

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

1996

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PREFACE

The Adams 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. 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 or site plans of specific areas described in this document are encouraged to contact the Pennsylvania Science Office of The Nature Conservancy for further information.

ACKNOWLEDGMENTS

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The Pennsylvania Science Office (PSO) of The Nature Conservancy thanks the members of the agencies noted above and all the individuals who have contributed time and expertise to the study. We especially thank Richard Schmoyer and Robert Thaeler of the Adams County Office of Planning and Development for their time and effort. Special thanks to Bert Frost of Gettysburg National Military Park and Kenneth Swartz, District Forester, and other staff at Michaux State Forest for sharing their expertise and comments. Larry Klotz at Shippensburg University conducted some of the botanical surveys under contract for this project. Ecology interns Heather Glennon and Kate Francis assisted in preparing the graphics work and compiling data and background information.

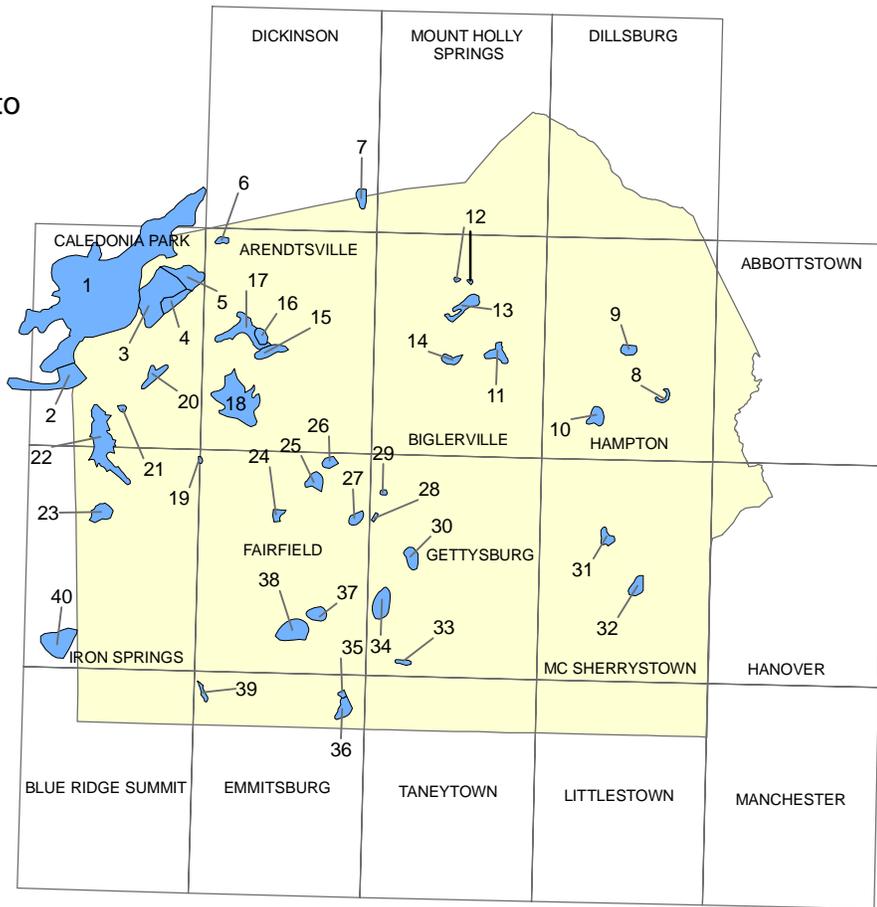
The species information utilized in the inventory came from many sources as well as our own field surveys. Biologists from institutions and agencies such as the Academy of Natural Sciences in Philadelphia, the Morris Arboretum of the University of Pennsylvania, Shippensburg University, the Department of Conservation and Natural Resources (formerly Department of Environmental Resources), the Pennsylvania Game Commission, and the Pennsylvania Fish and Boat Commission have contributed numerous plant and animal records over the years. Dr. Schildknecht's detailed records of the fauna of the Gettysburg area have been invaluable in locating extant (current) populations of animal species of special concern. In addition, many private citizens contributed valuable information that was incorporated into the study. Further, we wish to thank the many landowners who granted us permission to conduct inventories on their lands. The task of inventorying the natural heritage of Adams County would have been far more difficult without this tremendous pool of information gathered by many people over many years.

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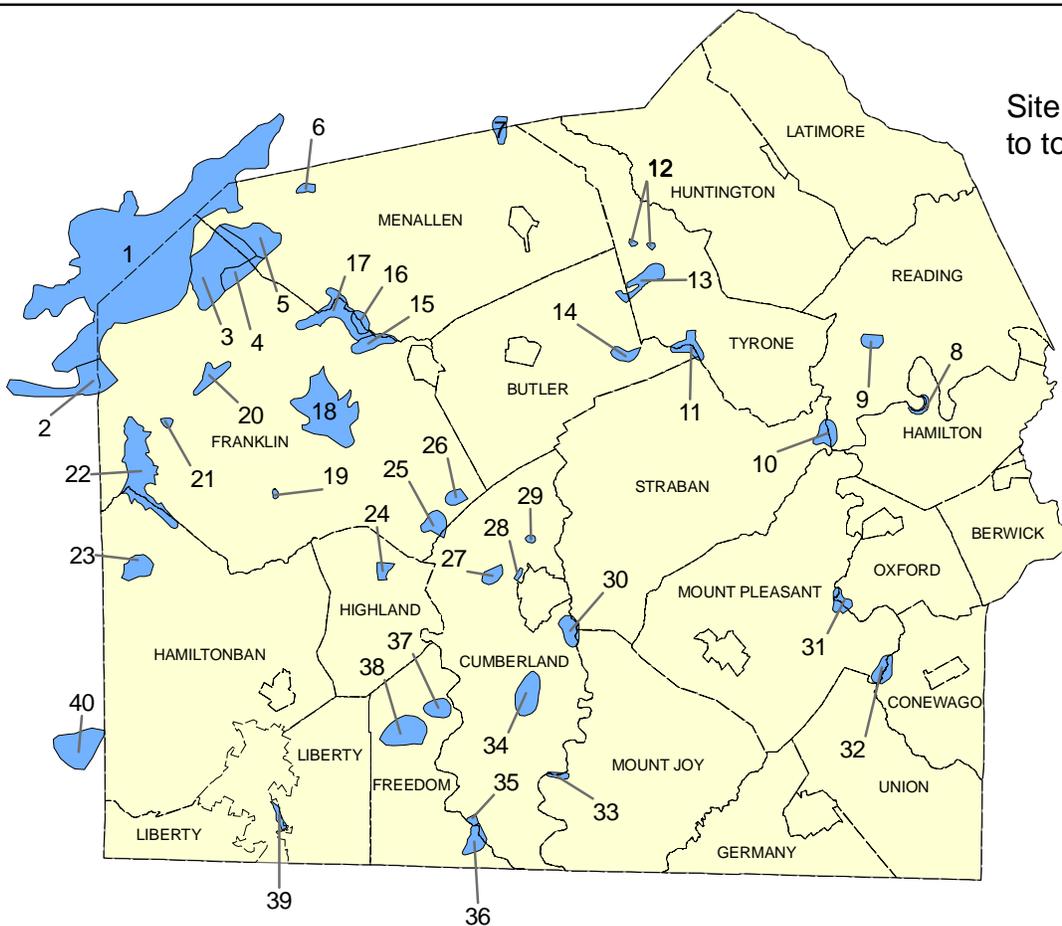
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Site location relative to USGS quadrangle



Site location relative to township



Site Name	Site ID	USGS Quadrangle	Township
Big Pine Flat	1	Caledonia Park	Franklin, Menallen
Conococheague Creek Floodplain at Caledonia Park	2	Caledonia Park	Franklin
Sand Spring Seep	3	Caledonia Park	Franklin, Menallen
Piney Mountain Swamp	4	Caledonia Park	Franklin, Menallen
Ram Hill Seep	5	Caledonia Park	Franklin, Menallen
Grave Ridge Site	6	Ardentsville	Menallen
Laurel Road Swamp	7	Dickinson	Menallen
Green Ridge Bend	8	Hampton	Reading, Hamilton
King's Pasture	9	Hampton	Reading
Conewago Creek / Newchester	10	Hampton	Reading, Straban
Conewago Creek / Plainview	11	Biglerville	Tyrone, Straban, Butler
Cranberry Valley	12	Biglerville	Tyrone
Chestnut Hill Woods	13	Biglerville	Tyrone, Butler
Conewago/opossum Creek Site	14	Biglerville	Butler
Bushy Hill Site	15	Ardentsville	Franklin, Menallen
Ardentsville Narrows Ravine	16	Ardentsville	Franklin, Menallen
Ardentsville Narrows Woods And Seeps	17	Ardentsville	Franklin, Menallen
Marsh Creek Wetlands	18	Ardentsville	Franklin
Adams County Winery Site	19	Fairfield, Iron Springs	Frankliin
Buchanan Valley Site	20	Caledonia Park	Franklin
Mount Newman Roadcut	21	Caledonia Park	Franklin
Carbaugh Run State Forest Natural Area	22	Caledonia Park, Iron Springs	Franklin, Hamiltonban
Cold Spring Seeps	23	Iron Springs	Hamiltonban
Meadow Brook Lane Woods	24	Fairfield	Highland
Seven Stars Floodplain Forest	25	Fairfield	Franklin, Cumberland
Mummasburg Road Fields	26	Fairfield	Franklin
Willoughby Run Woodland	27	Fairfield	Cumberland
Mcperson Ridge	28	Gettysburg	Cumberland
Butterfield Farm	29	Gettysburg	Cumberland
Rock Creek Hills	30	Gettysburg	Cumberland, Straban, Mount Joy
Storm Store Bridge Woods	31	McSherrystown	Mount Pleasant, Oxford
Brushtown Woods	32	McSherrystown	Mount Pleasant, Conewago
Barlow Woods	33	Gettysburg	Mount Joy, Cumberland
Round Top Hills	34	Gettysburg	Cumberland
North Harpers Hill	35	Emmitsburg	Cumberland
Harpers Hill	36	Emmitsburg	Cumberland, Freedom
Red Rock Road Site	37	Fairfield	Freedom
Plum Run Upland	38	Fairfield	Freedom
Zora Woods	39	Emmitsburg	Liberty
Makey Run Ponds	40	Iron Springs	Hamiltonban

GLOSSARY

ATV - all-terrain-vehicle.

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

canopy - the layer formed by the tallest vegetation.

circumneutral - pH between 5.5 and 7.

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

D.C.N.R. - Pennsylvania Department of Conservation and Natural Resources

diabase - a dark gray igneous rock

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

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

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

Exceptional Value Waters (EV) - D.C.N.R 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 purposes of this study, EV streams are mapped as High Gradient Clearwater Creek natural communities (see Appendix VI for community description). For more detailed information about EV stream designations, the reader is referred to the Special Protection Waters Implementation Handbook (Shertzer 1992).

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

extant - currently in existence

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

forb - non-graminoid herbaceous plant such as goldenrod.

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

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

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

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

lepidoptera - moths and butterflies

mesic - moist, not saturated.

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 D.C.N.R./Bureau of Forestry.

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

POSCIP - Plant of Special Concern in Pennsylvania

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

prescribed burning - burning under controlled conditions; helps to maintain some natural communities such as the pitch pine barrens.

riparian - streamside

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

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

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

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

State Forest Natural Area (SFNA) - Bureau of Forestry designation for an area of unique scenic, historic, geologic or ecological value which will be maintained in a natural condition, usually without direct human intervention.

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.

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

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

xeric - extremely dry or droughty.

INTRODUCTION

Adams County is situated in south-central Pennsylvania, an area rich in historical, scenic, and natural resources. The county's 526 square miles are occupied by a mix of agriculture, forest, and small towns. The centrally located borough of Gettysburg is the county's largest municipality with just over 7,000 residents (U.S. Census 1990). In 1995 the county's overall population was estimated to be about 86,000, which represents a 10 percent increase over its population in 1990, and growth is expected to continue (U.S. Census and Adams Co. Office of Planning & Development). Recent growth has been influenced by Adams County's desirability as a place to live and its close proximity to larger urban centers. Harrisburg, York, Baltimore, and Frederick are all within commuting distance of some area of the county. Adams County is also a popular tourist destination because of its rich history and recreational opportunities.

Tourists and residents alike are attracted to the extensive forests located on the west side of the county and to the pastoral scenery that dominates much of the rest of the landscape; these natural qualities are important to both the economic and social well-being of county residents. South Mountain, which includes Michaux State Forest, provides timber for the forest products industry and is a popular location for hiking, hunting and fishing. Trails in Caledonia State Park and the state forest connect with the Appalachian Trail in adjacent Cumberland and Franklin Counties. Conewago Creek, Carbaugh Run, and other streams originating in this area offer scenic and recreational value. The remainder of the county is characterized by low rolling hills dominated by agriculture; approximately 50 percent of the county is in farms including orchards, grain crops, dairy, and poultry farms. In fruit production alone, Adams County ranks among the top fifty counties in the nation (Cuff et al. 1989). However, the county's rural character, natural resources, and farmland are all threatened by the increase of suburban sprawl. From 1950 to 1980 there was a 65 to 80 percent decline in the rural farm population in the county (Cuff et al. 1989) and an estimated 500-1000 acres of agricultural land are currently being lost to subdivision each year (Adams Co. Office of Planning & Development). Changes in development patterns, particularly the trend towards low density development and increased lot size and away from the traditional borough centers, are evident across the county. Meanwhile the tourism industry in the county continues to grow, with Gettysburg National Military Park alone bringing in tens of thousands of visitors each year.

The scenic natural environment that attracts so many people to Adams County and that is so vital to county's economy can quickly be lost to expanding development. Wise planning can maintain open space including natural environments and the plants and animals associated with them. A balance between growth and conservation of scenic and natural resources can be achieved by guiding development away from the most environmentally sensitive areas. In order to plan development and ensure protection of critical natural areas, county and municipal governments, the public and developers must know the location and importance of these sites. This knowledge can help prevent conflicts over land use and direct protection efforts and limited conservation dollars to the most vulnerable areas. The Pennsylvania Science Office of The Nature Conservancy, under contract to the Adams County Board of Commissioners, has undertaken to provide this document and maps to aid in the identification of these important natural areas.

The Natural Areas Inventory report presents Adams County's known outstanding natural features—floral, faunal and geologic. The Inventory provides maps of the best natural communities (habitats) and all the known locations of animal and plant species of special concern (endangered, threatened, or rare) in the county*. A written description and a summary table of the sites, including quality, degree of rarity, and last-observed date, accompany each map. Potential threats and some suggestions for protection of the rare plants or animals at the site are included in many of the individual site descriptions. Selected geologic features of statewide significance are also noted. In addition, the inventory describes locations of areas that are significant on a county-wide scale but that 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 development and parks, for conserving natural areas, and for developing priorities for preservation of the most vulnerable natural areas. An overall summary of the highest quality sites in Adams County provides suggestions for maintaining these important sites as natural areas. All of the sites in this report are evaluated for their importance to protecting biological diversity on a state and local level, but many also provide scenic value and water quality protection as well as potential sites for low-impact passive recreation, nature observation and/or environmental education.

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

** Codes are used to identify these features on the maps. Rare plants and animals are subject to unauthorized collection and are not identified in the text in order to provide some measure of protection.*

2001 Update

The original Adams County Natural Areas Inventory (NAI), which was completed in 1996, included descriptions, maps, and rankings of sites of ecological significance in the county. The emphasis of the report was upon locations of species listed as rare, threatened, or endangered in Pennsylvania and exemplary natural communities. The NAI update is simply an addendum to the original report. It includes new information based on fieldwork that was completed since the original NAI was written. The sites that were not visited since completion of the original NAI were not reevaluated. The four sites listed as top priorities in the original report remain the most important sites for conservation in the county. Based upon the results of new field visits, the update includes changes in the rankings of sites listed in the original report, as well as new sites discovered since 1996. The rankings are based on the same criteria used in the original report. Table 1 from the original report has been updated to include all sites from the original report and the update. For your convenience, you may insert this table in place of Table 1 in the original report.

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

The results presented in the update follow that of the original Adams County NAI. There are tables for each USGS quadrangle map listing all new or updated elements by their PA Natural Diversity Inventory code. Each table provides the global and state rarity ranks, state legal status, site quality, and the date last observed for each element. Following the table is a brief narrative for each site, noting whether it is a NEW occurrence or an UPDATE.

All updated or new natural communities and species of special concern are coded on the maps and described in the text. The codes are PNDI map codes that are unique to each element on a given USGS topographic map. Species are identified by code to prevent unauthorized collection and possible extirpation of the species at the site. The natural communities are identified by **NC**, plants by **SP**, and animals by **SA**. All are followed by a three-digit code.

Sections of USGS maps accompany the text, showing the location of each NEW site identified or sites whose boundaries have been changed to include a new species. The maps for updated sites with unchanged boundaries are not included. The area outlined on a map represents the general location of a species as well as the watershed or subwatershed area where the elements are located. Proposed development activities within the encircled areas should be carefully assessed to determine the impact of the project on the species or communities before approval is granted. Consultation with the biologists of the Pennsylvania Science Office of The Nature Conservancy may be necessary to assess potential impacts. Questions about this supplement or the original NAI can be directed to Aura Stauffer, County Inventory Ecologist, at the address on the title page.

COUNTY OVERVIEW

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

Physiography and Geology

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

Adams County falls entirely within two physiographic provinces: the Piedmont Province and the Blue Ridge Province. In Adams County, the Blue Ridge Province is defined by South Mountain, a part of the Blue Ridge Mountain range that occupies the western and north-western portion of the county. South Mountain is characterized by pronounced ridges and deep valleys and is underlain with metavolcanic rocks, quartzite, and some dolomite. Much of this area remains forested, dominated by several species of oak and mixed with red maple, white pine, and hickory.

The rest of the county is a dissected plain which falls in the Piedmont Province. This portion of the Piedmont Province is sub-divided into three sections: the Piedmont Upland, Piedmont Lowland, and the Gettysburg-Newark Sections. The Piedmont Upland and Piedmont Lowland Sections are limited to small areas in the south-eastern part of the county. The Piedmont Upland Section is characterized by broad gently rolling hills and valleys and is underlain with schist, gneiss, quartzite, and other metamorphic rock types. The Piedmont Lowland Section is characterized by broad moderately dissected valleys separated by broad low hills with common occurrences of karstic terrain (often recognized by the occurrence of sinkholes) and is underlain with carbonite rock types including limestone, dolomite, and marble. Most of the land in the Piedmont Province is in

agriculture; in general only the steep slopes and wetter areas remain in woodland, usually dominated by oaks, tulip poplar, and hickory.

The Gettysburg-Newark Lowland Section occupies the rest of the county and is distinguished by rolling lowlands with isolated hills and highlands underlain with red and gray shale, siltstone, sandstone, conglomerate, and diabase (Berg et al. 1989). Diabase, a hard igneous rock high in base minerals, occurs primarily in a narrow band from Harpers Hill near the Maryland border running north-northeast into York County near Bermudian. At several locations the diabase formation occurs as prominent hills with large rock outcrops and boulder fields. Harpers Hill and several locations in Gettysburg National Military Park including Devils Den and Little Round Top are examples of this feature. Where forested, these hills are typically dominated by oaks and the mineral-rich soils may support a diverse herb flora. Several rare plant species are also associated with the diabase.

Soils

The distribution of soils in Adams County reflects both topography and bedrock geology. Eleven major soil associations are recognized in the county with several major soil types (series) and some minor soils as well. The types of soils in a given area have led to the distinctive patterns of use that are seen on the landscape today.

The following brief descriptions of soil characteristics are taken from Speir (1967) and the reader is referred to that document for more detailed information. Additional information on associated vegetation is provided based on field surveys for this Natural Areas Inventory. Soil types are important in the inventory process as some natural communities and rare plant species are associated with specific soil types or characteristics.

Edgemont-Highfield association: This association occurs primarily on moderately sloping to steep ridges in the extreme northern and western parts of the county on South Mountain. A small area also occurs in the Pigeon Hills region on the Adams and York County line. These soils are acidic, well-drained, sandy to stony, and derived primarily from quartzite. Most of this area is forested with mixed hardwoods (chestnut oak, hickory, red maple) and some white pine and pitch pine. Mountain laurel, blueberries, and scrub oak are common in the understory. "Big Flat Barren", a Pitch pine-scrub oak natural community (see Caledonia Park quadrangle), is a good example of native vegetation of this area.

Highfield-Myersville-Catoctin association: This association occurs in the western and northwestern parts of the county on moderately steep slopes of the South Mountain area. These soils formed over metamorphosed volcanic rocks such as greenstone and brittle metarhyolite and are less acidic than the quartzite derived soils. Mixed hardwoods, mainly oak and hickory, are common over much of this area.

Arendtsville-Highfield association: These well-drained gravelly soils occur on slopes ranging from gentle to steep. These soils are not very extensive but can be found on the rolling to

hilly eastern foot slopes of South Mountain in the north-central part of the county. They are some of the best soils for orchards in the county. Some areas remain in woodlands and contain a diversity of trees such as white oak, red oak, tulip poplar, cherry, hickory, and sassafras.

Penn-Readington-Croton association: Gently to moderately sloping, shallow to deep, moderately shaly soils that developed on acidic sandstone and shale. These soils, portions of which are locally called red lands, extend from the Maryland State line northeastward through the middle of the county and are found on gentle slopes, level areas, depressions, and stream courses. The majority of lands within this area have been cleared and cultivated. These soils are susceptible to erosion.

Klinesville-Penn-Abbottstown-Croton association: Gently to moderately sloping, mostly shallow shaly soils that are well drained to poorly drained. These soils occur on sharp breaks, moderate slopes, along drainage ways, in depressions and in nearly level areas throughout the central part of the county. They are moderate in available moisture capacity, and the surface layer is loose, friable and easily eroded.

Montalto-Mount Lucas-Watchung association: Rolling to gently sloping, medium acid soils that developed from material weathered from diabase, locally called ironstone or Gettysburg granite. This association is fairly extensive in the central part of the county and occurs on narrow ridges of red shale extending from the Maryland state border northward to York County. Boulders and stones are common (as illustrated at Devils Den or Round Top) and the rockier areas tend to be wooded, typically with chestnut oak, red oak, tulip poplar and pine. The nutrient rich soils may support a diverse flora and several rare plants, but weedy non-native species such as garlic mustard also thrive on these soils.

Lehigh-Brecknock association: Gently sloping to moderately steep, moderately deep soils. These soils occur on gentle to moderate slopes in areas adjacent to diabase ridges across the central part of the county and also in narrow bands over red shale and sandstone. These soils are moderately slow in permeability and have a high water table in the spring. Most of the land has been cleared for cultivation. Native vegetation includes mixed stands of oak, hickory, and chestnut.

Penn-Landsdale-Abbottstown association: Gently sloping to moderately sloping, strongly acidic soils that are mostly well drained or somewhat droughty. Most areas of these soils occur in a band several miles wide that extends from Abbottstown to New Oxford to the Maryland border. These soils are very important to county agriculture. Much of the land containing these soils has been cleared and cultivated. Remaining woodlands are comprised of mixed hardwoods, chiefly oak and hickory.

Conestoga-Wiltshire-Lawrence association: Mostly deep, gently sloping, medium acid and slightly acidic soils weathered from limestone and other calcareous rocks. These soils occur in the eastern part of the county near McSherrystown and extend southwestward to Littlestown and are usually found in depressions and streambeds in limestone areas. Most of the acreage is used for

crops and pasture. A small portion of the land is forested and consists of oak, hickory, and tulip poplar.

Glenelg-Manor-Glenville association: Shallow to moderately deep, mostly well-drained soils on gently sloping to moderately steep slopes weathered from schist and phyllite. These soils occur in the extreme southeastern part of the county in gently rolling areas and on fairly broad ridgetops and tend to remain wet later in the spring than do the surrounding soils at higher elevations. Most of this area is in cultivation, but woodlots are frequent on the stony and steep areas, supporting oak, hickory, locust, dogwood, and tulip poplar.

Athol-Wiltshire-Readington association: Deep, gently sloping, medium acid and slightly acid soils. Most of the acreage of these soils occurs in the undulating or gently rolling areas in the valley that contains the town of Fairfield, with smaller areas northwest of York Springs and in the hilly region of Pigeon Hills in the extreme east of the county. These soils are ideal for crops and have thus been intensively farmed. Historically, these soils supported a mixed hardwood forest with oak, hickory, walnut, locust, and maple.

Vegetation

The vegetation of Adams County reflects the environmental conditions (geology, topography, soils, climate) and disturbance history, both natural and anthropogenic. Adams County is located in the original Oak-Chestnut Forest Region, partly in the Piedmont Section and partly in the Northern Blue Ridge Section (Braun 1950). The American chestnut (Castanea dentata) was once a dominant feature of the Oak-Chestnut Forest, but was virtually eliminated with the introduction to North America of the chestnut blight fungus (Endothia parasitica) in 1904. Today the forest of this region is more aptly classified as Appalachian Oak Forest (Bailey 1980) or Mixed Oak Forest (Monk et al. 1990), dominated by white, red, scarlet, and black oaks, often mixed with tulip poplar, red maple, and/or beech, and ericaceous shrubs (e.g., blueberries, mountain laurel, etc.).

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

The Northern Blue Ridge Section of the Oak-Chestnut forest in Adams County falls within the Blue Ridge physiographic province (the South Mountain area). Most of this area is forested with oaks and other hardwoods. Several notable variations in the typical "Mixed Oak Forest"

composition (Monk et al. 1990) occur with relationship to soil, soil moisture, and topography. Drier ridge tops characterized by shallow nutrient poor soils are characterized by chestnut oak (Quercus montana) and black gum (Nyssa sylvatica) with red maple and other oaks as associates, and an understory of ericaceous shrubs including blueberries (Vaccinium spp.), huckleberries (Gaylussacia spp.), and mountain laurel (Kalmia latifolia). Some of these ridgetop woodlands also contain a significant component of pitch pine (Pinus rigida) and scrub oak (Quercus ilicifolia); areas known as Pitch pine-scrub oak barrens (Smith 1983). "Big Flat Barrens" on Caledonia Park quadrangle is an example of this community type.

Many of the stream corridors and adjacent north-facing slopes are dominated by hemlock (Tsuga canadensis) with a minor component of yellow birch (Betula alleghaniensis) and an understory of Rhododendron (Rhododendron maximum) and witch hazel (Hamamelis virginiana). Pin oak, swamp white oak, silver maple, ash, sycamore, and black walnut are frequent on the wetter floodplain soils, with understories including spicebush, violets, nettles (Urtica dioica), cut-leaved coneflower (Rudbeckia laciniata), golden alexanders (Zizia aurea) and other wildflowers. Several species of special concern are found on the wooded floodplains (e.g., "Seven Stars Floodplain", Fairfield quadrangle). In addition, floodplain forests also serve as a protective buffer against erosion and flood damage along many of the county's creeks.

Wetlands include vegetation types important for the area, providing essential habitat for many plant and animal species. The type of wetland depends on soil type, disturbance, and length and duration of flooding. In Adams County many of the wetlands are associated with streams and include floodplain forests as described above, forested swamps such as those in the South Mountain area, shrub swamps, and graminoid marshes. Many of the wetlands in the county are seepage swamps, which are relatively small forested or shrub-dominated wetlands found on lower slopes where water emerges at the surface in a diffuse flow. These wetlands may be dominated by red maple with hemlock and yellow birch as associates, and an understory of rhododendron, swamp azalea (Rhododendron viscosum), spicebush (Lindera benzoin), and/or highbush blueberry (Vaccinium corymbosum). Common wetland herbs include skunk cabbage, violets (Viola spp.), manna grass (Glyceria spp.), sedges (Carex spp.), and ferns (e.g., cinnamon fern, royal fern, sensitive fern, etc.). Graminoid marshes--wetlands dominated by grasslike plants such as cattails, sedges, and grasses, are uncommon in the county. Because wetlands are relatively rare in south-central Pennsylvania, they are important refugia for plants as well as important habitat for nesting and migrating birds. Many other animals such as amphibians, turtles, dragonflies, and damselflies also depend on specific wetland habitats for all or a portion of their life cycles.

Disturbance

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

Some examples of natural disturbances are flooding, fire and deer browsing. While often regarded as a detrimental impact, both fire and small-scale flooding can be beneficial to certain

communities or rare species. Fire is important in maintaining some plant communities such as the Pitch pine-scrub oak barrens. Floodplain forests benefit from the periodic scouring and deposition of sediments as streams overtop their banks. At the same time, streamside wetland communities hold excess water, thus reducing the scale of flooding downstream. In contrast, deer have been blamed for a number of negative impacts on Pennsylvania flora and fauna (Rhoads et al. 1992): a reduction in the amount of understory, poor regeneration of some species, decreased songbird diversity, and direct loss of rare plants.

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

An increasing threat to these communities and natural habitats is the introduction and spread of exotic (i.e. non-native), invasive species across the landscape. These include, among others: the chestnut blight fungus that dramatically changed the composition of our forests; the grass carp that can disrupt native aquatic life; and a long list of plants that outcompete native species. Non-native plants such as Japanese honeysuckle (*Lonicera japonica*), Tree-of-heaven (*Ailanthus altissima*), Oriental bittersweet (*Celastrus orbiculatus*), and garlic mustard (*Alliaria petiolata*) have become commonplace in disturbed woodlands, often to the point of excluding some of the native plants. In wetlands and along streams, purple loosestrife (*Lythrum salicaria*) and mile-a-minute weed (*Polygonum perfoliatum*) are aggressive, weedy species that follow in the wake of disturbance and crowd out native species.

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

PENNSYLVANIA NATURAL DIVERSITY INVENTORY DATA SYSTEM

In order to plan the wise use of Adams County's natural features, the Pennsylvania Science Office of The Nature Conservancy (PSO/TNC) was contracted by the Adams County Office of Planning and Development to provide an inventory of significant flora, fauna and natural communities in Adams County. Critical to this effort is the Pennsylvania Natural Diversity Inventory (PNDI) data base. PNDI was established in 1982 as a joint venture of The Nature Conservancy (PSO/TNC), the Pennsylvania Department of Conservation and Natural Resources (DCNR), and the Western Pennsylvania Conservancy. In its fourteen years of operation, the PNDI data base has become Pennsylvania's chief storehouse of information on outstanding natural habitat types (called natural communities in PNDI terminology), sensitive plant and animal species (species of special concern), and heron rookeries. Several other noteworthy natural features are also mapped including D.C.N.R. designated Exceptional Value streams (Shertzer 1992) and outstanding geologic features (based on recommendations from Geyer and Bolles 1979). Over 10,000 detailed occurrence records, largely the result of field surveys, are stored in computer files and denoted on topographic maps. Additional data are stored in extensive manual files set up for over 150 natural community types, over 800 plant and animal species, about 650 managed areas, and for each of Pennsylvania's 881 7½' USGS topographic quadrangle maps.

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

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

NATURAL AREAS INVENTORY METHODS

Methods used in the Adams 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) ground survey and reconnaissance by aircraft is conducted; and 3) data are analyzed and mapped.

Information Gathering

A list of natural features found in Adams County was prepared from the PNDI data base and supplemented with information volunteered by local individuals and organizations familiar with the county. In the summer of 1995 a public meeting was held in the county and Recommended Natural Area Survey Forms (Appendix III) were distributed to facilitate public input. TNC staff solicited information about potential natural communities, plant species of special concern and important wildlife breeding areas from knowledgeable individuals and local conservation groups. A number of Potential Natural Areas were identified.

Map and Air Photo Interpretation

PSO ecologists familiarized themselves with the air photo characteristics of high quality natural communities already documented by PSO (Appendix VI). Additional data from vegetation maps, soil-survey maps, field survey records and other sources were consulted to gain familiarity with the 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, therefore it was critical that an ecologist or person with similar training interpret the maps and air photos.

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

After an initial round of photo interpretation, field surveys were conducted to determine what was actually on the ground. Locations with minimally disturbed natural communities or with species of special concern were outlined on topographic quadrangle maps. The photo signatures (characteristic patterns, texture, tone of vegetation, and other features on the photos) of these sites

were then used as a guide for continued photo interpretation and future field surveys. Photo signatures which led to poor quality sites enabled the elimination of further field work on other sites with similar signatures.

Field Work

Experienced PSO biologists and contractors conducted numerous field surveys throughout the county from May to November 1995 with some follow-up work from February to April 1996. Biologists evaluated the degree of naturalness of habitats (including assessment of percent of native vs. non-native plant species, degree of human disturbance, age of trees, etc.) and searched for plant and animal species of special concern. Workers categorized the vegetation by natural community type for each Potential Natural Area visited. An evaluation of quality was made for each natural community, care being taken to give reasons for the quality rank. Boundaries of the community types were redrawn, if needed, based on new field information. The Potential Natural Area Survey Form (Appendix III) was completed for each community with a quality-rank of "C" and above. Community information recorded included the dominant, common, and other species, as well as disturbances to the community. Field forms were completed for all occurrences of sensitive plant and animal species (see sample plant survey form, Appendix V), the quality of each population was assessed and locations were marked on USGS topographic quadrangle maps.

On March 24, 1996, a reconnaissance flight was taken 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) is ranked using factors of rarity and threat on a state-wide (state element ranking) and range-wide (global element ranking) basis (see Appendix I). Each location of a species element (an element occurrence) is ranked according to naturalness, its potential for future survival or recovery, its extent or population size, and any threats to it. An explanation of the five element occurrence quality ranks is given in Appendix II. The element-ranking and element occurrence-ranking systems help PSO personnel to simultaneously gauge the singular importance of each occurrence of, for example, a Pitch pine-Scrub oak barren community, rough-leaved aster, or giant swallowtail in the county, as well as the state-wide or world-wide importance of these natural features. Obviously, sites with several highly ranked occurrences of high-ranked elements merit more immediate attention than sites with a few low-ranked occurrences 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 transcribed on to acetate map overlays for County use and distribution.

Information on the needs of the rare species in this report has come from a variety of sources, including field guides and research publications. For reptiles and amphibians, the major source is DeGraaf and Rudis (1981); for birds, Brauning (1992); for moths, Covell (1984); for butterflies, Opler and Krizek (1984) and Opler and Malikul (1992); Schweitzer (1981) provided much of the information on moth and butterfly species rarity in Pennsylvania. A list of some of species of special concern currently known in Adams County is provided in Appendix VII.

Map Codes

All natural communities, species of special concern, and significant geologic features are coded on the maps and described in the text. The codes are PNDI map codes that are unique to each element on a given USGS topographic map. Species are identified by code to prevent unauthorized collection and possible extirpation of the species at the site. Natural Communities are identified by **NC**, plants by **SP**, animals by **SA**, and geologic features by **GE**. All are followed by a three-digit code. Anyone seeking information on an individual site or species location may call or write the Pennsylvania Science Office of TNC; please provide the map code(s) and the corresponding map name(s) where applicable.

Priorities for Protection

A table with a priority listing of the county's natural community and species locations is presented in the Summary and Recommendations section. The 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. The table lists the site name, topographic map, and pertinent information on importance, threats, management needs, and recommendations for protection of the element. Some sites of local significance are indicated on the maps and are briefly discussed in the text accompanying each map. These secondary sites are arranged in a separate table in the Summary and Recommendations section and ranked in approximate order of importance. 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.

SUMMARY AND RECOMMENDATIONS

Each year staff from The Nature Conservancy, Western Pennsylvania Conservancy and PA Department of Conservation and Natural Resources meet to discuss and rank the most important sites for the protection of biodiversity in Pennsylvania. This meeting consists of a review and ranking of all sites within the state, in terms of the rarity and quality of the species or habitats of concern, potential threats, and protection needs. The results of these meetings provide a baseline for the County Natural Areas Inventory sites of statewide significance.

The County 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. Sites of statewide significance presented in Table 1 support species of special concern or exemplary natural communities. Sites in this category that are ranked 1 or 2 contain some of the best natural areas in the state. Locally significant sites are presented in Table 2. 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 listed in Table 2.

Top Priority Natural Areas in Adams County

All of the natural areas in the county are important to maintaining biodiversity in the region and the state. However, the following eight sites from Table 1 are the most critical in Adams County for maintaining biological diversity into the future (see Figure 1 for approximate locations of these sites). Detailed descriptions of all sites are included in the Results section which follows.

BIG FLAT BARRENS (Caledonia Park Quad., Menallen Twp. & Cumberland Co.) - This site is a fair to good quality Ridgetop Dwarf-Tree Forest natural community, more commonly known as a "Pitch pine-Scrub oak barren". The community occurs on drier, sandy soils in several locations across Big Flat Ridge in southern Cumberland County (part on Walnut Bottom quadrangle, not included in this report) and northern Adams County as shown on this quadrangle. Characteristic plants include pitch pine, scrub oak and huckleberries, species which are all fire-adapted. Much of the Adams County area of this site burned in 1963. Prescribed burns have been used in some of the barrens in the state to reduce the threat of wildfires while maintaining the existing pitch pine-scrub oak community. The site also supports a PA-Endangered plant species and a PA-Rare plant species (**SP513** and **SP537**), both are characteristic of the barrens habitats. The barrens habitat has potential for several rare butterfly/moth species which have been found in the Cumberland County barrens. Most of the site is within **Michaux State Forest**.

CONEWAGO CREEK/NEWCHESTER (Hampton Quad., Reading and Straban Twps.) - An animal species that has been recommended for PA-Endangered status was discovered at this site in 1995. The stream flows over a series of cobbles and low ledges and supports common animals such as crayfish, freshwater clam (*Pisidium*), caddisflies, and several species of fish. Native plants such as lizards tail (*Saururus cernuus*), rice cut-grass (*Leersia oryzoides*), box-elder (*Acer negundo*), pin oak, sycamore and elm line the stream edges. Clean flowing water is important for the survival of

SP509. Maintaining woodland buffers along the stream to minimize sedimentation and nutrient loading can help to protect both the rare animal (**SP509**) and the fisheries here.

MARSH CREEK WETLANDS (Arendtsville Quad., Franklin Twp.) - A PA-Endangered animal has been documented at various locations throughout this site in 1988 and again in 1996. Historically, much of this area was used as pasture and, based on studies elsewhere in the state, it appears that light to moderate grazing can help to maintain the open habitat that this animal species uses. However mowing in the wetland area could be detrimental to the animals. Maintaining the existing wetland habitat and the wooded tributaries in the area is critical for the population of this species.

SAND SPRING SEEP (Caledonia Quad., Franklin and Menallen Twps.) - This site is a mosaic of seep-derived wetland communities including shrub swamp, forested swamp, and small sedge-sphagnum openings. Dominant canopy species are red maple and hemlock. The thick shrub layer includes highbush blueberry, rhododendron, and mountain laurel with a ground cover of cinnamon fern, sedges, and grasses. Four plant species of special concern are known to occur here, including two PA-Endangered plant species. These species are vulnerable to soil disturbances and destruction of their wetland habitat. Any efforts to artificially make openings to promote flowering of these species should be carefully evaluated beforehand. This site is mostly within **Michaux State Forest**.

CALEDONIA STATE PARK SITE (Caledonia Park Quad., Franklin Twp. & Franklin Co.) - The moist woodland habitat at this site supports a good quality population of a PA-Endangered plant. The persistence of the population is dependent on retaining the minimal degree of disturbance of the area and maintaining the existing forest cover. The site is within **Caledonia State Park** and measures are being taken to assure the long-term survival of this PE species.

CONEWAGO CREEK/PLAINVIEW (Biglerville Quad., Butler, Straban & Tyrone Twps.) - A portion of Conewago Creek supports a globally rare animal species. Further surveys are needed to fully assess the extent and quality of this population. Maintaining the wooded buffer along the Conewago Creek can help to maintain this rare species as well as the fisheries here. Part of the site is bordered by **State Game Lands 249**.

ROCK CREEK HILLS (Gettysburg Quad., Cumberland Twp.) - This site supports five species of special concern and is comprised of a mosaic of vegetation cover types which flank the hills around Rock Creek in the south-east corner of **Gettysburg National Military Park**. One portion of this site includes a glade or barrens-like community with three plant species of special concern. This largely herbaceous community has a small amount of tree cover including eastern red-cedar, red oak, hickory, and black gum. Dominant herbs include tick trefoil, bush clover, and Indian grass. The open canopy and thin droughty diabase derived soils create the habitat necessary for these species. A major threat to these rare plants is succession to forest. Also within the site are two animal species of special concern. One of the animals was first observed in the Culps Hill area in 1979 and has been observed repeatedly since then, including during the 1995 field season. This species is dependent on prickly-ash as a food source. Loss of prickly-ash at this site would be detrimental to

this species. The other animal is an aquatic invertebrate that occurs in Spanglers Spring. Preservation of the water quality of the spring is important for the survival of this species.

ROUND TOP HILLS (Gettysburg Quad., Cumberland Twp.) consists of several forested diabase hills and adjacent successional meadows with much surface area being occupied by boulders and outcrops. Five species of concern are known here. Two of plants of concern are found in a wet meadow along with a diversity of herbs, sedges, and grasses. The meadow is active cattle pasture and it is uncertain what kind of effect trampling and grazing may be having on these elements. Another plant of special concern is found at a higher elevation on a dry wooded slope. Two animal species of special concern are found here and both have been observed as recently as 1995. In addition, "Devil's Den" is mapped as a significant geologic feature as identified by Geyer and Bolles (1979), an example of an Erosional Remnant that consists of a large mass of diabase boulders. **ROUND TOP HILLS** site is mostly within Gettysburg National Military Park.

Since there is only limited money and personnel time that can be devoted to the pursuit of land conservation, two tables are presented to direct protection efforts towards the sites of greatest biological significance. Table 1 lists all the known sites where exemplary natural communities and species of special concern are located in approximate order of importance for the protection of biological diversity. The table also summarizes their significance, any potential threats, and some recommendations for protection of the elements listed. Table 2 is a list of secondary (Locally Significant) sites that are significant on a county-wide level but do not contain known rare species and do not have exemplary natural communities. These may be important as sites for local parks or for natural areas and passive recreation. Ideally, the sites in Table 1 that are not already protected should, in most cases, be given higher priority for protection than the sites in Table 2

Table 1. The sites of statewide significance for the protection of biological diversity in Adams County. This table replaces Table 1 from the original NAI. Sites are listed in approximate order of priority from the most important (rank=1) to the least (rank=5). The revised table includes sites from the original NAI; sites updated since the NAI; and newly identified sites.

County Rank ¹	Site Name Or Code (Municipality)	USGS Topo. Map	TNC Global and State Ranks ² , Importance and Recommendations
1	Marsh Creek Wetlands (Franklin Twp.)	Arendtsville	1988, 1996 - This area supports a G3, S2 animal species (SA501). The site consists of a mosaic of wet meadows, open marsh & open woodland along Marsh Creek. Maintaining the existing wetlands is critical to this species; light to moderate use of this site as a pasture is compatible with this species.
1	Big Flat Barrens (Menallen Twp. & Cumberland Co.)	Caledonia Park	1995 - The plateau on the mountain ridges in this section of Adams and Cumberland Counties supports a Ridgetop Dwarf Tree Forest Community (NC516) (a.k.a. pitch pine – scrub oak barren.) Characteristic plant species include scrub oak, pitch pine, and huckleberries. Characteristic plant species include scrub oak, pitch pine, and huckleberries. Periodic fires helped maintain this community in the past; without fire the pitch pine tends to become less frequent. This site also supports a PE plant species and a PR plant species (SP513 & SP537) and has potential for several rare animal species. Most of the site is within Michaux State Forest .

¹ Sites are ranked from 1 to 5 with 1 being the highest priority sites for protection based on state or national significance, and 5 indicating the lowest priority for protection. Ranks take into account potential threats, management needs, and existing protection. Sites of similar rank are listed alphabetically by quadrangle.

² See Appendix I of the original NAI for an explanation of Global and State vulnerability ranks.

County Rank ¹	Site Name Or Code (Municipality)	USGS Topo. Map	TNC Global and State Ranks ² , Importance and Recommendations
1	Sand Spring Seep (Menallen & Franklin Twps.) UPDATE	Caledonia Park	<p>1995 - This site is a mosaic of seep derived wetland communities including shrub swamp, forested swamp, and small sedge sphagnum openings. It supports four plant species of special concern (SP506, SP517, SP526 & SP533) including two PE plant species. Minimizing disturbance within this site may be important to prevent direct damage to the plants or to prevent encroachment by non-native plants.</p> <p>1996 - Additional patches of a G5, S2 proposed PA-Threatened plant species (SP526) reported in the original NAI were located, expanding the size of the known population for this species at this site. The species is vulnerable to soil disturbances and destruction of its wetland habitat. Heavy logging, road building or disturbances to the surrounding hydrology would be a threat to the viability of this species. The extent and condition of the other plant species of special concern occupying this site, (SP506, SP517 & SP533) have not been updated since the original report. This site is mostly within Michaux State Forest.</p>
1	Conewago Creek/ Newchester (Reading & Straban Twps.)	Hampton	<p>1995 - This section of creek supports a globally rare (G3, S2) animal species (SA509). The creek is lined with native plants such as lizard's tail, rice cut-grass, elder, and elm. Minimizing disturbance of the creek bottom and maintaining the forest buffer along the creek can help minimize sedimentation and nutrient loading, benefiting both the fisheries and the rare animal.</p>

County Rank ¹	Site Name Or Code (Municipality)	USGS Topo. Map	TNC Global and State Ranks ² , Importance and Recommendations
2	Conewago Creek/ Plainview (Butler, Straban, & Tyrone Twps.) UPDATE	Biglerville	<p>1957, 1985, 1995 - This portion of the creek supports a globally rare (G3, S2) animal species (SA501). The full extent of area used by this species along the Conewago is not known. Maintaining a wooded buffer can help protect stream quality, which is critical for the survival of this rare species and the fisheries as well. Part of the site is bordered by State Game Lands 249.</p> <p>1996 & 1998 – This medium-sized low gradient stream contains sections with shallow riffles over a gravel and cobble substrate, and is home to two animal species of concern (SA501 & SA504). A single specimen of a G5, S2 PA-Threatened animal species (SA504) was observed along this section of the creek in 1996. There appears to be very little suitable habitat for this species at this site, although it may exist nearby. SA501 is a G3, S2 animal species recommended for PA-Endangered status. Several specimens of this species were observed at this location in 1998. This species is particularly sensitive to sedimentation of the streambed and changes in water chemistry due to nutrient run-off. Creating and maintaining forested buffers along this section of stream can help to minimize erosion and run-off problems, and help protect the diversity of stream life and the fisheries in general. Additional surveys are encouraged to assess the population status and habitat of these species.</p>
2	Rocky Knob (Franklin Twp.) NEW	Caledonia Park	<p>2001 - Several occurrences of an animal species of concern (SA544, SA545, SA546, SA647& SA548) were observed at this site throughout the 90's, and as recently as 2001. The area is remote and rugged. No disturbances were noted. A more thorough survey of the site for this species and its habitat is recommended. This site is within the Michaux State Forest.</p>

County Rank ¹	Site Name Or Code (Municipality)	USGS Topo. Map	TNC Global and State Ranks ² , Importance and Recommendations
2	Caledonia State Park (Franklin Twp. & Franklin Co.)	Caledonia Park	1995 - A good quality population of a PE plant (SP514) species occurs in a forested area at this site. The species requires the relatively undisturbed forest and stream habitat that is present at the site. Site mostly within Caledonia State Park .
2	Pitzar School Site (Cumberland Twp.) NEW	Fairfield	1997 - One pair of a PA-Endangered animal (SA524) was observed during a visit to this site. This species requires thickets or scrubby habitat with meadows nearby for feeding. It is uncertain how large an area is required to maintain this population. A more thorough survey of the site for this species and its habitat is recommended.
2	Plum Run Upland (Freedom Twp.) UPDATE	Fairfield	1996 - Hayfields and meadows at this site provide breeding habitat for a small population of a PT animal species (SA511) that has been known from this site since the 1950's. This species may also use fields outside of site boundary for feeding. Some evidence suggests this species may be declining statewide. 2001 – A single specimen of a PA-Endangered animal species SA525 was found at this site in 2001, which consists of a series of drainage swales surrounded by hayfields. This species is in decline throughout much of Pennsylvania and may have disappeared altogether from many historic sites. Another animal of special concern (SA511) reported in the original NAI, was unobserved during the site survey in 2001.

County Rank ¹	Site Name Or Code (Municipality)	USGS Topo. Map	TNC Global and State Ranks ² , Importance and Recommendations
2	Red Rock Road Site (Freedom Twp.) UPDATE	Fairfield	<p>1992, 1994 & 1996 - A small breeding population of a PE animal (SA518) has been known at this site for a number of years.</p> <p>1997, 1998 & 1999 – Subsequent visits to this site confirmed the continued use of this site as a nesting area for the animal of special concern. A breeding pair with several fledglings was observed at this site each of these years. The species requires shrubland and large grassy meadows and fields. The full extent of the area required for long-term survival here is not known. A more thorough survey is needed to determine the extent of the population and habitat of this species at this site.</p>

County Rank ¹	Site Name Or Code (Municipality)	USGS Topo. Map	TNC Global and State Ranks ² , Importance and Recommendations
2	Rock Creek Hills (Cumberland Twp.) UPDATE	Gettysburg	<p>1994, 1995 - A glade or barrens-like community at this site supports three plants of special concern (SP517, SP519, SP520). Other areas within the site support two animal species of special concern (SA506, SA522). One of the animal species is somewhat rare on a global level (G4).</p> <p>1996, 1997 - The plant populations (SP517, SP519 & SP520) from the original NAI were again located and described as doing well during brief visits to the site in 1996. A management plan to suppress the encroachment of invasive and successional plant species in this area would help the long-term viability of these species. Two new plant species of special concern were identified at this site during subsequent visits in 1996 & 1997 (SP524A, SP524B). SP534A requires open meadow-like conditions for its success, while SP524B requires the wooded fencerow where it lives to be left intact. Micro-management of this site may be necessary to provide adequate habitat to all the species present. Also in 1996, a new occurrence of a single immature specimen of a G5, S2 animal species of concern (SA526) was observed feeding on its host plant, prickly-ash (<i>Zanthoxylum americanum</i>). A more thorough survey is needed to determine the extent of the population of this species at this site. Mostly within Gettysburg National Military Park, this site includes Culps Hill, Pardee Field & Spanglers Spring.</p>

County Rank ¹	Site Name Or Code (Municipality)	USGS Topo. Map	TNC Global and State Ranks ² , Importance and Recommendations
2	Round Top Hills (Cumberland Twp.) UPDATE	Gettysburg	<p>1990, 1994, 1995 - The site consists of several forested diabase hills and adjacent successional meadows with large areas occupied by boulders and outcrops. The variety of habitats supports 5 species of special concern including 3 plants (SP513, SP515, SP518) and two animal species (SA507, SA523). "Devil's Den" is a significant geologic feature (GE514), which consists of a large mass of diabase boulders. Maintaining the existing woodlands is critical to the persistence of 3 of the rare species here. Mostly within Gettysburg National Military Park.</p> <p>2001 – The animal species SA523 has since been dropped from the list of species of special concern. The other species of concern at this site (SP513, SP515, SP518, SA507 & SA523) were not surveyed for since the original NAI.</p>
3	Chestnut Hill (Butler & Tyrone Twps.) UPDATE	Biglerville	<p>1995 – This site was listed as “Locally Significant” as a relatively large and diverse woodland in this predominantly agricultural area of the county.</p> <p>2000 - A survey found a good to marginal quality population of a PA-Endangered plant species (SP506). The site is a very diverse oak–tulip forest on a diabase ridge with exposed rock outcrops. Jeep lanes, exotic plant species, dumping and timber harvesting are disturbances and threats. Preservation of this site in its present condition is recommended. Further surveys of this site are recommended to assess its importance in the county.</p>

County Rank ¹	Site Name Or Code (Municipality)	USGS Topo. Map	TNC Global and State Ranks ² , Importance and Recommendations
3	Ram Hill Seep (Menallen Twp.) UPDATE	Caledonia Park	<p>1995 - This site, which is partially associated with a powerline right-of-way, supports good populations of two PE plant species (SP512, SP520). The site includes both upland and wetland habitats. Herbicides are a potential threat. This site is completely within Michaux State Forest.</p> <p>1996, 1997 & 1998 - During the 1996 survey, a scattered population of a previously undocumented S2 plant of special concern was found (SP508). In 1997, a proposed PA-Threatened animal species of concern (SA543) was observed at this site. The site consists of a series of rock ledges on a powerline right-of-way. There is a lot of pressure and disturbance on this site from ATV's that use the powerline maintenance road. The east side of Shippensburg Road has development pressure from several summer homes. Unless steps are taken to minimize these threats, the long-term viability for this species is not good. A more thorough survey of the site for this species and its habitat is recommended. The site was revisited during the winter of 1998, and the two PE plants (SP512 & SP520) reported in the original NAI were again observed in vigorous, though dormant populations. This site is mostly within Michaux State Forest.</p>
3	Jacks Mountain (Hamiltonban Twp.) NEW	Blue Ridge Summit	<p>Mid-1990's - A G4, S3S4 PA-Candidate animal species of special concern (SA505) has been observed at this site over several years throughout the 1990's. The site consists of rocky scree slopes with a deciduous tree canopy. Potential disturbances to the site include encroachment of housing development, cell towers, and nearby quarrying activity. Additional site visits are recommended to assess the habitat and population status of this species.</p>

County Rank ¹	Site Name Or Code (Municipality)	USGS Topo. Map	TNC Global and State Ranks ² , Importance and Recommendations
3	Harpers Hill (Freedom & Cumberland Twps.) UPDATE	Emmitsburg	<p>1984, 1985 - This forested, diabase boulder hill supports two animal species of special concern (SA501, SA502).</p> <p>2001 – The animal species SA502 has since been removed from the species of special concern list. The animal species of concern SA501 is presumed to still be present at this location. The shrub prickly ash (<i>Zanthoxylum americanum</i>) is essential to the continued well being of this rare animal.</p>
3	Seven Stars Floodplain Forest (Franklin Twp.) UPDATE	Fairfield	<p>1995 - The floodplain forest along Marsh Creek at this location supports a small population of a PR Plant species and a large population of a TU G5, S2 plant species (SP512, SP516). The forest cover also helps to minimize erosion and siltation, which in turn helps to maintain water quality & the fisheries.</p> <p>2001 – The plant species SP516 has since been removed from the species of special concern list. The site has not been revisited to determine the status of the other PA-Rare plant species (SP512) reported to inhabit this site.</p>
3	Willoughby Run Woodlands (Cumberland Twp.) UPDATE	Fairfield	<p>1991, 1995 - The mixed hardwood forest at this site supports a good population of a PE plant species (SP513).</p> <p>1997 - Several hundred flowering plants found during a revisit to the site. Clearing would be detrimental to this species and seasonal flooding may also be important to the long-term well being of this species. Partly in Gettysburg National Military Park.</p>

County Rank ¹	Site Name Or Code (Municipality)	USGS Topo. Map	TNC Global and State Ranks ² , Importance and Recommendations
3	Butterfield Farm (Cumberland Twp.)	Gettysburg	1995 - A little-known G4, S1 aquatic invertebrate species of special concern (SA521) occurs at this site. Another animal of concern has also been reported here but continued surveys are needed to confirm whether the species is breeding here. The farm is part of Gettysburg National Military Park and no immediate threats to SA521 are perceived at this time.
3	Brushtown Woods (Conewago, Union, & Mount Pleasant Twps.)	McSherrystown	1995 - A small but reproducing population of a PE tree species (SP502) occurs in this relatively large area (50 acres) of floodplain forest along Conewago Creek. Associates include sycamore, hickory & ash. Maintaining the woodland is critical for the PE species and serves as a buffer to minimize erosion and maintain water quality.
3	Conewago Creek @ Rt 234 (Menallen & Franklin Twps.) NEW	Arendtsville	1997, 2000 - This site contains a small population of a PA-Threatened plant species (SP507) observed in 1997. Potential threats include development, road maintenance, herbicides and mowing. A healthy, but marginally defensible population of a PA-Candidate plant species (SP509) was found on this site in 2000. Clearing upslope and downslope of the occurrence is a disturbance, but no immediate threats are apparent. Watershed of the tributaries should be carefully conserved.
4	Kepner Knob (Hamiltonban Twp.) NEW	Iron Springs	Mid-1990's - Several occurrences of a G4, S3S4 PA-Candidate animal species of special concern (SA512, SA513, & SA514) were noted during various site visits. Additional surveys are recommended to assess the habitat and viability of this species. This site is partially within Michaux State Forest .

County Rank ¹	Site Name Or Code (Municipality)	USGS Topo. Map	TNC Global and State Ranks ² , Importance and Recommendations
4	Long Pine Run (Franklin Twp.) UPDATE	Caledonia Park	<p>1995 - An acidic seep community at this site supports at least one species of special concern (SP531), as well as several other species uncommon in the county.</p> <p>Mid-1990's - Several occurrences of a G4, S3S4 PA-Candidate animal species of special concern (SA549 & SA550) were observed at this site on small rock patches scattered along the top rim of the ridge. Additional surveys are recommended to assess the habitat and viability of this species. This site also has a population of a G5, S3 plant species of concern (SP531) that was identified in the original report, but not observed in the subsequent visits. The area appears to be remote and undisturbed. This site is entirely within Michaux State Forest.</p>
4	Piney Mountain Swamp (Franklin Twp.) UPDATE	Caledonia Park	<p>1995 - This seep derived forested swamp supports a marginal to good-quality population of a plant species of special concern (SP524).</p> <p>1996 - This site was revisited, and two more isolated patches of the plant species were located. SP524 represents an extension of the population already documented, & SP541 represents a new, moderate sized population of the same species that occurs in the swamp. This species appears to be limited to areas with seasonally wet soils and is therefore vulnerable to soil compaction and alteration of the hydrology of the site. Roadside ditches, culverts and runoff were evidence of disturbances in the area. Heavy logging, road building or disturbances to the surrounding hydrology would be a threat to the viability of this species. Surrounding land is Michaux State Forest.</p>

County Rank ¹	Site Name Or Code (Municipality)	USGS Topo. Map	TNC Global and State Ranks ² , Importance and Recommendations
4	Buchanan Valley Site (Franklin Twp.)	Caledonia Park	1987, 1996 - A G3, S2 animal species is known from this site (SA522). This PE animal was found near a forested wetland and braided stream channel complex. This population is believed to be small due to limited habitat in the area but further surveys are encouraged.
4	Bushy Hill Site (Franklin Twp.)	Arendtsville	1995 - A G3, S2 animal species (SA503) has been observed along a wooded tributary to Conewago Creek, but the population is believed to be quite small based on limited breeding habitat available.
4	Arendtsville Narrows Ravine (Menallen & Franklin Twps.)	Arendtsville	1995 - A small population of a plant species of special concern (SP504) occurs on the rock outcrops at this site. The plant requires the cool microclimate created by the forested ravine along this section of Conewago Creek. Older hemlocks dominate the northeast-facing slope. The area is well known as one of the most scenic areas of the county.
4	Marsh Creek Hollow (Franklin Twp.) NEW	Caledonia Park	Mid-1990's - A PA-Candidate animal species of concern (SA551), was observed during various visits to this site. Additional surveys are recommended to assess the habitat and viability of this species. This site is entirely within Michaux State Forest .
4	Mount Newman Roadcut (Franklin Twp.)	Caledonia Park	1995 - has a fair sized population of a PE (G4, S1) plant species (SP528). The site is the result of a disturbance caused by road construction and is vulnerable to roadside related disturbances such as direct herbicide spraying or indirect salt spray.

County Rank ¹	Site Name Or Code (Municipality)	USGS Topo. Map	TNC Global and State Ranks ² , Importance and Recommendations
4	Quarry Gap Ponds (Franklin Twp. & Franklin County) UPDATE	Caledonia Park	<p>1995 - This site is a fair to poor-quality occurrence of an Ephemeral/Fluctuating Natural Pool community (NC532). It includes 12 ponds at the base of a steep ridge. Two plant species of special concern (SP529, SP530) occur at the site including a poor quality population of a PE G3, S2 species; this community also provides important breeding habitat for amphibians. Much of the forest area containing this site was salvage cut after ice and wind storms in 1993.</p> <p>1998 - A revisit to the site in the winter revealed the ponds all had water, and some trees had been planted by the Bureau of Forestry in cleared areas. Although buffers were left around the ponds, allowing the site to return to a forested state will best protect this community. A plant species found at the site in the 1995 survey (SP529) has since been dropped from the list of species of special concern. Within Michaux State Forest.</p>
4	King's Pasture (Reading Twp.)	Hampton	<p>1992, 1995 - This site is an abandoned marshy pasture with a diverse herbaceous flora. Four plants of special concern are found here including a PT and a PE species (SP501, SP506, SP507, & SP508).</p>
4	Cold Springs Seeps (Franklin Twp.)	Irons Springs	<p>1995 - A hemlock-hardwood forest association with a Rhododendron understory grows along the headwater seeps and springs of Antietam Creek. This site supports a small population of plant species of special concern (SP509) as well as several other species uncommon in this part of the state. Mostly within Michaux State Forest.</p>
5	Grave Ridge Site (Menallen Twp.)	Arendtsville	<p>1995 - A small population of a PE plant species (SP505) growing in a streamside forest; better populations of this species exist in the county. Within Michaux State Forest.</p>

County Rank¹	Site Name Or Code (Municipality)	USGS Topo. Map	TNC Global and State Ranks², Importance and Recommendations
5	Cranberry Valley (Tyrone Twp.)	Biglerville	1995 - supports two small populations of a plant species of special concern (SP503). Both occur in roadside meadow situations and long-term viability is marginal; no specific management is suggested.
5	Conewago/Opossum Creek (Butler Twp.)	Biglerville	1995 - One individual of an animal species of concern (SA504) was discovered along the creek in 1995. Surveys will continue to better assess the quality of the population. Restoring wooded buffers along the creek can improve condition for this animal and the fisheries.
5	Adams County Winery Site (Franklin Twp.)	Fairfield Iron Springs	1995 - A dry meadow at this site, which is periodically used for pasture, supports a fair size population of a PR plant species (SP507). Grazing at this site has helped limit competition from other plant species that might shade out the element.
5	Meadow Brook Lane Woods (Highland Twp.)	Fairfield	1995 - The floodplain forest at this site includes a small population of a PE tree species (SP515). Maintaining the existing forest here is the best way to assure the continuance of the species at this site.
5	McPherson Ridge (Cumberland Twp.)	Gettysburg	1985 - A G5S2 animal species (SA510) is known from this site but additional field surveys are needed to assess the current quality of the population. The site consists of a field and wet meadow.
5	Mummasburg Road Fields (Cumberland & Franklin Twps.)	Fairfield	1995 & 1996 – This site hosts a small breeding population of an animal species of concern (SA519). Species depends on open fields for feeding.

County Rank ¹	Site Name Or Code (Municipality)	USGS Topo. Map	TNC Global and State Ranks ² , Importance and Recommendations
5	Carbaugh Run (Hamiltonban & Franklin Twps.)	Irons Springs Caledonia Park	1995 - Carbaugh Run is an EV stream and High Gradient Clear Water Creek N.C., (NC508); (NC536 on the Caledonia Park Quad). Within Michaux State Forest , part of which is designated as Carbaugh Run SFNA . Maintaining a broad forest buffer along the stream will help to maintain water quality, scenic value and plant diversity here.
5	Storm Store Bridge Woods (Mount Pleasant & Oxford Twps.)	McSherrystown	1995 - A moderately disturbed floodplain forest along Conewago Creek supports a small aging population of a PE tree species (SP503).

Table 2. Areas of local significance in Adams County based on size, diversity of wildlife and plant life, water quality protection, and recreation potential. This table replaces Table 2 from the original NAI. (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	Site Name Or Code (Municipality)	USGS Topo. Map	TNC Global and State Ranks, Importance and Recommendations
HIGH	Arendtsville Narrows Woods & Seeps (Franklin & Menallen Twps.)	Arendtsville	The wooded slopes of this area support a relatively mature hemlock and pine forest for the county and lush mossy seeps occur in the low-lying areas along Conewago Creek. This locally significant area abuts two sites supporting species of concern; together these sites encompass an area that is well-known in the county for it's scenic value.
HIGH	Laurel Road Swamp (Menallen Twp.)	Dickinson	A seep derived hardwood swamp dominated by red maple, white pine, and white oak with an understory of swamp azalea, witch hazel, spicebush, and winterberry. The swamp is comprised of a dense network of braided seeps and streams, which meander through moss-covered hummocks at the base of trees, shrubs, and ferns. The swamp contains a diversity of herbs, sedges, and grasses and provides good habitat for amphibians as well.
HIGH	Zora Woods (Liberty Twp.)	Emmitsburg	This site is a relatively undisturbed hardwood forest on a steep rock covered slope. It supports a mature forest of sugar maple, beech, red oak, and tulip poplar. Where the slope faces southwest tree and herb species occur that reflect the drier hotter conditions of this exposure. Species occurring in this area include eastern-red cedar, sweet birch, Virginia pine, pussytoes, early saxifrage, and asters.
HIGH	Green Ridge Bend (Hamilton Twp.)	Hampton	Steep wooded slope, outcrops with locally uncommon plants such as rusty woodsia fern, and section of Conewago Creek with diversity of freshwater mussels. Creek supports fisheries also. Diversity dependent on maintaining wooded buffer and water quality.

County Rank	Site Name Or Code (Municipality)	USGS Topo. Map	TNC Global and State Ranks, Importance and Recommendations
MEDIUM	Barlow Woods (Cumberland & Mt. Joy Twps.)	Gettysburg	The wooded floodplain and slopes on private land along Rock Creek just northeast of Barlow support several habitat types with a diversity of native plant species. Sycamore, red oak, spicebush, Virginia bluebells, spring beauty, and dutchman's breeches cover the lowlands. Hemlock, oaks and hickory dominate the upper slopes with an understory of blueberries, lichens, mosses and sedges.
MEDIUM	Strawberry Hill Preserve (Hamiltonban Twp.)	Iron Springs	This site contains forests of varying ages including older stands of eastern hemlock with yellow birch along the various branches of swamp creek, and a variety of oaks mixed with beech on slopes above the stream valley. There is a diversity of herbs, ferns, sedges, and grasses growing throughout the forest with the greatest variety of species appearing in the canopy gaps along the stream corridor. The continued preservation of this site will allow the younger stands in the forest to mature and the older stands to become more heterogeneous, and therefore create habitat for a diverse array of animal and plant species. The site is protected as Strawberry Hill Nature Center and Preserve and is open to the public.
LOW	North Harpers Hill (Cumberland Twp.) UPDATE	Emmitsburg	1991 - The rocky wooded slopes of this diabase ridge support a fair population of a PR plant species (SP503). Maintaining the existing woodland can help to reduce further encroachment by the non-native plants and help to maintain habitat for the rare plant. 2000 – The plant species previously identified from this site has since been dropped from the list of species of special concern. The site has been removed from Table #1 and added to Table #2 as a Locally Significant site.

General Summary and Recommendations

Adams County residents are fortunate to have so much of the county and many natural areas protected within Michaux State Forest, Caledonia State Park, and Gettysburg National Military Park. In addition, private landowners are stewards of many of the other natural areas in the county. Suggestions for maintaining these natural areas and the biological diversity of the county are presented below. These recommendations are strictly those of The Nature Conservancy and do not necessarily reflect the policies of the municipalities or the county for which this report was prepared. These recommendations are provided as tools for those working to protect biodiversity and high quality natural areas in the county and region.

- 1. All sites that are ranked 1 or 2 (Table 1) 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 element 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 county.
- 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 (Table 1) 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. (Note: these sites may have other qualities such as scenic or recreation value that make them worth protecting, however.)

5. **Locally Significant sites (Table 2) may be protected as Table 1 sites are completed or as new information emerges.** These are sites in the county that do not have exemplary natural communities or known occurrences of rare species, but that could be excellent sites for county 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—recreation, environmental education, wildlife habitat, flood and sediment control, water supply, etc.—are ideal. Species of special concern which 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 Adams 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 Adams 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 the county. Protecting natural areas around municipal water supply watersheds provides an additional protective buffer around the water supply and habitat for wildlife and may also provide low-impact recreation opportunities.
7. **Minimize encroachment on the parks and conservation lands throughout Adams 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 stop-over 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 or water body.** 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 though there are no direct impacts, the site is effectively isolated and its value for wildlife is reduced. Cluster development could be used to allow the same amount of development but 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.** These groups can assist with the identification of landowners who wish to protect their land, provide information about easements to landowners, perhaps acquire land, and provide management and stewardship once the land is protected. Much of the work that needs to be done to protect and manage natural areas in Adams County can be done by county and municipal governments, park managers, and groups like the Audubon Society. However, these organizations will need the assistance of grassroots organizations and volunteers.

In this report, we have outlined the watersheds or subwatersheds where the natural communities and species of special concern occur. This area should be viewed as the ideal buffer zone for the communities and species (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. Ideally, all of the land within the areas outlined in this report should receive some form of protection. 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 PNDI data base, so too will the Adams County Natural Areas Inventory. If there are any questions about the impact of a proposed development or other activity, we suggest that our office, Pennsylvania Science Office of The Nature Conservancy, be consulted. Questions regarding protection methods and tools for planning should be directed to the Adams County Planning Commission.

RESULTS

TNC ecologists began field work for the Adams County Inventory in the spring of 1995 and continued through the spring of 1996. Contract biologists familiar with the county also conducted some of the field surveys for species of special concern. Sites for field evaluation were selected primarily on historical species location information, air photo interpretation and from information supplied by local citizens. Sites to search for species of concern were based on a combination of historical site location information, the species needs based on literature (*Gray's Manual of Botany* (1950), *The New Britton and Brown Illustrated Flora of the Northeastern United States and Adjacent Canada* (1952), *The Vascular Flora of Pennsylvania* (1993), and others) and locating prospective sites using air photos. Large woodlands, especially those with mature trees, unusual forest types for the county, wetlands, rocky slopes (from county soils maps), and woods on diabase all received priority for field inspection as potential natural communities and as habitat for rare species. Urban areas, agricultural fields, and other highly disturbed lands were disregarded. Small woodlands and woodlands that consisted of young trees were considered to have low potential for species of concern and no potential for exemplary natural communities.

Sites that are mapped in this inventory include sites of statewide significance (Table 1) and those of local or county-wide significance (Table 2). Sites of statewide significance (Table 1) contain "elements": plants or animal species of concern, high quality natural communities (habitats), and significant geologic features. Locally significant sites (Table 2) include sites that have high species diversity and may yet be found to harbor rare species, sites with examples of uncommon vegetation types for the county, or sites with potential to recover to natural community status. The natural areas mapped include not only the actual location for the elements but also a buffer which is typically the watershed upstream or upslope of the site. For locally significant areas, the site itself is mapped with only a small buffer. These mapped areas serve two purposes: to obscure the actual location of some species that may be vulnerable to collectors and as an indication that buffers are important for the survival of the rare elements (i.e., to protect them from development, erosion, runoff, trails, and other potential impacts). These buffers are meant only as a guide; smaller buffer zones may be sufficient to protect the resource but all activities within these boundaries should be evaluated for their impacts to the resource mapped.

Additionally, managed areas (whether owned, under easement or under management restrictions) that are maintained in a relatively natural state are also mapped. This information provides a guide to the lands that are already protected and those areas that may still be in need of protection.

Site Summaries by USGS Topographic Maps

Portions of Adams County are found on 18 USGS topographic quadrangle maps (Figure 2). Communities, species of special concern, significant geologic features, managed open-space lands such as state forest lands, and some areas that may be of local importance for wildlife and plant diversity have been located on these base maps. A labeling system has been used to visually indicate the relative importance of the sites on each map (see Figure 3) and in the text. Sites with

bold capital type indicate the highest priority sites (statewide significance), sites with upper case plain print are of lower priority for preserving biological diversity (county significance) but may have other values associated with them, and sites with bold upper and lower case type are areas that are managed for wildlife, parks or other natural resources. Below is a more detailed description of these labels.

BOLD UPPER CASE TYPE:

The most important areas for preserving biological diversity (Table 1) are represented on the maps in bold type; these sites all contain species of concern and/or exemplary natural communities. The highest quality sites have been given site names in bold upper case type (e.g., **SAND SPRING SEEP**) followed by natural community and/or species map codes (e.g., **NC503, SP501**). Lesser quality sites with poorer representations of communities or species of special concern are noted with bold type map code number(s) only (e.g., **SA532**). Note that the code numbers are specific to that quadrangle; e.g., **SP515** on the Fairfield Quadrangle may be a different species than **SP515** on the Gettysburg Quadrangle.

The area outlined for these sites represents the species' location and the watershed or subwatershed area where the elements (species or natural communities) are located. Development activities proposed within the encircled areas should be carefully assessed to determine the impact of the project on the species or communities before approval is granted. Consultation with the biologists of the Pennsylvania Science Office of The Nature Conservancy may be necessary to assess these impacts.

PLAIN UPPER CASE PRINT:

Some sites have been mapped that do not contain exemplary natural communities and that do not appear to have species of special concern. These are labeled with a site name in plain type, e.g., LAUREL ROAD SWAMP. At these sites, the vegetation has been disturbed enough that the sites cannot be considered exemplary natural communities on a statewide or rangewide level, but do include habitats that are important for preserving biodiversity on a countywide scale. The area outlined represents the significant habitat or feature at the site (the subwatershed area is not necessarily included). Many of these sites hold potential for parks, nature preserves within parks or passive recreation/open space areas.

Upper and Lower Case Type:

Managed areas are indicated with names in bold upper and lower case type, e.g., **Gettysburg National Military Park**. The approximate tract boundaries are also shown (--- · ---). These areas include sites that may contribute to the biological diversity of the county but that may be managed for a variety of interests (e.g., parks, State Game Lands, private preserves, etc.). In some cases the managed areas do contain species of special concern, in which case the map codes (in bold upper case type) appear on the map as well.

Each topographic map is accompanied by a table that lists all of the exemplary natural communities and species of special concern located on the map. The communities and species are identified by a PNDI map code unique to each element on that map. Following each of these

elements is its global and state ranks (Appendix I), federal and state protection status (Appendix I), the date last observed, and its quality rank (Appendix II). Sites of local significance are listed separately. Managed lands, state-designated scenic waterways, as well as natural communities and species that are located primarily on adjacent maps are listed within the "Other" category.

Key to Map Codes

NC = exemplary natural community

SP = plant of special concern

SA = animal of special concern

GE = significant geologic feature.

USGS QUADRANGLE MAP: Abbottstown

Code	<u>TNC Ranks*</u> Global State	<u>Legal Status*</u> Fed. State	Last Seen	Quality**
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NATURAL COMMUNITIES:

SPECIAL PLANTS:

SPECIAL ANIMALS:

LOCALLY SIGNIFICANT:

HQ-CWF:

MANAGED AREAS:

Abbottstown Quadrangle

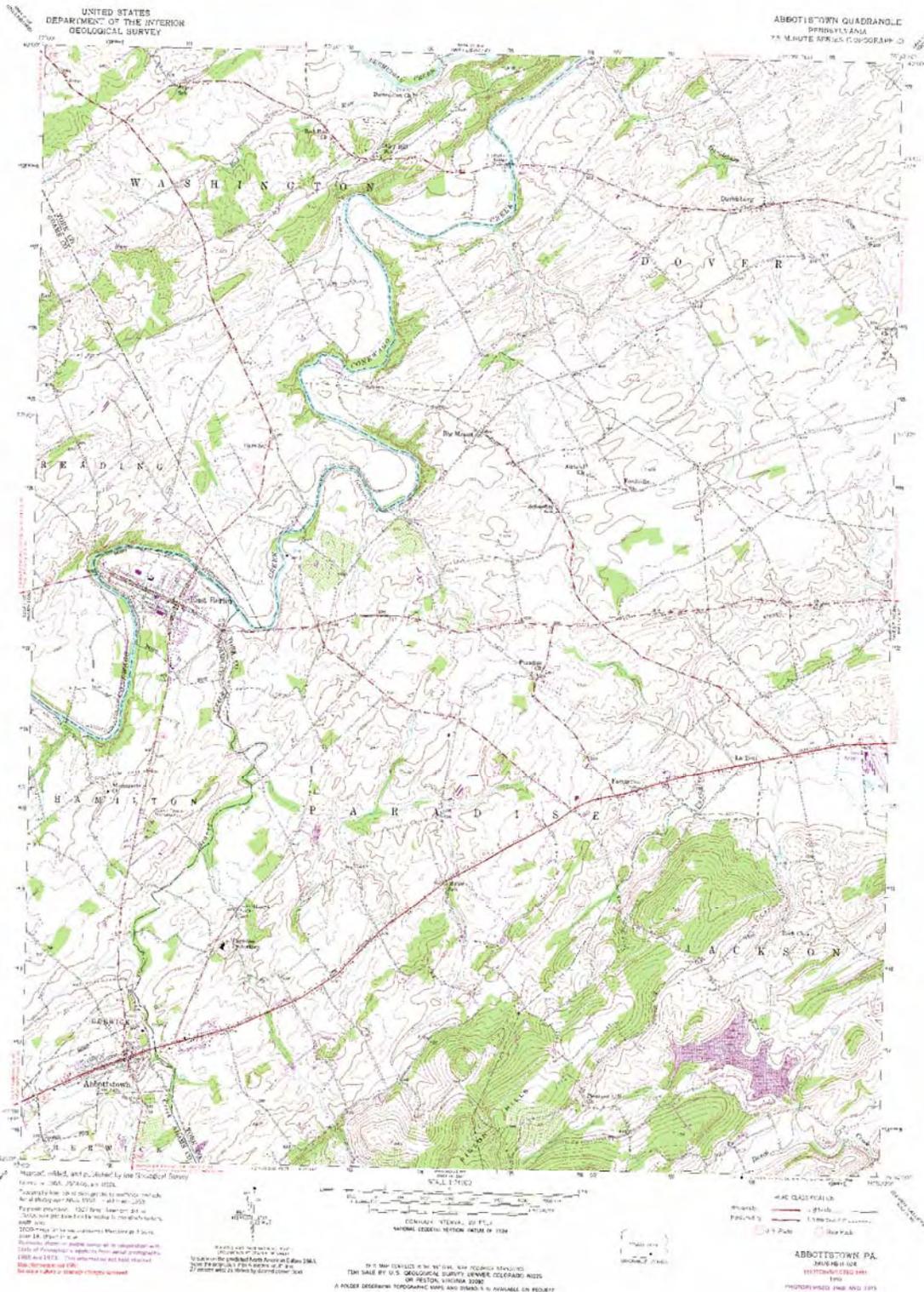
Only a small portion of Adams County occurs on this quadrangle and no species of special concern, exemplary natural communities, or Locally Significant sites (i.e., sites of countywide significance) were identified in this part of the county. Other areas that are important to natural diversity on a township level (e.g., streams or wetlands) may occur on this quadrangle.

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

** Please refer to Appendix II for Quality ranks.

Note: Outlined areas represent watershed or subwatershed areas that encompass the element(s) of concern. Activities within this area could potentially impact these elements (see page 29 for more information). Full size maps are available at the Adams County Office of Planning and Development. map

Abbottstown Quadrangle



USGS QUADRANGLE MAP: Arendtsville

	Code	<u>TNC Ranks*</u>		<u>Legal Status*</u>		Last Seen	Quality**
		Global	State	Fed.	State		
NATURAL COMMUNITIES:							
SPECIAL PLANTS:							
	SP504	G4	S3	N	N	04-17-95	D
	SP505	G5	S1	N	PE	07-11-95	C
	SP507	G5T5	SR	N	N	09-21-97	D
	SP509	G5	S3	N	N	05-17-00	BC
SPECIAL ANIMALS:							
	SA501	G3	S2	C2	PE	05-31-96	C
	SA503	G3	S2	C2	PE	1992	E
LOCALLY SIGNIFICANT:	ARENDSVILLE NARROWS WOODS & SEEPS						
HQ-CWF:	(West) Conewago Creek, Mountain Creek						
MANAGED AREAS:	Franklin Township Watershed, Michaux State Forest						

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

** Please refer to Appendix II for Quality ranks.

Note: Outlined areas represent watershed or subwatershed areas that encompass the element(s) of concern. Activities within this area could potentially impact these elements (see page 29 for more information). Full size maps are available at the Adams County Office of Planning and Development.

Arendtsville Quadrangle

MARSH CREEK WETLANDS/SA501 (Franklin Twp.) - A PA-Endangered animal was documented at several locations within this site in 1988. Surveys in 1996 confirmed that the animal is still here and the mosaic of marsh, shrublands, and adjacent woodlands provides food and cover for the species. The area is characterized by a diversity of sedges (*Carex* spp.) and grasses, skunk cabbage (*Symplocarpus foetidus*), and alder (*Alnus serrulata*), with wooded areas containing red maple (*Acer rubrum*) and ash (*Fraxinus* sp.). Historically, much of this area was used as pasture and, based on studies elsewhere in the state, it appears that light to moderate grazing can help to maintain the open habitat that this animal species uses. Mowing, however, can cause direct injury to the animals or impact breeding areas. Maintaining the existing meadows and open wetland habitat in the area is critical for maintaining the population of this rare animal (**SP501**).

SP504 (Menallen & Franklin Twps.) - "Arendtsville Narrows Ravine" - A small population of a plant species of special concern was found on south-facing rock outcrops with mountain laurel (*Kalmia latifolia*), wild gooseberry (*Ribes*), blackberry (*Rubus*), rock polypody (*Polypodium virginianum*), and marginal shield fern (*Dryopteris marginalis*). The woodlands in this ravine help to maintain the cool microclimate required by this rare plant (**SP504**). The area also includes some older hemlocks on the northeast-facing slopes and is well-known as one of the most scenic areas in the county. Additional area of local significance is included within ARENDSVILLE NARROWS WOODS & SEEPS site described below.

SP505 (Menallen Twp.) - "Grave Ridge Site" - A fair population of this PA-Endangered species was found in partial to filtered light in an oak dominated forest with black huckleberry (*Gaylussacia baccata*), highbush blueberry (*Vaccinium corymbosum*), and teaberry (*Gaultheria procumbens*). This site is entirely within **Michaux State Forest**.

SA503 (Franklin Twp.) - "Bushy Hill Site" represents observations of this species along a tributary to Conewago Creek. Based on the limited availability of suitable breeding habitat in the area, this population is believed to be quite small. This species prefers slow shallow rivulets found in marshy or boggy settings, but makes use of the small woodland streams as well. Alteration of wetland habitat and obstruction of stream flow has caused this species to decline throughout its range. At this site, maintaining the wooded slopes can help to prevent erosion and protect water quality of this section of Conewago Creek and tributaries where this species lives.

SP507 & SP509 - NEW - "Conewago Creek @ Rt. 234" (Menallen & Franklin Twps.) This site contains two plant species of special concern. SP507 is a poor-quality population of a PA-Threatened plant species observed during a field visit in 1997. Found primarily along roadsides shaded by black locust (*Robinia pseudoacacia*), and blackberry bushes (*Rubus* sp.), this species is vulnerable to herbicide applications and excessive mowing. In 2000, a good to marginal-quality population of SP509, a PA-Candidate plant species, was found on this site. This swamp forest with braided seeps and runs has canopy trees of hemlock (*Tsuga canadensis*), yellow birch (*Betula alleghaniensis*), red maple (*Acer rubrum*), black gum (*Nyssa sylvatica*), beech, (*Fagus grandifolia*), white pine (*Pinus strobus*), and both black and white ashes (*Fraxinus nigra* & *F. americana*). The understory of this site is dominated by American hornbeam (*Carpinus caroliniana*), and spice bush (*Lindera benzoin*). The surrounding land consists of residences, farms, old fields & wood lots. Potential threats include development, road maintenance and mowing. Clearing upslope and downslope of the occurrence is a disturbance, but no immediate threats are apparent. The watershed of the tributaries should be carefully conserved.

ARENDSVILLE NARROWS WOODS & SEEPS (Franklin & Menallen Twps.) - This Locally Significant site adjoins two sites for species of concern (see **SP503** and **SA503** above). The locally significant site contains good quality forest and wetland habitat, including older hemlocks (*Tsuga canadensis*) and white pine

(Pinus strobus) on the higher slopes and mossy forested seeps along the upper reaches of the Conewago Creek. A ground survey of this area was not conducted, but the area has potential for at least one species of special concern. The woodlands provide scenic value and help to maintain the quality of Conewago Creek and the fisheries there.

(West) Conewago Creek is a HQ-CWF throughout its basin from its source to Pleasant Dale Creek. Mountain Creek is a HQ-CWF throughout its basin from its source to the Adams/Cumberland County line.

USGS QUADRANGLE MAP: Biglerville

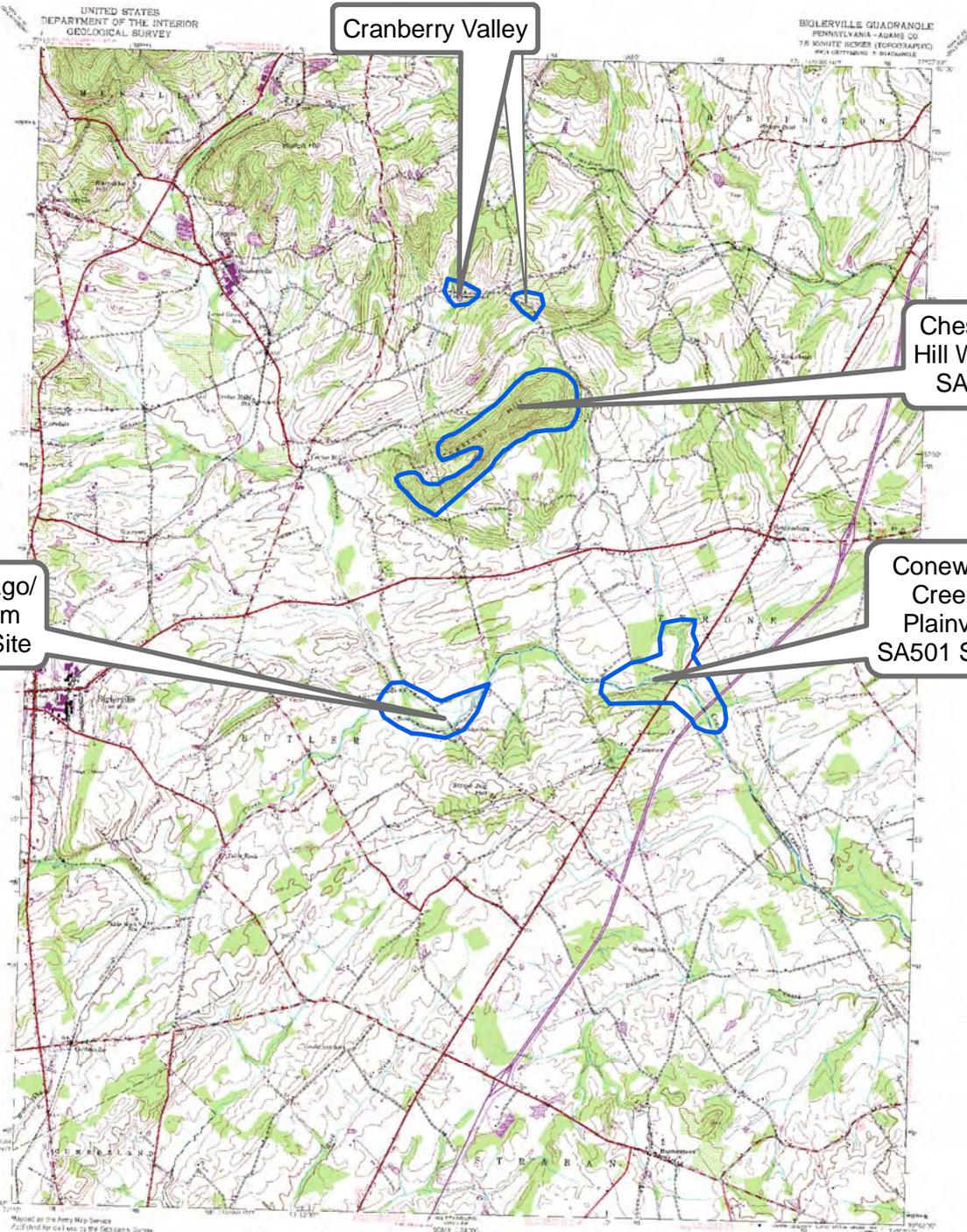
	Code	<u>TNC Ranks*</u> Global State		<u>Legal Status*</u> Fed. State		Last Seen	Quality**
NATURAL COMMUNITIES:							
SPECIAL PLANTS:	SP503	G5	S2	N	TU	09-06-95	D
	SP506	G5	S2	N	PE	05-16-00	BC
SPECIAL ANIMALS:	SA501	G3	S2	C2	N	05-19-98	E
	SA504	G3	S2	C2	N	07-14-96	E
LOCALLY SIGNIFICANT:	CHESTNUT HILL WOODS						
HQ-CWF:							
MANAGED AREAS:	State Game Lands 249						

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

** Please refer to Appendix II for Quality ranks.

Note: Outlined areas represent watershed or subwatershed areas that encompass the element(s) of concern. Activities within this area could potentially impact these elements (see page 29 for more information). Full size maps are available at the Adams County Office of Planning and Development.

Biglerville Quadrangle



Cranberry Valley

Chestnut Hill Woods SA514

Conewago/ opossum Creek Site

Conewago Creek / Plainview SA501 SA504

UNITED STATES DEPARTMENT OF THE INTERIOR GEOLOGICAL SURVEY
BIGLERVILLE QUADRANGLE PENNSYLVANIA-ADAMS CO. 7.5-MINUTE SERIES (EQUIDISTANT) 1954 (REVISED 1983) QUADRANGLE

Maplet of the Army Map Service
2:50,000 scale for sale to the Geological Survey
Control by ADAS, USGS and GPO
This maplet was prepared by the Army Map Service
and published in 1954. It is based on the
historical maplet, 1:50,000 scale, American Survey
of the Interior, 1897, and on the Pennsylvania
Geological Survey, 1:50,000 scale, 1954, and
other available information.
This maplet is a reproduction of the original maplet
and is not a new edition. It is based on the
original maplet, 1:50,000 scale, 1954, and
other available information.
This maplet is a reproduction of the original maplet
and is not a new edition. It is based on the
original maplet, 1:50,000 scale, 1954, and
other available information.

Scale: 1:50,000
CONTOUR INTERVAL: 20 FEET
NATIONAL GEODESIC SURVEY OF 1929

ROADS: 4-450W 05000
RAILROADS: 4-450W 05000
U.S. State
State Route

BIGLERVILLE, PA.
PHOTOGRAPHED BY AIR PHOTOGRAPHY
UNIT, U.S. ARMY, 1954
AND 1955 + REPHOTOGRAPHED

Biglerville Quadrangle

CONEWAGO CREEK/PLAINVIEW (Butler, Straban & Tyrone Twps.) - This site supports an animal (**SA501**) that has been recommended for PA-Endangered status. This animal was found along a forested stretch of Conewago Creek with crayfish, caddisfly larvae, minnows, and other invertebrates. This species occurs only in clean flowing streams with gravel bottoms and has suffered extensive declines throughout its range as a result of impacts to its habitat. Nutrient loading (e.g., from fertilizers, road salt, etc.) and sedimentation are particularly problematic for the species; efforts to prevent these problems can help prevent further decline of this population. Maintaining forested buffers along this section of stream, as well as at locations upstream helps to minimize erosion and siltation problems which in turn aids in protecting a diversity of stream life including **SA501** and the fisheries in general. **State Game Lands 249** encompasses a portion of this site.

SA501 & SA504 – UPDATE – “Conewago Creek/Plainview” (Butler, Straban & Tyrone Twps.) – This medium-sized low-gradient stream contains sections with shallow riffles over a gravel and cobble substrate, and is home to two animal species of concern. This site supports an unknown-quality population of a G3, S2 animal species (**SA501**) that has been recommended for PA-Endangered status. During a visit to this site in 1998, several specimens of **SA501** were observed. This species is particularly sensitive to sedimentation of the streambed, and changes in water chemistry due to nutrient run-off. A single specimen of a G5, S2 PA-Threatened animal species (**SA504**) was also observed along this section of the creek in 1996. There appears to be very little suitable habitat for this species at this site, although it may exist nearby. The surrounding land is agricultural with some wooded buffers. Creating and maintaining forested buffers along this section of stream can help to minimize erosion and run-off problems, and help protect the diversity of stream life and the fisheries in general. Additional surveys are encouraged to assess the population status and habitat of these species.

SP503 (Tyrone Twp.) - "Cranberry Valley" - Several small populations of this plant species were found in roadside meadow situations. This species, which is generally found in swamps or on shores, was growing amongst more common disturbance site species including blackberry, multiflora rose (*Rosa multiflora*), wild grape (*Vitis*), and evening primrose (*Oenothera biennis*). The long-term viability of this population is questionable given the location and small size of the population. The current status of this species is TU, but it has been suggested for PE status.

SA504 (Butler Twp.) - "Conewago/Opossum Creek Site" - One individual of an animal of special concern was found along a branch of Conewago Creek. Surveys will continue to better assess the extent of the population. The creek is bordered by agricultural lands with little forested buffer to prevent bank erosion, sedimentation and nutrient loading. **SA504** requires relatively clean flowing waters. Restoring wooded buffers could benefit this rare species as well as the fisheries throughout Conewago Creek.

SA504 – UPDATE – “Conewago/Opossum Creek” (Butler Twp.) – The species identified from this site in the original NAI was determined to exist further east than previously reported. The species **SA504** was added to the Conewago Creek / Plainview site, and the Conewago / Opossum Creek site was removed from the map.

CHESTNUT HILL WOODS (Butler & Tyrone Twps.) - This site is Locally Significant as a relatively large and diverse woodland for this predominantly agricultural area of the county. The area is dominated by hardwoods including oak, hickory, tulip poplar, and some beech with a well-developed shrub layer in the understory. Additional surveys are encouraged as only a portion of the site was field surveyed during this study.

SP506 – UPDATE – “Chestnut Hill Woods” (Butler & Tyrone Twps.) –During a survey of the site in 2000, a sizable population of an S2 PA-Endangered plant species (SP506) was discovered. Since this site is now known to host a plant species of concern, it has been removed from Table #2, and added to Table #1. The site is dominated by red oak (*Quercus rubra*), and tulip poplar (*Liriodendron tulipifera*), but also included beech (*Fagus grandifolia*), red maple (*Acer rubrum*), and butternut (*Juglans cinerea*). A partial survey of the site found it to contain 24 overstory tree species, 30 understory tree and shrub species, and 65 herbaceous species, most of which were native. The surrounding land includes agricultural fields, pastures and private residences. Jeep lanes, exotic species, dumping, timber harvesting and development are disturbances and potential threats. Preservation of this site in its present condition is recommended.

USGS QUADRANGLE MAP: Blue Ridge Summit

	Code	<u>TNC Ranks*</u>		<u>Legal Status*</u>		Last Seen	Quality**
		Global	State	Fed.	State		
NATURAL COMMUNITIES:	SA505	G4	S3S4	N	PCmid	1990s	E

SPECIAL PLANTS:

SPECIAL ANIMALS:

LOCALLY SIGNIFICANT:

HQ-CWF:

MANAGED AREAS:

Blue Ridge Summit Quadrangle

Only a small portion of Adams County appears on this quadrangle. No species of special concern, exemplary natural communities, or Locally Significant sites (i.e., sites of countywide significance) were identified in this part of the county. However, other areas that are important to natural diversity on a township level (e.g., woodlands, streams, wetlands) may occur in townships on this quadrangle.

SA505 – NEW – “Jacks Mountain” (Hamiltonban Twp.) – A G4, S3S4 Pennsylvania-Candidate animal species of concern has been observed at this site over several years throughout the 1990’s, along with fence lizards (*Sceloporus undulatus hyacinthinus*) and five-lined skinks (*Eumeces fasciatus*). The site consists of rocky scree slopes with a deciduous tree canopy. Potential disturbances to the site include encroachment of housing development, cell towers, and nearby quarrying activity. Additional site visits are recommended to assess the population status and habitat of this species.

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

** Please refer to Appendix II for Quality ranks.

Note: Outlined areas represent watershed or subwatershed areas that encompass the element(s) of concern. Activities within this area could potentially impact these elements (see page 29 for more information). Full size maps are available at the Adams County Office of Planning and Development.

USGS QUADRANGLE MAP: Caledonia Park

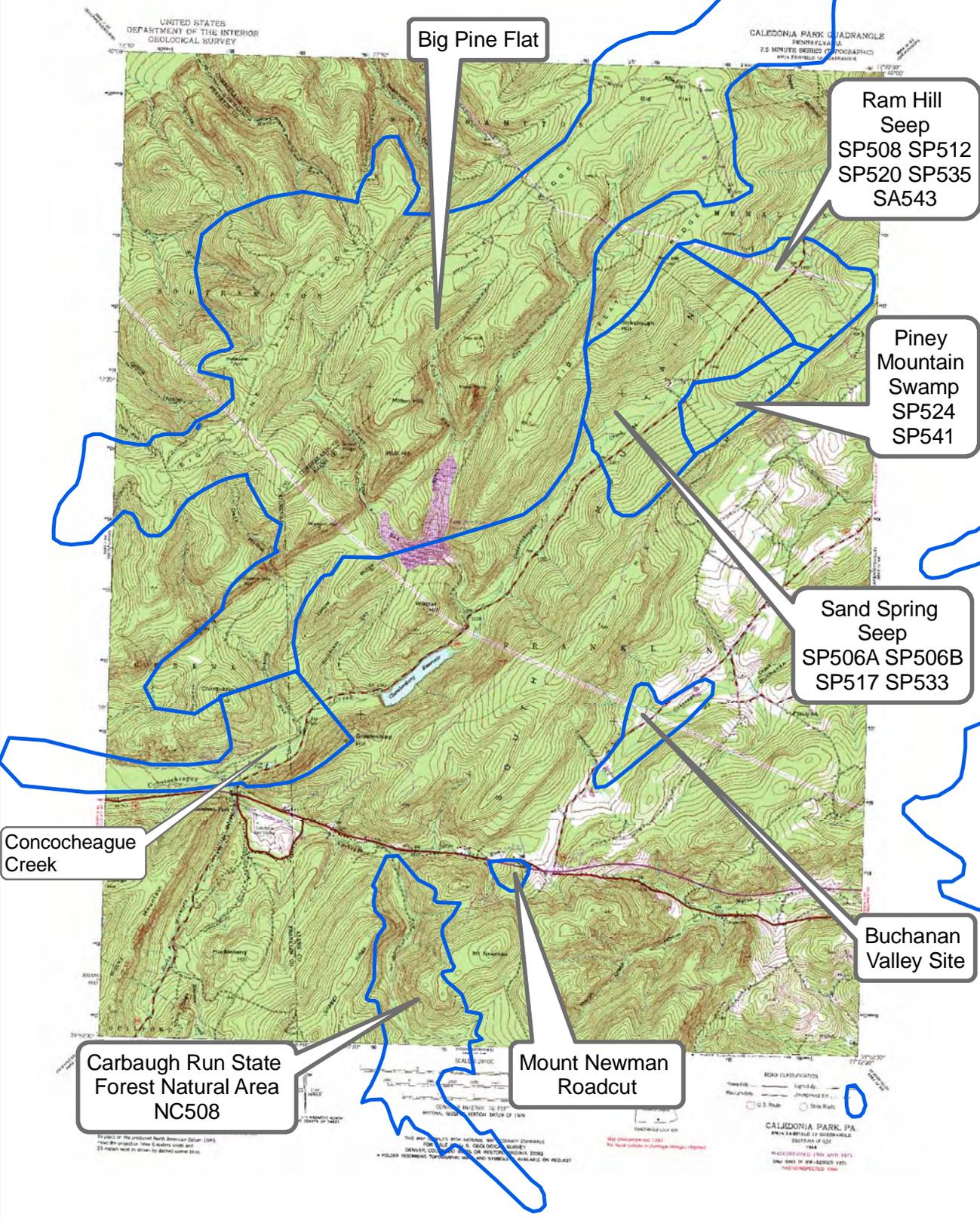
	Code	<u>TNC Ranks*</u>		<u>Legal Status*</u>		Last Seen	Quality**
		Global	State	Fed.	State		
NATURAL COMMUNITIES:	NC516	G4	S2S3	N	N	06-08-95	BC
	NC532	G?	S3	N	N	08-02-95	CD
	NC536	G?	S3	N	N	1995	E
SPECIAL PLANTS:	SP506	G4	S1	N	PE	06-06-95	D
	SP508	G5	S2	N	N	10-27-96	D
	SP512	G5	S1	N	PE	10-12-95	B
	SP513	G5	S1	N	PE	10-17-95	C
	SP514	G4	S1	N	PE	07-16-95	B
	SP517	G4	S1	N	PE	08-01-95	B
	SP520	G5	S1	N	PE	07-30-95	B
	SP524	G5	S3	N	N	10-03-95	BC
	SP526	G5	S3	N	N	09-26-95	B
	SP528	G4	S1	N	PE	05-18-95	C
	SP529	G5	S3	N	TU	08-02-95	C
	SP530	G3	S2	LE	PE	08-02-95	D
	SP531	G5	S3	N	N	09-26-95	C
	SP533	G5	S3S4	N	TU	07-29-95	D
	SP535	G5	S3S4	N	TU	07-30-95	BC
	SP537	G5	S2S3	N	PR	05-30-95	D
	SP541	G5	S2	N	N	10-22-96	BC
SPECIAL ANIMALS:	SA522	G3	S2	C2	PE	05-31-96	D
	SA543	G4	S3S4	N	PC	05-01-97	D
	SA544	G4	S3S4	N	PC	mid 1990s	E
	SA545	G4	S3S4	N	PC	mid 1990s	A
	SA546	G4	S3S4	N	PC	05-12-01	A
	SA547	G4	S3S4	N	PC	05-12-01	A
	SA548	G4	S3S4	N	PC	07-07-01	E
	SA549	G4	S3S4	N	PC	mid1990s	E
	SA550	G4	S3S4	N	PC	mid1990s	E
	SA551	G4	S3S4	N	PC	mid1990s	E
LOCALLY SIGNIFICANT:							
HQ-CWF:	Birch Run, Carbaugh Run, (West) Conewago Creek, Hosack Run, Mountain Creek, Stillhouse Run						
MANAGED AREAS:	Birch Run Reservoir, Caledonia State Park, Carbaugh Run State Forest Natural Area, Long Pine Run Reservoir, Michaux State Forest						

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

** Please refer to Appendix II for Quality ranks.

Note: Outlined areas represent watershed or subwatershed areas that encompass the element(s) of concern. Activities within this area could potentially impact these elements (see page 29 for more information). Full size maps are available at the Adams County Office of Planning and Development.

Caledonia Park Quadrangle



BIG FLAT BARRENS/NC516, SP513 & SP537 (Menallen Twp. and Cumberland Co.) - This site is a fair to good quality Ridgetop Dwarf-Tree Forest natural community, more commonly known as a "Pitch pine-Scrub oak barren". The community occurs in several locations across Big Flat Ridge in Cumberland County (part on Walnut Bottom quadrangle, not included in this report) and a small portion of Adams County as shown on this quadrangle. Most of the site is within **Michaux State Forest**.

Black gum (*Nyssa sylvatica*), chestnut oak (*Quercus montana*), and sassafras (*Sassafras albidum*) tend to dominate, but pitch pine (*Pinus rigida*) is a conspicuous and characteristic element of the community. Scrub oak (*Quercus ilicifolia*), mountain laurel (*Kalmia latifolia*), and huckleberries (*Gaylussacia baccata* and *G. frondosa*) comprise the shrub layer and the herbaceous layer includes Pennsylvania sedge (*Carex pensylvanica*), bracken fern (*Pteridium aquilinum*), and wintergreen (*Gaultheria procumbens*).

Many of the plant species of the pitch pine-scrub oak barrens are fire tolerant (e.g., with thick protective bark and the capability to resprout and to germinate after fires), and under natural conditions fire has helped to maintain the pitch pine-scrub oak community. However, with the advent of fire suppression efforts, this community type tends to succeed to a more common oak forest community. A large portion of Big Flat Barrens in Adams County burned in 1963 (pers. comm. Kenneth Swartz) but has recovered to pitch pine, oak, and black gum woods. Prescribed burning (i.e., a carefully controlled burn) may help to maintain the Pitch pine-Scrub oak barrens community and reduce the fuel load and the subsequent risk of uncontrolled fires in other portions of the barrens.

Several rare plant and animal species are associated with pitch pine-scrub oak barrens communities. To date two plant species of special concern have been discovered at Big Flat Barrens, **SP513** and **SP537**. Approximately 150 plants of a PA-Endangered species (**SP513**) occur in sandy soil in small clearings & open woods within and adjacent to the pitch pine-scrub oak barrens. Prior to the county inventory fewer than 30 stems of this species (**SP513**) were known from the site. In addition, a small population of another plant of special concern, a PA-Rare species (**SP537**), was discovered here in 1995. Associates include pitch pine, scrub oak, huckleberry, blueberries and Pennsylvania sedge. **SP513** and **SP537** are both characteristic of the barrens habitats and may have depended on openings created by occasional wildfires in this fire-tolerant system. Succession and closing of the forest canopy appear to be the primary limitations to the continued health of these populations. In addition, use of herbicides and planting of exotics (non-native plants) along the roadsides in this vicinity could impact a portion of the populations of both **SP513** and **SP537**.

This site also has potential for several rare lepidoptera (butterfly & moth) species. Five lepidoptera species of special concern have been located in the northern part of the barren in Cumberland County (Walnut Bottom quadrangle, not shown) but preliminary surveys have failed to locate these species in barrens habitat on the Caledonia Park quadrangle. Additional surveys are recommended. Parts of the barrens area were sprayed with Dimlin (an insecticide) in the past to control gypsy moth and this may have impacted the non-target lepidoptera species as well.

SP531, SA549 & SA550 - NEW - "Long Pine Run" (Franklin Twp.) – Multiple observations of unknown-quality populations of a PA-Candidate animal species of concern (SA549 & SA550), were reported at this site through the mid-1990's. The habitat consists of small rock patches scattered along the top rim of the ridge. A more thorough survey of the site for this species and its habitat is recommended. Also at this site is a G5, S3 plant species of concern (SP531) that was not surveyed for since the original NAI report. This species, which is typically found in acidic situations, was previously found growing on a sphagnum mat adjacent to an acidic seep. It occurred in a forest opening with New York fern (*Thelypteris noveboracensis*), swamp dewberry (*Rubus hispidus*), and a variety of grasses and sedges. The area appears to be remote and undisturbed. This site is entirely within **Michaux State Forest**.

SA551- NEW - "Marsh Creek Hollow Site" (Franklin Twp.) – An unknown-quality population of a PA-Candidate animal species of concern was observed at this site on various occasions during the mid-

1990's. A more thorough survey of the site for this species and its habitat is recommended. This site is entirely within **Michaux State Forest**.

SAND SPRING SEEP/SP506, SP517, SP526, & SP533 (Franklin and Menallen Twps.) - This site is a mosaic of seep-derived wetland communities including shrub swamp, forested swamp, and small sedge-sphagnum openings. Dominant canopy species at this site are red maple (*Acer rubrum*) and hemlock (*Tsuga canadensis*). The thick shrub layer includes highbush blueberry, rhododendron (*Rhododendron maximum*), and mountain laurel. The herbaceous layer is characterized by a dominance of cinnamon fern (*Osmunda cinnamomea*) and a high diversity of sedges and grasses. Four plant species of special concern are known to occur at this site. Good-sized populations of a PA-Endangered plant (**SP517**) and a plant of undetermined status (**SP526**) occur scattered throughout the wetlands. Only a few individuals of two other species of concern, **SP506** and **SP533**, have been found, restricted to areas with ample light. Although one of the rare plants, **SP517**, does well in shade, flowering and subsequent seed production of the other three species of concern may depend on light levels. For example, in 1995, **SP526** was observed scattered over the site, but flowering individuals were restricted to relatively large canopy gaps. Nonetheless, all four of these species (**SP506, SP517, SP526, SP533**) are perennials so may persist for some time in the vegetative state. Historically windthrows or die-offs of trees may have provided the openings that stimulate flowering in some of these species. The species are vulnerable to soil disturbances and destruction of their wetland habitat, so any efforts to artificially create openings to promote flowering of these species would need to be carefully evaluated beforehand. This site is mostly within **Michaux State Forest**.

SP506, SP517, SP526 & SP533 - UPDATE - "Sand Spring Seep" (Franklin and Menallen Twps.) - This site is an open, sandy, acidic seep with sphagnum moss hummocks surrounded by a mixed rhododendron / hemlock (*Rhododendron maximum* / *Tsuga canadensis*) thicket. In 1996, additional patches of an S2 PA proposed Threatened plant species (SP526) were located away from the main population described in the original NAI report. Only a few were flowering, most were merely vegetative. Other plants growing in association with this species include cinnamon fern (*Osmunda cinnamomea*), mountain laurel (*Kalmia latifolia*), tawny cotton grass (*Eriophorum virginicum*), and star flower (*Trientalis borealis*). The species is vulnerable to soil disturbances and destruction of its wetland habitat. Heavy logging, road building or disturbances to the surrounding hydrology would be a threat to the viability of this species at this site. The extent and condition of the other plant species of special concern occupying this site (SP506, SP517 & SP533) have not been updated since the original report. This site is mostly within **Michaux State Forest**.

CALEDONIA STATE PARK SITE (Franklin Twp. & Franklin Co.) - A good quality population of a PA-Endangered plant species (**SP514**) occurs in a seepy area of a hemlock-rhododendron forest. Minimizing impacts within the watershed area and on a nearby waterline right-of-way can help to maintain the population. Potential impacts would include erosion of the slopes, clearing and/or encroachment of exotics (non-native) species. This site is mostly within **Caledonia State Park** with a small section on **Michaux State Forest** lands.

NC532, SP529, SP530 (Franklin Twp. & Franklin Co.) - "Quarry Gap Ponds" - This site is a fair to poor quality occurrence of an Ephemeral/Fluctuating Natural Pool community. It includes 12 ponds which occur at the base of a steep south-east facing ridge. At the time of observation the ponds had varying depths of water ranging from several feet to a few inches with several ponds having only saturated soil. Vegetation cover varied widely between ponds with several ponds having little or no herbaceous cover and others having moderate to high cover. Common herbaceous species included three-way sedge (*Dulichium arundinaceum*), pale meadowgrass (*Torreyochloa pallida*), bladderwort (*Utricularia* sp.), violet (*Viola* sp.), and sedges (*Carex* spp.). Tree species providing cover at the ponds included chestnut, white, and red oaks, red maple, and black gum. Two plant species of special concern occur at the site. A poor quality population of a PE G3S2 species was observed in one pond only, and a fair population of a TU G5S3 species was distributed over several

ponds. This TU species has been suggested for deletion from the state list. In addition, seasonal ponds such as this are also important as breeding habitat for amphibians. Much of the forest area containing the ponds was salvage-cut after ice and wind storms in 1993. Although buffers were left around the ponds this community will be best protected by allowing the site to return to a forested state. The site is entirely within **Michaux State Forest**.

NC532, SP529 & SP530 - UPDATE - "Quarry Gap Ponds" (Franklin Twp. & Franklin Co.) - A plant species listed in the previous report (SP529) is no longer tracked as a species of concern. Even though this species is no longer tracked, this site does still contain a small population of a G3, S2 PA-Endangered plant species (SP530) found growing in a partially open-canopy vernal pond. This site is also significant as a fair to poor quality occurrence of an Ephemeral/Fluctuating Natural Pool community (NC532). These types of pools are essential as breeding grounds for many species, particularly amphibians, which require this type of habitat to complete their life cycle. Ephemeral pools typically contain water from late fall through early spring, and usually dry up completely during the summer months. In 1998, it was observed that the Bureau of Forestry had planted some trees in cleared areas.

NC536 (Hamiltonban & Franklin Twps.) - "Carbaugh Run" is designated as an EV (Exceptional Value) stream from its source to the first pipeline crossing upstream of Route 30. PNDI maps these streams as High-Gradient Clearwater Creek natural communities. Much of the EV stream watershed area on this quadrangle is within **Carbaugh Run State Forest Natural Area in Michaux State Forest**. This section of the stream is lined with hemlock, rhododendron, small mossy seeps and several outcrops. The EV status extends to the headwaters of this creek; see Iron Springs quadrangle, NC508. The site is also known for a locally significant geologic feature as described by Geyer and Bolles (1979). The "Columnar Jointed Volcanics" of precambrian age Catocin metarhyolite are exposed along the west wall below the dam at Carbaugh Reservoir.

SP512, SP520 & SP535 (Menallen Twp.) - "Ram Hill Seep" - Good quality populations of two PA-Endangered plant species are found at this site. **SP520** is a plant species more common in coastal plain wetlands. It occurs in only one boggy wetland in Adams County. At this site it grows under white pine, white oak, and red maple with mountain laurel, highbush blueberry, swamp azalea, and cinnamon fern. **SP512** is growing in open upland areas at this site. It is associated with heath species including blueberries, huckleberries, and sweet fern. A fair to good population of a wildflower species of concern, **SP535**, also occurs at the site. This site is mostly within **Michaux State Forest**.

SP508, SP512, SP520, SP535 & SA543 – UPDATE - "Ram Hill Seep" (Menallen Twp.) – Two new occurrences of species of concern have been reported from this site. In 1996, a new occurrence of a G5, S2 plant of special concern (SP508) was found scattered throughout the swampy area at this site. A poor quality population of a PA-Candidate animal species of concern (SA543) was observed at this site during a visit in 1997. The site includes a series of ledges along a powerline right-of-way. There is a lot of pressure and disturbance on this site from ATV's that use the powerline right of way. The east side of Shippensburg Road has development pressure from several summer homes. Unless steps are taken to minimize these threats, the long-term viability of the site for this species is not good. A more thorough survey of the site for this species is recommended. In the winter of 1998, two PA-Endangered plant species (SP512 & SP520) were again observed. SP520 is a plant species more common in coastal plain wetlands. In Adams County, it only occurs in this one boggy wetland under a canopy of white pine (*Pinus strobus*), white oak, (*Quercus alba*), and red maple (*Acer rubra*), in association with mountain laurel (*Kalmia latifolia*), highbush blueberry (*Vaccinium corymbosum*), swamp azalea (*Rhododendron viscosum*), and cinnamon fern (*Osmunda cinnamomea*). Disturbances to this site include powerline and roadbank clearings, jeep lanes, and private residences with extensive lawns. Potential threats include deer browse, collecting, succession, and untimely application of herbicides.

SP524 (Franklin Twp.) - "Piney Mountain Swamp" - This site is a seep-derived forested swamp. Red maple is dominant in the canopy with pitch pine, eastern hemlock, white pine, and sassafras (*Sassafras albidum*) as associates. The shrub layer is a mixture of witch hazel and heath species, including mountain laurel blueberries, huckleberries, and swamp azalea. **SP524** represents a small population of a plant species of special concern which occurs in the swamp. This species has been observed growing and flowering on sphagnum hummocks in forest openings. This species appears to be limited to areas with seasonally wet soils and is therefore vulnerable to soil compaction and alteration of the hydrology of the site. This site is mostly within **Michaux State Forest**.

SP524 & SP541 - UPDATE - "Piney Mountain Swamp" (Franklin Twp.) –This site was revisited in October of 1996. A marginal to good-quality population of a G5, S2 plant species (SP524) was again observed at this site. This population was found to be larger than previously reported. In addition, a second new marginal to good-quality population of the same species (SP541) was mapped. This species was found growing in association with cinnamon fern (*Osmunda cinnamomea*), royal fern (*O. regalis*), mountain laurel (*Kalmia latifolia*), which hazel (*Hamamelis virginiana*), & star flower (*Trientalis borealis*). Red maple (*Acer rubra*) is dominant in the canopy with pitch pine (*Pinus rigida*), eastern hemlock (*Tsuga canadensis*), white pine (*Pinus strobus*), and sassafras (*Sassafras albidum*) as associates. This species appears to be limited to areas with seasonally wet soils, and is therefore vulnerable to soil compaction and alteration of the hydrology of the site. Observed disturbances to the site include roadside ditches, culverts and runoff. This site is mostly within **Michaux State Forest**.

SP528 (Franklin Twp.) - "Mount Newman Roadcut" - In 1995 over a 150 stems of this PA-Endangered plant species were observed flowering on a steep dry slope. They were found growing under a canopy of red maple, white pine, and red oak (*Quercus rubra*), along with pussytoes (*Antennaria* sp.) and several species of grasses. Minimizing disturbance within the site and keeping the existing woodland canopy may be critical to the long-term persistence of this small population. The site is the result of a disturbance caused by road construction and is vulnerable to roadside related disturbances such as direct herbicide spraying or indirect salt spray.

SP531 (Franklin Twp.) - "Long Pine Run" - This species which is typically found in acidic situations was found growing on a sphagnum mat adjacent to an acidic seep. It occurred in a forest opening with New York fern (*Thelypteris noveboracensis*), swamp dewberry (*Rubus hispida*), and a variety of grasses and sedges. This site is entirely within **Michaux State Forest**.

SA522 (Franklin Twp.) - "Buchanan Valley Site" - A poor quality occurrence of a PA-Endangered animal was found near a forested wetland and braided stream channel complex with cattails, joe-pye-weed, and sedges. The species uses shallow rivulets found in marshy or boggy settings, as well as the adjacent woodlands and is therefore vulnerable to wetland alteration and destruction. The species may occur within other areas of this sub-watershed, although the limited extent of the habitat is not likely to support more than a small population of the species.

SA544, SA545, SA546, SA547 & SA548 – NEW – “Rocky Knob Site” (Franklin Twp.) – These records represent widespread observations of a single animal species. Good-quality populations of a PA-Candidate animal species of concern were observed at this site throughout the 1990’s, and as recently as 2001. The site consists of large rock fields on the top of the mountain. A canopy of oaks (*Quercus spp.*) and pines (*Pinus spp.*) are underlain with huckleberries (*Gaylussacia spp.*) and mountain laurel (*Kalmia latifolia*). The area is remote and rugged. No disturbances were noted. A more thorough survey of the site for this species and its habitat is recommended. This site is mostly within **Michaux State Forest**.

Birch Run is a HQ-CWF throughout its basin in Adams and Cumberland counties.

Carbaugh Run is a HQ-CWF throughout its basin from the pipeline crossing upstream of Route 30 to the Adams/Franklin county line.

(West) Conewago Creek is a HQ-CWF throughout its basin from its source to Pleasant Dale Creek.

Hosack Run is a HQ-CWF throughout its basin in Adams and Franklin counties.

Mountain Creek is a HQ-CWF throughout its basin from its source to the Adams/Cumberland county line.

Stillhouse Run is a HQ-CWF throughout its basin.

USGS QUADRANGLE MAP: Dickinson

	Code	<u>TNC Ranks*</u> Global State		<u>Legal Status*</u> Fed. State		Last Seen	Quality**
NATURAL COMMUNITIES:							
SPECIAL PLANTS:							
SPECIAL ANIMALS:	SA550	G4	S4S3	N	PC	mid 1990s	E
LOCALLY SIGNIFICANT:	LAUREL ROAD SWAMP						
HQ-CWF:	Mountain Creek						
MANAGED AREAS:	Michaux State Forest						

Dickinson Quadrangle

SA550 - NEW - “Piney Mountain Site” (Menallen Twp.) – An unknown-quality population of a PA-Candidate animal species of concern was observed at this site on various occasions during the mid-1990’s. A more thorough survey of the site for this species and its habitat is recommended. This site is entirely within **Michaux State Forest**.

LAUREL ROAD SWAMP (Menallen Twp.) is a Locally Significant natural community. It consists of a seep-derived hardwood swamp dominated by red maple, white pine, and white oak with an understory of swamp azalea, witch hazel, spicebush, and winterberry. The swamp is comprised of a dense network of braided seeps and streams, which meander through moss-covered hummocks at the base of trees, shrubs, and ferns. The swamp contains a diversity of herbs, sedges, and grasses and provides good habitat for amphibians as well.

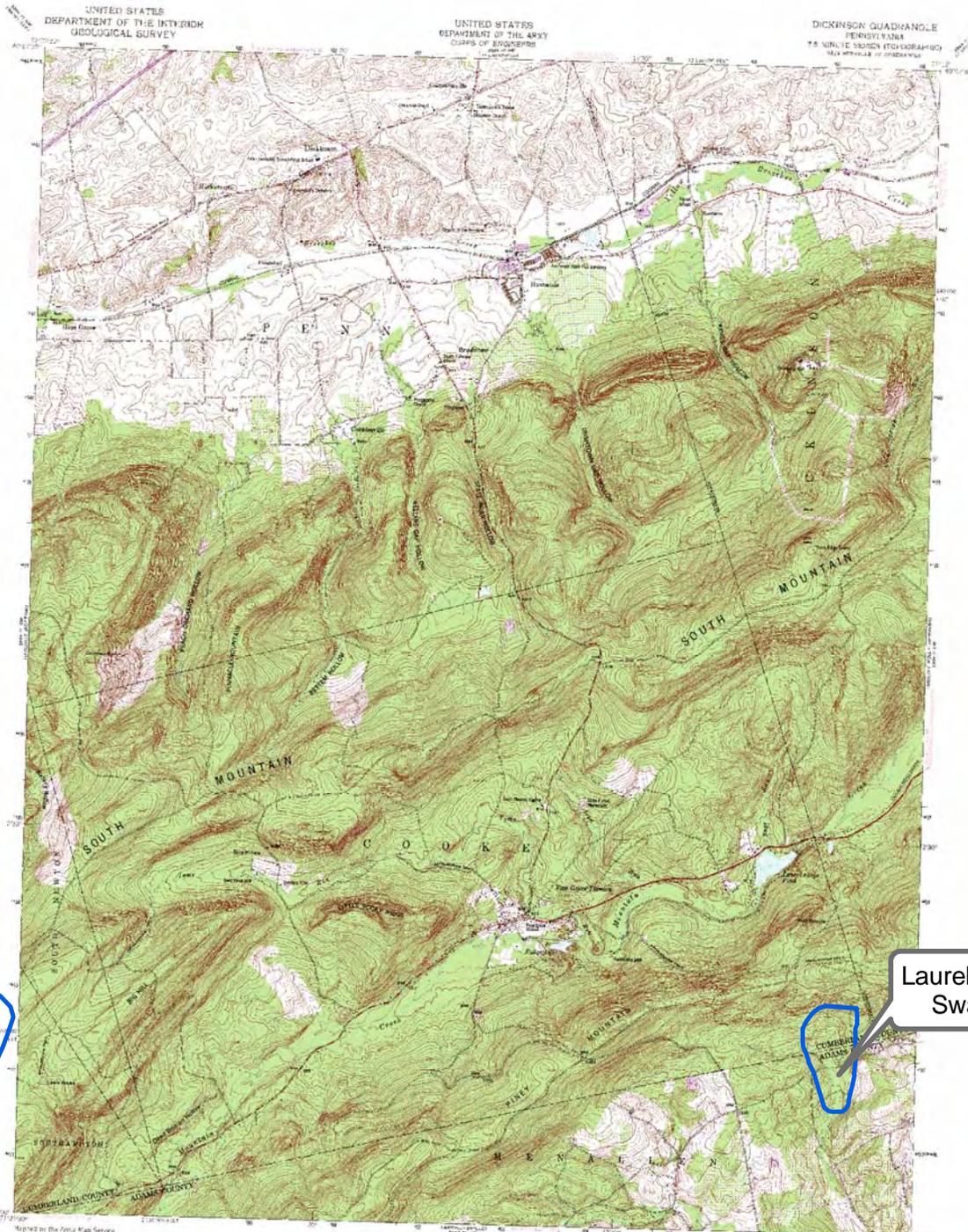
Mountain Creek is a HQ-CWF throughout its basin from its source to the Adams/Cumberland county line.

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

** Please refer to Appendix II for Quality ranks.

Note: Outlined areas represent watershed or subwatershed areas that encompass the element(s) of concern. Activities within this area could potentially impact these elements (see page 29 for more information). Full size maps are available at the Adams County Office of Planning and Development.

Dickinson Quadrangle



Laurel Road Swamp

Revised by the Army Map Service
Published by the U.S. Geological Survey
Control by USGS, USCGS, -067 and 067
Revised by the Army Map Service
Map of Dickinson, PA, 1900, 1902
Photorevised by the U.S. Geological Survey
1900-1902, 1904, 1906, 1908, 1910, 1912, 1914, 1916, 1918, 1920, 1922, 1924, 1926, 1928, 1930, 1932, 1934, 1936, 1938, 1940, 1942, 1944, 1946, 1948, 1950, 1952, 1954, 1956, 1958, 1960, 1962, 1964, 1966, 1968, 1970, 1972, 1974, 1976, 1978, 1980, 1982, 1984, 1986, 1988, 1990, 1992, 1994, 1996, 1998, 2000, 2002, 2004, 2006, 2008, 2010, 2012, 2014, 2016, 2018, 2020



ROAD CLASSIFICATION
Highway
Main Road
Local Road
Lynch Road
Unimproved Road

DICKINSON, PA.
BUREAU OF LAND MANAGEMENT
PHOTOGRAPHIC SCALE 1:50,000
ANSI Z39.48-1984 (PERM) 1984

USGS QUADRANGLE MAP: Dillsburg

Code	<u>TNC Ranks*</u> Global State	<u>Legal Status*</u> Fed. State	Last Seen	Quality**
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NATURAL COMMUNITIES:

SPECIAL PLANTS:

SPECIAL ANIMALS:

LOCALLY SIGNIFICANT:

HQ-CWF:

MANAGED AREAS:

Dillsburg Quadrangle

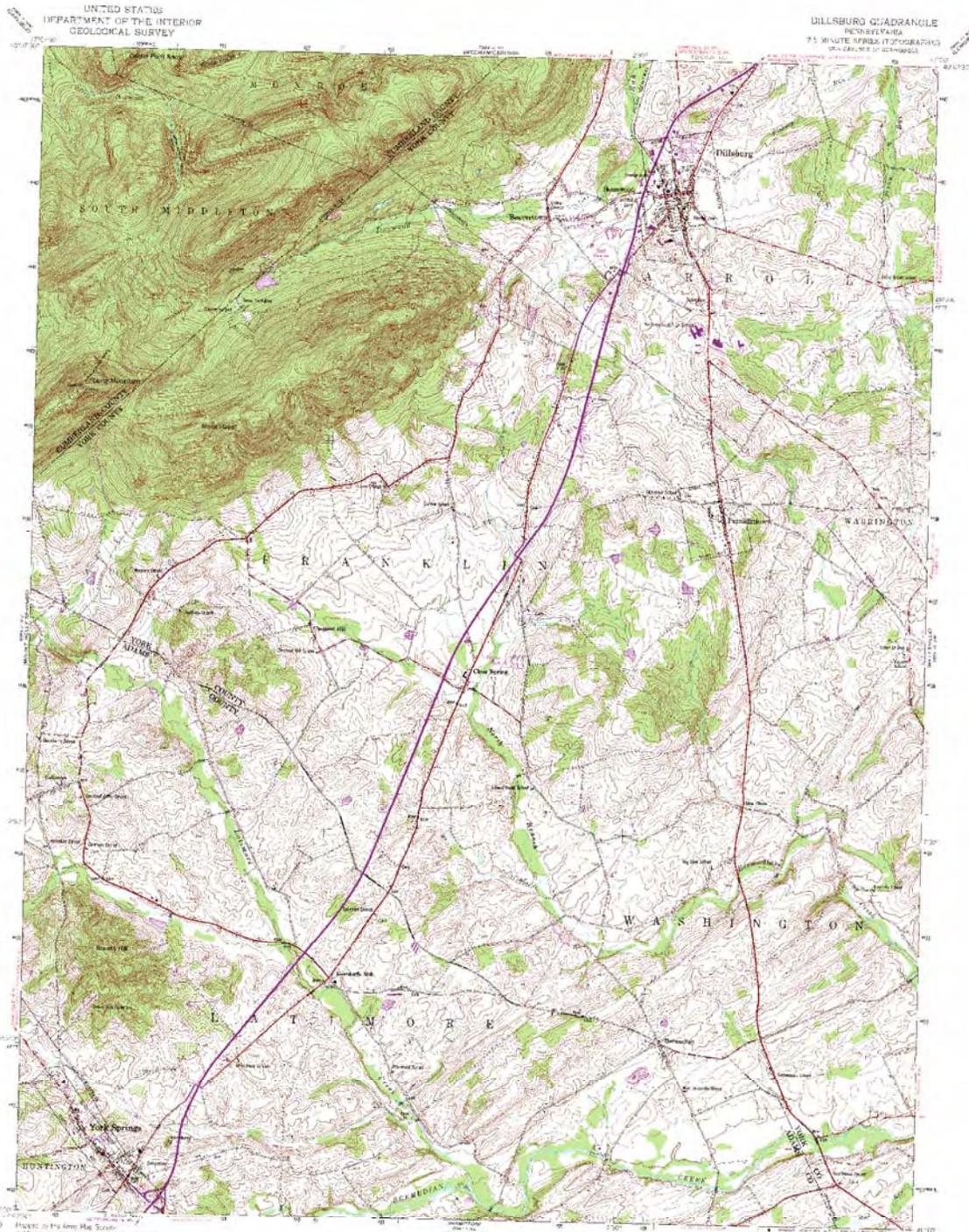
No species of special concern, exemplary natural communities, or Locally Significant sites (i.e., sites of countywide significance) were identified in this part of the county. Other areas that are important to natural diversity on a township level (e.g., woodlands, streams, wetlands) are found in townships on this quadrangle.

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

** Please refer to Appendix II for Quality ranks.

Note: Outlined areas represent watershed or subwatershed areas that encompass the element(s) of concern. Activities within this area could potentially impact these elements (see page 29 for more information). Full size maps are available at the Adams County Office of Planning and Development.

Dillsburg Quadrangle



UNITED STATES DEPARTMENT OF THE INTERIOR GEOLOGICAL SURVEY

DILLSBURG QUADRANGLE PENNSYLVANIA 7.5 MINUTE SPHERICAL TOPOGRAPHIC MAP SERIES OF QUADRANGLES

FIGURE OF THE STATE MAP SERIES
 NUMBER 10-240-100-1001 GEOLOGICAL SURVEY
 CONTROL AND 1:250,000 SCALE SERIES
 NATIONAL FIRE ENGINEERING SOCIETY, 2000 UNIVERSITY DRIVE
 ANN ARBOR, MICHIGAN 48106-1500
 1:250,000 SCALE, 1975-1980
 1:250,000 SCALE, 1975-1980
 1:250,000 SCALE, 1975-1980
 1:250,000 SCALE, 1975-1980

SCALE 24,000

COPIED FROM THE ORIGINAL MAP SERIES OF QUADRANGLES
 NATIONAL GEODESIC SURVEY, DIVISION OF SURVEYING

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 A FOLDER DESCRIBING TOPOGRAPHIC MAPS AND SYMBOLS IS AVAILABLE ON REQUEST

TO PLACE THIS MAP IN THE PROPER PERSPECTIVE, SEE THE
 MAP OF THE UNITED STATES AT THE TOP OF THIS MAP
 FROM THE PUBLISHED STATE MAP SERIES AND
 FROM THE STATE MAP SERIES OF QUADRANGLES

DILLSBURG, PA.
 10° 15' NORTH OF TOWNSHIP 10
 80° 15' WEST OF LONGITUDE 80
 1975
 PHOTOGRAPHIC SURVEY AND
 1:250,000 SCALE, 1975-1980
 PHOTOGRAPHIC SURVEY

USGS QUADRANGLE MAP: Emmitsburg

	Code	<u>TNC Ranks*</u>		<u>Legal Status*</u>		Last Seen	Quality**
		Global	State	Fed.	State		
NATURAL COMMUNITIES:							
SPECIAL PLANTS:	SP503	G5	S3	N	PR	04-30-91	C
SPECIAL ANIMALS:	SA501	G5	S2	N	N	06-07-85	AB
	SA502	G5	S2	N	N	1984	B
LOCALLY SIGNIFICANT:	ZORA WOODS						
HQ-CWF:							
MANAGED AREAS:							

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

** Please refer to Appendix II for Quality ranks.

Note: Outlined areas represent watershed or subwatershed areas that encompass the element(s) of concern. Activities within this area could potentially impact these elements (see page 29 for more information). Full size maps are available at the Adams County Office of Planning and Development.

Emmitsburg Quadrangle

SP503 (Cumberland Twp.) - "North Harpers Hill" - This small diabase ridgetop north of Harpers Hill supports a fair population of a PA-Rare plant. **SP503** was found on the rocky south-facing slopes of this hill within a relatively dry hardwoods forest. The population is reproducing successfully though encroachments by non-native weedy plants such as Japanese honeysuckle (*Lonicera japonica*) and stilt grass (*Microstegium vimineum*) may crowd out **SP503** and many other native plants over time. Maintaining the existing forest cover could help to maintain the population of **SP503** and minimize invasion by weedy species.

SP503 – UPDATE - "North Harpers Hill" (Cumberland Twp.) – The plant species identified at this site in 1991 is no longer tracked as a species of special concern. This site has been removed from Table #1, and added to Table #2 as a Locally Significant site.

SA501 & SA502 (Freedom & Cumberland Twps.) - "Harpers Hill" - This prominent hill is characterized by large diabase boulders and outcrops under a canopy of chestnut oak, tulip poplar, and pine. Marsh Creek runs along the northern edge of the hill. Two animal species of special concern occur at the site. **SA501**, an animal which is dependent on prickly-ash (*Zanthoxylum americanum*) as a food source, has been observed at locations throughout the Harpers Hill site on several occasions. Prickly-ash occurs along the stream and possibly on the hillside and is essential to the continued well-being of this rare animal. **SP502** represents another animal species of concern that was first documented to be breeding at the site in 1978 and was reported at the site in each subsequent year up until 1984. Surveys in 1996 failed to confirm breeding activity, but the habitat is still well-suited for this animal and several individuals of the species were observed in the vicinity in 1995. It is likely that the animal continues to breed at the site. Harper's Hill has received a fair amount of disturbance in the past from clearing and grazing. Weedy non-native species such as Japanese honeysuckle and stilt grass are abundant particularly on the lower slopes. While this reduces the natural quality of the plant community here, this may not impact the animal species of concern. However, both of the rare species (**SP501** and **SP502**) do depend on the forest cover.

SA501 & SA502 - UPDATE - "Harpers Hill" (Freedom & Cumberland Twps.) – One of the two animal species listed in the original report for this site has been removed from the species of special concern list (SA502). SA501 represents a good-quality population of a G5, S2 animal species of concern that was last observed in 1985, and is presumed to still be present at this location.

ZORA WOODS (Liberty Twp.) is a Locally Significant natural community along Tom's Run. It consists of a relatively undisturbed hardwood forest on a steep rock covered slope. Tulip poplar, beech, and sugar maple are dominant on the lower slope; the mid-slope is dominated by sugar maple and red oak; and chestnut oak and red oak are dominant on the upper slope. Distribution of shrubs and herbs also varies according to slope position. Where the slope faces southwest, tree and herb species occur that reflect the drier, hotter conditions of this exposure. Species occurring in this area include eastern-red cedar, sweet birch, Virginia pine, pussytoes, early saxifrage, and asters.

USGS QUADRANGLE MAP: Fairfield

	Code	<u>TNC Ranks*</u>		<u>Legal Status*</u>		Last Seen	Quality**
		Global	State	Fed.	State		
NATURAL COMMUNITIES:							
SPECIAL PLANTS:							
	SP507	G5	S3	N	PR	08-02-95	C
	SP512	G5	S2S3	N	PR	08-22-95	D
	SP513	G5	S1	N	PE	04-29-97	B
	SP515	G5	S1	N	PE	08-09-95	CD
	SP516	G5	S2	N	DL	08-22-95	B
SPECIAL ANIMALS:							
	SA511	G5	S1S2	N	PT	06-04-96	C
	SA518	G4T3	S1B	C2	PE	1999	E
	SA519	G5	S3	N	N	06-04-96	C
	SA525	G5	S2	N	PE	1997	E
	SA525	G5	S1	N	PE	10-17-01	E
LOCALLY SIGNIFICANT:							
HQ-CWF:	Middle Creek						
MANAGED AREAS:	Gettysburg National Military Park						

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

** Please refer to Appendix II for Quality ranks.

Note: Outlined areas represent watershed or subwatershed areas that encompass the element(s) of concern. Activities within this area could potentially impact these elements (see page 29 for more information). Full size maps are available at the Adams County Office of Planning and Development.

Fairfield Quadrangle

SP507 (Franklin Twp.) - "Adams County Winery Site" - A fair population of this PA-Rare plant species occurs in a dry pasture at this site. Associated species in this sparsely vegetated meadow include common mullein (Verbascum thapsus), pokeweed (Phytolacca americana), American pennyroyal (Hedeoma pulegioides), hackberry (Celtis occidentalis), and black cherry. This species requires open dry habitat and is vulnerable to succession. Current and past use of this site for grazing has probably been impeding succession and has therefore been helpful in limiting competition that would eliminate habitat for this species. However, grazing is only helpful to the rare plant to the extent that it does not result in erosion of the habitat or trampling of the plants. A small portion of the buffer area for this site overlaps onto Iron Springs quadrangle (see sp507 on Iron Springs map).

SP512 & SP516 (Franklin Twp.) - "Seven Stars Floodplain Forest" - Two plant species of special concern are found in the floodplain forest communities where Mummasburg Run and other tributaries join Marsh Creek. The stream is lined with varying widths of floodplain forest and the creek bed contains alluvial terraces, islands, and point bars which support a diversity of other plant communities. **SP512** represents a small, poor quality population of a PA-Rare plant, which had gone undetected since it was first documented in this vicinity in 1939. This plant occurs in an open wet area within the floodplain forest growing with black walnut, bitternut hickory (Carya cordiformis), hackberry (Celtis occidentalis), and red maple. Associated herb species include monkey-flower (Mimulus sp.), rice cutgrass (Leersia oryzoides), and clearweed (Pilea pumila). **SP516** represents a good quality population of a plant thought to be quite rare in the state but whose status is yet to be determined. This species of special concern occurs in a relatively undisturbed section of the floodplain forest with sugar maple, elm, black cherry, white ash, black walnut, hop-hornbeam (Ostrya virginiana), catalpa (Catalpa sp.), and shagbark hickory. Both of these species depend on the integrity of the floodplain forest and local hydrology (including seasonal flooding) for survival.

SP512 & SP516 - UPDATE - "Seven Stars Floodplain Forest" (Franklin Twp.) – The plant species SP516 is no longer tracked as a species of concern since the publication of the original report. The site has not been revisited to determine the status of the other PA-Rare plant species (SP512) reported to inhabit this site.

SP513 (Cumberland Twp.) - "Willoughby Run Woodland" - A good population of this PA-Endangered species is growing in the portion of **Gettysburg National Military Park** that falls between Herr Ridge and McPherson Ridge. An additional area of the population occurs along Willoughby Run which is outside the park boundary. These occurrences are located under a mixed canopy of oak, maple, and ash, with a variety of shrubs including spicebush (Lindera benzoin), rose (Rosa spp.), blackberry (Rubus), and Virginia creeper (Parthenocissus). Topography at this site is flat and soil moisture varies from saturated to dry depending on the distance from Willoughby Run. Clearing would be detrimental to this species. Seasonal flooding may also be important to the long-term well-being of this species.

SP513 – UPDATE – “Willoughby Run Woodlands” (Cumberland Twp.) – The good-quality population of an S1, PA-Endangered plant species found at this site in 1995, was relocated during a survey in 1997, and determined to be prospering. The site is a rich, moist bottomland forest adjoining a golf course, and surrounded by cultivated fields, pastures, and residential areas. Despite disturbances to the site, which include weedy exotic plant species & litter, SP513 seems to be doing well.

SP515 (Highland Twp.) - "Meadow Brook Lane Woods" - A small population of this PA-Endangered tree species was found growing in a floodplain forest along Marsh Run Creek. Associated species include pin oak (Quercus palustris) and green ash (Fraxinus pennsylvanica). Despite the small size of the population, the

presence of saplings indicated that successful reproduction has been occurring. Long-term viability of this population depends in part on the persistence of the woodlands here.

SA511 (Freedom Twp.) - "Plum Run Upland" - A small breeding population of a PA-Threatened animal species has been known to occur at this site since the early 1950's. This species requires prairie-like habitat such as dry meadows or pastures and although there is some encroaching development in the vicinity, appropriate habitat still exists at this site. Mowing during the period when young are present (between early May through mid to late June) can result in major losses to the population. However, limited grazing may be compatible with this animal of concern (**SA511**). The site also provides feeding and nesting habitat for a diversity of other animal species such as kestrels, hawks, and grassland birds.

SA518 (Freedom Twp.) - "Red Rock Road Site" - A small breeding population of a PA-Endangered animal species occurs at this site. It has been observed here for at least the past several years. This species requires thickets or scrubby habitat with meadows nearby for feeding. It is uncertain how large an area is required to maintain this population. Reproductive success has been limited due to a variety of disturbances. The site also provides important wintering habitat for another animal species of concern (only breeding occurrences are mapped and coded).

SA518 - UPDATE - "Red Rock Road Site" (Freedom Twp.) – Subsequent visits to this site in 1997, 1998, & 1999 confirmed the continued use of this site as a nesting area for this PA-Endangered animal of special concern. A breeding pair with several fledglings were observed at this site each of these years. The species requires shrubland and large grassy meadows and fields. A more thorough survey of the site for this species and its habitat is recommended.

SA519 (Cumberland and Franklin Twps.) - "Mummasburg Road Fields" - A small breeding population of an animal species of special concern was documented at this site in 1995 and 1996. The agricultural landscape here provides open fields where the animal can find food. **SA519** represents one of the more viable populations of this species known in the county at this time. Annual surveys are encouraged to evaluate the continued breeding success of this species here.

SA524 - NEW - "Pitzar School Site" (Cumberland Twp.) - One pair of an S2 PA-Endangered animal species (SA524) was observed in 1997. This species requires thickets or scrubby habitat with meadows nearby for feeding. It is uncertain how large an area is required to maintain this population. A more thorough survey of the site for this species and its habitat is recommended.

SA525 & SA511 - NEW – "Plum Run Upland Site" (Freedom Twp.) – A single specimen of an S1 PA-Endangered animal species was found at this site in 2001. The site consists of a series of drainage swales surrounded by hayfields. Small trees dot the area and consist of eastern red cedar (*Juniperus virginiana*), dogwood (*Cornus florida*), and redbud (*Cercis canadensis*). This species is in decline throughout much of Pennsylvania and may have disappeared altogether from many historic sites. A more thorough survey of the site for this species and its habitat is recommended. In the original NAI, another animal species of special concern (SA511) was also reported. This species was unobserved during the site survey in 2001.

Middle Creek is a HQ-CWF throughout its basin from its source to the Route 116 Bridge at Fairfield.

USGS QUADRANGLE MAP: Gettysburg

	Code	<u>TNC Ranks*</u>		<u>Legal Status*</u>		Last Seen	Quality**
		Global	State	Fed.	State		
NATURAL COMMUNITIES:							
SPECIAL PLANTS:							
	SP513	G4G5	S1	N	PE	07-06-94	B
	SP515	G5	S3	N	PR	05-06-90	D
	SP517	G5	S2	N	PE	07-06-94	B
	SP518	G5Q	S3	N	TU	07-06-94	B
	SP519	G5	S3S4	N	TU	07-06-94	B
	SP520	G5T5	S3	N	N	07-06-94	C
	SP524A	G5	S1	N	TU	08-08-96	D
	SP524B	G5	S1	N	PE	04-29-97	D
SPECIAL ANIMALS:							
	SA506	G5	S2	N	N	06-08-95	AB
	SA507	G5	S2	N	N	06-08-95	AB
	SA510	G5	S2	N	N	08-02-85	E
	SA521	G4	S1	NN	N	06-14-95	BC
	SA522	G4	S1	N	N	06-14-95	C
	SA523	G5	S2	N	N	06-14-95	B
	SA526	G5	S2	N	N	09-12-96	E
GEOLOGICAL FEATURE:							
LOCALLY SIGNIFICANT:	GE514	G?	S?	N	N	1995	E
BARLOW WOODS							
HQ-CWF:							
MANAGED AREAS: Gettysburg National Military Park							

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

** Please refer to Appendix II for Quality ranks.

Note: Outlined areas represent watershed or subwatershed areas that encompass the element(s) of concern. Activities within this area could potentially impact these elements (see page 29 for more information). Full size maps are available at the Adams County Office of Planning and Development.

Gettysburg Quadrangle

Gettysburg National Military Park and adjacent lands contain a concentration of species of special concern. Park management, local geology, and disturbance history have influenced the landscape here which includes several locally unique plant communities. Long term park management which emphasizes maintaining the park in the condition it was in during the Battle of Gettysburg has contributed to the persistence of successional plant communities which contain both rare animal and rare plant species. Local geology which is highlighted by large diabase hills located in and around the park has influenced the development of mineral rich soils which also favor certain rare species. Diabase boulders in forest and field communities are important habitat for some animal species. The park has been divided into several sites each of which has one or more species of special concern.

ROCK CREEK HILLS/SP517, SP519, SP520, SA506, SA522 (Cumberland Twp.) - This site is comprised of a mosaic of vegetation cover types which flank the hills around Rock Creek in the south-east corner of the park. One portion of this site includes a glade or barrens-like community which contains three plant species of special concern, **SP517, SP519, & SP520**. This largely herbaceous community has a small amount of tree cover including eastern red-cedar, red oak, hickory, and black gum. Dominant herbs include tick trefoil, bush clover, and Indian grass. The open canopy and thin droughty diabase derived soils create the habitat necessary for these species. A major threat to these occurrences is succession to forest. **SA506** is an animal species of special concern that was first observed in the Culps Hill area in 1979. It has been observed repeatedly since then including during the 1995 field season. This species is dependent on prickly-ash (*Zanthoxylum americanum*) as a food source. Loss of prickly-ash would be detrimental to this species. **SA522** is an aquatic animal species that occurs in Spanglers Spring. Preservation of the water quality of the spring is important for the survival of this species.

SP517, SP519, SP520, SP524A, SP524B, SA506, SA522 & SA526 – UPDATE – “Rock Creek Hills” (Cumberland Twp.) - Mostly within **Gettysburg National Military Park**, this site includes Culps Hill, Pardee Field & Spanglers Spring. The plant populations (**SP517, SP519, & SP520**) from the barrens-like community of the site described in the original report, were again located and described as doing well during a brief search in 1996. No population changes were noted for these species. A management plan to suppress the encroachment of invasive and successional plant species into this area would help the long-term survival of these species. Two new plant species of special concern were also identified at this site during visits in 1996 & 1997 (**SP524A, SP524B**). **SP524A** represents a poor-quality population of an S1 plant species of special concern that requires open meadow-like conditions. The site is mostly mowed grassland with scattered individual trees. Succession is proceeding in the area with many native and exotic species becoming established. Management practices to maintain this site as a field within the park should be compatible with the continued existence of this species. **SP524B** represents a poor-quality population of an S1 PA-Endangered plant species of special concern that inhabits a wooded fence line. This strip of woodland along the stone fence should be maintained for the continued existence of this species. Micro-management of the various habitats within this site may be necessary to provide adequate habitat to all the species present. Also in 1996, a new occurrence of a single immature specimen of an animal species of concern (**SA526**) was observed feeding on its host plant, prickly-ash (*Zanthoxylum americanum*). **SA506** represents a separate occurrence of the same animal species as **SA526** that was first observed in the Culps Hill area in 1979. A more thorough survey is needed to determine the extent of the population of this species at this site. **SA522** is an aquatic animal species that occurs in Spanglers Spring. This species has not been surveyed for since the original NAI report.

ROUND TOP HILLS/SP513, SP515, SP518, SA507, SA523 & GE514 (Cumberland Twp.) - This site consists of several forested diabase hills and adjacent successional meadows with much surface area being occupied by boulders and outcrops. Three plant species of special concern are found here. Two of these,

SP513 & SP518, are found in a wet meadow along with a diversity of herbs, sedges, and grasses. The meadow is active cattle pasture, but disturbance from grazing and trampling has not been a problem for these elements. **SP515** is found at a higher elevation on a dry wooded slope in partial light. This element, which was last observed in 1990, may have been lost from this heavily used area of the park. Two animal species of special concern (**SA507 & SA523**) are found here as well, both seen as recently as 1995. **GE514** "Devil's Den" is mapped as a significant geologic feature as identified by Geyer and Bolles (1979). The site provides an example of an Erosional Remnant that consists of a large mass of diabase boulders. Diabase is an erosion-resistant igneous rock that has been locally referred to as ironstone or Gettysburg granite (Speir 1967). The "Round Top Hills" site is mostly within **Gettysburg National Military Park**.

SP513, SP515, SP518, SA507, SA523 & GE514 – UPDATE - "Round Top Hills" (Cumberland Twp.) – The statewide populations for one plant species and one animal species from the original report (**SP515 & SA523**) were determined to be sufficient to warrant removal from the species of special concern list. The two other plant species of special concern (**SP513 & SP518**), the other animal species (**SA507**) and the geological feature (**GE514**) from this site were not surveyed for since the original NAI report.

SA510 (Cumberland Twp.) - "McPherson Ridge" - A G5S2 animal species was last observed at this site in 1985. Additional field surveys will be done to assess the current quality of the population. The site consists of a field and wet meadows.

SA521 (Cumberland Twp.) - "Butterfield Farm" - A little-known aquatic invertebrate species of special concern is found here. Another animal of special concern was also reported here but continued surveys are needed to confirm whether the species is breeding here. The farm is part of **Gettysburg National Military Park** and no immediate threats to **SA521** are perceived at this time.

See also Fairfield quadrangle for additional "Gettysburg Battlefield Site" elements.

BARLOW WOODS (Cumberland & Mt. Joy Twps.) is a Locally Significant site on private lands along Rock Creek. The wooded floodplain and slopes support several habitat types with a diversity of native plant species. Sycamore, red oak, spicebush, Virginia bluebells, spring beauty, and dutchman's breeches cover the lowlands. Hemlock, oaks and hickory dominate the upper slopes with an understory of blueberries, lichens, mosses and sedges. The site also serves as a buffer along the creek which helps to maintain water quality in the creek.

USGS QUADRANGLE MAP: Hampton

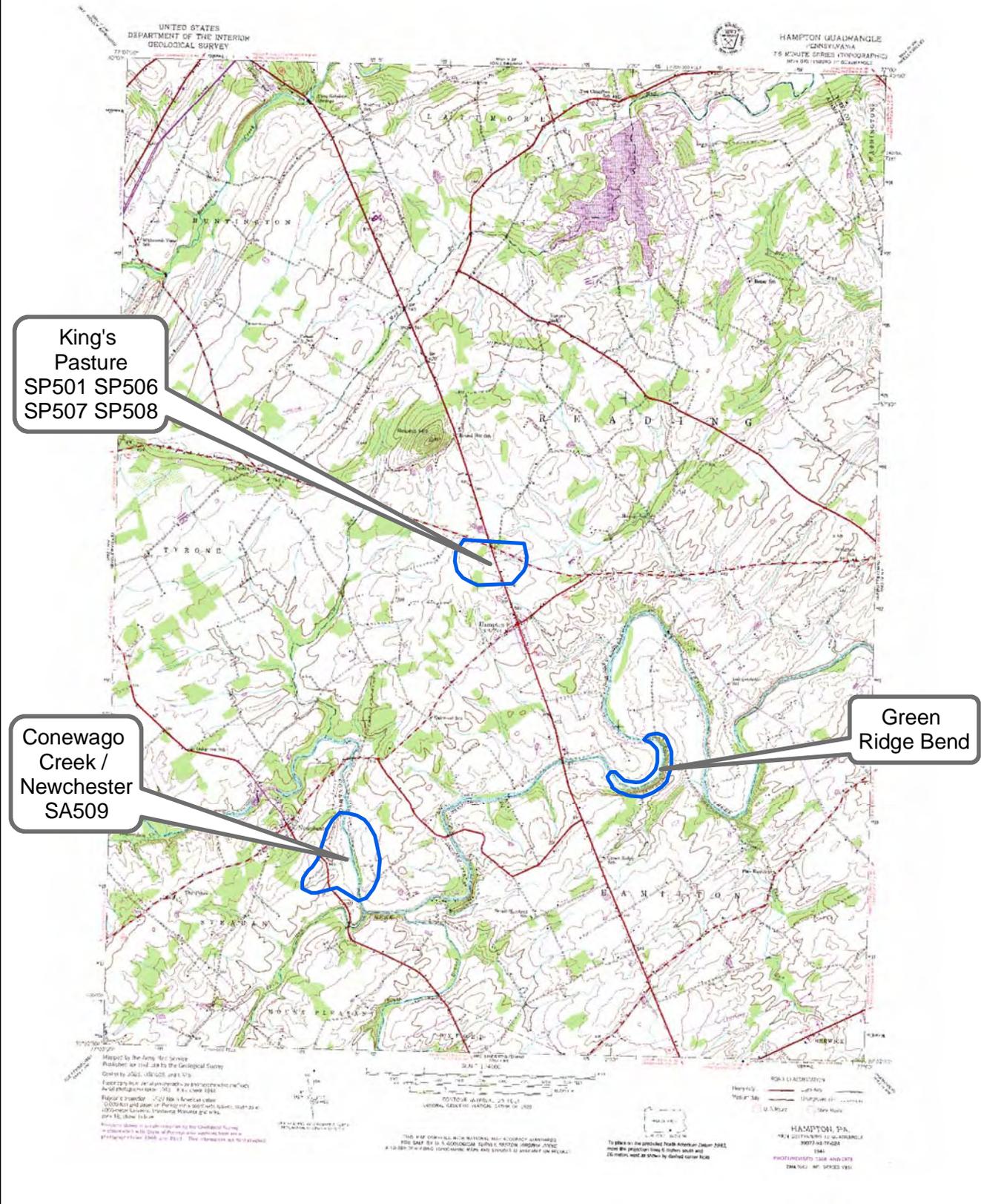
	Code	<u>TNC Ranks*</u>		<u>Legal Status*</u>		Last Seen	Quality**
		Global	State	Fed.	State		
NATURAL COMMUNITIES:							
SPECIAL PLANTS:							
	SP501	G5	S3	N	PE	06-08-95	D
	SP506	G5	S3	N	TU	06-08-95	B
	SP507	G4G5	S2	N	PT	06-08-95	BC
	SP508	G5	S3	N	TU	06-09-92	C
SPECIAL ANIMALS:							
	SP509	G3	S2	C2	N	09-14-95	E
LOCALLY SIGNIFICANT: GREEN RIDGE BEND							
HQ-CWF:							
MANAGED AREAS: State Game Lands 249							

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

** Please refer to Appendix II for Quality ranks.

Note: Outlined areas represent watershed or subwatershed areas that encompass the element(s) of concern. Activities within this area could potentially impact these elements (see page 29 for more information). Full size maps are available at the Adams County Office of Planning and Development.

Hampton Quadrangle



Hampton Quadrangle

CONEWAGO CREEK/NEWCHESTER/SA509 (Reading & Straban Twps.) - An animal species that has been recommended for PA-Endangered status was discovered at this site in 1995. The stream flows over a series of cobbles and low ledges and supports common animals such as crayfish, freshwater clam (Pisidium), caddisflies, and several species of fish. Native plants such as lizards tail (Saururus cernuus), rice cut-grass (Leersia oryzoides), box-elder (Acer negundo), pin oak, sycamore, and elm line the stream edges. Clean flowing water is important for the survival of **SP509**. Maintaining woodland buffers along the stream to minimize sedimentation and nutrient loading can help to protect both the rare animal (**SP509**) as well as the fisheries here.

SP501, SP506, SP507, & SP508 (Reading Twp.) - "King's Pasture" - This abandoned marshy pasture has a very diverse herbaceous flora. Wetter areas of the site are dominated by grasses, sedges, skunk cabbage (Symplocarpus foetidus), and sensitive fern (Onoclea sensibilis). Woody species such as eastern red cedar (Juniperus virginiana), silky dogwood (Cornus ammomum), American elm (Ulmus americana), and boxelder occur primarily in adjacent hedge rows though there is some scattered encroachment into the open wetland. Four species of special concern are found here. In 1992 several hundred stems of **SP506** were observed in the marshy areas, along with more than a hundred stems of PA-threatened plant, **SP507**. The wet meadow also supports a fair population of **SP508** and a poor population of **SP501**, a PA-Endangered plant. Although this site has received drainage manipulation in the past further alteration of its hydrology could decrease the diversity of wetland species and lead to the decline of these species of special concern.

GREEN RIDGE BEND (Hamilton Twp.) is a Locally Significant site along Conewago Creek that supports a diverse flora and fauna. The steep wooded slopes are dominated by chestnut oak, white oak, and flowering dogwood on the drier sections, and hemlock and sugar maple on the more mesic, north-facing slope. Rock outcrops support plants that are relatively uncommon in the county including rusty woodsia fern (Woodsia ilvensis), wild pink (Silene carolina), and others. The stream supports a diversity of freshwater mussels and fish. Great blue herons and osprey were also observed at the site. Maintaining a wooded buffer on both sides of the stream helps to maintain water quality for the benefit of both the fisheries and the shellfish here; the woodlands help to reduce run-off and siltation and the shade keeps water temperatures cool.

USGS QUADRANGLE MAP: Hanover

Code	<u>TNC Ranks*</u>	<u>Legal Status*</u>	Last Seen	Quality**
	Global State	Fed. State		

NATURAL COMMUNITIES:

SPECIAL PLANTS:

SPECIAL ANIMALS:

LOCALLY SIGNIFICANT:

HQ-CWF:

MANAGED AREAS:

Hanover Quadrangle

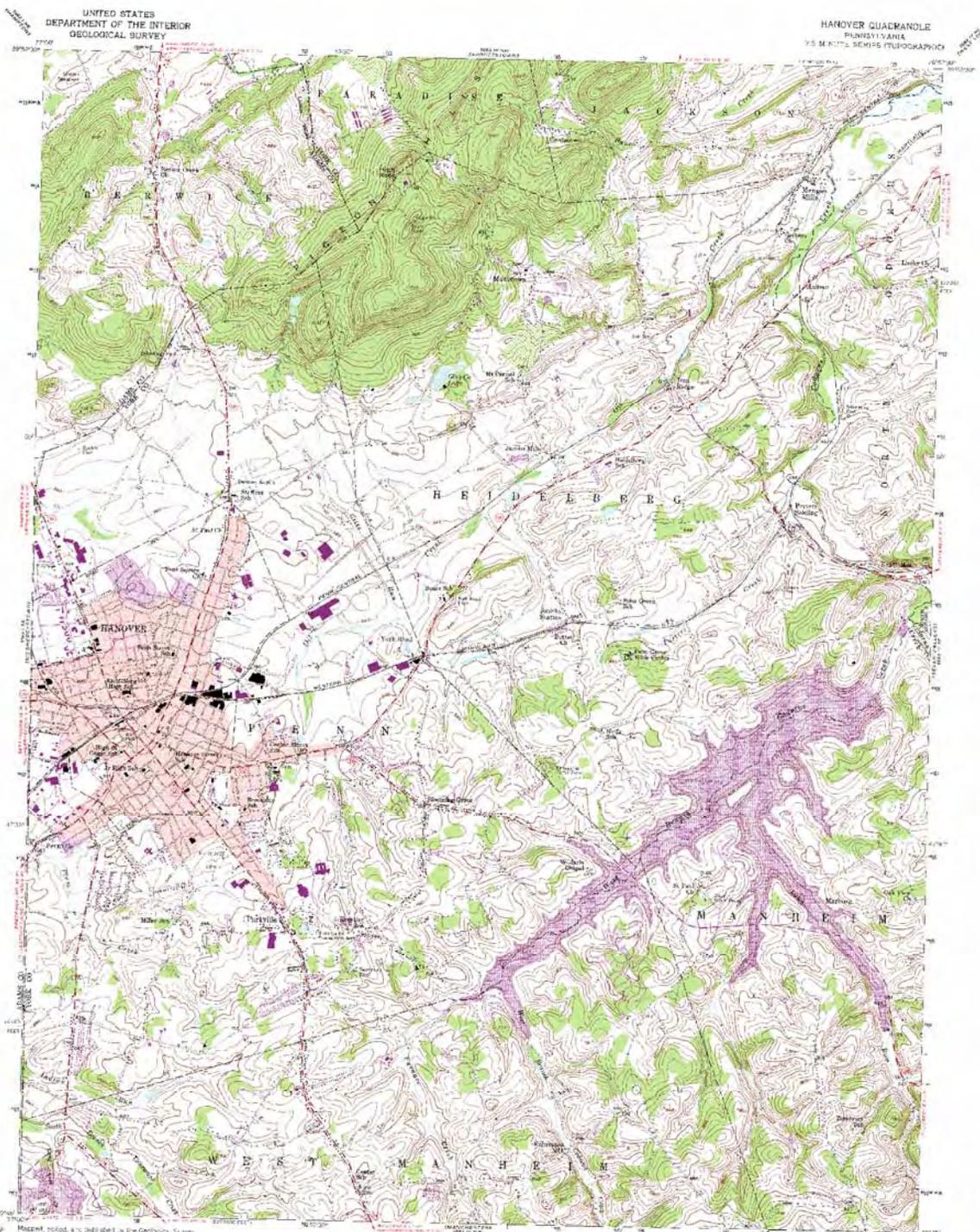
Only a small portion of Adams County is included along the western edge of the map adjacent to York County. No species of special concern, exemplary natural communities, or Locally Significant sites (i.e., sites of countywide significance) were identified in this part of the county. However, other areas that are important to natural diversity on a township level (e.g., woodlands, streams, wetlands) do occur in townships on this quadrangle.

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

** Please refer to Appendix II for Quality ranks.

Note: Outlined areas represent watershed or subwatershed areas that encompass the element(s) of concern. Activities within this area could potentially impact these elements (see page 29 for more information). Full size maps are available at the Adams County Office of Planning and Development.

Hanover Quadrangle



UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

Magnetic declination is 10° 00' east of true at the date of publication. The magnetic declination for any other date may be obtained from the U.S. Geological Survey, Reston, Virginia 20192.

Topographic maps are published by the U.S. Geological Survey in a variety of scales. The scale of this map is 1:50,000. The scale of the map is 1:50,000. The scale of the map is 1:50,000.

Horizontal datum is North American Datum of 1983. The datum is North American Datum of 1983. The datum is North American Datum of 1983.

Vertical datum is Mean Sea Level. The datum is Mean Sea Level. The datum is Mean Sea Level.

Red line indicates a major highway. The red line indicates a major highway. The red line indicates a major highway.

Blue line indicates a railroad. The blue line indicates a railroad. The blue line indicates a railroad.

Black line indicates a road. The black line indicates a road. The black line indicates a road.

Green line indicates a stream. The green line indicates a stream. The green line indicates a stream.

Blue line indicates a water body. The blue line indicates a water body. The blue line indicates a water body.

Black line indicates a boundary. The black line indicates a boundary. The black line indicates a boundary.

Black line indicates a boundary. The black line indicates a boundary. The black line indicates a boundary.



COURTESY: NATIONAL SURVEY
INTERNATIONAL SURVEY CENTER, BOSTON, MA 02115

THIS MAP COMPILED WITH AIR PHOTO MAP ACCURACY STANDARDS
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MA 01923

A POLAR GRID OF TOPOGRAPHIC MAPS AND SYMBOLS IS AVAILABLE ON REQUEST



ROAD CLASSIFICATION

Majority — Light blue
Minority — Dark blue
State route — Red

HANOVER, PA.
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USGS QUADRANGLE MAP: Iron Springs

	Code	<u>TNC Ranks*</u>		<u>Legal Status*</u>		Last Seen	Quality**
		Global	State	Fed.	State		
NATURAL COMMUNITIES:	NC508	G?	S3	N	N	1995	E
SPECIAL PLANTS:	SP509	G5	S3S4	N	TU	08-24-95	D
	SP514	G4	S4S3	N	PC	mid 1990s	E
SPECIAL ANIMALS:							
LOCALLY SIGNIFICANT:	STRAWBERRY HILL PRESERVE						
HQ-CWF:	East Branch Antietam Creek, Middle Creek						
MANAGED AREAS:	Michaux State Forest, Strawberry Hill Nature Center and Preserve, Waynesboro Watershed						
OTHER:	sp507 - see Fairfield quadrangle SP507.						

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

** Please refer to Appendix II for Quality ranks.

Note: Outlined areas represent watershed or subwatershed areas that encompass the element(s) of concern. Activities within this area could potentially impact these elements (see page 29 for more information). Full size maps are available at the Adams County Office of Planning and Development.

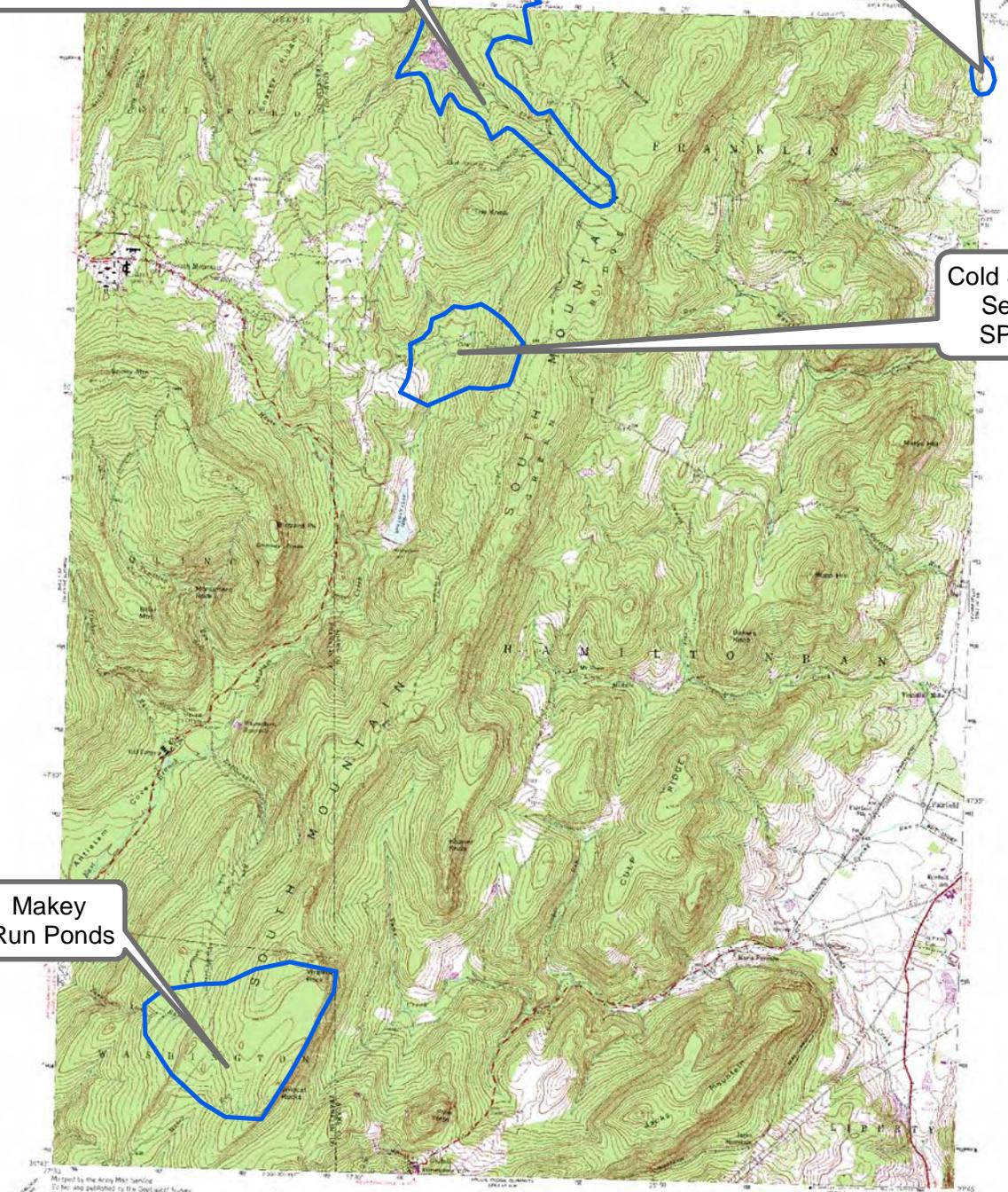
Iron Springs Quadrangle

Carbaugh Run State Forest Natural Area
NC508

Adams County Winery Site

Cold Spring
Seeps
SP509

Makey
Run Ponds



Map by the Army Map Service
to be and published by the Geological Survey
CROSS REFERENCE TO THE 1:50,000
TOPOGRAPHIC MAPS OF THE
ADAMS COUNTY AREA
GIVEN TO THE GEOLOGICAL SURVEY
BY THE ARMY MAP SERVICE
ON 10/10/50
THIS MAP COMPILED WITH AIRPHOTO MAP ADJUSTMENT STRIPS
FOR SALE BY U.S. GEOLOGICAL SURVEY
DENVER, COLORADO 80215 OR RESTON, VIRGINIA 20192
A COLOR COPY OF THIS MAP AND STRIPS IS AVAILABLE ON REQUEST

IRON SPRINGS, CO.
7.5-MINUTE QUADRANGLE
PHOTOGRAPHIC 1984 AND 1973
AND 1947 BY THE ARMY MAP SERVICE

Iron Springs Quadrangle

NC508 (Hamiltonban & Franklin Twps.) - "Carbaugh Run" is an EV (Exceptional Value) stream as designated by DCNR. The EV status applies to the section of Carbaugh Run from its source to the first pipeline crossing upstream of Route 30 in Adams and Franklin counties. EV streams are currently mapped as High Gradient Clearwater Creek natural communities in the PNDI data base. See also Caledonia Park quadrangle, **NC536**. **NC508** falls within **Michaux State Forest**. Most of the watershed area for the lower section of the EV stream has been designated as **Carbaugh Run State Forest Natural Area**.

SP509 (Franklin Twp.) - "Cold Spring Seeps" - A small population of a plant species whose status is Tentatively Undetermined (this species has been suggested for PT status) occurs in partial light in wooded slopes along Antietam Creek. This site is primarily upland forest dominated by a mix of hemlock, white pine, and tulip poplar. Two large spring pools (i.e. Cold Spring) and numerous small seeps characterize the area. These wetter soils support Rhododendron and denser patches of herbaceous vegetation including sphagnum moss, skunk cabbage, cinnamon fern and other wetland species. This site is partly within **Michaux State Forest**.

SP507 - "Adams County Winery Site" a small portion of the buffer area for this site overlaps onto this quadrangle; see Fairfield quadrangle **SP507** for a complete description.

SA514 – NEW - "Kepner Knob Site" (Hamiltonban Twp.) - A Pennsylvania Candidate animal species of concern was observed at this site on various occasions during the mid-1990's. No disturbances were noted. A more thorough survey of the site for this species and its habitat is recommended. This site is partially within **Michaux State Forest**.

STRAWBERRY HILL PRESERVE (Hamiltonban Twp.) - Locally Significant -This site contains forests of varying ages including older stands of hemlock with yellow birch along the various branches of swamp creek, and a variety of oaks mixed with beech on slopes above the stream valley. There is a diversity of herbs, ferns, sedges, and grasses growing throughout the forest with the greatest variety of species appearing in the canopy gaps along the stream corridor. The continued preservation of this site will allow the younger stands in the forest to mature and the older stands to become more heterogeneous, and therefore create habitat for a diverse array of animal and plant species. A study done by The Morgan Group (1989) for **Strawberry Hill Nature Center and Preserve** contains a list of the plant and animal species found at the site.

East Branch Antietam Creek is a HQ-CWF throughout its basin from its source to the Adams/Franklin county line.

Middle Creek is a HQ-CWF throughout its basin from its source to the Route 116 Bridge at Fairfield.

USGS QUADRANGLE MAP: Littlestown

Code	<u>TNC Ranks*</u> Global State	<u>Legal Status*</u> Fed. State	Last Seen	Quality**
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NATURAL COMMUNITIES:

SPECIAL PLANTS:

SPECIAL ANIMALS:

LOCALLY SIGNIFICANT:

HQ-CWF:

MANAGED AREAS:

Littlestown Quadrangle

No species of special concern, exemplary natural communities, or Locally Significant sites (i.e., sites of countywide significance) were identified in this part of the county. Other areas that are important to natural diversity on a township level (e.g., woodlands, streams, wetlands) may be found in townships on this quadrangle.

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

** Please refer to Appendix II for Quality ranks.

Note: Outlined areas represent watershed or subwatershed areas that encompass the element(s) of concern. Activities within this area could potentially impact these elements (see page 29 for more information). Full size maps are available at the Adams County Office of Planning and Development.

USGS QUADRANGLE MAP: Manchester

Code	<u>TNC Ranks*</u>		<u>Legal Status*</u>		Last Seen	Quality**
	Global	State	Fed.	State		

NATURAL COMMUNITIES:

SPECIAL PLANTS:

SPECIAL ANIMALS:

LOCALLY SIGNIFICANT:

HQ-CWF:

MANAGED AREAS:

Manchester Quadrangle

A very narrow section of Adams County occurs at the western edge of this quadrangle. No species of special concern, exemplary natural communities, or Locally Significant sites (i.e., sites of countywide significance) were identified in this area.

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

** Please refer to Appendix II for Quality ranks.

Note: Outlined areas represent watershed or subwatershed areas that encompass the element(s) of concern. Activities within this area could potentially impact these elements (see page 29 for more information). Full size maps are available at the Adams County Office of Planning and Development.

USGS QUADRANGLE MAP: McSherrystown

	Code	<u>TNC Ranks*</u>		<u>Legal Status*</u>		Last Seen	Quality**
		Global	State	Fed.	State		
NATURAL COMMUNITIES:							
SPECIAL PLANTS:							
	SP502	G5	S1	N	PE	08-09-95	C
	SP503	G5	S1	N	PE	08-09-95	CD
SPECIAL ANIMALS:							
LOCALLY SIGNIFICANT:							
HQ-CWF:							
MANAGED AREAS:							

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

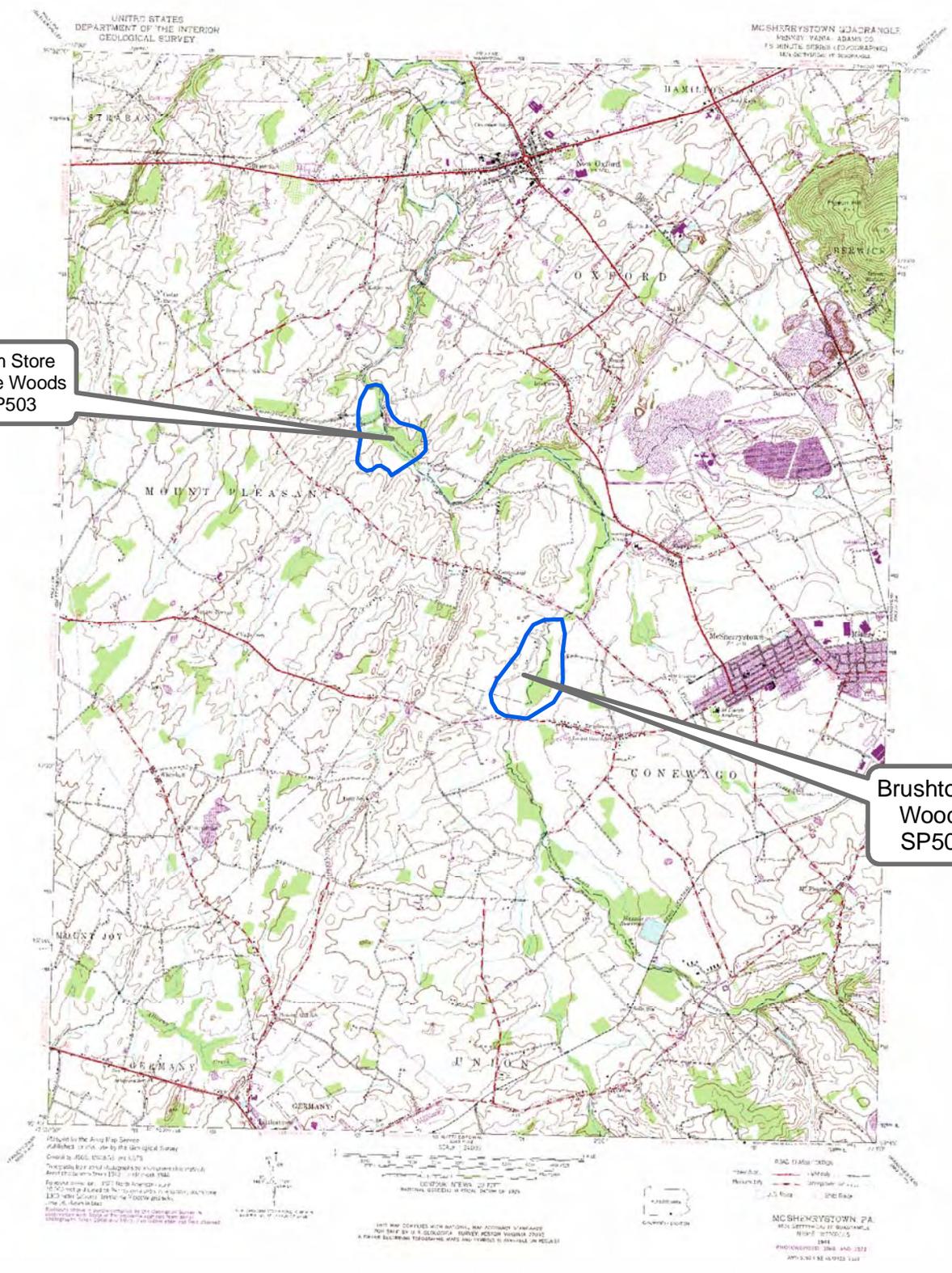
** Please refer to Appendix II for Quality ranks.

Note: Outlined areas represent watershed or subwatershed areas that encompass the element(s) of concern. Activities within this area could potentially impact these elements (see page 29 for more information). Full size maps are available at the Adams County Office of Planning and Development.

McSherrytown Quadrangle

Storm Store
Bridge Woods
SP503

Brushtown
Woods
SP502



McSherrystown Quadrangle

SP502 (Conewago, Union & Mount Pleasant Twps.) - "Brushtown Woods" - A small population of a PA-Endangered tree species occurs in a large section (approximately 50 acres) of riparian forest along the South Branch Conewago Creek. The forest is dominated by sycamore (Platanus occidentalis), hickory (Carya sp.), and ash (Fraxinus sp.). The species represented by **SP502** does not form pure stands but occurs as an infrequent member in some bottomland hardwood forest types. It prefers deep, moist, but well-drained soils such as those often found along river courses (Harlow & Harrar 1969), conditions which aptly describe this site. Some reproduction was apparent and it is likely that this population will persist for many years as long as the floodplain forest remains intact and stream flow is not altered.

SP503 (Mount Pleasant & Oxford Twps.) - "Storm Store Bridge Woods" - A small population of a PA-Endangered tree occurs in a narrow strip of floodplain forest along South Branch Conewago Creek. At this site, the forest is dominated by pin oak, silver maple (Acer saccharinum), sycamore, hickory, and ash. This population (**SP503**), comprised of a dozen aging trees, is vulnerable to loss due to the small number of individuals, the lack of successful reproduction, and the limited amount of riparian forest habitat at this site. Reproduction may be impeded by the density of weedy non-native species (multiflora rose and garlic mustard) in some areas of the woodland or other factors. However, the mature trees could persist for many years if the woodland remains intact.

USGS QUADRANGLE MAP: Mount Holly Springs

	<u>TNC Ranks*</u>	<u>Legal Status*</u>	Last	
Code	Global State	Fed. State	Seen	Quality**

NATURAL COMMUNITIES:

SPECIAL PLANTS:

SPECIAL ANIMALS:

LOCALLY SIGNIFICANT:

HQ-CWF:

MANAGED AREAS:

Mount Holly Springs Quadrangle

No species of special concern, exemplary natural communities, or Locally Significant sites (i.e., sites of countywide significance) were identified in this part of the county. Other areas that are important to natural diversity on a township level (e.g., woodlands, streams, wetlands) are found in Adams County townships on this quadrangle.

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

** Please refer to Appendix II for Quality ranks.

Note: Outlined areas represent watershed or subwatershed areas that encompass the element(s) of concern. Activities within this area could potentially impact these elements (see page 29 for more information). Full size maps are available at the Adams County Office of Planning and Development.

Mount Holly Springs Quadrangle



Prepared by the Army in 1953 and revised
 Published for sale by the Geological Survey
 (Circular 1036, 1036a, 1036b, 1036c, and 1036d)
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 U.S. GOVERNMENT PRINTING OFFICE: 1953
 1:25,000 (Scale of 1 inch = 2,000 feet)
 1:25,000 (Scale of 1 inch = 2,000 feet)
 1:25,000 (Scale of 1 inch = 2,000 feet)
 1:25,000 (Scale of 1 inch = 2,000 feet)

SCALE 24000
 CONTINUED SEVERAL 15 MINUTE
 MAPS COVER THIS QUADRANGLE

MOUNT HOLLY SPRINGS, PA.
 7.5 MINUTE SERIES
 1953
 PHOTOGRAPHIC (1948 AND 1953)
 AND AIR PHOTO (1953)

USGS QUADRANGLE MAP: Taneytown

Code	<u>TNC Ranks*</u>	<u>Legal Status*</u>	Last Seen	Quality**
	Global State	Fed. State		

NATURAL COMMUNITIES:

SPECIAL PLANTS:

SPECIAL ANIMALS:

LOCALLY SIGNIFICANT:

HQ-CWF:

MANAGED AREAS:

Taneytown Quadrangle

No species of special concern, exemplary natural communities, or Locally Significant sites (i.e., exemplary on a countywide basis) were identified in this part of the county. Wooded areas, streams, and other features that are important to natural diversity on the township level are found in townships occurring on this quadrangle.

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

** Please refer to Appendix II for Quality ranks.

Note: Outlined areas represent watershed or subwatershed areas that encompass the element(s) of concern. Activities within this area could potentially impact these elements (see page 29 for more information). Full size maps are available at the Adams County Office of Planning and Development.

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Appendices

APPENDIX I. FEDERAL AND STATE STATUS, AND THE NATURE CONSERVANCY (TNC) 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 threat(s) 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.

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.

Appendix I (Continued.)

- 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.

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.

Appendix I (Continued.)

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.

TNC 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.

TNC 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 nonbreeding 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 infraspecific 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 II PENNSYLVANIA NATURAL DIVERSITY 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 state-wide 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	Poor occurrence: protection of the occurrence may be worthwhile for historical reasons or only if no higher ranked occurrences exist. A D-rank community is severely disturbed, its structure and composition been greatly altered, and recovery to original conditions, despite management and time, essentially will not take place. A D-rank population of a sensitive species is very small with a high likelihood of dying out or being destroyed, and exists in a highly disturbed and vulnerable habitat.
E	Verified as extant, but has not been given a rank; additional information needed to evaluate quality.

* Intermediate ranks may also be assigned.

APPENDIX III THE NATURE CONSERVANCY RECOMMENDED 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, 34 Airport Drive, Middletown, PA 17057 (717)948-3962. Additional forms may be obtained from this office. Thank you for your contribution.

APPENDIX IV THE NATURE CONSERVANCY POTENTIAL NATURAL AREA SURVEY FORM

COUNTY _____ NO. _____ QUAD NAME/CODE: _____
 Site Name: _____ PHOTO NO./DATE: _____
 Location: _____ Township: _____

Air Survey Surveyors: _____ Date: _____

FOREST AGE	CUTTING			GRAZING			RECVRY POT			PRIORITY*					
	yng	mat	old	lt	hvy	clr	lt	mod	hvy	gd	fr	pr	hi	med	lo
<u>Wetland</u>															
Marsh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Meadow	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Shrub	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Seep	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Fen	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bog	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pond Shore	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Conifer	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hdw-Cnfr	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hardwood	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Floodpln	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
_____	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
_____	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<u>Upland</u>															
Ser Barr	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Gras Land	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Lim Barr	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Rck Glade	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pine Sav	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Oak Sav	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pine For	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Oak For	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hdw For	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hdw-Cnfr	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cliff	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
_____	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
_____	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Ground Survey Surveyors: _____ Date: _____

Community Type	Eliminate	Notable	Natural	Quality-Rank
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____

Comments: _____

**THE NATURE CONSERVANCY
POTENTIAL NATURAL AREAS SURVEY FORM--NATURAL COMMUNITY**

NATURAL COMMUNITY (C rank or better) _____

Map the exact boundary around ranked portions of natural community.

EO-RANK: _____ WHY? _____

COMMON PLANTS (or attach species list): _____

OTHER PLANTS: _____

DOMINANTS OF THE PLANT COMMUNITIES (PC) IN THE NATURAL COMMUNITY:

1. _____
2. _____
3. _____
4. _____

SIGNS OF DISTURBANCE: _____

SPECIAL PLANT (map) FREQUENCY/HOW MANY? IN HOW MUCH AREA? PC#

ANIMALS: _____

APPENDIX V. THE NATURE CONSERVANCY SPECIAL PLANT SURVEY FORM

Site Name: _____ Date: _____ Source Code: _____ Quad Name: _____
 _____ Date: _____ Source Code: _____ Quad Code: _____
 _____ Date: _____ Source Code: _____ State: _____ County: _____
 _____ Date: _____ Source Code: _____ Field Quad #: _____
 _____ Date: _____ Source Code: _____ Full extent of EO known and mapped? yes no
 Precise locations of individuals or groups mapped on base map? yes no

BIOLOGY

Element Name: _____ Element Code: _____ Occ. #: _____

<u>Phenology</u>	<u>Approx. #</u>	<u>Population Area</u>	<u>Age Structure</u>	<u>Vigor</u>
<input type="checkbox"/> in leaf <u>Ramets</u>	<u>Genets</u>	<input type="checkbox"/> 1 yd ²	<input type="checkbox"/> % seedlings	<input type="checkbox"/> very feeble
<input type="checkbox"/> in bud <input type="checkbox"/> 1-10	_____	<input type="checkbox"/> 1-5 yd ²	<input type="checkbox"/> % immature	<input type="checkbox"/> feeble
<input type="checkbox"/> in flower	<input type="checkbox"/> 11-50	_____	<input type="checkbox"/> 5-10 yd ²	<input type="checkbox"/> % 1st year <input type="checkbox"/> normal
<input type="checkbox"/> immature fruit	<input type="checkbox"/> 51-100	_____	<input type="checkbox"/> 10-1000yd ²	<input type="checkbox"/> % mature <input type="checkbox"/> vigorous
<input type="checkbox"/> mature fruit	<input type="checkbox"/> 101-1000	_____	<input type="checkbox"/> 100yd ² -2ac	<input type="checkbox"/> % senescent <input type="checkbox"/> exceptionally
<input type="checkbox"/> seed dispersing	<input type="checkbox"/> 1001-10,000	_____	<input type="checkbox"/> 2 ac+	<input type="checkbox"/> vigorous
	<input type="checkbox"/> 10K+	_____	<input type="checkbox"/> est. area	
	<input type="checkbox"/> est. #	_____		

Comments on above: _____ Evidence of reproduction? yes no Explain: _____ Type of reproduction: _____
 sexual asexual both
 Evidence of symbiotic or parasitic relationships? yes no Explain: _____
 Evidence of disease, predation, etc. yes no Explain: _____

Success at Each Stage of Life Cycle

good fair poor none uncertain
 reproduction _____ Comments: _____
 dispersal _____
 establishment _____
 maintenance _____

HABITAT

<u>Aspect</u>	<u>Slope</u>	<u>Light</u>	<u>Topographic position</u>	<u>Moisture</u>
<input type="checkbox"/> N <input type="checkbox"/> NE	<input type="checkbox"/> Flat	<input type="checkbox"/> Open	<input type="checkbox"/> Crest	<input type="checkbox"/> Inundated(Hydric)
<input type="checkbox"/> E <input type="checkbox"/> NW	<input type="checkbox"/> 0-10	<input type="checkbox"/> Partial	<input type="checkbox"/> Upper slope	<input type="checkbox"/> Saturated(Wet-mesic)
<input type="checkbox"/> S <input type="checkbox"/> SE	<input type="checkbox"/> 10-35	<input type="checkbox"/> Filtered	<input type="checkbox"/> Mid-slope	<input type="checkbox"/> Moist(Mesic)
<input type="checkbox"/> W <input type="checkbox"/> SW	<input type="checkbox"/> 35+	<input type="checkbox"/> Shade	<input type="checkbox"/> Lower-slope	<input type="checkbox"/> Dry-Mesic
	<input type="checkbox"/> Vertical		<input type="checkbox"/> Bottom	<input type="checkbox"/> Dry(Xeric)

Elevation: _____ feet to _____ feet
 CROSS SECTION OF TOPOGRAPHY (HABITAT)-include scale, directions, element position: _____

Appendix V (Concluded.)

Associated natural community/plant community: _____ Natural community form completed? yes no

Associated plant species: _____

Substrate/Soils: _____ Estimated # of acres of potential habitat for element in immediate area: _____

IDENTIFICATION

Photograph taken? yes no

Specimen taken? yes no If yes, give coll. # & repository: _____

Do other members of this genus occur at this site? yes no If yes, complete below:

List: _____

Hybridization? yes no

Identification problems? yes no

CONSERVATION

Evidence of disturbance: _____

Threats to EO: _____

How large an area is needed to provide species survival here? _____

Explain: _____

Conservation/management needs: _____

Research needs: _____ Data security? yes no If yes, explain: _____

SUMMARY

EO Quality: (i.e., how representative is this occurrence on rangewide scale? Consider the size & productivity of the population & the vitality & vigor of the individuals.)

A-Excellent B-Good C-Marginal D-Poor

Comments: _____

EO Condition: (i.e., is the habitat supporting the EO pristine or degraded? Is there a potential for the habitat to recover from past disturbances?)

A-Excellent B-Good C-Marginal D-Poor

Comments: _____

EO Viability: (i.e., what are the long-term prospects for continued existence of this occurrence at the indicated level of quality?)

A-Excellent B-Good C-Marginal D-Poor

Comments: _____

EO Defensibility: (i.e., can this occurrence be protected from extrinsic human factors?)

A-Excellent B-Good C-Marginal D-Poor

Comments: _____

EO Rank: (i.e., a summary of all the factors listed above) A B C D

Comments: _____

APPENDIX VI. CLASSIFICATION OF NATURAL COMMUNITIES IN PENNSYLVANIA

(1995 DRAFT)

COMMUNITY NAME	MAP CODE	GLOBAL RANK*	STATE RANK*
<u>ESTUARINE COMMUNITIES</u>			
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
<u>RIVERINE COMMUNITIES</u>			
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
<u>LACUSTRINE</u>			
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

Appendix VI (Continued.)

COMMUNITY NAME	MAP CODE	GLOBAL RANK*	STATE RANK*
<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
Appendix VI (Continued.)			
FLOODPLAIN FOREST	TFA	G?	S2
RIVER GRAVEL COMMUNITY	TGA	G?	S4S5

COMMUNITY NAME	MAP CODE	GLOBAL RANK*	STATE RANK*
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?
<u>SUBTERRANEAN COMMUNITIES</u>			
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
<u>DISTURBED COMMUNITIES</u>			
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 VI (Concluded.)

The following is a brief description and list of species typically found in the natural communities of Adams County, Pennsylvania (based on Smith 1983).

Ephemeral/Fluctuating Natural Pool (LCB): A community inhabiting a small (less than 0.5 acres) basin, with a naturally fluctuating water level. Water levels fluctuate seasonally or semi-annually from dry or nearly dry to inundated. Water comes from runoff and direct precipitation. Vegetation ranges from none (dead-leaf ponds) to completely vegetated, often in zones representing length of inundation. These woodland ponds are breeding areas for amphibians, aquatic insects and other invertebrates. A notable lack of fish is indicative of this type of community.

Broad-leaved cattail (Typha latifolia)
Sedge (Carex spp.)
Spike rush (Eleocharis spp.)
Bulrush (Scirpus spp.)
Rush (Juncus spp.)
Odonates (dragonflies and damselflies)
fairy shrimp (Amphipoda)

High-gradient Clearwater Creek (RCC): This stream community drains a watershed of less than 200 square miles, is less than 50 feet wide, and has a drop of more than 10 feet per mile. The substrate is composed of bedrock, boulders, and alluvial deposits of sand and gravel; riffles and pools are common. The water is generally highly oxygenated and relatively cold.

Brook trout (Salvelinus fontinalis)
Mayflies (order Ephemeroptera)

Ridgetop Dwarf-tree Forest (TCD): A forest community on the tops of high ridges where thin, infertile soils, extreme temperatures, and high wind velocities create harsh growing conditions. The forest is characterized by stunted oaks (less than 15 feet) and shrubs. Adverse growing conditions, successive fires, and, in some cases, cutting have acted to arrest succession in these areas. Also known as Pitch pine-Scrub oak barrens.

Scrub oak (Quercus ilicifolia)
Chestnut oak (Q. montana)
Pitch pine (Pinus rigida)
Sassafras (Sassafras albidum)
Pin cherry (Prunus pensylvanica)
Lowbush blueberry (Vaccinium angustifolium)
Black huckleberry (Gaylussacia baccata)
Black chokeberry (Aronia melanocarpa)

APPENDIX VII SPECIAL PLANTS AND ANIMALS OF ADAMS COUNTY

PLANTS

<u>SCIENTIFIC NAME</u>	<u>COMMON NAME</u>
<u>Asplenium pinnatifidum</u>	Lobed spleenwort
<u>Aster radula</u>	Rough-leaved aster
<u>Carex bullata</u>	Bull sedge
<u>Carex buxbaumii</u>	Brown sedge
<u>Carex tetanica</u>	Wood's sedge
<u>Cirsium horridulum</u>	Horrible thistle
<u>Dicentra eximia</u>	Wild bleeding-hearts
<u>Dichanthelium oligosanthos</u>	Heller's witch grass
<u>Glyceria acutiflora</u>	Sharp-flowered manna-grass
<u>Helianthemum bicknellii</u>	Bicknell's hoary rockrose
<u>Iris verna</u>	Dwarf iris
<u>Juncus biflorus</u>	Grass-leaved rush
<u>Juncus brachycarpus</u>	Short-fruited rush
<u>Opuntia humifusa</u>	Prickly-pear cactus
<u>Phlox pilosa</u>	Downy phlox
<u>Quercus shumardii</u>	Shumard's oak
<u>Ranunculus micranthus</u>	Small-flowered crowfoot
<u>Ribes missouriense</u>	Missouri gooseberry
<u>Scirpus ancistrochaetus</u>	Northeastern bullrush
<u>Stylosanthes biflora</u>	Pencil-flower
<u>Tripsacum dactyloides</u>	Eastern gamma-grass
<u>Woodwardia areolata</u>	Netted Chainfern

Only a few animal species of special concern are currently known in Adams County. In an effort to assure maximum protection of those species, a list of the animals is not provided. Some plant species of concern may also have been omitted from the list above for security reasons. Any landowners of sites that contain species of concern as identified in this report may obtain additional information by writing to the PA Science Office of The Nature Conservancy at 34 Airport Drive, Middletown PA 17057.

APPENDIX VIII NAMES OF COMMON PLANT SPECIES REFERRED TO IN TEXT

COMMON NAME/NATIVE PLANTS	SCIENTIFIC NAME
ash	<u>Fraxinus</u> sp.
American pennyroyal	<u>Hedeoma pulegioides</u>
big bluestem	<u>Andropogon gerardii</u>
black cherry	<u>Prunus serotina</u>
black gum	<u>Nyssa sylvatica</u>
black walnut	<u>Juglans nigra</u>
blackberry	<u>Rubus</u> spp.
blueberry	<u>Vaccinium</u> spp.
low bush blueberry	<u>Vaccinium angustifolium</u>
box elder	<u>Acer negundo</u>
bracken fern	<u>Pteridium aquilinum</u>
bush clover	<u>Lespedeza</u> spp.
sedge <u>Carex</u> spp.	
cinnamon fern	<u>Osmunda cinnamomea</u>
clearweed	<u>Pilea pumila</u>
common mullein	<u>Verbascum thapsus</u>
cut-leaved coneflower	<u>Rudbeckia laciniata</u>
elm	<u>Ulmus</u> spp.
evening primrose	<u>Oenothera biennis</u>
golden alexanders	<u>Zizia aurea</u>
hackberry	<u>Celtis occidentalis</u>
hemlock	<u>Tsuga canadensis</u>
hickories:	
bitternut	<u>Carya cordiformis</u>
shagbark	<u>Carya ovata</u>
hop-hornbeam	<u>Ostrya virginiana</u>
huckleberry	<u>Gaylussacia</u> spp.
Indian grass	<u>Sorghastrum nutans</u>
little bluestem	<u>Schizachyrium scoparium</u>
lizards tail	<u>Saururus cernuus</u>
maples:	
red	<u>Acer rubrum</u>
silver	<u>Acer saccharinum</u>
sugar	<u>Acer saccharum</u>
marginal shield fern	<u>Dryopteris marginalis</u>
meadow grass	<u>Glyceria</u> spp.
monkeyflower	<u>Mimulus</u> sp.
mountain laurel	<u>Kalmia latifolia</u>
stinging nettles	<u>Urtica dioica</u>
oaks:	
black	<u>Quercus velutina</u>
chestnut	<u>Quercus montana</u> (=Q. prinus)
pin	<u>Quercus palustris</u>
red	<u>Quercus rubra</u>

Appendix VII (Concluded.)

COMMON NAME/NATIVE PLANTS

SCIENTIFIC NAME

oaks:	
scarlet	<u>Quercus coccinea</u>
scrub	<u>Quercus ilicifolia</u>
white	<u>Quercus alba</u>
New York fern	<u>Thelypteris noveboracensis</u>
persimmon	<u>Diospyros virginiana</u>
prickly-ash	<u>Zanthoxylum americanum</u>
pussytoes	<u>Antennaria</u> spp.
pitch pine	<u>Pinus rigida</u>
pokeweed	<u>Phytolacca americana</u>
red-cedar	<u>Juniperus virginiana</u>
rice cutgrass	<u>Leersia oryzoides</u>
rhododendron	<u>Rhododendron maximum</u>
rock polypody	<u>Polypodium virginianum</u>
royal fern	<u>Osmunda regalis</u>
rose	<u>Rosa</u> spp.
rusty woodsia	<u>Woodsia ilvensis</u>
sassafras	<u>Sassafras albidum</u>
sensitive fern	<u>Onoclea sensibilis</u>
sphagnum (moss)	<u>Sphagnum</u> spp.
spicebush	<u>Lindera benzoin</u>
silky dogwood	<u>Cornus amomum</u>
skunk cabbage	<u>Symplocarpus foetidus</u>
swamp azalea	<u>Rhododendron viscosum</u>
swamp dewberry	<u>Rubus hispidus</u>
sycamore	<u>Platanus occidentalis</u>
tick-trefoil	<u>Desmodium</u> spp.
tulip poplar	<u>Liriodendron tulipifera</u>
violet	<u>Viola</u> spp.
Virginia creeper	<u>Parthenocissus quinquefolia</u>
white pine	<u>Pinus strobus</u>
wild gooseberry	<u>Ribes</u> spp.
wild grape	<u>Vitis</u> spp.
wild pink	<u>Silene carolina</u>
wintergreen	<u>Gaultheria procumbens</u>
witch hazel	<u>Hamamelis virginiana</u>
yellow birch	<u>Betula alleghaniensis</u>

COMMON NAME/NON-NATIVE PLANTS

catalpa	<u>Catalpa</u> sp.
garlic mustard	<u>Alliaria officinalis</u>
oriental bittersweet	<u>Celastrus orbiculatus</u>
Japanese honeysuckle	<u>Lonicera japonica</u>
mile-a-minute weed	<u>Polygonum perfoliatum</u>
purple loosestrife	<u>Lythrum salicaria</u>
stilt grass	<u>Microstegium vimineum</u>
tree of heaven	<u>Ailanthus altissima</u>