Conservation Recommendations

The nesting of this species is already monitored closely by Mercersburg Academy. It is recommended that this program continue to educate the public about the nesting behavior and ecology of Barn Owls. It is also recommended that pesticides that are used to control mice be limited due to the possibility of destroying the main food prey, the Meadow Vole.

MERCERSBURG WOODS (Montgomery and Peters Townships)

This site contains several Pennsylvania plant species of concern found in a small floodplain forest and marsh next to the Conococheague Creek and Johnston Run. A fair to good population of **Cattail Sedge** (*Carex typhina*), a G5, S2 plant species of concern, was found in a narrow zone of marsh. Several species were found in the floodplain area, including a fair-quality population of a G4G5, S2 PA-Threatened plant species, **Limestone Petunia** (*Ruellia strepens*), and a small population of a G5, S1 plant species, **Shumard's Oak** (*Quercus shumardii*). A good population of a G4G5, S3 plant species, **American Beakgrain** (*Diarrhena obovata*) was also documented at this site. This species was recently removed from the plant species of concern list based on updated statewide population estimates. Recent documentation of several excellent quality populations of American Beakgrain in Franklin County may suggest this species is truly on the rebound. All these species were found in the creekside floodplain forest on an alluvial terrace. Associated species include Silver Maple, Sycamore, Sugar Maple, Box-elder, American Elm, Slippery Elm, Pin Oak, Swamp White Oak, Shagbark Hickory, and Black Walnut. Surrounding land use includes rural residential areas and agricultural fields.

Threats and Disturbances

Threats and disturbances include invasion from exotic plant species, especially near the rural residential and agricultural areas. Another disturbance would be timber harvesting in the floodplain areas. New houses built on the banks of the creek fragment the continuity of the habitat, interrupting its effect as a wildlife corridor, and potentially introducing invasive species of plants into the habitat.

Conservation Recommendations

Forested buffers should remain intact for the length of the creek with logging operations refraining from cutting within 50 to 100 feet of the creek bank. Stream bank forests help buffer the watershed from the effects of non-point sources of pollution including runoff from agricultural, residential and roadway settings. In addition, the stream bank floodplain and corridor is usually an area of significantly higher biodiversity than the adjoining uplands. Much of the area's important biodiversity can be preserved by maintaining an intact, forested floodplain along the creek. The effectiveness of the forested creek as a habitat corridor would be diminished by fragmentation of the forest continuity by the construction of houses and additional roadways along the creek. Local planning should discourage construction of new residences and roadways along the creek and floodplain.

RATTLESNAKE RIDGE (Peters Township)

A good population of **Slender Goldenrod** (*Solidago speciosa var. erecta*), a G5, S1 Pennsylvania plant species of concern, was found on a south facing rocky roadbank on a dry shale and chunky sandstone substrate.

Threats and Disturbances

The population of this species is vulnerable to roadside spraying or construction.

Conservation Recommendations

Roadside maintenance should be kept to a minimum in this area to fully protect the population of this species. It is also recommended that further surveys be conducted to determine the viability of the population and its potential occurrence in other surrounding areas.

SPORTSMAN’S ROAD SHALE BANK (Antrim and Peters Townships)

A small population of **Kate’s Mountain Clover** (*Trifolium virginianum*), a G3, S1 Pennsylvania plant species of concern, a fair to good population of **Cat’s Paw Ragwort** (*Senecio antennariifolius*), a G4, S1 Pennsylvania plant species of concern, and a fair population of **Prickly-Pear Cactus** (*Opuntia humifusa*), a G5, S3 Pennsylvania plant species of concern, were found in a nearly bare shale area with mixed deciduous forest on the north side and surrounding lawn and a manmade lake. This area is an old shale excavation area that simulates a shale barren and has very sparse vegetation cover. Japanese Honeysuckle occurs in abundance in the surrounding deciduous forests. Also at this site, a good population of **White Water-Crowfoot** (*Ranunculus aquatilis var diffusus*), a G5T5 Pennsylvania plant species of concern, occurs in the creek. The stream banks in this area also support an unknown quality population of **Shumard’s Oak** (*Quercus shumardii*) a G5, S1 PA-Endangered tree species of concern.

Threats and disturbances

Disturbances include mowing and invasive species. Residential development of the shale bank area can potentially eliminate the species of concern that occur here. Logging operations along the creek bank can potentially eliminate this occurrence of Shumard’s Oak. Increased sedimentation and non-point sources of pollution can significantly decrease the water quality for the aquatic plant species. There were no immediate threats observed in this area.

Conservation Recommendations

Forested buffers should remain intact for the length of the creek with logging operations refraining from cutting within 50 to 100 feet of the creek bank. Stream bank forests help buffer the watershed from the effects of non-point sources of pollution including runoff from agricultural, residential and roadway settings. Periodic monitoring of the spread of invasive species such as Japanese Honeysuckle is recommended.

TUSCARORA RIDGETOP (Metal and Peters Townships, and Fulton County)

This site extends into Fulton County but mostly straddles the county line along Tuscarora ridgetop area. Evidence of several populations of a G3G4, S3 PA-Threatened animal species, the **Allegheny woodrat** (*Neotoma magister*), was found at this site during a site survey in 1988. This species typically inhabits the deep crevices of rocky outcrops, boulder-strewn talus slopes and caves. Populations of this species throughout the state have experienced rapid decline in recent decades for unknown reasons (Merritt 1987). Additional surveys for this species at this site are recommended. This site includes portions of Buchanan State Forest.

Threats and Disturbances

Potential disturbances include logging on top of ridges, increased hiking traffic and residential development.

Conservation Recommendations

An undisturbed forested buffer should be maintained around ridgetop rocky outcrops where the woodrats occur. The population of this species at this site needs to be reassessed and updated.

UPPER HORSE VALLEY (Metal, Peters and St. Thomas Townships)

This site contains an unknown quality population of **an S3S4 Pennsylvania animal species of concern**. One individual of this species was found in a “Tuliptree-American Beech-maple forest” (Fike, 1999). The forested areas consisted primarily of Tuliptree, Sassafras, Pignut Hickory, Butternut, Black Walnut, Slippery Elm, Chestnut Oak, Red Oak, Scarlet Oak, Yellow Birch, Black Birch, American Beech, Red Maple, and Eastern Hemlock.

Threats and Disturbances

Deer over browse is a serious problem in this area and is an overall disturbance to the area. A distinct “browse-line” is evident throughout the forest, with the understory dominated by Hay-scented Ferns and poor tree seedling regeneration. Recreational hiking and potential poaching are possible disturbances to the animal species of concern.

Conservation Recommendations

It is recommended that more surveys be conducted to determine the extent of this population. This area yielded no plant species of concern, but has some potential to be diverse in the spring for ephemeral wildflowers.

UPPER WEST BRANCH CONOCOCHIEGUE CREEK (Metal and Peters Townships)

The steep, dry, shale slopes and banks along the West Branch of the Conococheague Creek and Hogback Mountain in this area support several small populations of a G5, S3 plant species of concern, **Purple Bedstraw (*Galium latifolium*)**. The underlying geology includes shale and sandstone and is well drained. The banks of the creek in this narrow valley are primarily undisturbed, and have many larger trees overhanging the relatively clear water. Expansive flat floodplains lie adjacent to the creek where the valley widens. The creek banks are cloaked in a combination of upland and floodplain canopy tree species including American Beech, Hemlock, Sugar Maple, Silver Maple, Basswood, Shagbark Hickory, Black Gum, and White, Chestnut and Red Oaks. Characteristic shrub species include Spicebush, Witch-hazel, Bladdernut, Pinxter-flower, Maple-leaved Viburnum, Ninebark and Hop-hornbeam. Scattered in many large patches along the creek banks and floodplain is an excellent-quality population of the American Beakgrain, a plant species that has recently been removed from the species of concern list due to increased state-wide population estimates. The creek in this area also supports good populations of several submerged aquatic plant species including Longleaf Pondweed, Water-stargrass & Waterweed in a swift-water, shallow bend in the creek. This site includes a portion of Buchanan State Forest.

Threats and Disturbances

Virtually no disturbances were observed along the creek in this location. Moderate deer browsing was evident. Potential disturbances include logging and development of the riparian corridor. New houses built on the banks of the creek fragment the continuity of the habitat, interrupting its effect as a wildlife corridor, and potentially introducing invasive species of plants into the habitat.

Conservation Recommendations

(Peters Township continued)

The habitat appears to be very favorable for the species of concern located here and it should continue to thrive here. Conservation and expansion of the undisturbed forested canopy along the creek and floodplain will best preserve the habitat of this site. Forested buffers should remain intact for the length of the creek with logging operations refraining from cutting within 50 to 100 feet of the creek bank. Stream bank forests help buffer the watershed from the effects of non-point sources of pollution including runoff from agricultural, residential and roadway settings. In addition, the stream bank floodplain and corridor is usually an area of significantly higher biodiversity than the adjoining uplands. Much of the area's important biodiversity can be preserved by maintaining an intact, forested floodplain along the creek. The effectiveness of the forested creek as a habitat corridor would be diminished by fragmentation of the forest continuity by the construction of houses and additional roadways along the creek. Local planning should discourage construction of new residences and roadways along the creek and floodplain. Deer hunting should be encouraged to keep the deer population from increasing to unsustainable levels.

WILLIAMSON-RED CEDAR-REDBUD SHRUBLAND (Antrim, Peters and St. Thomas Townships)

This site represents one of the most important areas for the conservation of biological diversity in Franklin County. Multiple populations of nine plant species of concern and two animal species of concern have been documented at this site. The successional shrubland habitat found on this site consists of a mosaic of habitat types, with a **Red-cedar – Redbud Shrubland Natural Community**, an S2 tracked natural community type, occurring in some areas. This natural community type is the result of repeated disturbance of the relatively dry limestone bedrock outcrops, which create frequent openings in the tree and shrub canopy. The high pH of the soil weathered from the limestone parent material in these woods and openings creates ideal conditions for the calcium-loving species encountered here. The limestone bedrock is perforated with openings leading into an extensive cave system that was once open to the public as a tourist attraction called Baker's Caverns. Past disturbances such as farming, grazing animals and fire, as well as the thin soils and dryness of the site have kept much of this area in an early successional stage. In the absence of disturbance such as fire, much of this site will succeed to a hardwood forest.

Limestone Petunia (*Ruellia strepens*), a G4G5, S2 PA-Threatened plant species of concern, was found in several small populations at this site. The habitat was unusual for this species, which is typically found growing along the banks of creeks and streams in the county. At this site, Limestone Petunia was found in relatively dry habitat in several locations. This species occurs frequently in the lower Conococheague Creek and through parts of Cumberland County, but is otherwise rare in the state.

Several excellent-quality populations of a closely related plant species, the **Fringed-leaved Petunia (*Ruellia humilis*)**, a G5, S1 PA-Endangered species of concern, were found throughout this site. This site contains the only currently known populations of this species in the state. This species is more common in the grassland habitats of the Midwestern U.S.

Several populations of the G5, S3 PA-Rare plant species of concern, **Prickly-Pear Cactus (*Opuntia humifusa*)**, were located on this site. These populations include one roadside population and one on a limestone outcrop, and range from small to fair quality. This species is typically found on dry shaly cliffs and barrens and can be found in a variety of locations scattered around southern and eastern Pennsylvania.

Lance-leaved Buckthorn (*Rhamnus lanceolata*), a G5, S1 PA-Endangered plant species of concern, was found in several locations within this site. Populations of this understory shrub species at this location range from good-quality to small.

A small-to-fair quality population of **Tufted Buttercup** (*Ranunculus fascicularis*), a G5, S1S2 PA-Endangered plant species of concern, and a small-to-fair population of **Spreading Rockcress** (*Arabis patens*), a G3, S2 plant species of concern were found at the top of a limestone bluff overlooking the Conococheague Creek. The Spreading Rockcress has a relatively limited range in North America, hence the G3 rank, with the best-quality populations occurring in Pennsylvania and Maryland (NatureServe 2003). The degradation of any local population of Spreading Rockcress may significantly impact the global range of this species. The area where these species were found is infested with the invasive introduced plant Japanese Honeysuckle. Control of this aggressive plant throughout the site may be necessary to keep the habitat viable for these species as well as the other plant species of concern found at this site.

Also found on the limestone bluffs is a small population of **Oblique Milkvine** (*Matelea obliqua*), a G4, S1 PA-Endangered plant species of concern. This species occurs in only a few locations in Pennsylvania. This species is considered rare throughout its range, occurring most frequently in Virginia (Plants Database 11-04-2003).

A good-quality population of **Limestone Adder's-Tongue** (*Ophioglossum engelmannii*), a G5, S1 PA-Endangered plant species of concern, was found on a dry-mesic rock outcrop in a powerline cut clearing. This population represents the only currently known location in the state for this species. The non-chemical vegetation management procedures used along this powerline likely help maintain the successional "limestone glade" habitat necessary for the continued success of this species.

A fair-quality population of **Side-oats Grama Grass** (*Bouteloua curtipendula*), a G5, S2 PA-Endangered plant species of concern, was found during a 1989 survey in a small limestone outcrop surrounded by quarries and open agricultural land. Side-oats Grama Grass dominates the quarter acre savannah-like opening where this species occurs, creating a small "Side-oats Grama Calcareous Grassland Natural Community". A large quantity of aggressive introduced plants and succession to woody shrubs and trees threaten the long-term success of this species at this location. Additional surveys for this species and natural community type are recommended.

Finally, two good-quality populations of animal species, a **G2G3, S1 animal species of concern and a G3G4, S2S3 animal species of concern**, were documented during cave surveys of this site in 1993. Four individuals of the S1 animal species of concern were collected in parts of seven caves with a stream flowing through it. Two individuals of the S2S3 animal species of concern were also found in the same area. Contamination of groundwater by agricultural runoff or suburban development poses the greatest threat to these species.

Threats and Disturbances

Threats and disturbances to the Red Cedar-Redbud shrubland area include natural succession, invasion of exotic plant species, poorly timed mowing, and change of land use. Sensitive placed quarry pits may not pose a great risk to these species. In over two decades of biological surveys to

(Peters Township continued)

this site, the aggressive introduced plant Japanese Honeysuckle was described as the most immediate threat to the habitat for the species of concern at this location.

Conservation Recommendations

The Red cedar / redbud Shrubland natural community on this site is the result of continued disturbance, which in pre-agricultural times was likely fire. The site has since been disturbed by a series of farming, grazing, mining and fire events. Carefully executed prescribed burns could rejuvenate this community type, which in the past 20 years has seen rapid canopy closure by larger trees and shrubs. Increased housing and commercial/industrial development should be discouraged near this community, and adjacent farms. Large quantities of aggressive introduced plants have invaded much of the habitat of this site. Mechanical removal, spot application of herbicides and prescribed burns may be necessary to keep the available habitat from being overrun with invasive species. This site should be considered as a potential natural area in the event this land is proposed for sale. Additional surveys of this site are recommended to determine the extent and current status of previously documented species, and to locate new species of concern.



Large, relatively unfragmented forested areas still exist on the eastern and western edges of Franklin County including these ridges of Tuscarora and Kittatinny Mountains.

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.



QUINCY TOWNSHIP & Mont Alto Borough

Site Name	Special Species / Community Type	PNHP Ranks*		State Status	Last Seen	Quality**
		Global	State			
Erosional remnant	Geologic feature	G?	S?	N/A	N/A	N/A
Glenn Forney Vernals	Lance-leaf Loosestrife (<i>Lysimachia hybrida</i>)	G5	S1	N	7/13/2002	AB
	Ephemeral/Fluctuating Natural Pool Community	G?	S3	N	7/13/2002	E
Mont Alto Mountain	Short-leaf Pine (<i>Pinus echinata</i>)	G5	S1S2	N	11/5/1996	BC, C
Nunnery Springs	Animal	G4Q	S?	N	8/8/2002	E

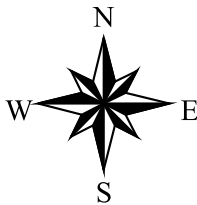
Managed Lands: Michaux State Forest
Meeting of the Pines Natural Area
Mont Alto State Park

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

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

[Quincy Township Map](#)

Quincy Township and Mont Alto Borough



Quincy Township and Mont Alto Borough

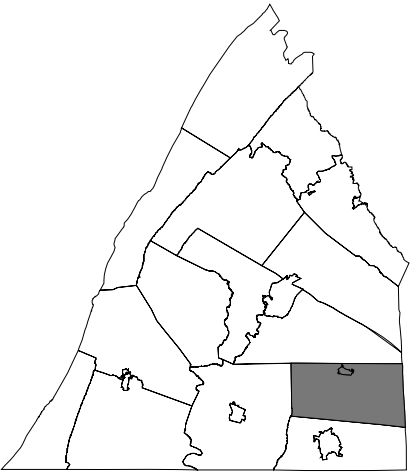
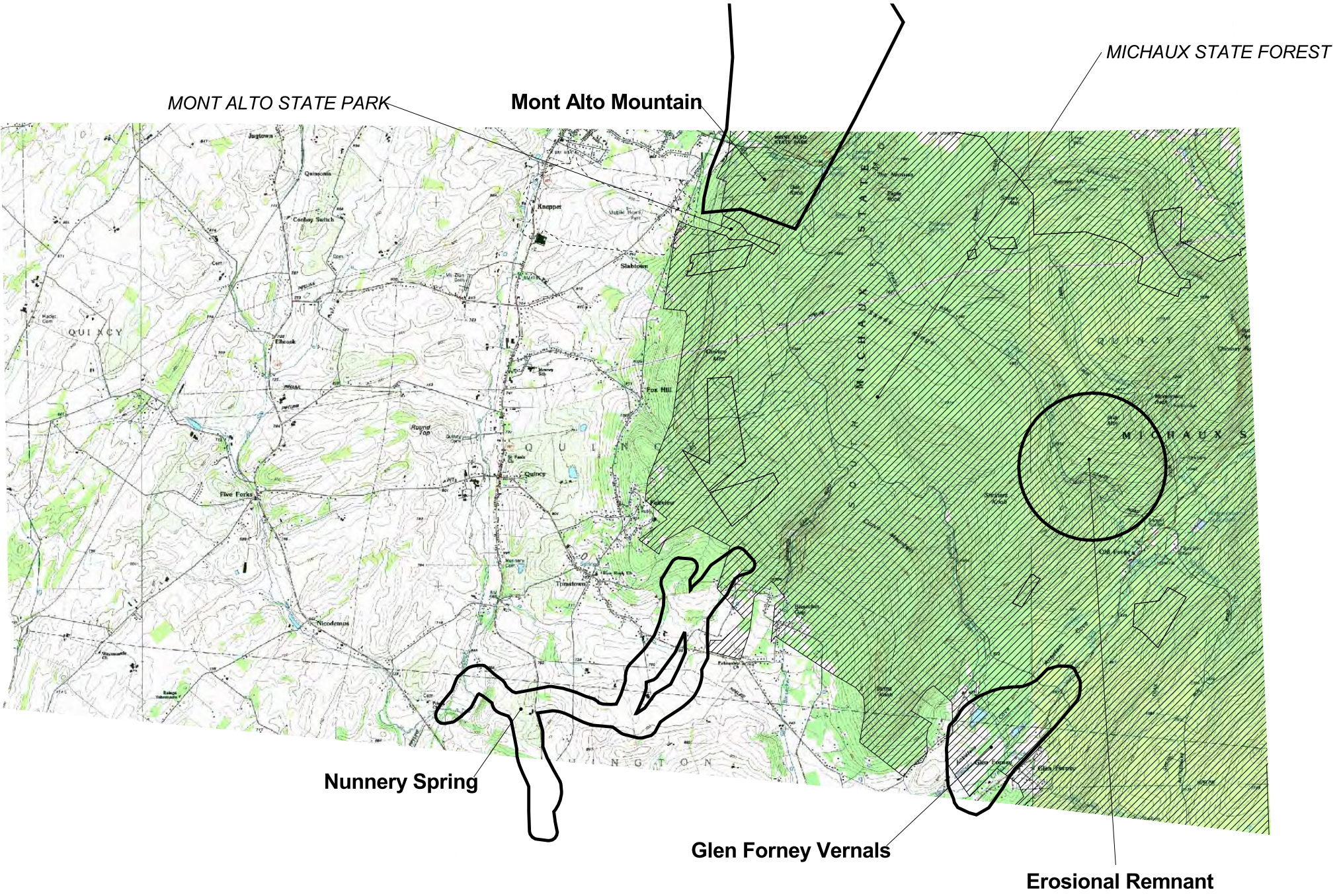
Franklin County Natural Areas Inventory

Natural Areas:

- Erosional Remnant
- Glen Forney Vernals
- Mont Alto Mountain
- Nunnery Spring

Managed Areas:

- Michaux State Forest
- Mont Alto State Park



Legend

- Natural Area or Locally Significant Site
- Municipal Boundary
- Managed Area

(Quincy Township continued)

EROSIONAL REMNANT (Quincy Township)

This **geologic feature** contains an erosional remnant that is an outstanding overview from spectacular pinnacles of Weverton quartzite (Cambrian age). Stretched pebbles and crossbedding may be seen on the rocks, which are located approximately 650 feet from the road. Chimney Rock and Buzzard Peak can be seen in the distance from the north side.

GLEN FORNEY VERNALS (Quincy and Washington Townships)

This site contains a series of approximately 30 vernal ponds that make up an **Ephemeral / Fluctuating Natural Pool Community**. Ephemeral/fluctuating or vernal pools are wetlands that fill annually from precipitation, surface water runoff, and rising groundwater to appear pond-like during the winter and spring months. These pools often become completely dry through evaporation by late spring or summer. Since these ponds may dry up during a portion of the year, they cannot support fish populations. During the brief time the pools contain water, and in the absence of fish, they become important breeding areas for a variety of amphibian species such as wood frogs (*Rana sylvatica*) and spotted salamanders (*Ambystoma maculatum*), many of which breed solely in vernal pools. The ponds are scattered over roughly 200 acres located just within the Michaux State Forest boundary. These ponds are found within a young red maple-mixed hardwood forest with many successional species. The small size of the trees, along with the prominence of successional tree species, suggests that this forest has likely been harvested within the last 30-50 years.

Several good-quality populations of an S1 PA plant species of concern, the **Lance-leaved Loosestrife** (*Lysimachia hybrida*) occur at the edge of the open zone of many of these ponds. Only a few of these plants were in flower. Many showed evidence of herbivory. These ponds include canopy trees such as Red Maple, Pin Oak and Black Gum. A shrub zone rings most of the ponds and is composed of Highbush Blueberry, Winterberry Holly, Pinxter-flower, Red Chokeberry, Scrub Oak, Greenbriar and the introduced invasive shrub species Alder Buckthorn. Herbaceous species associated with the central zone of many of the ponds includes Smartweeds (*Polygonum punctatum*, *P. caespitosum*, *P. hydropiperoides*), Dwarf St. John's-wort, Primrose Violet, Wool-grass, Mad-dog Skullcap, Sedges (*Carex lupulina*, *C. vesicaria*, *C. festucacea*), Panic Grasses (*Panicum acuminatum*, *P. rigidulum*), and Pale Meadowgrass.

Threats & Disturbances

This site is still recovering from relatively recent logging in the surrounding area. The proximity of these ponds to residential development may lead to abuses such as dumping of household waste, lawn clippings and other debris. The ponds may also be perceived as mosquito breeding areas, with accompanying demands for pesticide application to reduce insect populations. Introduced invasive species, especially Alder Buckthorn, are dominant in the shrub layer around the ponds, and threaten the natural character and diversity of this site. Herbivory by deer poses a threat to the populations of Lance-leaved Loosestrife. The increased use of All Terrain Vehicles (ATVs) in public forest property poses a potential threat to the site.

Conservation Recommendations

Logging within this portion of the forest should be avoided due to the numerous ponds scattered over this 200-acre area. An undisturbed forested buffer between nearby residences and the ponds should be established, and additional buffer should be acquired if the opportunity becomes available. The site should be monitored for ATV traffic, and trails blocked as they appear. Aquatic pesticide applications for mosquito control should be avoided in these ponds, as this would disrupt the food cycle necessary to

(Quincy Township continued)

maintain amphibian populations. The biggest threat to the ponds appears to be the dense stands of the invasive shrub species, alder buckthorn. Control of this introduced plant pest may be necessary to protect the diversity of this natural community. Deer hunting should be encouraged in the area to reduce herbivory pressure at this site. Additional surveys for species of concern in this area are encouraged.

MONT ALTO MOUNTAIN (Guilford and Quincy Townships)

This area contains several populations of **Short-leaf Pine (*Pinus echinata*)** in a “mixed hardwood-pine forest” with well-drained sandy soil. Associated species include Pitch Pine, White Pine, Red Oak, Scarlet Oak, Black Oak, Chestnut Oak, Black Tupelo and Red Maple.

Also included in this area is the **Meeting of the Pines Natural Area**, a remnant stand of a “Xeric Central Conifer Forest Natural Community”. This site once had the distinction of once having most native *Pinus* species that occur in Pennsylvania (Kunsman, pers. comm.). The species of pine that have been found here include Table Mountain Pine, Shortleaf Pine, Virginia Pine, Pitch Pine, and White Pine. Historic fires enhanced this area by promoting new growth of pine saplings. However, in recent years, succession has allowed increasing amounts of Oaks to invade the area.

Threats and Disturbances

Threats include succession of pine forest into Dry-Oak Heath forest. One disturbance would be excessive recreation.

Conservation Recommendations

A prescribed burn of this area would significantly improve the quality of the natural community. A prescribed burn would also enhance the Short-leaf Pine growth in the area.

NUNNERY SPRINGS (Quincy and Washington Townships)

This site contains an unknown quality population of a **G4Q Pennsylvania animal species of concern**. This species was found in a spring-fed stream in an agricultural/residential setting. This and the other sites in this county are the only known populations of this species in the state. Associated species included the introduced species Rainbow Trout (*Onchorynchos mykiss*), Pearl Dace (*Margariscus margarita*), White Sucker (*Catostomus commersoni*), Crayfish and Trichoptera (*Caddisflies*). This spring flows into the West branch of Antietam Creek and only a small section of the stream was sampled.

Threats and Disturbances

Direct threats to the population of the species would be changes in hydrology (warming of water), water pollution such as lawn runoff and chemicals, and agricultural runoff. Disturbances include lack of forested buffer, mowing right up to edge of the stream, and nearby agriculture.

Conservation Recommendations

It is recommended that further surveys of this species be conducted in nearby springs to determine the extent of the population. It is recommended that this spring be protected from pollution. It is also recommended that some areas of this spring be used in the Pennsylvania’s Department of Environmental Protections stream releaf program:

(<http://www.dep.state.pa.us/dep/deputate/watermgt/WC/Subjects/StreamReLeaf/default.htm>).

This program could assist in replanting critical buffers along this stream to prevent warming and maintain the population of this species.

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 on Mont Alto Mountain.

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.

SOUTHAMPTON TOWNSHIP & Shippensburg Borough

Site Name	Special Species / Community Type	PNHP Ranks*		State Status	Last Seen	Quality**
		Global	State			
Big Pine Flat	Animal	G4	S3S4	PC	7/31/2002	E
	Animal: Footpath Sallow Moth (<i>Metaxaglaea semitaria</i>)	G5	S2	N	10/01/2003	E
	Ridgetop Dwarf-Tree Forest	G4	S3	N	6/08/1995	BC
	Northeastern Bulrush (<i>Scirpus ancistrochaetus</i>)	G3	S3	PE	8/2/1995	D
	Ephemeral/Fluctuating Natural Pool Community	G?	S3	N	1/14/1998	B
	Animal Netted Chainfern (<i>Woodwardia areolata</i>)	G4 G5	S3S4 S2	PC N	05/01/1997 9/26/1995	E C
Conodoguinet Creek at Orrstown	Pineland Pimpernel (<i>Samolus parviflorus</i>)	G5	S2	TU	8/7/2002	E
Mains Run Ponds	Small Beggar's Tick (<i>Bidens discoidea</i>)	G5	S3	N	11/01/1998	C
Middle Spring Creek Watershed	Animal	G3	S2	PE	6/3/2000	E
	Grass-leaved Rush (<i>Juncus biflorus</i>)	G5	S2	TU	7/28/2001	BC
	Short-fruited Rush (<i>Juncus brachycarpus</i>)	G4G5	S1	PE	7/28/2001	BC
Mountain Run/ Stillhouse Hollow Ponds	Northeastern Bulrush (<i>Scirpus ancistrochaetus</i>)	G3	S3	PE	9/3/1992	AB, D
	Oakes' Pondweed (<i>Potamogeton oakesianus</i>)	G4	S1S2	TU	7/11/1992	C
	Ephemeral/Fluctuating Natural Pool Community	G?	S3	N	9/3/1992	AB

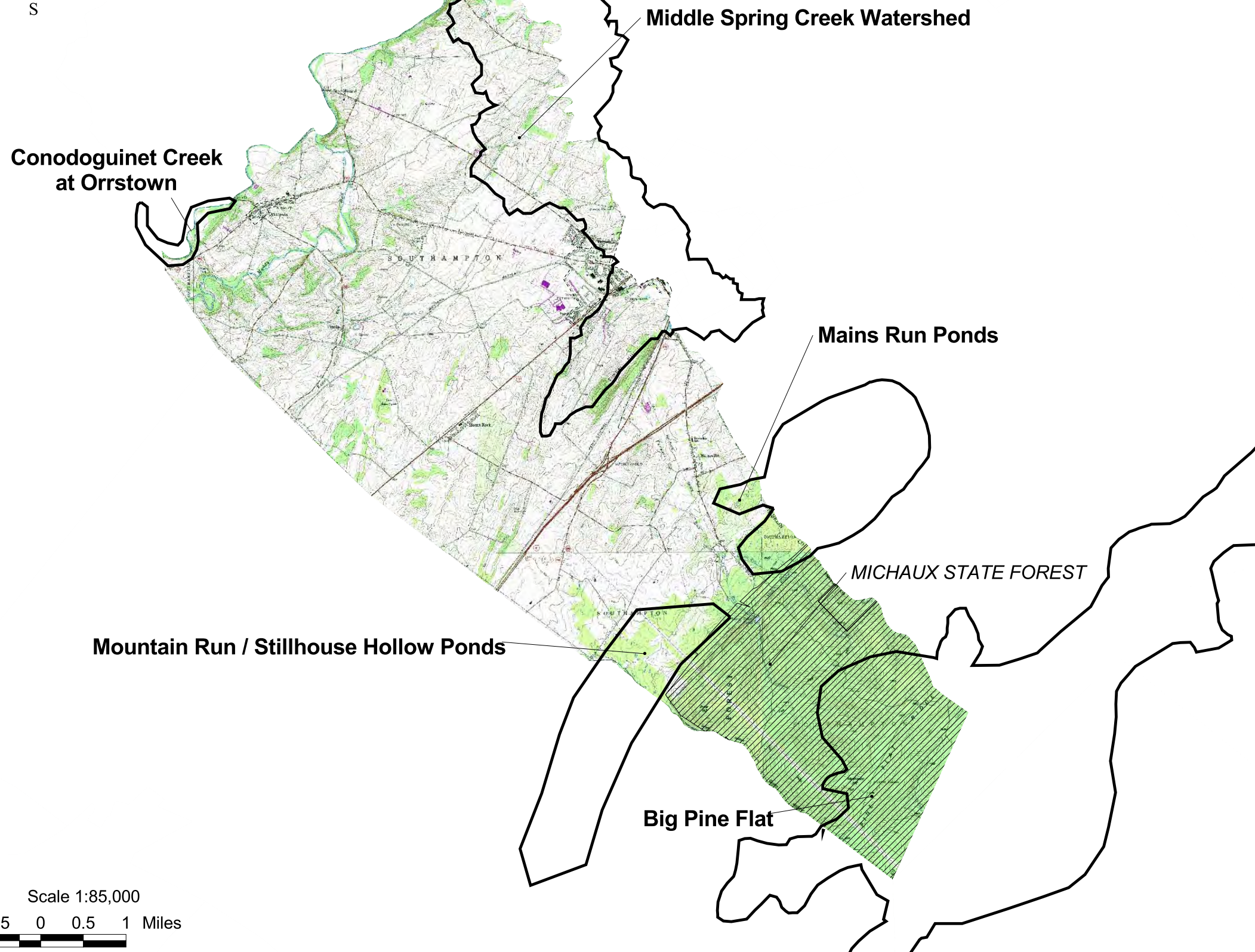
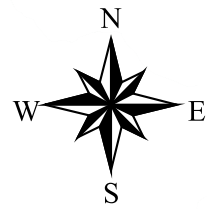
Managed Lands: Michaux State Forest

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

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

[Southampton Township Map](#)

Southampton Township, Orrstown and Shippensburg Boroughs



Southampton Township, Orrstown and Shippensburg Boroughs

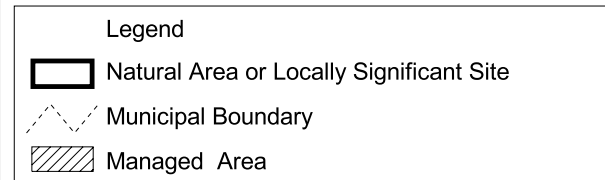
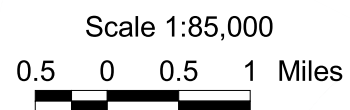
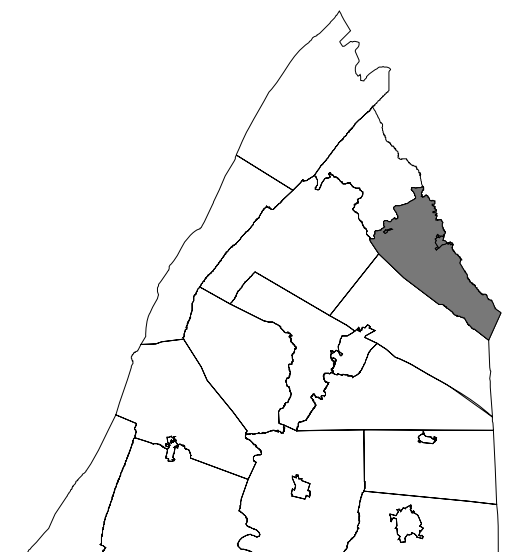
Franklin County Natural Areas Inventory

Natural Areas:

- Big Pine Flat
- Conodoguinet Creek at Orrstown
- Mains Run Ponds
- Middle Spring Creek Watershed
- Mountain Run/Stillhouse Hollow Ponds

Managed Areas:

- Michaux State Forest



BIG PINE FLAT (Greene and Southampton Townships, and Cumberland County)

This site contains a small population of **Northeastern Bulrush** (*Scirpus ancistrochaetus*), a G3, S3 Federally Endangered plant species of concern, and a good quality **Ephemeral/fluctuating Pool Natural Community**. The site 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 shelter belts 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.

This site also 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.

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, wild sarsaparilla (Fike 1999).

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. The pitch pine barrens are disturbance dependent ecosystems. The development and implementation of a prescribed burn management program would help maintain the quality of this naturally occurring community. 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 extent of this Natural Community was delineated from aerial photography.

Two animal species of concern were also documented from this site. An unknown quality population of an **S3S4 animal species of concern**. was observed along the Appalachian Trail. An unknown quality population of the **Footpath Sallow Moth** (*Metaxaglaea semitaria*) a G5, S2 animal species of concern was collected in a light trap in a utility line right-of-way adjacent to a scrub oak-pitch pine dominated forest. This species feeds on blueberry plants in its larval stage. Other, more common species documented from this site include Copper Underwing (*Amphipyra pyramidoides*), Bristly Cutworm (*Lacinipolia renigera*), Venerable Dart (*Agrotis venerabilis*), Swordsman Dart (*Agrotis gladiaria*), Gold-striped Leaf-tier Moth (*Machimia tentoriferella*), Celery Leaf-tier Moth (*Udea rubigalis*), Bent-Line Carpet (*Orthonama centrostrigaria*), The Wedgling (*Galgula partita*), Maple Spanworm (*Ennomos magnaria*), Green Cloverworm (*Plathypena scabra*), Lunate Zale (*Zale lunata*),

(Southampton Township continued)

Scalloped Sallow (*Eucirroedia pampina*), Corn Earworm Moth (*Heliothis zea*), a Dart (*Xestia dilucida*), (*Agriphila vulgivagella*), Large Tolyte (*Tolyte vellada*) and Wandering Brocade (*Oligia illocata*)

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.

CONODOGUINET CREEK AT ORRSTOWN (Letterkenny, Lurgan and Southampton Townships)

This forested floodplain area contains an undetermined quality population of **Pineland Pimpernel** (*Samolus parviflorus*), a G5, S2 Pennsylvania plant species of concern. The last recorded occurrence of this species in Franklin County was in 1850 near Mercersburg by Thomas Conrad Porter, an early influential Pennsylvania botanist who had been professor of natural sciences in Marshall College, Mercersburg in the mid 1800's. The floodplain area contains many invasive introduced species of plants, but a diverse native floodplain flora persists at this site. Among the associated species of plants at this site include the trees Pin Oak Bitternut and Pignut Hickories, Red, Sugar and Silver Maples, American Sycamore, White Oak and American Basswood. Characteristic floodplain shrubs found at this site include Spicebush, Black-haw, Swamp Dogwood, Black Willow, Smooth Alder, Hornbeam, Slippery Elm, Greenbriar, Poison Ivy and the invasive introduced species Multiflora Rose. Herbaceous species found along the creek floodplain include Winged Monkey-flower, Orange Jewelweed, Seedbox, Cardinal flower, a Sedge (*Carex lupulina*), Arrow-leaved tearthumb, Cutgrass, Clearweed, White Avens, Bottlebrush Grass, Wingstem, New York Ironweed, Swamp Milkweed, and Sensitive Fern.

Bird species recorded at this site include Chestnut-sided Warbler, Northern Cardinal, White-breasted Nuthatch, Downy Woodpecker, Gray Catbird, Northern Flicker, and Belted Kingfisher.

Threats and Disturbances

Potential threats to this site include invasive plant species, conversion to agricultural fields, draining, pasturing, grazing, and invasive species.

Conservation Recommendations

The current minimal selective logging occurring on the site does not appear to significantly degrade this habitat. The area should be fenced from cattle to avoid increased invasion by non-native plants into the floodplain. Additional surveys for this and other species of concern are recommended along the floodplain at this location.

MAINS RUN PONDS (Southampton Township, and Cumberland County)

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 (*Lemna minor*).

(Southampton Township continued)

Threats and Disturbances

Threats and Disturbances include dumping, clearing, deer over-browsing, and a dump in the southwest part of this pond.

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 (Southampton Twp., Shippensburg Boro. and Cumberland Co.)

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 Middle Spring Creek. Associated species include Creek Chub (*Semolitus atromaculatus*), Blacknose Dace (*Rhinichthys cataractae*), Longnose Dace (*Rhinichthys cataractae*), Flathead Minnow (*Pimephales promelas*), Bluegill (*Lepomis macrochirus*), Pearl Dace (*Semolitus margarita*), and juvenile Brown Trout (*Salmo trutta*).

Within this site, a calcareous wetland contains a population of **Grass-leaved Rush (*Juncus biflorus*)**, an S2 Pennsylvania plant species of concern. 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.

MOUNTAIN RUN/STILLHOUSE HOLLOW PONDS (Greene and Southampton Townships)

This site contains a good-to-excellent quality example of an **Ephemeral/fluctuating Natural Pool Community**. This area contains five vernal/ephemeral ponds rimmed by swamp forest surrounded by mixed-oak forest matrix on the lower slopes of South Mountain. Vegetation includes shrub and graminoid zones around the ponds. This site contains a good to excellent quality population of **Northeastern Bulrush (*Scirpus ancistrochaetus*)**, a G3, S3 plant species of concern. A small separate population of **Northeastern Bulrush (*Scirpus ancistrochaetus*)** was also found in this site. The Federally endangered status of this plant indicates that the species is in danger of extinction throughout all or a significant portion of its range. The northeastern bulrush is primarily found in temporary ponds

(Southampton Township continued)

and other pools with fluctuating water levels. In addition, a fair quality population of **Oakes' Pondweed** (*Potamogeton oakesianus*), a G4, S1S2 plant species of concern, was found in a few vernal ponds at this site. Associated species include Golden-club (a recently delisted plant species), Buttonbush, Highbush Blueberry, Mannagrass, Pale Meadowgrass, Rattlesnake Mannagrass, and Three-way Sedge.

Threats and Disturbances

Disturbances at this site include jeep lanes, deer paths, selective cutting, and bulldozing brush by owners in and around the ponds. Threats include an increasing pressure from a residential area adjacent to the forest.

Conservation Recommendations

Logging within this portion of the forest should be avoided because of the ponds scattered over this area. An undisturbed forested buffer between nearby residences and the ponds should be established, and additional buffer should be acquired if the opportunity becomes available. The site should be monitored for ATV traffic, and trails near the ponds blocked as they appear. Aquatic pesticide applications for mosquito control should be avoided in these ponds, as this would disrupt the food cycle necessary to maintain amphibian populations. Deer hunting should be encouraged in the area to reduce herbivory pressure at this site. Additional surveys for species of concern in this area are encouraged.



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.
Photo by the PA Science Office of The Nature Conservancy



This extensive floodplain along the Conodoguinet Creek south of Roxbury provides valuable habitat for a variety of animal and plant species. Stream bank forests help buffer the watershed from the effects of non-point sources of pollution including runoff from agricultural, residential and roadway settings. In addition, the stream bank floodplain and corridor is usually an area of significantly higher biodiversity than the adjoining uplands. Maintaining an intact, forested floodplain along the creek can preserve much of the area's important biodiversity.

Photos: PA Science Office of The Nature Conservancy



Among the species encountered in Franklin County floodplain habitats include two recently delisted plant species. Pictured at top right is American Beakgrass (*Diarrhena obovata*), and at top left is Shellbark Hickory (*Carya laciniosa*). Both of these species occur infrequently in the state. Recent documentation of several excellent quality populations of these plants in Franklin County may suggest these species are truly on the rebound. Pictured bottom left is a common musk turtle (*Sternotherus odoratus*), which also relies on the creek bed habitats of Franklin County.

(Photos: PA Science Office of The Nature Conservancy)

ST. THOMAS TOWNSHIP

Site Name	Special Species / Community Type	PNHP Ranks*		State Status	Last Seen	Quality**
		Global	State			
Bear Valley	Ephemeral/fluctuating Natural Pool Community	G?	S3	N	3/2/2002	B
Edenville Meadows	Animal: Dickcissel (<i>Spiza americana</i>)	G5	S2B	PE	6/1/1986	E
St. Thomas Barren	Prickly Pear Cactus (<i>Opuntia humifusa</i>)	G5	S3	PR	11/08/2003	C
Upper Horse Valley	Animal	G4	S3S4	CA	7/16/2002	E
	Animal	G2G3	S1	N	6/25/1993	B
	Animal	G3G4	S2S3	N	6/25/1993	B
	Spreading Rockcress (<i>Arabis patens</i>)	G3	S2	N	5/24/1994	CD
	Tall Gramma (<i>Bouteloua curtipendula</i>)	G5	S2	PT	7/9/2002	C
	Oblique Milkvine (<i>Matelea obliqua</i>)	G4?	S1	PE	8/31/1990	CD
Williamson Red Cedar -Redbud Shrubland	Limestone Adder-tongue (<i>Ophioglossum engelmannii</i>)	G5	S1	N	5/24/1994	B
	Prickly Pear Cactus (<i>Opuntia humifusa</i>)	G5	S3	PR	6/26/1996	C, D
	Tufted Buttercup (<i>Ranunculus fascicularis</i>)	G5	S1S2	PE	5/24/1994	CD
	Lance-leaved Buckthorn (<i>Rhamnus lanceolata</i>)	G5	S1	PE	7/9/2002	BC, C, D
	Fringed-leaved Petunia (<i>Ruellia humilis</i>)	G5	S1	PE	7/9/2002	AB, C, BC
	Limestone Petunia (<i>Ruellia strepens</i>)	G4G5	S1	PT	8/22/1994	C, D, D

Locally Significant: Wilson Run

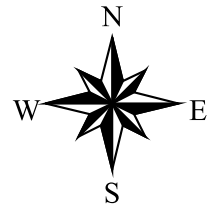
Managed Lands: State Game Lands #235

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

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

[St. Thomas Map](#)

St. Thomas Township



STATE GAME LANDS #235

Bear Valley

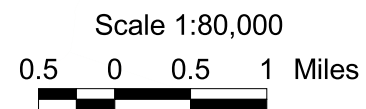
Edenville Meadows

Upper Horse Valley

Wilson Run
(Locally Significant)

Williamson Red-cedar - Redbud Shrubland

St. Thomas Barren



St. Thomas Township Franklin County Natural Areas Inventory

Natural Areas:

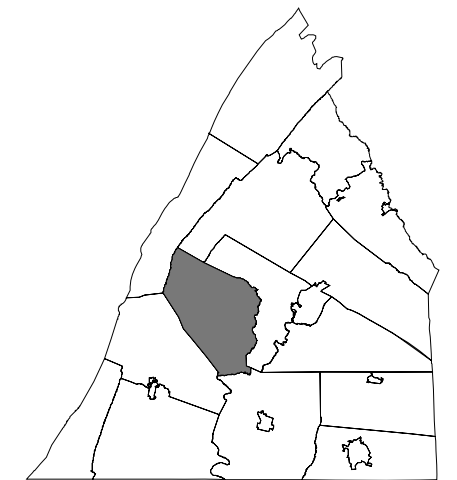
- Bear Valley
- Edenville Meadows
- St. Thomas Barren
- Upper Horse Valley
- Williamson Red-cedar
- Redbud Shrubland

Locally Significant Sites:

- Wilson Run

Managed Areas:

- State Game Lands #235



Legend

- Natural Area or Locally Significant Site
- Managed Area

BEAR VALLEY (Letterkenny and St. Thomas Townships)

Most of this valley is in public lands, containing portions of State Game Lands #235 and Buchanan State Forest. The forest is biologically diverse and very attractive. The surrounding forest canopy is primarily a Tuliptree-(American Beech)-Maple Forest (Fike 1999), with a strong component of Cucumber-tree. This area includes the headwaters of Broad Run, which grades into a “Hemlock-mixed hardwood Palustrine Forest” (Fike 1999). The palustrine forest area has extensive carpets of sphagnum moss-covered substrate under a Hemlock, Yellow Birch, and Cucumber-tree canopy. Occasional herbaceous openings dominated by ferns and sedges dot the bottomland of the valley. This area contains at least 22 good-quality temporary ponds that make up an **Ephemeral/Fluctuating Natural Pool Community**. These ponds occur in very stony soils at the headwaters of Broad Run. Ephemeral / fluctuating or vernal pools are wetlands that fill annually from precipitation, surface water runoff, and rising groundwater to appear pond-like during the winter and spring months. These pools typically become completely dry through evaporation by late spring or summer. Since these ponds dry up during a portion of the year, they cannot support fish populations. During the brief time the pools contain water, and in the absence of fish, they become important breeding areas for a variety of amphibian species such as wood frogs and spotted salamanders, many of which breed solely in vernal pools.

The ponds are within a richly diverse mixed coniferous-deciduous forest composed primarily of Hemlock, White Pine, Yellow Birch, Tuliptree, Pin, Red, Chestnut and White Oaks, Black Gum, Red and Sugar Maples, American Beech, Basswood, and a large population of Cucumber-tree. The ponds are frequently ringed by shrubs including Winterberry Holly, Pinxter-flower, Mountain Laurel, Huckleberries and Blueberries and Greenbriar. Several of the ponds contain wetland vegetation while many are unvegetated except for a thick ring of sphagnum moss at the waterline.

Animal species observed in association with these habitats include spotted salamanders (*Ambystoma maculatum*), wood frogs (*Rana sylvatica*), pickerel frogs (*Rana palustris*), eastern box turtles (*Terrapene carolina carolina*), wood turtles (*Clemmys insculpta*), black bear, white-tailed deer and porcupines.

Threats and Disturbances

Threats to this area include logging activities that do not include buffers around the ponds. Introduced species of plants are noticeably absent from the forest, but pioneer populations of Tree-of-heaven and Multiflora Rose are becoming established along the valley roadway. Heavy deer browse was noticed in portions of the forest. The increased use of All Terrain Vehicles (ATVs) in public forest property poses a potential threat to the site.

Conservation Recommendations

Logging within the portion of the forest where the ponds are located should be avoided. Undisturbed forest buffers need to be maintained around these ponds and other wetland habitats within the valley. The large size of the trees surrounding the pools suggests this practice has been exercised in logging operations at this site. The site should be monitored for ATV traffic, and trails blocked as they appear. Monitoring for invasive species of plants is also recommended. Populations of invasive species removed as they first appear are far more easily and effectively eliminated than established populations. Surveys for species of concern in this area are encouraged.

(St. Thomas Township continued)

EDENVILLE MEADOWS (Hamilton and St. Thomas Townships)

This site has previously supported an unknown quality population of **Dickcissel** (*Spiza americana*), an S2B Pennsylvania-Endangered bird species of concern. This site may or may not presently support this species due to changing land use conditions. This site was resurveyed in June 2003. The target species Dickcissel was not found at this site, but other grassland bird species were observed such as Savannah Sparrow, Grasshopper Sparrow, Song Sparrow, and Eastern Meadowlark. However, this area still has potential for Dickcissels since the area is still a mixture of mixed grasses, row-crops and alfalfa fields. In Pennsylvania, Dickcissels nest in older reclaimed surface-mine sites planted with various grasses and legumes and grown up with scattered, taller, woody plants (Brauning, 1993). This species also nests in mixed hayfields containing grasses, alfalfa, and other forbs. It is thought that the only viable population of Dickcissel in Pennsylvania is in Franklin County. Further surveys and encouragement of Conservation Reserve Programs (CRP) is needed to secure the future of this species in Pennsylvania.

Threats and Disturbances

Potential nesting Dickcissels would not find suitable habitat in this area if much of the fields were converted to rowcrop agriculture. Changing land use would make the habitat unsuitable for this Pennsylvania-Endangered species. Any type of development would be a threat to the area. Disturbances include the road, farm machinery, and crop pesticides.

Conservation Recommendations

This species prefers mixed hayfields containing grasses, alfalfa, and other forbs and creating this type of field would make for optimum habitat. However, it is not known what condition this habitat was in when the first Dickcissels nested at the site. It is recommended that yearly surveys be conducted to determine if this species still occupies this site on a regular basis. Another recommendation is that any harvesting of hay be delayed until late July or August to give time for fledgling grassland birds to develop and leave the nest.

ST. THOMAS BARREN (St. Thomas Township)

This site contains a fair population of **Prickly-Pear Cactus** (*Opuntia humifusa*), a G5 S3 plant species of concern. This species was found in five sub-populations in dry (xeric) grassy areas, road embankment and one area of woods.

Threats and Disturbances

Threats and disturbances to this site include succession, roadside mowing, maintenance and spraying. Invasive species are a disturbance to this site.

Conservation Recommendations

It is recommended that this site be managed (mowing, grazing) for this species without destroying the viability of the plant population.

UPPER HORSE VALLEY (Metal, Peters and St. Thomas Townships)

This site contains an unknown quality population of **an S3S4 Pennsylvania animal species of concern**. One individual of this species was found in a "Tuliptree-American Beech-maple forest" (Fike, 1999). The forested areas consisted primarily of Tuliptree, Sassafras, Pignut Hickory, Bitternut, Black Walnut, Slippery Elm, Chestnut Oak, Red Oak, Scarlet Oak, Yellow Birch, Black Birch, American Beech, Red Maple, and Eastern Hemlock.

Threats and Disturbances

Deer over browse is a serious problem in this area and is an overall disturbance to the area. A distinct “browse-line” is evident throughout the forest, with the understory dominated by Hay-scented Ferns and poor tree seedling regeneration. Recreational hiking and potential poaching are possible disturbances to the animal species of concern.

Conservation Recommendations

It is recommended that more surveys be conducted to determine the extent of this population. This area yielded no plant species of concern, but has some potential to be diverse in the spring for ephemeral wildflowers.

WILLIAMSON-RED CEDAR-REDBUD SHRUBLAND (Antrim, Peters and St. Thomas Townships)

This site represents one of the most important areas for the conservation of biological diversity in Franklin County. Multiple populations of nine plant species of concern and two animal species of concern have been documented at this site. The successional shrubland habitat found on this site consists of a mosaic of habitat types, with a **Red-cedar – Redbud Shrubland Natural Community**, an S2 tracked natural community type, occurring in some areas. This natural community type is the result of repeated disturbance of the relatively dry limestone bedrock outcrops, which create frequent openings in the tree and shrub canopy. The high pH of the soil weathered from the limestone parent material in these woods and openings creates ideal conditions for the calcium-loving species encountered here. The limestone bedrock is perforated with openings leading into an extensive cave system that was once open to the public as a tourist attraction called Baker’s Caverns. Past disturbances such as farming, grazing animals and fire, as well as the thin soils and dryness of the site have kept much of this area in an early successional stage. In the absence of disturbance such as fire, much of this site will succeed to a hardwood forest.

Limestone Petunia (*Ruellia strepens*), a G4G5, S2 PA-Threatened plant species of concern, was found in several small populations at this site. The habitat was unusual for this species, which is typically found growing along the banks of creeks and streams in the county. At this site, Limestone Petunia was found in relatively dry habitat in several locations. This species occurs frequently in the lower Conococheague Creek and through parts of Cumberland County, but is otherwise rare in the state.

Several excellent-quality populations of a closely related plant species, the **Fringed-leaved Petunia (*Ruellia humilis*)**, a G5, S1 PA-Endangered species of concern, were found throughout this site. This site contains the only currently known populations of this species in the state. This species is more common in the grassland habitats of the Midwestern U.S.

Several populations of the G5, S3 PA-Rare plant species of concern, **Prickly-Pear Cactus (*Opuntia humifusa*)**, were located on this site. These populations include one roadside population and one on a limestone outcrop, and range from small to fair quality. This species is typically found on dry shaly cliffs and barrens and can be found in a variety of locations scattered around southern and eastern Pennsylvania.

Lance-leaved Buckthorn (*Rhamnus lanceolata*), a G5, S1 PA-Endangered plant species of concern, was found in several locations within this site. Populations of this understory shrub species at this location range from good-quality to small.

A small-to-fair quality population of **Tufted Buttercup** (*Ranunculus fascicularis*), a G5, S1S2 PA-Endangered plant species of concern, and a small-to-fair population of **Spreading Rockcress** (*Arabis patens*), a G3, S2 plant species of concern were found at the top of a limestone bluff overlooking the Conococheague Creek. The Spreading Rockcress has a relatively limited range in North America, hence the G3 rank, with the best-quality populations occurring in Pennsylvania and Maryland (NatureServe 2003). The degradation of any local population of Spreading Rockcress may significantly impact the global range of this species. The area where these species were found is infested with the invasive introduced plant Japanese Honeysuckle. Control of this aggressive plant throughout the site may be necessary to keep the habitat viable for these species as well as the other plant species of concern found at this site.

Also found on the limestone bluffs is a small population of **Oblique Milkvine** (*Matelea obliqua*), a G4, S1 PA-Endangered plant species of concern. This species occurs in only a few locations in Pennsylvania. This species is considered rare throughout its range, occurring most frequently in Virginia (Plants Database 11-04-2003).

A good-quality population of **Limestone Adder's-Tongue** (*Ophioglossum engelmannii*), a G5, S1 PA-Endangered plant species of concern, was found on a dry-mesic rock outcrop in a powerline cut clearing. This population represents the only currently known location in the state for this species. The non-chemical vegetation management procedures used along this powerline likely help maintain the successional "limestone glade" habitat necessary for the continued success of this species.

A fair-quality population of **Side-oats Grama Grass** (*Bouteloua curtipendula*), a G5, S2 PA-Endangered plant species of concern, was found during a 1989 survey in a small limestone outcrop surrounded by quarries and open agricultural land. Side-oats Grama Grass dominates the quarter acre savannah-like opening where this species occurs, creating a small "Side-oats Grama Calcareous Grassland Natural Community". A large quantity of aggressive introduced plants and succession to woody shrubs and trees threaten the long-term success of this species at this location. Additional surveys for this species and natural community type are recommended.

Finally, two good-quality populations of animal species, a **G2G3, S1 animal species of concern and a G3G4, S2S3 animal species of concern**, were documented during cave surveys of this site in 1993. Four individuals of the S1 animal species of concern were collected in parts of seven caves with a stream flowing through it. Two individuals of the S2S3 animal species of concern were also found in the same area. Contamination of groundwater by agricultural runoff or suburban development poses the greatest threat to these species.

Threats and Disturbances

Threats and disturbances to the Red Cedar-Redbud shrubland area include natural succession, invasion of exotic plant species, poorly timed mowing, and change of land use. Sensitive placed quarry pits may not pose a great risk to these species. In over two decades of biological surveys to this site, the aggressive introduced plant Japanese Honeysuckle was described as the most immediate threat to the habitat for the species of concern at this location.

(St. Thomas Township continued)

Conservation Recommendations

The Red cedar / redbud Shrubland natural community on this site is the result of continued disturbance, which in pre-agricultural times was likely fire. The site has since been disturbed by a series of farming, grazing, mining and fire events. Carefully executed prescribed burns could rejuvenate this community type, which in the past 20 years has seen rapid canopy closure by larger trees and shrubs. Increased housing and commercial/industrial development should be discouraged near this community, and adjacent farms. Large quantities of aggressive introduced plants have invaded much of the habitat of this site. Mechanical removal, spot application of herbicides and prescribed burns may be necessary to keep the available habitat from being overrun with invasive species. This site should be considered as a potential natural area in the event this land is proposed for sale. Additional surveys of this site are recommended to determine the extent and current status of previously documented species, and to locate new species of concern.

Locally Significant Site:

Wilson Run (St. Thomas Township)

This locally significant site contains potential habitat for an animal species of concern. Site surveys are recommended to determine the quality of the habitat for this species.



A good quality population of prickly-pear cactus (*Opuntia humifusa*), a G5, S3 PA Rare plant species of concern, is found in several locations in Franklin County.

(Photo: PA Science Office of The Nature Conservancy)

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*)

WARREN TOWNSHIP

Site Name	Special Species / Community Type	PNHP Ranks*		State Status	Last Seen	Quality**
		Global	State			
Licking Creek Woods	Blunt-leaved Spurge (<i>Euphorbia obtusata</i>)	G5	S1	PE	6/4/1991	B
	Lobed Spleenwort (<i>Asplenium pinnatifidum</i>)	G4	S3	N	5/15/1989	C
	Jeweled Shooting-star (<i>Dodecatheon meadia</i>)	G5	S2	PT	7/16/1997	A
	Large-leaved Waterleaf (<i>Hydrophyllum macrophyllum</i>)	G5	S1	PR	6/10/1997	B
	Sedge (<i>Carex shortiana</i>)	G5	S3	PR	6/8/1997	E
	Beard-Tongue (<i>Penstemon canescens</i>)	G4	S3	N	6/6/1997	C
	Spring Coral Root (<i>Corallorhiza wisteriana</i>)	G5	S1	TU	5/7/1993	B
	Prickly-Pear Cactus (<i>Opuntia humifusa</i>)	G5	S3	PR	5/17/1997	CD
	Hoary Puccoon (<i>Lithospermum canescens</i>)	G5	S2	N	5/3/1997	C
	Green-and-Gold (<i>Chrysogonum virginianum</i>)	G5	S1	PE	6/4/1990	D
	Oblique Milkvine (<i>Matelea obliqua</i>)	G4?	S1	PE	6/4/1991	CD
	Black-stemmed Spleenwort (<i>Asplenium resiliens</i>)	G5	S1	PE	9/3/1990	BC
	St. Andrew's Cross (<i>Hypericum stragulum</i>)	G5	S2	N	7/16/1997	BC
	Common Hop-Tree (<i>Ptelea trifoliata</i>)	G5	S2	PT	6/28/1997	C
	Allegheny Stonecrop (<i>Sedum telephioides</i>)	G4	S3	PR	6/28/1997	B
Limestone Petunia (<i>Ruellia strepens</i>)	G4G5	S2	PT	6/4/1991	C	
Purple Bedstraw (<i>Galium latifolium</i>)	G5	S3	N	6/28/1997		

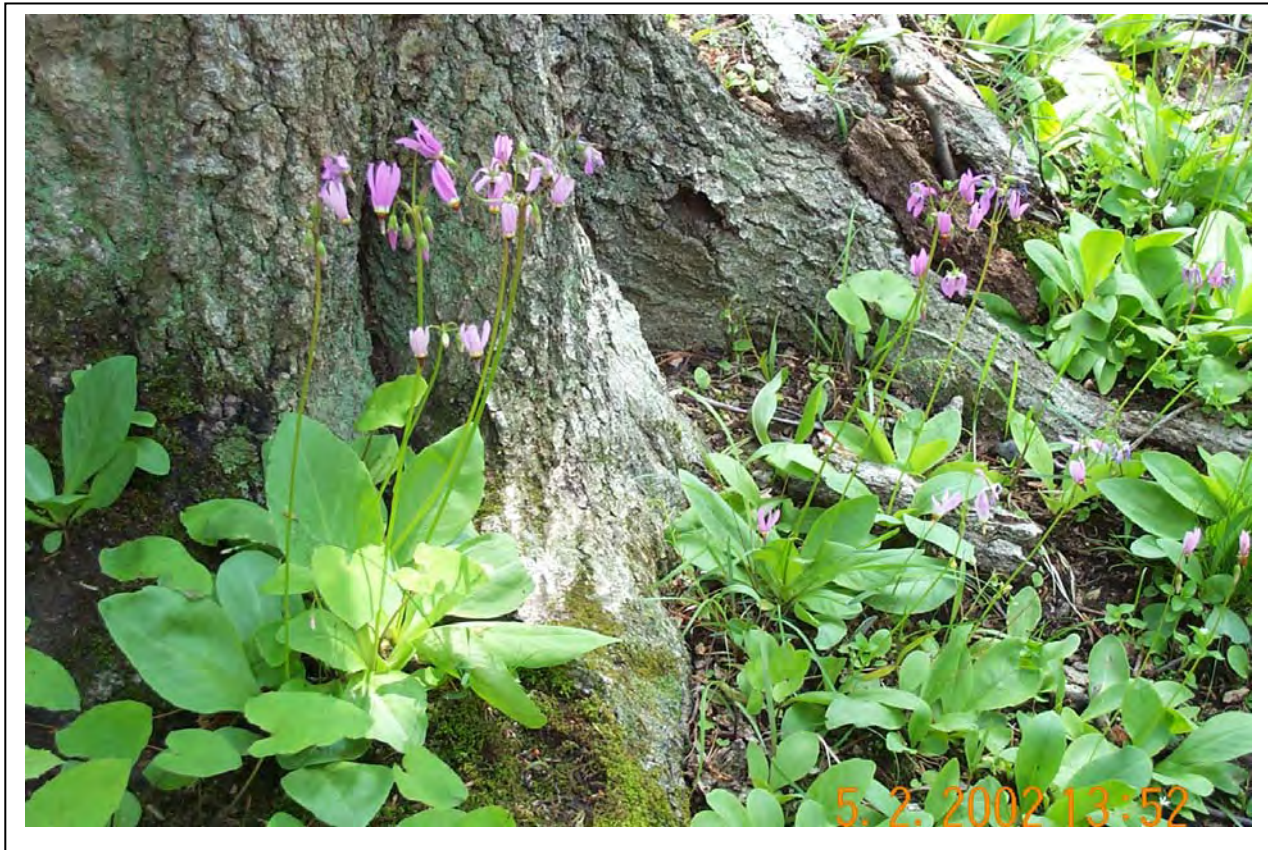
Site Name	Special Species / Community Type	PNHP Ranks*		State Status	Last Seen	Quality**
		Global	State			
Little Cove Creek Cliff	Black-stemmed Spleenwort (<i>Asplenium resiliens</i>)	G5	S1	N	6/10/1988	BC
State Game Lands #124 Tuscarora Trail	St. Andrew's Cross (<i>Hypericum stragulum</i>)	G5	S2	N	8/16/2001	D
	Purple Bedstraw (<i>Galium latifolium</i>)	G5	S3	N	8/16/2001	B
Tuscarora Trail	Purple Bedstraw (<i>Galium latifolium</i>)	G5	S3	N	8/16/2001	C

Managed Lands: State Game Lands #124

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

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

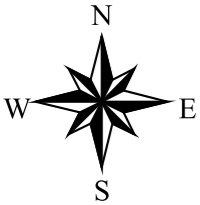
[Warren Township Map](#)



The jeweled shooting star (*Dodecatheon radicans*) is one of seventeen species of plants of special concern documented at Licking Creek Woods, one of the top priority sites for the conservation of biological diversity in Franklin County.

(Photo: PA Science Office of The Nature Conservancy)

Warren Township



Warren Township

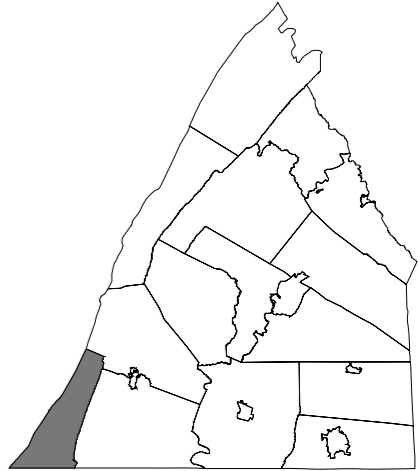
Franklin County Natural Areas Inventory

Natural Areas:

- Licking Creek Woods
- Little Cove Creek Cliff
- State Game Lands #124
- Tuscarora Trail
- Tuscarora Trail

Managed Areas:

- State Game Lands #124



Legend

- Natural Area or Locally Significant Site
- Managed Area

LICKING CREEK WOODS (Warren Township and northern Maryland)

The vegetation at this site in the southwestern-most portion of Franklin County has been significantly influenced by the limestone substrate of the forested hills, creek banks and rocky outcrops in this area. Though aerial observations seem to indicate nothing out of the ordinary in this corner of the county, the incredibly rich herbaceous vegetation found at this site makes it one of the top sites for the conservation of biological diversity in the County. This site contains one animal species of concern and a total of 17 plant species of concern, some species that do not occur anywhere else in the state. These species inhabit a variety of habitat types such as a floodplain forest, moist calcareous shale woods, limestone cliffs, mixed deciduous “rich” woods, mesic upland forest, etc.

In addition to the plant species of special concern, this site also supports a number of species that are more typical of the Ohio River watershed in Pennsylvania and are therefore noteworthy for their occurrence in Franklin County. These species include Short’s Aster (*Aster shortii*), Dwarf Larkspur (*Delphinium tricorne*), Twinleaf (*Jeffersonia diphylla*), Miami-mist (*Phacelia purshii*), and Toadshade (*Trillium sessile*). In a study of plant diversity, a total of 253 plant species in 69 families were found within an area of about four hectares at this site. This entire area represents one of the most diverse plant areas in the state (Klotz and Walck, 1993).

Several plant species of concern are found primarily on the rich, forested, calcareous slopes at this site. These include several populations of **Jeweled Shooting-star** (*Dodecatheon meadia*), a G5, S2 Pennsylvania-Threatened plant species of concern, a fair-quality population of **Limestone Petunia** (*Ruellia strepens*), a G4G5, S2 PA-Threatened plant species of concern, and a small population of **Green and Gold** (*Chrysogonum virginianum*), a G5, S1 PA-Endangered plant species of concern. This species is most common in the southern Appalachians and Piedmont of North Carolina (NatureServe 2004), but in Pennsylvania, it is currently only known from southern Franklin and Fulton Counties.

Several other plant species of concern were documented along roadways and other artificially maintained habitats. A small population of **Hoary Puccoon** (*Lithospermum canescens*), a G5, S2 plant species of concern, and several populations of **Oblique Milkvine** (*Matelea obliqua*), a G4?, S1 PA-Endangered plant species of concern, were found alongside a road and the adjoining woods. Oblique Milkvine is considered imperiled or critically imperiled throughout much of its range (NatureServe 2003). Three various sized populations of **Blunt-leaved Spurge** (*Euphorbia obtusata*), a G5, S1 PA-Endangered plant, were also found along a weedy zone of shale-dominated roads. This species, though occurring more frequently in other parts of the U.S., is currently known only from this location in Pennsylvania. A fair to good quality population of **St. Andrew’s Cross** (*Hypericum stragulum*), a G5, S2 plant species of concern, was found on a pipeline right of way with an artificial early successional habitat that simulates a grassland or meadow. The introduced invasive plant species Japanese Honeysuckle is a potential threat to each of these populations.

Rocky limestone outcrops, cliffs and steep slopes provide habitat for several other plant species of concern. Five populations of **Allegheny Stonecrop** (*Sedum telephioides*), a G4, S3 PA-Rare plant species of concern, were documented on calcareous cliffs and steep slopes alongside Licking Creek. A small population of **Lobed Spleenwort** (*Asplenium pinnatifidum*), a G4, S3 plant species of concern, was found at the crest of a ridge. A fair quality population of **Prickly-Pear Cactus** (*Opuntia humifusa*), a G5, S3 PA-Rare plant species of concern was found on a talus opening area at the base of a calcareous cliff. Three populations of **Black-stemmed Spleenwort** (*Asplenium resiliens*), a G5,

(Warren Township continued)

S1 PA-Endangered plant species of concern, were found on a limestone cliff. The Black-stemmed Spleenwort is another species, though occurring in many other states, reaches its northern limit in Pennsylvania. In this state it is currently only known to occur in southern Franklin County.

The rich herbaceous layer on the moist, forested, slopes in this area contains several other plant species of concern. A good-quality population of **Large-leaved Waterleaf** (*Hydrophyllum macrophyllum*), a G5, S1 PA-Rare plant species of concern, is at its northern limit in southern Pennsylvania (NatureServe 2003). Also documented in this area are a fair-quality population of **Beard-Tongue** (*Penstemon canescens*), a G4, S3 plant species of concern; a good-quality population of the saprophytic orchid **Spring Coral-root** (*Corallorhiza wisteriana*), a G5, S1 plant species of concern; an undetermined-quality population of a **Sedge** (*Carex shortiana*), a G5, S3 PA-Rare plant species of concern; and an undetermined-quality population of **Purple Bedstraw** (*Galium latifolium*), a G5, S3 plant species of concern. A fair-quality population of **Common Hop-Tree** (*Ptelea trifoliata*), a G5, S2 PA-Threatened plant species of concern, was found in a floodplain forest along Licking Creek.

Threats and Disturbances

Threats to all the plant populations, the overall Licking Creek Woods, and the various cliffs associated with this site include trampling and collection of plants, invasive plant species, overbrowsing by deer, logging, and herbicide spraying.

Conservation Recommendations

The most significant long-term threat to this area is development, and the best long-term protection for the many species of concern that occur here is to acquire property and conservation easements with the intent of conserving the incredible diversity of plants found here. Local planning and zoning should discourage construction of new residences and roadways in this area. Forested buffers should remain intact for the length of the creek with logging operations refraining from cutting within 50 to 100 feet of the creek bank. Stream bank forests help buffer the watershed from the effects of non-point sources of pollution including runoff from agricultural, residential and roadway settings. Maintaining an intact, forested floodplain along the creek can preserve much of the area's important biodiversity. The effectiveness of the forested creek as a habitat corridor would be diminished by fragmentation of the forest continuity by the construction of houses and additional roadways along the creek. It is also recommended that this site be monitored for the further invasion of exotic plants that could threaten some of the plant populations. However, only hand-removal of exotic plant species is recommended since herbicides could jeopardize many of the populations of plant species of concern. Deer hunting should be encouraged to keep the deer population from increasing to unsustainable levels. This area extends into the state of Maryland, but the overall conservation goals for this site may differ for Maryland due to differences in species rarity rankings across state boundaries. Additional surveys of this site are recommended to determine the extent and current status of previously documented species, and to locate new species of concern.

LITTLE COVE CREEK CLIFF (Warren Township)

This site contains a fair to good quality population of **Black-stemmed Spleenwort** (*Asplenium resiliens*), a G5, S1 PA-Endangered plant species of concern. This species was found on a northeast facing calcareous cliff. No disturbances or threats were identified at this site. This species, though occurring in many other states, reaches its northern limit in Pennsylvania. In this state it is currently only known to occur in southern Franklin County.

(Warren Township continued)

Threats and Disturbances

Exotic plant species invasion could cause shading and competition for the plant species of concern.

Conservation Recommendations

It is recommended that this site be monitored for invasive plant species and for excessive overbrowsing by deer.

STATE GAME LANDS #124 TUSCARORA TRAIL (Warren Township)

This site contains a good population of **Purple Bedstraw** (*Galium latifolium*), a G5, S3 plant species of concern. This population was found in an upland-hardwood forest in well-drained rocky shale and sandstone soil. Associated species include Woodland Dropseed, White-snakeroot, Panic-Grass (*Panicum boscii*), Wild Licorice, Sweet-scented Bedstraw, Common Dittany, American Pennyroyal, Tick-trefoil, Poverty Grass, Canada Brome, Stiltgrass, and Virginia Snake-root.

Threats and Disturbances

Disturbances to this site include exotic plant species, gypsy moth defoliation, and deer overbrowsing. Logging is a potential disturbance.

Conservation Recommendations

It is recommended that this site be monitored for invasive plant species and for excessive overbrowsing by deer.

TUSCARORA TRAIL (Warren Township)

This woodland supports a fair population of a G5, S3 PA plant species of special concern, **purple bedstraw** (*Galium latifolium*). The habitat appears to be very favorable for this species and it should continue to thrive here, since the woodland is situated within the Tuscarora State Forest. This site has an open forest consisting of a variety of hardwood species, particularly various Oaks, Hickories, Maples, Tuliptree, White Ash and Serviceberry. The underlying geology includes shale and sandstone and is well drained. Because of the relative openness of the woodland and the general lack of a shrub zone, a diversity of woodland herbs is present. Typical herb species include panic grass (*Panicum* spp., especially *Panicum boscii*), Woodland Dropseed, Bottlebrush Grass, various Sedges (*Carex* spp.), American Pennyroyal, Common Dittany, Forked Chickweed, Cinquefoil and Bedstraws (*Galium* spp.).

Threats and Disturbances

Disturbances to this site include exotic plant species, deer overbrowsing, and gypsy moth defoliation. No threats were identified.

Conservation Recommendations

It is recommended that this site be monitored for invasive plant species and for excessive overbrowsing by deer.



Though occurring in other Southern and Midwestern states, Large-leaved Waterleaf (*Hydrophyllum macrophyllum*) is currently only known to occur in PA in a few southern counties bordering Maryland and West Virginia.



Left: Wafer Ash (*Ptelea Trifolium*), a G5, S2 PA-Threatened plant species of concern.

Right: Hoary Puccoon (*Lithospermum canescens*), a G5, S2 plant species of concern.

Photos: PA Science Office of The Nature Conservancy





In addition to the plant species of special concern, Licking Creek Woods also supports a number of species that are more typical of the Ohio River watershed in Pennsylvania and are therefore noteworthy for their occurrence in Franklin County.

Top Left: Twinleaf (*Jeffersonia diphylla*)

Top Right: Toadshade (*Trillium sessile*)

Right: Dwarf Larkspur (*Delphinium tricorne*)



WASHINGTON TOWNSHIP & Waynesboro Borough

Site Name	Special Species / Community Type	PNHP Ranks*		State Status	Last Seen	Quality**
		Global	State			
Antietam West Branch	Animal: Loggerhead Shrike (<i>Lanius ludovicianus</i>)	G4T3Q	S1B	PE	1996	E
Beartown Woods	Natural Community: Rich hemlock-mesic hardwood forest	G?	S2S3	N	6/30/1989	E
Glenn Forney Vernal	Lance-leaf Loosestrife (<i>Lysimachia hybrida</i>)	G5	S1	N	7/13/2002	AB
	Natural Community: Ephemeral/Fluctuating Pools	G?	S3	N	7/13/2002	E
Hoover Spring	Animal	G4Q	S?	N	8/8/2002	E
Makey Run Ponds	Natural Community: Ephemeral/Fluctuating Pools	G?	S3	N	7/01/1997	E
	Northeastern Bulrush (<i>Scirpus ancistrochaetus</i>)	G3	S3	N	7/01/1997	BC
Needy Cave	Animal	G3G4	S2S3	N	1/25/1995	AB
	Animal	G2G4	S1	N	1/25/1995	AB
	Animal	G2G4	S1	N	1/25/1995	B
Nunnery Spring	Animal	G4Q	S?	N	8/8/2002	E
Waynecastle Old Field	Lance-leaved Buckthorn (<i>Rhamnus lanceolata</i>)	G5	S1	N	7/25/2002	BC
	Sedge (<i>Carex shortiana</i>)	G5	S3	PR	6/03/2003	BC
Zullinger Spring	Animal	G4Q	S?	N	8/8/2002	E

Locally Significant: Happel's Meadow Shrub Swamp

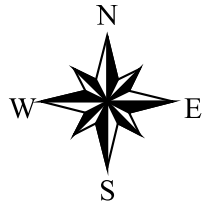
Managed Lands: Michaux State Forest

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

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

[Washington Township Map](#)

Washington Township and Waynesboro Borough



Washington Township and Waynesboro Borough Franklin County Natural Areas Inventory

Natural Areas:

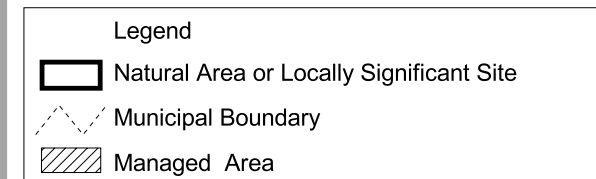
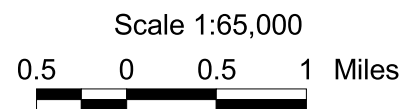
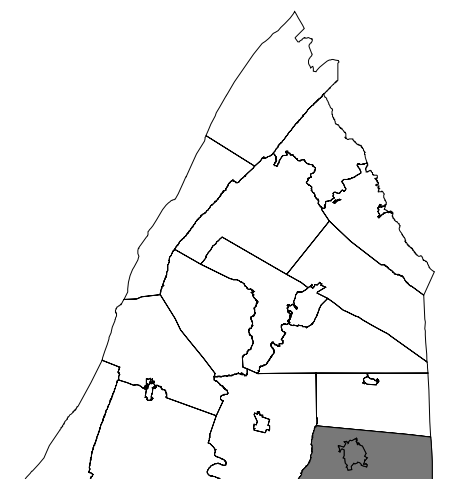
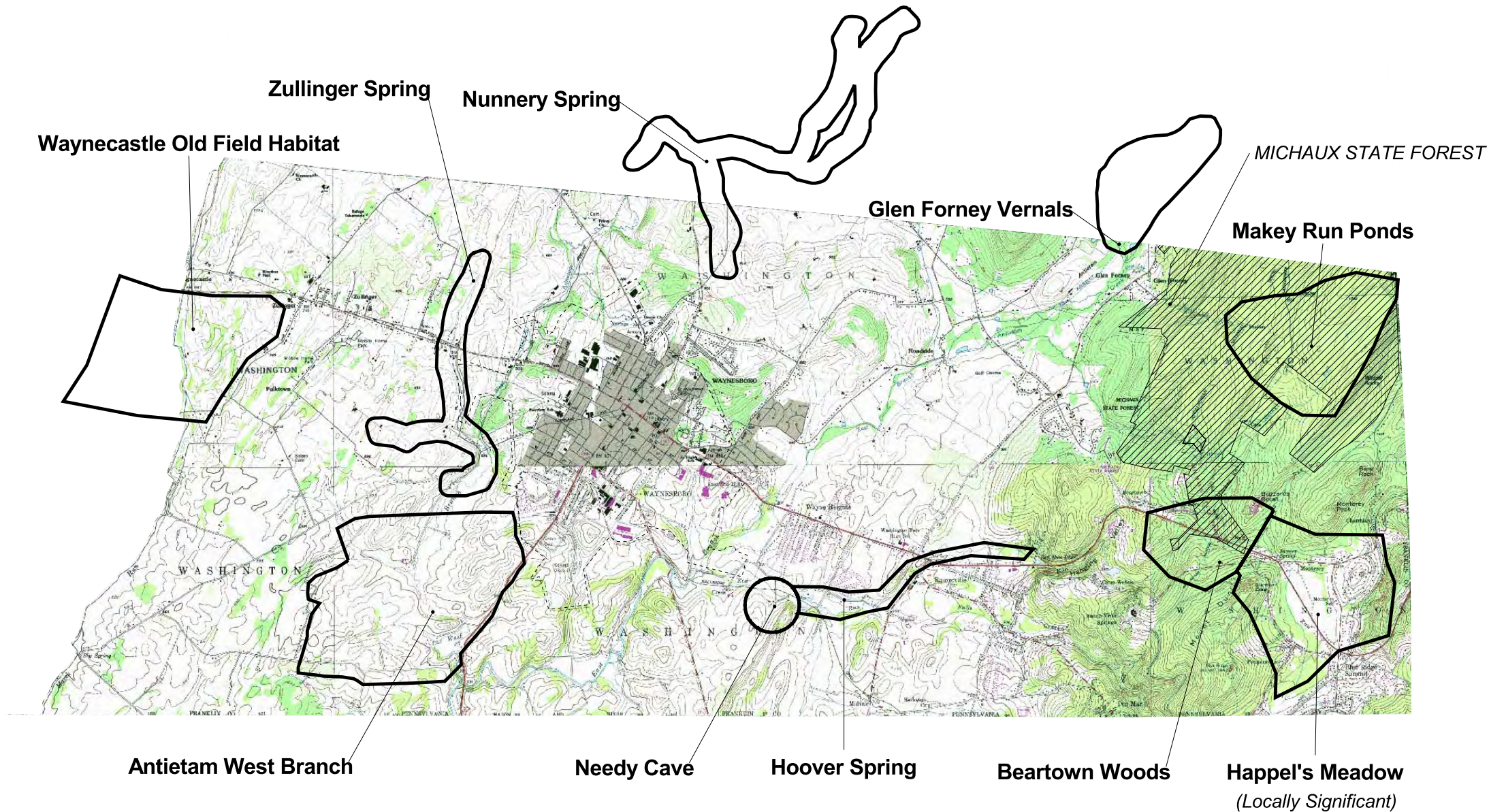
- Antietam West Branch
- Beartown Woods
- Glen Forney Vernal
- Hoover Spring
- Makey Run Ponds
- Needy Cave
- Nunnery Spring
- Waynecastle Old Field Habitat
- Zullinger Spring

Locally Significant Sites:

- Happel's Meadow

Managed Areas:

- Michaux State Forest



ANTIETAM WEST BRANCH (Washington Township)

This site contains an unknown quality population of **Loggerhead Shrike** (*Lanius ludovicianus*), a G4T3Q PA-Endangered bird species of concern. Three young of this species were seen in 1996 indicating that breeding of this species has occurred at this site at least once. Shrikes prefer open countryside, inhabiting short-grass pastures, weedy fields, grasslands, agricultural areas, swampy thickets, orchards, and right-of-way corridors (Michigan Natural Features Inventory, 2001). This species prefers areas containing hedgerows, scattered trees or shrubs such as Hawthorns, Osage-orange and Multiflora Rose. There should be some trees containing thorns or at least barbed wire fence for impaling prey since the species has no sharp talons.

Threats and Disturbances

Direct threats to this species include conversion of land use from farm/open grasslands to development or rowcrop agriculture. Bushwhacking of shrubs and small trees in this area would likely cause Shrikes to abandon their nesting site. Another direct threat is the use of pesticides on farm pests such as mice. Pesticides such as DDT may have contributed to the rapid decline of Shrikes throughout the northeast. (Michigan Natural Features Inventory, 2001; New Jersey Fish & Wildlife, 2002). Succession into forest is another threat to the site itself. Disturbances include potential development, and encroaching roads and suburbanization.

Conservation Recommendations

It is important if this species is still breeding at this site that monitoring, management, and intensive research be conducted to better assess the Shrike's life history and habitat needs. It is recommended that this site be managed for this species by keeping the area at an early successional stage but with scattered trees, adequate patch size, short grasses (4-18"), adequate hunting perches, adequate nest sites, sufficient prey supply, and impaling substrate (Michigan Natural Features Inventory, 2001). If an active farm is nearby, it is recommended that limited pesticides be used. This species is in great peril in the northeast, and if this site still supports breeding pairs of migrant Loggerhead Shrikes, it is vital to protect the habitat that it depends. A subspecies of the Loggerhead Shrike (*Lanius ludovicianus migrans*), which also occurs in Pennsylvania, is a candidate for federal listing and is a Nongame Migratory Bird of Management Concern (New Jersey Fish & Wildlife, 2002).

BEARTOWN WOODS (Washington Township)

This site contains an unknown quality example of a "**Rich hemlock-mesic hardwoods forest**", an S2S3 Natural Community. This community occupies most of the valley bottom along Red Run. Associated species include Eastern Hemlock, Sugar Maple, Red Maple, Basswood, American Beech, Yellow Birch, Black Birch, Tuliptree, Chestnut Oak, Black Gum, Witch-hazel, Mountain Laurel, Spicebush, Virginia Creeper, Poison-Ivy and Partridgeberry. Surrounding land use includes a portion of Michaux State Forest, and single home residential units. Part of this site is a Natural Area within the State Forest Management Plan and no logging is allowed. Major storm damage in recent years has contributed to its old growth characteristic.

Threats and disturbances

Disturbances to this site include Route 16, and recreational hiking on the Appalachian Trail and Bicentennial Tree Trail. Another disturbance is the presence of a few exotic plant species that could become more of a problem in the future.

Conservation Recommendations

Being a relatively uncommon natural community for Franklin County, this site could potentially be allowed to develop into an undisturbed old-growth stand. Since most of the canopy species were also observed as saplings and/or seedlings in the understory, this diverse community may be maintaining itself.

GLEN FORNEY VERNALS (Quincy and Washington Townships)

This site contains a series of approximately 30 vernal ponds that make up an **Ephemeral / Fluctuating Natural Pool Community**. Ephemeral/fluctuating or vernal pools are wetlands that fill annually from precipitation, surface water runoff, and rising groundwater to appear pond-like during the winter and spring months. These pools often become completely dry through evaporation by late spring or summer. Since these ponds may dry up during a portion of the year, they cannot support fish populations. During the brief time the pools contain water, and in the absence of fish, they become important breeding areas for a variety of amphibian species such as wood frogs (*Rana sylvatica*) and spotted salamanders (*Ambystoma maculatum*), many of which breed solely in vernal pools. The ponds are scattered over roughly 200 acres located just within the Michaux State Forest boundary. These ponds are found within a young red maple-mixed hardwood forest with many successional species. The small size of the trees, along with the prominence of successional tree species, suggests that this forest has likely been harvested within the last 30-50 years.

Several good-quality populations of an S1 PA plant species of concern, the **Lance-leaved Loosestrife** (*Lysimachia hybrida*) occur at the edge of the open zone of many of these ponds. Only a few of these plants were in flower. Many showed evidence of herbivory. These ponds include canopy trees such as Red Maple, Pin Oak and Black Gum. A shrub zone rings most of the ponds and is composed of Highbush Blueberry, Winterberry Holly, Pinxter-flower, Red Chokeberry, Scrub Oak, Greenbriar and the introduced invasive shrub species Alder Buckthorn. Herbaceous species associated with the central zone of many of the ponds includes Smartweeds (*Polygonum punctatum*, *P. caespitosum*, *P. hydropiperoides*), Dwarf St. John's-wort, Primrose Violet, Wool-grass, Mad-dog Skullcap, Sedges (*Carex lupulina*, *C. vesicaria*, *C. festucacea*), Panic Grasses (*Panicum acuminatum*, *P. rigidulum*), and Pale Meadowgrass.

Threats & Disturbances

This site is still recovering from relatively recent logging in the surrounding area. The proximity of these ponds to residential development may lead to abuses such as dumping of household waste, lawn clippings and other debris. The ponds may also be perceived as mosquito breeding areas, with accompanying demands for pesticide application to reduce insect populations. Introduced invasive species, especially Alder Buckthorn, are dominant in the shrub layer around the ponds, and threaten the natural character and diversity of this site. Herbivory by deer poses a threat to the populations of Lance-leaved Loosestrife. The increased use of All Terrain Vehicles (ATVs) in public forest property poses a potential threat to the site.

Conservation Recommendations

Logging within this portion of the forest should be avoided due to the numerous ponds scattered over this 200-acre area. An undisturbed forested buffer between nearby residences and the ponds should be established, and additional buffer should be acquired if the opportunity becomes available. The site should be monitored for ATV traffic, and trails blocked as they appear. Aquatic pesticide applications for mosquito control should be avoided in these ponds, as this would disrupt the food cycle necessary to

(Washington Township continued)

maintain amphibian populations. The biggest threat to the ponds appears to be the dense stands of the invasive shrub species, alder buckthorn. Control of this introduced plant pest may be necessary to protect the diversity of this natural community. Deer hunting should be encouraged in the area to reduce herbivory pressure at this site. Additional surveys for species of concern in this area are encouraged.

HOOVER SPRING (Washington Township)

This site contains an unknown quality population of a **G4Q Pennsylvania animal species of concern**. An abundant population of this species was found in a stream with a moderate volume spring, cobble/gravel substrate, and dense areas of submerged aquatic vegetation. Hoover Spring serves as a tributary to Red Run. A portion of the stream is tree-shaded, but a significant portion of the stream is open and mowed right up to the edge. Surrounding land use to the stream includes residential, wooded, small business, and transportation.

Threats and Disturbances

Threats to the population include changes in hydrology and water temperatures (warming), development, and water pollution from lawn. Disturbances include release of chlorine from the water treatment shed.

Conservation Recommendations

It is recommended that further surveys of this species be conducted in nearby springs to determine the extent of the population. It is recommended that this spring be protected from pollution to protect the population. It is also recommended that some areas of this spring be used in the Pennsylvania's Department of Environmental Protection's stream releaf program;

(<http://www.dep.state.pa.us/dep/deputate/watermgt/WC/Subjects/StreamReLeaf/default.htm>).

This program could assist in replanting critical buffers along this stream to prevent warming and maintain the population of this species.

MAKEY RUN PONDS (Washington Township)

This site contains a fair to good quality population of **Northeastern Bulrush** (*Scirpus ancistrochaetus*), a G3 S3 Pennsylvania plant species of concern. This species was found in wooded ponds along the headwaters of Makey Run. This area also contains several temporary ponds making up an **Ephemeral-fluctuating Pool Natural Community**. This area contains very important habitat for dragonflies, damselflies, and amphibians.

Threats and Disturbances

This site is still recovering from relatively recent logging in the surrounding area. The ponds may also be perceived as mosquito breeding areas, with accompanying demands for pesticide application to reduce insect populations. Other disturbances include foot traffic, heavy deer overbrowsing and alteration of hydrology of the pools.

Conservation Recommendations

Future logging within this portion of the forest should be avoided due to the numerous ponds scattered over the area. An undisturbed forested buffer between nearby residences and the pond area should be established, and additional buffer should be acquired if the opportunity becomes available. The site should be monitored for ATV traffic, and trails near the ponds blocked as they appear. Aquatic pesticide applications for mosquito control should be avoided in these ponds, as this would disrupt the food cycle necessary to maintain amphibian populations. Deer hunting should be encouraged in the area to reduce herbivory pressure at this site. Additional surveys for species of

(Washington Township continued)

concern in this area are encouraged. The vernal pools as a whole are of great importance to a good diversity of wildlife such as amphibians, dragonflies, and other invertebrates.

NEEDY CAVE (Washington Township)

This site contains three animal species of concern. Specimens of a **S2S3 animal species of concern**, and two separate **S1 animal species of concern** were documented in a complex cave system.

Threats and Disturbances

Hydrologic changes could jeopardize the protection of these species of concern.

Conservation Recommendations

The establishment of forested buffers around the cave opening can help protect the site from non-point sources of pollution. It is recommended that this site not be hydrologically altered for the protection of these species of concern. More surveys of these species are needed to better assess the population.

NUNNERY SPRING (Quincy and Washington Townships)

This site contains an unknown quality population of a **G4Q Pennsylvania animal species of concern**. This species was found in a Watercress-dominated, spring-fed stream in an agricultural/residential setting. This and the site above are the only known populations of this species in the state. Associated species included Rainbow Trout (*Onchorynchos mykiss*), Pearl Dace (*Margariscus margarita*), White Sucker (*Catostomus commersoni*), Crayfish and Trichoptera (*Caddisflies*). This spring flows into the West Branch of Antietam Creek and only a small section of the stream was sampled.

Threats and Disturbances

Direct threats to the population of the species would be changes in hydrology (warming of water), water pollution such as lawn runoff and chemicals, and agricultural runoff. Disturbances include lack of a forested buffer, mowing right up to edge of the stream, and nearby agriculture.

Conservation Recommendations

It is recommended that further surveys of this species be conducted in nearby springs to determine the extent of the population. It is recommended that this spring be protected from pollution. It is also recommended that some areas of this spring be used in the Pennsylvania's Department of Environmental Protections "Stream Releaf" program. This program could assist in replanting critical buffers along this stream to prevent warming and maintain the population of this species.

WAYNECASTLE OLD FIELD HABITAT (Antrim and Washington Townships)

This site contains a fair to good quality population of **Lance-leaved Buckthorn** (*Rhamnus lanceolata*), an S1 Pennsylvania plant species of concern, and a small population of a **Sedge** (*Carex shortiana*), an S3 plant species of concern. The **Lance-leaved Buckthorn** population is located in an old-field habitat on a gently undulating terrain with exposed limestone bedrock. This species is thriving amid extensive competition from invasive species. The successional habitat maintained by the regimen of infrequent mowing at this site helps provide the habitat necessary for the continued success of this species.

(Washington Township continued)

The rare **sedge** species found at this site (*Carex shortiana*) was growing in a moist, graminoid dominated pasture with a limestone substrate. The dominant species are exotic grasses such as orchard grass, smooth brome grass and blue grasses pasture appears to have only occasional grazing.

The disturbance from infrequent mowing or grazing is likely beneficial for this species. Some of the land at this site is in the Conservation Reserve Enhancement Program (CREP). The agricultural practices encouraged under this program, such as agricultural filter strips and forested buffers help protect streams, lakes, and rivers from sedimentation and agricultural runoff, as well as provide valuable habitat for common and uncommon plants and animals.

Threats and Disturbances

The spread of exotic plant species, and expanding suburban development pressure are the greatest threats to the species of concern at this site. Continued succession from a young, old-field habitat to a more mature forest will also tend to decrease the amount of habitat suitable for these species.

Conservation Recommendations

The agricultural practices encouraged under the CREP program, such as the infrequent mowing and forested buffer strips, help provide the successional habitat necessary for these species. A carefully designed and executed prescribed burn regimen would also help reduce the invasive species present while rejuvenating the habitat of this site. Additional surveys for species of concern in this area are encouraged.

ZULLINGER SPRING (Washington Township)

This site contains an undetermined quality population of a **G4Q Pennsylvania animal species of concern**. The population of this species was found in an unnamed tributary to West Branch Antietam Creek. This is a small spring run with gravel/silt substrate and dense water-cress beds in an agricultural setting. This spring has some bank erosion and channelization and very little shade. The spring is in poor condition and is somewhat degraded. Shade trees include Sycamore, Tuliptree and Black Walnut.

Threats and Disturbances

Threats to this population include herbicides and pesticides from agricultural field, development, changes in hydrology, and additional sedimentation from bank erosion or from a farm field. Disturbances include stream bank erosion and channelization.

Conservation Recommendations

It is recommended that further surveys of this species be conducted in nearby springs to determine the extent of the population. It is recommended that this spring be protected from pollution to protect the population. It is also recommended that some areas of this spring be used in the Pennsylvania's Department of Environmental Protections stream releaf program:

(<http://www.dep.state.pa.us/dep/deputate/watermgt/WC/Subjects/StreamReLeaf/default.htm>).

This program could assist in replanting critical buffers along this stream to prevent warming and maintain the population of this species.

LOCALLY SIGNIFICANT SITE:

Happel's Meadow (Washington Township)

This **locally significant site** consists of a good-sized shrub swamp, and dry and wet meadows along Route 16 in Washington Township. This area is adjacent to a baseball/softball field but the overall quality of the site is not decreased from the proximity of the recreational field. Even though no plant species of concern were found at this site during this visit, the potential exists for plant species of concern. This site is deemed locally significant mainly due to the very good plant diversity and for being one of the few remaining good quality shrub swamps in Franklin County.

Threats and Disturbances

Threats and disturbances to this site include the recreational ball field and infringement of this field, invasive plant species, and hydrology changes due to Route 16.

Conservation Recommendations

Only minimal development is recommended around this shrub swamp. It is recommended that a forested buffer be left around much of the shrub swamp/wet meadow area to preserve the sensitive hydrology of the swamp.



The lance-leaved loosestrife (*Lysimachia hybrida*) is a G5, S1 plant species of concern found in several Ephemeral/fluctuating pools in Franklin County. Herbivory by deer and the degradation of these pond environments are potential threats to this species. (Photo: PA Science Office of The Nature Conservancy)

GLOSSARY

Acid Mine Drainage (AMD) – drainage flowing from or caused by surface mining, deep mining, or coal refuse piles that are typically highly acidic with elevated levels of dissolved metals (DEP).

Acidophilic – a plant that requires or prefers acidic soil conditions.

Alluvium – material such as sand, silt, or clay that is deposited on land by streams.

Anthracite- Dense, shiny coal that has a high carbon content and little volatile matter and burns with a clean flame. Also called *hard coal*.

Anthropogenic – human caused.

Aphid- Any of various small, soft-bodied insects of the family Aphididae that have mouthparts specially adapted for piercing and feed by sucking sap from plants. Also called *plant louse*.

ATV – all-terrain-vehicle.

Bedrock- The solid rock that underlies loose material, such as soil, sand, clay, or gravel.

Bt (*Bacillus thuringiensis*) – an insecticide, which is produced by the fermentation of a bacterium (Bt), used to control many caterpillar-type pests (e.g., gypsy moth).

Bog – a nutrient poor, acidic peatland that receives water primarily from direct rainfall with little or no input from groundwater or runoff; vegetation consists primarily of peat moss and ericaceous shrubs.

Calcareous- composed of, containing, or characteristic of calcium carbonate, calcium, or limestone; chalky.

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.

DBH – the diameter of a tree at breast height.

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.

Dimilin – a commercially produced, restricted-use insecticide containing diflubenzuron as the active ingredient. Diflubenzuron, which has been used as a method to control gypsy moth, interferes with chitin production during the early stages of certain insects (DCNR, Division of Pest Management).

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.

Ecosystem- an ecological community together with its environment, functioning as a unit.

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 sometime present a problem because they may out-compete native species.

Extant – currently in existence.

Fen- open-canopy peatland that has developed under the influence of basic-rich waters

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

Forb – non-grass herbaceous plant such as goldenrod.

Fragipan- a very dense soil layer that prevents water from draining quickly through the soil.

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.

Hemic – an organic soil in which the plant remains show a good degree of decomposition (between 1/3 and 2/3 of the fibers are still visible after rubbing the material between the fingers).

Hibernacula – a location where animals hibernate.

Hibernation –the period of winter inactivity during which time normal physiological processes are reduced and a significant decrease in body temperature occurs. In Pennsylvania, true hibernation is shown by woodchucks, jumping mice, and bats.

High-Quality Coldwater Fisheries (HQ-CWF)– DEP designation (PA Code, Chapter 93) for a stream or watershed that has excellent quality waters and environmental or other features that require special water quality protection.

Hydrology – water system of an area including both surface water and ground water.

Igneous-formed by solidification from a molten state. Used of rocks.

Kame – a short ridge or mound of sand and gravel deposited during the melting of glacial ice.

Kettle – a depression left in a mass of glacial drift, apparently formed by the melting of an isolated block of glacial ice.

Lepidoptera – moths and butterflies.

Listed species – species that is monitored and considered to be of concern by PNDI.

Littoral – the area where water meets land, the shoreline.

Mesic – moist, not saturated.

Minerotrophic – groundwater fed; influenced by water that has been in contact with bedrock or soil, and is richer in mineral content than rainwater.

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.

Neo-tropical- referring to the tropical locations in the new world; Mexico, Caribbean Islands, and Central America and parts of Northern South America.

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

Obligate species- able to exist or survive only in a particular environment or by assuming a particular role

Oligotrophic – poor to extremely poor in nutrients; typically describes dilute waters with low base metal ion concentrations.

Palustrine- describes wetlands; areas intermediate between aquatic and terrestrial habitats, supporting predominately hydrophytic vegetation, where conditions are at least periodically wet enough during the growing season to produced anaerobic soil conditions and thereby influence plant growth.

Peat – partially decomposed remains of plant material in which at least some of the plant parts are still distinguishable.

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).

PNHP – Pennsylvania Natural Heritage Program

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.

R-O-W – strip of land occupied or intended to be occupied by a street, crosswalk, railroad, electric transmission line, oil or gas pipeline, water main, sanitary or storm sewer line, or other special use.

Sapric – organic soils (muck) in which most of the plant material is decomposed and the original constituents cannot be recognized.

Sedge- grasslike herbaceous plant of the family *Cyperaceae*, especially members of the genus *Carex*.

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

Shrub - a perennial, woody plant that differs from a tree in its short stature (less than five meters in height) and typically multi-growth form.

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.

Subcanopy - in a forest community, the tops and branches of the small trees and tall shrubs that form a distinct layer beneath the high tree canopy and above the shrub layer (if present).

Swamp - a wooded wetland, intermittently or permanently flooded

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

Trilobite- any of numerous extinct marine arthropods of the class Trilobita, of the Paleozoic Era, having a segmented body divided by grooves into three vertical lobes and found as fossils throughout the world.

Understory – layer of shrubs and small trees between the herbaceous layer and the canopy.

Upland- sites with well-drained dry to mesic soils.

Wetlands- areas 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 (1995 DRAFT)

COMMUNITY NAME	MAP CODE	GLOBAL RANK*	STATE RANK*
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ESTUARINE COMMUNITIES

DEEPWATER SUBTIDAL COMMUNITY	EAA	G?	S1
SHALLOW-WATER SUBTIDAL COMMUNITY	EAB	G?	S1
FRESHWATER INTERTIDAL MUDFLAT	EBA	G3G4	S1
FRESHWATER INTERTIDAL MARSH	ECA	G3G4	S1

RIVERINE COMMUNITIES

LOW-GRADIENT EPHEMERAL/INTERMITTENT CREEK	RAA	G?	S5
LOW-GRADIENT CLEARWATER CREEK	RAB	G?	S3S4
LOW-GRADIENT CLEARWATER RIVER	RAC	G?	S2S3
LOW-GRADIENT BROWNWATER CREEK	RAD	G?	S2S3
MEDIUM-GRADIENT EPHEMERAL/INTERMITTENT CREEK	RBA	G?	S5
MEDIUM-GRADIENT CLEARWATER CREEK	RBB	G?	S3
MEDIUM-GRADIENT CLEARWATER RIVER	RBC	G?	S?
MEDIUM-GRADIENT BROWNWATER CREEK	RBD	G?	S3
HIGH-GRADIENT EPHEMERAL/INTERMITTENT CREEK	RCA	G?	S5
HIGH-GRADIENT CLEARWATER CREEK	RCB	G?	S3
HIGH-GRADIENT CLEARWATER RIVER	RCC	G?	S?
HIGH-GRADIENT BROWNWATER CREEK	RCD	G?	S?
WATERFALL AND PLUNGEPOOL	RDA	G?	S3S4
SPRING COMMUNITY	REA	G?	S1S2
SPRING RUN COMMUNITY	REB	G?	S1S2

LACUSTRINE

ACIDIC GLACIAL LAKE	LAAA	G?	S2S3
CALCAREOUS GLACIAL LAKE	LAAB	G?	S1
NONGLACIAL LAKE	LAB	G?	S2
ARTIFICIAL LAKE	LAC	*	*
NATURAL POND	LBA	G?	S2S3
ARTIFICIAL POND	LBB	*	*
STABLE NATURAL POOL	LCA	G?	S?
EPHEMERAL/FLUCTUATING NATURAL POOL	LCB	G?	S2
ARTIFICIAL POOL	LCC	*	*

EPHEMERAL/FLUCTUATING LIMESTONE SINKHOLE	LCD	G?	S1
<u>PALUSTRINE COMMUNITIES</u>			
ACIDIC BROADLEAF SWAMP	PAA	G5	S2S3
CIRCUMNEUTRAL BROADLEAF SWAMP	PAB	G?	S2S3
BOREAL CONIFER SWAMP	PAC	G?	S3
NORTHERN CONIFER SWAMP	PAD	G?	S3S4
BROADLEAF-CONIFER SWAMP	PAE	G?	S3S4
FLOODPLAIN SWAMP	PAF	G?	S1
EASTERN CALCAREOUS SEEPAGE SWAMP	PAG	G?	S1
ACIDIC SHRUB SWAMP	PAH	G5	S3
CIRCUMNEUTRAL SHRUB SWAMP	PAJ	G?	S3
GRAMINOID MARSH	PBA	G?	S3
ROBUST EMERGENT MARSH	PBB	G?	S2
MIXED GRAMINOID-ROBUST EMERGENT MARSH	PBC	G?	S2S3
CALCAREOUS MARSH	PBD	G?	S1
OLIGOTROPHIC GLACIAL KETTLEHOLE BOG	PCAA	G?	S3
WEAKLY MINEROTROPHIC LAKESIDE BOG	PCAB	G?	S2
NONGLACIAL BOG	PCB	G?	S3
RECONSTITUTED BOG	PCC	*	*
POOR (GRAMINOID) FEN	PCD	G?	S1
SHRUB (CALCAREOUS) FEN	PDA	G2G3	S1
BASIN GRAMINOID-FORB (CALCAREOUS) FEN	PDB	G?	S1
HILLSIDE GRAMINOID-FORB (CALCAREOUS) FEN	PDC	G?	S1
NORTHERN APPALACHIAN CIRCUMNEUTRAL SEEP	PEA	G?	S3?
NORTHERN APPALACHIAN CALCAREOUS SEEP	PEB	G?	S1
NORTHERN APPALACHIAN ACIDIC SEEP	PEC	G?	S3?
RIVERSIDE SEEP	PED	G?	S2?
<u>TERRESTRIAL COMMUNITIES</u>			
NORTHERN CONIFER FOREST	TBA	G5	S3S4
NORTHERN HARDWOOD (DECIDUOUS) FOREST	TBB	G?	S3S4
NORTHERN HARDWOOD-CONIFER FOREST	TBC	G?	S3
XERIC CENTRAL HARDWOOD (DECIDUOUS) FOREST	TCA	G?	S5
XERIC CENTRAL CONIFER FOREST	TCB	G?	S3S4
XERIC CENTRAL HARDWOOD-CONIFER FOREST	TCC	G?	S3
RIDGETOP DWARF-TREE FOREST	TCD	G4	S2S3
DRY-MESIC ACIDIC CENTRAL FOREST	TCE	G?	S5
DRY-MESIC CALCAREOUS CENTRAL FOREST	TCF	G?	S2S3
MESIC CENTRAL FOREST	TCG	G?	S2
TALUS SLOPE FOREST	TCH	G?	S2?
COASTAL PLAIN FOREST	TEA	G?	S1
FLOODPLAIN FOREST	TFA	G?	S2
RIVER GRAVEL COMMUNITY	TGA	G?	S4S5

MESIC SCRUB OAK-HEATH-PITCH PINE BARRENS	TCDA	G1	S1
EASTERN SERPENTINE BARRENS	THA	G2	S1
CENTRAL APPALACHIAN SHALE BARREN	THBA	G?	S1
NORTHERN APPALACHIAN SHALE BARREN	THBB	G?	S2
NORTHERN APPALACHIAN SAND BARREN	THC	G?	S?
NORTHERN APPALACHIAN BOULDER FIELD	THD	G?	S5
NORTHERN APPALACHIAN CALCAREOUS CLIFF	THE	G?	S2
NORTHERN APPALACHIAN ACIDIC CLIFF	THF	G?	S5
NORTHERN APPALACHIAN SHALE CLIFF	THG	G?	S2
RIVERSIDE OUTCROP/CLIFF	THJ	G?	S1S2
NORTHERN APPALACHIAN TALUS WOODLAND	TCHA	G?	S?
NORTHERN APPALACHIAN ACIDIC ROCKY SUMMIT	THK	G?	S2
NORTHERN APPALACHIAN CALCAREOUS ROCKY SUMMIT	THM	G?	S1
CALCAREOUS ROCKY SLOPE	TFG	G?	S?
CALCAREOUS RIVERSIDE OUTCROP	THH	G?	S1
LAKE SEDIMENT SLUMP	TGB	G?	S1
EASTERN GREAT LAKES BEACH COMMUNITY	TJA	G?	S?
EASTERN GREAT LAKES DUNE COMMUNITY	TJB	G?	S?
EASTERN GREAT LAKES SAND PLAINS COMMUNITY	TJC	G?	S?
EASTERN GREAT LAKES BLUFF/CLIFF COMMUNITY	TJD	G?	S?

SUBTERRANEAN COMMUNITIES

SOLUTION CAVE TERRESTRIAL COMMUNITY	SAA	G?	S3
SOLUTION CAVE AQUATIC COMMUNITY	SAB	G?	S3
TECTONIC CAVE COMMUNITY	SAC	G?	S3S4
TALUS CAVE COMMUNITY	SAD	G?	S2S4

DISTURBED COMMUNITIES

BARE SOIL	DAA	----
MEADOW/PASTURELAND	DAB	----
CULTIVATED LAND	DAC	----
SUCCESSIONAL FIELD	DAD	----
YOUNG MISCELLANEOUS FOREST	DAE	----
CONIFER PLANTATION	DAF	----

* 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:

EO RANK

COMMENTS:

DATA:

HABITAT

DESCRIPTION:

MISCELLANEOUS:

DATA SENSITIVITY:

OWNERCODE

**REASON FOR DATA
SENSITIVITY:**

OWNER

HABITAT SKETCH:

FEDERAL AND STATE STATUS, AND THE NATURE CONSERVANCY (PNHP) 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.
- 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.

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- Intermediate ranks may also be assigned.

APPENDIX VI: Special Plants and Animals of Franklin County

Animals of Special Concern Documented in Franklin County

Scientific Name	Common Name	PNHP Ranks		Status
		Global	State	
<i>Alasmidonta varicosa</i>	Brook Floater	G3	S2	N
<i>Bartramia longicauda</i>	Upland Sandpiper	G5	S1S2B	PT
<i>Caecidotea pricei</i>	Price's Cave Isopod	G3G4	S2S3	N
<i>Calycopis cecrops</i>	Red-banded Hairstreak	G5	S2S3	N
<i>Clemmys muhlenbergii</i>	Bog Turtle	G3	S2	PE
<i>Cottus sp 7</i>	Checkered Sculpin	G4Q	S?	N
<i>Crangonyx dearolfi</i>	Pennsylvania Cave Amphipod	G2G3	S1	N
<i>Crotalus horridus</i>	Timber Rattlesnake	G4	S3S4	PC
<i>Heterodon platirhinos</i>	Eastern Hognose Snake	G5	S3S4	N
<i>Lanius ludovicianus</i>	Loggerhead Shrike	G4T3Q	S?	PE
<i>Metaxaglaea semitaria</i>	Footpath Sallow Moth	G5	S2	N
<i>Myotis septentrionalis</i>	Northern Myotis	G4	S3B, S3N	N
<i>Neotoma magister</i>	Allegheny Woodrat	G3G4	S3	PT
<i>Papilo cresphontes</i>	Giant Swallowtail	G5	S2	N
<i>Pseudemys rubriventris</i>	Redbelly Turtle	G5	S2	PT
<i>Pseudotriton montanus</i>	Mud Salamander	G5	S1	PE
<i>Spiza americana</i>	Dickcissel	G5	S2B	PE
<i>Stygobromus biggersi</i>	Biggers' Cave Amphipod	G2G4	S1	N
<i>Stygobromus gracilipes</i>	Shenandoah Valley Cave Amphipod	G2G4	S1	N
<i>Tachopteryx thoreyi</i>	Thorey's Grayback Dragonfly	G4	S3	N
<i>Tyto alba</i>	Barn Owl	G5	S3B, S3N	PC

Plants of Special Concern Documented in Franklin County

Scientific Name	Common Name	PNHP Ranks		
		Global	State	
<i>Arabis patens</i>	Spreading Rockcress	G3	S2	N
<i>Asclepias variegata</i>	White Milkweed	G5	S1	TU
<i>Asplenium pinnatifidum</i>	Lobed Spleenwort	G4	S3	N
<i>Asplenium resiliens</i>	Black-stemmed Spleenwort	G5	S1	PE
<i>Bidens discoidea</i>	Small Beggar's Tick	G5	S3	N
<i>Bouteloua curtipendula</i>	Tall Gramma	G5	S2	PT
<i>Carex buxbaumii</i>	Brown Sedge	G5	S3	TU
<i>Carex prairea</i>	Prairie Sedge	G5?	S2	PT
<i>Carex shortiana</i>	Sedge	G5	S3	TU
<i>Carex typhina</i>	Cattail Sedge	G5	S2	PE
<i>Chrysogonum virginianum</i>	Green-and-Gold	G5	S1	PE
<i>Clematis viorna</i>	Leather Flower	G5	S1	PE
<i>Corallorhiza wisteriana</i>	Spring Coral Root	G5	S1	TU
<i>Dodecatheon meadia</i>	Jeweled Shooting-star	G?	S2	PT
<i>Eupatorium coelestinum</i>	Mistflower	G5	S3	N
<i>Euphorbia obtusata</i>	Blunt-leaved Spurge	G5	S1	PE
<i>Galium latifolium</i>	Purple Bedstraw	G5	S3	N
<i>Hydrophyllum macrophyllum</i>	Large-leaved Waterleaf	G5	S1	PE
<i>Hypericum stragulum</i>	St. Andrew's Cross	G5	S2	N
<i>Juncus arcticus var. littoralis</i>	Baltic Rush	G5T5	S2	PT
<i>Juncus biflorus</i>	Grass-leaved Rush	G5	S2	TU
<i>Juncus brachycarpus</i>	Short-fruited Rush	G4G5	S1	PE
<i>Lathyrus palustris</i>	Vetchling	G5	S1	N
<i>Listera smallii</i>	Kidney-leaved Twayblade	G4	S1	PE
<i>Lithospermum canescens</i>	Hoary Puccoon	G5	S2	N
<i>Lupinus perennis</i>	Lupine	G5	S3	PR
<i>Lysimachia hybrida</i>	Lance-leaved Loosestrife	G5	S1	N
<i>Matelea obliqua</i>	Oblique Milkvine	G4?	S1	PE
<i>Ophioglossum engelmannii</i>	Limestone Adder-tongue	G5	S1	N
<i>Opuntia humifusa</i>	Prickly Pear Cactus	G5	S3	PR
<i>Penstemon canescens</i>	Beard-tongue	G4	S3	N
<i>Pinus echinata</i>	Short-leaf Pine	G5	S1S2	N

Scientific Name	Common Name	PNHP Ranks		
		Global	State	
<i>Potamogeton oakesianus</i>	Oakes' Pondweed	G4	S1S2	N
<i>Ptelea trifoliata</i>	Common Hop-Tree	G5	S2	PT
<i>Quercus shumardii</i>	Shumard's Oak	G5	S1	PE
<i>Ranunculus ambigens</i>	Water-plaintain spearwort	G4	S3	N
<i>Ranunculus aquatilis var. diffusus</i>	White Water-Crowfoot	G5T5	S3	N
<i>Ranunculus fascicularis</i>	Tufted Buttercup	G5	S1S2	PE
<i>Rhamnus lanceolata</i>	Lance-leaved Buckthorn	G5	S1	PE
<i>Ruellia humilis</i>	Fringed-leaved Petunia	G5	S1	PE
<i>Ruellia strepens</i>	Limestone Petunia	G4G5	S1	PT
<i>Salix myricoides</i>	Broad-leaved Willow	G4	S2	N
<i>Samolus parviflorus</i>	Pineland pimpernel	G5	S2	TU
<i>Scirpus ancistrochaetus</i>	Northeastern Bulrush	G3	S3	PE
<i>Sedum telephioides</i>	Allegheny Stonecrop	G4	S3	PR
<i>Senecio antennariifolius</i>	Cat's-Paw Ragwort	G4	S1	PE
<i>Senna marilandica</i>	Wild Senna	G5	S1	TU
<i>Sida hermaphrodita</i>	Virginia Mallow	G2	S2	PE
<i>Solidago speciosa var. erecta</i>	Slender Goldenrod	G5	S1	PE
<i>Solidago speciosa var. speciosa</i>	Showy Goldenrod	G5T5?	SR	N
<i>Trifolium virginicum</i>	Kate's Mountain Clover	G3	S1	PE
<i>Woodwardia areolata</i>	Netted Chainfern	G5	S2	N

Natural Communities of Special Concern Documented in Franklin County

Natural Community Name	PNHP Ranks	
	Global	State
Ephemeral-fluctuating Pool Natural Community	G?	S3
Northern Appalachian Calcareous Rocky Summit Natural Community	G2?	S1
Rich hemlock-mesic hardwood forest Natural Community	G?	S2S3
Ridgetop Dwarf-Tree Forest Natural Community	G4	S2S3

APPENDIX VII: Plant and Bird Common Names and Scientific equivalents

1. Plant common names listed alphabetically with scientific equivalent
(Based on “The Vascular Flora of Pennsylvania” by Rhoads & Klein 1993)

Plant Common Name	Plant Scientific name
Alder Buckthorn	<i>Rhamnus frangula</i>
Alternate-leaved Dogwood	<i>Cornus alternifolia</i>
Alum-Root	<i>Heuchera pubescens</i>
American Beakgrain	<i>Diarrhena obovata</i>
American Beech	<i>Fagus grandifolia</i>
American Elder	<i>Sambucus canadensis</i>
American Elm	<i>Ulmus americana</i>
American Pennyroyal	<i>Hedeoma pulegioides</i>
Anise-root	<i>Osmorhiza longistylis</i>
Arrow-leaved Tearthumb	<i>Polygonum sagittatum</i>
Arrow-Wood	<i>Viburnum recognitum</i>
Ash	<i>Fraxinus sp.</i>
Asiatic Bittersweet	<i>Celastrus orbiculatus</i>
Asiatic Dayflower	<i>Commelina communis</i>
Autumn Olive	<i>Elaeagnus umbellata</i>
Basswood	<i>Tilia americana</i>
Bitternut Hickory	<i>Carya cordiformis</i>
Black Birch	<i>Betula lenta</i>
Black Cherry	<i>Prunus serotina</i>
Black Chokeberry	<i>Aronia melanocarpa</i>
Black Huckleberry	<i>Gaylussacia baccata</i>
Black Locust	<i>Robinia pseudoacacia</i>
Black Oak	<i>Quercus velutina</i>
Black Raspberry	<i>Rubus occidentalis</i>
Black Tupelo	<i>Nyssa sylvatica</i>
Black Walnut	<i>Juglans nigra</i>
Black Willow	<i>Salix nigra</i>
Black-Haw	<i>Viburnum prunifolium</i>
Bladdernut	<i>Staphylea trifolia</i>
Bladderwort	<i>Utricularia geminiscapa</i>
Bloodroot	<i>Sanguinaria canadensis</i>
Blue Chicory	<i>Cichorium intybus</i>
Blue Grasses	<i>Poa spp.</i>
Blueberries	<i>Vaccinium spp.</i>
Blunt-lobed Woodsia	<i>Woodsia obtusa</i>
Bottlebrush Grass	<i>Elymus hystrix</i>
Bouncing-Bet	<i>Saponaria officinalis</i>

Plant Common Name	Plant Scientific name
Box-Elder	<i>Acer negundo</i>
Brachyelytrum	<i>Brachyelytrum erectum</i>
Bracken Fern	<i>Pteridium aquilinum</i>
Bur Oak	<i>Quercus macrocarpa</i>
Burning-Bush	<i>Euonymus atropurpureus</i>
Bur-Reed	<i>Sparganium americanum</i>
Butternut	<i>Juglans cinerea</i>
Buttonbush	<i>Cephalanthus occidentalis</i>
Calico Aster	<i>Aster lateriflorus</i>
Canada Brome	<i>Bromus pubescens</i>
Cardinal Flower	<i>Lobelia cardinalis</i>
Catalpa	<i>Catalpa bignonioides</i>
Cattail	<i>Typha latifolia</i>
Chestnut Oak	<i>Quercus montana</i>
Choke Cherry	<i>Prunus virginiana</i>
Christmas Fern	<i>Polystichum acrostichoides</i>
Cinnamon Fern	<i>Osmunda cinnamomea</i>
Cinquefoil	<i>Potentilla canadensis</i>
Clearweed	<i>Pilea pumila</i>
Coltsfoot	<i>Tussilago farfara</i>
Common Blackberry	<i>Rubus allegheniensis</i>
Common Dittany	<i>Cunila origanoides</i>
Common Hairgrass	<i>Deschampsia flexuosa</i>
Common Milkweed	<i>Asclepias syriaca</i>
Cucumber-Tree	<i>Magnolia acuminata</i>
Cutgrass	<i>Leersia virginica</i>
Dame’s Rocket	<i>Hesperis matronalis</i>
Duckweed	<i>Lemna minor</i>
Dutchman’s-Breeches	<i>Dicentra cucullaria</i>
Dwarf St.-John’s-wort	<i>Hypericum mutilum</i>
Early Meadow-Rue	<i>Thalictrum dioicum</i>
Eastern Figwort	<i>Scrophularia marilandica</i>
Ebony Spleenwort	<i>Asplenium platyneuron</i>
English Ivy	<i>Hedera helix</i>
Evening Primrose	<i>Oenothera biennis</i>
False Nettle	<i>Boehmeria cylindrica</i>
False Solomon’s Seal	<i>Smilacina racemosa</i>

Plant Common Name	<i>Plant Scientific name</i>
Fescue	<i>Festuca elatior</i>
Flowering Dogwood	<i>Cornus florida</i>
Fly-Poison	<i>Amianthium muscaetoxicum</i>
Forked Chickweed	<i>Paronychia canadensis</i>
Fowl Mannagrass	<i>Glyceria striata</i>
Fox Grape	<i>Vitis labrusca</i>
Fragrant Sumac	<i>Rhus aromatica</i>
Frostgrape	<i>Vitis vulpina</i>
Garlic Mustard	<i>Alliaria petiolata</i>
Golden-Alexanders	<i>Zizia aurea</i>
Golden-club	<i>Orontium aquaticum</i>
Great Lobelia	<i>Lobelia siphilitica</i>
Greenbrier	<i>Smilax rotundifolia</i>
Gypsyweed	<i>Veronica officinalis</i>
Hackberry	<i>Celtis occidentalis</i>
Halberd-leaved Tearthumb	<i>Polygonum arifolium</i>
Hawthorns	<i>Crataegus spp.</i>
Hay-Scented Fern	<i>Dennstaedtia punctilobula</i>
Hemlock	<i>Tsuga canadensis</i>
Hickories	<i>Carya spp.</i>
Highbush Blueberry	<i>Vaccinium corymbosum</i>
Honeysuckle	<i>Lonicera spp.</i>
Hooked Crowfoot	<i>Ranunculus recurvatus</i>
Hop Hornbeam	<i>Ostrya virginiana</i>
Hornbeam	<i>Carpinus caroliniana</i>
Hornwort	<i>Ceratophyllum sp.</i>
Horse-nettle	<i>Solanum carolinense</i>
Huckleberries	<i>Gaylussacia spp.</i>
Japanese Barberry	<i>Berberis thunbergii</i>
Japanese Honeysuckle	<i>Lonicera japonica</i>
Jewelweed	<i>Impatiens sp.</i>
Joe-Pye-Weed	<i>Eupatorium fistulosum</i>
Kentucky Bluegrass	<i>Poa pratensis</i>
Lady's-thumb	<i>Polygonum persicaria</i>
Liverleaf	<i>Hepatica nobilis</i>
Longleaf Pondweed	<i>Potamogeton nodosus</i>
Low Sweet Blueberry	<i>Vaccinium angustifolium</i>
Lowbush Blueberry	<i>Vaccinium pallidum</i>
Mad-dog Skullcap	<i>Scutellaria lateriflora</i>
Maidenhair Spleenwort	<i>Asplenium trichomanes</i>
Mannagrass	<i>Glyceria acutiflora</i>
Maple-leaved Viburnum	<i>Viburnum acerifolium</i>
Marginal Shield Fern	<i>Dryopteris marginalis</i>
Marsh Bellflower	<i>Campanula aparinoides</i>

Plant Common Name	<i>Plant Scientific name</i>
Marsh-purslane	<i>Ludwigia palustris</i>
Meadow Fescue	<i>Festuca pratensis</i>
Meadow-Sweet	<i>Spiraea latifolia</i>
Mockernut Hickory	<i>Carya tomentosa</i>
Morrow's Honeysuckle	<i>Lonicera morrowii</i>
Mountain Laurel	<i>Kalmia latifolia</i>
Multiflora Rose	<i>Rosa multiflora</i>
New York Ironweed	<i>Vernonia noveboracensis</i>
Ninebark	<i>Physocarpus opulifolius</i>
Nodding fescue	<i>Festuca obtusa</i>
Northern Oatgrass	<i>Danthonia compressa</i>
Norway Maple	<i>Acer platanoides</i>
Orange Jewelweed	<i>Impatiens capensis</i>
Orchard Grass	<i>Dactylis glomerata</i>
Orpine	<i>Sedum sarmentosum</i>
Osage-Orange	<i>Maclura pomifera</i>
Oswego-Tea	<i>Monarda didyma</i>
Pale Meadowgrass	<i>Torreyochloa pallida</i>
Pale Meadowgrass	<i>Torreyochloa pallida</i>
Panic-Grass	<i>Panicum boscii</i>
Partridgeberry	<i>Mitchella repens</i>
Pasture Rose	<i>Rosa carolina</i>
Pawpaw	<i>Asimina triloba</i>
Persimmon	<i>Diospyros virginiana</i>
Pignut Hickory	<i>Carya glabra</i>
Pin Oak	<i>Quercus palustris</i>
Pinxter-Flower	<i>Rhododendron periclymenoides</i>
Pitch Pine	<i>Pinus rigida</i>
Poison Ivy	<i>Toxicodendron radicans</i>
Poison-Sumac	<i>Toxicodendron vernix</i>
Pokeweed	<i>Phytolacca americana</i>
Poverty Grass	<i>Danthonia spicata</i>
Prickly Ash	<i>Zanthoxylum americanum</i>
Primrose Violet	<i>Viola primulifolia</i>
Pussytoes	<i>Antennaria sp.</i>
Queen Anne's Lace	<i>Daucus carota</i>
Rattlesnake Mannagrass	<i>Glyceria canadensis</i>
Rattlesnake-Weed	<i>Hieracium venosum</i>
Red Ash	<i>Fraxinus pennsylvanica</i>
Red Cedar	<i>Juniperus virginiana</i>
Red Chokeberry	<i>Aronia arbutifolia</i>
Red Maple	<i>Acer rubrum</i>
Red Oak	<i>Quercus rubra</i>
Redbud	<i>Cercis canadensis</i>

Plant Common Name	<i>Plant Scientific name</i>
Reed Canary Grass	<i>Phalaris arundinacea</i>
Rock-Cap Fern	<i>Polypodium virginianum</i>
Rosebay	<i>Rhododendron maximum</i>
Rough Bluegrass	<i>Poa trivialis</i>
Royal Fern	<i>Osmunda regalis</i>
Rue-anemone	<i>Thalictrum thalictroides</i>
Rusty Woodsia	<i>Woodsia ilvensis</i>
Sassafras	<i>Sassafras albidum</i>
Sassafras	<i>Sassafras albidum</i>
Scarlet Oak	<i>Q. coccinea</i>
Scrub Oak	<i>Quercus ilicifolia</i>
Seedbox	<i>Ludwigia alternifolia</i>
Sensitive Fern	<i>Onoclea sensibilis</i>
Serviceberry	<i>Amelanchier arborea</i>
Shagbark Hickory	<i>Carya ovata</i>
Shellbark Hickory	<i>Carya laciniosa</i>
Shortleaf Pine	<i>Pinus echinata</i>
Silky Dogwood	<i>Cornus amomum</i>
Silver Maple	<i>Acer saccharinum</i>
Slippery Elm	<i>Ulmus rubra</i>
Smartweed	<i>Polygonum spp.</i>
Smooth Alder	<i>Alnus serrulata</i>
Smooth Brome Grass	<i>Bromus inermis</i>
Smooth Goldenrod	<i>Solidago gigantea</i>
Smooth Sumac	<i>Rhus glabra</i>
Soft Rush	<i>Juncus effusus</i>
Solomon's Seal	<i>Polygonatum biflorum</i>
Spicebush	<i>Lindera benzoin</i>
Spotted Knapweed	<i>Centaurea maculosa</i>
Spotted St. John's-Wort	<i>Hypericum punctatum</i>
Staghorn Sumac	<i>Rhus typhina</i>
Stiltgrass	<i>Microstegium vimineum</i>
Stinging Nettle	<i>Urtica dioica</i>
Striped Maple	<i>Acer pensylvanicum</i>
Sugar Maple	<i>Acer saccharum</i>
Swamp Dogwood	<i>Cornus racemosa</i>
Swamp Milkweed	<i>Asclepias incarnata</i>
Swamp White Oak	<i>Quercus bicolor</i>
Sweet Cherry	<i>Prunus avium</i>
Sweet-scented Bedstraw	<i>Galium triflorum</i>
Sycamore	<i>Platanus occidentalis</i>
Table Mountain Pine	<i>Pinus pungens</i>
Teaberry	<i>Gaultheria procumbens</i>
Thimbleflower	<i>Anemone virginiana</i>

Plant Common Name	<i>Plant Scientific name</i>
Three-Way Sedge	<i>Dulichium arundinaceum</i>
Tickseed	<i>Bidens sp.</i>
Tick-trefoil	<i>Desmodium sp.</i>
Tree-Of-Heaven	<i>Ailanthus altissima</i>
Trout-Lily	<i>Erythronium americanum</i>
Tufted Hairgrass	<i>Deschampsia cespitosa</i>
Tulip Poplar	<i>Liriodendron tulipifera</i>
Virgin's Bower	<i>Clematis virginiana</i>
Virginia Creeper	<i>Parthenocissus quinquefolia</i>
Virginia Pine	<i>Pinus virginiana</i>
Virginia Snake-root	<i>Aristolochia serpentaria</i>
Walking Fern	<i>Asplenium rhizophyllum</i>
Water Cress	<i>Nasturtium officinale</i>
Water-Stargrass	<i>Zosterella dubia</i>
Waterweed	<i>Elodea nuttallii</i>
White Ash	<i>Fraxinus americana</i>
White Aster	<i>Aster divaricatus</i>
White Avens	<i>Geum canadense</i>
White Champion	<i>Silene alba</i>
White Oak	<i>Quercus alba</i>
White Pine	<i>Pinus strobus</i>
White Vervain	<i>Verbena urticifolia</i>
White Wood Aster	<i>Aster divaricatus</i>
White-snakeroot	<i>Eupatorium rugosum</i>
Wild Bergamot	<i>Monarda fistulosa</i>
Wild Columbine	<i>Aquilegia canadensis</i>
Wild Ginger	<i>Asarum canadense</i>
Wild Hydrangea	<i>Hydrangea arborescens</i>
Wild Licorice	<i>Galium circaezans</i>
Wild Sarsaparilla	<i>Aralia nudicaulis</i>
Wild Stonecrop	<i>Sedum ternatum</i>
Wild Yam	<i>Dioscorea quaternata</i>
Willow	<i>Salix spp.</i>
Winged Monkey-Flower	<i>Mimulus alatus</i>
Wingstem	<i>Verbesina alternifolia</i>
Winterberry Holly	<i>Ilex verticillata</i>
Witch Hazel	<i>Hamamelis virginiana</i>
Wood Nettle	<i>Laportea canadensis</i>
Woodland Dropseed	<i>Muhlenbergia tenuiflora</i>
Woolgrass	<i>Scirpus cyperinus</i>
Yellow Birch	<i>Betula alleghaniensis</i>
Yellow Oak	<i>Quercus muhlenbergii</i>
Yellow Pond-Lily	<i>Nuphar lutea</i>
Yellow-flowered sanicle	<i>Sanicula odorata</i>

Appendix VIII (continued): 2. Plant scientific names listed alphabetically with common equivalent
(Based on “The Vascular Flora of Pennsylvania” by Rhoads & Klein 1993)

Plant Scientific name	Plant Common Name
<i>Acer negundo</i>	Box-Elder
<i>Acer pensylvanicum</i>	Striped Maple
<i>Acer platanoides</i>	Norway Maple
<i>Acer rubrum</i>	Red Maple
<i>Acer saccharinum</i>	Silver Maple
<i>Acer saccharum</i>	Sugar Maple
<i>Ailanthus altissima</i>	Tree-Of-Heaven
<i>Alliaria petiolata</i>	Garlic Mustard
<i>Alnus serrulata</i>	Smooth Alder
<i>Alnus</i> spp.	Alders
<i>Amelanchier arborea</i>	Serviceberry
<i>Amianthium muscaetoxicum</i>	Fly-Poison
<i>Anemone virginiana</i>	Thimbleflower
<i>Antennaria</i> spp.	Pussytoes
<i>Aquilegia canadensis</i>	Wild Columbine
<i>Aralia nudicaulis</i>	Wild Sarsaparilla
<i>Aristolochia serpentaria</i>	Virginia Snake-root
<i>Aronia arbutifolia</i>	Red Chokeberry
<i>Aronia melanocarpa</i>	Black Chokeberry
<i>Asarum canadense</i>	Wild Ginger
<i>Asclepias incarnata</i>	Swamp Milkweed
<i>Asclepias syriaca</i>	Common Milkweed
<i>Asimina triloba</i>	Pawpaw
<i>Asplenium platyneuron</i>	Ebony Spleenwort
<i>Asplenium rhizophyllum</i>	Walking Fern
<i>Asplenium trichomanes</i>	Maidenhair Spleenwort
<i>Aster divaricatus</i>	White Wood Aster
<i>Aster lateriflorus</i>	Calico Aster
<i>Berberis thunbergii</i>	Japanese Barberry
<i>Betula alleghaniensis</i>	Yellow Birch
<i>Betula lenta</i>	Black Birch
<i>Bidens</i> sp.	Tickseed
<i>Boehmeria cylindrica</i>	False Nettle
<i>Brachyelytrum erectum</i>	Brachyelytrum
<i>Bromus inermis</i>	Smooth Brome Grass
<i>Bromus pubescens</i>	Canada Brome
<i>Campanula aparinoides</i>	Marsh Bellflower
<i>Carpinus caroliniana</i>	Hornbeam
<i>Carya cordiformis</i>	Bitternut Hickory

Plant Scientific name	Plant Common Name
<i>Carya glabra</i>	Pignut Hickory
<i>Carya laciniosa</i>	Shellbark Hickory
<i>Carya ovata</i>	Shagbark Hickory
<i>Carya</i> spp.	Hickories
<i>Carya tomentosa</i>	Mockernut Hickory
<i>Catalpa bignonioides</i>	Catalpa
<i>Celastrus orbiculatus</i>	Asiatic Bittersweet
<i>Celtis occidentalis</i>	Hackberry
<i>Centaurea maculosa</i>	Spotted Knapweed
<i>Cephalanthus occidentalis</i>	Buttonbush
<i>Ceratophyllum</i> sp.	Hornwort
<i>Cercis canadensis</i>	Redbud
<i>Cichorium intybus</i>	Blue Chicory
<i>Clematis virginiana</i>	Virgin’s Bower
<i>Commelina communis</i>	Asiatic Dayflower
<i>Cornus alternifolia</i>	Alternate-leaved Dogwood
<i>Cornus amomum</i>	Silky Dogwood
<i>Cornus florida</i>	Flowering Dogwood
<i>Cornus racemosa</i>	Swamp Dogwood
<i>Crataegus</i> spp.	Hawthorns
<i>Cunila origanoides</i>	Common Dittany
<i>Dactylis glomerata</i>	Orchard Grass
<i>Danthonia compressa</i>	Northern Oatgrass
<i>Danthonia spicata</i>	Poverty Grass
<i>Daucus carota</i>	Queen Anne’s Lace
<i>Dennstaedtia punctilobula</i>	Hay-Scented Fern
<i>Deschampsia cespitosa</i>	Tufted Hairgrass
<i>Deschampsia flexuosa</i>	Common Hairgrass
<i>Desmodium</i> sp.	Tick-trefoil
<i>Diarrhena obovata</i>	American Beakgrain
<i>Dicentra cucullaria</i>	Dutchman’s-Breeches
<i>Dioscorea quaternata</i>	Wild Yam
<i>Diospyros virginiana</i>	Persimmon
<i>Dryopteris marginalis</i>	Marginal Shield Fern
<i>Dulichium arundinaceum</i>	Three-Way Sedge
<i>Elaeagnus umbellata</i>	Autumn Olive
<i>Elodea nuttallii</i>	Waterweed
<i>Elymus hystrix</i>	Bottlebrush Grass
<i>Erythronium americanum</i>	Trout-Lily

Plant Scientific name	Plant Common Name
<i>Euonymus atropurpureus</i>	Burning-Bush
<i>Eupatorium fistulosum</i>	Joe-Pye-Weed
<i>Eupatorium rugosum</i>	White-snakeroot
<i>Fagus grandifolia</i>	American Beech
<i>Festuca elatior</i>	Fescue
<i>Festuca obtusa</i>	Nodding fescue
<i>Festuca pratensis</i>	Meadow Fescue
<i>Fraxinus americana</i>	White Ash
<i>Fraxinus pennsylvanica</i>	Red Ash
<i>Fraxinus sp.</i>	Ash
<i>Galium circaezans</i>	Wild Licorice
<i>Galium triflorum</i>	Sweet-scented Bedstraw
<i>Gaultheria procumbens</i>	Teaberry
<i>Gaylussacia baccata</i>	Black Huckleberry
<i>Gaylussacia spp.</i>	Huckleberries
<i>Geum canadense</i>	White Avens
<i>Glyceria acutiflora</i>	Mannagrass
<i>Glyceria canadensis</i>	Rattlesnake Mannagrass
<i>Glyceria striata</i>	Fowl Mannagrass
<i>Hamamelis virginiana</i>	Witch-Hazel
<i>Hedeoma pulegioides</i>	American Pennyroyal
<i>Hedera helix</i>	English Ivy
<i>Hepatica nobilis</i>	Liverleaf
<i>Hesperis matronalis</i>	Dame's Rocket
<i>Heuchera pubescens</i>	Alum-Root
<i>Hieracium venosum</i>	Rattlesnake-Weed
<i>Hydrangea arborescens</i>	Wild Hydrangea
<i>Hypericum mutilum</i>	Dwarf St.-John's-wort
<i>Hypericum punctatum</i>	Spotted St. John's-Wort
<i>Ilex verticillata</i>	Winterberry Holly
<i>Impatiens capensis</i>	Orange Jewelweed
<i>Impatiens sp.</i>	Jewelweed
<i>Juglans cinerea</i>	Butternut
<i>Juglans nigra</i>	Black Walnut
<i>Juncus effusus</i>	Soft Rush
<i>Juniperus virginiana</i>	Red Cedar
<i>Kalmia latifolia</i>	Mountain Laurel
<i>Laportea canadensis</i>	Wood Nettle
<i>Leersia virginica</i>	Cutgrass
<i>Lemna minor</i>	Duckweed
<i>Lindera benzoin</i>	Spicebush
<i>Liriodendron tulipifera</i>	Tulip Poplar
<i>Lobelia cardinalis</i>	Cardinal Flower
<i>Lobelia siphilitica</i>	Great Lobelia

Plant Scientific name	Plant Common Name
<i>Lonicera japonica</i>	Japanese Honeysuckle
<i>Lonicera morrowii</i>	Morrow's Honeysuckle
<i>Lonicera spp.</i>	Honeysuckle
<i>Ludwigia alternifolia</i>	Seedbox
<i>Ludwigia palustris</i>	Marsh-purslane
<i>Lythrum salicaria</i>	Purple Loosestrife
<i>Maclura pomifera</i>	Osage-Orange
<i>Magnolia acuminata</i>	Cucumber-Tree
<i>Microstegium vimineum</i>	Stiltgrass
<i>Mimulus alatus</i>	Winged Monkey-Flower
<i>Mitchella repens</i>	Partridgeberry
<i>Monarda didyma</i>	Oswego-Tea
<i>Monarda fistulosa</i>	Wild Bergamot
<i>Muhlenbergia tenuiflora</i>	Woodland Dropseed
<i>Nasturtium officinale</i>	Water Cress
<i>Nuphar lutea</i>	Yellow Pond-Lily
<i>Nyssa sylvatica</i>	Black Tupelo
<i>Oenothera biennis</i>	Evening Primrose
<i>Onoclea sensibilis</i>	Sensitive Fern
<i>Orontium aquaticum</i>	Golden-club
<i>Osmorhiza longistylis</i>	Anise-root
<i>Osmunda cinnamomea</i>	Cinnamon Fern
<i>Osmunda regalis</i>	Royal Fern
<i>Ostrya virginiana</i>	Hop Hornbeam
<i>Panicum boscii</i>	Panic-Grass
<i>Paronychia canadensis</i>	Forked Chickweed
<i>Parthenocissus quinquefolia</i>	Virginia Creeper
<i>Phalaris arundinacea</i>	Reed Canary Grass
<i>Phragmites australis</i>	Common Reed
<i>Physocarpus opulifolius</i>	Ninebark
<i>Phytolacca americana</i>	Pokeweed
<i>Pilea pumila</i>	Clearweed
<i>Pinus echinata</i>	Shortleaf Pine
<i>Pinus pungens</i>	Table Mountain Pine
<i>Pinus rigida</i>	Pitch Pine
<i>Pinus strobus</i>	White Pine
<i>Pinus virginiana</i>	Virginia Pine
<i>Platanus occidentalis</i>	Sycamore
<i>Poa pratensis</i>	Kentucky Bluegrass
<i>Poa spp.</i>	Blue Grasses
<i>Poa trivialis</i>	Rough Bluegrass
<i>Polygonatum biflorum</i>	Solomon's Seal
<i>Polygonum arifolium</i>	Halberd-leaved Tearthumb
<i>Polygonum cuspidatum</i>	Japanese Knotweed

Plant Scientific name	Plant Common Name
<i>Polygonum perfoliatum</i>	Mile-a-minute Weed
<i>Polygonum persicaria</i>	Lady's-thumb
<i>Polygonum sagittatum</i>	Arrow-leafed Tearthumb
<i>Polygonum</i> spp.	Smartweed
<i>Polypodium virginianum</i>	Rock-Cap Fern
<i>Polystichum acrostichoides</i>	Christmas Fern
<i>Potamogeton nodosus</i>	Longleaf Pondweed
<i>Potentilla canadensis</i>	Cinquefoil
<i>Prunus avium</i>	Sweet Cherry
<i>Prunus serotina</i>	Black Cherry
<i>Prunus virginiana</i>	Choke Cherry
<i>Pteridium aquilinum</i>	Bracken Fern
<i>Q. coccinea</i>	Scarlet Oak
<i>Quercus alba</i>	White Oak
<i>Quercus bicolor</i>	Swamp White Oak
<i>Quercus ilicifolia</i>	Scrub Oak
<i>Quercus macrocarpa</i>	Bur Oak
<i>Quercus montana</i>	Chestnut Oak
<i>Quercus muhlenbergii</i>	Yellow Oak
<i>Quercus palustris</i>	Pin Oak
<i>Quercus rubra</i>	Red Oak
<i>Quercus velutina</i>	Black Oak
<i>Ranunculus recurvatus</i>	Hooked Crowfoot
<i>Rhamnus frangula</i>	Alder Buckthorn
<i>Rhododendron maximum</i>	Rosebay
<i>Rhododendron periclymenoides</i>	Pinxter-Flower
<i>Rhus aromatica</i>	Fragrant Sumac
<i>Rhus glabra</i>	Smooth Sumac
<i>Rhus typhina</i>	Staghorn Sumac
<i>Robinia pseudoacacia</i>	Black Locust
<i>Rosa carolina</i>	Pasture Rose
<i>Rosa multiflora</i>	Multiflora Rose
<i>Rosa palustris</i>	Swamp Rose
<i>Rubus allegheniensis</i>	Common Blackberry
<i>Rubus occidentalis</i>	Black Raspberry
<i>Salix nigra</i>	Black Willow
<i>Salix</i> spp.	Willow
<i>Sambucus canadensis</i>	American Elder
<i>Sanguinaria canadensis</i>	Bloodroot
<i>Sanicula odorata</i>	Yellow-flowered sanicle
<i>Saponaria officinalis</i>	Bouncing-Bet
<i>Sassafras albidum</i>	Sassafras
<i>Scirpus cyperinus</i>	Woolgrass
<i>Scrophularia marilandica</i>	Eastern Figwort

Plant Scientific name	Plant Common Name
<i>Scutellaria lateriflora</i>	Mad-dog Skullcap
<i>Sedum sarmentosum</i>	Orpine
<i>Sedum ternatum</i>	Wild Stonecrop
<i>Silene alba</i>	White Campion
<i>Smilacina racemosa</i>	False Solomon's Seal
<i>Smilax rotundifolia</i>	Greenbrier
<i>Solanum carolinense</i>	Horse-nettle
<i>Solidago gigantea</i>	Smooth Goldenrod
<i>Sparganium americanum</i>	Bur-Reed
<i>Spiraea latifolia</i>	Meadow-Sweet
<i>Staphylea trifolia</i>	Bladdernut
<i>Symplocarpus foetidus</i>	Skunk Cabbage
<i>Thalictrum dioicum</i>	Early Meadow-Rue
<i>Thalictrum thalictroides</i>	Rue-anemone
<i>Tilia americana</i>	Basswood
<i>Torreyochloa pallida</i>	Pale Meadowgrass
<i>Toxicodendron radicans</i>	Poison Ivy
<i>Toxicodendron vernix</i>	Poison-Sumac
<i>Tsuga canadensis</i>	Hemlock
<i>Tussilago farfara</i>	Coltsfoot
<i>Typha latifolia</i>	Cattail
<i>Ulmus americana</i>	American Elm
<i>Ulmus rubra</i>	Slippery Elm
<i>Urtica dioica</i>	Stinging Nettle
<i>Utricularia geminiscapa</i>	Bladderwort
<i>Vaccinium angustifolium</i>	Low Sweet Blueberry
<i>Vaccinium corymbosum</i>	Highbush Blueberry
<i>Vaccinium pallidum</i>	Lowbush Blueberry
<i>Vaccinium</i> spp.	Blueberries
<i>Verbena urticifolia</i>	White Vervain
<i>Verbesina alternifolia</i>	Wingstem
<i>Vernonia noveboracensis</i>	New York Ironweed
<i>Veronica officinalis</i>	Common Speedwell
<i>Viburnum acerifolium</i>	Maple-leaved Viburnum
<i>Viburnum prunifolium</i>	Black-Haw
<i>Viburnum recognitum</i>	Arrow-Wood
<i>Viola primulifolia</i>	Primrose Violet
<i>Vitis labrusca</i>	Fox Grape
<i>Vitis vulpina</i>	Frost Grape
<i>Woodsia ilvensis</i>	Rusty Woodsia
<i>Woodsia obtusa</i>	Blunt-lobed Woodsia
<i>Zanthoxylum americanum</i>	Prickly Ash
<i>Zizia aurea</i>	Golden-Alexanders
<i>Zosterella dubia</i>	Water-Stargrass

Appendix VIII (continued): 3. Bird common names listed alphabetically with scientific equivalent
 (Based on “Atlas of Breeding Birds in Pennsylvania” by D.W. Brauning, ed. 1992

Bird Common Name	Bird Scientific Name
American Goldfinch	<i>Carduelis tristis</i>
American Kestrel	<i>Falco sparverius</i>
American Robin	<i>Turdus migratorius</i>
Barn Swallow	<i>Hirundo rustica</i>
Belted Kingfisher	<i>Ceryle alcyon</i>
Blue Jay	<i>Cyanocitta cristata</i>
Bobolink	<i>Dolichonyx oryzivorus</i>
Canada Goose	<i>Branta canadensis</i>
Chestnut-sided Warbler	<i>Dendroica pensylvanica</i>
Chipping Sparrow	<i>Spizella passerina</i>
Common Yellowthroat	<i>Geothlysis trichas</i>
Dickcissel	<i>Spiza americana</i>
Downy Woodpecker	<i>Picoides pubescens</i>
Eastern Meadowlark	<i>Sturnella magna</i>
Eastern Towhee	<i>Pipilo erythrophthalmus</i>
Eastern Tufted Titmouse	<i>Baeolophus bicolor</i>
Eastern Wood-Pewee	<i>Contopus virens</i>
European Starling	<i>Sturnus vulgaris</i>
Field Sparrow	<i>Spizella pusilla</i>
Grasshopper Sparrow	<i>Ammodramus savannarum</i>
Gray Catbird	<i>Dumetella carolinensis</i>
Great Horned Owl	<i>Bubo virginianus</i>
Great-crested Flycatcher	<i>Myiarchus crinitis</i>
Green-backed Heron	<i>Butorides virescens</i>
Henslow’s Sparrow	<i>Ammodramus henslowii</i>
Mourning Dove	<i>Zenaida macroura</i>
Northern Cardinal	<i>Cardinalis cardinalis</i>
Northern Flicker	<i>Colaptes auratus</i>
Red-eyed Vireo	<i>Vireo olivaceus</i>
Red-tailed Hawk	<i>Buteo jamaicensis</i>
Red-winged Blackbird	<i>Agelaius phoeniceus</i>
Savannah Sparrow	<i>Passerculus sandwichensis</i>
Song Sparrow	<i>Melospiza melodia</i>
Tree Swallow	<i>Tachycineta bicolor</i>
Upland Sandpiper	<i>Bartramia longicauda</i>
Vesper Sparrow	<i>Pooechetes gramineus</i>
White-breasted Nuthatch	<i>Sitta carolinensis</i>
Willow Flycatcher	<i>Empidonax trailli</i>

APPENDIX VIII:

**Fact Sheets of Selected Species of Concern in
Franklin County**

Allegheny Woodrat

Neotoma magister

Pennsylvania Threatened Species

State Rank: S3 Global Rank: G3G4

Identification

The Allegheny woodrat (*Neotoma magister*) is a relatively large member of this group, ranging from 14-17 inches in total length (including tail). The fur is brownish-gray with slightly darker coloration in the middle of the back. The belly and paws are white and the sides are buffy. The Allegheny woodrat has large ears and a furry, bicolored tail. The introduced exotic Norway rat (*Rattus norvegicus*) has a naked tail and overall brown coloration, which distinguishes it from the woodrat in Pennsylvania.

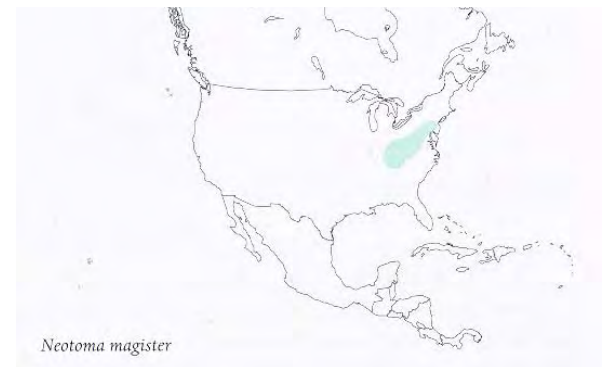


Habitat/Behavior

Another name for this species is cave rat because it sometimes inhabits limestone caves. It is also found along cliff faces, in boulder piles and talus slopes. Nests composed of shredded plant fibers are found in dry cave entrances, along narrow ledges and in rock crevices. This species feeds on nuts, seeds, bark, grasses, fruits and berries. They are nocturnal and a relatively shy species that is often found by locating food caches and latrines.

Status

Distribution of the Allegheny woodrat is primarily along the Appalachian Mountains from New York to Georgia and west to Indiana. Populations in Pennsylvania appeared healthy during the 1940's and early 1950's. However, during bat surveys in 1978 and 1979, John S. Hall from Albright College noted an absence of woodrat sign in caves. Very few locations were occupied in the former range, and woodrats were only found in a few counties during that time. This led to its current status of Threatened in Pennsylvania. It is not clear why this species declined so suddenly in Pennsylvania but it is likely due to a variety of factors. Increased habitat fragmentation, especially in the eastern portion of its range may be a major factor in the decline. Fragmentation from roads and development causes loss of habitat, isolation and increased exposure to parasites. The once relatively isolated ridgetops where the woodrat thrived are not bisected by roads, allowing easy access for humans. These corridors also provide easy access for parasite hosts such as raccoons, which increase the frequency of parasite infection among woodrats. Raccoon roundworm (*Baylisascaris*) is a dangerous and quickly spreading parasite that may be devastating to woodrat populations in the east. Intact forest ridges that provide habitat for this species must be protected from further fragmentation to ensure the long-term viability of the Allegheny Woodrat in Pennsylvania.



Pennsylvania Natural Heritage Program



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- Pennsylvania Game Commission. Endangered and Threatened Species. Eastern Woodrat Species Profile. Website: sties.state.pa.us/PA_Exec/PGC/woodrat/profile.htm

Barn Owl

Tyto alba

Pennsylvania Animal Species of Concern

State Rank: S3B, S3N Global Rank: G5

Identification

The Barn Owl (*Tyto alba*) is a member of the family *Tytonidae*, the only representative of that family occurring in the United States. Barn Owls are on average 14 inches long with a wingspan of 44 inches. It is a large, nocturnal and predatory bird with a large rounded head. It has pale facial disks with a dark frame. This species has tawny and gray upperparts with small black and white spots, and white underparts with scattered dark spots. The two sexes are similar to each other. The Barn Owl is easily distinguished from other owls by its face pattern. Flight patterns are similar to Long-eared and Short-eared Owls but lacks dark wrist marks.

Range

Barn Owls have a nearly worldwide distribution, being absent from only the high latitudes. It is found throughout most of the United States and it frequents open areas with suitable nesting areas in Pennsylvania.

Habitat

Barn Owls require open areas with cavities for nesting. These cavities can be natural tree cavities or human-made structures such as church steeples, barns, abandoned buildings, or even nest boxes. This species needs a good population of small rodents, especially meadow voles (*Microtus pennsylvanicus*). In winter, Barn Owls will sometimes roost in dense conifer trees, even plantations.

Conservation/Status

Barn Owls were undoubtedly rare in Pennsylvania before the cutting of the primeval forests. This species became common in the early 20th century, with many open farmlands containing optimum habitat for this species and their major prey, meadow voles. Changing land-use and agricultural practices have led to a decline in Barn Owl populations. Shifting from pasture to row crops and a loss of nesting sites are the most serious problems for this species, which also result in lower meadow vole populations. This species, despite populations being secure globally, should be monitored to ensure that the Barn Owl continues to be a breeder in Pennsylvania.



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SAVING THE LAST GREAT PLACES ON EARTH

The Barrens Moths

Pennsylvania animal species of concern

Introduction/Description

Nestled within the Pocono Mountains in Monroe and Carbon Counties is home to large examples of Pitch Pine (*Pinus rigida*)/Scrub Oak (*Quercus ilicifolia*) Barrens and associated Rhodora (*Rhodora canadense*) barrens. However, other types of barrens are scattered throughout the state, including Moosic Mountain Barrens in Lackawanna County, and an extensive Ridgetop dwarf tree community in Schuylkill County. Other examples of barrens communities occur in Columbia, Luzerne, Franklin, Cumberland, Centre, and others. These barrens are home to many rare plants, animals and natural communities, including some rare moths that are globally threatened.

There are at least 18 state-listed moths that inhabit areas in the barrens and ridgetop dwarf tree natural communities in Pennsylvania. Some of these species rely solely on barrens areas for every stage of their life cycle. Listings of these moths and their habitat requirements are summarized below.

Moth Species of Concern/Habitats:

- Barrens Chaetagnela** (*Chaetagnela tremula*)- Xeric sites with abundant scrubby oaks and low ericaceous shrubs
- A Sallow Moth** (*Chaetagnela cerata*)- Pitch Pine/Scrub Oak Barrens
- Pine Devil** (*Citheronia sepulcralis*)- Pitch Pine Barrens, forests, occasional plantations
- Barrens Dagger** (*Acronicta albarufa*)- Dry-Oak habitats, including black oak /bur oak, Pitch Pine/Scrub Oak barrens
- Pointed Sallow** (*Epiglaea apiata*)- Cranberry patches in bogs and northern pitch pine/scrub oak barrens
- Blueberry Gray** (*Glena cognataria*)- Bogs and Blueberry (*Vaccinium spp.*) dominated barrens
- Esther Moth** (*Hypagyrtis esther*)- Pitch Pine Barrens
- Barrens Itame** (*Itame spp. I*)- Pine Barrens with sandy soils
- Black-waved Flannel Moth** (*Lagoa crispata*)- restricted to Pitch Pine/Oak Woods or Pitch Pine/Scrub Oak barrens
- Twilight Moth** (*Lycia rachelae*)- Sand plain pine barrens as well as some dry, acidic, scrubby ridges in P A and MA
- Footpath Sallow** (*Metaxaglaea semitaria*)- Bogs, acidic swamps, barrens with extensive blueberry patches
- Fly-poison Borer Moth** (*Papaipema sp.I*)- Fly-poison (*Amianthium muscaetoxicum*) dominated areas
- A noctuid moth** (*Platyperigea meralis*)- dry, sandy sites such as pine barrens
- Broad Sallow Moth** (*Xylotype capax*)- Barrens, oak-pine woods, acidic swamps, with abundant pitch pine
- Pine Barrens Zale** (*Zale spp.*)- exclusively Pine Barrens



Barrens Buckmoth (*Hemileuca maia*)-Pitch Pine/Scrub Oak or Blackjack Barrens
Photo by Connecticut Agricultural Experiment Station



Zale Moth larvae (*Zale curema*)- Pitch Pine Barrens/hard pines
Photo by Connecticut Agricultural Experiment Station



Zale Moth larvae (*Zale submediana*)-Hard Pines/Pitch Pine areas

Photo by Connecticut Agricultural Experiment Station

Range

Some of these moths are more widespread and occur in throughout the eastern United States, while the Fly-poison Borer Moth (*Papaipema sp. 1*), is known to occur only in Pennsylvania. There is also little information on the full ranges for some of these species, but some are extremely restricted in habitat, which restricts their distribution as well.

Conservation/Status

Conservation of these moth species depends on the protection of the habitat to which they depend on for all stages of their life cycles. Fire and microclimate are important factors in helping to maintain these community types. The pitch pine barrens are disturbance dependent ecosystems and the development of a prescribed burn management program would help maintain the quality of this naturally occurring community. Without periodic fires, the scrub habitat would succeed to other hardwood and pine species. Some area of the barrens have seen heavy industrial/residential/commercial development in the past couple of years, so it is critical to protect the remaining best examples of Pitch Pine/Scrub Oak Barrens in the state in order to fully protect the rare moths that depend upon this natural community. Additional inventories and monitoring are needed to determine the extent of the population and occurrences of many different species of moths in many different barrens communities in Pennsylvania.

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Bog Turtle

Clemmys muhlenbergii

Pennsylvania Endangered Species
State Rank: S2 Global Rank: G3

Identification

The bog turtle (*Clemmys muhlenbergii*) is one of Pennsylvania's smallest turtles, growing only 3 to 4.5 inches in length. Its most distinguishing feature is the large orange blotches on each side of the head. The shell and body are a dark brown with no distinctive markings. The bog turtle can be confused with the spotted turtles (*Clemmys guttata*). Spotted turtles have small yellow spots on the carapace, or shell and small orange spots on the head and body. Sometimes, few spots are present and initially the two species may appear very similar. The presence of large orange patches on the bog turtle's head are the best way to distinguish these species.

Habitat

This turtle has very specific habitat requirements, which is a major factor in its rarity throughout the United States. Bog turtles occur in wet meadows and bogs where tussock sedge and grasses dominate the wetlands. They require open conditions associated with early-successional wetland habitats. The substrate must consist of deep mucky soils fed by groundwater, generally with some open water or seepy areas. If any of these conditions change, the population can decline and may eventually disappear from the area.

Status

The bog turtle occurs in very low numbers in southeastern Pennsylvania and is imperiled or critically imperiled throughout its entire range in North America. The species is classified as Federally threatened on the U.S. Fish and Wildlife Service Endangered Species List. Habitat loss, habitat fragmentation and succession are major factors in the decline of this species. In the past, natural wetland succession would occur causing populations to relocate nearby as appropriate habitat became available. With the extreme habitat fragmentation in southeastern Pennsylvania, remaining habitat has been isolated and wetland succession can lead to localized extinctions.

Additionally, this species is threatened by decreased water quality and roadway mortality. Another major threat to the bog turtle is collection. Reptile collectors consider this turtle a valuable prize, as it is the most rare of all North American turtles. In Pennsylvania, fines for illegal collection and possession range from \$250 to \$5000 with the possibility of jail time and additional charges from the U.S. Fish and Wildlife Service. State and federal protection for this species have helped conservation efforts so far, but more resources are needed to continue species recovery efforts in the eastern United States.



Photo: PA Science Office



References

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- NatureServe Explorer: An online encyclopedia of life [web application]. 2002. Version 1.6. Arlington, Virginia. Website: www.natureserve.org/explorer.
- PA Department of Conservation and Natural Resources Website. Wild Resource Conservation Fund, Endangered and Threatened Species in Pennsylvania. Bog Turtle: www.dcnr.state.pa.us/wrcf/bogt.htm.

Cave Invertebrate Species of Concern

- Biggers' Cave Amphipod (*Stygobromus biggersi*) G2G4 S1
- Pennsylvania Cave Amphipod (*Crangonyx dearolfi*) G2G3 S1
- Price's Cave Isopod (*Caecidotea pricei*) G3G4 S2S3
- Shenandoah Valley Cave Amphipod (*Stygobromus gracilipes*) G2G4 S1

An Underground World

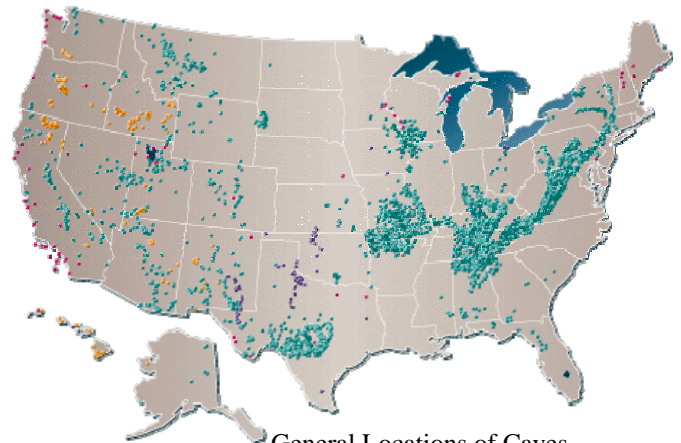
Organisms that make their homes in caves are a unique group called Troglolobites. Troglolobites are organisms whose entire life cycles are spent underground and are typically blind and unpigmented. It is likely that Troglolobites evolved from organisms living on the surface that were partially adapted to the cave environment. Some of these subterranean species have survived in caves long after their surface-dwelling relatives went extinct or relocated because of dynamic changes on the surface. Caves provide a more stable environment with relatively unchanging temperatures and absence of light. Primary producers are almost completely absent in these environments and organic matter from external sources provides the very basic food resource. A variety of organisms inhabit the cave environment in both the aquatic and terrestrial habitats of these subterranean ecosystems. Three Amphipods and one Isopod species of concern were located in Franklin County. These species are aquatic, inhabiting pools of water within caves.

Status

The Biggers', Pennsylvania and Shenandoah Valley Cave Amphipods are listed as state critically imperiled (S1) in Pennsylvania. These species are very rare across the state and range from globally imperiled to apparently secure (G2-G4). Price's Cave Isopod is state imperiled/vulnerable (S2S3) and globally vulnerable/apparently secure (G3G4). Continued survey efforts across the state will yield more information about the status of these species in Pennsylvania.

Threats

Many human activities threaten caves and the fauna that depend on them. Pollution in caves is a major problem. Carbonate rocks easily pass solid and liquid wastes into caves and groundwater. Pollution of water caves can negatively impact the aquatic and terrestrial species within, possibly causing localized extinctions. Deforestation on the surface can cause changes in hydrology and increased sedimentation in caves. Alteration of cave entranceways such as vegetation removal and structural changes can affect conditions in the cave such as airflow, temperature and humidity. Another major threat to cave biodiversity is high intensity visitation. Some cave systems are able to sustain low intensity visitation, but high-intensity visitation and alteration can have very negative effects. Caves used for commercial purposes are exceptionally vulnerable and may never return to a natural state. Protection of caves is vital for all fauna that depend on them and populations that depend on the groundwater within.



General Locations of Caves
Across the United States

References

- Geologic Survey. 2000. Limestone and Dolomite Distribution in Pennsylvania. Website: www.dcnr.state.pa.us/topogeo.
- General Locations of America's Caves. CAVR Website: www.cavevader.com/caving.
- Troglolobites: The Evolution of Cave-Dwelling Organisms. American Scientist, 115(1), 153.
- Threats to Cave Fauna. Website: www.nature.com/old/Indexjava.html?Cave%20threats.html



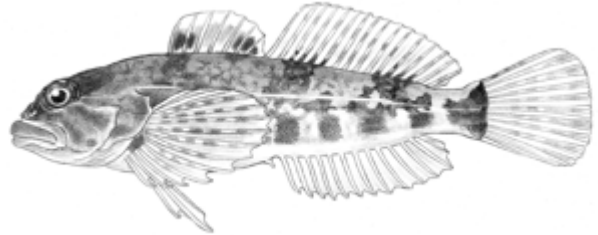
Checkered Sculpin

Cottus n.sp.

Description

The Checkered Sculpin (*Cottus n. sp.*) is an undescribed cottid that was formerly assigned to the slimy sculpin (*C. cognatus*), but there is now consensus among ichthyologists familiar with this group that Potomac specimens are distinctive and deserve species status.

This species has only five known populations in Pennsylvania, and all sites where this species lives have obvious threats or concerns. The habitats that are inhabited by this species should be considered for conservation efforts.



Range

This species is apparently endemic to the Potomac drainage of Maryland, Pennsylvania, Virginia, and West Virginia.

Habitat

This species appears to be confined to limestone and spring runs.

Conservation and Status

Checkered Sculpins are rare due to their restricted range and habitat requirements of limestone springs. This species occurs only in the Potomac River drainage and since only a few counties in Pennsylvania occur within this drainage, this species will probably continue to be a rare species in this state and throughout its range.

This species depends on limestone springs in the Potomac drainage watershed of Pennsylvania, West Virginia, Virginia, and Maryland. Since it has the potential to occur in a few counties in Pennsylvania, it is important that this species habitat is conserved to secure its future in the state. Many springs in Franklin County are in a more agricultural setting, and the planting of buffers around these springs would benefit this species.



Pennsylvania Natural Heritage Program



SAVING THE LAST GREAT PLACES ON EARTH

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Maryland Department of Natural Resources, Maryland Biological Stream Survey. Distribution of Checkered Sculpin (*Cottus sp.n.*), 2003.

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Eastern Mud Salamander

Pseudotriton montanus montanus

Pennsylvania Endangered Species
State Rank: S1 Global Rank: G5

Identification

The eastern mud salamander is relatively large, with adults measuring up to 8 inches in length. Juveniles are bright red but as individuals age the color changes to a darker, muddy red with scattered black spots. Although similar in size and coloration to the northern red salamander (*Pseudotriton ruber ruber*) this species are best identified by iris color. The eastern mud salamander has a brown iris while the northern red salamander's iris is bright yellow.

Habitat

Throughout its range, the eastern mud salamander is found along muddy floodplains, seeps and streams with muddy substrate, swamps and bogs. This species is fossorial and burrows under leaf litter, rocks and woody debris. Burrows have also been located in creek banks. In Pennsylvania, this species has been found in an eastern hemlock (*Tsuga canadensis*)/mountain laurel (*Kalmia latifolia*) swamp near streams.

Status

The eastern mud salamander (*Pseudotriton montanus montanus*) is extremely rare in Pennsylvania, limited to one location in the state. The location of the first specimen collected in the state in 1850 was described as "South Mountain, near Carlisle." In 1992, a second specimen was collected from Caledonia State Park in Franklin County. In general, very little is known about this species in Pennsylvania and the northeast. However, on a global scale the eastern mud salamander is considered secure. The salamander ranges from New Jersey to Florida and east to Tennessee. The endangered status in our state is due mostly to Pennsylvania's location on the edge of this species' range. However, amphibians are in danger worldwide and many species in North America are declining in numbers. Factors that threaten other salamanders such as habitat loss and reductions in water quality would likely affect this species as well. It is important that we monitor species distribution and abundance to ensure the survival of our living natural heritage into the future. More surveys are needed to better assess the status of this species in Pennsylvania.



Pennsylvania Natural Heritage Program



SAVING THE LAST GREAT PLACES ON EARTH

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- Atlas of Amphibians in Tennessee Website. Eastern Mud Salamander: www.apsu.edu/amatlas/Map74.htm
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- NJ Division of Fish and Wildlife, Endangered and Non-Game Species Program Website. Eastern Mud Salamander: www.njfishandwildlife.com/ensp/pdf/end-thrtened/eastmudsal.pdf
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Grassland-dependent bird species

Upland Sandpiper (*Bartramia longicauda*)

***Dickcissel** (*Spiza americana*)

Henslow's Sparrow (*Ammodramus henslowii*)

Grasshopper Sparrow (*Ammodramus savannarum*)

Savannah Sparrow (*Passerculus sandwichensis*)

Vesper Sparrow (*Poocetes gramineus*)

Eastern Meadowlark (*Sturnella magna*)

Bobolink (*Dolichonyx oryzivorus*)

***Short-eared Owl** (*Asio flammeus*)

Pennsylvania Animal fact sheets

*Denotes species of concern in Pennsylvania

Introduction

Many bird species depend on early-successional habitats such as hayfields, open grasslands and prairies, abandoned strip-mines, and air fields. These species are habitat specialists, and the specificity of their habitat choices has deemed them a species group of management concern. Many of these species cannot tolerate land use changes from open grassland/pasture to row crop agriculture such as cornfields and soybean fields. In Pennsylvania, many of these species are quite unpredictable in their range and site fidelity. Species, such as Dickcissel, for example, occur unpredictably on the fringe of their range. Other species, such as Henslow's Sparrow, may have increased in Pennsylvania due to the reclaiming of abandoned strip mines into grassland habitats. The historic extent of the distribution of grassland-bird dependent species in Pennsylvania is relatively unknown, but indications are that prior to European settlement, grassland bird species were fairly rare in Pennsylvania. However, as forests were cleared in the 1800's, and by 1840, almost half of Pennsylvania was farmland. This cleared the way for grassland bird species to increase in numbers, and become somewhat common up until the mid 1900's. However, by 1980, only 26 percent of the land remained in agricultural production. Many grassland bird species are now decreasing in Pennsylvania and throughout their range. There is hope in programs such as CREP (Conservation Reserve Enhancement Programs), and reclaiming of strip mines into grassland, which have assisted in restoring habitat for these grassland-dependent species.



Species specific habitat requirements

***Upland Sandpiper**-areas with low to moderate forb cover, low woody cover, moderate grass cover, moderate to high litter cover, and little bare ground (fence posts and display perches may be important components of suitable habitat)- they use native and tame grasslands, wet meadows, hayland, pastures, planted cover, highway and railroad rights-of-way, and grassy areas of airports. The Upland Sandpiper is a Partners in Flight (PIF) priority species in the regional conservation plans for physiographic regions Allegheny Plateau and Northern Ridge and Valley.

Henslow's Sparrow- fallow weedy fields, often with broomsedge (*Andropogon spp.*) grasses, reclaimed strip mines, use grasslands that have well-developed litter, relatively high cover of standing dead residual vegetation, tall dense vegetation, and generally low woody stem densities. They may use idle hayfields, CREP lands, or wet meadows. The Henslow's Sparrow is listed on the Partners in Flight (PIF) watch list as a highest concern species and is a priority target species in the regional conservation plans for physiographic regions Allegheny Plateau and Northern Ridge and Valley.

***Dickcissel**- prefers habitat with dense, moderate to tall vegetation and moderately deep litter. Suitable habitats are found in oldfields, hayfields (especially alfalfa), fencerows, hedgerows, road rights-of-way, planted cover, CREP fields and dense nesting cover, and moderately grazed and idle prairie. The Dickcissel is listed on the Partners in Flight (PIF) watch list as threatened and declining.

Grasshopper Sparrow- generally prefers moderately open grasslands and prairies with patchy bare ground, selects different components of vegetation, depending on grassland ecosystem. This species generally avoids grasslands with extensive shrub cover but regularly occurs in hayfields, dry pastures, and reclaimed strip mines.

Savannah Sparrow- occupies similar habitats to Grasshopper Sparrow such as hayfields and pastures, but also may occur in wet meadows. In Pennsylvania, the species occurs in meadows, cultivated fields, grasslands, hayfields, and reclaimed strip mines.

Vesper Sparrow- prefer extensive meadowlands or even croplands, cornfields, alfalfa fields, hayfields, reclaimed strip mines. They require elevated perches from which to sing from such as isolated trees, power lines, or tall grass.

Eastern Meadowlark- grazed and ungrazed pastures, hayfields, winter wheatfields, idle or fallow areas, reclaimed strip mines. Males prefer areas with an elevated perch, such as a tree or utility perch.

Bobolink- prefers open fields, moist meadows with heavy stands of hay, clover, alfalfa, or weeds, and reclaimed strip mines. The Bobolink is a Partners in Flight (PIF) priority species in the regional conservation plans for physiographic region Northern Ridge and Valley.

***Short-eared Owl**- reclaimed strip mines, field stubble and grasslands, and originally, and possibly still, open marshlands. Within such areas, these owls require cover, dense thickets, grassy tussocks, clumps of rushes or reeds, and even dense evergreen, and an abundance of mammalian prey. The Short-eared Owl is listed on the Partners in Flight (PIF) watch list as threatened and declining.

Conservation/Management Recommendations

Many of the above species depend heavily on some type of agricultural practice for maintenance of their preferred breeding habitats. The loss of pasture and hayfields to suburban development and succession of abandoned pasture and hayfields to old-field and woodland habitat are two of the biggest threats to these species in Pennsylvania. Many of the above species nest in active hayfields and pasture, and early mowing and harvesting of these fields in the summer will destroy many nests. It is recommended, if possible and feasible, that farmers delay mowing and harvesting hayfields until late July to give these species juveniles time to fledge. Selling of farms to developers is a process that is occurring most frequently in southern Pennsylvania, where development pressure is high. Reclaimed strip mines may be a harbor for some of these grassland species, especially ones that have been applied proper management. However, there are far too few of these reclaimed strip mines to support healthy populations of these species. Conservation Reserve Enhancement Programs (CREP) have also been proving beneficial to restoring some breeding areas for many of these species, and one of the goals of this program is to provide financial and technical assistance for Pennsylvania farmers to voluntarily restore wetlands, riparian areas and grasslands by enrolling up to 200,000 acres of farmland in CREP. For more information on how to enroll in CREP, visit <http://www.fsa.usda.gov/pas/publications/facts/html/creppa03.htm>. This program will hopefully give farmers incentives to plant native grasses and help the populations of grassland birds reach a healthy level.

Partners in Flight Goals

Partners in Flight has identified the Northern Ridge and Valley and Allegheny Plateau physiographic provinces as high priorities for conserving grassland bird species. In Northern Ridge and Valley, one objective of Partners in Flight is to identify, and either acquire, manage, or restore grasslands greater than 50 hectares with potential to support Henslow's Sparrow or Upland Sandpiper. Another objective is for 13,000 hectares of pastureland could be required to support 12,000 pairs of Bobolinks and other grassland species, and at least 1,000 hectares should be in patches large enough to support 50+ pairs of Upland Sandpipers and potentially Henslow's Sparrow.

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Loggerhead Shrike

Lanius ludovicianus

Pennsylvania Endangered Species

State Rank: S1B Global Rank: G4

Identification

The Loggerhead Shrike (*Lanius ludovicianus*), a Pennsylvania-Endangered animal species of concern, is a short-distance to permanent migrant landbird. This species is about 7 inches in length, has a heavy, hooked bill, a black mask, and gray head and back with white underparts. This species has black wings and white wing patches and a black tail with white outer tail feathers. The juveniles and immatures are duller with faint barring above and below.

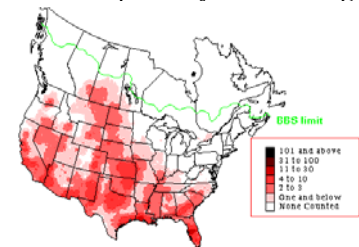


photo by Ron Austing

Range

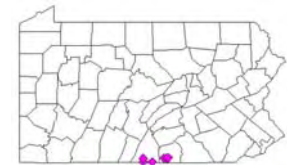
Loggerhead Shrikes formerly bred throughout the northeastern United States, even into New England. However, as early successional fields have been reforested, this species has rapidly disappeared from former nesting areas throughout the northeast.

A very few remnant populations may remain in the northeast, even in Pennsylvania, where the species is very rare. The species is still relatively common in the western United States, but decreasing in southeastern United States.



Habitat

This species prefers open habitat characterized by grasses and forbs of low stature interspersed with bare ground and shrubs or low trees. In Pennsylvania, this species uses pastures with scattered low trees (especially hawthorns, or other thorny shrub species, and crab-apples), farmsteads, mowed right-of-ways, and croplands. Scattered shrubs or trees, particularly thick or thorny species, serve as nesting substrates, hunting perches, and impaling stations. This species is a predator that preys on small songbirds, grasshoppers, and small rodents but does not have talons like raptors. This species will therefore impale the prey on a sharp thorn in a small tree such as a hawthorn.



Conservation/Status

Shrikes can no longer be regarded as a regularly breeding bird in Pennsylvania. Widespread declines contraction of the breeding range throughout the northeast has prompted several states, including Pennsylvania, to list the species as an animal species of concern. Declines in the northeast have been attributed with pesticide contamination such as DDE, roadway mortality, and subtle habitat degradation. The degree of tolerance of disturbance of this species is still unknown. Regions with severe Loggerhead Shrike declines had lost 39 percent of their unimproved pasture to cropland from 1946 to 1986 and 79 percent since settlement. The widespread decline of this species in the northeastern United States has led the U.S. Fish and Wildlife Service to consider listing the migrant subspecies, *migrans*, as an endangered species. Inventories of suitable habitat should be conducted in Franklin County and throughout southcentral Pennsylvania to determine whether a remnant population remains. Some individuals of this subspecies could be breeding in southcentral Pennsylvania. Should breeding pairs of any subspecies are discovered, intensive research and management should be undertaken.

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Brauning, D.W. (ed.). 1992. Atlas of Breeding Birds in Pennsylvania Univ. of Pittsburgh Press, Pittsburgh, PA. 484 pp.

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Pennsylvania Natural Heritage Program



Northern Myotis

Myotis septentrionalis

Pennsylvania Mammal Species of Concern
State Rank: S3B, S3N Global Rank: G4

Identification

The northern myotis (*Myotis septentrionalis*) is also known as the northern long-eared myotis for its long-rounded ears that when folded forward, extend beyond the tip of the nose. Also, the shape of the tragus, the flap of skin inside the ear area, is long and dagger shaped compared to the little brown bats curved and blunted tragus. This species has a longer tail and larger wing area than other similar sized bats in this genus. The fur is dull yellow/brown above and a pale gray on the belly. Another characteristic of this species is that the calcar, a spur extending from the foot, lacks a keel. These bats weigh only 6 to 8 grams and have a wingspan of 9 to 10 inches.



Photo: Aura Stauffer

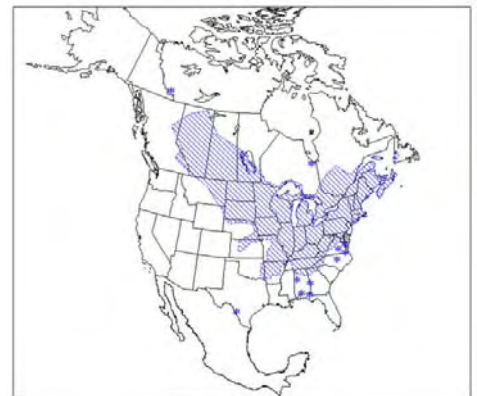
Habitat/Behavior

In the more northern parts of their range the northern long-eared bat is associated with boreal forests. In Pennsylvania, this bat is found in forests around the state. Northern myotis hunt at night over small ponds, in forest clearings, at tree top level and along forest edges. They eat a variety of night-flying insects including caddisflies, moths, beetles, flies, and leafhoppers. This species uses caves and underground mines for hibernation and individuals may travel up to 56 kilometers from their summer habitat for hibernation. Maternity roosts are located in tree cavities, under exfoliating tree bark and in buildings.

Status

The status of the northern myotis in Pennsylvania is uncertain. The state status of this species currently is candidate rare (CR). More information is needed before adequate management decisions can be made. It occurs throughout Pennsylvania, but has been found in relatively low numbers. Traditionally, bats have been unpopular with the public because of a misunderstanding of their ecology and due to their presence as pests in homes and barns. However, bats play a very important role in the environment by eating large amounts of insects. For example, a single little brown bat (*Myotis lucifugus*) can eat up to 1,200 mosquito-sized insects in just one hour!

More than 50% of American bat species are rapidly declining or already listed as endangered. The loss of bat species in Pennsylvania could greatly affect our ability to protect our plants from pests and enjoy the outdoors. For more information on bats and bat houses visit the Bat Conservation International website at <http://www.batcon.org/>.



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- Ollendorff, J. 2002. "*Myotis septentrionalis*" (On-line), Animal Diversity Web. Accessed February 25, 2004 at [Http://animaldiversity.ummz.umich.edu/site/accounts/information/Myotis_septentrionalis.htm](http://animaldiversity.ummz.umich.edu/site/accounts/information/Myotis_septentrionalis.htm).



Redbelly Turtle

Pseudemys rubriventris

Pennsylvania Threatened Species
State Rank: S2 Global Rank: G5

Identification

The redbelly turtle (*Pseudemys rubriventris*) is one of Pennsylvania's largest turtles. The carapace, or shell is brown to black with reddish bars on some scutes. The plastron, or belly is pink to red and the head, neck and legs are covered with bright yellow lines in younger individuals. Markings may become less obvious with age and some older turtles are almost completely black above with few distinguishing characteristics. Confusing species are painted turtles (*Chrysemys picta*) and the introduced red-eared slider (*Trachemys scripta*). Painted turtles can be distinguished by the light borders along the carapace seams and smaller size in adults. Red-eared sliders are similar in size and coloration, however the presence of a red "ear patch" can sometimes be used to identify this species. Like *Pseudemys*, as these individuals age they can become melanistic and difficult to identify.



Photo: Jason Ambler

Habitat

This aquatic species is primarily found in large water bodies including lakes, ponds, marshes, slow-moving rivers and creeks. Red-bellied turtles prefer deeper water with sandy or muddy substrate and require aquatic vegetation. This species also depends on abundant basking sites and spend a great deal of time perched on logs and downed trees. Nesting sites are in upland habitat and usually within 100 meters of the water, though they have been known to nest up to 250m from water. Eggs are laid in sandy or loamy soil, in clutches of 10 to 12.

Status

Pseudemys rubriventris ranges from New York to North Carolina and has been introduced into some areas around the United States. Red-bellied turtles are listed as a threatened species in our state. Though we are on the edge of it's range, many factors contribute to the threatened status this species in Pennsylvania. In the late 1800's, this species was captured and sold as a food item in large metropolitan markets. The population in the east was significantly reduced through collection. Currently, threats to this species include loss of habitat through development and reductions in site and water quality, and threats from exotic species. The range of red-eared sliders is expanding and this species may compete with the exotic slider in some areas. Road mortality is an issue for females traveling away from water to lay eggs. Also, nest predators such as raccoon and fox increase with forest fragmentation and can significantly decrease nesting success of this species. More information is needed on the life history of this species and factors affecting populations in the state.



Pennsylvania Natural Heritage Program



SAVING THE LAST GREAT PLACES ON EARTH

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Timber Rattlesnake

Crotalus horridus

Pennsylvania Reptile Species of Concern

State Rank: S3S4 Global Rank: G4

Identification

Timber rattlesnakes (*Crotalus horridus*) are easily distinguished from other snakes in Pennsylvania. Timber rattlesnakes are stout-bodied, large snakes reaching lengths of up to 5 feet. Color is extremely variable but usually consists of brown or black bands on bright yellow to black coloration. The head is triangular in shape and a black rattle is present at the end of the tail. This species may be confused with the less common eastern massasauga (*Sistrurus catenatus catenatus*) only present in the western portion of the state. The timber rattlesnake can be distinguished from the massasauga by the lack of white facial lines, completely black tail and scale-covered head.

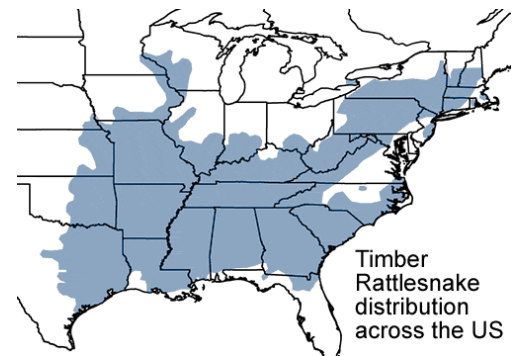


Habitat/Behavior

Crotalus horridus is associated with deciduous forests and rocky outcrops. Hibernacula are usually found on south-facing rocky slopes with adequate crevices to provide shelter during the winter months. Males may travel far from the den site in the summer, moving into valleys and low-lying areas. Gravid females are far less mobile and tend to stay within a short distance of the den. Timber rattlesnakes are venomous, however are generally mild-mannered and not likely to strike.

Status

Timber rattlesnake numbers have decreased significantly from historic records. This species was once widespread across the state. The remaining populations are usually found in remote, isolated areas. Collection and destruction of habitat are likely the main reasons for reductions in population size. Den sites have been targets for collection and should be the focus of conservation efforts for this species. The state status of the timber rattlesnake is candidate at risk (CA). Though this species is still relatively abundant across the state, it remains vulnerable to exploitation. Permits are now required to collect rattlesnakes and only one snake can be taken each year. Snake hunts still occur in the state but after capture, snakes must be marked and released and the site of capture. Biologists are gathering information from collectors and individual studies to determine the current status of this species in the state.



Timber Rattlesnake distribution across the US



References

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